



**Dedicated to stimulate demand for sustainable  
energy skills in the construction sector**

[www.busleague.eu](http://www.busleague.eu)

<b>Document:</b>	<b>D9 (D2.3): Ethnographic Research Report on the recognition of energy efficiency skills</b>
Prepared by:	Domen Bančič & Gregor Cerinšek (IRI UL)
Contributors:	Naghmeh Altmann & Georg Trnka (AEA) Dragomir Tzanev (EnE) Henry Le Marois & Narjisse Ben Moussa (AVE) Alice Ryan & Marion Jammet (IGBC) Lis O'Brien & Seamus Hoyne (LIT) María José Esparza & Leticia Ortega (IVE) Dirk de Wit & Jan Cromwijk (ISSO)
Date:	19-5-2021



*This project has received funding from the European Union's h2020 framework programme for research and innovation under grant agreement no 892894.*

## TABLE OF CONTENTS

<b>I</b>	<b>Executive Summary.....</b>	<b>5</b>
	<b>Introduction .....</b>	<b>8</b>
1.1	Report outline.....	10
1.2	Research method outline .....	11
1.3	Relations to other BUSLeague Tasks and WPs.....	13
<b>2</b>	<b>Case studies .....</b>	<b>16</b>
2.1	Austria.....	16
2.1.1	<i>Notes on NIP &amp; Key outcomes from T2.2.....</i>	<i>16</i>
2.1.2	<i>New Insights.....</i>	<i>17</i>
2.1.3	<i>EE Skills – Value &amp; Expectations.....</i>	<i>17</i>
2.1.4	<i>Research participants.....</i>	<i>19</i>
2.2	Bulgaria .....	22
2.2.1	<i>Notes on NIP &amp; Key outcomes from T2.2.....</i>	<i>22</i>
2.2.2	<i>New Insights.....</i>	<i>22</i>
2.2.3	<i>EE Skills - Value &amp; Expectations.....</i>	<i>23</i>
2.2.4	<i>Research participants.....</i>	<i>24</i>
2.3	France.....	27
2.3.1	<i>Notes on NIP &amp; Key outcomes from T2.2.....</i>	<i>27</i>
2.3.2	<i>New Insights.....</i>	<i>27</i>
2.3.3	<i>EE Skills - Value &amp; Expectations.....</i>	<i>28</i>
2.3.4	<i>Research participants.....</i>	<i>30</i>
2.4	Ireland.....	34
2.4.1	<i>Notes on NIP &amp; Key outcomes from T2.2.....</i>	<i>34</i>
2.4.2	<i>New Insights.....</i>	<i>34</i>
2.4.3	<i>EE Skills - Value &amp; Expectations.....</i>	<i>35</i>
2.4.4	<i>Research participants.....</i>	<i>37</i>
2.5	Spain .....	42
2.5.1	<i>Notes on NIP &amp; Key outcomes from T2.2.....</i>	<i>42</i>
2.5.2	<i>New Insights.....</i>	<i>42</i>
2.5.3	<i>EE Skills - Value &amp; Expectations.....</i>	<i>43</i>
2.5.4	<i>Research participants.....</i>	<i>45</i>
2.6	The Netherlands .....	48
2.6.1	<i>Notes on NIP &amp; Key outcomes from T2.2.....</i>	<i>48</i>
2.6.2	<i>New Insights.....</i>	<i>48</i>
2.6.3	<i>EE Skills – Value &amp; Expectations.....</i>	<i>50</i>
2.6.4	<i>Research participants.....</i>	<i>52</i>
<b>3</b>	<b>Synthesis.....</b>	<b>56</b>
3.1	Barriers & Challenges .....	56
3.1.1	<i>Demand side .....</i>	<i>56</i>
3.1.2	<i>Supply side.....</i>	<i>59</i>
3.1.3	<i>Policy, Regulation &amp; Financing.....</i>	<i>71</i>
3.2	Opportunities & solutions.....	75
3.2.1	<i>Demand side .....</i>	<i>75</i>
3.2.2	<i>Supply side.....</i>	<i>78</i>
3.2.3	<i>Policy, Regulation &amp; Financing.....</i>	<i>85</i>
<b>4</b>	<b>ANNEX – Fieldnotes by country.....</b>	<b>88</b>
4.1	Austria.....	88
4.1.1	<i>Energy expert &amp; Trainer .....</i>	<i>88</i>

4.1.2	<i>Education provider &amp; expert in comprehensive comfort ventilation system</i> .....	92
4.1.3	<i>Teacher &amp; expert in HVAC systems</i> .....	95
4.1.4	<i>Education provider &amp; expert on solar-thermal systems</i> .....	97
4.1.5	<i>Association for Heat pump installer</i> .....	100
4.1.6	<i>Support to policy maker &amp; employee</i> .....	102
4.1.7	<i>Support to policy maker &amp; employee</i> .....	104
4.2	<i>Bulgaria</i> .....	109
4.2.1	<i>Independent expert (architect &amp; nZEB building designer)</i> .....	109
4.2.2	<i>Financial institution</i> .....	117
4.2.3	<i>Supplier</i> .....	121
4.2.4	<i>Local Authority</i> .....	127
4.2.5	<i>Professional association representatives</i> .....	130
4.2.6	<i>Local authorities representative</i> .....	135
4.3	<i>France</i> .....	142
4.4	<i>Ireland</i> .....	149
4.4.1	<i>DIY retail company</i> .....	149
4.4.2	<i>Local Government – Clare County</i> .....	152
4.4.3	<i>Building owner – Social housing company</i> .....	156
4.4.4	<i>DIY retail – Hardware Association Ireland</i> .....	160
4.4.5	<i>Local Government – Wexford County</i> .....	162
4.4.6	<i>SME – product supplier</i> .....	164
4.4.7	<i>SME – Retrofitting contractor</i> .....	168
4.4.8	<i>SME – Retrofitting contractor</i> .....	172
4.4.9	<i>SME – Energy Agency</i> .....	174
4.4.10	<i>Financial body</i> .....	177
4.4.11	<i>Training providers – WWETB</i> .....	179
4.5	<i>Spain</i> .....	188
4.5.1	<i>Professional organisation (independent workers)</i> .....	188
4.5.2	<i>Building manager representative</i> .....	191
4.5.3	<i>Consumer association</i> .....	195
4.5.4	<i>Financial body</i> .....	197
4.5.5	<i>Female worker</i> .....	198
4.5.6	<i>Regional Government</i> .....	200
4.6	<i>The Netherlands</i> .....	203
4.6.1	<i>Female worker</i> .....	203
4.6.2	<i>Training centre Rep's</i> .....	207
4.6.3	<i>SME employee &amp; professional energy advisor</i> .....	214
4.6.4	<i>Policy advisors &amp; professional organisation</i> .....	220
4.6.5	<i>Professional organization</i> .....	226

## CHANGE RECORDS

Version	Date	Author	Changes
Version 0.1	29.3.2021	IRI UL	First version for internal review
Versions 0.2-0.9		All contributors	Updates and comments by contributors and internal reviewers
Version 1.0	14.4.2021	IRI UL	Final draft submitted
Version 1.1	19.5.2021	ISSO	Deliverable finalised and submitted.

### Abbreviations used in the report

**CPD** – Continuing Professional Development

**EE** – Energy Efficiency

**IEQ** – Indoor Environmental Quality

**nZEB** – Near Zero Energy Buildings; also, Nearly Zero Emission Buildings

**Rep.** – representative (of a company, business, institution, etc.)

## I Executive Summary

The Ethnographic Research Report on the recognition of energy efficiency skills (EE Skills) builds on an ethnography inspired qualitative research of the construction and renovation value chain. Its purpose is to highlight new insights into the social, cultural, and material realities of the construction and renovation sector in search of potentials for stimulating demand for sustainable energy skills. The knowledge established through the research will continue to be used throughout the project development and relations with key stakeholders strengthened to monitor and optimize effective rollout of BUSLeague interventions and development of solutions. A selection of valuable new insights from research activities highlighted by contributors include:

- There are differences in motivation to participate in training depending on the geographic location and should be considered in planning of training services (e.g. rural vs. urban market contexts, proximity of training activities, etc.). (AT)
- The micro-learning (such as learning via app or short clips) could be used to support the contents of the existing trainings. (AT)
- The white-collar workers (e.g. those involved in planning) are more willing to participate in training courses than blue-collar workers. They are also more motivated to learn outside of the daily working hours. (AT)
- The best way to apply EE in the building is by providing advice for the building owner and accompanying him through the planning and construction of the building. (AT)
- The professionals are willing to get trainings if the technology is new, or a certification is needed to carry out the job. (AT)
- Training provided by product suppliers is widely recognized on the market as reliable and high quality, both by experts working in the sector as well as the general population. (BG)
- Interventions by public authorities – either as legislation, support programmes or within procurement – are (still) deemed decisive in shaping the demand. (BG)
- The growing need for knowledge transfer through qualified training providers and the general lack of quality training providers in combination create one of the key constraints. The fact that many coaches and trainers are not sufficiently qualified for quality up-to-date training makes this a significant challenge for the future of upskilling in the sector. (FR)
- Isolation and ventilation are not considered as traditional “crafts” (like for plumbers, bricklayers, or electricians). Consequently, there are not enough trainings taking care of these two tasks. (FR)
- DIY stores are a vehicle for targeted promotion as they are frequently the go-to place for people planning or doing construction or renovation. (FR)
- It is necessary to adopt a “big picture” approach to training. In case of new national level regulations, this means creating grounds for deep understanding, appreciation, and professional (respectful) attitude towards responsibilities of construction work. (IE)
- Retrofit should be seen as a specific career path requiring an overlapping skillset. (IE)
- Innovative financial tools at the EU level have the potential to drive the market for EE Skills. (IE)
- It is necessary to advance the construction and renovation sector in digitalization and offer people-centred online tools and services. An example would be an independently reviewed and continuously updated list (application), where clients can find qualified professionals in EE quickly and with minimal effort. (ES)
- The 2008 economic crisis continues to have a negative impact on the sector and inevitably on motivation and capacity of workers to upskill. This is particularly the case with small SMEs and independent workers, who often struggle to keep their business running. (ES)
- There is a need for discussion and action with regard to inclusion and diversity in the construction and renovation sector. (NL)
- Building and installing companies and SMEs prefer lean training, one that is strictly focused on the essential skills, practice, and theory needed to do the job well. (NL)
- Close collaboration is required between partners, both in development of practical and focused training for the building and installation sector as well as on-site work on real projects. (NL)

- With regard to innovation in technics, methods, training etc., a targeted regional and local approach to working on projects in construction and renovation has been highlighted by a number of research participants. (NL)
- A step-by-step approach is likely the best to get people engaged in realization of energy transition. In principle, most people care about energy transition, but find the topic overwhelmingly complex. This is why advisors are needed who present the whole story and guide people to the goal of nZEB dwellings, also through qualified installers and builders. (NL)

Besides the new insights, contributors highlighted several other goal-oriented conclusions that will guide the consortium's future work on the project. The following points focus primarily on the (perceived) value of EE Skills and the future expectations in development of the market of EE Skills:

- The regulations and tailor-made subsidies can contribute to the market growth of the skills. (AT)
- EE Skills are recognized as a national-level priority, which is reflected in numerous public initiatives, progressive regulations and legislation, and public institutions setting an example. (AT)
- Training and education are proxies for quality, meaning that they are widely recognized as necessary for guaranteeing quality of services. (AT)
- There is a need for an integrated building design, including not only energy efficiency principles, but also sustainability, circularity, and smart technologies. (BG)
- Designers (and other white-collar professionals) recognize the value of EE Skills, also in terms of skilled blue-collar workers. The general perception, however, is that they are underappreciated by other actors in the value chain, such as investors, employers (construction companies), end-users, etc. (BG)
- There is a need for concise definition of skills and competences, and to work towards recognizing competences workers and professionals already have. (FR)
- The gap between the needs for EE Skills (particularly on the side of policy requirements) and qualified workforce (supply) is becoming increasingly wide. Expectations are that this gap will continue to grow in the future. (FR)
- Training should (upskilling) be based on practice (hands-on & on-site training) rather than theory. (FR)
- There is a need for efficient strategies at local level, geographically close to the people and businesses working in the sector. (FR)
- EE Skills are perceived as desirable but not essential, and EE is generally considered with lower priority in comparison to aspects such as aesthetics, location of the property, convenience, etc. (IE)
- Airtightness was suggested to be the “common denominator” for build quality, linking together all trades interacting with the building envelope. (IE)
- Heritage buildings must be dealt with appropriately, and limitations of retrofit solutions considered in due contexts. (IE)
- Much of the currently available training courses fail to meet the needs of the sector. They were described as not flexible, while they should in fact be offering innovative, high-demand contents, in a brief, direct, practical, and affordable format. (ES)
- Sustainability needs to be made a baseline principle of doing business. This implies a process of progressive adaptation and integration. To speed up the process, companies (SMEs) need support and guidance to achieve optimal results. (ES)
- New trends in the sector are promising careers and imply a high level of employability for those professionals and companies that invest in learning and experimenting with it. Such are the installation of renewable energy for domestic use, prefabrication and standardization, construction 4.0, etc. (ES)
- Recognition of existing competence with regard to EE Skills is very important. Much of the active workforce (both white and blue-collar workers) in the construction sector were not able to study or decided consciously to acquire their skills through working experience. Their existing knowledge and competences have to be accounted for, recognized, and certified. (ES)
- When planning for construction and renovation, the price criterion still prevails, which indicates low awareness and/or poor perception of the value of EE Skills among citizens. (ES)

- Action is needed that triggers workforce or SME entrepreneurs engage in upskilling. Motivation for this depends on a wide variety of contextual factors, including convenience, personal preferences, financial aspects, and regulation. (NL)
- There are loopholes in policy regarding recognition of skills, particularly on the level of certification of companies as a whole. This often results in lack of transparency regarding who actually has the knowhow and skills represented by the certificate. (NL)
- EE Skills encompass much more than just knowledge and skills regarding a specific topic or segment related to energy efficiency and sustainability. They require a broad understanding of other EE-measures and technics, an eye for details, a feeling for work with people (customers) etc. When training is designed, EE Skills have to be considered holistically and in due context. (NL)
- The recognition of EE-skills can make people proud about their skills – they can show them and others can recognize the skills they have. (NL)
- There are differences in how established upskilling (continuous education) processes work in different disciplines, such as in the case of electrical and mechanical technicians in the Netherlands. This is also an opportunity for exchange of good practices. (NL)

This report also makes an intentional effort to emphasize the viewpoints of people who work in the construction and renovation sector – ones that constitute it, co-create it, and give it character. Some of the people-centred social and cultural aspects this report highlights are:

- Inclusion, diversity, and minorities within the sector (e.g. women, migrants, young workers other minority groups of workers within the sector),
- Influence of demographic factors in training, such as gender, age, language, etc.,
- Socio-cultural patterns and phenomena, such as migrations, identity, tradition, etc.

Readers will find a more in-depth overview of the report's purpose and content in the introductory chapter (Chapter 1), which also includes a section on research method. Section 1.3, which highlights relations with other project tasks, is primarily intended for project members. Readers interested in the ethnographic research in individual countries can focus on Case studies (Chapter 2). Qualitative data and information gathered in the research is included in the annex to this report. Readers interested in the general outcomes, providing an overview of challenges and prospects for the market of EE Skills across the EU, are advised to read first two sections of the introduction and then proceed to the Synthesis (Chapter 3). This chapter includes a collection and interpretation of barriers and challenges, followed by a list of opportunities and solutions, all noted by the BUSLeague researchers in their reporting.

This deliverable is intended to provide an insight into the complexity of the EU markets of EE Skills. It does not try to determine which of the outlined challenges should be addressed as a priority; this is a task for the following steps of the project development and very much depends on the country-specific particularities of the market. In this respect, this report is a milestone in the broader context of the BUSLeague's mission to develop people-centred products and solutions. It is a step towards a holistic approach, which implies working with and for the people who (co-)create the reality which BUSLeague explores and strives to improve with effective and long-lasting solutions. Most importantly, the report offers an insight into the varied landscape of the construction and renovation sector in the EU, highlighting a number of inspirational reference points for future research and development of concrete solutions within and beyond BUSLeague.

## Introduction

BUSLeague is dedicated to stimulating demand for sustainable energy skills (EE Skills) in the construction sector by means of addressing and overcoming challenges of the existing market of EE Skills. These challenges have already been largely identified. Two of the main challenges are (1) the lack of awareness of the benefits and principles of highly energy efficient buildings and (2) the incomprehension of the building workforce of the need to upskill in that area. This implies a need to generate and stimulate demand for EE Skills (demand side) as well as build hands-on capacity by increasing the number of skilled workers (supply side).

In this context, the mission of the Task 2.2 was to develop and implement a short-term ethnographic research across the building design, operation, and maintenance value chain to provide new in-depth qualitative insights related to the aims and goals of BUSLeague project. An interdisciplinary team of engineers, architects and anthropologists conducted the research in six countries – Austria, Bulgaria, France, Ireland, Spain, and the Netherlands. They used ethnographically informed qualitative methodology and anthropological theories to structure both the research and analysis that resulted in this deliverable, which builds on knowledge and experiences shared by research participants (informants) and contributors (researchers) to this report.

The most valuable result of the research is in fact exactly the transfer of knowledge between researchers and their research participants as well as the relations they established within each of the case studies. Based on these, researchers will be able to contextualize their further work and develop locally and regionally specific solutions in BUSLeague project and beyond. With reference to their deepened empathic and intuitive understanding of the conditions and complexities of the markets of EE Skills in their countries, researchers will continue to work with their research participants throughout the BUSLeague project in order to steer the development of solutions and monitor the impact of interventions. The purpose of this report in this context is to outline some of the new insight into ways that knowledge, behaviours, and conditions of work are experienced and played out in construction and renovation sector, provide ground for comparative analysis between cases, and function as a reference point for further in-depth research within and beyond the project.

In pursuit of the outlined goals, the report also makes an intentional effort to emphasize the viewpoints of people who work in the construction and renovation sector – ones that co-create it and simultaneously give it character. By doing so, we stress that discussion about the future of construction and renovation should not be confined exclusively to aspects of policies, markets, and technologies. At first sight, the sector may appear to be defined predominantly by its particular materiality, economic and administrative barriers, and technical or organisational challenges. Such worldview, however, often fails to consider the social and cultural dimensions of the discussion, which arguably are just as important.

Demographic factors, such as gender, age, and language, importantly define and characterize the individual and collective lived realities of construction and renovation sector. In this regard, understanding complex socio-cultural phenomena through concepts, such as migrations, identity, or heritage and tradition, can help us better understand everyday life of people working in the sector's realm, and ultimately help us search for solutions that will fit the context specific needs and conditions. In essence, this report follows the core premise of ethnography and people centred development, which is that all human practice, whatever and wherever, must be studied with all the seriousness it deserves. With this report, BUSLeague therefore takes a step towards a holistic approach, which implies working with and for the people who (co-)create the reality which we explore and strive to improve with effective and long-lasting solutions.



### **Diversity and inclusion – minorities in the sector**

As a social and cultural sphere, construction and renovation sector is not a level playing field for everyone who want to participate. The sector is the EU's largest industrial employer with 15 million workers, yet only marginal percentages of these employees are women and young people. Similar figures can be found in other realms of engineering and technology, such as the energy sector.

BUSLeague made a conscious decision to address these issues through its research and work towards empowering women and young workers in the sector by promoting values of diversity and inclusion. In fact, the scope was further widened to include a wide array of **“minorities” within the sector**. In the Netherlands, for example, the theme of female workers was broadened to all minorities, including LHBQTI, workers with a migrant background, disabled people, lateral entrants<sup>1</sup> etc. Various related aspects were highlighted also in other countries, particularly regarding migrant workers and influence of demographic factors, such as language, age, and social background of workers. Through the ethnographic research, relevant questions surfaced, such as:

- How do socially normalized gender identities (femininity and masculinity, or rather, what does it mean to be a woman or a man) constitute a part of the construction and renovation sector?
- What role do knowledge, skills, competences and experience have in construction of identities (both individual and collective)? How does this influence the motivations for upskilling?
- What is the role of migrations in the context(s) of local and regional specifics of the sector?
- What can we learn from studying the socio-cultural context and background of white and blue-collar workers, and does it influence their propensity to engage in upskilling activities?

This report offers only hints and reference points for exploration of these and similar questions that aim to understand the social and cultural aspects of construction and renovation sector. Posing such questions also makes it clear that discussions regarding diversity and inclusion should not – and must not – stop at the declarative or generalized “societal” level. Rather contrary, they must be *pinned down* to concrete contexts of people’s everyday life and work. In the context of BUSLeague, this means that in pursuit of **diversity and inclusion**, as one of the Dutch research participants pointed out, it is important to recognize that everyone in the construction and renovation sector has their own needs and facilitate them in this regard. At the same time, however, it is important to enable everyone to fully participate.

---

<sup>1</sup> Lateral entrants are people who before entering the installation or construction sector worked in a completely different areas, such as banking, nursing etc.

## 1.1 Report outline

The report consists of three chapters – Introduction, Case studies, and Synthesis – with an Annex containing original contributors' research notes. **The introductory chapter** outlines the purpose of the report in relation to the mission and goals of Task 2.2. It also includes a section on the report outline, the methods used in the research, and a section on the relation of T2.2 to other tasks in BUSLeague.

**The second chapter** focuses on case studies included in the report, listed by individual participating countries. Each contributor presented their case studies in four subsections. The first subsection includes notes on the **relation between T2.2 and the country's National Implementation Plan (NIP)**<sup>2</sup>. It describes the role of ethnographic research in the context of NIP and reflects on how the research outcomes relate to the current state of BUSLeague project. The second subsection defines **key new insights or lessons learned**. These are selections of insights that contributors found most valuable accounting for their previous knowledge and specific interests in the context of their NIP. The third subsection highlights some of the recorded aspects of **value and expectations regarding (recognition of) EE Skills**. These are not necessarily new insights but rather goal oriented conclusions that will guide the consortium's future work on the project. Finally, the fourth subsection lists the **research participants** representing key stakeholders. At the beginning, lists include a table indicating which stakeholder groups have been covered, how many participants have been included, and the number of research activities (interviews) conducted. Each of the participants – and, if applicable, the institutions they represent – is characterised with a short presentation, some also with a direct quote, statement, or testimony they shared during the interviews.

**The third chapter** is a synthesis of the research outcomes, structured around the goal-oriented perspective to stimulate market demand for EE Skills. In attempt to organize the research outcomes, the two sections were further divided in subsections roughly corresponding to three different **stakeholder groups** that constitute and co-create the EE Skills market environment – the Demand side, the Supply side, and Policy, Regulation, & Financing.

First section of the third chapter is focused on **barriers and challenges** for development of the market for EE Skills. It looks at aspects of demand and supply, awareness, motivation, and scepticism (active opposition) towards EE Skills from various angles, corresponding to the outlined stakeholder group categories. It also explores some aspects of the existing training opportunities, such as availability, accessibility, perceived value and quality, etc. It also points out more specific topics, such as inertia of the market with regard to introducing change, and, the role of migrant workforce, policy and regulation, financial instruments and incentives etc.

The second section is focused on the **opportunities and solutions**. It looks at the positive and forward-looking aspects regarding the development strategies for overcoming barriers and challenges outlined in the previous section. It suggests reference points for raising awareness, highlights the potential of targeted campaigning and marketing, and stresses the importance of systematic and reliable financial support. On the supply side, it highlights several points related to training along the lines of key principles of adult learning (andragogy). It highlights various aspects of training design, content, management, and learning environment. It also looks at more specific aspects, such as stressing the skills for on-site collaboration, digital tools (e-learning), the importance of building a community, and the need for coordination and collaboration with product suppliers.

---

<sup>2</sup> A National Implementation Plan (NIP) is a roadmap to reach the desired goals outlined in the BUSLeague project proposal. The six countries involved in BUSLeague are diverse from an economic, employment, regulatory and cultural points of view among others. To ensure the project has a real impact, work packages 2 to 4 will hence be implemented through NIP. (see Part B section 4-5 Annex I.)

Throughout the report, references are made to the original research outcomes by means of highlighted examples and/or direct quotations. These are often separated from the main body of the text by specific formatting – indentation and smaller font. Direct quotation of complete sentences and statements are further formatted in italic font. More elaborate or longer emphases are framed to enable better orientation in reading. These frames include illustrations corresponding to the analysis, such as stories (e.g. concrete experience narrated by a comfort ventilation expert from Austria) or concrete examples of good practices (e.g. a case for upskilling in DIY stores shared informants from Ireland). They also contain quick dives into specific topics, such as the aspect of increasingly fast and constant change, digitalization, diversity and inclusion, time, health, comfort, prejudice, etc. The Annex to this report contains original research notes and, in some cases, partial interview transcriptions for future research and analysis within and beyond BUSLeague. The structure of the original reporting template is largely retained.

## 1.2 Research method outline

Ethnographic research is traditionally conducted over a longer period – months or years – and requires some sort of physical fieldwork involving researchers participating in everyday life activities of their informants. Most importantly, it requires researchers to engage and conduct their research in real life environments, which gives it a particular qualitative edge in comparison more traditional quantitative and simple hermeneutic (interpretation of texts) approaches.

Already in the planning phase, BUSLeague ethnographic research was tailored to the time bound and goal-oriented structure of the project. This required significant divergence from the traditional methods (particularly long-term fieldwork) and analytical procedures, which in its essence are oriented towards discovery and recording of the “unknown” rather than pursuing established objectives, aims and goals, which are the very essence of H2020 projects.

### **The original research outline**

The project proposal assumed the following scope of work and research methods to be used:

- one 8-days intensive short-term ethnographic field research in Ireland (IRI UL), and
- five 3-days studies in other participating countries (all contributors to the T2.2).

Methodological steps of T2.2 in BUSLeague project proposal were stated as following:

1. Setting the scope for the identified stakeholders to be involved in the ethnographic research (M1).
2. Development of the framework of relevant ethnographic categories and concepts together with practical guidelines (M1).
3. “Fast track to ethnography” training workshop (M2 – in combination with the Kick-off meeting).
4. 8-days short-term ethnographic research in Ireland – IRI UL ethnographer (M3 – M6).
5. 3-days short-term ethnographic research in other countries – all case holders (M3 – M6).
6. Analysis and interpretation of results together with lessons learnt, including the report D2.3 (M6 – M7).
7. Coaching of the consortium on application of the results within the other work packages (M6 – M7).

Heavily tailored methods were further downscaled due to COVID-19 pandemics and the related unforeseen circumstances. Physical fieldwork was rendered unfeasible as it would put both researchers and research participants at risk. Any attempt at keeping to the original T2.2 outline of the research despite the risk of the spreading the infection would be ethically questionable. Activities assuming physical presence of researchers on the field were therefore substituted with interviews and video-calls focused on collecting testimonials and stories related to informants’ experiences from their real-life work environment. Within the project scope, this was the

closest viable approximation of spontaneous exploration of people's everyday life and experiences.

Despite all difficulties, the ethnographic research under T2.2 can be seen as successful. The essence of the ethnographic inquiry remained central throughout the research, which is the quest to understand the informants' worldview through empathy while trying to neutralize ethnographer's own biases towards the research topic. IRI UL set the scope for the ethnographic research and developed a guideline that accounted for the pandemic circumstances. They presented the outline of the research on a dedicated workshop, which was part of the Kick-off meetings (14th of October 2020). Following that, the case study holders drafted their research plans in close collaboration with IRI UL, focusing on their specific interests, capacities. A special review session was organized in November 2020, including IRI UL and case study holders from contributing member states to synchronise the scope of the planned research activities and to ensure desired outcomes are agreed and understood by all partners involved.

	<b>No. of activities per stakeholder group</b>	<b>No. of participants per stakeholder group</b>
<b>National Gov.</b>	3	3
<b>Regional Gov.</b>	3	3
<b>Local Gov.</b>	5	5
<b>DIY retailer companies</b>	3	4
<b>Small and Medium Enterprises</b>	5	9
<b>Independent workers and experts (blue and white collar)</b>	2	2
<b>Female workers and experts</b>	4	4
<b>Building managers</b>	1	1
<b>Professional associations</b>	6	10
<b>Construction sector training providers</b>	5	7
<b>Building owners</b>	3	3
<b>Financial bodies</b>	5	5
<b>Suppliers</b>	2	2
<b>Total No.</b>	<b>47</b> interviews	<b>58</b> participants

*Table 1: Table for total BUSLeague research participants and interviews/activities in T2.2. For data on individual country, see individual country reports.*

Contributors to this deliverable were asked to conduct a minimum of six interviews with representatives of at least three stakeholder groups. They structured their interviews around the six BUSLeague challenges (see BUSLeague project proposal, pg. 3):

- Testing and recognition of Energy skills,
- Awareness of both the general public and workforce,
- Lack of support / request for the skilled professional by the Public Authorities,

- Lack of motivation, time, and trainings on the side of construction sector professionals,
- Integration of new technologies and addressing new societal and technological trends, and
- Market demand and uptake of prospective BUSLeague solutions.

Based on these challenges, researchers were provided with a list of relevant topics and questions for discussion and an analysis framework to be used after each individual interview. The analysis sheet (structure of which one can observe in the annex) included:

- Topical notes corresponding to the six BUSLeague challenges,
- A template for notes on potential EE Skills qualifications,
- Dedicated sections for recording stories, testimonials, and other qualitative data.

Researchers were asked to obtain a signed informed consent from research participants in order to comply with the GDPR and ethical standards. Additionally, they were advised to record an audio of their conversations for their personal use (analysis and interpretation). The recordings were largely or partially transcribed and interpreted by the researchers alongside their personal research notes. At the end of the research, all contributing researchers submitted their analysis and notes to IRI UL for an aggregate analysis, result of which is this report. True identities of the vast majority of research participants, as well as large part of the institutions they represent, are protected with pseudonymisation or anonymisation. For the few that are represented with their true identities, informed consents are stored by BUSLeague researchers and are entitled to anonymisation upon their explicit request throughout the duration of the project. Contributors used direct quotations, narrative examples, and other references to real-life experiences of their informants to outline BUSLeague-specific challenges and opportunities. Recorded qualitative data (reports) for each of the contributing countries can be found in the annex to this document.

BUSLeague ethnographic managed to provide new valuable insights into challenges and opportunities for EE Skills across the construction and renovation value chain. Based on these, BUSLeague will continue focusing on the people and development of people-centred solutions. Some aspects of this are discussed in the following section.

#### **Recognize thy biases**

The BUSLeague research proposal has a significant bias towards a structured and rational understanding of the problem – lack of awareness, lack of demand, poor market uptake. There clearly are well founded reasons for that. Nonetheless, ethnographic research aims to provide insights into tacit and intuitive everyday aspects of the problem, accounting for people's experience of the process of education, recognising the importance of social relations within these contexts, and modes of work, being and doing.

### **I.3 Relations to other BUSLeague Tasks and WPs**

For project member and others interested in meta-details of BUSLeague project, this section highlights some relations between this deliverable and a number of Work Packages (WPs) and tasks of the project. The objective of WP 2 is to create a basis to enable the recognition of sustainable energy and energy efficiency skills, particularly in the field of nearly zero emission buildings (nZEB), thermal renovation of residential buildings, and promotion of renewable energy use. As such, WP2 is an enabler for both legislative and financing activities in WP3 'Stimulate market demand' and upskilling activities in WP4 'Enable upskilling demand'.

In this context, ethnographic research under task 2.2 is one of the important first steps of BUSLeague project. Its purpose is to generate new insights into the social, cultural and material ways that the construction industry, knowledge, behaviour and conditions of work are experienced and played out. For this reason, the task does not have initial input from other tasks at its initial stages and is the cornerstone for WP2. With regard to the methods used, it is

complementary to Task 2.1 (see D2.1), which focuses on much of the same questions regarding recognition of EE Skills by means of desk research. The results of the interviews and the gained insight regarding the behaviour of the workers regarding education has an impact on the content and type of qualifications that will be developed under the task 2.3. In this respect, T2.2 contributed to understanding value and expectations regarding working with recognized skills and understanding and stimulating market demand from the perspective of different actors involved.

Furthermore, T2.2 contributed to the goal of mapping and analysing the experiences and expectations of involved national, regional and local stakeholders. This is particularly useful for activities under WP3 and WP4, which take place on several levels in order to:

- Deliver value recognized by the market,
- Understand and enable market recognition as a mean for legislative actions delivering direct stimulation of demand for energy skills in construction, and
- Inform the development of processes and IT-elements needed to implement the recognized energy skills in each member state.

Outcomes from D2.3 will be used for steering the development of solutions and inform the necessary internal reviews. In the latter point, D2.3 relates with WP5, particularly Tasks 5.2, the purpose of which is to monitor the interventions by collecting feedback and evidence from the perspective of the lived realities (the context of real-life settings). Contributors to T5.2 will be asked to focus on particular topics outlined in this report and observe the effects that BUSLeague interventions have in the communities they work with. In this regard, D2.3 is one of the reference points for assessment of BUSLeague impact, but also a source of inspiration with regard to facilitating continuous involvement and sustained collaboration with project partners.

Particularly with reference to relationships established with key stakeholder representatives in T2.2, continuous engagement with key informants through other tasks of BUSLeague will make T5.2 a reference for observation on how the project evolves, learns, empathizes and deepens its understanding of key issues. Some of the main points in this regard include the appreciation of the end user's needs, understanding cross-craft challenges, and elements of quality assurance. Accounting for these will contribute to reduction in performance gap. Moreover, the possibility to add entrepreneurial skills for owners of SMEs in a modular way will be explored.

#### **The challenge of common understanding**

One of the meta-challenges that crystallized through the process of research and reporting are differences in understanding notions, concepts, and terminology. Lack of common understanding can cause confusion and hinder communication, which evidently can lead to variety of negative effects (misunderstandings, slow project progression, conflicts etc.).

French contributors stressed the importance of establishing common understanding, and particularly of concise definitions is the case of skills and competences. Similar challenges, which have not been addressed in this report, include:

- The subtle difference between training, upskilling, and continuous professional development (CPD), which are being used interchangeably in the reports,
- Concise definition of the notion of “recognition”, particularly with regard to the recognition of EE Skills,
- Differences between label, qualification, certification etc.

The list could go on, but the point is to stress not only the importance of seeking concise definition and consensus regarding this terminology within the project consortium, which is crucial for effective collaboration and clarity in reporting. It is perhaps even more important to keep this in mind when working with people beyond the project consortium, and to recognize that people will most certainly have a very different understanding of what seem to be well established definitions and terminology.

In case of recognition of EE Skills, people might talk about recognizing the importance of EE Skills in general (in terms of opinions and attitudes), or perhaps regarding aspects of institutionalized objective recognition of skills, following training and assessment activities (in terms of existing schemes, training

opportunities, and qualification criteria). A similarly slippery notion is value, and in our case in particular, the value of EE Skills. Are we talking about monetary value? Emotional value? Moral and ethical values?

The key here is to recognize, that exactly through observation of differences in the interpretation of meaning, one can get a better understanding of people's point of view, and even map the cognitive and associate networks of meaning that define their capacity to understand and interact with the world. This allows one to optimize their way of communication and avoid unnecessary complications and hinderances.

## 2 Case studies

This chapter presents individual case studies. The six sections of the chapter correspond to countries participating in the BUSLeague ethnographic research – Austria, Bulgaria, France, Ireland, Spain and the Netherlands. For each country, the following information are provided:

- Notes on how the ethnographic research relates to their National Implementation Plan (NIP),
- A shortlist of key new insights and lessons learned from the research activities,
- A shortlist of key aspects on values and expectations regarding EE Skills derived from the research, and
- A list of research participants and their short characterisation – their background and statements or summarized attitudes or opinions regarding EE Skills, their recognition and the future of upskilling.

The raw qualitative data in form of fieldnotes and transcriptions of key interview segments are attached to the report as an Annex (see chapter 5).

### 2.1 Austria

#### 2.1.1 Notes on NIP & Key outcomes from T2.2

The Austrian implementation plan is designed to engage different stakeholder:

- The professionals through their umbrella supplier associations and guilds,
- The government at national level foremost through the environmental initiative klimaaktiv<sup>3</sup>, energy conservation program,
- A few regional governments through their energy officers, and
- The training providers for construction and energy skills through their trainers.

Within the implemented interviews with these stakeholders the needs for special training through specifically micro learning was discussed. These stakeholders will be invited to further dialogs and workshops for further consultations and development of the micro learning contents.

Within the survey carried out during the first phase of the project, which included the experiences from the previous projects carried out under Build Up Skills program, it could be observed that unfortunately the Austrian construction companies show little willingness in sending their employees to further education courses. This is because the workers and professionals are needed on construction site. Furthermore, the benefits of the trainings are not clear enough for both, employee and employer. The most successful trainings were the ones carried out on site or practical ones. Moreover, it is very difficult to motivate blue-collar workers

---

<sup>3</sup> An Austrian climate protection initiative (See <https://www.klimaaktiv.at/partner/landing>). Klimaaktiv is a climate protection initiative of the Austrian Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology (BMK). Klimaaktiv complements the national climate protection goals with the development and provision of quality standards, the training and further education of professionals, with advice, information and a large partner network. Klimaaktiv provides different knowledge transfer guidelines (brochures) and upskilling tools for construction and renovation trade professionals. The initiative also plays an important role in promoting schemes relating to environment aspects. The platform can be used to disseminate the results/tools developed within the project for the policy makers. The network of professionals can use the developed tools/trainings to be informed and trained.



to participate in courses. A main reason for the demotivation of craftspeople is that attending further education is voluntary in Austria and is not required by the market.

In the framework of BUSLeague, in order to push the further education of the blue-collar workers and professionals forward, interviews with different identified stakeholders (see above) were carried out. During the interviews, all the barriers and challenges observed before were confirmed and more insights were gained. Some of the key takeaways from the interviews are:

- The travel distance to possible training locations should be short.
- The motivation to participate in a training changes when it comes to the location of the SME: rural areas more than the ones close to the bigger cities.
- The micro-learnings could be added to the existing trainings in order to support the main contents of the courses/trainings.
- The professionals (mainly involved in planning) are more willing to participate in training courses. They are also more motivated to learn outside of the daily working hours.
- The more experienced professionals are more willing to take part in further or deepening trainings.
- The market (end user) doesn't ask for skilled workers.
- The regulations and tailor-made subsidies can contribute to the market growth of the skills.

Energy consulting, especially as a tool to support the building owners, can raise awareness of the end user / building owner regarding quality and therefore indirectly promote the skilled workers.

### 2.1.2 New Insights

The new insight from the interviews can be summarised as follows:

- The motivation to participate in a training changes when it comes to the **location** of the SME: rural areas more than the ones close to the bigger cities concerning the reputation of SME.
- **The micro-learnings** (such as learning via app or short clips) could be added to the existing trainings in order to support the main contents of the courses/trainings, e.g., installing the components of a heating system or tuning the settings.
- The **professionals** (white-collar workers, mainly involved in planning) are more willing to participate in training courses. They are also more motivated to learn outside of the daily working hours.
- The best way to apply EE in the building is by providing **advice** for the building owner **and accompanying** him through the planning and construction of the building
- The professionals are willing to get trainings if the **technology** is new, or a **certification is needed** to carry out the job.

### 2.1.3 EE Skills – Value & Expectations

- **EE Skills in AT are recognized as a priority**
- **Training and education are proxies for quality**

#### EE Skills as priority

Variety of national and regional programmes and initiatives in Austria indicate that energy efficiency skills are important for the Austrian government. These include:

- Publicly supported initiatives, such as Qualifizierungsoffensive, Klimaaktiv, ...
- Progressive and proactive regulations and legislation regarding both trade as well as education and training in the construction and renovation sector,
- Public institutions setting examples in setting high goals and meeting strict standards on EE in construction and renovation of built environment,

### **Training and education are proxies for quality**

Training schemes are recognized as necessary for guaranteeing quality of services, such as correct installing the heat pump system and all its components, comprehensive comfort ventilation system and energy consulting for the building owners as accompanying method for minimising the construction error.

## 2.1.4 Research participants

	Participants (businesses & institutions represented)
<b>National Gov.</b>	klimaaktiv - National initiative on climate protection
<b>Professional associations</b>	Austria Solar – Association for the promotion of thermal solar energy Association Comfort Ventilation Austria Association Heat Pump Austria
<b>Construction sector training providers</b>	ARGE-EBA Working Group of Energy Consultants (interview with trainer), ATGA Institute for Facility Management (interview with trainer), Construction Academy Upper Austria (interview trainer)
<b>Total No. of participants</b>	7
<b>Total No. of interviews</b>	7

### Energy expert & Trainer

Alexander Ebner is an architect, expert energy advisor, and consultant working for EAS<sup>t</sup> – Energy Agency of Styria, which is based in Graz. EAS<sup>t</sup> is one of the earliest non-profit organisations in Austria to promote energy efficiency, the use of renewable energy and measures leading to reductions in energy consumption. EAS<sup>t</sup> alongside the office of the Energy Commissioner for Styria and the Styrian Energy Advisory Centre, has been playing a significant role in Styrian energy politics since the adoption of the Styrian Energy Plan in 1984. Its activities comprise the technical and organizational support of energy projects, consciousness raising and PR work (exhibitions, publications, conferences etc.), training (expert further training, promotion of research), European cooperation (participation in EU-research and development projects), energy counselling as well as the organization and award of grants.

As an energy advisor, Alexander specializes in areas such as renovation of single-family houses, technical and financial (incentives). In addition, he is also a member of ARGE-EBA<sup>4</sup> (working group of energy consultants), which provides trainings for the on different EE subjects. EAS<sup>t</sup> was

---

<sup>4</sup> Working group of energy consultants in Austria (See <https://arge-eba.net/>). ARGE-EBA is an organization of all Austrian federal states or their energy agencies. It has 9 members corresponding to the 9 federal states. The provinces are partly represented by themselves and partly by their provincial energy agencies as members. ARGE-EBA sees its task in the quality assurance and further development of an Austria-wide, high-quality training for energy consultants. ARGE-EBA is one of the main stakeholders in the project. The working group can profit from the outcomes of BUSLeague regarding micro learning. They train the workers and professionals in bringing understanding of EE in installation and construction work. Energy consultancy program is one of the most effective programs to support implementing EE in the construction of new buildings and renovation.

a project partner in NEWCOM (see [www.newcomtraining.com](http://www.newcomtraining.com)) and other Build Up Skills projects.

### **Education provider & expert in comprehensive comfort ventilation system**

Andreas Greml is an engineer specialized in comprehensive comfort ventilation systems. He is also a teacher at universities in this field and owns an engineering company based in Kufstein. The project BUSLeague received a letter of support from Andreas as the chairperson of the association for comprehensive comfort ventilation systems in Austria.

His opinion regarding the (further) education of professional is that all craftsmen working in installing comprehensive comfort ventilation system, heat pumps and PV systems need further education. It is important that at the construction site, the supervisor understands the requirements and challenges of installing the system quite well, and should be able to convey it to the other workers. At present, the qualified professionals do not have to be certified to carry out the job.

Andreas finds micro learning and gamifications – elements part of BUSLeague solutions – appropriate if they are combined with official trainings or trainings offered by the producers of the components of the system. However, even here the attitude toward these micro learnings is divided and very individual.

At the time of the interview, he was offering and carrying out trainings for municipalities across Austria, providing information on the benefits of comprehensive comfort ventilation systems especially for schools, in connection with the pandemic

### **Teacher & expert in HVAC systems**

Rudolf Baier is an engineer specialized in design and installation of HVAC systems. He also teaches at different education providing institutions and owns his own company. In his opinion, the installers need further training after they have entered the job market and have gained some experiences. Then the further training could support them for especial malfunctioning components and elements in the system, tuning the settings and adjustments according to the user behaviour/tenants and learn from best practices and other experiences.

### **Education provider & expert on solar-thermal systems**

Roger Hackstock is an electrical engineer (expert on environmental engineering), an expert in the area of solar thermal systems, teacher for installing solar thermal systems (not active in the last 4 to 5 years in this field) and the CEO of the Association for solar thermal systems in Austria.

As CEO of the Association for solar thermal systems in Austria, Roger provided a letter of support for the BUSLeague project and has extensive experiences in the area and beliefs the installation of solar thermal systems.

He believes that skills on installing solar thermal systems should be recognised as essential because the need for energy for heating the building is reducing due to energy efficient buildings, never the less the need for hot water remains (which implies the production of domestic hot water in summer). He observes that the current market for solar-thermal systems has decreased, but noted there is considerable potential for improvement. In this regard, he highlighted the need for accredited installers and called for more regulation, and awareness building activities among the general public and professionals.

### **Association for Heat pump installer**

Siegfried Kopatsch is the CEO of the Association Heat Pumps. Among others, the association is in charge of quality assurance and education of installers. As CEO of the Association Heat Pumps Austria, Siegfried provided a letter of support for the BUSLeague project and has extensive experiences in the area.

In his opinion, the dual educations of trainees regarding HP are sufficient; but when it comes to specific requirements and needs of the system in relation to the building type, that is where some problems occur. Especially issues regarding buildings physics, thermos-dynamic of low temperature system, planning of the system according to the needs of the object, can be mentioned here.

He believes the installation of heat pumps need further education for installers when it comes to the above- mentioned issues, especially the renovation of old buildings where the heating system is being replaced.

There is no obligation for attending in HP courses but the SMEs do it because the most powerful way to have projects is word of mouth. Therefore, they send their employees to the courses.

### Strategy developer for education for construction sector

Erich Kremsmeier is holds Master degrees in management and education and is in charge of several education programs at the Danube University in Krems and in the Construction Academy (Bauakademie) of Upper Austria, specialised in education for construction sector and strategy development.

He was involved in the previous BUIL Up Skills project NEWCOM and at the providing an overview on the market situation of the provided educational schemes in the national construction sector.

### Support to policy maker & employee

Barbara Alexander-Bittner is a member of klima**aktiv** management team, in charge of the education and network of professionals under the Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK). Klima**aktiv** provides information on implementing different EE and environmentally friendly measures in the buildings and mobility, aiming at reduction of CO<sub>2</sub>-emissions. This initiative promotes education activities for different stakeholders.

## 2.2 Bulgaria

### 2.2.1 Notes on NIP & Key outcomes from T2.2

The ethnographic research, on top of the common topics investigated by the general project approached, targeted specific insight regarding the deployment of the national implementation plan. More specifically, questions were raised on key areas of intervention as the development of an online distance learning platform based on a coherent qualification framework (which is expected to serve as a basis for a future CPD scheme and qualification register), the market recognition of different certification schemes, as well as on the approach to the format of the training courses.

The respondents confirmed the initial hypothesis that the lack of qualification register and deployment of skills passports represent an outstanding barrier for the development of the continuous professional development system, and emphasized on the need for collaboration of stakeholders alongside the whole value chain in the construction industry. The need for policy support for both building renovation as such, and specifically for skills development, was also stated on most of the occasions, which confirmed the overall BUS League approach in Bulgaria based on active policy advocacy and promotion campaigns regarding the design and implementation of the national renovation support programmes.

The responses on the other two country-specific components of the research – the market recognition of certification schemes and the format of the trainings, lead to less affirmative conclusions. Unfortunately, there is no evidence for broad market acceptance of neither national nor international certification schemes, especially as regards highly qualified professionals. The situation is looking more positive in consideration of blue-collar workers, where specialized training and certification are deemed as a positive sign for the overall attitude of the worker. On several occasions, the upskilling courses provided by product suppliers are quoted as good practice; however, this stance is not equivocal and there is no suitable system which can integrate these training into a coherent certification scheme (a gap that could potentially be filled through BUS League-supported actions). As per the format of training, the answers are even more ambivalent, which is probably understandable given the transitional situation provoked (even more) by the COVID-19 pandemic. In any case, there is a preference for blended learning systems, which is also in line with the proposed approach in the Bulgarian NIP.

#### 2.2.2 New Insights

- **Quality of suppliers' training is broadly recognized on the market**
- **Interventions by public authorities decisively shape the demand**

##### **Quality of suppliers' training is broadly recognized on the market**

The training provided on ad hoc basis by product suppliers on the application of their new products is considered as the main carrier of market-relevant skills and knowledge and also as a sign for the professional attitude of the workforce. These training courses are mentioned in most of the interviews, and the attitude of most of the respondents can be defined as positive

##### **Interventions by public authorities decisively shape the demand**

Interventions by public authorities – either as legislation, support programmes or within procurement – are (still) deemed decisive in shaping the demand. The interest towards vocational education and training is often related to either the legal requirements for qualification of the workers or to the existence of financial support programmes for building renovation.

Introducing the practice of placing specific skills requirements in public procurement is also discussed

### **2.2.3 EE Skills - Value & Expectations**

- **Integrated design and EE competences**
- **The certified skills of the construction workers are valued by the designers**

#### **Integrated design and EE competences**

There is increased understanding of the importance of integrated design and high expectations to the EE competences of architects. The architects and designers are recognized as the leading actors for implementation of new features in the buildings in general – not only in the area of energy efficiency, but in the broader aspects of sustainability, circularity and smart technologies. Thus, the expectations towards their qualification, knowledge and continuous professional development become higher and well outlined, which makes them one of the key target groups for BUSLeague.

#### **The certified skills of the construction workers are valued by the designers**

The skills and the effort for upskilling by construction (blue-collar) workers are highly valued by highly qualified (white-collar) professionals. It is also true however that most of the respondents are sceptical on the awareness levels of other actors in the construction value chain as regards the benefits of energy efficient buildings and the importance of skilled labour. In many of the cases, the awareness levels and the understanding of specific approaches to achieve energy efficiency are put under question, especially when referring to investors, both private and public. This in turn reflects on the attitudes of service providers (construction companies), and to a certain extent, the end users. This is why BUS League and other initiatives in Bulgaria are focused on the development of the real estate market in general and stimulating the demand for quality nZEBs through improved understanding of the benefits of sustainable construction among different end-user groups.

#### 2.2.4 Research participants

	Participants (businesses or institutions represented)
Local Gov.	2
Independent workers and experts (blue and white collar)	1
Female workers and experts	(4)
Professional associations	2
Financial bodies	1
Suppliers	1
Total No. of participants	7
Total No. of interviews	6

##### Financial institution

Svetlin Andonov is an energy engineer in his 40's. His long-term engagement in a specialized financing institution enables him to represent the specific aspect of financial institutions in Bulgaria. His work included activities in several roles – as technical adviser, quality assurance expert (monitoring implementation of actual construction works), and, as of recently, supporting the marketing activities and client relations of the financing institutions. Regarding the existing state of the construction market in Bulgaria, he shared the following statement:

*“In my opinion, there are gaps along the whole value chain. Given project proposals very often are requested to perform correction and improvement, both of energy audits or technical projects. Subsequently in inspections of construction work again we are noticing things which should not be admitted, and request construction companies to rework. The whole chain lacks capacity and it mainly because there is no practice. If there is practice for more ambitious, more efficient projects, people will learn, but at the moment there is no such practice and they are doing the things in the way they did in the past.”*

##### Local Authority

Alexandra Nikolova is a structural engineer and energy expert in her mid-30-ies, currently a head of an environmental protection office in one of the biggest Bulgarian municipalities. Her long-term experience in two big Bulgarian municipalities and involvement in different roles regarding project design, quality assurance of construction activities, support to public procurement procedures, energy and climate planning, promotion and awareness raising enables her to deliver practical assessment on the barriers and opportunities to provide quality construction services for the local authorities. With regard to EE Skills in Bulgaria, she stated the following:



*“Of course, there should be minimum requirements for each expert in terms of his / her education, which usually comes down to higher education in a given field and practical experience, for example in at least three projects with a subject similar to the contract. But additional points can now be awarded if this expert has received additional training on energy efficiency, e.g. if they passed specialized training that is specifically targeted to reconstruction of existing buildings to achieve much higher energy efficiency classes. These are some options that are less commonly used, but definitely not impossible to implement.”*

## **Supplier**

Tsvetana Marinova is an architect in her late 30ies, representative of one of the biggest multinational construction product manufacturers, working in the Bulgarian office of the company. She has a long-standing experience in training activities in the academy of the supplier, participation in promotional events and demonstration projects, and involvement in policy advocacy. Thus, she is reliable source of information on a broad range of topics, varying from policy making to hand-on training for construction workers. She summarizes the recent developments in Bulgaria regarding the public and professional interest in energy efficiency in the following way:

*“If 10 years ago when I participated in a conference in Bulgaria and the topics of energy efficiency and sustainable buildings was so far away, and I was thinking how this in Bulgaria is unlikely to start happening at all... At the moment I rather see how thanks to the work of organizations like yours, the private sector, end users of materials, investors who care about the comfort of their buildings, the requirements of the European Union, different projects and programs, things change. The pressure is outside, really, but interest is beginning to emerge even in state institutions. There is currently a hunger for such training.”*

## **Independent expert (architect & nZEB building designer)**

Anton Georgiev is an experienced architect in his 50ies. He has an extensive practice in architectural design of nZEB projects, being one of the frontrunners in the field in Bulgaria. He also has significant experience as trainer on national and international certification schemes, placing him in position to discuss both the market dynamics and the practice in the area of vocational training and education. Regarding the added value of the training and certification for construction workers, he delivers the following statement:

*“Personally, I appreciate it [certification of construction workers] because the construction workers are a different stratum from the designers, these are not people who have the attitude to sit down and study. But in order to get a certificate, you still have to pass exams, and this is not their field of play. This is a positioning of their profession, which is genuinely practical, in a different perspective, through the prism of knowledge and theory. A builder who has made an effort to go to a course and learn something theoretical on top of the practical is worthy of respect. This means that this person has a desire to progress. I always enjoy such specialists among builders.”*

## **Professional association representatives**

Mimi Zhelyazkova and Milena Ivanova are economists around their 40ies, representatives of the nationally representative professional association of the construction industry. They have considerable experience in organization of training activities of at national and regional level and have been involvement in various promotional initiatives of the association. Their participation in several EU-financed projects in the area of vocational training and education makes them relevant interviewees on the topics of skills demand and supply services. Regarding one of the

main goals of BUS League in Bulgaria – the establishment of a register of certified workers, Milena Ivanova shared her view in the following words:

*“Over the years, the issue of such online register for certification of knowledge and skills has been raised more than once. Within our branch organization there are several professional sections that unite construction companies operating in different construction areas i.e. high construction, supervision, energy efficiency. This question has been asked, it is considered necessary, but I think that, and this, of course, is my subjective opinion, that the concept should be clarified in order to answer the most important question – what do we want to achieve and how we can achieve it. In principle, there is agreement in the industry on the need for something like this. The question is how can this be done in practice.”*

### Local authorities representative

Zlatin Genadiev is a very experienced architect and building designer in his late 60ies, combining the design practice with many activities in the public areas. He has long-standing experience as university lecturer and author of specialized educational programmes, extensive training activities for the local authorities, participation in promotional events and demonstration projects, and involvement in policy advocacy. Currently, he is working for a voluntary association of local authorities aiming at achieving high local policy goals in the area of energy efficiency. He believes EE Skills are key for stimulating the demand for green building training, particularly in the following points:

- (a) the existence of a real **state and local (municipal) policy** for the imposition of nZEB,
- (b) promotion of the **nZEB market** (realistic programs),
- (c) active participation of **the professional chamber** and associations in this process, and
- (d) active participation of **the non-governmental sector**.

## 2.3 France

### 2.3.1 Notes on NIP & Key outcomes from T2.2

The key issue in France is the renovation of housings. The French energy transition law<sup>5</sup> (2015) has set a target of 500.000 deep renovations per year to reach the objective of having 100% of buildings renovated to the low energy standard by 2050. At the beginning of 2021 we are very far away from these objectives. Needless to say, French stakeholders involved in the housing renovation market all talk about barriers and how to overcome them. In this regard, BUSLeague came up at the right moment in time.

The ethnographic research has contributed to enlarge our scope of potential partners in BUSLeague, and to get them involved in the implementation of the French plan. This is especially true with Leroy Merlin, Saint Gobain, and Electricity of France (EDF). Following the ethnographic research, the interviewees have been invited to a web seminar (March 11, 2021) during which we have made a presentation of BUSLeague, and of the outcome of the French ethnographic research. The two French professional organisations (FFB and CAPEB) also joined this meeting, as well as representatives of local authorities. All the participants agree to join BUSLeague France.

Together, we will try to develop strategies for efficiently approaching the following groups of decision makers:

- Social landlords,
- Associations of Co-owners of housings, and
- Private owners.

In France, the nZEB global housing renovation market largely depends on their willingness to act. To address the challenge of their engagement, four working groups will be set-up – **Finance**, **Skills and skill recognition**, **Training clause**, and **Local strategies**. By opening a space for discussion and creating a good foundation for future collaboration, the ethnographic research definitely contributed significantly towards making these developments possible.

### 2.3.2 New Insights

- **Lack of qualified coaches/trainers**
- **Isolation and ventilation are not considered as traditional “crafts”**
- **Propensity for renovation corresponds to certain socio-demographic patterns**
- **DIY stores are a vehicle for targeted promotion**

#### **Lack of qualified coaches/trainers**

The growing need for knowledge transfer through qualified training providers and the general lack of quality training providers in combination create one of the key constraints. The fact that

---

<sup>5</sup> The French Energy Transition for Green Growth Law (or Energy Transition Law), adopted in August 2015, marks a turning point in carbon reporting. It sets out a roadmap to mitigate climate change and diversify the energy mix. The law includes ambitious targets around reducing greenhouse gas (GHG) emissions and overall energy consumption, reducing the share of fossil fuels and nuclear power in favour of renewable energy and increasing the price of carbon. (See <https://www.unpri.org/climate-change/french-energy-transition-law-global-investor-briefing-on-article-173/295.article>)

many coaches and trainers are not qualified enough for quality up-to-date training of workers in the construction sector makes this a significant future challenge for upskilling in the sector. (FR)

### **Isolation and ventilation are not considered as traditional “crafts”**

Isolation and ventilation are not considered as traditional “crafts” (like plumber, bricklayer, or electrician). Consequently, there are not enough trainings taking care of these two tasks.

### **Propensity for renovation corresponds to certain socio-demographic patterns**

Our research indicates that likelihood for an individual (decision-maker) to decide for renovation is related to certain socio-demographic patterns, age in particular. According to one of our DIY retail store Rep.’s, a French person makes the decision to renovate his/her housing when becoming the owner, at the average age of 39. When retiring, renovation is no more an issue.

### **DIY stores are a vehicle for targeted promotion**

Almost all owners who want to renovate their housing, go to a DIY store; these stores therefore have a strong influence on people’s awareness, perceptions, attitudes and therefore demand for EE Skills.

## **2.3.3 EE Skills - Value & Expectations**

- **There is a need for concise definition of skills and competences**
- **There is a need for skilled workforce**
- **There is a need for transfer of knowledge through qualified training providers.**
- **The training should be based on practical (not theoretical) training**
- **Need for an efficient strategy at local level**

### **There is a need for concise definition of skills and competences**

There is a need to define notions of skills and competences concisely.

- One can have the competencies (being able to do/deliver) without being skilled.
- And one can be skilled without being competent (not being able to do/deliver).

This is important, because some enterprises are able to do & deliver the works that they have been ordered properly although their workers might not have officially recognized skills.

On the other hand, many craftsmen and workers have the skills and competencies in their speciality and yet are not competent, which is to say that they do not have the capacity (the ability) to work efficiently at the workplace, including coordinating their work with other crafts.

### **There is a need for skilled workforce**

The gap between the needs for EE Skills (demand) and qualified workforce (supply) is becoming increasingly wide. Expectations are that this gap will continue to grow in the future. Policy makers and implementers do recognize the importance of EE Skills and – to a certain extent – work towards raising standards and norms, also enshrining it in policy. Their efforts, however,

fail to have a significant impact on the field. The gap between what regulators require from the SMEs (demand) and what they can offer (existing supply of quality services) is becoming unsustainably vast. In words of our research participant:

*“The step is becoming too high. It is like asking a young primary school student to compete for a bachelor’s degree.”* (SME Rep. and CEO, France)

### **The training should be based on practical (not theoretical) training**

Most stakeholders agree, that training (upskilling) should be based on practice rather than theory.

### **Need for an efficient strategy at local level**

The issue is to build and **to implement a strategy at the scale of the territory (local level)**, close to the inhabitants and to the SMEs. This includes the following key aspects:

- **Mobilization** of all stakeholders.
- **Local engineering** – setting someone to make things happen at the local level
- A shared in-depth **diagnosis** of local housing stock
  - For instance, to define buildings where deep renovation is likely to have a significant impact – ones where investment costs and efforts are relatively low and with considerable improvements in energy performance (and possibly quality and comfort of indoor environment).
  - The favourable and convenient timing to do the works (like when the housing is transferred, or at the start of other heavy works)
- The **combination** of several options:
  - Global nZEB renovation
  - Step by step renovation, with works done in the proper way, with a short-term goal on renovation performance, and the nZEB objective taken into account from the beginning.
  - “Blended” renovation, works being partially done by an artisan, and partly by the owner with the assistance of the craftsman.
  - The prefabricated way (like “Energiesprong”<sup>6</sup>)
- Special attention on “**communication and prescription**” as close as possible to the inhabitants. Entities that can be mobilized for this include:
  - The SMEs
  - The DIY stores and the wholesalers
  - And the local stakeholders (politicians, local authorities, advisors ...)
- The implementation of a **local network of “trustees”** to give inhabitants courage and confidence in nZEB renovation.
- The mobilization and the organization of **resources** to achieve the renovations programme with:
  - Technical advisors
  - Partnership with banks
  - Actions to upskill local craftsmen and SMEs
  - Organisation of enterprises’ groups

---

<sup>6</sup> A Dutch project focused on deep nZEB renovations (See <https://energiesprong.org/>). In France, Energiesprong was mentioned by ADEME as a possible way to renovate up some types of housing, reportedly up to 20%.

### 2.3.4 Research participants

	Participants (businesses or institutions represented)
<b>National Gov.</b>	ADEME – National Agency for Sustainable Energies AQC – programme FEEBAT
<b>Regional Gov.</b>	Hauts de France Regional Council: Housing department Hauts de France: Public service for energy savings in housings
<b>DIY retailer companies</b>	ADEO group - Leroy Merlin
<b>Small and Medium Enterprises</b>	Artizol
<b>Female workers and experts</b>	Virginie Hamon & Elsa Serre
<b>Construction sector training providers</b>	Practee Formations
<b>Building owners</b>	OPAL02 – Social housing manager
<b>Financial bodies</b>	Constructys (mutualised fund financing trainings) EDF (Electricity of France) Finances
<b>Suppliers</b>	Saint Gobain
<b>Total No. of participants</b>	13
<b>Total No. of interviews</b>	13

#### Governmental level

In the context of T2.2, we interviewed two National Gov. Rep's:

- Cedric Alvera, a building specialist at the Hauts de France ADEME - National agency for sustainable energy, and
- Jeremy Ferrari, a representative of AQC – National agency for the quality of the buildings.

Our regional focus is on Hauts de France (Reg. Gov.). The number of global nZEB renovations in this region is far from the objectives set by the State and the Region Hauts de France. In the

best-case scenario, private owners will do pieces of renovation year after year. To illustrate, according to a study done by CERC, a French public agency specialised in the building sector, the objective for “nZEB global” renovations (meaning a complete and simultaneous renovation, as opposed to a step-by-step approach) in the Cambresis, a territory with 170.000 inhabitants, the objective for renovated houses is set at the minimum of 2000 buildings a year, with an average of 4’5 actions per building (an example of such combination of actions could be changing the heating system + isolating walls + isolating the roof + changing the windows etc). The actual average rate of renovated houses at the time of the interview was only 1700 renovations a year with only 1,4 action.

The Rep’s of Hauts de France were:

- Anne- Sophie Legandre from the Housing department at Région Hauts de France, and
- Alice Morcrette and Jeremy Ferrari for Régie du SPEE<sup>7</sup> – A public enterprise for energy saving in private housings, also in charge of the FEEBAT<sup>8</sup> trainings.

### Private owners & (social) housing managers

In France, private owners are one of the key decision-makers groups. They importantly influence the nZEB global housing renovation market and are key for its development in the future. To get a deeper understanding of private building owners’ viewpoint, we talked to François Philippe – a building manager at OPAL02, a social landlord. Their company owns 13.500 housings in the Aisnes district (Hauts de France region) and has a strategic plan to perform a systematic deep renovation of their entire housing stock.

A French person makes the decision to renovate his/her housing when becoming the owner. This typically happens at the average age of 38, as claims the representative of Leroy Merlin. When retiring, renovation is no more an issue. Also, almost all owners who want to renovate their housing, go to a DIY store; these stores have, therefore, a strong influence. Another difficult challenge, observed with regard to private owners by the representative of Saint Gobain (product producer and supplier), is that they have difficulties calculating the ratio between costs and benefits of deep renovation, which is one of the main factors that negatively impacts the decision-making process

### SMEs and independent professionals

To represent perceptions of French SMEs and professionals, three people were interviewed – **Virginie Hamon**, an expert in building’s renovation, and **Elsa Serre**, a retired white-collar worker that spent all her life in the building industry. They provided us with invaluable insights for a deeper understanding of issues and challenges faced by individual professionals working in the French building sector. In addition, their participation in the research offered some more specific insights into challenges women face in the traditionally male-dominated sector.

A more business-focused view was presented by **David Castro**, the managing director of Artizol, expanded on their inputs and presented a managerial point of view. Artizol is a small enterprise working in the construction and renovation sector. They are specialised in deep

---

<sup>7</sup> A public organization la Régie du SPEE that can do, on behalf of the private owner, all the necessary to carry out a nZEB global renovation (audit, financial and technical engineering, choice and management of the companies.). Their service fee is currently set at €1860 per housing. Régie du SPEE is not related with the “Plan Bâtiment Durable” but could be seen as a good practice.

<sup>8</sup> FEEBAT – Free training program on energy efficiency and energetic renovation of buildings financed by EDF (Electricity of France) via the CEE mechanism (Energy efficiency certificates). Its aim is to strengthen the skills of building contractors on energy efficiency. (See <https://www.ffbatiment.fr/>)

renovation in the area of Cambrai (Hauts de France). At the time of the interview the company had ten employees.

David stressed that to achieve global nZEB renovations, the enterprises need good knowledge of new materials and equipment and know-how to work with professionals from different fields of speciality (cross-crafts), especially around weak points in the building. With regard to the yawning gap between the demand for EE Skills – including the demand side, but particularly with regard to standards set by policy makers in the “offices” – David shared the following remark that illustrates a growing issue of lack of available EE Skills in France:

*“There is a huge gap between the field and the ‘offices’”. (SME Rep. and CEO, France)*

### DIY stores

Leroy Merlin – part of the ADEO group – is the largest European DIY chain store and the third largest worldwide. We talked to Stéphane Calmès, the manager a training centre for EE Skills set up by the company. Their (worldwide) “housing campus”, as they call it, has the objective to upskill both the Leroy Merlin employees, as well as the SMEs working for Leroy Merlin. A so-called “Blended renovation” approach, one where the owner does part of the works with the help of a craftsman, may be a methodology to mitigate the significant lack of available skill in the sector.

Stéphane pointed out that almost all owners who want to renovate his/her housing go visit a DIY store. In France, people become owners usually between the age of 35 to 40. These stores therefore have a strong influence on their awareness, perceptions and attitudes regarding EE Skills.

Leroy Merlin owns 140 stores in France. They frequently have customers asking for specific services, such as to install products what they have ordered in their stores. To deliver these services, Leroy Merlin works with approximately 5000 local SMEs across France. Stephany described recruitment and training as one of their biggest future challenges. In her words:

*“There is an tremendous lack of good workers in the building sector, and, especially, for nZEB renovation.” (DIY store Rep., France)*

### Financial bodies

For insights on the financial side of the construction and renovation market, we talked to Ronan Segalen – a member of the Hauts de France regional government. Specifically, he represented Constructys – a public/private organisation partly financed by the enterprises of the building sector that are bound by law to devote at least 1% of their wages and salaries for training. Part of this money is mutualised and spent by Constructys to finance trainings and advices. In addition, we talked to Catherine Gillet representing Electricity of France (EDF) Finances. Catherine is EDF's executive in charge of FEEBAT trainings and its energy saving certificates.

### Supply and wholesale

For an in-depth discussion and a big business point of view, we talked to Mickael de Chalendar – a manager of regional actions at Saint Gobain. They are a world-wide enterprise, employing approximately 180.000 in manufacture of windows, roof isolation (wool), coatings for wall isolation etc. Saint Gobain also owns Point P – the largest French wholesaler of products for craftsmen and SMEs. In fact, it is estimated that 80% of the products (heating not included) entering in French renovated housing comes from Saint Gobain and its subsidiaries.



Mickael stressed that there is a lack of good workers to do the renovation of housings in France. On the other side, workers and craftsmen who have the necessary skills for their crafts, often do not know how to work together. This is why, he stressed, the upskilling is so important.

Mickael pointed out, that the RGE label<sup>9</sup> does not enough guarantee the quality of the work by workers, professionals and SMEs who have the certification. As the Rep. of Leroy Merlin, they observe the increasing gap between what is required from the SMEs and what they can factually deliver. The step is becoming too high, and it has to be overcome too fast. The SMEs continue to do what they know. This is one of the reasons why Saint Gobain runs a training centre that trains 2000 workers each year.

### Training providers

Benjamin Fedor, is an environmentalist engineer who has graduated from the ISA of Lille in 2002. Since 2005, he has been the funding member and manager of a consulting firm specialized in environmental performance. Since 2011, he is the President of PRACTEE Formation – a French company specialised in training tools and training contents for white and blue-collar workers of the building industry. They develop interactive demo models demonstrating the energy related process in the building, mobile equipment to test workers on their insulation and airtightness skills, “Hands-on” practical training mobile canters, innovative training programs for blue-collar workers to control airtightness, guarantee indoor air quality by good ventilation of the premises etc.

Since 2013 Benjamin has been working as a trainer referent for ADEME. He has been much involved in sustainable development trainings at several universities. He has been working for many years on trainings of operational practices on site (learning by doing). Starting 2013, Benjamin has initiated different pedagogical experimentation for construction professional (trainings on site).

---

<sup>9</sup> The RGE label (Reconnu garant de l'environnement) is a French national label that allows building professionals specializing in energy renovation work or the installation of equipment using renewable energies to promote their skills and competences and to be referenced on an official RGE information site. Only works and installations carried out by professionals and enterprises holding an RGE quality mark are entitled to certain financial aid and tax deductions. (see <https://www.quelleenergie.fr/rge-reconnu-garant-environnement>)

## 2.4 Ireland

### 2.4.1 Notes on NIP & Key outcomes from T2.2

As many as 1.5 million Irish homes are considered energy inefficient and require upgrade work between now and 2050. The Irish Programme for Government commits to retrofitting 500,000 homes to an EPC rating of B2 by 2030. This is far in excess of the current rate of retrofitting so there is a big task at hand. Lack of awareness and skills shortages have been identified as barriers to the uptake of retrofitting in Ireland, so the aims of the BUSLeague project are directly aligned to the key issues in this area.

The ethnographic research was conducted to address the key focus areas of the Irish NIP namely: raising awareness with specific target groups including local authorities, social housing associations and clients of DIY stores, providing nZEB training for craft workers, site supervisors and public authority staff and developing a skills register.

Many of the barriers to the uptake of energy skills training that had previously identified were raised in the ethnographic research.

- This is a lack of awareness amongst homeowners about skills. A general awareness campaign similar to the campaign for the “RECI” certification for electricians was recommended.
- There is a lack of awareness in the workforce. There is a culture of saying “this is the way we have always done it” and an unwillingness to make changes.
- There is an issue with lack of time. Even if they could pay for their employees to do the training, SME’s reported that they couldn’t afford losing the time.
- There is a need for clarity. There should be one standard that everyone needs to meet. Part of the issue is knowing what training to do as there are so many different courses.
- Professionals are more likely to sign up to training than construction workers, even if the training is designed for construction workers.
- Practical training was recommended at the best format. Construction workers don’t like classrooms, they like to be hands on operating in the open
- Providing training on site or at the hardware store will increase uptake.
- There is a shortage of skilled workers in the industry.
- Respondents felt that Build Up Skills Ap was a useful tool. Although one queried whether it was suitable for an older (less tech savvy) workforce.

### 2.4.2 New Insights

- **It is necessary to adopt a “big picture” approach to training.**
- **Retrofit should be seen as a specific career path.**
- **The new sustainable finance taxonomy has the potential to be a driver for skills.**

#### **It is necessary to adopt a “big picture” approach to training**

Training should aim to give an understanding of the purpose of the new regulations and what they are trying to achieve. To appreciate why the changes have been made to the building regulations. This will give an understanding of the importance of their job on site in relation to the bigger picture.

*“If you focus just on the individual elements there are going to be gaps. They have to fundamentally understand what the whole thing is trying to achieve. It's not just their part, they are feeding into another part, and they have to be mindful of what is going on around them. For example, if someone is putting in a window, he might make it easier to achieve airtightness*

*if he puts the window in in a certain way. If he puts it in a half an inch off it just makes another person's job that much harder.” (Local Gov. Rep. Ireland)*

### **Retrofit should be seen as a specific career path.**

People should be trained in a number of areas to work on retrofits. There is an overlapping skillset that is needed to do the job efficiently.

*“When people would have done an apprenticeship years ago, they would have say done an apprentice in carpentry, it would have been just purely carpentry. But nowadays with the retrofit market, we need a scheme that would be able to bring people in, give them a reasonable amount of knowledge for a larger variety of the job that is in hand.” (SME Ireland)*

### **The new sustainable finance taxonomy has the potential to be a driver for skills.**

Once the EU adopts Sustainable Finance Taxonomy<sup>10</sup> there will be more things to consider than just an EPC. This might lead to a requirement for testing and recognising energy skills when applying for a “green” loan for retrofit work.

#### **2.4.3 EE Skills - Value & Expectations**

- **EE Skills are perceived as desirable but not essential.**
- **Airtightness as the common denominator for build quality.**
- **Heritage buildings must be dealt with appropriately.**

#### **EE Skills are perceived as desirable but not essential.**

The representative of a DIY retail store pointed out that homeowners view energy efficiency skills as desirable but not essential. Similarly, a Local Gov. Rep. pointed out that homeowners tend to consider several aspects of quality of housing – such as aesthetics, location, convenience etc. – as more important than EE.

#### **Airtightness as the common denominator for build quality.**

Airtightness was mentioned several times in relation to quality buildings and EE Skills. Our Rep. of product suppliers suggested it should be considered a “common denominator” for build quality and EE Skills.

*“The airtightness installer links everything together and every trade together that interacts with the external envelope.” (Product supplier, Ireland)*

#### **Heritage buildings must be dealt with appropriately.**

We have about 400,000 solid wall buildings in Ireland. These buildings have to be approached in a more sympathetic way e.g. by internally insulating. Understanding the limitations of retrofit

---

<sup>10</sup> The EU Taxonomy is a tool to help investors understand whether an economic activity is environmentally sustainable, and to navigate the transition to a low-carbon economy. (see <https://www.unpri.org/policy/eu-sustainable-finance-taxonomy>)

solutions in this context and knowing what is appropriate for older buildings is essential to achieving desired results.

#### 2.4.4 Research participants

	Participants (businesses or institutions represented)
<b>Local Gov.</b>	Kieran Greene, Clare County Council Elizabeth Hore, Wexford County Council
<b>DIY retailer companies</b>	Austin Nevin & David Celt Chadwicks, DIY company Martin Markey, Hardware Association of Ireland
<b>Small and Medium Enterprises</b>	David Widdis & Martin O'Reilly Green Watt, Alexandra Hamilton 3 Counties Energy Agency, Niall Crosson, Ecological Building Systems.
<b>Construction sector training providers</b>	Barry Madigan, Michael Dalton & Joss Power WWETB
<b>Building owners</b>	Susan Vickers, Cluid, Social Housing Cooperative
<b>Financial bodies</b>	Laura Heuston, Sustainability Works
<b>Total No. of participants</b>	14
<b>Total No. of interviews</b>	10

##### Local Government – Wexford County

Elizabeth Hore is a procurement officer at the Wexford County Council. She pointed out that Wexford has a huge construction industry and is extremely outward looking (role of foreign direct investment). For the council, creating jobs in that area, innovation (e.g. green materials) and Green Wexford are priority (part of Wexford brand). She stressed the importance of engaged individuals, or rather, having “the right people at the right time, passionate people driving that agenda”. With regard to BUSLeague aims and goals, Elizabeth stated the following:

*“Wexford will be delighted to be the local authority piloting the clause. We want to be pioneer in the area. You need to develop the clause but also build capacity for the LAs to use the clause e.g. training and awareness. We need greater awareness of the importance of skills in relation to nZEB.”*

##### Local Government – Clare County

Kieran Greene is a Building Control Officer who has worked for 20 years at Clare County Council. He is responsible for Inspections for compliance with Building Regulations. A major part of his role is to assess commencement notices that come in for planning applications for compliance with Building Regulations. Later he would do an inspection during the building phase of the project. He would often find the detailing of the work would not be achieving the required outcomes in the designs. So that makes his job a lot more difficult. It was Kieran’s understanding that there was a considerable need for training of construction workers to understand the intentions of the building designs when it comes to the energy efficiency aspects. Kieran felt that construction workers need to work as a team and to be proactive in understanding the intention

of the building design rather than to expect Building Control to suggest solutions when problems arise.

*“In Building Control enforcement is the last resort. We are solution based as opposed to problem based, we will look for solutions, we won't offer solutions. We take things on board.”*

### **Building owner – Social housing company**

Susan Vickers represented Cluid – an Irish social housing company. The properties services team in Cluid has a really good handle on stock. They are carrying out stock condition surveys. They know when elements of certain properties need to be addressed. The windows might be coming up for replacement soon or they know where the gas boilers are in terms of the fact that we need to start phasing these out or they are coming up to the end of their life cycle. They have a really solid handle of the condition of the houses.

Susan explained that Cluid have a mix of skills from building surveying managers, to Clerk of Works, Architects, a whole new business department (well up-to-date with nZEB and EE Skills), building surveying managers (people who are going to have to maintain these properties). She pointed out that all these profiles are going to have to make sure that their skills are updated, and stressed that this is something that Cluid are very committed to. With regard to demand for EE Skills, Susan put it in the context of fuel poverty:

*“If we can reduce fuel poverty for social housing residents, that's something that we are really interested in. So it's not as simple as we are willing to do x,y and z. It's how that will benefit and how we can explore that. Yes, we would pay more for skills but there is an understanding that those skills will be needed anyway on most builds now.”*

### **SME – Energy Agency**

Alex Hamilton is a Senior Engineer at 3Counties Energy Agency. She has experience in implementing projects in the public, private and community sectors relating to energy efficiency and renewable technologies. She has project managed a number of SEAI Better Energy Community Grant projects. This involved overseeing numerous energy efficiency upgrade projects and administering grant funding from the SEAI, including all payment claims, progress reports and arranging site inspections.

*“It is continual improvement on an annual basis. Every time that we deliver a project there are new things that we, as an energy agency, are finding and therefore passing on to the contractors. From our own internal point of view, having the in-house skills to be able to understand what is required, and then pass on those messages and skills is always an ongoing problem.”*

### **SME – Retrofitting contractor**

Martin O'Reilly and David Widdis are co-founders of Greenwatt Ltd which specialises in energy retrofits to homes and businesses. Greenwatt aims to provide viable sustainable energy solutions, which will reduce costs and energy use (see <https://greenwatt.ie/>). Martin is an energy consultant at Greenwatt. He has experience in the areas of renewable energy and energy efficiency, upgrading residential, commercial, educational and community buildings. David is an architect and has thirty years' experience working as an architect and project manager.

David believes that with the targets of the Climate Action Plan<sup>11</sup> there will be a great demand for the solutions BUSLeague is offering. To illustrate his stance towards EE Skills, he shared the following statement:

*“When you are retrofitting houses, there’s a solution that has to be designed for every house based on what you find when you get in there. Whether it’s boilers or showers or there’s been extensions added. The plumbing has been pulled this way or that way. So you have to think on your feet and come up with a solution. We’ve designed some of our own thermal bridging details to deal with issues we’ve had on site. We find that also any of the subcontractors we use, we train them to meet the SEAI standard that is different to the Building Regulations standards. We know for a fact, the standard that we put in a heat pump is used as a standard for the inspectors.”*

### **SME – product supplier**

Niall Crosson represented the view of product suppliers. Niall is Group Technical Manager at Ecological Building Systems. Niall provides guidance in the area hygrothermal analysis of building components and in relation to airtightness and thermal insulation of various forms. Niall has knowledge of a range of natural insulation products including wood fibre, hemp, paper and sheep wool. With regard to recognition of EE Skills in Ireland, Niall called for a positive approach, based on recognition rather than enforcement. Specifically, he favours airtightness as an overarching skill:

*“We’d love to see a national award or some form of recognition of skills because as a supplier we can give a certificate that you’ve done a training but it’s not a third party verified cert and that holds more value. At a recent conference and there was a round table discussion, and we were asked to select one thing we would change. We highlighted that there should be formal recognition of airtightness installers as a skill set because that links all the skills together.”*

### **DIY retail company**

Austin Nevin is a representative of a DIY retail company Chadwicks specialising in selling building products. Austin was happy to collaborate with BUSLeague. He has been active in the area of EE Skills for a while as part of Chadwicks activities related to a sustainability hub they have plans to activate in their stores. With regard to BUSLeague, they are particularly interested in developing a one-stop-shop. Austin pointed out why the collaboration is mutually beneficial:

*“We are aware that there is a plan to have 500,000 homes upgraded. For this reason, we are going back to the drawing board and exploring the possibility to see how to partner with someone to provide a one-stop-shop service. We are in a great position we have the customer base; we have the product, we have all the knowledge.”*

### **DIY retail – Hardware Association Ireland**

Martin Markey represents the Hardware Association Ireland, and therefore the (more top-down) viewpoint of DIY Retailer Companies. The HAI has over 400 members from big chains such as Chadwicks, big manufacturers such as St Gobain, Tegral and Wavin, to smaller hardware shops. It is an industry that is worth 2.4 billion and employs more than 26,000 people. With regard to the future of EE Skills in Ireland, Mr. Markley stated the following:

---

<sup>11</sup> Ireland’s plan to tackle climate breakdown. (see <https://www.gov.ie/en/publication/ccb2e0-the-climate-action-plan-2019/>)

*“The whole area is very new and anything we can do in terms of education is positive. Business during the lockdown has been good for hardware stores. They have been able to remain open as an essential service. Many people have been undergoing refurbishments of their homes. If we are looking for opportunity for the sector, then retrofitting for energy efficiency is a key opportunity.”*

### Training providers – WWETB

WWETB Waterford and Wexford Education and Training Board (WWETB) provides a range of education and training services throughout Waterford and Wexford. NZEB Training courses are being delivered in WWETB's Training Centres in Enniscorthy and Waterford. These courses are the first trade specific NZEB Courses being delivered in Europe.

**Barry Madigan** is a master plasterer, originally from Waterford. He left school at the age of 15, became involved with different projects with Ancho (before FAS). Took part in OPLA Scheme (Old People Living Alone). Given taste of different trades and eventually got involved in plastering. He did four years apprenticeship in Waterford training centre and later worked for McInerneys, a big construction house building company. Became self-employed. Still part time self-employed. In busy times, he had six to seven apprentices, couple of gangs of subcontractors, maybe two sites at a time.

Experienced change from traditional build to timber frame. Big change, putting in insulation with no training. Learn as you go and word of mouth. Self-employed up to 2008, then with downturn retrained in external wall insulation and did that for a couple of years until grants were cut. Got involved in the training centre seven years ago and works part time. Covers the plastering, but classes are split due to Covid so they have seven apprentices each.

**Michael Dalton** is a master plumber, originally from Wexford. He started in building at the age of about 15 or 16 years. Did weekends and summer work. Did his leaving cert and started plumbing with his father's business. Did four year apprenticeship in Waterford. Also trained to be a gas installer. Did a lot of work with McInerney Construction, Waterford, and some other smaller building companies. Did foreman for a few years while working for South East Plumbing.

2008 downturn his father retired & Michael became self-employed. Built a few houses himself, plumbed a few houses, carried on with gas. Moved into doing smaller private dwellings, and did maintenance work on oil, gas boilers. Got job opportunity with the centre a little over a year ago, started November 2019. Hadn't heard of nZEB while doing private small housing schemes. New to him but he's learning and enjoying it.

**Joss Power** is an old headmaster in school brought in Ancho/FAS, who showed them careers they could go down. He chose bricklaying and went to Ancho in 1977. Qualified 1981. You have a Clerk of works on site, and back then they were nervous of him because he'd check your work- your bricklaying, cavities, clean ties etc. They learned from that. Boom came along and he went working for McInerney's 1993. There was no one watching anything. Busting aeroboard with a hockey stick. No one checked, so no one cared.

Downturn of 2008 McInerney's folded & he retrained himself, came to the centre and got job. Dealt with a lot of unemployed men- brought them in for 12 or 14 weeks, did walls, footpaths with them, construction and kerbs. Turned into a ten-week course which he deals with since 2014, which teaches basic construction skills, hands on.

Also involved as peer advisor in pre bricklaying apprenticeship with City and Guilds. Thinks pre apprenticeships are the best way forward. Thinks you should bring in TYs etc and give them a taste of what's out there. Thinks they must get in early or they'll do "the bad things" on site.

### Financial body



Laura Heuston, is co-founder of SustainabilityWorks, a sustainability consulting firm that works in the area of sustainability strategy, finance, policy and communications. Laura is a Chartered Tax Adviser and specialises in responsible investment, impact investment, renewable energy finance and energy efficiency finance. Laura is seeing a greater interest in the financial sector in green products. Financial bodies are beginning to recognise that mortgages on efficient houses carry a lower risk:

*“The financial regulators are saying they are going to come in and climate stress test. The Irish Central Bank has specifically said that Irish mortgages, which are 50% of AIB and Bank of Ireland balance sheet, will be tested. When the central bank say they are going to climate stress test, the EPCs are going to be an important part of that. Why would that be? Those (with poor EPCs) are going to become the more risky assets. Carbon tax is going to start to go up. Energy prices are going to start to go up as a result and electricity prices and then people will have less money to pay their mortgage. This is a really good opportunity for the banks to show they are doing something to tackle climate change by introducing these new green products. So those are the two drivers now. They are becoming less concerned about the commercial side of it and more focussed on the other two which is the risk and the reputation.”*

## 2.5 Spain

### 2.5.1 Notes on NIP & Key outcomes from T2.2

BUSLeague focusses on a blend of four elements: mutual recognition of energy skills, awareness raising, capacity building and legislative changes. The Spanish National Implementation Plan has established specific objectives for each of these lines of action, but it has placed special interest in organizing awareness campaigns aimed at both citizens in general and professionals in particular. As part of this motivating message, we want to analyze the gender perspective and the role of women in the sector, with the aim of leaving no one behind.

In order to carry out these campaigns successfully, the collaboration of key entities in the sector is necessary, such as user and consumer associations, which have a large number of citizens among their associates and have the appropriate communication channels to send them an awareness message. The participation of Bauhaus in the project is also an advantage since its stores are the ideal place to intercept the consumer and expand the environmental information of the products it buys and the services it hires.

But it is also necessary to know the starting point to set viable and realistic objectives in the medium-long term. For this, it is advisable to know the level of awareness of all the agents since all are necessary and all must advance to the beat:

- Do citizens attach importance to the energy efficiency of their homes? Are they willing to invest in an efficient home?
- What about independent workers and SME's? are they interested in learning about energy efficiency and advertising it to their customers? or is energy efficiency an affordable luxury only for large construction companies?
- Are governments and public entities sufficiently promoting energy efficiency and creating adequate policies?

The interviews carried out in Spain within the framework of the BUSLeague project as part of the anthropological study have been a first step to know the vision of the agents, their current situation, their interests, their barriers, their needs, their priorities, etc. Each interview can be considered as a piece of a puzzle of which we are all part and that must be assembled little by little but in a coordinated way for the common good.

The main conclusion obtained through all the interviews is that everyone agrees on the importance of energy efficiency and is willing to collaborate on the next actions to be determined. Therefore, it is likely that several of the interviewees will be consulted again to contribute to some of the actions proposed in the project.

### 2.5.2 New Insights

- **Digitalization trend**
- **The 2008 economic crisis continues to impact the sector**
- **Apps, websites, skills cards & passports to find EE-skilled workers**

#### Digitalization trend

Research shows it is necessary to advance in digitizing and offering online tools. Although some experience difficulties adapting to the ongoing digitalization, most citizens, including older ones, are motivated to adapt to the digital age. In words of one of our informants:

*“The shift of the sector towards digitization is inevitable but there is still a long way to go.”*  
(Building manager, Spain)

### **The 2008 economic crisis continues to impact the sector**

One of the two highlighted reasons why few courses regarding EE have been held in Spain during the last years the consequences of the 2008 economic crisis. Its consequences are still present on today's market and many companies, especially SMEs and independent professionals, struggle with keeping their business afloat. The other reason for lack of courses is the cost of elaborating and updating the energy efficiency contents needed to run the training sessions.

### **Apps, websites, skills cards & passports to find EE-skilled workers**

Several of the interviewees miss an online list, web or application where clients can find qualified professionals in energy efficiency easily and quickly. They imagine an online platform, supported by official bodies (Government, non-profit associations, professional associations, etc.) for greater confidence, and periodically reviewed to update the information of professionals (which is very changing). It is important that:

- the professionals themselves can upload the information under supervision,
- the platform is easy to use,
- the requirements for registration do not discriminate against the small business (SMEs) or independent workers for low turnover,
- show the professional's competencies acquired both through training and through recognition mechanisms.

### **2.5.3 EE Skills - Value & Expectations**

- **Current courses are not flexible enough**
- **Support to companies in their progressive adaptation**
- **New trends**
- **Recognition of EE skills**
- **Citizen awareness**

#### **Current courses are not flexible enough**

The current economic situation makes it difficult for construction companies to set internal CPD programmes to upskill their workforce talent. Organizing courses and preparing a training offer adapted to the real needs of the sector in terms of innovative and highly demanded topics can be of great help. It must also be specialized to be brief and direct (since the worker does not have much time), practical, flexible and economically affordable.

#### **Support to companies in their progressive adaptation**

Companies seem to be aware that sustainability should become a must in the business, not only from an ecological point of view but as a way of running business. Companies must adapt their way of working to the sustainable development goals. Many of them are lost in the adaptation process.

#### **New trends**

There are hot topics such as the installation of renewable energy for domestic use, prefabrication and standardization, construction 4.0 that are promising careers and imply a high level of employability for those professionals and companies that invest in learning and experimenting with it.

### **Recognition of EE skills**

It is very important to certify or support the current professionals working in the construction sector as the most part of them were not able to study and acquired their skills through working experience.

### **Citizen awareness**

Citizens are already aware of hiring qualified professionals in general but not so much in professionals with energy skills. When hiring a professional, the price criterion still prevails.

Awareness must be directed above all to citizens who are those who commission the work and to whom professionals must respond and satisfy. But professionals must be prepared for when the time comes to act under energy efficiency parameters.

## 2.5.4 Research participants

	Participants (businesses or institutions represented)
<b>Regional Gov.</b>	Valencia Regional Government (Generalitat Valenciana) - Ecological Innovation in Construction Department
<b>Independent workers and experts (blue and white collar)</b>	FEVEC – an association representing construction companies and workers in Valencia region
<b>Female workers and experts</b>	Marta – an installer at Bauhaus
<b>Building managers</b>	AAFF – a Building managers association
<b>Building owners</b>	TYRIUS – a consumer association
<b>Financial bodies</b>	Unidad de Gestión del Mediterráneo S.L. – a private consulting company
<b>Total No. of participants</b>	6
<b>Total No. of interviews</b>	6

### Consumer association

Amparo Mocholí is a member of the legal and consumer department at TYRIUS – a consumer association established in the regions of Valencia, Castellón and Alicante since 1967. The association currently has 28,000 members and attends a wide range of topics of interest to citizens: information, training, support in the processing of subsidies and public aid, consumer claims, volunteering, health, support for immigrants, accompaniment of victims of gender violence, psychological care, flats for population at risk of exclusion, etc. With regard to efficient communication and rising awareness about EE Skills, Amparo shared the following statement:

*“Before we had a magazine that was stopped publishing but now, with everything that is happening, we want to edit it again, because we have to reach more people. Technology and telematic communication are very important but unfortunately there are also many older people who live alone and are not familiar with new technologies. We must not exclude these people and for this reason, the traditional media must coexist with the new communication channels”.*

### Building manager representative

Juana Blasco is the director of the ecological awareness department at AAFF – a Building managers association. The association represents the building managers of the Valencia and Castellón regions and currently has 1,000 associates.

The AAFF association, is keen to contribute to BUSLeague project by making her communication channels available to us to echo the achievements and results. This includes both the website and social networks, as well as the AAFF association’s magazine, which is published biannually (June / December) and distributed to its 1,000 associates (on paper). This magazine is also available in PDF through its website (See <https://aaffvalencia.es/>).

With regard to what Juana learned about the interest and demand regarding EE Skills from the pandemic, she shared the following observation:

*“Due to the restrictions of the COVID19 pandemic we had to change our courses to online mode and ... it was a success. Our reach and number of people has skyrocketed. This shows that sometimes, it is not a lack of interest, but a lack of flexibility in the actions that we propose. The fact that many of our associates are attending our courses guarantees that they will be able to practice their profession with higher quality and this will contribute to a better service to the citizen.”*

### Financial body

Jose María Díaz Rubio is a Financial manager at Unidad de Gestión del Mediterráneo S.L. It is a private consulting company whose objective is looking for ways of getting funding and obtaining the best possible financing conditions. The company is located in Castellon and Valencia and collaborates closely with 70-80% of the banking institutions in Spain.

Their main input channels are real estate agencies and administrators. They do not currently advertise their services. In the construction sector, they mostly manage self-promotion financing for both new buildings and refurbishments, but not public grants. They usually deal with individuals, not with residents' associations since the procedures are more complex. The most common financing entities are the banking entities, for instance, making direct payments to the construction companies based on the work certifications, but this is not common. Other ones promptly put on the market specific products or agreements targeted at certain sectors of activity.

They have been developing their activity for more than 24 years. They offer a service not really known in Spain but widely established for instance in the US. The company is growing due to the workload or inquiries that they receive, but they prefer to keep the size to give a more familiar treatment, they like to personalize the whole process. They manage the entire process to free the client from most of the details.

He points out that nowadays everything that is visible and influences comfort, such as aesthetic finishes, lighting, acoustics, electrical appliances, is more highly valued than energy efficiency arguments, so the price is not equated with the energy efficiency rating (EPC), but with other assessment criteria. At present, there is a specific banking institution that discounts the interest rate on mortgages based on the energy rating. The bank rewards you for buying optimal energy-efficient homes. However, he believes that many institutions are still not aware of these issues and do not recognize the relevance of EE and associated skills. Nonetheless, he thinks more work is needed in this direction. For example, he notes that it would be logical for insurance companies to improve the insurance premium by insuring more efficient homes.

### Regional Government

Nuria Matarredona Desantes (early 30s) is the General Director of Ecological Innovation in Construction of the Valencia Regional Government (Generalitat Valenciana). Her mission is to promote the transfer of know-how and that the built environment we inhabit incorporates sustainability criteria at an environmental, economic, and social level.

She appreciates the opportunity to share knowledge and to be able to collaborate with the BUSLeague project because it pursues targets that have a lot to do with the current line of action to achieve a paradigm shift to reach sustainability in all areas. People are aware of the importance of energy efficiency but they find problems when it comes to materializing it.

*“People want it but do not know how.”*

There is a lack of knowledge about strategies and getting a sustainable response. In this regard she noted the key role of Public Authorities with regard to raising awareness and enabling access to reliable knowledge.

Nuria pointed out that Generalitat Valenciana in the BUSLeague project can be carried out through: the 3 pilot buildings (case studies), Plan ASTREA (financial mechanism), Plan IRTA (financial mechanism + awareness), and Green guide (public procurement). For this, it will be necessary to advance in the planning of tasks and the creation of working groups in which staff from Generalitat Valencian and IVE participate.

### Female worker

Marta is a kitchen installer for Bauhaus in her mid-30s. She works and collaborates for the Bauhaus kitchen section in the Madrid area and also does other kinds of work related to construction and refurbishments – everything from buying homes to refurbish and sell to solving interior design issues. She is passionate about construction from her late teens and related issues to energy efficiency, bioclimatic housing or ecological footprint. In this regard, she believes Spain is lagging far behind many other EU countries, but we are on the way.

She considers that appropriate training for EE Skills already exists, and it is a basic item to be a successful independent worker. She is interested in knowing what level of consciousness regarding EE and related skill Spain actually is.

With regard to the aspect of gender, she pointed out that there is “still work to be done” but it is a matter of time before a greater number of women join the construction. She believes construction sector has an emotional component and therefore attracts women a lot. She also pointed out the following observations:

- She has not felt discriminated against because of her way of being, but it is true that there is still a trace of sexism in some situations.
- An increasing number of women works in the construction sector, but the majority of are men.
- Only a small minority of clients prefer to be attended by men or only speak to male colleagues.
- It is necessary to change that women are systematically inhibited to carry out some tasks that were traditionally assigned to men, and it is necessary to stop differentiating tasks by gender.

Regarding the mission and activities of BUSLeague, she considers it very relevant and motivating to organize gender activities and workshops, since it is a way to connect with women in a playful way and open the door to their increasing participation in the sector.

### Professional organisation (independent workers)

FEVEC is a non-profit business organization that represents construction companies of the Valencian region. Maria Lladró oversees the Training department at FEVEC and has a wide training experience over the last decades. They focus on health and safety trainings to be able to work in the construction sector.

*“I think that what we have lived this year (COVID-19) has changed everything. In some way it has connected us with forgotten needs related to nature, balance and respect for the environment that surrounds us. In general, there is more demand for sustainable housing, and this means a higher economic investment at the beginning but significant energy savings in the medium term”.*

María pointed out that accreditation by experience is very necessary in the sector and should be strongly requested by companies and associations. FEVEC has been working on the workers certification for years, trying to launch an ambitious certification together with FLC (Construction Labour Foundation) and the Ministry of Spain.

## 2.6 The Netherlands

### 2.6.1 Notes on NIP & Key outcomes from T2.2

In the Netherlands, the National Implementation Plan follows the two main aims of BUSLeague – stimulating demand and providing skilled workforce. Besides the main aims there are some other qualitative goals, such as connecting to female workers and professionals in the building and installation sector.

Our NIP contains a large number of actions on both main aims. As a result, interviews have only been conducted for a few actions. When starting other actions, we will also take time for questions from an ethnographic perspective, as this type of research gives us new and useful insights about the people involved in the actions and the environment in which they work.

On the demand side, we interviewed a provider of energy counters to find out how local authorities work and how they incorporate the demand for skilled workers into their subsidy schemes. In addition, this interviewee gave us useful information on the skills needed by an advisor for renovation of existing houses to the nZEB standard.

In order to reach out to SMEs and motivate them to upskill and make use of the BUSLeague means, we interviewed two training providers in a group interview. Since we need to upskill a huge number of workers to achieve the goal of a nZEB built environment and in order not to demotivate workers, the trainings should be as practical as possible and focus on what is really needed.

We also held interviews with the two branch organisations of the construction and installation sector, because they are key to reach SMEs. They agree with making training as practical and targeted as possible. They also agree with our interviewee from the energy desk provider, claiming that a regional approach works better than a nationally coordinated (top down) approach. At the same time, this does not mean that a national (and possibly top-down) approach and a regional approach are at odds with each other. On the contrary, they reinforce each other.

On both the demand and supply side of BUSLeague, we would like to reach many different people, including female employees. To reach them, we interviewed an employee of the training fund of the installation sector. Our interviewee told us that we need to take into account the specific needs of each group of workers, such as women, lateral entrants and migrants. Without taking into account their specific needs, it is impossible to successfully employ them in the sector.

Besides the expected information from the interviews, the interviews were also conducted to build a stronger relationship with the interviewed organisations. The interviewed organisations are in fact important stakeholders in the implementation of the actions that are part of the two main trajectories of our NIP.

What stood out in the interviews was that there is a strong drive to work on good training for professionals in the construction and installation sectors. The enthusiasm was regularly visible on the screen (all interviews were conducted online) and most interviews were stopped because of time rather than because the interviewees had already finished talking. This gives us great confidence that the BUSLeague objectives for a nZEB built environment will be achieved.

### 2.6.2 New Insights

- **Inclusion and diversity**
- **Make training as focused as possible**
- **Collaboration is key**
- **Regional and local approach**



- **Tell the whole story, but focus to get action.**

### **Inclusion and diversity**

An often-overlooked aspect in the field of construction and renovation is the topic of inclusion of women, migrants, LHBQTI, workers with a migrant background, disabled people, lateral entrants (people entering the sector from a different field of expertise) and other minority groups and communities. In pursuit of diversity, it is necessary to realize that everyone has their own needs. Providing space that facilitates them in this while, at the same time, letting everyone fully participate.

In addition, it is necessary to consider diversity in the recruitment process. People tend to choose people who are similar to themselves. For stimulating inclusion, however, it is necessary to overcome this automatism. A possible solution would be to have additional people from different background in the team responsible for the recruitment process.

### **Make training as focused as possible**

In the Netherlands, there are two schools (directions) when it comes to the content of training courses. One school tends to cover the entire body of knowledge about a theme or technic in the training. The other chooses to make training as focused as possible, leaving out whatever is not deemed essential.

The second school seems to develop training that works from the base of the sector, and that building and installing companies and SMEs prefer. The first school is from outside the sector. All the interviewees who talked about this topic choose for the second school.

Thus, make training as focused on the topic as possible – with only the skills, practice, and theory needed to do the job well. Every general or specialistic theory, which is not strictly needed has to be excluded. The trainings provided have to be strongly related to the practice of the student/trainee's work and life.

According to our research, investing energy and resources in small, achievable steps, ones that have real impact on the field in this regard, is worth much more than focusing on administration and policy that is coming from the outside. In words of our Training centre representatives:

*“Don't lose energy on trying to change bureaucracy.”*

### **Collaboration is key**

Collaboration in the area of nZEB building and renovation is key. Development of practical and focused training requires close collaboration between partners in the building and installation sector. Similarly important is on-site collaboration in action. A lot of different specialisms are needed for planning and implementation of integrated energy systems and EE-measures, and not least, for development of complex projects that involve a lot of stakeholders, which is what deep renovations projects generally are. With regard to the latter, there are only a few companies (the biggest ones) who have all the necessary skills.

### **Regional and local approach**

In the Netherlands, value of targeted regional and local approach to working on projects in construction and renovation and in innovation about technics, methods, training etc. has been

highlighted by a number of research participants. Wijkaanpak<sup>12</sup> – a neighbourhood approach to systematic energy transition – has been specifically highlighted as an example of good practice. In conversation with Rep's of one of the professional (branch) organizations, the following reasons were for success of emerging bottom-up projects were given:

- The members in a certain region know each other, trust plays a role here.
- The members see the need for change in their own context. They know the local market. Clear and recognizable ambitions and objectives can then be formulated for this.
- Collaboration takes place across the sector: in addition to the builders, the installers often also participate, whether or not from the regional departments of the sector organization for the installation companies. Completely different companies also join in, as does education for professionals in those regions.
- This innovative projects in the regions are key for the renewal of the sector in the direction of nZEB.

Suggestions were made to plan upskilling activities and stimulate uptake of innovations in the sector following the similar model.

### **Tell the whole story, but focus to get action**

Like energy transition, integrated renovation of a dwelling is a complex topic. Most people in principle care to act for energy reduction and a better environment, but find the topic as a whole far too complex. As a result, what often happens if one asks them to engage *fully* with the overwhelming complexity of the energy transition, they tend to avoid or even refuse. In contrast, they like to do small steps and acts. The role of advisors is to present the whole story and to guide people step by step to the goal of nZEB dwellings, also through installers and builders who are able to realize it. In this way, it is possible to get them involved in realizing the energy transition.

### **2.6.3 EE Skills – Value & Expectations**

- **Motivation for upskilling depends on the context**
- **Recognition and certification are represented on company level**
- **The broad scope of EE skills**
- **Recognition as a mean to be proud about having EE-skills**
- **Difference in developing skills**

### **Motivation for upskilling depends on the context**

Training centre Rep's have different experiences with the motivation for upskilling. On the one hand the installers say "I'm busy, busy, busy, to busy". On the other hand, when the annually blue-collar workers days are held at the training centres, dozens of employees of installation

---

<sup>12</sup> **wijkaanpak** (literally: neighbourhood approach) is the action plan to transform the whole build environment to natural gas free. Every local government has made a plan for every neighbourhood which solutions are chosen (i.e. district heating or a heatpump for every building) related to the specific situation of the buildings in that neighbourhood. By development of the executing plan for a specific neighbourhood, involving the building owner is key to success. The Wijkaanpak is only one kind of regional and local collaboration and applied innovation models that run in the Netherlands.

companies attend every evening, indicating there is interest (perceived value) and recognition of importance of EE Skills among the workforce.

What is necessary is taking action that triggers the workforce or SME entrepreneur to break through the “busy, busy” thinking. Such example would be subsidies, or making trainings mandatory. At the same time, it is important to make it easy and convenient for the workers – bringing training and recognition to the work spot and design the trainings aligned to their preferences.

### **Recognition and certification are represented on company level**

In the Netherlands, recognition and certification are represented on company level. This means that sometimes a company can show all kinds of (required) recognition and certifications, but their workforce does factually not have the skills and competences that are supposed to be represented by the certifications. Certification at company level also says nothing about the subcontractors involved in nZEB projects.

### **The broad scope of EE Skills.**

Having EE Skills is more than just having knowledge and skills regarding a specific topic or segment related to energy efficiency and sustainability. It includes a broad understanding of other EE-measures and technics, a broad view (not the same as a broad expertise, expertise can be on one technic or topic), to have an eye for the dwelling as a whole, the installations, and for the owner. This is needed on different levels in an organisation and for the different actors in the chain, such as advisor, engineers, installers, designers, builders and service technicians.

### **Recognition as a mean to be proud about having EE Skills**

The recognition of EE-skills makes people proud about their skills. The fact, that they can show them is as an advantage. What is more, others can recognize the skills they have. For some interviewees, enabling demonstration of officially recognized EE Skills is an extra motivational stimulus to work on recognition systems and means, such as ones developed in BUSLeague.

### **Difference in developing skills**

Electrical technicians are used to continuing education in order to acquire new knowledge and skills. For mechanical technicians this is becoming a new element in their working life. Dutch branch organizations need to devote extra attention to the latter group to make them familiar with upskilling on a regular basis.

## 2.6.4 Research participants

	Participants (businesses or institutions represented)
Local Gov.	An SME employee servicing local governments
Small and Medium Enterprises	Directors of training centres (2) and employees (trainers) in the training centres (2)
Female workers and experts	A manager at a worker development fund
Professional association	Policy advisors and employees of building sector branch organizations (2) Program managers and employees of installation sector branch organizations (3)
Total No. of participants	11
Total No. of interviews	5

### SME employee & professional energy advisor

Adam Sethsson is an energy advisor. The organization he works for offers Energy counters as a service for local governments and advises them on how to create and make policy for an Energy Counters to reach a nZEB build environment. They run about 50 Energy Counters. In this case the local government is the procurer of the Energy Counter as a service.

Adam's company currently offers only virtual Energy Counters. You can call them, visit their website, follow webinars, attend meetings in community centres or on local exhibitions and so on, but they don't have dedicated physical shops, because they are expensive and labour intensive. Adam told they will have these shops maybe in the future, because a shop is accessible to everyone, regardless of age, digital skills or finding it difficult to contact by telephone.

Regarding BUSLeague's interest in training, and particularly remote learning, Adam shared their surprisingly positive experiences with webinars during the COVID-19 pandemics:

*"But we actually see that remotely via webinars works quite well. There are more people who ask questions in a Webinar, at a physical meeting there are often a few people who are either very critical or ask a lot of questions. But a lot of people don't feel comfortable doing that. While online, yes, if we ask a question to the group, almost 80% answer such a question, say a poll. There is then again more chatting. There is actually more interaction, it almost sounds paradoxical. In terms of age, we also reach younger people. For example, people who do not come to physical residents' evenings because they have young children. They can now [have] the kids in bed, [or the children] play for an hour or so away [in the room] and they [the homeowners] check in on such a webinar, say an hour. So that actually has quite a lot of advantages from a distance."*

### Training centre

Seth Enosson, Nathan Joas, Dave Jesseson, and Jozef Jackson are colleagues and know each other very well. They all working in the sector of training and education in the construction and renovation sector. The two training centres share a vision and work strongly together on their common mission.

Seth and Nathan work for work for the same Practical Training Centre – Seth in the head office (an education director), Nathan works at one of the 7 regional branches (a director of a regional branch). Legally these organizations are separated, but they collaborate a lot in that case that it seems to be one organization.

As the director, Seth wants to execute the mission of his training centre organization to develop the Heat pump training centres to climate profession centres to provide all trainings on climate technology, short trainings for assemblers, mechanics and executive mechanics. He likes to participate in BUSLeague because he likes collaborating, sharing knowledge, and interacting with ISSO provides him a lot of information he can include in the work of the training centre. He told us:

*“And if you are close to the source of information, you can also more quickly translate what this means into concrete training design.”*

Nathan is director of one of the regional training branches, including the climate profession centre in his region. He likes the principle of BuildUpSkills: he is one of the few people who have attended al the BUS-conferences in The Netherlands. He started his career as an electrotechnical mechanic and ended about 12 years ago as an entrepreneur. Then he made a job change to the practical training centre, because he disliked the relation with his increasingly difficult clients. Upskilling people, however, gives him a lot of energy. Upskilling means learning in practice, with as little theory as possible. As he puts it:

*“I learned the most when I finally started working with my hands. So I support that way of training.”*

Dave and Jozef work for another training centre – Dave as a Business Developer and Jozef as an Education & Training manager. Dave claims he has a “strange” background. He walked through the whole regular school system: from the lowest level of secondary education to technical university, and worked for about 25 years in the semiconductor industry. Then he transferred to the practical training centre. He was unfamiliar with the installation and industry technology, but he had motivation to explain complex things in a simple and practical manner. He has a strong collaborative attitude. His organization is part of a large training consortium. He likes to work with BUSLeague, because:

*“That there will be a practical component to it. We are very good at that together with [the organization of Seth and Nathan]”*

Josef is an educationalist. He has a long career in education development and organization of educating systems and qualifications. He has significant experience with collaboration on a regional level, particularly between secondary schools and vocational schools. He likes the vocational training most, because he likes to train the craftsmen, to work in a pragmatic way towards knowing a trade. An important motive of Jozef is to work together to meet the great demand for energy transition professionals.

With regard to the future of EE Skills (in The Netherlands) Seth expressed the following vision, doubled by both Joseph and Nathan.

*“Before my retirement in a number of years, I hope to experience that we will then have a fully-fledged sector qualification structure in addition to the current monstrosity of the national qualifications structure and that companies will be at the helm instead of organizations, such as the Ministry of Education, Culture and Science and SBB [a organization in the field of the national qualification structure], that the Ministry of Economic Affairs is involved instead of the Ministry of Education, Culture and Science, that we are talking about short practical training*

*courses instead of MBO training [secondary vocational training, part of the formal school system with a length of about 3 to 4 years], that we are talking about quality assurance by companies instead of the discipline of the inspectorate, that the Walhalla is not an MBO diploma, but a [diploma] recognized by the companies and the industry and also when I look at where you are in this project, where we in this project, I say, I see much more advantage in coming up with solutions within that branch qualification structure, than trying to embed that in that cumbersome official few flexible national qualifications structure.”*

### **Female worker**

Johanna Binnenhuis is a project manager at a worker development fund. She has a background in cultural work. She is responsible for projects about themes as diversity and inclusion, female entrepreneurs and socially responsible personnel policies.

*“Everyone needs training. So don't just do the preliminary track for lateral entrants and then let them go. Keep investing in them as well. It is precisely those people who must continue to be involved in their jobs, the company and their development.”*

### **Policy advisors & professional organization**

Jesse Boazsen and Lea Jackson are policy advisors and employees at a branch organization for the building sector. Jesse works at the branch organization for approximately 10 years, the last two years as a policy advisor specialized in sustainability and energy transition. She stresses the role of the energy transition has increasing importance, i.e. in translating national policies and plans to the practice of the sector. He has an economic and legal background and an anthropological background:

*“How people work together to create beautiful things can also [...] apply to the construction sector.”*

Lea is a senior advisor at the branch organization. Originally a historian, she is now specialized and responsible for projects about education and labour market and loves collaborating with other organizations working in the field. Continuing professional development is important to her, which is why she leads an additional program about this at her organization. Until it is measurable when someone has reached the target of knowing enough, they do not stop, she claims.

### **Professional organization**

Miriam Jonassen, Nathan Ezekias, and Debora Salmonson are program managers and employees of a branch organization for the installation sector. Miriam is (senior) program manager specialized in development, schooling, and labour market. As part of her work, she has a lot of board and advisory functions in other sector organizations (i.e. the organization of Johanna). She studied political science and public administration. Her work is focused on how people learn and how they learn from each other. As a daughter of the entrepreneur couple of a small electrical installation enterprise, she stated:

*“If you look at it anthropologically, I come from an installation culture.”*

Nathan is program manager for development, schooling, and labour market. Although his educational background is biology, he worked most of his life on topics related to learning, working, and professional development in the workplace. With experience of laboratories and process technology, he is now in the technical sector, focusing on the installation sector in the last years.

*“This is the sector where things are going to happen in the next 30, 40 years that will have an impact and that can make a difference in the world outside. And that impact combined with the people factor, of how you can give people at all social and educational levels the tools to be able to play a role in that, yes, that is what I find interesting about the work I do.”*

Debora is a self-employed program manager specialized in procurement and energy transition. For the branch organization she leads the program for the regional Energy Transition. She is active on the topic of new commissioning processes in case of the ‘Wijkaanpak’. To describe herself, she shared this compact definition of herself:

*“I am not a biologist by education, I wish I was, I am a PhD lawyer, mediator, far too interested in far too many things, so I am an [everyman]. And yes, with a passion for the ET [Energy Transition].”*

## 3 Synthesis

This chapter is a synthesis of the research outcomes, structured around the goal-oriented perspective to stimulate market demand for EE Skills. It consists of two sections – first focusing on barriers and challenges for development of the market for EE Skills, and the second on the opportunities and solutions. The sections are further subdivided in three subsections – Demand, Supply, and Policy, Regulation & Financing. Recognizing that many of the aspects highlighted in the chapter are too complex to be attributed exclusively to one stakeholder cluster, this chapter should be understood as an attempt to provide structured overview and guidance through the vast body of qualitative data collected in Task 2.2, highlighting some of its most relevant aspects.

### 3.1 Barriers & Challenges

#### 3.1.1 Demand side

##### Lack of demand for skilled workforce

Demand has a direct effect on the market for EE Skills. Lack of demand was frequently reported as one of the key barriers for development of the market for EE Skills. It can be divided in two broad categories:

- **Lack of demand in the residential sector**
- **Lack of demand in the non-residential sector**

Lack of demand for EE Skills indeed is most appropriately observed and should in large part be addressed with focus on prospective private clients or institutional contracting authority.

**In Ireland**, lack of demand reportedly has a negative effect on the awareness for the need for EE Skills in the construction sector.

**In Bulgaria**, lack of practice (policy) for demanding EE Skills certification/qualification has been stressed on the side of (public) institutions, such as municipalities. This is both a challenge – due to its negative effect on the existing market for EE Skills – and a solution – from the point of view of developing targeted BUSLeague solutions.

**French contributors** note that the market's demand for nZEB global renovation in France is too weak (sometimes not even existing) to create motivations for upskilling.

Nonetheless, lack of demand can largely be assumed external – a consequence of issues rooted predominantly on the side of supply (e.g., lack of skilled workforce), policy and regulation (e.g. lack of institutional support), and financing (e.g. lack of access to affordable financing). Before looking at those, we now look at aspects that can be identified on (and in large part attributed to) the demand side. These aspects include awareness, knowledge, motivation, scepticism, and finally aspects of entrenched knowledge and practices.

##### Lack of knowledge and awareness

Lack of knowledge and awareness proved to be one of the most frequently reported barriers and challenges for the existing and future EE Skills market. Reasons for and forms of “lack of awareness” are very diverse, including everything from ignorance to lack access to information. Several aspects regarding lack of awareness and knowledge with regard to demand side have been identified:

- **EE Skills in “the bigger picture”** – Lack of general awareness regarding importance and benefits of existence of EE Skills, knowledge and certification/qualifications has been widely reported. In addition, it has been reported in close relation to **inefficient communication** (lack of promotion and marketing) on the side of EE Skills suppliers and responsible public



authorities. A particularly important aspect in this regard is **lack of access to reliable information**, which has been pointed out in several countries.

- **Lack of understanding of the (basic/key) concepts and notions** – Concepts, such as nearly zero-energy buildings (nZEB), Plus energy buildings, Passive house, etc. have been reported as poorly understood.
- **EE Skills as a benefit** – Lack of understanding regarding the importance and benefits of skilled workforce for investors (individual or institutional), such as to minimize construction errors, or ensure long term savings.

*“What I would like to see is more emphasis put on the benefits of energy efficiency so that I can motivate others to make their home healthier and more energy efficient.”* (Representative of a professional org., Bulgaria)

### Lack of motivation

Besides the lack of awareness and knowledge, other aspects are to be considered with regard to motivation for engagement of individuals and institutions with the field of EE Skills. French contributors highlighted the **“switch to act”** of the private owners as one of the main challenges in creating favourable market conditions for enhancing market demand for upskilling. In contrast to the “lack of awareness”, French contributors pointed out that **usefulness of advice is often misunderstood or ignored**.

Reports of some form of **passive avoidance of action** were frequent. Such are cases when the importance of EE and related skills for the future of the built environment were simultaneously recognized (on the declarative level) and “ignored” at the same time. Reasoning was mostly described in lines of pragmatism – any concrete actions were avoided for the sake of convenience, lower costs, or other stronger alternative motivations. Some of the reported aspects include:

- **Financial aspect**

**Bulgarian contributors** report reluctance to working with (white-collar) professionals (designers, architects, specialized engineers etc.) and preference to working with (blue-collar) workers directly to avoid “unnecessary” complications and costs.

Similar, **in France** people are allegedly reluctant to make use of advisors and architects because they “don’t understand” what will be their “intellectual” contribution and therefore do not want to pay for it.

- **Disruption of everyday life** – Disturbing aspects of construction and renovation work, such as noise, dusts and dirt, “intrusion” of workers into the private space of living and working areas (aspect of privacy) etc. Another very important aspect is time management – the period of renovation tends to be stressful for people also for practical reasons of managing time in their everyday life.
- **Socio-cultural reasons** – These include traditions and emotional attachment (individual or collective) to certain forms of technology and/or techniques, construction of identity and social status etc. In this regard, age, culture, tradition, social norms and even gender, language or (national) identity can play a significant role.
- **DIY culture and entrenched knowledge** – A particular socio-cultural aspect, also closely related to inertia of the market, which we discuss later in the report. In some regions of the EU, people are inclined to practice DIY building and renovation, which is often far from the contemporary state of the art of building and renovation. Such entrenched practices and knowledge have been observed as a significant factor with regard to how attitudes and opinions regarding EE Skills are formed.

Observations of such (pragmatic) behaviour come close to the concept of the **value-action gap**<sup>1314</sup> – a phenomena widely describe in relation discrepancy between people’s (declarative) values on the one hand and their consumption practices on the other. Many people tend to recognize the importance of EE in the built environment on the declarative level, but fail to act towards actual investment in improving EE of the properties they own.

## Scepticism

Having discussed lack of awareness and lack of motivation, we now look **at active avoidance of action**. In contrast to lack of motivation, active avoidance can be understood as avoidance of action based on believes and attitudes that defy recognition of EE and related skills. Establishing a theoretical continuum between lack of awareness on the one hand and active avoidance on the other is useful to understand some aspects reported from the fieldwork research. In this regard, scepticism can be highlighted as a notion which emerged in relation to number of aspects and is conceptually very close to active avoidance. Individuals who actively (intentionally) avoid or even campaign against the recognition and importance of EE in buildings and related skills can be assumed as sceptics of some sort. Following are some commonly reported aspects of scepticism with regard to EE Skills:

- **Gap between theory and practice** – Scepticism that emerges in transition from belief in theory to disbelief in practice.
- **Doubt & denial in feasibility and efficacy of EE** - Scepticism regarding the efficacy and financial feasibility of EE measures and/or technologies (examples of failed investments, myths and misconceptions). This diminishes objective relevance of EE Skills, making them subject to misconception and prejudice, baseless beliefs and averse attitudes.

**In Austria**, building owners or developers avoid **costs associated with the ventilation installation**, which is perceived as unnecessary/unjustified due to scepticism and lack of awareness. Contributors also noted that people are often opposed to new technologies even when they do not know them or have no fact-based arguments against them.

**In France**, lack of guarantees for results of investments has been specifically pointed out as a source of scepticism and lack of motivation.

### Never live in an apartment without comfort ventilation

A story that indicates how attitudes and opinions are tied to individual’s personal experience comes from Austria, related to comfort ventilation.

Austrian contributors reported a project, where tenants of the building were sceptical towards the implementation of a comprehensive comfort ventilation system in the whole apartment building. Especially one of the tenants was really against the implementation of such a system.

A year after the construction was finalised and the residents moved in, the expert in charge of the project (education provider and expert in comfort ventilation, also BUSLeague research participant) encountered this person. The tenant said, he has changed his opinion and is so satisfied with the ventilation that he would never want to live in an apartment without it.

<sup>13</sup> Blake, J. (1999), ‘Overcoming the ‘value-action gap’ in environmental policy’, *Local Environment*, 4(3): 257–278.

<sup>14</sup> Christie, I., Jarvis, L., (2002), ‘How green are our values?’ in Park, A., Curtice, J., Thomson, K., Jarvis, L., Bromley, C., (eds), (2002), *British Social Attitudes: The 18th Report*, London: Sage

### 3.1.2 Supply side

In the section above we have highlighted some of the common barriers and challenges stemming mostly from lack and inconsistency of demand for EE Skills. Indeed, unfavourable conditions on the existing markets are often – both explicitly and implicitly – primarily associated with the lack of demand for EE Skills. Unsurprisingly, this renders investing into upskilling risky and undesirable and has a negative effect on demand (and motivation) for upskilling among workers and businesses.

#### Lack of available (skilled) workforce

An issue parallel to lack of demand for EE Skills is **lack available skilled workforce**. This leads to a passive market environment through lack of competition and lack of capacity to even start generating demand in the first place. All this has a negative influence on motivation for upskilling (supply side) and constitutes a rather futile context for widespread recognition and demand of EE Skills workforce. In close relation to this aspect two other particular aspects were reported:

- **Increasing gap between supply and demand of EE Skills** – The gap between the developing technologies, materials and techniques on the one hand, and available (reliable) knowhow on the other is increasing faster than the market can adapt, resulting in increasing demand and chronically lagging supply.
- **General lack of workforce in the construction sector** – Not only lack of competence and skill, also the general lack of workforce influences the construction and renovation markets negatively.

**In France**, a general lack of candidates for work in the building sector has been reported.

**In Bulgaria**, skilled workers tend to migrate abroad in pursuit of better working conditions while little skilled workers tend to come in the country. Consequential lack of workforce has a negative effect on the entire sector by lowering the (expected) quality standards.

*“For the builders, the problems with time are even greater, because among designers, a large part of the qualified specialists stay in the country, while the builders go abroad en masse. And the problem of finding quality builders is gigantic. This is really something that interferes with the whole investment process to an incredible extent. So, in fact, some builders who are more literate are able to secure a good job without any kind of extra courses. The question is how we can make such a person stay in a week-long course, which on top of everything else might be a paid course. He will neither give this money nor give this time. So, yes, the time factor comes first for me.”* (Independent architect and building designer, Bulgaria)

#### Too many skilled workers?

Austrian contributors report general decrease of participation in certification courses specific to comprehensive comfort ventilation systems due to the market saturation. Their informant, an education provider and expert in comfort ventilation, noted that courses started many years ago and that currently people are not looking for certified comprehensive comfort ventilation installers, which impacted the motivation for upskilling among workers in the sector.

This example, on the one hand, indicates on the difficulty of generalizing reasons for “lack of demand” for either upskilling on the supply side, as well as the importance of accounting for the **life-cycle of practices** in the construction sector, which involves consideration of changing technologies, materials, skills, knowhow, meanings etc. With passing of time, practices can change from being labelled as “new” to “mainstream” and finally to “outdated” (or “traditional”, to stress a warmer socio-cultural connotation). This strongly defines the level of how they are influencing the market for EE Skills in terms of motivation for upskilling and demand.

**Lack of consistency in upskilling** is a particular aspect related to lack of skilled workforce. Although upskilling (opportunities) in current market condition do exists, the rate of upskilling

is not proportional to the needs, especially with regard to future projections. The result can be slow professional progression or loss of existing know-how. Following are some key reported aspects resulting from lack of consistency in upskilling:

- **Little or no continuity in training activities** – This refers to the attitude that once a qualification or certification is obtained by a worker or a professional, it is considered to be finite and forever-lasting.

In this regard, **Bulgarian contributors** stressed the importance of the system for Continuous Professional Development (CPD), which exists in many countries, as they note, but is still not available in Bulgaria.

- **Lack of (consistent) demand for EE Skills** – Connected to the point above, workers who have already gone through some form of upskilling process can lose their grip of techniques and necessary skill-related knowledge, resulting in less reliable performance.
- **High turnover of workforce** – Reports indicate that a considerable percentage of workforce in the construction sector, and white-collar workers in particular, tend to have a relatively short time working in the same speciality or business. Reasons for that include low pay, poor working conditions, socio-cultural factors (social norms, prejudice, patterns of socio-cultural background of workers)

### Skills (availability) and Policy

Besides focusing on the demand side, existing market conditions are often blamed on policy makers and regulators. Here it has to be stressed, that suppliers of products and services in the construction and renovation sector are not only (passively) subjected to market conditions, but also importantly co-create it. Nonetheless, aspects such as lack of incentives and financial support from both public and private actors in the broad ecosystem of construction and renovation markets, lack of regulatory requirements and support, cannot be decoupled from the developments on the supply side. With regard to (institutional and policy related) requirements, the following aspects are worth stressing:

- **Increasing gap between regulatory (theoretical) requirements and available skills** – In some countries, policy makers already tend towards more ambitious policies which are in conflict with capacities of the sector. This is a specific aspect of the issue of supply and demand in general, closely related to lack of skilled workforce, continuous change, inertia of the market etc.

**In France**, the issue of such gap between what is required from the SMEs (regulatory and administrative demands) and what they can offer (existing capacity to meet the regulations) was illustrated as “asking a young primary school student to compete for a bachelor’s degree.” (Supplier, France).

This was doubled by a French SME boss, who highlighted the same issue stating “there is a huge gap between the field and the ‘offices’”, “offices” meaning the policy makers and regulators and “the field” being workers and SMEs working on the field.

- **Lack of experience (practice) with implementation of nZEB** – In contrast to the point above, some countries lag behind with implementation of policies. Lack of capacity of the system(s) to implement requirements for EE Skills in the whole value chain of the sector can be a key factor with regard to recognition of EE Skills.

**Bulgarian contributors** stressed the systemic lack of practice with nZEB in their national construction and renovation sector.

#### Life-cycle of technologies and skills

Emerging (new) technology creates demand for upskilling in the market. If the technology becomes trendy and an is seen as an attractive (emerging) business opportunity, many installers want to be

trained to have the competitive advantage in relation to their colleagues. Eventually the skill becomes more mainstream, when more workers obtain the skills and qualifications and market becomes “saturated”, or rather, supply meets the demand or becomes larger than it is. That means that a lot of workers has the skill or qualification, which effectively decreases the demand. This can also happen because the technology becomes outdated (substituted with better technology) or because it proves to have poor impact.

In Austria, an example of the “hype” was reported in relation to comprehensive comfort ventilation systems and heat pumps. The expert on ventilation pointed out, that during COVID pandemics, demand for skills related to ventilation increased, and posed a question if the trend will continue also after the end of the pandemic. Similarly, the expert on heat pumps pointed out, that heat pumps have been a popular technology for the last 20 years, and therefore, the demand for upskilling has remained somewhat consistent.

Both cases indicate the correlation between demand for EE Skills (demand side) and demand for upskilling (supply side). Just as significantly, however, they indicate the need for a resilient and flexible framework of upskilling withing the construction sector. This realisation is rendered even more relevant with consideration of ever-faster change societies have been experiencing in the past decades. In the context of BUSLeague, the consideration, that **technology and knowledge are changing constantly and increasingly fast**, seems paramount. For long term success of the project, not only existing challenges will have to be addressed and complex (local and regional) market specifics accounted for. Developed solutions and tools, if they are to be sustainable, will also need the capacity to respond to somewhat unexpected rapid change (e.g., pandemics and its influence on the market) as well as address the existing (and forecastable) needs and expectations that correspond to future developments on the market of EE Skills.

### Lack of quality training opportunities

Another widely reported aspect is **lack of quality training opportunities**. Some of the most commonly reported aspects in this regard include:

- **Poor transfer of knowledge and experiences** (lack of thereof, poor adaptation to local specifics, etc.),
- **Not enough stress on cross-trade collaboration on the building site**, and
- **Training contents are either overly generalized or overly specialized.**

Setting up well balanced training activities is indeed a major challenge. Upskilling that fails to strike a good balance between generalization and specialization is in danger of **failing to live-up to expectations of the trainees**. What is considered as “quality” training and upskilling, however, is very much dependant on the particular profile (interest) and knowledge background of the workers and professionals. Needs and expectations as well as the perception of “quality” of training is largely individualized.

**French contributors** pointed out that many craftsmen and workers have the skills and competencies when it comes to their specialty. However, most of them do not know why and how to coordinate their work with other craftsmen at the nZEB workplace. This is especially evident (and problematic) around weak points.

*“Each worker is qualified to do what he has to do, but he does his tasks without taking care of what the other workers are doing.”* (Social landlord, France)

The responsibility of balancing between the content and expectations usually falls on training providers and trainers (coaches). In this respect, it is significant that one of the complaints regarding existing training and upskilling opportunities was regarding **“poor qualifications of trainers”**, or **“limited quality of training personnel”** in terms of limited qualifications or lack of coaching skills.

*“Personally, for me, on the one hand, [a major barrier is] the distrust in the training institutions. Too often, the trainings I have attended do not live up to my expectations in terms of the fact that the people who conduct these trainings are not familiar and are not so in-depth*

*in what they want to teach us. Just retransmitting topics that are relevant in Western Europe, in more advanced countries, but somehow most of the time the trainers are not competent enough on the topic. I do not refer to all the trainings I have attended, but this is very often the case.” (Financial institution Rep., Bulgaria)*

Finally, it should be noted that approach to upskilling should be organic (as opposed to forced) in a sense that it is built from and for the specific context in which it will take place. As pointed out by the Bulgarian contributors, in cases where (free) training is offered under different national and EU projects, and where unskilled and unmotivated trainers train unmotivated trainees, the whole concept of upskilling is compromised.

### Low (perceived) value of qualifications and certificates

Another aspect closely related to workers’ and professionals’ perception of “quality” is the value they see in the qualification or certification as such. Reports indicate that **overcoming low recognition of (and trust in) the value of certification and qualifications of EE Skills** is one of the central challenges of the future of upskilling efforts. Some of the most commonly reported reasons are:

- **Lack of knowledge and awareness,**
- **High numbers of (available) qualifications on the market,**
- **High numbers of (qualified) workforce on the market,**
- **Lack of appropriate regulation (standards and enforcement).**

Firstly we look at high numbers of either available qualifications and/or qualified workforce. In principle, **higher number of qualified workforce improves the overall quality of work**, given that the qualification schemes indeed meet the assumed level of quality. Market saturation with qualifications, however, can also have a negative effect on **the (perceived) value of qualifications**. Thinking of qualifications as a sort of a currency, large quantities can diminish their overall value. If the number of certified workers is high, this decreases the value of certificates as an element of competitive advantage on the market.

**Austrian contributors** highlighted the case of comprehensive comfort ventilation systems where upskilling reportedly become undesirable due to the saturation of skilled workers on the market. They noted that **motivation for upskilling** could be raised through stimulation of the job market focusing on two key points:

- If there are more workers on the market, the **competition for getting work/jobs** with this specific skill would be higher. In such case, also the demand for upskilling is expected to increase since having a better education and training would be seen as a competitive advantage. In contrast, the existing lack of demand and awareness causes that professionals do not want to upskill, and workers do not want to become installer.
- For the unemployed workers who want to change their qualification, **the prospect of finding (a better) job** by participating in the courses/trainings by AMS (employment office) would likely be a good motivation.

What is more, high numbers of available certifications on the market can have a negative effect on their **(perceived) quality**. This is particularly true if the official certifications/qualifications are perceived as non-representative of how competent the workers really are (e.g., if it is assumed that certification is relatively easy to obtain). French contributors, for example, pointed out poor value of an existing national label called **RGE national label**<sup>15</sup>. They report that the existing label does not always guarantee (reflect) the actual qualification of workers working for enterprises because the criteria of the scheme are not specified enough, allowing enterprises to

---

<sup>15</sup> The RGE label (Reconnu garant de l'environnement) is a French national label that allows building professionals specializing in energy renovation work or the installation of equipment using renewable energies to promote their skills and competences and to be referenced on an official RGE information site. Only works and installations carried out by professionals holding an RGE quality mark give entitlement to certain financial aid and tax deductions.



get the label without actually upskilling their staff (e.g. there were cases where SMEs sent individuals, even office workers, to do the trainings). To avoid this issue, they suggested:

- Criteria of the labels should make training obligatory for all the workers of the enterprise if they want to obtain the label, and
- Streamline the administrative processes necessary to get the label (this was pointed out as a barrier for small enterprises, which do not have staff to comply with the procedures).

#### Labels and their value

On the note of the perceived value and quality of labels, Bulgarian contributors reported a claim by an independent architect and building designer, saying that there are different approaches towards certification according to which we can roughly divide the professionals into the following groups:

- **Enthusiasts** – There is **the enthusiastic group** that is genuinely interested in energy efficiency and considers it an important feature of the building. They tend to be active on the market, really want to improve their knowledge, and are generally able to provide quality services.
- **Opportunists** – There are **“certificate collectors”**, who don’t care about the quality but want to enter emerging markets.
- **Conformists** – There is a **big group of disinterested designers** who are attached to investors and contractors and do exactly what they are told to do.

All these aspects influence the (perceived) value of qualifications, affect established standards of skills on the market (poor quality of training) and/or low influence trust in qualifications and the value of EE Skills by both the general public as well as the workers and professionals in the sector. Again, this is a complex issue, and – generally speaking – **having more qualified workforce on the market is a positive thing**. Negative aspects discussed above can therefore largely be attributed to lack of effective (and proactive) market regulation & quality control, which we discuss the section Policy, Regulation & Financing.

#### Lack of demand for upskilling

As in the section on Demand side, lack of knowledge and awareness was frequently pointed out as one of the main barriers to developments of the market for EE Skills. Again, there were various degrees of the “lack” reported – from the alleged lack of knowledge and awareness to lack of motivation and finally active opposition.

#### Lack of knowledge and awareness

With regard to **lack of knowledge and awareness among stakeholders** (workers, professionals and other stakeholders that co-create the market) that form part of the construction and renovation value chain, reports have been made with regard to lack of understanding of the importance of EE, nZEB, IEQ, etc.

*“On site we would look for compliance on airtightness. We had someone got a contractor in doing a fantastic job in the attic space airtightness the whole lot. Then you’d go up there and there would be a big cable going through. Now is that a case where the Electrician just didn’t care? Or did he fundamentally not understand what was trying to be achieved up there? So, these guys they’d make their mistake once and if it’s down to ignorance or just not caring, you’ll never solve that. But if it’s down to that they fundamentally just didn’t understand, the next job they go to obviously that issue will be resolved.” (Local Gov. Rep., Ireland)*

#### Lack of motivation

On the other hand, many workers recognize the importance of EE Skills yet **lack motivation for upskilling**. Some most commonly reported aspects in this regard include:

- Existing (official) training in schools included some elements of EE Skills,
- Product-specific training by suppliers/producers, and
- Previous (on-site, DIY, individual) experience with installing products.

The above aspects imply the pragmatic logic that can be found behind the lack of motivation. **In the existing market environment, investment of resources in upskilling is not perceived feasible and/or desirable.** Perhaps unsurprisingly, reports that implicitly or explicitly talk about the lack of motivation for upskilling refer to **“lack of time” as one of the main barriers** for upskilling in the sector.

**Austrian contributors** note that SMEs with experience, having had installed more than just one or two solar-thermal systems (learning by doing DIY), have no interest in training.

Lack of time can also be associated with the aspect of **work-life balance**. This complex notion is defined by existing market conditions, the perception of time, social and cultural aspects (traditions, values, norms, etc.), capacity of an individual or a business, etc. Poor balance can be described in terms of work overload. Reports made reference to that in terms of excessively high market demand.

Another important aspect, that directly affects the perception of balance are finances, or more specifically, how much workers are paid and the related conditions of work. Concretely, high income gives workers more freedom with regard to managing their time and career. In contrast, **low income deflates the (monetary) value of their time**, effectively forcing them to work more to earn more. In the latter case, upskilling is seen as an additional burden/strain.

*“I repeatedly talked to colleagues from Western Europe, architects, who, when they see what sites Bulgarian architects have at hand, hardly believe that small design studios can have so big projects. For them, it is OK to have two or three houses per year in order to consider the year successful, both professionally and financially. In our country, of course, due to the low payment, two or three houses cannot be enough in any way. Maybe that's why we are looking for many more sites, there are many more sites around and therefore Bulgarian architects are engaged I guess five to ten times more than with their Western counterparts due to low payment.”*  
(Independent architect and building designer, Bulgaria)

As the latter – money related – aspect indicates, **perception of time is largely defined by the value one associates with time spent for an activity/action**. Value, of course, is not established through the aspect of monetary value exclusively. As we indicate in various places, value is also established through social norms, and individuals' values and aspirations, which stresses the importance of establishing **a set of principles (ethos) that favours EE Skills** within communities of stakeholders that constitute the construction and renovation sector. Nonetheless, the widely reported “lack of time” with regard to upskilling can primarily be understood as a consequence or side-effect of the existing market conditions, which is largely defined by monetary value.

### **Lack of interest by employers**

The perceived low value of upskilling goes beyond motivation and interests of individual workers. Employers (SMEs) were also widely reported to show lack of interest in investments into upskilling of their employees.

*“Our observation of construction companies regarding their attitude to certificates as a requirement for their workers is that they are extremely strict when they have to meet their regulatory requirements for their human resources. Everything additional, in my opinion, should be presented in an attractive way and lead to a decision to motivate the participation in training. This is feasible mainly by proving the practical orientation of the training and what added value the training will bring to the construction company.”* (Professional association Rep., Bulgaria)

Two most important aspects have been highlighted in this regard:



- **Lost turnover** due to disruption in the ongoing work and business activities.  
**French contributors** report the turnover loss estimated at around 40 € per trainee per hour. That makes the ratio between the investment in upskilling and the short-term impact on the sales is being perceived as poor.
- **Higher qualification anticipates higher pay** – The workers with higher qualification expect higher financial compensation for their work, which effectively represents more cost for employers.

### **Scepticism and aversion to change**

Similar to the Demand side, reports of active opposition to upskilling on the supply side were made, often associated with some sort of **scepticism and aversion to change**.

In this regard, **scepticism towards the need for upskilling** is one of the most commonly reported aspects. This aspect was already highlighted in relation to the lack of motivation for upskilling, however, the degree to which workers and businesses are (un)motivated to engage in upskilling can vary significantly. Concretely, workers and professionals who strongly believe they already have all of the necessary knowledge, skills and experiences can be considered less likely to engage in training than workers who find their excuse primarily in the “lack of time” argument. Such beliefs were reported in relation to the following attitudes:

- **DIY attitude** – “Do It Yourself” attitude is not only a particular variation on pragmatic action but also strongly socially and culturally rooted practice that goes beyond the professional sphere of construction and renovation, particularly in the so-called self-build culture.

*“Knowledge in Bulgaria has always seemed to be slightly underestimated. We have the attitude that we know everything and that we can do everything ourselves. I don't know if this is a characteristic feature for us, but I have always had the feeling that the self-confidence that we know everything is much greater than the real coverage. This factor may not be the most decisive factor in the lack of high demand today, but it has more long-lasting effects.”* (Independent architect and building designer, Bulgaria)

- **Traditional and entrenched practices** – French contributors reported an attitude, described as a “culture of saying”, illustrated with the statement “The way we have always done it”. Such socio-cultural tendency towards maintaining traditional practices of work can be understood not only from a pragmatic perspective of avoiding “unnecessary” investments of resources (energy, time, and money), but to a significant extent as a way of constructing identity and status. Disregarding the specific source of this phenomena, it factually has a significant influence on (the lack of) market development and should be considered a significant factor and addressed accordingly.

Besides analogue parallels to aspects indicated in connection to motivation above, here are some other commonly noted aspects:

- **Scepticism regarding the efficacy of EE measures and technologies** – This scepticism stems from more or less well-founded doubts regarding financial feasibility of EE interventions and technologies, generally deducted from personal experiences, stories, or “myths” and misconceptions regarding (failed) EE interventions, technologies and measures.

**Austrian contributors** provided a couple of examples of such “myths”: that the ventilation ducts cannot be cleaned and therefore could cause diseases or allergies, or that they cause noise, or that they are very complex systems etc.

- **Lack of recognition and appreciation of intellectual labour** – Bulgarian contributors report that intellectual labour in Bulgaria is not valued, or in words of one

of their informants, is “slightly underestimated”, which in turn undermines the motivation for upskilling and (public) appreciation of EE skills and qualifications. Similarly, French contributors highlighted the fact, that many workers in French construction sector have a poor educational background and often have unfavourable attitude towards educational activities in general.

### Various contextual factors

Besides aspects outlined above, several other observations of barriers and challenges have been reported that variably yet significantly explain both lack of demand for upskilling by stakeholders on the supply side, as well as their incapacity to generate (popular) demand for EE Skills.

- **Preference for newbuilds rather than retrofitting** – With BUSLeague’s focus on the need for stimulating renovation of buildings, several reports pointed out that the general preference among workers in construction sector is to engage in construction of new buildings rather than in renovations.

**In Ireland**, new builds have been described as “more attractive” among workers and professionals.

- **Demographic factors** – Aspects, such as age and social background of individuals can have a significant influence on the motivation for upskilling.

**In Ireland**, age has been highlighted as a considerable in upskilling using digital media and technologies as means of knowledge transfer.

*“You do have to consider the age bracket of the trades people who you are targeting for the training. An app is not always suitable for older people. With the shortage of skilled workers in the industry, we are currently seeing the recruitment and retraining of people in their 40s and 50s.”* (DIY retail association Rep., Ireland)

**In France**, a point was raised that workers in the construction sector often have a negative attitude towards education, either because of their past negative (frustrating) experience with the standard national educational system, or because they come from social background that does not value education. In this regard, idea of upskilling, particularly with regard to learning theory, has been pointed as potentially problematic.

- **Theory vs. practice** – Reports indicate patterns of preferences and interests in communities of workers and professionals regarding how theoretical or practical the upskilling activities ought to be.

**French contributors** described many trainings are “too theoretical” and/or organised too far away from the working places. Thus, not fitting the needs of workers that want practice-based “hands-on” trainings, minimizing time spent in travel to and from the training site.

Similar reports come from **the Netherlands**, where training personnel voiced the need for interconnectedness of systems and structures of qualifications and recognition. As our Dutch contributors report, the problem is not that there are different systems, but that they cannot interact with each other or that recognition cannot be exchanged between them. Part of the recognition will therefore have to be, that you are able to give evidence of competence on the spot, hands-on, not only theoretically.

- **Outdated practices and knowledge** – Related to the aspect of entrenched practices on both demand and supply side, existing workforce (supply side) – including their implied know-how – perpetuates the established and often outdated construction and renovation practices. The overarching collective body of knowledge and practice can therefore be described as inert, especially with consideration of established means and processes of production (construction materials and technologies) and consumption (demand side).

- **Lack of efficient communication, promotion and marketing** – French contributors highlighted lack of communication as a major challenge, stressing the following points:
  - It is difficult to find out and to understand the right and useful information about what to do and how to get advice and grants,
  - Savings and benefits of investing in nZEB renovation are not clear,
  - There are no clear guarantees of results, and
  - Usefulness of advice is often misunderstood or ignored.
- **Poor commissioning** – Failing to ensure effective functioning of building systems can significantly negatively impact not only energy performance of buildings, but also the uptake of new technologies and general perception regarding EE policies and industries.

**In Ireland**, incorrect commissioning of poorly implemented ground source heat pumps of biomass boilers reportedly had a significantly negative effect on the uptake of these technologies.

### **Inertia of the market and entrenched practices**

Encompassing infrastructures, practices, and capacity to (implement) change, inertia of the market is another point of view that is best observed from the supply point of view. Supply of EE Skills and services is often found difficult to change due to the following commonly highlighted aspects:

- **Limited access to appropriate materials and technologies** – Some interviewees pointed out access to certain materials and technologies as a barrier for workers and SMEs working building and renovation sectors. This indicates towards the challenge of remodelling the established industries and their business models and relations (established networks of stakeholders), which includes existing infrastructures and established processes (administrative, production, operational, logistics, etc.).

**In France**, access to the necessary materials and technologies required for performing EE Skills was highlighted.

**In Spain**, lack of ecological materials linked to energy efficiency was pointed out.

- **Inertia of existing knowledge and practices** – Focusing on practices, which according to the theory of social practice<sup>16</sup> involve meanings, materials and skills, this aspect helps to explain why certain patterns of doing are difficult to change and why a holistic approach is necessary.

**In Bulgaria**, planning of building and renovation projects is traditionally heavily reliant on architects, which is in conflict with principles of integrated design.

*“Still too often, the formation of the basic principles of sustainability and energy efficiency for the specific project in the course of the design is assigned to a separate specialty, most often the HVAC designer, therefore they do not penetrate sufficiently into the essence of architectural concepts, and are attached to them, often too mechanically and as a result – inefficiently. These methods are inherited from many years of practice in other times and societal conditions where sustainability and energy efficiency were not a meaningful value. Unfortunately, the pressure to change these outdated practices has proven insufficient and ineffective.”* (Local authority Rep., Bulgaria)

- **Age-related idiosyncrasies** – A particular but significant aspect of inertia, that relates to the socio-cultural patterns and motivation, is how older generations tend to stick to

---

<sup>16</sup> Shove, Elizabeth, Mika Pantzar and Matt Watson, (2012). *The Dynamics of Social Practice: Everyday Life and How It Changes*. London: Sage.

their existing knowledge and experiences while younger are more prone to change and innovation. As illustrated by contributors from Ireland and Spain:

*“Some of the younger guys doing apprenticeships they would have had an appreciation for products and innovation. But on site, you're meeting guys of the older generation. They need to develop a culture of appreciation of new products. Unfortunately, a lot are just gravitating to what they are familiar with.”* (Local Gov. Rep., Ireland)

*“Certainly, clients know more about this type of issues, they are more educated, also more aware of everything and they are more conscious about the living standard they want, so the matter of climate change in Europe is internalized. Young people are much more aware than other groups of people, since for example, they study what energy self-consumption is. Citizens need to know the benefits of energy efficiency.”* (Professional organisation Rep., Spain)

In contrast to the point above, a report by the French contributors also indicates that younger age does not necessarily imply propensity for training and education. Their analysis demonstrates that there are two categories of craftsmen and SMEs owners:

- The “old ones”, on their way to retirement: they have a high level of skills and competencies, but they do not have the knowledge on energy issues.
- The “new comers” who, quite often, want to move too fast.

Many of the outlined aspects are strongly defined by existing economic and business structures, systems, and practices. For better understanding, they should be investigated in further depth, which is a challenge beyond the scope of BUSLeague. What is more interesting for BUSLeague, however, is the aspect of entrenched practices on the level of individual businesses and workers. Besides being subjected to existing materials, technologies, and industry norms, ways of doing (practicing) construction and renovation are strongly related to individuals existing experiences and (embodied) knowledge. These are strongly tied to individuals (and collective) identities, beliefs, and aspirations. These aspects are certainly a venue worth investigating in further depth also within BUSLeague, as such knowledge will directly contribute towards the aims and goals of the project.

#### **Digitalization unleashed?**

We have already stressed the need to account for increasing complexity and rapid change, yet it seems development does (or should?) have limits – in the inertia of existing systems and practices, if not otherwise.

For example, building automation and smartness/connectivity of buildings is becoming more and more important. However, as the Bulgarian contributors report, it is also important to find the balance between the functionalities that are available and those that are really used and useful.

*“The advent of artificial intelligence provides indescribable opportunities for building automation, and of course there is a very important point – where to put these technologies in homes. There is a huge risk that it will stumble in the direction of oversaturation of buildings with management systems, in fact, as on a phone you use 5% of the possibilities, but you pay for it with all its available systems. There is a danger that this will happen to buildings as well. So, there's that balance here, we designers have to learn to set the limit.”* (Independent architect and building designer, Bulgaria)

#### **Migrant workers and professionals**

Construction sector in many countries is strongly dependent and intertwined with (predominantly economic) migrations. This aspect is subject to policy makers and regulators in arguably to the same extent as it is to supply side stakeholders. Nonetheless, the following two observations from BUSLeague ethnographic research seem to fit better under the perspective of barriers and challenges on the supply side, although they can only efficiently be addressed through appropriate policy and regulation.

- **Brain (and skill) drain, and**
- **Unfair competition.**

For regions and countries of emigration, migration – often referred to as brain-drain, which in our case could be conceptualized as skill-drain – is an issue because it **creates a lack of (skilled) workforce**. Due to poor working conditions in the areas of emigration, or simply less attractive conditions in comparison to the immigration destination, skilled (and qualified) workers tend to search for better opportunities outside of their areas of origin. This includes not only movement of workforce between countries, but can also be observed locally and regionally, as movement between different socio-economic spheres (urban-rural divide, centre and periphery). Finally, emigration not only creates lack of available workforce, but also has a **negative effect on standards of quality and expected level of skill** within the sector as the lack of workforce renders quality of skill a secondary concern to the availability.

**In Bulgaria**, skilled workers are leaving to work abroad for more favourable working conditions, especially better pay. Since there is no significant influx of immigrant workers to Bulgaria, this has a negative effect not only on the market of EE Skills but on the entire construction and renovation sector.

For regions and countries of immigration, migrant workforce can have a significant influence on the overall labour market and are often seen as **“unfair” competition**. On the one hand, migrant workforce – often synonymously referred to as cheap and often non-qualified (or even illegal) workforce – tend to be blamed for contributing to the “saturation of the market”. This can negatively affect the standards and expectations regarding quality of workforce and effectively **decrease value of work** in this sector of economy. Importantly, value of work can arguably be affected not only in terms of monetary value, but socio-cultural value as well, influencing perceptions of particular jobs and influencing local and regional patterns of the workforce.

#### Language as a barrier

With regard to BUSLeague goals and aims, an issue closely (but not exclusively) related to the topic of migrant workers, is language. As the Dutch contributors' report, language appears to be necessary, especially with further training.

*“For VCA [a course on basic safety rules], the material on the construction site is available in 25 languages, but Dutch is still required for mutual communication. If someone in a security situation shouts 'Stoop', it must be understood. That is why we [the installation sector] work with language buddies: employees who work with language once a week and help with language problems, important! [Language buddies help with language; they are not teachers of Dutch as a second language]”*  
(Female worker, the Netherlands)

#### Prejudice as a barrier

Although often rooted in real-life challenges and inconveniences, prejudice can be defined as a (cognitive) barrier to creating a more inclusive and diverse culture of work (or working environment) in the construction and renovation sector.

A prime example of such a barrier was reported by the Dutch contributors. Johanna, the Rep. of women in the sector, highlighted the big problem of prejudices against women, particularly with regard to ideas such as that they get pregnant quickly, seduce the male staff, or want to work part-time. Johanna stressed that to create ground for inclusion of women – or any minority – in the construction and renovation sector, concrete action is needed, including activities to overcome the prejudices.

To illustrate the topic of inclusion of women in the Netherlands, she shared a story about a lecture she gave to a group of male (SME) employers:

*“They don't like the theme of female workers in the installation sector. But after telling them that The Netherlands has fewer female workers than the masculine Italy, they go to another mode: we had to beat the Italians. From that point in the lecture the employers listened and in the next years start to diversifies their workforce.”*

On the other hand, migrant workforce is seen – in combination with lack of regulation – to also have a negative effect on the market of EE Skills in terms of **standards and norms regarding the expected level of skill**. This conclusion is derived from the observation of considerable differences between education systems, standards and norms in countries of immigration and emigration.

**In Austria**, the cheaper migrant workforce is – in part – a symptom of high cost of construction. This push project developers in reducing costs by hiring construction workers from countries with lower wages (migrant workers and professionals). Research participants also pointed out that a significant part of migrant workers are **seasonal workers** and that their presence on the market is more notable in urbanised areas, where the (density of) demand for construction is higher.

### 3.1.3 Policy, Regulation & Financing

Market conditions with regard to demand for EE Skills and therefore uptake of BUSLeague solution were often explicitly or implicitly reported as unfavourable. In this respect, reports have particularly stressed the significant role of policy makers, regulators, and financial bodies. They create and shape the grounds on which existing systems stand, encompassing the complex (locally-specific) reality of construction and renovation markets, involving institutions, policies, regulators, financial bodies etc.

#### Lack of supportive policy and regulation

Policy and regulation can be seen as a defining factor of market conditions and driver of demand for EE Skills. Securing active support of public institutions for development of the market for EE Skills is a major challenge. Policies that have no proactive effect with regard to supporting upskilling activities, that leave developments to “the market”, and imply lack of support by policy makers and enforcers can be regarded as a barrier. In current conditions such policy tends to create or perpetuate poor market conditions.

**Lack of quality control and policy enforcement**, especially in case of already existing policies, is one of the most widely reported and perhaps the most significant barrier in the context of policy and regulation. Addressing this lack can therefore be understood as one of the main future challenges. Reports in this regard can be summarized in two key aspects:

- **Lack of penalties** – Enforcing existing policies require penalties for non-compliance. Absence of penalties can – to an extent – be understood as rules require enforcement that forces stakeholders and market players to follow the rules.
- **Lack of rewards** – Understanding EE Skills as an area of strategic importance for the future of the construction and renovation sector, the existing lack positive affirmation for proactivity and good practice can be understood as a barrier. As such, working towards improvements in this regard can be seen as a complementary challenge to the one described above (enforcement) in pursuit of functional and sustainable system of policies and regulation that enable prosperous market conditions.

Other more specific aspects from the reports are:

- **Criteria for public tender** – Some reports highlighted low criteria or absence of demands for EE in public tender or calls for public financial support (grants & subsidies).

*“The limited demand from the ‘objects’ may be due to years of inertia in the exercise of the profession concerned, to limited understanding of the nature and importance of energy efficiency and ‘sustainability’, or the lack or too little market pressure – this is particularly pronounced in municipalities where public funds are spent.” (Local authority Rep., Bulgaria)*

- **Poor value of existing labels and qualifications** – In some cases, existing schemes and systems intended to support and direct the market of EE Skills is not functioning as expected or desired.

As already highlighted, in **France**, the national label for professionals specializing EE Skills – **RGE** – is reportedly not perceived as a reliable guarantee for qualification of enterprises and is also not seen as a market advantage for the enterprises with the qualification, meaning that upskilling under this label is having relatively poor value due to lost financial turnover for the duration of the upskilling, and poor direct effect on the competitiveness of the business.

- **Lack of (efficient) commissioning** – Lack of requirements and mechanisms for inspection and control of efficacy of nZEB implementation and realization (e.g. the installations of building systems or building thermal quality).
- **Low norms and standards for professionals** – Lack of requirements (policy related or legislative) for certified professionals for installation of technical systems.

- **Lack of control over accuracy, validity or legitimacy of existing certificates and labels** – related to issues of market saturation and lack of trust due to lack of reliability of existing labels and certificates.
- **Lack of public support for EE (promotion and marketing)** – Lack of public support through policy and legislation with regard to new requirements regarding building energy efficiency standards or new requirements regarding the building technical systems.

### Market saturation

Market saturation is a notion associated with (unfavourable) market conditions. Some aspects of market saturation with regard to EE Skills have already been discussed, such as high numbers of available certifications and qualifications on the market, or rather, high numbers of qualified workforce. Although a complex phenomenon, one that goes beyond policy and regulation, it can to a significant extent be attributed to lack of efficient regulation of the market, or incapacity of the system to create favourable market conditions, and not exclusively to incompetence of suppliers of EE Skills.

### Policy and regulation as a barrier

While policy and regulation can be seen as a driver of market development, which is the implied position when thinking about lack-of one or another thing, it can also be seen as a barrier. Some of the commonly reported aspects regarding policy (makers and enforcers) in this regard are:

- **Rigidity of the system** – Parallel to the aspect of market inertia, encompassing infrastructures, practices, and capacity to (implement) change, also systems of policy making and implementation tend to take very long before changes are implemented.

*“The limited demand from the ‘objects’ may be due to years of inertia in the exercise of the profession concerned, to limited understanding of the nature and importance of energy efficiency and ‘sustainability’, or the lack or too little market pressure – this is particularly pronounced in municipalities where public funds are spent.” (Local authority Rep., Bulgaria)*

- **Lack of foresight** – A general lack of foresight from all stakeholder groups regarding the future of upskilling has been reported as well as lack of vision for strategic planning and development of systematic upskilling of workforce in the construction and renovation sector.
- **Lack of knowledge and expertise** – Public institutions reportedly lack necessary knowledge and qualifications to be able to support (and drive) demand for EE Skills and qualifications on the market.

*“I think that building management is an extremely interesting and endless topic that is now entering. We [Bulgaria] are very, very, very unprepared in this regard, there are probably other things, because the more we learn, the more we see that we know nothing, but here we do not know where to learn from. I'm really having a hard time because in several projects that have been looking for a kind of systems management, we are contacting the ‘leading’ vendors and advertising agents who arrive, unload some beautiful glossy catalogues and can't say a word about the product.” (Independent architect and designer, Bulgaria)*

- **Dumping prices** – An aspect particularly visible in case of public tender, where quality of service is often secondary to price. Although largely an issue of the supply side, it is the limits of the system and/or poorly defined priorities of public tender that can create ground for this issue to emerge in the first place.



### Training of construction service providers after winning of public tender

Bulgarian contributors reported an example of a proactive approach towards alleviating lack of skill in projects funded by public tender.

*“We have no such practice, but if you look at the practice of large companies, e.g., those who deal with specific activity that requires certain licensing regimes, there is such practice. When they choose a contractor for their activity, they must include a condition for the contractor to undergo training to work on their territory.*

*We can give such an example with the Oil Refinery near Burgas. Working at a port or at an airport also requires a similar training course, which is usually not very long, but gives the basic rules of operation, mode of communication, etc. I do not see a problem in adapting this so that the specialists have a reasonable confidence that they are sufficiently prepared for the task we assign to them, especially considering that we do not yet have good enough experience in the implementation of buildings with high energy performance.*

*This is the truth, especially for reconstructions, so this is an interesting possibility that can be considered.” (Local authority Rep., Bulgaria)*

In the context of various levels of governance (local, regional, national), both of the above aspects are closely related to the notion of **political willingness**. In this regard, policy and regulation are largely a subject of political relations of power between the established social, economic, expert and other stakeholders. In terms of lobbying – seeking to influence representatives of public authorities – partial interests of individual stakeholders and their (political) influence and agency play an important role. Two common aspects have been stressed in the reports:

- **Lack of political pressure on the regulators** – Lobbying or mobilizing interest of key stakeholder groups to apply political pressure on representatives of the public (governing bodies and institutions) to push for policies in favour of – in the case of BUSLeague – upskilling is an important aspect of political willingness.

**Austrian contributors**, for example, highlighted a significant lack of lobbying and political pressure (by regulatory and law-making bodies) in shaping policies regarding the installation of comprehensive comfort ventilation systems.

- **Power and influence of the established actors** – On the more regressive (negative) side of the spectrum, policy makers, implementors and enforcers can also intentionally hamper developments of the EE market by creating policies that effectively work against progressive developments of the EE market. This is often due to power and interests of established networks of lobbies and other involved parties pursuing their agenda.

### Lack of financial instruments and incentives

On the other hand, policy maker and regulators also have the capacity to enable and support meaningful systematic change. The broad area of financing is certainly key in this respect. Following are some barriers and challenges that were reported with regard to existing and future developments in the area.

- **Lack of innovation and specialization in the area of commercial financing**, which keeps the renovation market passive,
- **Lack of a functional system for financing training in the construction sector**,
- **Lack of support from both private and public financial institutions** for EE measures and developments. This is closely related to instability in demand for EE skills (or particular skills tied to specific technology and materials) and has a negative impact on the market in general.

**Dutch contributors** reported that subsidies are a kind of procurement, seen from a legal point of view. In the Netherlands, in normal procurement sometimes there is some

attention for certifications or quality, but this is normally on the company level and about formal issues. Recognized EE-skills are never part of public procurement or subsidy schemes..

## 3.2 Opportunities & solutions

### 3.2.1 Demand side

Results from the research largely support the claim that **demand creates (drives) demand**. Concretely, demand for EE buildings is expected to drive demand for the necessary skills and therefore drive demand for upskilling. This will therefore also drive demand for prospective BUSLeague solutions. Some of the key aspects needing to be addressed in this regard include:

- **Raising awareness,**
- **Exploit synergies with existing (global market, societal) trends,**
- **Creating favourable market conditions** (public policy, subsidies, promotion, ...),
- **Enabling access to affordable funding (financial bodies),**
- **Targeting (needs and expectations of) individual stakeholder groups,** and
- **Socio-cultural normalization of EE in the living environment and beyond** (promoting holistic sustainable living).

#### Raise awareness and motivation

Awareness rising activities, such as promotion, education, define and target motivation touch-points of key target groups, train, demonstrate, make pilot projects.

- **Build on existing awareness**

**In Austria,** heat pumps are reportedly a successful and trendy technology. Correlating their “success” and resulting benefits for consumers can be seen as leverage point for promotion and marketing of other EE technologies, products and measures, which will in effect also drive demand for EE Skills.
- **Integrate and promote synergies with existing concepts** (e.g., Building renovation passports, Energy performance certificates, Energy performance contracting etc.) for more effective communication.
- **Capitalize on a variety of leverage points** – progressive policies, financial opportunities, examples of good practices, cooperation with (and building coalition of) different stakeholders etc.
- **Dedicate resources** to providing access to information & training, construction and activity of demonstration sites, etc.

#### Digitalization and automatization trends

Counting with current trends and future prospects of technological development, particularly with the all-encompassing trend of digitalization, provides one with an avenue for exploration of defining particular market niches for awareness rising, supporting the decision-making process, and generating more demand for EE Skills.

*“Energy efficiency, in my opinion, in order to keep up with the times, with the current development of the construction process, it must be part of the increasingly popular smart buildings, intelligent buildings in which energy efficiency is not reduced to insulating and sealing the building but comes down to managing the building and its various components.”* (Independent architect and building designer, Bulgaria)

#### Health, comfort, environment – the bigger picture

In addition to the above, Bulgarian informant also state that EE is only one of many other functions of the building and it is not possible to have the focus solely on it. It has to be integrated in broader concept.

*“Energy efficiency is ultimately one of the many components in building development, design and construction. I think that considering energy efficiency purely as an element of energy saving, is the wrong approach, because it further narrows and reduces the importance of energy efficiency in the overall process of constructing a building. I personally would consider it as an element of a healthy living environment, of ecological thinking, no matter how cliché it may sound to many people, but this is increasingly beginning to be present as an argument for young people who come convinced of a healthy lifestyle and in their impact on the environment. So, energy efficiency as part of something bigger can take a more significant element in the overall project investment package.” (Independent architect and building designer, Bulgaria)*

## Define market niches with potential for high impact

To optimize impact of prospective BUSLeague solutions, local specifics and patterns should be accounted for and specific market niches defined.

*“In principle we have access [to training], it is however another question that the trainings offered are closely profiled, and if they give a real practical orientation. And the other more delicate point is that one expert is responsible for several things. What I mean, for example, in a district administration we have one or two, three construction experts who are responsible for almost all maintenance, i.e., starting from road maintenance, going through small building repairs and reaching the reconstruction of playgrounds, i.e., there is no single concentrated expertise to be used.” (Local Authority Rep., Bulgaria)*

Research indicates that demand for EE Skills varies in relation to a variety of factors:

- **Urban vs. rural contexts** – Different forms of technologies have different aspects of convenience, financial feasibility, or even aesthetics appeal, all of which is often closely related with – or defined through – social norms and cultural traditions.

**Austrian contributors** pointed out, that motivation to participate in a training changes when it comes to the location of the SME: rural areas more than the ones close to the bigger cities.

- **Geographical contexts** – Depending on the specific climate, terrain and other geographical conditions, some technologies (and EE Skills) are more appropriate than others.
- **Demographic patterns and phenomena** (age, migrations, unemployment, gender, ...) – Another layer of complexity is related to demographical aspects. In close relation to socio-cultural norms specific to either specific localities or social (identity) groups, demographic factors can have a significant impact on demand of EE Skills renovation skills.

**In the Netherlands**, the discussion in the interview with a Worker development fund Rep. regarding female workers in the sector was broadened to all minorities – LHBQTI, workers with a migrant background, disabled people, lateral entrants (*zij instromers*<sup>17</sup>) etc.

- **Socio-political patterns** (negative or positive attitudes & beliefs) – Some technologies and practices are not well received or are being subjected to (collective) rejection rooted in identity or (collective) consciousness that can appear to have little or no correlation with rational logic.

## Addressing needs of public institutions

<sup>17</sup> These are people who before their entrance to the installation or construction sector worked in a completely different area of expertise or work, such as banking, nursing etc.

Public institutions (municipalities, hospitals, educational institutions, ...) proved to be one of the most widely reported niches for increasing uptake of BUSLeague solutions.

*“The professionals should be motivated to participate in training by purposefully promoting the demand for green buildings, renewable energy sources and sustainable solutions in settlements, by introducing mandatory education and training standards or by introducing a system of certificates and linking it with the professional realization. All of this can be fully successfully applied at the local level [in the municipality], as there are practices in a number of European countries.” (Local Authority Rep., Bulgaria)*

Two of the most reported aspects in this context are:

- Targeted awareness raising campaigns for generating demand on the side of public demand, and
- Offering tailored upskilling format and contents for specialized public authority profiles that work in areas related to construction and renovation.

### 3.2.2 Supply side

#### Quality training design

Reports from the ethnographic research indicate that existing expectations for upskilling for workers and professionals in the construction and renovation sector align closely with key principles of andragogy<sup>18</sup>. These direct learning to be learner-centred, meaning it builds on individuals' intrinsic motivation, readiness to learn, prior experience, orientation (particular interest), enabling control over the learning process (self-directed learning), and access to relevant information about the training itself. Similarly, reports correspond to elements of learning process design for adult learners<sup>19</sup>. This indicates that the process of upskilling – including periods before and after the upskilling activities take place – should include proper preparation of trainees, establishing an appropriate (trainee-tailored) setting, enabling certain level of collaborative planning of training activities, setting learning objectives, and paying attention to the design of both learning experience as well as learning activities, and evaluation of knowledge and skill.

To create desirable upskilling contents and service(s), a holistic and integrated approach is necessary aiming towards a convenient and meaningful experience. Some explicitly and implicitly reported qualities and properties of training activities include:

- **Accessibility** – financially, practically (particularly in terms of time management and location), and user-friendly (format of training or user interface – addressing the capacity and preferences of trainees).
- **Flexibility** – Time-wise, content wise, capacity to accommodate change etc.
- **Quality of content and materials** – Professional, widely recognised, valuable and meaningful.
- **Relevance and timeliness** – Up to date, tailored to the needs of trainees (and employers).
- **Professional guidance** – Purposeful, informed (stress the benefits of EE Skills), trainee oriented.
- **Mindfulness and respect** – Understand the background of trainees, acknowledge their existing know-how (experiences, knowledge and competence), and recognize the established (traditional) practices.

*“The building of the future will be green, or sustainable, safe and durable - as opposed to the ‘modern’ concept of ‘turnover’ and ‘substitutability’ of building stock. The role of knowledge and skills is crucial for achieving these characteristics, but with an appropriate combination of traditional knowledge and skills with qualitatively new ones. This understanding is at the heart of lifelong learning.” (Local authority Rep., Bulgaria)*

#### Time management and organisation of training activities

As time was reported as a key constraint for upskilling, management of training activities timewise can be defined as a priority. According to reports, various modes of time-intensity can be outlined:

- **High intensity** – Intensive (immersive) training.
- **Medium intensity** – Training for a few hours per day over a limited period of time (e.g., a week or two)

---

<sup>18</sup> Knowles, M. S. (1989). *The making of an adult educator*. San Francisco, CA: Jossey-Bass.

<sup>19</sup> Knowles, M. S. (1984). *The adult learner: A neglected species*. Houston, TX: Gulf Publishing.

- **Low intensity** – self-taught or prolonged training (e.g., a couple of hours per week over a period of a couple of weeks or months)

Most importantly, training has to be flexible and adjustable to needs and expectations of prospective trainees. Perception of time also depends strongly on how well training is integrated with the daily lives and work of trainees.

### Time & training

Bulgarian contributors reported a position of an independent architect and designer, saying that although two or three days of remote training would be probably the best, he doesn't see how it can be possible in practical terms given the high workload. He would prefer to spend on training a few hours each day spread over several days.

*"I have many times wondered which is the better option. I do not have an unambiguous answer. I realize that when a person focuses for three days on one topic, it's better because he clears his head of all other things and thinks only about it, but I don't know if the practice allows it now. If you are an active person, this model is a bit theoretical, and it seems to me that it is a little harder to implement... I will never forget the course in Borovets with Rainer Pfluger some 15 years ago, a whole week from morning to evening, many people thinking together on one topic, in the evening the topic is still the same, it is unravelled, discussed, but then it was as if we had inertia from the old political regime. Now I don't see how you can do such a course.... I would prefer it to be within two to three days of two to three hours a day. It would be easier to take this time rather than spending three days from morning to evening studying."* (Independent architect and designer, Bulgaria)

Although remote training was widely discussed, many informants argued strongly for practical "hands-on" training courses, or a combination of remote, classroom and practical teaching, which makes time management a considerable challenge.

### Teaching methods and means

Several possible learning formats and methods have been discussed in the reports.

- **Learning by doing** – Stress on practical training (on-site, hands-on etc.) has been widely reported, particularly strongly with reference to white-collar workers.
- **Challenge common misconception** – Challenge trainees not by confrontation but by practical examples that expose their misconceptions and false beliefs.
- **Define knowledge gaps** – Avoiding teaching existing knowledge and focusing on gaps in skills and competences is a step towards time and content optimization.
- **Capitalize on trends and interests** – Building on intrinsic interests of trainees is seen as a good method to improve motivation of trainees.
- **Enable interactive knowledge transfer** – Sharing existing knowledge and experience in a supportive (and facilitated) environment can enhance participants' engagement.

### Misconceptions, gaps and prejudice

Austrian contributors reported a story illustrating how misconceptions and "we know it all" attitudes can be effectively addressed.

*During the on-site trainings (within CrossCraft project), it became apparent that at the beginning of the on-site training most of the trainees were of the opinion that they actually worked well and couldn't learn anything new. Moreover, many of them were of the opinion that a building should be able to breathe, which means that it is ok when there are air-leakages in the construction. But after starting the Blower-Door test, the trainees feeling the air draft (especially next to sockets and windows). In Austria this is called "es zieht" which means "there is a draft", which is not appealing. After this experience the trainees started to understand that heated air is going through the wall (!!) and what*

*will happen if the humidity at some point in the wall condenses and makes the wall wet. Conclusion: Let them learn by making them doing experiments.*

On a similar note, Bulgarian contributors reported a number of common misconceptions, prejudices and knowledge gaps, that would likely have a proportionally significant impact if addressed accordingly.

*“Without this being an exhaustive list, the challenges that must be overcome through the trainings are the following:*

- a) the prejudice that ‘green’ construction is more expensive than conventional,*
- b) the prejudice that the increasing the thickness of the thermal insulation causes cooling problems during the summer,*
- c) certain harmful habits of construction workers who install thermal insulation on the external walls of buildings (the methods of gluing and fixing to the wall),*
- d) achieving some of the requirements for the nZEB (eg thermal insulation) and neglecting others (ventilation, air tightness), etc.*
- e) the lack of verification (energy audit) of the actual energy performance of the building after its construction or renovation (renovation)*

*Even if there is no national regulation on the challenges listed above, any of them can be introduced at local (municipal) level.” (Local authority Rep., Bulgaria)*

## Trainers

One of the most important elements of a quality training, as already indicated in the chapter on barriers and challenges, are trainers and instructors. According to the reports, they are expected to:

- **Be qualified,**
- **Have a significant level of experience, and**
- **Have training skills and competences matching the profile of trainees.**

Instructors are perfectly positioned to “translate between theory and practice” in the broadest sense of the notion – from the point of view of training contents and format, to aspects of group dynamics, embedding the training in the wider context, steering the process of teaching/learning (adapting it to the needs and conditions) etc. The trainers should strive to make the class/training attractive. This could involve showing video clips, providing necessary learning environment for self-experimenting and so on. Also, they should include new trends know-how to the contents of training, and relating it with the needs of the trainees.

## Examination

Examination and testing are an important part of an educational process. How this could be done best needs to be further investigated, however, there is a clear need for simplicity and convenience. Certainly, as it has already been stressed on various occasions, there is a need to recognize and validate existing know-how of the workers in early stages of certification, accommodate it in the examination and – if necessary – add additional skills on top of the worker/professional’s existing skillset.

As pointed out by the Dutch contributors, recognition of skills can certainly add value and contribute to worker’s self-image. Their informants stressed the need to make examinations to be easy and safe, making the training (and testing) ground a “safe spot”, be it in the training centre or in the workplace.

The place where the recognition is obtained is reportedly not as important as whether it fits well with work and living practice of training participants. As the Dutch contributors highlight, it does not necessarily have to be on the construction site, or just outside work in a training centre.

As for the criteria that should be used for assessing skills, the Dutch contributors report the view of a Training centre director regarding their approach to examination:



*“The basic idea is actually very simple with us. I always say to my instructors, if these mechanics are at your door tomorrow, regardless of whether he is a nice guy or not. But in terms of skills, you let him in or not. If you don't let him in, he could never have gotten his certificate.” (Training centre director, the Netherlands)*

## Learning environment

Training environment includes aspects of space and its experience, contexts, and cultures. In development of quality training, focus on environment is just as important as are the contents of training.

In terms of space and experience of space, references were made to physical space (including tools and objects necessary for the education process) and location of training, such as classrooms, training sites (e.g., in training centres or DIY stores) or work-sites (e.g., on-site training). This includes the digital space and the underlying technologies (whatever is required for e-learning). With regard to these aspects, preferences differed significantly. Nonetheless, general preference goes in direction of a combination (mixed) training environment – on and off-site with elements of e-learning.

### The role of environment

Dutch contributors illustrated the relevance of the environment on the case of worker's inclusion, discussed in the interview with a Rep. of women in the sector.

When workers from minorities come to work in a company you have to give them a good start. One has to ask – how are newcomers triggered to participate, and how are they consciously included in the culture. But also vice versa: how does the culture become such that newcomers also feel at home.

This onboarding training, especially for minorities, also means offering a place to ask questions, explaining unwritten rules etc. Similar principles apply in all spheres of work in the sector, including training and education.

## Stress integration of on-site work processes

A significant frequently reported aspect is **lack of integration of different disciplines and workers on the field**. This presents an opportunity for improvement and perhaps an entry point for educational/collaboration activities.

**In Bulgaria**, the construction/renovation planning processes is fragmented (rather than integrated) and lacks collaboration between HVAC designers and Architects.

**In France**, lack of (capacity for) on-site collaboration has been reported as one of the key challenges.

**In Ireland**, a suggestion for a transportable training unit (“pod”) has been given, one that could be taken to different working sites around the country and integrate it in the work process as much as possible.

*“How do you motivate the main contractor? This is a valuable exercise and well worth doing but time and cost is the challenge. It may be a matter of trying to accommodate them in such a way that if it could be done on site, if there was a transportable pod that could be brought around the country. So, you could bring to site and they could get their training on site and then get back to work.” (SME and product supplier, Ireland)*

### A DIY store upskilling – an outline

Irish contributors reported an outline for a DIY store upskilling suggested by the representative of Chadwicks, the DIY store. In terms of testing and recognition of Energy skills, this serves as an example of an upskilling niche – a specific contexts and community of potential users of BUSLeague solutions – that address real needs and expectations of participating workers and professionals.

In the case of Chadwicks, informant felt that their staff has strong product knowledge. The need or potential for upskilling of their staff is therefore in the technical requirements of the new nZEB regulations. This is important so that they understand some of the key challenges of implementing low energy projects and be aware of the various solutions available to meet those challenges.

Online training was pointed out as a possible solution to the challenge of disruption of work process for SMEs and DIY companies, that would potentially have to send their workers for upskilling courses. The informant was interested in the Build Up Skills App. They would be happy to make it available on the shop floor.

Some suggested aspects of training design for DIY store employees include:

- A 4 Hour CPD should cover the basics to raise awareness.
- This could be tested by a test at the end of the CPD, but not essential.
- Classroom or online training would be suitable.

Significantly, Chadwicks are willing to pay for such training.

### E-learning (digital tools)

**E-learning** was widely referred to in the reports. Tools, such as apps, video, gamification, online platforms (and communities), were implicitly or explicitly mentioned in virtually all reports, also due to BUSLeague's particular interests in this area. Some aspects worth investigating in this regard are:

- **Micro-learning,**
- **Self-learning,**
- **Interactive online courses.**

Most importantly, digital learning has the potential to enable:

- **Distant (remote) learning,**
- **A gradual & responsive learning experience** by optimizing the learning experience and progression according to the student's knowledge background and results, and to
- **Accommodate the learning capacity** of trainees (depending on their availability and preferences).

Clearly these have their limits. In this regard, it is important to emphasize, that several informants suggested either a mixed approach to upskilling, involving a combination of e-learning and face-to-face (on-site) training, or stressed their preference of practical (on-site) training. Again, the ideal (combination) of learning approaches depends on the profile of the student.

### Prospects and realities of digital (remote) learning

Dutch contributors reported an interesting case of webinars for raising awareness and providing information to residents. Being forced to take their activities online, the organizers noted a significant increase in total numbers attending the webinars, increase in the level of interaction (questions asked), and an increase in the numbers of younger people attending. With regard to BUSLeague interests, it would be interesting to research if such effect could also apply with webinars for training purposes, contributors note.

*But we actually see that remotely via webinars works quite well. There are more people who ask questions in a Webinar, at a physical meeting there are often a few people who are either very critical or ask a lot of questions. But a lot of people don't feel comfortable doing that. While online, yes, if we ask a question to the group, almost 80% answer such a question, say a poll. There is then again more chatting. There is actually more interaction, it almost sounds paradoxical.*

*In terms of age, we also reach younger people. For example, people who do not come to physical residents' evenings because they have young children. They can now [have] the kids in bed, [or the children] play for an hour or so away [in the room] and they [the homeowners] check in on such a webinar, say an hour. So that actually has quite a lot of advantages from a distance.*

## Contents

Commonly highlighted desirable properties of upskilling in terms of content:

- **Timeliness** – Relevant in terms of state-of-the art, current regulation, etc.  
**In Ireland**, for example, new national-level building regulation was stressed as a specific need and therefore an opportunity for creating tailored educational contents.
- **Meaningfulness** is the key element of individual's intrinsic motivation to learn and reference that defines the (perceive) value of training. Closely related to contextualization and tailored content.
- **Integration and contextualization** – Individual theoretical chapters have to be meaningfully and practically integrated and contextualized, ideally with special attention to the participant's work.  
**French contributors** stressed the interconnectedness of skills with knowledge regarding materials and equipment. They also pointed out weak points<sup>20</sup> as a focus point for stressing the skills of “cross-craft” collaboration.

Some of the specific topical areas referred to in the reports are:

- **Technological trends and digitalisation** – Reports both refer to the existing demand for skills in this area and forecast its increase for the foreseeing future. Importantly, digitalization also implies new venues for enhanced human-building interaction, which will not only drive demand for digitally-specific but also other EE Skills that enable or enhance control over the management of energy use (and comfort) in the built environment.
- **Progressive construction practices** – Several specialized features and topics have been mentioned in the reports as prospective upskilling content.  
**In Bulgaria** thermal (energy balance) calculations and Green roofs have been pointed out as an example.  
**In Austria**, the need for noise reduction for heat-pump installations has been pointed out.  
**In Ireland**, advanced upskilling regarding specific technical details of nZEB regulation has been identified as a niche for employees of DIY stores, also due to new national-level regulation passed in 2020.
- **General topics and skills** – Reports noted calls for more general (but optional) modules of professional improvement, such as organisation, time management, marketing and communication.
- **Stress the aspect of trust** – Dutch contributors stressed building trust between the building / home owners and the installation or building company who will realise the EE-measure as “a huge topic”, particularly in collective actions. Similar opinion was voiced by a Spanish worker, who stated that trust in the renovation process is essential for popular demand for skills and, consequentially, the uptake of BUSLeaue solutions.  
Adam (SME employee and professional energy advisor, the Netherlands) stated that they invest a lot of time and effort in this, by selecting companies with a system of about 60 or 70 criteria, building a relationship between the company and the building owners in advance of the project and giving clear and complete information, i.e.: our working hours

---

<sup>20</sup> A “weak point” – *un point singulier* in French – is a place where there are potential problems with air-tightness, for instance the link between a window and a wall.

are..., when we break up the pathway in your garden, we rebuild it, we use facemasks when we go inside your home etc.

### Confusing names of courses and qualifications

With regard to efficient people-centred design of the training courses, the **need for clarity in communicating training content** was highlighted by the Austrian contributors. One of their informants – an energy expert and trainer – noted “confusion” with regard to terms or names used for courses in Austria, effectively failing to communicate clearly what is being taught during the training.

### Build a community

In relation to creating a supportive learning environment, the aspect of community building plays an important part. Reports indicated several different aspects related to community building:

- **Building a coalition** – The need for constructive consensus and active collaboration of key stakeholders (from business, political and social/public spheres) has been reported frequently.
- **Target the entire construction and renovation value chain** – The need to reach all key stakeholder groups has been particularly stressed.

*“I think that the participation of all stakeholders is extremely important i.e., it should not be a commitment only for a separate branch organization to independently develop the training content it deems necessary. Representatives of branch organizations, representatives of employers, secondary and higher and continuing education, and vocational training providers, as well as representatives of construction material supply companies should be involved.”*  
(Professional Association Rep., Bulgaria)

- **Enthusiastic individuals** – Individuals who find EE Skills essential to their personal performance and professional excellence and set a leading example or even actively promote their working values and principles. They can be referred to as local heroes, ambassadors, influencer, trustees etc.

**French contributors** reported a suggestion for local network(s) of “trustees” and “influencers” to give people courage and confidence regarding nZEB renovation, and to encourage SMEs to train their workers.

- **EE-focused ethos** – Work towards establishing a set of principles (ethos) that favours EE Skills within communities of stakeholders that constitute the construction and renovation sector.

### Inclusive and diverse working culture

Related to the aspects of community, culture of work, and ethos, creating a diverse and inclusive work – or training – environment has been implicitly or explicitly stressed in several reports. Most prominently, the Dutch contributors reported the following definitions shared by the Rep. of women in the sector:

- **Diversity** means that all different groups may be attended in an organization or company,
- **Inclusions** means that everyone is included in all activities;

Example: diversity means that women may work in the company; inclusion means that they have the same rights and opportunities, i.e., for personal development.

Topics, such as social and emotional safety of minorities in the construction and renovation sector, diversity in practice (active policies, dedicated resources, diverse recruitment commissions etc.), identity and cultures in the sector also emerged through research as relevant avenues for future research in development of BUSLeague solutions, some of which include:

- Construction of identity through established (and embodied) practices of work,
- Socio-demographic patterns in establishment of social (or knowledge) authority,

- Imaginaries of masculinity and femininity with regard to physical and technical work etc.

### Coordination and collaboration with producers and suppliers

A specific aspect related to virtually all aspects of quality training design in building and renovation sector is coordination of training with leading industry representatives. Producers and suppliers of technology and materials offer their own training and proved to be a significant stakeholder in the existing landscape of upskilling in the sector. Reports – both explicitly and implicitly – indicate the **need for collaboration and integration of learning activities and contents**. Some key aspects highlighted in the reports include:

- Producers and suppliers' knowhow and skills necessary for installation of their products go **beyond the regional and national realms** since they are reportedly valid abroad.

*“Based on my personal impressions of the construction industry and speaking specifically about the installers, I think that these certificates that we as manufacturers of materials give them are very important. Some of them are valid abroad and it is not necessary to make recertification in other countries. Why is it so priceless, I come back to something I mentioned that the end customer holds and realizes that the investment he makes in construction is long-term. It is extremely important for him to know that the installer who will come to work on the site will do a good job and will apply the given solutions and products in the right way, which will guarantee the quality of the final product.” (Supplier, Bulgaria)*

- **Clients (demand side) thinks in terms of concrete solutions & products** rather than holistically (an aspect of driving demand for EE Skills).
- Due to market competition **private businesses have to be on the cutting edge of technology**, while official educational institutions sometimes lag behind the developments and trends.

### 3.2.3 Policy, Regulation & Financing

Progressive policies and instruments of financial institutions are expected to play a pivotal role in influencing development of the market of EE Skills. On the one hand they are expected to support the development of favourable conditions with incentives, financial products and policies that push development of skill-specific EE job market. On the other hand, policy developers and regulator have the leverages to generate demand through regulation and enforcement to drive demand for EE Skills. Here are some key aspects highlighted in the report:

- **Political willingness** – Given that policy subjected to powerplay between various parties and stakeholders, political will has to be pursued actively. Various types of lobbying and advocacy therefore are needed.

*“Of course, I think it's very important for people who are in government positions, the ‘big wheels’ on which it depends to turn things around and everything to go in the right direction. The trainings and the various events that you organize are the way we reach them.” (Supplier, Bulgaria)*

- **Consistency and clarity in support** – This is widely considered as one of the most important aspects with regard to efficiency and scale of impact policy makers and financial institutions have on the market and developments in the construction and renovation

**In Ireland**, lack of both consistency and clarity with regard to public support for progressive policies in the area of construction and renovation has been highlighted as problematic.

*“Mixed messages or inconsistent messages at a national level is not helping the industry at all. Bit by bit process, we change the rules and we change the standards as we go along. That's not helpful.” (SME and Energy agency Rep., Ireland)*

- **Policy enforcement** – Some informants pointed out that enforcement is of key significance for pushing key stakeholders towards upskilling and creating favourable market environment.

### Awareness rising

Some key aspects for awareness raising for policy makers and implementers are:

- **Enable or support access to reliable information** – Effective access to reliable, holistic and unbiased information is deemed a responsibility of the regulators and policy makers.
- **Promote & disseminate** – Public support for transfer of existing knowledge, experience and practices was also voiced as important.

**In Austria**, for example, good practices, positive experience, and relevant outcomes of BUSLeague will be disseminated through klimaaktiv – a key stakeholders closely related to the sphere of public administration.

- **Set a leading example** as a public institution

**In Austria**, activities by BundesImmobilienGesellschaft (BIG) & klimaaktiv have been highlighted as examples of good practice.

**Bulgarian contributors** reported calls for requirements for qualifications in EE Skills in public tender.

### Financial support for upskilling

Support by policy makers, implementers and financial bodies for generating demand for EE Skills and creating favourable market conditions is deemed essential. Following are some aspects – needs and expectations – that have been reported in this regard:

- **Subsidies for investments in EE (for demand side)**
- **Subsidies for upskilling activities (for supply side)**
- **Allocated funds for and a coherent strategy on all governmental levels**

**Austrian contributors** report that many Austrian provinces (regional government level) provide subsidy if the building is built or retrofitted under the klimaaktiv criteria. Such is the example of the province of Carinthia, which has raised the amount of the **grants** for the buildings with different klimaaktiv standards since January 2021. Similarly, Salzburg provides subsidy if the renovated building has energy efficiency class according to klimaaktiv criteria.

- **Incentives for workers, professionals and businesses** to constructively contribute to functioning and development of upskilling activities.

**Irish contributors** suggested that there should be public support available for SMEs to upskill their workers in order to overcome the barrier of lost turnover and change alleviate the lost turnover resulting from disruption of work process (unavailability of workers for the duration of the training activities). Also, they reported a suggestion by a Local Gov. Rep. saying that construction companies could get €3.000 if they take someone on an apprenticeship programme.

- **Tax reduction**
- **Dedicated financial support for building renovation projects**

**French contributors** listed the following aspects of financial support on the local government level:

- Grants and subsidies by the council can come in addition to the State and the Local Authorities grants and subsidies.

- Grants, subsidies and low interest long term loans (up to 25 years) that are available for the renovation of private housing. It is claimed that the costs of nZEB global renovation can be (almost) funded by savings in energy spending.
  - A device to co-finance thermal audits.
- **Capitalize on success stories and examples of good practices** (knowledge transfer on the institutional level)

## 4 ANNEX – Fieldnotes by country

The annex is a collection of original unedited research notes from contributors to T2.2 and this deliverable. In some cases, partial interview transcriptions are provided. Some contributors use the following tagging system for clarity and orientation:

CS – case specific

KEY – an important/key insight

ATT – Attention! Information, that is in contradiction or requires further research.

In principle, the notes are arranged firstly by countries and secondly in chronological order. Notes consist of a set of metadata (name, stakeholder group, specialty and date of interview) and a table. Topics of the notes are outlined in the left column. Content (notes) is presented in the right column. Direct quotes from research participants are marked with italics.

### 4.1 Austria

#### 4.1.1 Energy expert & Trainer

**Informant:** Alexander Ebner (around 50)

**Stakeholder group:** Consultant, Education provider, SME employee

**Speciality:** Energy expert and consultant, Architect

**Date of interview:** 16. 12. 2020

General	
Stories	<p><b>There is a draft! (Es zieht!)</b></p> <p><i>During the on-site trainings (within CrossCraft<sup>21</sup> project), it became apparent that at the beginning of the on-site training most of the trainees were of the opinion that they actually worked well and couldn't learn anything new. Moreover, many of them were of the opinion that a building should be able to breath, which means that it is ok when there are air-leakages in the construction.</i></p> <p><i>But after starting the Blower-Door test. the trainees feeling the air draft (especially next to sockets and windows). In Austria this is called "es zieht" which means "there is a draft" which is not appealing.</i></p> <p><i>After this experience the trainees started to understand that heated air is going through the wall (!!) and what will happen if the humidity at some point in the wall condenses and makes the wall wet.</i></p>

---

<sup>21</sup> A Build Up Skills project at national level.



	<i>Conclusion: Let them learn by making them doing experiments.</i>
<b>Testing and recognition of Energy skills (Building inspection)</b>	<ul style="list-style-type: none"> <li>• For building inspection, the scheme as such is not available. The scheme has been prepared as modules to be added to different trainings available on the market.</li> <li>• The energy advisors can update their skills through these modules (schemes).</li> <li>• The basic and advanced energy advisor courses can be considered as part of building inspection trainings. These trainings are recognised and include testing.</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• Most people including the building owners/managers are not aware of requirements for high quality or energy efficient buildings</li> <li>• The planners or architects or most of other professionals as planners are aware of the requirements</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• Public authorities provide subsidies for thermal renovation of the buildings or replacing the heating system but there is little quality control</li> <li>• The employment office provides trainings for the unemployed workers if needed</li> <li>• The authorities do not directly support the skills or trainings as such</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• Among the energy skills professionals the planners are the one more interested and take time in up-skilling</li> </ul>
<b>Skills</b>	<b>Content</b>
<b>Energy advisor – especially for the renovation of single family houses, technical and financial (incentives)</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>• Generally speaking, people don't know what nzeb is. The term low energy buildings (Niedrigenergiegebäude) or Passiv houses are better known.</li> <li>• The planners are more familiar with nzeb and they are more willing to take part on courses regarding nzeb skills. The other professionals such as contractors know less about nzeb and often don't have time to participate in trainings. Also, the end consumers are not aware of the quality and therefore they don't ask for it.</li> </ul>

	<ul style="list-style-type: none"> <li>• Some craftsmen such as Passive house constructors or the carpenters and HVAC installers are more interested in the courses locally (esp. in east Styria), but going towards north to Vienna the interest decreases.</li> <li>• There is a confusion regarding terms and names used for courses. Some planners or professionals say why more courses, I have been in one.</li> <li>• EASt has advantages through the developed courses within NEWCOM. When they are asked to hold courses esp. for the responsible authorities in municipalities, non-profit housing associations and developers, Ebner uses the content of courses developed in NEWCOM.</li> </ul> <p>Recognition of skill</p> <ul style="list-style-type: none"> <li>• professionals are not interested even though there are members of educational institutions from Slovenia (neighbouring country) who take part in courses and take the know-how to implement in their courses. Note: EASt has helped them to make their education courses.</li> </ul> <p>Incentives</p> <ul style="list-style-type: none"> <li>• EASt has worked with AMS and BFI for many years (15) and at least 3-4 courses have been performed with 15 participants each time. He thinks that the incentives are good to bring the workers to educate themselves.</li> </ul> <p>APP and registration on the web</p> <ul style="list-style-type: none"> <li>• In his opinion the developed database within NEWCOM is not very easy to use. If it is simpler and you can find your way around, it could be of more interest. Nevertheless, EASt is going to introduce the Register and the app to the federal government of Styria. Hopefully until then it is further developed (easier to use)</li> </ul> <p>Make courses attractive</p> <ul style="list-style-type: none"> <li>• Next to frontal lectures, experiments and short teaching films/clips are important. Nowadays e-learning is also a way to educate because one can learn without going to a training especially if it is further away. 15 years ago, it was not possible but now everybody has access to PC or smart phones. This is of course easier for white-collar workers or some professionals (window-</li> </ul>
--	--

	installer, carpentry planners) but blue-collar workers will not use it at home. Home is where you don't work!
--	---

#### 4.1.2 Education provider & expert in comprehensive comfort ventilation system

**Informant:** Andreas Greml (mid 50's)

**Stakeholder group:** Education provider, SME CEO

**Speciality:** Expert, teacher and engineer in comfort ventilation

**Date of interview:** 13. 01. 2021

General	
<b>Story</b>	<p>Never live in an apartment without comfort ventilation</p> <p><i>In a project, the tenants of the building were sceptical towards the implementation of a comprehensive comfort ventilation system in the whole apartment building. Especially one of the tenants was really against the implementation of such a system.</i></p> <p><i>A year after the construction was finalised and the residents moved in, Mr Greml encountered this person. The tenant said, he has changed his opinion and is so satisfied with the ventilation that he would never want to live in an apartment without it.</i></p>
<b>Testing and recognition of Energy skills (Ventilation installer)</b>	<ul style="list-style-type: none"> <li>• There are qualification and certification schemes and entities</li> <li>• Participating in these courses is decreasing due to the market saturation and interest before the pandemic</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• The skills regarding installing ventilation are known in the public and private sector in non-residential buildings</li> <li>• Regarding the sub-section of non-residential buildings, namely schools there are misconceptions! (there is no need for ventilation)</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• Generally, the professionals are considered to be qualified in their section because of the dual way for the profession (school and practical work experience)</li> <li>• Public authorities provide courses for the unemployed through employment office.</li> </ul>
<b>Lack of motivation, time and trainings on the side of</b>	<ul style="list-style-type: none"> <li>• Because of lack of workers or professionals, the companies are happy to find somebody to work for them, therefore, there is no motivation for up-skilling. There is no competition, who will do the job.</li> </ul>

<b>construction sector professionals</b>	
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• Due to the pandemic ventilation of the buildings especially in the schools are becoming more important. This includes also the new technology.</li> <li>• The hype might cool down after the pandemic.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• Advisor app, short clips and gamification could be a supplement to the classic trainings of the professionals</li> </ul>
<b>Testimonials</b>	<p><i>The installation of the comprehensive comfort ventilation systems in the residential buildings is being considered as not relevant. Therefore, due to the cost reduction the building owners or developers waive the installation. This is the case also in the public buildings such as schools.</i></p> <p><i>For hospitals installing the ventilation is a necessity, because of obvious reasons.</i></p> <p><i>For other (new) buildings such as (luxury) hotels, office buildings, etc. installing ventilation is more or less normal.</i></p>
<b>Skills</b>	<b>Content</b>
<b>Ventilation installer</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>• His opinion regarding the (further) education of professional is that all craftsmen working in installing ventilation, heat pumps and PV plants need further education. At the construction site, the supervisor has to understand quite well the requirements and challenges for installing the system, and should be able to convey it to the other workers. But since the number of professionals in these crafts-sector is very limited, the companies are happy to find craftsmen without the required qualifications. Therefore, they don't send their workers to classes or trainings, because they are needed at site. This makes also the motivation for workers in attending trainings very low.</li> </ul> <p>Motivation</p> <ul style="list-style-type: none"> <li>• The motivation could be raised through the job market: if there are more workers, a competition for getting the job could be having a better education or training.</li> </ul>

	<ul style="list-style-type: none"> <li>• A possibility could be for the unemployed workers who want to change their qualification (to be able to find a (better) job) could participate in the courses AMS (employment office) provides.</li> </ul> <p>Micro learning</p> <ul style="list-style-type: none"> <li>• Micro learning plus gamification is good if it is combined with training that are provided by the system/component producers. But even here the attitude toward these micro learnings are divided and very individual. The producers and the trainees don't need a qualification or certification document.</li> </ul> <p>Recognition of skill</p> <ul style="list-style-type: none"> <li>• The further education programmes could be offered to the employers of the municipalities, especially the ones involved in e5 programme (European Energy Award Programme), so that they are able to understand the tasks. These could be (short) half-a-day courses. Longer courses don't have a chance of being accepted by the market. Right now he is offering and carrying out trainings for the municipalities, providing information on ventilation systems and advantages for schools, especially in connection with the pandemic. At the end, the decision for installing the ventilations is up to the policy makers and could be politically motivated.</li> <li>• Additionally, there are also opposite parties against the use of ventilation which makes the installation of ventilation systems quite difficult.</li> </ul> <p>Policy makers</p> <ul style="list-style-type: none"> <li>• Different lobbying or political opinions could also have huge influence in making regulations or laws for the installation of ventilation, as seen in the OIB guidelines and klimaaktiv criteria.</li> </ul>
--	--

### 4.1.3 Teacher & expert in HVAC systems

**Informant:** Ing. Rudolf Baier (mid 40's)

**Stakeholder group:** Education provider, SME CEO

**Speciality:** Expert, teacher and engineer in heating and cooling systems, comfort ventilation

**Date of interview:** 21. 1. 2021

General	
<b>Trainings for HVAC</b>	<b>Make energy saving visible</b>  <i>The trainees usually are sceptical regarding the € saved or energy use. He puts it into pictures and that is what that makes a positive effect on the contents of the training: 100.000m³/h airflow makes it 120 Tonnes. This is 10 Lorries.</i>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• Informant claims there are trainings for testing and recognition of installing ventilation.</li><li>• He uses short clips during the training sessions, so using the app especially on site on installations of components seems to be good idea because it is much easier to understand how things work</li><li>• He will think of some ideas for the app</li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• Regarding the single-family houses or residential buildings: Comfort ventilation has not been successful, there are also many negative myths around which makes it even more difficult</li><li>• More of the trainees are experienced installers (member of the facility team) working for office buildings or hospitals, who want to know how to maintain or optimise the system</li><li>• The installers with little experience (new in the market) are not aware of the challenges yet</li></ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"><li>• There is no financial support from the public authorities for ventilation installers</li><li>• For the AC systems, the installers have to be certified</li></ul>

<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>The motivation comes with experience: to solve the challenges for the complicated systems in especial buildings such as hospitals, office buildings, etc.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>See above</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>Short explanation clips could be helpful, especially if the installer (the facility manager) is having a problem on the weekends etc.</li> </ul>
<b>Skills</b>	<b>Content</b>
<b>Ventilation installer</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>The importance of the skill is that the systems need to be maintained and or replaced with new systems. Therefore, skilled personnel is needed</li> <li>The installers have to know about the new standards and regulations</li> <li>There are saving potentials after installing and operating, a regulating is needed</li> <li>Regular upskilling is needed to meet the standards</li> </ul> <p>Recognition of skill</p> <ul style="list-style-type: none"> <li>The skill regarding AC (cooling) needs accreditation (in place)</li> </ul> <p>Upskilling</p> <ul style="list-style-type: none"> <li>The method of upskilling should be mixture of training in class, and onsite but it should be interesting and new methods are welcome</li> <li>Producing short clips are useful</li> </ul>



#### 4.1.4 Education provider & expert on solar-thermal systems

**Informant:** Dipl. Ing. Roger Hackstock (mid 50's)

**Stakeholder group:** Education provider, SME CEO

**Speciality:** Expert, electrical engineer (expert on environmental engineering), teacher of solar thermal systems, SME CEO

**Date of interview:** 22. 01. 2021

General	
<b>Story</b>	<ul style="list-style-type: none"><li>• He didn't have any stories since he has not taught for 4-5 years.</li></ul>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• Informant claims there is no accreditation necessary for the installation of solar thermal plants.</li><li>• Implementing a certification or accreditation by the municipalities or law improves the installing and preventing the mistakes</li><li>• The accreditation would help start the trainings again</li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• Some parts of the skill are taught which the basic training which makes the installers less willing to have further training</li><li>• The producers have their product's own training</li><li>• The general public believes that the installer has the knowledge how to install the plant</li></ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"><li>• The public Authorities provide support including financial support if</li><li>• The technology is new to the market</li><li>• The technology is expensive and the policy makers want to promote</li></ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"><li>• If the company installs only one or two plants, they are not motivated to have trainings</li><li>• If the company has one installer who is trained, uses this person for his jobs and supervising others (if they have much to do, this will not happen)</li></ul>

<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>The “new” system is taught by the producers</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>There is no special demand on the market for the installation of the solar plants</li> <li>The installers who install more than one or two plants are not interested in trainings</li> <li>The installers who install more plants, rely on their experience and since they are very busy, they do not want to spend time sitting in training schemes</li> </ul>
<b>Skills</b>	<b>Content</b>
<b>Installation solar thermal plant – for warm water and heating including the distribution pipes, storage, hydraulic balancing and further components</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>For guaranteeing the correct installing the system and all its components a training scheme is necessary</li> <li>Not all installers install a solar thermal plant regularly</li> <li>The installers are not motivated to take part in the trainings</li> <li>The trainings are provided by the producers for their product</li> </ul> <p>Recognition of skill</p> <ul style="list-style-type: none"> <li>The skill should be recognised as essential because the need for energy for heating the building is reducing and the need for hot water remains which includes warm water in summer</li> <li>The up skilling is needed regularly because of the development of new technologies and therefore the new insights</li> <li>How could/should we test it? He had no idea!</li> <li>The installation of the solar thermal plant should be done by an accredited installer</li> <li>How do they imagine it will function in practice? Why (not)?</li> </ul> <p>Upskilling</p>

	<ul style="list-style-type: none"> <li>• The methods of upskilling: training on and off site, including product specific needs</li> <li>• For the time being it doesn't make sense to invest in upskilling this skill if the public authorities do not ask for certificates</li> </ul>
--	--

#### 4.1.5 Association for Heat pump installer

**Informant:** Siegfried Koptsch (mid 40's)

**Stakeholder group:** Association Heat Pumps CEO

**Speciality:** Expert, Heat Pumps

**Date of interview:** 26. 01. 2021

General	
<b>Story</b>	The installers' point of view: The attend trainings in order to maximise their income and profit through having success in what they do. The want to do a good job and be proud to have installed a well-functioning heating system.
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• There is a certified heat pump installation training<ul style="list-style-type: none"><li>○ Two weeks course developed together with Austrian Institute of Technology (AITI)</li><li>○ The course is offered 7-10 per year</li><li>○ The number of participants differ from 12 to 20</li></ul></li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• The public is aware of the system because the system is in the market for almost 40 years</li><li>• The real hype has been noticed in the past 20 years</li><li>• There is a huge difference between the city (due gas and district heating grid availability) and suburbs</li></ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"><li>• The public Authorities provide support including financial support generally for replacing the fossil fuel heating systems with environmentally friendly systems such as heat pumps</li><li>• The courses are self-running due to the market demand, therefore no subsidies for the installers' trainings</li></ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"><li>• The companies (SMEs) want to do a good job, thus send their employees to training</li></ul>
<b>Integration of new technologies and</b>	<ul style="list-style-type: none"><li>• /</li></ul>

addressing new societal and technological trends	
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• There is a need for consultation of choosing the appropriate HP-system for the building</li> <li>• There is a need for hydraulic balancing</li> </ul>
<b>Skills</b>	<b>Content</b>
<b>Installation Heat pump – air, water, earth</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>• For guaranteeing the correct installing the system and all its components a training scheme is necessary</li> <li>• The market is good for heat pumps</li> <li>• The installers attend the trainings</li> <li>• The trainings are provided by the producers for their product</li> </ul> <p>Recognition of skill</p> <ul style="list-style-type: none"> <li>• The skill is recognised and certified</li> </ul> <p>Upskilling</p> <ul style="list-style-type: none"> <li>• The upskilling: choice of the right HP system and its planning</li> <li>• Training on the especial features is necessary: pumps, noise reduction</li> </ul>

#### 4.1.6 Support to policy maker & employee

**Informant:** Erich Kremsmeier (mid 50's)

**Stakeholder group:** Education provider

**Speciality:** Education for construction sector, Strategy development

**Date of interview:** 26. 01. 2021

General	
Testing and recognition of Energy skills	• /
Awareness of both the general public and workforce	• /
Lack of support / request for the skilled professional by the Public Authorities	• /
Lack of motivation, time and trainings on the side of construction sector professionals	• /
Integration of new technologies and addressing new societal and technological trends	• /
Market demand and uptake of prospective BUSLeague solutions	• /
Skills	Content
Education provider	<p>General notes</p> <ul style="list-style-type: none"><li>• The platform<sup>22</sup> of the chamber of commerce has 10,000 users.</li><li>• The courses are not related to the energy efficiency or cross trade matters.</li></ul> <p>Upskilling</p>

---

<sup>22</sup> BAU deine zukunft – Educational platform by AT Chamber of Commerce (See <https://www.e-baulehre.at/>). BAU deine zukunft (Build your future) is a platform established and maintained by the Austrian Chamber of Commerce intended for the apprentice or construction workers. It includes 70 sections (construction section) with 373 subjects in form of short clips. People can register and watch these videos. At the beginning of 2021, the platform had around 10,000 registered users. The courses are not related to the energy efficiency or cross trade matters. The courses or clips can be used for the upgrading.

	<ul style="list-style-type: none"><li>• The courses or clips can be used for the upgrading</li></ul>
--	--

#### 4.1.7 Support to policy maker & employee

**Informant:** Barbara Alexander-Bittner (mid 40's)

**Stakeholder group:** Representative of the government in klimaaktiv Education, employee

**Speciality:** Energy expert and consultant

**Date of interview:** 09. 02. 2021

General	
<b>Story</b>	<p>She suggested to collect some testimonials by klimaaktiv partners. Here are a few of testimonials regarding the klimaaktiv initiatives under <a href="http://www.klimaaktiv.at/partner/landing">www.klimaaktiv.at/partner/landing</a>:</p> <ul style="list-style-type: none"><li>• <b>Bernd Vogl (City of Vienna):</b> My department for energy planning (MA20) in Vienna aims at a future-oriented development of the heating market. We therefore push the increased use of renewable energy as well as waste heat sources in the city and develop and provide comprehensive information on subsidies. For example, with the new app "Viennese Energy Showcase Projects", which already communicate the energy system of tomorrow today.</li><li>• <b>Thomas Priglhuber (WILO Pumps):</b> Together with klimaaktiv's partners and supporters, we will achieve the ambitious targets for future heat supply for 2050. klimaaktiv provides an ideal platform to highlight the importance of heat supply in addition to measures such as thermal insulation and window replacement.</li><li>• <b>Michael Gehbauer (WBV-GPA Housing association for private employees):</b> Our corporate philosophy "social - cost-effective - innovative" obliges us to constantly develop new innovative approaches in residential construction. The fact that we are on a successful, forward-looking path with this is demonstrated by a large number of innovation projects and awards of which we are particularly proud.</li><li>• <b>Gerhard Kopeinig (Architect):</b> As a winner of the State Prize for Architecture and Sustainability, it is essential for every project and every consultation to consistently explore from the outset what contribution we can make to climate protection. Because, as we know, building requires a lot of energy: in production, processing, operation and recycling. By providing coherent support and advice to investors, developers, operators and users, from the choice of site to the spatial concept, the design of the building structure and lighting, to the choice of materials and their processing, we can contribute to the achievement of climate targets.</li></ul>



	<ul style="list-style-type: none"> <li>• <b>Hannes Gschwentner (CEO Heimat Tirol):</b> Conserving resources is part of our responsibility to ensure affordable housing in the long term. klimaaktiv supports us in this in many ways. Energy-efficient new buildings and qualitative and sustainable building refurbishment are effective tools for protecting the climate and keeping operating costs low. This is where we see our most important task. Being open to new ideas and actively designing buildings that are as climate-neutral as possible - these are the cornerstones of our daily work.</li> </ul>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• For reaching the climate action goals, the Austrian government has come up with many initiatives, among them also promoting the education of the workforce. The reason is not only concerning the increasing the climate actions but also to address unemployment. Since the middle of 2020, there is an initiative of the Austrian Government “Qualifizierungsoffensive” (Qualification campaign) for all skilled workers including construction sector. In this initiative the industry and businesses come together to educate the apprentices at the same time providing jobs for them (e.g., big energy provider company for electricians to install parts or the whole system).</li> <li>• The Austrian Federal Economic Chamber functions as the federal parent organization for the nine State Chambers and 110 trade associations for different industries within Austria's system of economy. Most State Chambers and associations have local offices to provide services in close proximity to members. Compulsory membership by Austrian federal law is automatic with obtaining the operating licence of the company and thus includes all Austrian companies in operation. Representation of membership interests at all levels of government. By law, governments are obliged to consult with Chambers on legislative projects and important regulation. In many laws, a provision is made to involve Chambers in decision-making and administrative procedures. Information and advisory service to members: Typical issues include taxation, labour law, vocational training, industry-specific legislation, industry-wide advertising and market research.</li> <li>• In Austria, the trades’ regulation generally determines what is needed and how the trades should be trained. The apprentices have to attend courses and work for at least 3 years. Within these training they learn what they need (including the latest techniques) in order to carry out their work. If they don’t practice or don’t carry out special installation, the know-how is almost lost.</li> </ul>

<p><b>Awareness of both the general public and workforce</b></p>	<ul style="list-style-type: none"> <li>• The state promotes energy efficiency more on asking for especial quality in the buildings, especially public buildings. BundesImmobilienGesellschaft BIG (the Federal Property Association), which manages the public buildings started building and renovating their buildings under klimaaktiv criteria since 2020. For these buildings, a trained construction/project manager is assigned to supervise the construction activities.</li> <li>• Regarding the involvement and information to building owners or managers, the EAVG (Energy Performance Provision Act) is the main tool (EPC). EPC needs to be provided at the point of sale or rent, as well as for building permit and carrying out deep renovation when the building owner apply for available subsidies and grants. Klimaaktiv is seen as add on campaign and motor for further activities and measures (installing renewable systems and using environmentally friendly construction materials).</li> </ul>
<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<ul style="list-style-type: none"> <li>• Apart from this, many Austrian provinces provide subsidy if the building is built or retrofitted under the klimaaktiv criteria (e.g., Carinthia has raised the amount of the grants for the buildings with different klimaaktiv standards since January 2021, or Salzburg provides subsidy if the renovated building has energy efficiency class according to klimaaktiv). Furthermore, some (building) develop companies have started to construct their buildings with klimaaktiv criteria (e.g., developers 6B47 and GED). These companies put their crew or their service companies together (providing training in some cases) in order to make these energy efficient buildings. Many of these activities include high quality trainings.</li> <li>• Regarding financing the trainings for the employees (workers and installers) there are funding programs for the companies (e.g., the program <sup>23</sup> provided by Chamber of Commerce where 75% of the costs are provided; <a href="https://www.wko.at/service/bildung-lehre/foerderungen-lehre.html">https://www.wko.at/service/bildung-lehre/foerderungen-lehre.html</a>). Of course, not all are for construction sector. The basis for the trainings is the Austrian Vocational Training Act BGBl. Nr. 142/1969, and Guideline for the promotion of the operational</li> </ul>

<sup>23</sup> Austrian Chamber of Commerce programme for subsidising educational activities in the construction sector (See <https://www.wko.at/service/bildung-lehre/foerderungen-lehre.html>). The Chamber of Commerce provides subsidies for apprentice companies and apprentices. For example, the subsidies for apprentices during the pandemic. The chamber can profit from the outcomes of the project and promote them among the companies and trainees.

	training of apprentices in accordance with §19c Para. 1Z I-7 BAG.
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• See above.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Skills</b>	<b>Content</b>
<b>Policy maker</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>• In the Austrian construction sector, there are many workers and installers from the neighbouring countries.</li> <li>• The education system in Austria has a dual path: school and practical work for a certain period including passing exams.</li> <li>• Sometimes it is difficult to find the necessary qualification for the job.</li> </ul> <p>Recognition of skill</p> <ul style="list-style-type: none"> <li>• The Austrian education system is based on the Trades Regulations.</li> </ul> <p>Upskilling</p> <ul style="list-style-type: none"> <li>• There are upskilling schemes which being supported by the government.</li> <li>• Through klima<b>aktiv</b> initiative the schemes relating to environment aspects are being widely promoted.</li> <li>• The klima<b>aktiv</b> platform provides different guidelines and tools for different trades for the upskilling and transfer know-how.</li> </ul>

--	--

## 4.2 Bulgaria

### 4.2.1 Independent expert (architect & nZEB building designer)

**Informant:** Anton Georgiev (early 50-ies)

**Stakeholder group:** Independent experts (designer)

**Speciality:** Architect

**Date of interview:** 1. 1. 2021

General	
<b>Story</b>	<p>Low value of the intellectual labour and underpayment of design services – relation to time constraints</p> <p><i>Until recently, the Bulgarian market was a bit distorted in terms of the fact that we were at the end of perhaps the biggest boom in construction and in design, respectively. Maybe this somehow spoiled us, the designers, and our attitude is not identical to that of our Western colleagues. I repeatedly talked to colleagues from Western Europe, architects, who, when they see what sites Bulgarian architects have at hand, hardly believe that small design studios can have so big projects. For them, it is OK to have two or three houses per year in order to consider the year successful, both professionally and financially. In our country, of course, due to the low payment, two or three houses cannot be enough in any way. Maybe that's why we are looking for many more sites, there are many more sites around and therefore Bulgarian architects are engaged I guess five to ten times more than with their Western counterparts, which naturally leads to a total lack of time. So I personally think that the time factor in our country is a very important element for the lack of great demand and attendance to trainings by architects. Maybe not only from architects but also from all the others, because we are all tied.</i></p>
<b>Testing and recognition of Energy skills</b>	<p>KEY: Informant claims that there are different approaches towards certification among the professionals.</p> <ul style="list-style-type: none"> <li>• There is a group that is active on the market and considers energy efficiency as important feature of the building, so they really want to improve their knowledge and are able to provide quality services</li> <li>• There are “certificate collectors”, who don’t care about the quality but want to enter emerging markets</li> </ul> <p>CS. There is a big group of disinterested designers who are attached to investors and contractors and do exactly what they are told to do</p>

	<ul style="list-style-type: none"> <li>• It is very hard for the client to differentiate between the three groups</li> </ul> <p>KEY: Informant claims that he respects and values certified construction workers</p> <p>KEY: Informant claims that certification by suppliers and manufacturers is the most valuable one</p> <p>KEY: Informant claims that the educational system offers low quality driven by ad hoc project financing; he doesn't have much appreciation for (most of the) international certification systems, claiming that they are too commercialized, do not develop the professional knowledge but repeat well-known things</p> <p><i>"I would divide people into two groups. Some are looking for this knowledge to better position themselves in the market, and others are the ones who think that this is extremely important. Those who rely on energy efficiency by conviction are people who already have their practice, their experience and their clientele. And I think those are the people who can really produce a quality end product. While others are always looking for a place to move - I have encountered more than one or two such cases. They accumulate endless certificates and enroll in all kinds of courses, but they do it only to find where there is a demand at the moment and to make their product more attractive. But I don't think they are the people who can deliver a quality product. However, it is very difficult to distinguish these people when you are a customer. And how can customers get this information properly, I can't really answer."</i></p> <p><i>"Certainly, in my opinion, the main people with such a lack of desire to update their knowledge are people who are directly related to the builders. There are many such designers who carry out a builder's order. They are literally attached to the builder and their job is to make some details that are generally custom. These are optimized, practical solutions given by builders who have no imagination. So this may be the third group of people who may not be given the opportunity to seek new knowledge, because they are simply flooded with specific demands."</i></p> <p><i>"Personally, I appreciate it (certification of construction workers) because the construction workers are a different stratum from the designers, these are not people who have the attitude to sit down and study. But in order to get a certificate, you still have to pass exams, and this is not their field of play. This is a positioning of their profession, which is genuinely practical, in a different perspective, through the prism of knowledge and theory. A builder who has made an effort to go to a course and learn something theoretical on top of the practical is worthy of respect. This means that this person has a desire to progress. I always enjoy such</i></p>
--	--

	<p>specialists among builders. With the builders, I wouldn't say that they are people who waste their time enrolling for every course they see and decide to study, but with the designers there is such a practice. I haven't thought about how to sift them, but in any case the presence of such certificates is a plus.</p> <p>"I personally would appreciate a purely practical skill acquired from a course organized by Knauf or one of the big companies than a course organized by the construction professional high school. I don't know why, whether from the general attitude that our system is compromised or because I know how these courses are done. In fact, they are initiated according to what programs there are available at the moment and to whether they can earn some money for organizing courses. They deliver information that is very outdated, it is not a specific program developed for the specific course. I just think that's what these technical schools do, and if you will, even universities. They win a European project, they put in an assistant and tell him you will read about this now, because we have won a project for it. And he starts reading, but from the same textbook from which he reads the other course.</p> <p>While in the courses, that are organized by the supplier companies, of course there is a huge dose of marketing and advertising, but a quality designer can always understand where the quality of the product is and where the empty talk starts. It's no secret that innovation in construction comes from these places, not from the laboratories at universities that study some materials. They create some knowledge, maybe the manufacturers then use the knowledge of the universities, but the very creation of new products comes from large construction companies and material suppliers. So these courses could be very interesting and very useful for construction companies. And the international ones - I don't think we should kneel before them just because they are international, and they have a great deal of commercialism and repetition of some things in other forms that bring nothing new. So I don't think that an international certificate is a priori better - just because it's international, than the one which came from our university structure."</p>
<p><b>Awareness of both the general public and workforce</b></p>	<ul style="list-style-type: none"> <li>• The informant states that there are important gaps in the awareness of professional audiences.</li> </ul> <p>"But the advent of technology and building management now requires knowledge that you can't gain on your own. A smart home can be an endless sea of information, and it's not easy to find your way around, let alone the people who sell building management technology, even they don't know exactly what they're selling."</p>

<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<p><b>ATT:</b> N/A – the informant only considers the demand by private investors, which is unusual for Bulgaria</p>
<p><b>Lack of motivation, time and trainings on the side of construction sector professionals</b></p>	<p>KEY: Informant says that time is the most significant barrier. This is valid for both designers and construction workers, but is even a bigger obstacle for the latter</p> <p>CS: Informant claims that in Bulgaria intellectual labour is not valued in general, and on top, most of the professional are hard to be convinced that they have gaps in knowledge (“we think we know everything”)</p> <p><i>"For me the most significant barrier is, first of all, the lack of time. In our country, of course, due to the low salary (...) we are looking for many more projects and that is why Bulgarian architects are engaged five to ten times more, compared with our Western counterparts, which naturally leads to a total lack of time. So I personally think that the time factor in our country is a very important element for the lack of great demand and attendance to trainings by architects. Maybe not only from architects, but from everyone in the sector because we are all connected."</i></p> <p><i>"For the builders, the problems with time are even greater, because among designers, a large part of the qualified specialists stay in the country, while the builders go abroad en masse. And the problem of finding quality builders is gigantic. This is really something that interferes with the whole investment process to an incredible extent. So, in fact, some builders who are more literate are able to sure to secure a good job without any kind of extra courses. The question is how we can make such a person stay in a week long course, which on top of everything else might be a paid course. He will neither give this money nor give this time. So, yes, the time factor comes first for me. "</i></p> <p><i>"Knowledge in Bulgaria has always seemed to be slightly underestimated. We have the attitude that we know everything and that we can do everything ourselves. I don't know if this is a characteristic feature for us, but I have always had the feeling that the self-confidence that we know everything is much greater than the real coverage. This factor may not be the most decisive factor in the lack of high demand today, but it has more long-lasting effects."</i></p>
<p><b>Integration of new technologies and addressing new societal and technological trends</b></p>	<ul style="list-style-type: none"> <li>• The informant says that energy efficiency is one of many other functions of the building and it is not possible to have the focus solely on it. It has to be integrated in broader concept, and at the moment it is very</li> </ul>



	<p>important to integrate it to the trends towards smart buildings</p> <p><i>“Energy efficiency is ultimately one of the many components in building development, design and construction. I think that considering energy efficiency purely as an element of energy saving, is the wrong approach, because it further narrows and reduces the importance of energy efficiency in the overall process of constructing a building. I personally would consider it as an element of a healthy living environment, of ecological thinking, no matter how cliché it may sound to many people, but this is increasingly beginning to be present as an argument for young people who come convinced of a healthy lifestyle and in their impact on the environment. So energy efficiency as part of something bigger can take a more significant element in the overall project investment package. And energy efficiency, in my opinion, in order to keep up with the times, with the current development of the construction process, it must be part of the increasingly popular smart buildings, intelligent buildings in which energy efficiency is not reduced to insulating and sealing the building but comes down to managing the building and its various components.”</i></p>
<p><b>Market demand and uptake of prospective BUSLeague solutions</b></p>	<p>KEY: The informant says that he considers upskilling courses mostly as the first step for an responsible designer to enter a new area with a systematic approach, and then to continue his/her self-education. The role of the lecturer is considered very important for the structuring of the knowledge in the specific field</p> <ul style="list-style-type: none"> <li>• Informant says that building management systems and smart technologies are a potential field of interest</li> <li>• Informant says that although 2 or 3 days remote training would be probably the best, he doesn't see how it can be possible in practical terms given the high workload. He would prefer to spend on training a few hours each day spread over several days</li> </ul> <p><i>"I personally find the postgraduate form of education as a good step to stimulate further improvement. Starting from scratch and finishing training without going through any level of a training course, be it online or otherwise, a person is under the threat that he may not understand the foundation, not catch the right recommendation for what he is looking for. But as he goes through such a course, he steps on a solid foundation and from there he can train himself and even surpass his lecturers. So, yes, there are lots of forms of self-learning, but there is still a need to start from an elementary level of knowledge transfer through other people.</i></p> <p><i>"I think that building management is an extremely interesting and endless topic that is now entering. We are very, very, very unprepared in this regard, there are probably other things, because the more we learn, the more we see that we</i></p>

	<p>know nothing, but here we do not know where to learn from. I'm really having a hard time because in several projects that have been looking for a kind of systems management, we are contacting the "leading" vendors and advertising agents who arrive, unload some beautiful glossy catalogs and can't say a word about the product.</p> <p>"I have many times wondered which is the better option. I do not have an unambiguous answer. I realize that when a person focuses for three days on one topic, it's better because he clears his head of all other things and thinks only about it, but I don't know if the practice allows it now. If you are an active person, this model is a bit theoretical, and it seems to me that it is a little harder to implement... I will never forget the course in Borovets with Rainer Pfluger some 15 years ago, a whole week from morning to evening, many people thinking together on one topic, in the evening the topic is still the same, it is unraveled, discussed, but then it was as if we had inertia from the old political regime. Now I don't see how you can do such a course.... I would prefer it to be within two to three days of two to three hours a day. It would be easier to take this time rather than spending three days from morning to evening studying."</p>
<b>Other notes</b>	<ul style="list-style-type: none"> <li>• Building automation and smartness/connectivity of buildings becomes more and more important but it is also important to find the balance between the functionalities that are available and those that are really used and useful.</li> </ul> <p>"The advent of artificial intelligence provides indescribable opportunities for building automation, and of course there is a very important point - where to put these technologies in homes. There is a huge risk that it will stumble in the direction of oversaturation of buildings with management systems, in fact, as on a phone you use 5% of the possibilities, but you pay for it with all its available systems. There is a danger that this will happen to buildings as well. So, there's that balance here, we designers have to learn to set the limit."</p>
<b>Testimonials</b>	<p>"Personally, I appreciate it (certification of construction workers) because the construction workers are a different stratum from the designers, these are not people who have the attitude to sit down and study. But in order to get a certificate, you still have to pass exams, and this is not their field of play. This is a positioning of their profession, which is genuinely practical, in a different perspective, through the prism of knowledge and theory. A builder who has made an effort to go to a course and learn something theoretical on top of the practical is worthy of respect. This means that this</p>

	<p>person has a desire to progress. I always enjoy such specialists among builders. "</p>
Skills	Content
<b>Energy efficient building design</b>	<p>General notes</p> <p><i>"This skill refers to the ability to exchange, engage, convey, and express knowledge and ideas in an energy efficiency context. The role of the architect in the whole investment process for the formation of the entire project policy is undoubtedly the greatest. I can even boldly say that the role of the architect specifically for energy efficiency is much greater than that of the HVAC designer.</i></p> <p><i>From now on we have a lot of phases, undoubtedly the role of the HVAC designer is also very important, he could be of benefit to the architect in the initial phase when even the investor does not require the presence of such a specialist in the conversation, but I think it is good for architects when it comes to energy efficiency, to include engineers and HVAC designers in a more conceptual phase and not in the phase that the project plans are ready and he only has to materialize what the architect has agreed with the investor."</i></p> <p>Recognition of skill</p> <p><i>"This skill refers to the ability to direct and guide a group in completing tasks and attaining goals of energy efficiency. After completing the design phase, the implementation phase begins with the main role of the builders. I would not say that the builder has any part in changing what has been done so far. Rather, there is no such role, but to a large extent it depends on the quality of implementation whether the idea that is implemented in the project will be executed correctly. So, the quality of execution is very important, but the most important thing is to be able to find trained builders who can execute the project tasks and also being able to properly manage the workforce.</i></p> <p><i>"I would divide people into two groups. Some are looking for this knowledge to better position themselves in the market, and others are the ones who think that this is extremely important. Those who rely on energy efficiency by conviction are people who already have their practice, their experience and their clientele. And I think those are the people who can really produce a quality end product. While others are always looking for a place to move - I have encountered more than one or two such cases. They accumulate endless certificates and enroll in all kinds of courses, but they do it only to find where there is a demand at the moment and to make their product more attractive. But I don't think they are the people who can deliver a quality product. However, it is very difficult</i></p>

	<p><i>to distinguish these people when you are a customer. And how can customers get this information properly, I can't really answer."</i></p> <p>Upskilling</p> <p><i>"I personally find the postgraduate form of education as a good step to stimulate further improvement. Starting from scratch and finishing training without going through any level of a training course, be it online or otherwise, a person is under the threat that he may not understand the foundation, not catch the right recommendation for what he is looking for. But as he goes through such a course, he steps on a solid foundation and from there he can train himself and even surpass his lecturers. So, yes, there are lots of forms of self-learning, but there is still a need to start from an elementary level of knowledge transfer through other people."</i></p> <p>Case specific</p> <p><i>"The architect, at least in our country, appears much earlier in the conversations with the investor than the other engineering specialties, it is a separate question whether this is a good practice, but this is the reality. In our country, engineers intervene at a much later stage, when the architect and the investor have already given the main direction of project development."</i></p>
--	--

#### 4.2.2 Financial institution

**Informant:** Svetlin Andonov (around 40)

**Stakeholder group:** Financial institutions

**Speciality:** Energy engineer

**Date of interview:** 11. 1. 2021

General	
<b>Story</b>	<ul style="list-style-type: none"><li>• Financing related to certification on public authorities under ISO:50001</li></ul> <p><i>This idea to link the certification to a new attractive financial product aims to somehow change the standard practice in Bulgaria, in which, especially in public institutions using such financial products by specialized financial institutions, does not exist a real assessment of the results achieved as a consequence of the implemented measures. The practice in Bulgaria is that after a certain period of time a verification energy audit is delivered, but it is usually done a year or so after the implementation of the measures. Realistically, through one such product, both the funding agency and the owner of the building will understand the effects of the project much faster, they will see whether there were weaknesses in the implementation and will take measures accordingly. Practice shows that a year or a year and a half after the implementation of the measures, even if the results are not achieved, it is too late for any corrections and in the end in many cases the results are compromised. So we hope that through this product we will finally improve the results achieved by this type of projects, taking the appropriate measures in time, a single month after the introduction of the measures or even earlier.</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• Informant claims there is no practice in requiring quality in the renovation projects.</li></ul> <p>KEY: The reason for the lack of recognition is that there is no practice for implementation of quality nZEB projects.</p> <p><i>“In my opinion, there are gaps along the whole value chain. Given project proposals very often are requested to perform correction and improvement, both of energy audits or technical projects. Subsequently in inspections of construction work again we are noticing things which should not be admitted, and request construction companies to rework. The whole chain lacks capacity and it mainly because there is no practice. If there is practice for more ambitious, more efficient projects, people will learn, but at the moment there</i></p>

	<p><i>is no such practice and they are doing the things in the way they did in the past.”</i></p> <p>ATT: The informant does not make difference between certification systems and in general does not show much appreciation to the current educational and training practices (see below). However, the response demonstrates principle support:</p> <p><i>“I'm not sure you can say that one system is better than another. I am not familiar with all certification systems, but in the end, any system would always be useful for construction workers, showing them the basic principles they must rely on when performing activities. I can't say that any system stands out at this stage, at least in Bulgaria.”</i></p>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• The informant states that the investors they work with are totally unfamiliar with the specifics of energy efficiency projects. However, he states that this is not their job in principle; they should be advised by consultants and if consultants do not have the capacity, obviously it cannot be transferred to the investors.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• Informant claims that financing institutions can guarantee the quality of implementation, which will lead to better results; on the other hand they can also demand and give preferences to more ambitious energy efficiency projects. Unfortunately, this is still not happening in Bulgaria.</li> <li>• Informant claims that if financial institutions set higher requirements and give priority to projects pursuing higher results, there should be demand, but it is also determined to some extent by how much the investor would be willing to pay for this knowledge and skills.</li> </ul> <p><i>“This takes time and costs more money, both at the energy audit level and at the design level”</i></p> <p>CS. Informant claims that current grant programmes are detrimental for the quality of the projects, respectively to the skills demand:</p> <p><i>“Not only do they aim for minimum requirements, they also lack any mechanisms (...) to check the results. They also lack any mechanisms for timely assessment of the implemented energy efficiency measures. It is actually through these grant mechanisms that the foundations (for requiring quality) should be laid and they should in fact require monitoring and evaluation of the results, and that is not currently the case in practice.”</i></p>

<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• Informant claims that continuing training is an accident rather than a mass practice. There is a need for training, but it will be quite difficult to achieve it until the payment of the construction works increases and the workers stay in the industry for a long time rather than occupy temporary positions as it is the case now</li> <li>• KEY: The informant questions the quality of the training that are being conducted as general practice <i>“Personally for me, on the one hand, (a major barrier is) the distrust in the training institutions. Too often, the trainings I have attended do not live up to my expectations in terms of the fact that the people who conduct these trainings are not familiar and are not so in-depth in what they want to teach us. Just retransmitting topics that are relevant in Western Europe, in more advanced countries, but somehow most of the time the trainers are not competent enough on the topic. I do not refer to all the trainings I have attended, but this is very often the case.”</i></li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• The informant claims that investors are interested in both energy efficiency and more “traditional” arguments as appearance, structural stability, maintenance works, but they do not exploit the full potential of energy efficiency due to lack of capacity.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<p>CS. The informant claims that it will be hard for financing institutions to set requirements for specific certification to the service providers due to normative (legal) reasons. However, he is positive that requirements for achievement of classes higher than the minimum required by the norms is possible.</p> <ul style="list-style-type: none"> <li>• The informant claims that there could be demand for training on modern construction practices leading to higher levels of energy efficiency and on products that have already been tested and are gradually entering the market in Western Europe, and for which in Bulgaria we still have no experience and knowledge.</li> </ul>
<b>Testimonials</b>	<p><i>“In my opinion, there are gaps along the whole value chain. Given project proposals very often are requested to perform correction and improvement, both of energy audits or technical projects. Subsequently in inspections of construction work again we are noticing things which should not be admitted, and request construction companies to rework. The whole chain lacks capacity and it mainly because there is no practice. If there is practice for more ambitious, more efficient projects, people will learn, but at the moment there</i></p>

	<p><i>is no such practice and they are doing the things in the way they did in the past.”</i></p>
--	---



### 4.2.3 Supplier

**Informant:** Tsvetana Marinova (mid-30ies)

**Stakeholder group:** Suppliers

**Speciality:** Architect

**Date of interview:** 11. 1. 2021

General	
<b>Story</b>	<p>Training of different actors in the construction sector value chain</p> <p><i>In general, I think that our role is very important, as the business plays a key role in informing the people who work in the field of construction about the innovations in the offered materials and solutions. This means not only about the materials, but also what solutions can be applied to achieve good energy efficiency. We definitely communicate with different target groups. Starting with the end customer, you know the demand determines the market, so it is good when the customer is increasingly informed and makes an informed decision before choosing and purchasing a product or implementing a solution in his building. Secondly, we continue with the distribution network: there is additional training of sales staff, technicians and some of the distributors, because it is good to be able to explain and inform the end customer. Then I'll continue with the training and awareness that we are looking to establish through various channels to reach the assembly companies and the big construction companies. Including going to the building sites and on-site instruction. Of course, here we are talking about engineers, architects, who mainly decide on the application of certain products.</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• Informant claims the certification delivered by suppliers is very important .</li></ul> <p>KEY: One reason is that they are valid abroad</p> <p>KEY: Another reason is that the client understands that the installer knows about the specific products and solutions</p> <ul style="list-style-type: none"><li>• There are reasons to believe that in the recent years there is interest towards training, especially as regards building designers</li></ul> <p>CS: It is very important to introduce a system for CPD, which exists in many countries but is still not available in Bulgaria</p> <p><i>“Based on my personal impressions of the construction industry and speaking specifically about the installers, I think that these certificates that we as manufacturers of materials</i></p>

	<p>give them are very important. Some of them are valid abroad and it is not necessary to make recertification in other countries. Why is it so priceless, I come back to something I mentioned that the end customer holds and realizes that the investment he makes in construction is long-term. It is extremely important for him to know that the installer who will come to work on the site will do a good job and will apply the given solutions and products in the right way, which will guarantee the quality of the final product.”</p> <p>“With regard to designers, we do not have certificates to issue specifically for them, but I have seen that in neighboring countries for the designer it is important to constantly update their knowledge. With them everything is set at the state level and to be able to have an active design qualification means not only to have completed your internship in a design office, but also to constantly update your knowledge. This is related to a CPD system, which is largely mandatory. Each investor has the opportunity to track the designer what training he has gone through , and this is a guarantee for him that the designer will be able to implement the latest solutions in his building. In addition, this encourages the designers themselves to constantly update their knowledge. This can happen not only at the level of designers - why not look at other participants in the construction process. If there is any database of information that may be visible to the end customer, it would be an advertisement of the construction company or craftsman.”</p> <p>“Let's say that in the last 6 years, according to my observation, changes have taken place, there are indications of a clear desire from my colleagues who are interested and want to implement certain solutions, but a lot of work needs to be done before that. Because some of the specialists have huge knowledge, here we do not question this, here we are talking about awareness of what new solutions can be applied. It is necessary for each of the participants in the investment process to be open to innovations and to think one step forward. And we have the scientific capacity, people just have to open up, be ready for such communication, have a desire to learn new things. Architects, builders and designers actually deal with what they create, the whole building sector must guarantee that the people will live well and feel good. Both in medicine and in our branch, there must be a constant desire to learn about innovations. I believe that maybe the solution really is to initiate more training, without thinking that we are questioning someone's knowledge or abilities, but simply to learn new things.”</p>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• The informant states it is important to reach each of the stakeholders; groups so that there are no gaps in awareness and knowledge.</li> </ul>

	<p><i>"In my opinion, it is good to act simultaneously to cover each of the target groups and to reach out to each of these related stakeholders in the field of construction so that there are no gaps. For example, it may be the case that a person who has a key position in a project has to make an important decision, but it happens that with him we have not taken the necessary communication and that he does not have enough information, and at some point the connection may be completely lost."</i></p>
<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<p>KEY: Informant says that even it is very important to reach the experts in key public positions to drive changes in the positive direction.</p> <p><i>"Of course, I think it's very important for people who are in government positions, the "big wheels" on which it depends to turn things around and everything to go in the right direction. The trainings and the various events that you organize are the way we reach them."</i></p>
<p><b>Lack of motivation, time and trainings on the side of construction sector professionals</b></p>	<p>KEY: The Informant says that time is the most significant barrier. To tackle this, efficiency and practical, on-site training is key</p> <p><i>"Something you mentioned - time. Ways must be sought for people who will be trained to plan their own time. They should determine when to conduct the training. Imagine, for example, a designer, he designs a building, and he is expected to coordinate all specialties with all the drawings.... Against this background, he must solve any structural problems that have arisen in the field, or he must coordinate with the investor in order to be able to implement a solution as well as possible. Imagine what would happen if, while he was solving all these problems, manufacturers from at least three companies contacted him at the same time, and each of these companies wanted to present their products, I don't see how this designer will have time to design."</i></p> <p><i>"Personally, I have assessed that for any of the target groups it is very important for the training to be outside, on the spot, to see how certain solutions are implemented and how things happen on the ground, and not just to look at them as pictures. It is extremely valuable and very efficient when people are taken out of their comfort zone, those who are used to being behind the desk all day, go to the site and see what is happening, face the problems of installers for example, it gives them a different point of view and a different experience."</i></p>

<b>Integration of new technologies and addressing new societal and technological trends</b>	<p>The informant says integration of new societal and technological trends is key mission of the designers</p> <p><i>“As a designer, not only as a person who works in this company, I definitely want to introduce innovative solutions to ensure the comfort of living in the building. We spend 90% of our time in buildings, the conditions in them must be healthy and safe enough, the materials used must be safe, ie. fire safety to be guaranteed, air quality in the relevant premises, good sound insulation, and so on. Now we talk about the building as a living organism. This means to live in buildings that are safe, comfortable, and as you mentioned, to be able to affect the environment in such a way that it is preserved for the generations to come.”</i></p>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• The informant says that while there is a raising demand for training driven by end-client requests</li> <li>• The blended learning approach, as per the example of the Bulgarian Building Knowledge Hub, is positive, but it needs institutional support and intensive networking between all involved stakeholders</li> <li>• The attractive topics are energy balance calculations and green roofs</li> </ul> <p><i>“There is definitely a demand, perhaps most pronounced among designers, because they are specifically faced with the sustainable type of construction provoked by demand. The end customer and large investors care a lot about this. It's good to build a network, which can offer this type of training and makes the connection between the private sector and state institutions because we do not have such a large number of people. These are a lot of companies on the market with production facilities in Bulgaria for which it would be interesting to coordinate and contact the state institutions. The people who attend our webinars and trainings are engineers, architects, less specialists from institutions. People are already realizing how important it is for a building to be energy efficient and what the benefits will be for them personally if they live in such a home. It is also not unimportant how they will invest their own funds. Sometimes people with different inquiries call on the phone and they sound much more competent than some colleagues in the construction industry. People are trying to read and understand, this is good and it is an indication that they will be looking for highly insulated buildings, they will want their new homes to be a type of sustainable construction, which is indicative of the need for such coordination.”</i></p> <p><i>“I have very good impressions of your trainings and the events you organize. You invest a lot of energy and effort, especially working in the training center you have</i></p>

	<p>built. Everything you do as a type of activity and projects that you try to implement in a different and attractive way, not only digitally, but also in the field, is also an invaluable approach. The only thing you lack, in my opinion, is stronger support from the institutions and your work to be properly appreciated by them. Everyone is ready to say "I'm very busy, I don't have time, I don't have the opportunity to attend", but with the ideas you have, I hope you can implement them, I believe you will succeed with flexible planning and using the time to move forward and this network of training to get bigger."</p> <p>"I would like to deepen my knowledge of sustainable construction, I am interested in energy efficiency in buildings. We are talking about a slightly more engineering orientation, about thermal calculations. I use software and I understand a lot of things, but I want to do a lot more in-depth. The other topic, which is very important to me, although I have made many steps in this direction, is about green roofs and their potential in Bulgaria. It is good to deepen the developments in this direction, unfortunately there is nowhere to get more technical information. There are sources, but there is a need for more research."</p>
<b>Other notes</b>	<ul style="list-style-type: none"> <li>To achieve progress towards a CPD system in Bulgaria, it is necessary to establish partnership relations between the branch chambers, the state institutions and active actors in the NGO sector</li> </ul> <p>"The branch organizations supported by the state institutions, some such form must exist, because, I say it again, you (EnEffect) act as a translator in this communication between the producers of materials and the state institutions. The projects and ideas that you have set are good, you only need to have the support of the state institutions and that is how things will happen. It cannot be without state institutions. The question is really only about support. When someone provides you with a package of information, ideas and developments that can be used, there is nothing wrong with that. This is a partnership! So you can take a few steps forward instead of taking these steps on your own, paving paths on your own. The idea is, once you've gone in that direction, to widen the road so that it's enough for another one walking next to you, not that person following you and repeating the same steps."</p>
<b>Testimonials</b>	<p>"If 10 years ago when I participated in a conference in Bulgaria and the topics of energy efficiency and sustainable buildings was so far away, and I was thinking how this in Bulgaria is unlikely to start happening at all... At the moment I rather see how thanks to the work of organizations like yours, the private sector, end users of materials, investors</p>

	<i>who care about the comfort of their buildings, the requirements of the European Union, different projects and programs, things change. The pressure is outside, really, but interest is beginning to emerge even in state institutions. There is currently a hunger for such training.”</i>
--	--

#### 4.2.4 Local Authority

**Informant:** Alexandra Nikolova (mid-30ies)

**Stakeholder group:** Local Authorities

**Speciality:** Energy engineer

**Date of interview:** 20. I. 2021

General	
<b>Story</b>	<p>Training of construction service providers after winning of public tender</p> <p><i>We have no such practice, but if you look at the practice of large companies, e.g. those who deal with specific activity that requires certain licensing regimes, there is such practice. When they choose a contractor for their activity, they must include a condition for the contractor to undergo training to work on their territory. We can give such an example with the Oil Refinery near Burgas. Working at a port or at an airport also requires a similar training course, which is usually not very long, but gives the basic rules of operation, mode of communication, etc. I do not see a problem in adapting this so that the specialists have a reasonable confidence that they are sufficiently prepared for the task we assign to them, especially considering that we do not yet have good enough experience in the implementation of buildings with high energy performance. This is the truth, especially for reconstructions, so this is an interesting possibility that can be considered.</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• Informant claims there is no practice in requiring certification in municipal projects .</li></ul> <p>KEY: One reason for the lack of recognition is that public officials are not aware of the certification systems</p> <p>KEY: Another reason is the difficulty to set up qualification requirements for more complex tasks</p> <p>CS: There are certain ways for companies to circumvent such criteria, e.g. by declaring to use experts who are actually not involved</p> <p><i>“The practice so far is such that when conducting procedures for selection of a contractor for construction and repair works, such certificates are not required. I will immediately explain why my colleagues avoid it. First, yes, there is this point that they are not fully aware of what certificates they might require, ie. whether from a particular manufacturer, say Weber have very good training systems for building insulation. They are not aware whether this would not be a restrictive condition, because as we know there must be equal access, almost at the cost of everything. In reality this</i></p>

	<p><i>makes the task of the contracting authority more difficult – to be able to screen without discriminating, but to really identify those who are better qualified. Another problem that occurs is that very often, when the task is more complex, eg. if it is a complete reconstruction of a building, then energy efficiency is only part of it. Usually then we have consortia of companies and a few times it happens that several companies use the same key experts. This is a practice that we have tried to limit, because in the end the key experts, ie. the people with their knowledge and skills are the added value that can be given in a construction process.”</i></p>
<p><b>Awareness of both the general public and workforce</b></p>	<ul style="list-style-type: none"> <li>• The informant states that the municipalities are very interested and largely aware of the benefits of energy efficiency, and to a certain extent relate it to skilled labor. With their project, although on a limited scale, they can also influence investment in energy efficiency by homeowners.</li> </ul>
<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<p>KEY: Informant says that even though there are certain difficulties and it is not a common practice, if there is a will, the municipalities could apply different options to request specialized qualifications</p> <p><i>“The procurer can clearly define what materials they want to work with, ie. when we talk about thermal insulation, what coefficient of heat transfer should be provided, but when we talk about human resources, it becomes more delicate. Of course, there should be minimum requirements for each expert in terms of his / her education, which usually comes down to higher education in a given field and practical experience, for example in at least three projects with a subject similar to the contract. But additional points can now be awarded if this expert has received additional training on energy efficiency, e.g. if they passed specialized training that is specifically targeted to reconstruction of existing buildings to achieve much higher energy efficiency classes. These are some options that are less commonly used, but definitely not impossible to implement.”</i></p>
<p><b>Lack of motivation, time and trainings on the side of construction sector professionals</b></p>	<p>CS: The Informant says that the training courses are too specialized, while the municipality experts usually have much broader responsibilities and different information needs</p> <p><i>“In principle we have access (to training), it is however another question that the trainings offered are closely profiled, and if they give a real practical orientation. And the other more delicate point is that one expert is responsible for several things. What I mean, for example, in a district administration we have one or two, three construction</i></p>



	<p>experts who are responsible for almost all maintenance, ie. starting from road maintenance, going through small building repairs and reaching the reconstruction of playgrounds, ie. there is no single concentrated expertise to be used.”</p>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• The informant says that the local authorities have a very strong desire to address new societal and technological trends. Sometimes they do not have the full understanding and rarely have the necessary resources to put this into practice.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• The informant says that while the institutionalized training are sometimes useful, training courses offered by private providers are sometimes more interesting and practical; however, the municipality does not pay for them and the experts must invest own resources</li> <li>• The most efficient training courses are the remote ones, when public officials are separated from the daily routine for a few days. Training for a few hours in working time is hardly possible. A possible compromise is training over few hours in several consecutive weekends</li> <li>• The attractive topics are project management and on-site practical training in combination with classroom lectures and demonstrations</li> </ul>
<b>Other notes</b>	<p>There are certain gaps in the qualification along the value chain, including as regards the capacity of municipal officials; their training however can lead to very positive results</p> <p><i>“We know that a project, no matter how good it is, if during its implementation there are no adequate competencies on the part of the contractor, and accordingly those responsible for the control of the construction, the result will not be so good. Accordingly, the opposite, even if a project is not perfect, if the specialists who perform it have good enough technical training or the municipal experts responsible for its coordination also have good enough technical knowledge, then these small discrepancies, if I may call them that, can be easily smoothed in the implementation process so as not to compromise the end result.”</i></p>
<b>Testimonials</b>	<p><i>“Of course, there should be minimum requirements for each expert in terms of his / her education, which usually comes down to higher education in a given field and practical experience, for example in at least three projects with a</i></p>

	<p>subject similar to the contract. But additional points can now be awarded if this expert has received additional training on energy efficiency, e.g. if they passed specialized training that is specifically targeted to reconstruction of existing buildings to achieve much higher energy efficiency classes. These are some options that are less commonly used, but definitely not impossible to implement.”</p>
--	--

#### 4.2.5 Professional association representatives

**Informant:** Mimi Zhelyazkova (early 40ies), Milena Ivanova, (mid-30ies)

**Stakeholder group:** Professional associations

**Speciality:** economists, marketing specialists

**Date of interview:** 20. 1. 2021

General	
<b>Story</b>	<p>Live demonstration as part of training for non-specialists</p> <p><i>“For me, the demonstrations in previous projects were very interesting. Apart from the fact that people like me - non-specialists - get to better understand the topic, I personally became very enthusiastic about the topic of "passive building" from my participation in only two projects. For me, general topics are more interesting without going into much technical detail, that being more difficult for non-specialists to understand. What I would like to see is more emphasis put on the benefits of energy efficiency so that I can motivate others to make their home healthier and more energy efficient.”</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• Informant claims the training has to be very carefully profiled according to the needs of the trainees.</li> </ul> <p>KEY: There is no evidenced interest in training in the construction sector as a whole</p> <p>KEY: The training content has to be specialized for all stakeholders' groups</p> <p><i>"I think that in general there should be at least two levels of professional development. On the one hand, these are the on-site construction workers who should meet the requirements to reach the required energy class. On the other hand, we should involve all other stakeholders in the process. When we think in the direction of building training content, we must keep in mind that it must be specialized and aimed at different levels of participants in this process."</i></p>

	<p>"Training in the construction sector certainly needs improvement. Referring to the statistics of people over the age of 16 who are being trained in construction specialties as a total, the data are not optimistic. The number of centers training in construction specialties is approximately 100, and throughout 2019 about 1700 people participated in trainings for acquiring professional qualifications, as for part of profession the number was approximately 1300. Given that in Bulgaria the number of people employed in construction is over 200,000<sup>24</sup>, we see that this is a negligible percentage. So we should stimulate not only the inclusion of such trainings, but also to make a qualitative assessment, consulting employers and employees in the construction sector, what is their assessment of the quality of the training content, what are their suggestions for improvement, etc. "</p>
<p><b>Awareness of both the general public and workforce</b></p>	<p>KEY: The informant states that the implementation of national support programmes is crucial for the awareness and interest of the workforce.</p> <p>"A particularly good example of demand is related to the implementation of the National Energy Efficiency Program. Even before the start of the procedure, there was great interest from companies from all over the country, which expressed a desire to participate in trainings related to the installation of insulation and other such focused trainings related to energy efficiency. So, we can say that the need and active action on the part of construction companies in terms of professional development occurs at times when we are faced with the commitment to implement a national program and this is such a simple example."</p>
<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<ul style="list-style-type: none"> <li>• Informant says that professional training is very important for the branch organization</li> <li>• Informant says that there is no working system for financing of training</li> </ul> <p>KEY: Informant say that the normative requirements towards qualification of the employees play a key role</p> <p>"In terms of professional qualifications, industry organizations put the topic among their main development policies, carry out activities in a way that they can at the moment and, of course, there are a number of opportunities for improvement. For professional qualifications, I can say that the Bulgarian Construction Chamber invests considerable resources in providing training for its members</p>

<sup>24</sup> ATT: overestimation

	<p>and for all construction companies registered in the Central Professional Register of Builders. The possibilities are not endless and therefore the way should be opened to exploring new avenues for additional funding.”</p> <p>"One major shortcoming of vocational education in construction in Bulgaria is the lack of a well-established funding system. In Germany, for example, VTCs are financed through paritarian funds, to which all construction companies, including those that do not train workers, contribute 2.3% of the gross payroll. This generates a permanent and significant resource for providing quality vocational education. Attempts have been made in Bulgaria to build such a fund, but at this stage they have failed. For such a system to function well, there must be a well-established legal framework, which requires the efforts and motivation of all social partners in the sector, construction companies and the state."</p> <p>"Our experience shows that where there are regulatory requirements related to professional qualifications, there is no doubt that the interest of companies to meet these requirements increases and thus increases the demand for training content. According to the Law on the Chamber of Builders and according to the Law on Spatial Planning, requirements are set for each construction company in terms of staffing. In this sense, all these requirements for companies to have the appropriate human resources and its constant updating, undoubtedly increase the ambitions of companies to meet these requirements. For this reason, I consider it necessary, in addition to setting requirements for the profile of workers in the sector, to provide opportunities to support these requirements in terms of professional qualifications. "</p>
<p><b>Lack of motivation, time and trainings on the side of construction sector professionals</b></p>	<p>KEY: The Informant says that financing and time are the most significant barrier. However, format, specialization and practical value of the training play a major role</p> <p>“For their part, construction companies also have their own barriers to improve the quality of their workforce, of course, they are limited to some extent, both in terms of the opportunity to participate in training due to unwanted separation from the work process, as well as in relation to the limited financial resources they can allocate."</p> <p>"Regarding the barriers for companies to send their employees for training, the financial resources they have are undoubtedly important, but the way of organizing and conducting such trainings is also important. On the other hand, the training content should be carefully prepared for the relevant target groups of learners. Thus, we can summarize as barriers on the one hand the funding, on the other hand the relevance and accessibility of the content that</p>

	<p>is important for construction companies, and on the third hand the way of training to support their core business and thus motivate them to train. "</p>
<p><b>Integration of new technologies and addressing new societal and technological trends</b></p>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<p><b>Market demand and uptake of prospective BUSLeague solutions</b></p>	<ul style="list-style-type: none"> <li>• The informant says a new training platform with nZEB relate knowledge has to be developed in cooperation between all professional and stakeholders groups</li> <li>• The informant says that certification on top of the legally required one is viable only if it is very practical and efficient</li> <li>• Hybrid/blended forms of training are preferred, as practical on-site experience is vital</li> </ul> <p>"I think that the participation of all stakeholders is extremely important i.e., it should not be a commitment only for a separate branch organization to independently develop the training content it deems necessary. Representatives of branch organizations, representatives of employers, secondary and higher and continuing education, and vocational training providers, as well as representatives of construction material supply companies should be involved. All this in order to make a suitable training product, which is a mix of all these three levels that you have indicated."</p> <p>"Our observation of construction companies regarding their attitude to certificates as a requirement for their workers is that they are extremely strict when they have to meet their regulatory requirements for their human resources. Everything additional, in my opinion, should be presented in an attractive way and lead to a decision to motivate the participation in training. This is feasible mainly by proving the practical orientation of the training and what added value the training will bring to the construction company."</p> <p>"I would prefer a hybrid form of training that includes elements of both distance learning and fieldwork. Undoubtedly, over the past year, not only because of the pandemic, but also because of the reality in which we live, remote form and remote access is becoming increasingly relevant. This undoubtedly has its positive sides in terms of flexibility, the opportunity for better planning between personal and professional life. Of course, this has its limitations. Undoubtedly, the real contact with what I am training for is just as important i.e. the theoretical part could be in remote form, and all demonstrations and practical</p>

	<p><i>exercises could be performed in a real environment that is as close as possible to the real process."</i></p>
<p><b>Other notes</b></p>	<ul style="list-style-type: none"> <li>• It is very important to establish a National Sector Council so that the process of matching demand and supply of training could be more streamlined and based on the actual tendencies and needs</li> </ul> <p><i>"I absolutely believe that it is necessary to create a National Sector Council, the sooner, the better, because these are general issues that are not in the capacity of any party in the process to cope alone i.e. we can do all this only if we are united, with active participation, and with the respective role of each stakeholder. As a branch organization, we have specific experience in creating such a council, which was related to the topic of professional qualification, but in a slightly different aspect. So we have experience in this direction, experience that is definitely needed - yes, my answer is yes."</i></p>
<p><b>Testimonials</b></p>	<p><i>"Over the years, the issue of such online register for certification of knowledge and skills has been raised more than once. Within our branch organization there are several professional sections that unite construction companies operating in different construction areas i.e. high construction, supervision, energy efficiency. This question has been asked, it is considered necessary, but I think that, and this, of course, is my subjective opinion, that the concept should be clarified in order to answer the most important question - what do we want to achieve and how we can achieve it. In principle, there is agreement in the industry on the need for something like this. The question is how can this be done in practice. "</i></p>

#### 4.2.6 Local authorities representative

**Informant:** Zlatin Genadiev (mid-60ies)

**Stakeholder group:** Network of local authorities

**Speciality:** Architect

**Date of interview:** 21. 1. 2021

General	
<b>Story</b>	<p>Establishing the network of Building Knowledge Hubs</p> <p><i>"Within the framework of EU project,s in a number training centers for energy efficiency and RES in the buildings (the Building Knowledge Hubs) have been established in different countries, and they are still active. Unfortunately, some of them are left entirely to the initiative and energy of a few enthusiasts and NGOs, while support from government agencies is severely limited to symbolic sizes and shapes. This is the existing basis on which sustainability and energy efficiency training and education can be implemented. It can only be achieved with the permanent participation (and leading role) of the respective universities and with the support of the state, which has no right to abdicate from this obligation. "</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• Informant claims there are no nationally recognized certification systems related to green/sustainable buildings.</li> </ul> <p>KEY: Informant claims that the motivation of experts and employees can be improved through the introduction of mandatory state / regional / local standards, which will encourage professionals to strive for appropriate levels of knowledge and skills, proven by relevant certificates.</p> <p>KEY: The qualification of municipal experts is deemed to be of key relevants</p> <p>KEY: The demand could be increased by presenting best practice examples</p> <p><i>"The constant development and raising the qualification of the municipal leaders and specialists is of critical importance. However, their training only partially overlaps with the training of technical specialists - designers, builders, supervisors. It is important for local staff to focus primarily on the opportunities, challenges and responsibilities of municipalities in their role of:</i></p> <p><i>(a) politicians, who forming and implementing local policies for EE, RES, and sustainable development policy in the interest of citizens)</i></p>

	<p>(b) investors in the fields of EE, RES, and sustainable development, and</p> <p>(c) managers, managing the processes in the listed areas,</p> <p>There are generally 4 forms of impact to increase the capacity on the issue: information, training, certification, demonstration sites. All four listed forms are extremely important for municipal staff - managers and specialists. In this sense, the role of EcoEnergy can be of paramount importance if it is used as a tool for organizing and coordinating information, training, certification, demonstration sites."</p> <p>"Municipal specialists must understand the essence of energy efficiency and "sustainability", their benefits and missed opportunities in inappropriate solutions and implementations; they must know in detail and constantly develop their knowledge of the specific requirements in the respective specialty and have (and constantly develop) basic knowledge of the requirements for other specialties involved in the design and construction of EE / "green" buildings. This fully applies to local communities, chambers and universities."</p> <p>"To my knowledge, there is no existing state system of certification of the level of knowledge and skills in the sector of EE and RES in buildings and the environment. This recognition is important, but only if it is really linked to a comprehensive state policy and active promotion of the market. The introduction of local (municipal) standards and certificates is a possible practice that should be encouraged. European projects can catalyze these processes, but only if they lead to or influence decisions at the state level and do not remain isolated islands of good practice. The existence of high and mandatory state standards, which would create natural competition between specialists - this can create trust and make certificates attractive."</p>
<p><b>Awareness of both the general public and workforce</b></p>	<ul style="list-style-type: none"> <li>• The informant states it there is still not much understanding of the need for continuous training and education.</li> </ul> <p>KEY: The informant claims that the awareness should be raised through training, demonstrations and pilot projects</p> <p>"Understanding the need for continuous training and qualification is gradually (but too slowly) imposed in practice. It is happening within the Chambers of Builders in Bulgaria and the Chamber of Architects in Bulgaria, but still too slowly and insufficiently. I think that there are still more training opportunities (albeit limited) than the real demand. A significant stimulus in this regard are EC projects, which are often implemented in conjunction with vocational training."</p>



	<p><i>"From the point of view of the subjects of the training - investors, designers, builders, real estate specialists and to some extent the maintenance - this need is not sufficiently realized. However, there is some demand that is slowly expanding. While in the private sector the need for such knowledge and skills is manifested as a result of market pressure, in municipalities, or more broadly in the public sector, this need must be realized through training, demonstrations and pilot initiatives. From the point of view of specialists in energy efficiency and "sustainability", the need to increase knowledge and skills is realized to a much greater extent."</i></p>
<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<p>KEY: Informant states that the state is not interested in support of training and education in the area, and unfortunately the same applies to the universities as well</p> <ul style="list-style-type: none"> <li>• Informant says that there are still many outdated practices which hamper the efficiency of the design and construction process. They are still very much instilled in the mainstream practice and thus limit the interest towards training and education on innovative approaches</li> </ul> <p><i>"Above all, the formal and ineffective state policy in support of knowledge and skills. The capacity of NGOs is not used, and some universities show arrogance and / or indifference to the activities of some of their (enthusiastic) professors and especially to NGOs. "</i></p> <p><i>"Within the design process, the coordination between the various specialties is taking place mainly at the end and not continuously, from its beginning to its end. Still too often, the formation of the basic principles of sustainability and energy efficiency for the specific project in the course of the design is assigned to a separate specialty, most often the HVAC designer, therefore they do not penetrate sufficiently into the essence of architectural concepts, and are attached to them, often too mechanically and as a result – inefficiently. These methods are inherited from many years of practice in other times and societal conditions where sustainability and energy efficiency were not a meaningful value. Unfortunately, the pressure to change these outdated practices has proven insufficient and ineffective. They need to be changed through aggressive information and persuasion and, above all, through training. At the local level, these practices can be updated through a targeted policy of municipalities in this direction. "</i></p>
<p><b>Lack of motivation, time and trainings on the side of</b></p>	<p>ATT: The Informant says that time is NOT the most significant barrier.</p>

<b>construction sector professionals</b>	<p>KEY: Informant says that the barriers are the inertia and the lack of market pressure/pull</p> <p><i>"The limited demand from the "objects" may be due to years of inertia in the exercise of the profession concerned, to limited understanding of the nature and importance of energy efficiency and "sustainability", or the lack or too little market pressure - this is particularly pronounced in municipalities where public funds are spent."</i></p> <p><i>"The issue is not so much the objective lack of time, but the insufficient attractiveness of the qualification process."</i></p>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• The informant says integration of new societal and technological trends should be a part of the main characteristics of the building stock of the future and must overcome the deficiencies in the current practice.</li> </ul> <p><i>"The goal will be to preserve the characteristics of the buildings that are included in the projects and / or to upgrade them for as long as possible, but not to deteriorate them. Unfortunately, maintenance is now often reduced to unavoidable repairs due to damage and accidents, but the maintenance of the design characteristics of the buildings is neglected."</i></p> <p><i>"The building of the future will be green, or sustainable, safe and durable - as opposed to the "modern" concept of "turnover" and "substitutability" of building stock. The role of knowledge and skills is crucial for achieving these characteristics, but with an appropriate combination of traditional knowledge and skills with qualitatively new ones. This understanding is at the heart of lifelong learning."</i></p>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<p>KEY: There should be a system to motivate participation in training and promote the understanding of its benefits based on national policies, standards and certification requirements, as well as on the cooperation between different stakeholders</p> <p>KEY: The informant says that there is a set of knowledge in skills related to the policy making, design and project management process which are still largely missing</p> <ul style="list-style-type: none"> <li>• The informant says that there are many challenges related to the uptake of BUSLeague solutions which have to be overcome</li> </ul> <p><i>"Skills demand can be improved by promoting local examples developed under municipal programs, by promoting successful practices supported by international (European) projects and promoting successful practices in other European countries themselves"</i></p> <p><i>"The professionals should be motivated to participate in training by purposefully promoting the demand for green</i></p>

	<p>buildings, renewable energy sources and sustainable solutions in settlements, by introducing mandatory education and training standards or by introducing a system of certificates and linking it with the professional realization. All of this can be fully successfully applied at the local level (in the municipality), as there are practices in a number of European countries.</p> <p>“The benefits of training can be disseminated through obligatory adoption of the highest standards for energy efficiency and sustainability in case of investment of budgetary (including municipal) or European funds, and through active dissemination of information on positive prices; in municipalities this can have a strong multiplier effect, especially through EcoEnergy”</p> <p>"For local officials, the key skills of the 21st century will be the knowledge and skills to identify, develop and implement local policies to achieve carbon-free economic development, with buildings and their immediate environment being considered as primary impacts; the knowledge and ability to ensure energy efficiency and sustainability ("greenness") as immanent qualities of buildings and not as additional inputs from remediation or the sporadic efforts of individual specialists. This should be done through the full process of tendering, award, design, construction and maintenance of buildings. Next is the ability to carry out research and design on the basis of the principles of whole and integrated design of buildings and their immediate environment. The increase of the listed knowledge and skills should be embedded in the local policies, which should perceive them as leaders in all practical actions ”.</p> <p>“Without exhaustiveness, the challenges that must be overcome through the trainings are the following:</p> <ul style="list-style-type: none"> <li>(a) the prejudice that "green" construction is more expensive than conventional</li> <li>(b) the prejudice that the increasing the thickness of the thermal insulation causes cooling problems during the summer</li> <li>(c) certain harmful habits of construction workers who install thermal insulation on the external walls of buildings (the methods of gluing and fixing to the wall)</li> <li>(d) achieving some of the requirements for the NZEB (eg thermal insulation) and neglecting others (ventilation, air tightness), etc.</li> <li>(e) the lack of verification (energy audit) of the actual energy performance of the building after its construction or renovation (renovation)</li> </ul> <p>Even if there is no national regulation on the challenges listed above, any of them can be introduced at local (municipal) level. "</p>
--	--

	<p>"Among the practical challenges related to nZEB in our work are that the requirements for nZEB laid down in the Bulgarian norms do not comply with the basic laws of physics, therefore they would not work as expected; consequently, the new requirements for nZEB are not known and are not observed by many designers, as well as by investors and even by municipalities. In addition, no energy audits are carried out on newly constructed or rehabilitated sites to determine whether and to what extent the design parameters have been achieved, etc. "</p>
<b>Testimonials</b>	<p>"They are key to stimulating the demand for green building training:</p> <ul style="list-style-type: none"> <li>(a) the existence of a real state and local (municipal) <b>POLICY</b> for the imposition of nZEB</li> <li>(b) promotion of the nZEB <b>MARKET</b> (realistic programs)</li> <li>(c) active participation of the <b>PROFESSIONAL CHAMBER</b> and associations in this process</li> <li>(d) active participation of the <b>NON-GOVERNMENTAL SECTOR</b>"</li> </ul>
<b>Skills</b>	<b>Content</b>
<b>Sustainability skills for municipal officials</b>	<p>General notes</p> <p><i>I believe that my qualification as an architect is key both in the coordination of building design and in the coordination of different types of research. This understanding is based on the architect's obligation to coordinate the formation of the overall concept for the creation of a new building or for the renovation of an existing one.</i></p> <p><i>This qualification of mine has served me in the implementation of my activities within EcoEnergy and in the individual municipalities with which we have worked.</i></p> <p>Recognition of skill</p> <p><i>The existence of an organization (network) of municipalities with similar interests and priorities (in this case - energy efficiency, RES, sustainable development) is a favorable basis for expanding the impact of initiatives in individual municipalities among other network members.</i></p> <p><i>Furthermore, I think that more professional associations should begin training providers for the conceiving, planning, and designing stage of energy efficiency buildings. Associations organize conferences, seminars or short training courses on emerging techniques, technologies, and regulations for green building to keep their members up to</i></p>

	<p><i>date. The knowledge provided may be general or very specific. They target mainly association members at higher skilled levels. This training helps promote industry-wide standards and best practices.</i></p> <p>Upskilling</p> <p><i>In my opinion more training courses should be provided by private training centres focused on updating the knowledge of new building technologies and techniques among higher level occupations concerned with energy efficiency such as architects and civil and mechanical engineers.</i></p>
--	--

## 4.3 France

This note is an outcomes synthesis of 12 interviews done for the BUSleague project between December 2020 and February 2021 with:

Cedric Alvera (ADEME) ;

Stéphane Calmès (ADEO/Leroy Merlin)

Daniel Castro (Artizol)

Mickaël de Chalendar (Saint Gobain)

Benjamin Fedor (Practee Formations)

Jérémy Ferrari, (AQC programme FEEBAT)

Catherine Gillet (EDF, pilote FEEBAT)

Viviane Hamon, (consultante)

Anne-Sophie Legendre, (Région Hauts de France)

Alice Morcrette, (Régie du SPEE Région Hauts de France)

François Philippe (OPAL02)

Ronan Segalen (Constructys)

Elisa Serres (retraîtée BTP)

	The nZEB global housing renovation market
<b>Decision makers</b>	<p>The housing renovation decision makers are:</p> <ul style="list-style-type: none"><li>• Social landlords</li><li>• Associations of Co-owners of housings</li><li>• Private owners;</li></ul> <p>A French person makes the decision to renovate his/her housing when becoming the owner, at the average age of 39. When retiring, renovation is no more an issue.</p> <p>Almost all owners who want to renovate his/her housing, goes to a DIY store; these stores have, therefore, a strong influence.</p>
<b>The barriers for private owners</b>	<p>It is difficult for a private owner to «switch to act» for several reasons.</p> <p>Money &amp; financial aspects</p> <p>Access to public grants and subsidies appear to be complicated.</p>

	<ul style="list-style-type: none"> <li>• What has to be paid cash, looks too high and not expected for too many people</li> <li>• Reluctance to sign long-term loans (that some people are not even allowed to get)</li> <li>• Banks are quite often reluctant to finance renovation works.</li> <li>•</li> </ul> <p>Communication</p> <ul style="list-style-type: none"> <li>• It is difficult to find out and to understand the right and useful information about what to do and how to get advice and grants.</li> <li>• Savings and benefits of investing in nZEB renovation are not clear.</li> <li>• There are no clear guarantees of results</li> <li>• Usefulness of advice is often misunderstood or ignored.</li> <li>• Complexity of what has to be done (thermal audit, financial and technical engineering, choice of the enterprises, works management ...)</li> </ul> <p>Negative impacts</p> <ul style="list-style-type: none"> <li>• There are negative impacts on the daily life: noises, dusts, intrusions</li> <li>• Suppliers</li> <li>• It is difficult to find out the SMEs that will do the job well. People are reluctant to make use of advisors and architects.</li> </ul> <p>Consequences:</p> <p>The number of global nZEB renovations is small, far from the objectives set by the State and the Region Hauts de France. In the best-case scenario, private owners will do pieces of renovation year after year.</p> <p>Example: in the Cambrésis territory (170000 inhabitants), the objective should have been to renovate 2000 « nZEB global » housing per year, with an average 4'5 action per housing (e.g. changing the heating system + isolating walls + isolating the roof + changing the windows ...), when there are an average of only 1700 renovations a year, with 1,4 action.</p>
--	---

<b>Barriers for social landlords</b>	<ul style="list-style-type: none"> <li>• Availability of funds to finance the renovation works</li> <li>• The shortage of enterprises able to do the works properly.</li> </ul>
<b>Opportunities in the Hauts-de-France region to overcome the barriers</b>	<p>The Hauts-de-France Regional Council has set up: (a) an organization to inform and advise private owners who want to renovate their housings, and (b) grants and subsidies to finance the works. These grants and subsidies can come in addition to the State and the Local Authorities grants and subsidies. Consequently, private owners can find:</p> <ul style="list-style-type: none"> <li>• Grants, subsidies and low interest long term loans (up to 25 years) that are available for the renovation of private housing. It is claimed that the costs of nZEB global renovation can be (almost) funded by savings in energy spending.</li> <li>• A network of information offices, where any owner can get free information and advice to renovate its housing.</li> <li>• A device to co-finance thermal audits</li> </ul> <p>A public organization « la Régie du SPEE » that can do, on behalf of the private owner, all the necessary to carry out a nZEB global renovation (audit, financial and technical engineering, choice and management of the companies.)</p> <p>Their fees being €1860 per housing.</p>
<b>Challenge and strategies</b>	<p><b>The challenge is to stimulate the « switch to act »</b> of the private owners, and to <b>help them all along the renovation process</b>. For this matter, a specific strategy for each local territory has to be built and implemented.</p> <p>Local strategies</p> <p>The issue is to build and to implement a strategy at the scale of the territory, close to the inhabitants and to the SMEs, with:</p> <ul style="list-style-type: none"> <li>• A <b>mobilization</b> of all the stakeholders.</li> <li>• A local engineering</li> <li>• A shared in depth <b>diagnosis</b> of local housings (for instance to find out which ones could be auspicious for massive renovations and the favorable and convenient timing to do the works (like when the housing is transferred, or at the start of other heavy works)</li> <li>• The combination of several options : <ul style="list-style-type: none"> <li>• Global nZEB renovation</li> <li>• Step by step renovation, with works done in the proper way, with a short-term goal on renovation performance, and the nZEB objective taken into account from the beginning.</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>• « Blended » renovation, works being partially done by an artisan, and partly by the owner with the assistance of the craftsman.</li> <li>• The prefabricated way (like « energiSprong »)</li> <li>• A chapter on « communication and prescription » as close as possible to the inhabitants. Can be mobilized for this : <ul style="list-style-type: none"> <li>• The SMEs</li> <li>• The DIY stores and the wholesalers</li> <li>• And the local stakeholders (politicians, local authorities, advisors ...°</li> </ul> </li> <li>• The implementation of a <b>local network of « trustees »</b> to give inhabitants courage and confidence in nZEB renovation.</li> <li>• The mobilization and the organization of <b>resources</b> to achieve the renovations programme with : <ul style="list-style-type: none"> <li>• Technical advisors</li> <li>• Partnership with banks</li> <li>• Actions to upskill local craftsmen ad SMEs</li> <li>• Organisation of enterprises' groups</li> </ul> </li> </ul>
	The upskilling of the SMEs
<b>The lack of craftsmen and SMEs</b>	<p>Some interviewees pointed out a « cruel » lack of craftsmen, at two levels:</p> <ul style="list-style-type: none"> <li>• Lack of candidates for the building sector.</li> <li>• Lack of skills and competencies for nZEB renovation</li> </ul> <p>The analysis demonstrates that there are two categories of craftsmen and SMEs owners;</p> <ul style="list-style-type: none"> <li>• The « old ones », on their way to retirement: they have a high level of skills and competencies, but they do not have the knowledge on energy issues.</li> <li>• The « new comers » who, quite often, want to move too fast.</li> </ul>
<b>Skills and competencies</b>	<p>One can have the competencies (abilities ?) without being skilled. Moreover, one can be skilled without being competent (able to do).</p> <p>What is important is that the enterprises are able to do properly the works that they have been ordered. ;</p> <p>Many craftsmen and workers have the skills and competencies when it comes to their specialty. However, most of them <b>do not know why and how to coordinate organize themselves with other craftsmen at the nZEB workplace.</b></p>

	<p><b>The RGE label</b> do not always guarantee the quality of the work, especially since it does oblige all the workers of the enterprise to take the trainings (that are necessary to obtain the label). On the other hand, the administrative processes to get the label are barriers for small enterprises, which do not have staff to comply with the procedures.</p> <p>The need for skills and competencies is not limited to the crafts. The workers have also to be trained to:</p> <ul style="list-style-type: none"> <li>• The « gestures »</li> <li>• The « co-activity »</li> </ul> <p>In addition, the craftsmen and the bosses to:</p> <ul style="list-style-type: none"> <li>• Organisation</li> <li>• Time management</li> <li>• Marketing and communication</li> </ul>
<b>Upskilling and increasing competencies</b>	<p><b>Challenges</b></p> <p>To achieve global nZEB renovations, the enterprises:</p> <ul style="list-style-type: none"> <li>• Must have a good knowledge of new materials and equipment</li> </ul> <p>Should know how to work « cross-crafts », especially around weak points. But, today, most often</p> <p><i>« each worker is qualified to do what he has to do, but he does his tasks without taking care of what other workers are doing »</i></p> <p>( remark coming from a social landlord)</p> <p><b>Barriers</b></p> <p>The lack of « appetite » and motivations of the building sectors enterprises and of their employees for training, especially when it comes to nZEB trainings, has several reasons:</p> <ul style="list-style-type: none"> <li>• The market's demand for nZEB global renovation is too weak (sometimes not even existing) to create motivations for upskilling</li> <li>• The fact that an enterprise loses turnover when sending its workers to training sessions (the turnover lost is estimated to be around 40 € per trainee and per hour).</li> <li>• The poor ratio between the investment in upskilling and the short-term impact on the sales.</li> <li>• A training offer which, too often, does not fit the needs of the SMEs – with a shortage of trainers having the</li> </ul>

	<p>updated knowledge, and the necessary competencies/abilities to train highly qualified workers.</p> <p>Remark from the boss of a SME:</p> <p><i>« There is a huge gap between the field and the « offices »</i></p> <p>Motivations</p> <p>There are also several type of motivations. Are quoted :</p> <ul style="list-style-type: none"> <li>• The market demand : <i>« to have the enterprise doing the other way, the customers have to ask for it »</i></li> <li>• The demand for nZEB can be boosted by public policies (see ERBM)</li> <li>• The easiness of what has to be done to upskill.</li> <li>• Trainings fitting the culture and needs of SMEs, with a minimum of theory and a maximum of practice and « learning by doing »</li> <li>• A « label » recognizing the acquired skills and competences/abilities, should be a key market advantage.</li> </ul> <p>Opportunities</p> <ul style="list-style-type: none"> <li>• Training costs are financed by Constructys, which, furthermore, provides free advice to the enterprises.</li> <li>• There are available pedagogical tools and training contents that fit the needs of SMEs: FEEBAT, PRAXIBAT, and FIT....</li> <li>• There are possibilities to be trained at the workplace, but the works should be big enough to make it possible.</li> <li>• There are a type of « problems solving » trainings, organized by suppliers (such as Saint Gobain).</li> <li>• Experiences carried out in the Hauts-de-France Region have proven the interest of combining obligations (like the training clause) and motivations, as a « bonus » for the SMEs that have acquired the skills and competencies needed to fit the clients' needs.</li> </ul>
<b>The recognition of skills and competencies</b>	<p>The RGE national label is not enough to guarantee the abilities of the enterprises to do nZEB works. Furthermore, the formalities (paper work) to get it are quite heavy for a small enterprise.</p>

<b>An increasing gap between demand and offer</b>	<p>The gap between what is required from the SMEs and what they can offer is increasing fast.</p> <p><i>« The step is becoming too high. It is like asking a young pupil to compete for a bachelor degree »</i></p>
<b>Local strategies</b>	<p>The local territory also appears to be the good level to build and implement a strategy having for objectives to increase and upskill the workforce.</p> <p>The challenge and the possibilities for these strategies are to:</p> <ul style="list-style-type: none"> <li>• Urge and/or oblige (push and pull) the SMEs to train all their workers, for instance, by linking works and trainings.(like with the FIT, the FEST, PRAXIBAT ...)</li> <li>• The « encouragement » can come from a « plus » to get a market;</li> <li>• The obligation can be implemented through an action similar to the« training clause »</li> <li>• Facilitate the access to the trainings which have to be « practical » and provided locally</li> <li>• Enlarge the field of skills and competencies</li> <li>• Build up a network of highly skilled trainers.</li> <li>• Set up a local network of « influencers » who will encourage the SMEs to train their workers.</li> <li>• Create « enterprises groups »</li> <li>• Motivate young and unemployed people to upskill and join the building sector.</li> </ul>

## 4.4 Ireland

### 4.4.1 DIY retail company

**Informant:** Austin Nevin, Chadwicks

**Stakeholder group:** DIY Retailer

**Speciality:** Selling building products

**Date of interview:** 25.11.2020

General	
<b>Story</b>	<p>We have recently conducted training on heat pumps, heat recovery ventilation etc. Although they wouldn't all be experts, some of the staff in the branches would be experts and would have a very strong product knowledge. They would know their EPC and would be able to do an EPC assessment. The majority of the guys in the branches would have a good understanding of the workings of the whole thing. They understand the practicality of the products but where they might fall down is nZEB for Part L and Part F. In terms of product the lads would know everything that you need to know about the products. It's the application or the more technical side when you go into the regulations that we probably could do with knowing more on. Staff in every branch are up to speed on airtightness on insulation and the plumbing side. Some people are better than others. Have to try to get them all on the same level. Some of the guys who recently did the nZEB training are going to go and do the course in Wexford.</p> <p>The people who are going on the training are four regional managers. We couldn't afford to take all the people out of the branches to do training, we would have to come up with some other way of doing online training or something like that. Yes, we would probably do something to encourage them to engage with that type of training. We had Manchester online training which has modules on different things, modules on electric showers modules on oil boilers, gas boilers. Once the guy did that module, he got brownie points and when they did so many modules then we'd give them a voucher or something like that. We could provide those types of incentives. We have to talk to our HR department and get them to work together to do this. But they are mad keen to do all of that type of stuff.</p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• Informant felt that in terms of product their staff knew everything that they needed to know about the products. It's the application or the more technical side when you go into the nZEB regulations that they could probably could do with knowing more on.</li></ul>

	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• When asked if they found there was an interest in retrofitting work the informant responded that there was not a great awareness because the demand was not there. "I can't answer for the insulation side but from a plumbing perspective I don't think the interest is there. Not necessarily hearing the demand on the shop floor. They are not hearing it yet; the contractor is not hearing it yet".</li> <li>• He felt that as the landscape broadens there would be greater interest from contractors</li> <li>• Home energy retrofit is currently a niche market. If the programme for retrofit is managed properly he thought the demand would increase but it is not there yet.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• The informant felt that they couldn't afford to take all their staff out for training.</li> <li>• Online training was thought to be a possible solution to that.</li> <li>• Could increase motivation by offering incentives such as store vouchers.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• Chadwicks are currently developing their sustainable showroom in Limerick. The plan is to have insulation, PV and heat pumps on display. They are also interested in providing a one-stop shop service for retrofitting. For their Bray store they have two buildings they are converting into one shop. The plan is to make the shop totally sustainable to be a flagship store and an example of best practice.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• The informant was interested in the Build Up Skills App. They would be happy to make it available on the shop floor.</li> </ul>
<b>Testimonials</b>	<p><i>We are aware that there is a plan to have 500,000 homes upgraded. For this reason, we are going back to the drawing board and exploring the possibility to see how to partner with</i></p>

	<p><i>someone to provide a one-stop-shop service. We are in a great position we have the customer base; we have the product, we have all the knowledge</i></p>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Content</li> </ul>
<p><b>Awareness of new nZEB building regulations. Part L Building Regulation changes: Backstop U-Values, RER, Airtightness. Part L Building Regulations Changes – Mechanical Ventilation</b></p>	<p>General notes</p> <ul style="list-style-type: none"> <li>• Staff in Chadwicks had strong product knowledge. What they need is training in the technical requirements of the new nZEB regulations.</li> <li>• This is important so that they understand some of the key challenges of implementing low energy projects and be aware of the various solutions available to meet those challenges.</li> </ul> <p>Recognition of skill</p> <ul style="list-style-type: none"> <li>• General awareness of DIY staff of new building regulations is desirable but not essential.</li> <li>• A 4 Hour CPD should cover the basics to raise awareness.</li> <li>• This could be tested by a test at the end of the CPD but not essential.</li> <li>• As stated above there are issues in having all staff available for training.</li> </ul> <p>Upskilling</p> <ul style="list-style-type: none"> <li>• Classroom or online training would be suitable.</li> <li>• Chadwicks are willing to pay for this training.</li> </ul> <p>Case specific</p> <ul style="list-style-type: none"> <li>• As the new regulations were introduced in Ireland last year. This training is specifically on the new Irish building regulations.</li> </ul>

#### 4.4.2 Local Government – Clare County

**Informant:** Kieran Greene, Building Control Officer, Clare County Council

**Stakeholder group:** Local Government

**Speciality:** Building Control

**Date of interview:** 07/12/20

General	
<b>Story</b>	<p>The issue here goes back before nZEB, with the introduction of the Building Control Amendment Regulation (BCAR). There was a backlash from rural developments one off housing where the concept of direct labour would be a huge thing. You manage the build yourself. BCAR brought a more technical input that was required by law. There was a huge backlash that led to political lobbying. So, in 2015 the regulations were amended which meant you could opt out of the role of the assigned certifier for one off dwelling houses. Since that happened 90% building in the West in are opting out. So this technical layer has been removed. You still have to get Engineer sign off on your building for the banks, that's known as substantial compliance. But the assigned certifier role if it was still there would be saying this is fully compliant with building regulations and hence that would be nZEB compliant at this juncture. So that was a major setback in my opinion with regards to compliance with building regulations as it was putting the onus back on the owner/developer. It took out this layer of technical input. This technical input is still required for commercial buildings and bigger developments and multi residential developments because obviously it would be a developer with a view to selling dwellings, but if you are building your own house you can opt out of this. You still have to comply with the building regulations, but the technical input helping you achieve compliance was removed. That was at your own discretion. So, I thought that was a huge set back. We do see that on the ground as well, because if you engage an individual trades from ground works up to the roof, there is no real overlap regards to a team. The team is a dynamic thing, it's changing all the time and there's no one group that sit down together and go look this is what we're hoping to achieve. This is what the end point is. We're all going to get there together. In the opt out situation there is individual construction operative coming in, doing their part, and their detailing might not be sympathetic to the next guy who is coming in. Obviously for nZEB it is a holistic thing. It works as one big package. But it's not treated as such on site. All the design in the world won't fill that gap because everything always looks good on paper. A huge part of my role would be to assess commencement notices that come in and their demonstration of compliance with the building regulations. So that would come in and be all grand on paper and six</p>



	<p>months later I'd be out on site and while the building would look the same, again back to detailing, they wouldn't be achieving what in my opinion is the desired outcome of the design. So that set back has made my job more difficult. Team work not there. Individual contractors not working together. Detailing not being achieved. The overall design is pretty good. Even designers who would not now be at the required level, over time they will get there. They have CPD that they have to do with their professional organisations, so they have to attend courses and upskilling. But there is nothing there for the construction sector in my opinion. What was envisioned with BCAR was that the CPD would come through CIRI (Construction Industry Register Ireland) but that hasn't been followed up on.</p> <p>On site we would look for compliance on airtightness. We had someone got a contractor in doing a fantastic job in the attic space airtightness the whole lot. Then you'd go up there and there would be a big cable going through. Now is that a case where the Electrician just didn't care? Or did he fundamentally not understand what was trying to be achieved up there? So, these guys they'd make their mistake once and if it's down to ignorance or just not caring, you'll never solve that. But if it's down to that they fundamentally just didn't understand, the next job they go to obviously that issue will be resolved. The next job they'll know that they should tell every time they have made a perforation in the seal. I think a lot of the operatives are learning as they go on site, because they are not attending courses. We've gone to St Gobain institute there. They have training on all their products. They have workshops and they show how it is all detailed. We found that very beneficial. I've been to two of their courses now and there would have been 11 people on them, 8 would be Architects or Engineers and 3 would be Construction. I actually think it should be the other way round. The majority should be contractors as they will be the ones actually applying this product.</p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• Informant feels that CPD should be required by the CIRI register but that is not the case.</li> <li>• In his opinion construction workers are not interested in upskilling.</li> <li>• Also, with CIRI there are subscription fees, another reason why not to get involved.</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• For people building their own one-off house, they are not interested in Airtightness. They are interested in the aesthetic. They are looking at their €20k kitchen and their big TV. It's important to educate these people because they are the ones investing in these products.</li> </ul>

	<p>This is the biggest thing they'll ever do but they are looking at it from a very short-term point of view. They are not looking at the full life of their project.</p> <ul style="list-style-type: none"> <li>Some of the younger guys doing apprenticeships they would have had an appreciation for products and innovation. But on site, you're meeting guys of the older generation. They need to develop a culture of appreciation of new products. Unfortunately, a lot are just gravitating to what they are familiar with.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>The real job is to get the hands-on people on the construction sites up to date on building regulations and what they are trying to achieve. And this will have to be required rather than them doing it if they want to.</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>There is a labour supply issue in Ireland. Time is of the essence.</li> <li>There are construction workers who would like to engage with this stuff by they are not given the opportunity because their employer wants them there to get the work done.</li> <li>Kieran felt that perhaps they needed a stick (regulations) rather than a carrot (incentives). Unless someone has to do it it's very hard to get them to do it.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>/</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>On the bigger sites there is practical training. On the smaller sites it depends. Some people don't ever go outside what they know, it's all dwellings houses that they build. They are carbon copies as they move along. Time is money. Where do we find a gap for them or where is the upskilling, where is the opportunity?</li> </ul>
<b>Testimonials</b>	<p><i>In Building Control enforcement is the last resort. We are solution based as opposed to problem based, we will look for solutions, we won't offer solutions. We take things on board.</i></p>

Skills	<ul style="list-style-type: none"> <li>Content</li> </ul>
<p><b>Onsite consideration of airtightness testing &amp; sealing: Understand why there is need for teamwork to produce low-energy buildings and be able have such discussions in relation to Airtightness.</b></p>	<p>General notes</p> <ul style="list-style-type: none"> <li>Kieran identified a need for a holistic element to training “if you focus just on the individual elements there are going to be gaps. They have to fundamentally understand what the whole thing is trying to achieve. It's not just their part, they are feeding into another part, and they have to be mindful of what is going on around them. For example, if someone is putting in a window, he might make it easier to achieve airtightness if he puts the window in in a certain way. If he puts it in a half an inch off it just makes another person’s job that much harder.</li> </ul> <p>Upskilling</p> <ul style="list-style-type: none"> <li>Kieran thought that a practical training course was the best format. Construction workers don’t like classroom. They like to be hands on operating in the open</li> </ul>

#### 4.4.3 Building owner – Social housing company

**Informant:** Susan Vickers, Cluid.

**Stakeholder group:** Building Owner

**Speciality:** Social Housing

**Date of interview:** 07/12/20

General	
<b>Story</b>	<p><i>Cluid is committed to quality. The properties have to be of a good quality. The cheapest property does not mean it is the best quality. But you have to marry that with there is only a certain budget as well. While we'd all love to put bells and whistles into our properties there's a balance. When you talk about a skills set and whether we would pay more for skills, those skills are more and more necessary now. Properties have to meet nZEB now, so it is part and parcel of it. There is a skills set to achieving that and that is passed on in the cost. So that's all part of it. Cluid knows that we have to meet the minimum requirements. Sometimes we exceed those requirements. We are constantly looking and exploring what else we can do in this space. If properties can be built as efficiently as possible, maybe modular so it is cutting down on onsite time as well and that sometimes has an impact positively on cost. Sometimes it doesn't in the real world. We are definitely in the space of exploring all of those.</i></p> <p><i>We've just completed a project in Kerry that has two photovoltaics on each roof. The developer there has put in twice that on maybe four houses and he's capturing his own data on this to see if 50% of the overall house energy can be met by the doubling of the photovoltaics. He's doing this out of his own pocket to see what can be achieved himself. We would absolutely have a look at that and see what we can achieve, because fuel poverty is something that we are aware of. If we can reduce fuel poverty for social housing residents, that's something that we are really interested in. So it's not as simple as we are willing to do x,y and z. It's how that will benefit and how we can explore that. Yes, we would pay more for skills but there is an understanding that those skills will be needed anyway on most builds now.</i></p> <p><i>I think in a European context, a lot of social housing residents their rent and their energy costs are included in one package. So, if you like the landlord is the energy supplier. In a normal domestic house situation here, there would be a payback of however many years if you are going to put whatever into your home. But we don't have that, the benefit to us doesn't really exist it is always to the resident. So, we get something up to a really good standard, we are putting in renewables. For us, the bottom line doesn't have a payback period. It is on the residents themselves. Ultimately that is something that in an Irish context, that's the way that it is. We are not</i></p>

	<p><i>the energy supplier for our properties. So, the funding mechanism has to fit more appropriately with the way we do business. I'm saying that in terms of housing bodies and housing associations in Ireland, the funding mechanism doesn't fit our model. It's built for a private residence where ultimately there is going to be a payback.</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• The contractors who Cluid use have been authorised by the SEAI. There would be a complete understanding that they would have the skills to deliver because the work is SEAI funded.</li> <li>• In terms of skills recognition, there has to be an overseeing accreditation body or certification body.</li> <li>• There has to be a multi-pronged approach. We need to look at apprenticeships, we need to look at a whole range of initiatives to try and get people to upskill, reskill. That there is really something properly in place for them to go into an apprenticeship from school where they are being paid. These schemes existed years ago, and they were very successful schemes.</li> <li>• Testing and recognition of skills does not necessarily have to be SEAI's responsibility. There will be many different training bodies and further education boards involved in that.</li> <li>• There should be one standard or certification that they need to meet.</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• Cluid, as an organisation, in reflection of the government climate action plan, has their own plan for 2030 which is to have their housing stock to a minimum of B2. In addition, there is a minimum requirement for the Better Energy Communities scheme that the houses have to be retrofitted to a certain standard. Cluid's new properties are to nZEB as a minimum and in some cases they might exceed nZEB.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Lack of motivation, time and trainings on the side of</b>	<ul style="list-style-type: none"> <li>• The scale of Cluid's retrofitting at the moment would be manageable enough at a national level. But with everybody gearing up to achieve 2030 goals to get B2 ratings on the properties there is going to be a bigger demand. It is Susan's understanding that the skills set</li> </ul>

<b>construction sector professionals</b>	<p>isn't there to meet demand at the moment and that is something that we are aware of. Cluid want to try and get around it by having a partnership or a longer-term contract with a contractor.</p>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• Susan thought that the Build Up Skills Ap was a useful tool.</li> <li>• Part of the issues around training is to understand what you need to be trained in in the first instance. There are so many different courses, to have something collective and concise like the Build Up Skills App is great. For most organisations who have a multiple skills set for sure yes that would be really important. Our own HR department is very good on identifying possible courses.</li> </ul>
<b>Other notes</b>	<ul style="list-style-type: none"> <li>• Cluid don't go purely on cost, so if something is the cheapest it has to meet a number of requirements, quality of work and there are other issues when trying to avail of grants the measures that the grants needs you to meet and how cost beneficial that is overall, do we need to meet all those measures. For example, windows might have been replaced only five years ago, so that might not be a measure for this project. So, there's more in it than just the lowest price, the lowest price does not guarantee that the work will be done as good as it should be and that it's going to be a long-term project in terms of quality in 20 years' time it's going to hold, whatever retrofitting measures have taken place.</li> <li>• The contractor absolutely has to be registered with SEAI so, in relation to skills beyond that and beyond having a working relationship Cluid would presume because they are SEAI registered that they are going to have those skills. So, the SEAI register is the quality mark along with how they deliver.</li> </ul>
<b>Testimonials</b>	<p><i>The properties services team in Cluid has a really good handle on stock. They are carrying out stock condition surveys. They know when elements of certain properties need to be addressed. The windows might be coming up for replacement soon or they know where the gas boilers are in terms of the fact that we need to start phasing these out or</i></p>

	<p><i>they are coming up to the end of their life cycle. They have a really solid handle of the condition of the houses.</i></p> <p><i>We have a mix of skills in Cluid, you've got building surveying managers, to Clerk of Works, Architects, there's a whole new business department that would have a lot of up to date knowledge on all of that as well on what nZEB entails and what the various elements of it are composed of and then you've got the people involved as I say the building surveying managers who are going to have to maintain these properties, so they are going to have to make sure that their skills are updated. The whole area of skills and keeping up to date and making sure the most current training is in place is something that Cluid are very committed to. There is an understanding that it is throughout the organisation.</i></p>
--	---

#### 4.4.4 DIY retail – Hardware Association Ireland

**Informant:** Martin Markey, Hardware Association Ireland

**Stakeholder group:** DIY Retailer Companies

**Speciality:** Hardware Retail

Date of interview: 12 January 2021

General	
<b>Story</b>	<i>The whole area is very new and anything we can do in terms of education is positive. Business during the lockdown has been good for hardware stores. They have been able to remain open as an essential service. Many people have been undergoing refurbishments of their homes. If we are looking for opportunity for the sector, then retrofitting for energy efficiency is a key opportunity.</i>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• The whole area is very new and anything we can do in terms of education is positive. Business during the lockdown has been good for hardware stores. They have been able to remain open as an essential service. Many people have been undergoing refurbishments of their homes. If we are looking for opportunity for the sector, then retrofitting for energy efficiency is a key opportunity.</li> <li>• The area of retrofitting for energy efficiency is a very complex subject and is not an easy marketing message. Having a Warmer home is an easy enough message but knowing what work to do and with what products is more complex.</li> <li>• A recent survey of readers of the Hardware journal indicated that readers wanted more information on green products.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Lack of motivation, time and trainings on the side of</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>



<b>construction sector professionals</b>	
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• Another way members access training is via manufacturers of product e.g. heat pumps. They often visit stores with a practical demonstration and staff can go out and attend the demonstration. Also, the HAI has an Education hub where there is a bank of training videos that members can download</li> <li>• Currently we are developing a suite of green webinars on eco products suppliers who work in that area. Webinars are generally 20 to 30 mins and no longer as we are aware everyone is pushed for time and attention spans are not long. Currently the uptake of training is mixed.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• Yes an App is a good idea. However, you do have to consider the age bracket of the trades people who you are targeting for the training. An app is not always suitable for older people. With the shortage of skilled workers in the industry, we are currently seeing the recruitment and retraining of people in their 40s and 50s.</li> </ul>
<b>Testimonials</b>	<p><i>The HAI has over 400 members from big chains such as Chadwicks, big manufacturers such as St Gobain, Tegral and Wavin, to smaller hardware shops. It is an industry that is worth 2.4 billion and employs more than 26,000 people.</i></p>

#### 4.4.5 Local Government – Wexford County

**Informant:** Elizabeth Hore, Wexford County Council

Stakeholder group: Local Government

**Speciality:** procurement

Date of interview: 13/01/21

General	
<b>Story</b>	<i>Wexford has a huge construction industry and is extremely outward looking (role of FDI). Creating jobs in that area, innovation (e.g. green materials) and Green Wexford are priority (part of Wexford brand). It also happened that we had the right people at the right time. Passionate people such as Tomas O’Leary and Michael O’Brien who have been driving that agenda.</i>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>You have safepass for safety. CS. You need something similar for nZEB. Need to understand quality nZEB is core part of their job. Not only something that is nice to have.</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>Lack of awareness about the need to upskilling that area in the construction industry and inside local authorities.</li> <li>There is a huge emphasis on training in Local Authorities, so if we can raise awareness / show it’s important upskilling is likely to follow. For planners, engineers within LAs should ensure they can get CPDs for this training and they will do it.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>Support for nZEB is strong. People like Sean Armstrong in Dep. Of Housing has done a very good job. We also have the Climate Action Plan, but the issue is that many people don’t understand the need for upskilling / specific skills for nZEB. There is a clear need to raise awareness about it</li> <li>Under the Public Expenditure Code, Local Authorities must look for value for money, but perhaps we could take a similar approach to the one taken for heritage buildings i.e. a two steps process. 1. Qualifying criteria (based on green competency) 2. price</li> <li>One thing that you may want to do in relation to planning is to get the importance of skills / quality mentioned in development plans.</li> </ul>

<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>For contractors: Why should I pay that guy while he is doing some training? = General attitude, need to change the mindset, to make it worthwhile for them. So that they see the value of upskilling. Typical way of thinking of a contractor: Profit and time are the priorities. Won't let staff take a few days off for upskilling is they have to pay them. PP can do just that. Perhaps a need for some sort of financial incentive to release staff for training. E.g. construction companies get €3k if they take someone on an apprenticeship programme.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>/</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>/</li> </ul>
<b>Testimonials</b>	<p><i>Wexford will be delighted to be the local authority piloting the clause. We want to be pioneer in the area. You need to develop the clause but also build capacity for the LAs to use the clause e.g. training and awareness. We need greater awareness of the importance of skills in relation to nZEB</i></p>

#### 4.4.6 SME – product supplier

**Informant:** Niall Crosson, Ecological Building Systems.

**Stakeholder group:** SME

**Speciality:** Product Supplier

**Date of interview:** 18 January 2021

General	
<b>Story</b>	<p><i>There is always going to be resistance to new methods. We do have on occasion some who come into the training centre who would be there because they were told to go. There is always going to be that portion of industry that doesn't buy into and they are convinced maybe, for example, airtightness is just a bad thing. The name, it gives the impression of suffocation and poor indoor air quality and they may be cynical. A guy came in once, we were demonstrating an airtightness test on our training house and we ran the fan, closed the doors, depressurised the house and then when we were finished it we thought we had explained the principle well and then he opened the door and then he said, there you go now your airtightness is gone. So, you'll have a proportion of cynics that just will not buy into it.</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• There should be a national award or some form of recognition of skills because as a supplier we can give a certificate that you've done a training but it's not a third party verified cert and that holds more value.</li><li>• There should be formal recognition of airtightness installers as a skill set because that links all the skills together.</li><li>• The common denominator for build quality was the airtightness work, because leaving aside all the principles and the reasons for achieving better airtightness the airtightness installer links everything together and every trade together that interacts with the external envelope. So, they are very much connected from the foundation to the roof and they connect the painter all the way back towards the block layer, so it's a quality control standard. The buildings that were built more airtightly were inherently a better-quality building.</li><li>• Formal recognition of training has a very high value and there is a big need for it. It can improve outcomes and improve quality and for homeowners and for specifiers to gain more confidence it's very valuable.</li></ul>

<p><b>Awareness of both the general public and workforce</b></p>	<ul style="list-style-type: none"> <li>• The awareness of the terminology of nZEB I would say they were very aware of it.</li> <li>• What we notice is that some specifiers now putting together the specification for a project, that you must have an awareness of airtightness and proof of scope and one way of proving competence is to have completed training with a manufacturer or supplier.</li> <li>• We have had contractors come in in groups sometimes specifically for training because the architect had specified that they had to complete training.</li> <li>• In terms of the ramping up of the nZEB training centres though we're seeing more builders coming with more experience based on the training they've got from the WWETB and there are other ETBs opening up around the country and we see that as being very positive around increasing awareness and knowledge</li> <li>• Compared to 15 years ago the knowledge in Ireland has come a very far way.</li> <li>• You could see their awareness of thermal bridge junctions, the use of thermal bridge junctions, of airtightness and the basic principle of moving services away from external walls. This shows how far we've come in our national standards. In relation to nZEB and awareness, we have a very high awareness of energy conservation in Ireland.</li> </ul>
<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<p><b>Lack of motivation, time and trainings on the side of construction sector professionals</b></p>	<ul style="list-style-type: none"> <li>• The cost, builders will look at it as another cost. Time, the management of the training and how to give it in a time when you have such a high demand for building, even in the best of times we found that to get builders to commit to come to our centre and get trained the big issue was time and cost. Because if you are a main contractor and you've got a staff of 4 or 5 and you want to progress your work but if they need to get trained they have to take a day off. Then the cost of doing that.</li> <li>• When we do product training, we usually get architects and homeowners. Builders would not be the majority which speaks for itself. How do you motivate the main contractor? This is a valuable exercise and well worth doing but time and cost is the challenge. It may be a matter of trying to accommodate them in such a way that if it could be done on site, if there was a</li> </ul>

	transportable pod that could be brought around the country. So, you could bring to site and they could get their training on site and then get back to work.
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>/</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>Build Up Skills App will be a good tool to support upskilling in this area.</li> </ul>
<b>Other notes</b>	<i>We also have seen on site, we carry out demonstrations on site, tool box talks and we schedule a meeting on site with the architect the main contractor and the sub-contractor doing the work if they are not using a recommended applicator and we can demonstrate what's needed where and the correct execution. That's quite a positive and effective medium for transferring knowledge as well.</i>
<b>Testimonials</b>	<i>We'd love to see a national award or some form of recognition of skills because as a supplier we can give a certificate that you've done a training but it's not a third party verified cert and that holds more value. At a recent conference and there was a round table discussion, and we were asked to select one thing we would change. We highlighted that there should be formal recognition of airtightness installers as a skill set because that links all the skills together.</i>
<b>Skills</b>	<ul style="list-style-type: none"> <li>Content</li> </ul>
<b>airtightness</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>The common denominator for build quality is the airtightness work. The airtightness installer links everything together and every trade together that interacts with the external envelope.</li> </ul> <p>Recognition of skill</p> <ul style="list-style-type: none"> <li>There should be formal recognition of airtightness installers as a skill set because that links all the skills together</li> </ul>

	<p>Upskilling</p> <ul style="list-style-type: none"> <li>For people fitting the materials, practical demonstration is key. Product supplier training is appropriate.</li> </ul>
<b>proper installation of insulation materials in different forms of construction detailing for thermal bridge free junction</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>How to execute it correctly</li> </ul> <p>Upskilling</p> <ul style="list-style-type: none"> <li>For people fitting the materials, practical demonstration is key. Product supplier training is appropriate.</li> </ul>
<b>retrofit solutions</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>Understanding the limitations of solutions and what it appropriate for older buildings. Hard to treat brick walls</li> </ul> <p>Case specific</p> <p><i>We have about 400,000 solid wall buildings and these have to be approached in a more sympathetic way and internally insulating.</i></p>

#### 4.4.7 SME – Retrofitting contractor

**Informant:** David Widdis, Greenwatt

**Stakeholder group:** SME

**Speciality:** Retrofit contractor

**Date of interview:** 22 January 2021

General	
<b>Story</b>	<p>One of the problems we have is we need a carpenter, we need a plumber, we need an electrician. But don't need them all the time. So, we need somebody who can do all of those things. Which is a skill set that just doesn't exist at the moment. You need to be doing an awful lot to keep those guys busy all the time. To keep those guys busy you would really be going after the new build market. Say going into a large housing estate where you could employ a team and a plumber would be plumbing all day every day. But when you are retrofitting a house, there is only so many houses you can take on comfortably. If you are bringing in individual plumbers to individual jobs to link up to various different systems, very few people have that knowledge base. I think it is purely a lack of training for them to be able to piece it all together. When people would have done an apprenticeship years ago, they would have say done an apprentice in carpentry, it would have been just purely carpentry. But nowadays with the retrofit market, we need a scheme that would be able to bring people in, give them a reasonable amount of knowledge for a larger variety of the job that is in hand. Not saying that you are going to take on a young chap that is 19 years of age and is going to wire a heat pump and wire a house on his own, that would never happen. But if you had a plumber who would be able to say, know what kind of wires he has to bring out to run your heat pump, ventilation, that type of thing. We need a plumber that can wire a house as well. So, he could have a domestic electrician certificate along with his plumbing certificate so then your plumber could rewire a house as well. So that gives them a broader scope of what they can do on a house so we can keep them busy for longer on one house. So that's an overlapping skills set that doesn't exist. Bringing in an electrician just to wire up a heat pump doesn't really make any sense.</p> <p>A quick side-line issue and a serious pet peeve of mine is that every time you go to the building suppliers to buy pipe insulation its all the wrong size. 20% of the insulation that the building suppliers have is legal. Most of what they have is undersized. What is contained in the building regulations as a standard, we end up ordering in as a special. That's just nonsense, just really annoying.</p>



	<p>We've designed some of our own thermal bridging details to deal with issues we've had on site. We find that also any of the subcontractors we use, we train them to meet the SEAI standard that is different to the Building Regulations standards. They are higher and all our work is inspected. We can't use any plumber that's old because they want to do it their way, and it won't pass an SEAI inspection. That's on gas boilers and heat pumps.</p> <p>In Ireland, every house is plumbed differently. If you go back to houses that were built in the 1960s, quite often the heating could be an optional extra. It was not included in the price and would have been retrofitted later. So you could go into a housing estate with 30 or 40 houses in it. So it would have been 30 or 40 plumbers, or even the people who lived in the house fitted it themselves. And there would have been changes over the years. It would be more unusual to find two heating systems the same in a housing estate. We've seen heating systems where we've had to go in and replumb the entire house because it was plumbed wrong in the first place.</p> <p>There's huge uncertainty in what we do, and if I'm very blunt about this. If they want to retrofit 10,000 homes per year, let alone 50,000, they need to remove SEAI from the process. They must be taken out of the process. If you've got a homeowner and they want to go for a deep retrofit and they want to apply for a grant, they should to online, use their BER certificate, design a solution for them, and then they need to be able to get the grant approved in 24 or 48 hours and they then need to be able to proceed with that when they want to do the work. You cannot be telling people yes we can get you a grant, but it's going to be 6 months for the application process, 50/50 chance you'll get the grant, and then it would be another 2 to 3 months before they can do the work. It's nine months from today. People can't be dealing with that. If they want to do the job they want to do it in their timetable. If they want to get a grant, they need to be 100% sure they'll get a grant. They can't be in some kind of a lottery for grants</p>
<b>Testing and recognition of Energy skills</b>	<p>We certainly think that to have a company recognised as a specialist retrofit company, that would be good. To demonstrate our experiencing. It would be nice, if we were looking for people, to know that they had a skillset</p>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• We are actually looking for skilled people at the moment and can't find them.</li> <li>• It's more appealing for workers to work on new builds rather than on retrofits.</li> </ul>

<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>CS: We find that also any of the subcontractors we use, we train them to meet the SEAI standard that is different to the Building Regulations standards. They are higher and all our work is inspected. We can't use any plumber that's old because they want to do it their way, and it won't pass an SEAI inspection..</li> <li>CS: Qualified electricians, if they are wiring different things for gas or for heat pumps. Their RECI standard is less than what SEAI deem acceptable. People don't want to deal with that, there is enough work out there for them. They don't want to be dealing with SEAI and random rule changing.</li> <li>CS: They can fit or plumb a boiler perfectly to the RECI standard, the gas standard, the building regulations standard. The SEAI inspector can still come in a fail it. So then you don't get paid, you can get taken off the list.</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>If they are asking us to take our guys off for a week or two weeks to go on a training course to get accredited, we're not going to let them do that, because we don't have the time to let them do that. Even if we could pay for them to go on the course, it would put us under pressure, because we are under pressure the whole time. Even if we could treble our workforce.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	/
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>With the targets of the Climate Action Plan there will be a great demand for the solutions you are offering.</li> </ul>
<b>Other notes</b>	<ul style="list-style-type: none"> <li>Attic insulation is very hard work. People don't stay too long in the job. About a year normally. So you are constantly training people to do it. It's all specialist stuff. It's surgery really. Some guys you just cannot train them to do it. They don't get that it is delicate. It would take two guys a day to seal round windows properly, that's just on airtightness, that's not doing the silicone on the outside.</li> </ul>

<b>Testimonials</b>	<p><i>When you are retrofitting houses, there's a solution that has to be designed for every house based on what you find when you get in there. Whether it's boilers or showers or there's been extensions added. The plumbing has been pulled this way or that way. So you have to think on your feet and come up with a solution. We've designed some of our own thermal bridging details to deal with issues we've had on site. We find that also any of the subcontractors we use, we train them to meet the SEAI standard that is different to the Building Regulations standards. We know for a fact, the standard that we put in a heat pump is used as a standard for the inspectors.</i></p>
<b>Skills</b>	<b>Content</b>
<b>Multi-skills for Retrofit</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>• It would be very useful to have a guy who is trained as an electrician and trained as a plumber in the domestic retrofit market. He could do the plumbing and the electrical wiring on that house and sign it all off to the standard.</li> </ul>

#### 4.4.8 SME – Retrofitting contractor

**Informant:** Martin O'Reilly

**Stakeholder group:** SME

**Speciality:** Retrofit contractor

**Date of interview:** 22 January 2021

General	
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• Working on new builds is more attractive for the workforce than working on retrofits.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<p>CS If you think of a young fella coming out, and he wants to do plumbing with us and he coming out to fit a condensing gas boiler, he'll do that for a better energy communities job, so he'll have a standard there and do it to that standard. Then if he is doing a job for Warmer Homes for an elderly person, totally different standard again. So a lot of people just don't want the hassle.</p>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• We can't afford to take our employees off work to do training.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• Retrofit should be seen as a specific career path. People should be trained to work on retrofits. That way we will be able to fulfil the Climate Action Plan.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• More opportunities for training would be useful.</li> </ul>
<b>Other notes</b>	<p><i>Last year we worked in a housing estate in Shankhill and in that housing estate there were two heat pumps. They thought it would be straight forward as they had already learnt from the first house. But they went into the second</i></p>

	<p><i>house and yet again there were changes made to it. In all of our retrofits we have never come across a house that is actually similar to the next one.</i></p>
Skills	Content
Heat pump installation	<p>General notes</p> <ul style="list-style-type: none"> <li>There is a paperwork element with the heat pump, which is your heating design, your commission cert, your hand over cert, your safety cert. that's just all your paperwork. There is a bit of work in that. But the hands-on fitting part of the heat pump there is a lot to that and it has to be done right. A lot of houses would have been built back 20 or 30 years ago. There would have been various different components to the plumbing such as oil, mixed with back boiler, mixed with a stove, so you are taking all of that out, making it safe stripping it out and you're starting from a fresh. It needs to be done correctly. With every house it is a complex situation</li> </ul>
Plumbing for retrofitting	<p>General notes</p> <ul style="list-style-type: none"> <li>A plumbing a apprenticeship will cover a lot of things, domestic, commercial and more in depth. Whereas I don't believe there needs to be as in depth a course for people doing retrofit of houses, because it is pretty straight forward. Plumbing apprenticeships are a four-year process or longer. What they learn in college is very good, it gives them a very good knowledge of plumbing, but it's not the reality of dealing with whole properties. It's good for new builds, but it doesn't work with your old construction methods that we are dealing with in retrofits.</li> </ul>

#### 4.4.9 SME – Energy Agency

**Informant** Alex Hamilton, 3CEA

**Stakeholder group:** SME

**Speciality:** Energy Agency / Retrofit Project Manager

**Date of interview:** 5 February 2021

General	
<b>Story</b>	<p><i>When we deliver work, we try to deliver them to the best standards and SEAI conditions, Part L etc. So, these are the main areas that we are looking at but the contractors are not looking at those. So, when we come along an specifically point out the energy side of standards let's say, they've never been pulled up on them before. They look at us and say "we've never been pulled up on that before".</i></p> <p><i>Yes, I think it is an absolute lack of awareness, but I think it is also a lack of accountability. Where is the self-certification or the self-regulation? Where is the ethics behind doing things properly? There is none, in reality, I think. I've been working as an engineer for however long and the attitude is if I can get away with doing the bare minimum that's what I'm going to do. So that is a problem so when you come across people or programmes that want to get better standards, you'll have contractors who just won't deal with those programmes or won't apply for those contracts because they won't meet those standards, so they don't go for it. Therefore, all the projects that we are delivering there are the same 3 or 4 contractors who we deal with over an over because they are the ones that are doing it to that standard. Why that is, in my opinion, is because there is no accountability.</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• But when we go to procure contractors to do the work its very few contractors out there that would pass evaluation based on their skills and their past experience.</li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• There is a lack of awareness amongst homeowners about skills. There need to be a general awareness campaign like there was with the RECI certification for electricians. Homeowners need to be made aware about asking for the skills of the contractors working for the.</li><li>• There is a lack of awareness about having to improve the fabric of the building before installing a heat pump. If we are going to put in half a million heat pumps then we have to upgrade half a million houses to match that</li></ul>

	<p>because you can't put in a heat pump where it is not suitable and I think that message has been really missed. Everyone is looking for a heat pump, but we are asking what is your EPC what is your HLI "Heat Loss Indicator", homeowners don't realise they have to do all of that beforehand.</p> <ul style="list-style-type: none"> <li>• There is a lack of awareness in the workforce. There is a culture of saying "this is the way we have always done it" and therefore unwilling to make changes.</li> <li>• On site with regards to airtightness we are finding the knowledge and skills are not there.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• Mixed messages or inconsistent messages at a national level is not helping the industry at all. Bit by bit process, we change the rules and we change the standards as we go along. That's not helpful.</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• Now very slowly over the past 10 years we come up to the new Part L and nZEB standards. But again who is enforcing that those standards are being met, so until that is being done I think the culture won't change.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• But new tech can be put in wrong situations or not commissioned correctly or whatever and they died a death and killed the market. We saw it ten years ago, the incorrect implementation of ground source heat pumps of biomass boilers.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• Yes, the Build Up Skills App is a great tool for the workforce. Anything to help awareness around the availability of training is good.</li> </ul>
<b>Testimonials</b>	<p><i>It is continual improvement on an annual basis. Every time that we deliver a project there are new things that we, as an energy agency, are finding and therefore passing on to the contractors. From our own internal point of view, having the in-house skills to be able to understand what is required, and then pass on those messages and skills is always an ongoing problem.</i></p>
<b>Skills</b>	<b>Content</b>

<b>New regulations</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>• Gain an understanding of the purpose of the new regulations, what they are trying to achieve. To understand why the buildings regulations are here and why the changes have been made. To achieve this, this is what we need to do. Understand the theoretical side of things. Understanding the importance of your job on site on a bigger picture.</li> </ul>
<b>Independent training in the correct solutions for a house</b>	<p>General notes</p> <ul style="list-style-type: none"> <li>• Product suppliers doing their own training, that is not very independent. How do we know we are putting in the correct solutions for a house? A heat pump supplier will say that their heat pump is the best. There has to be independent general training as well.</li> </ul>



#### 4.4.10 Financial body

**Informant:** Laura Heauston, Sustainability Works

**Stakeholder group:** Financial Bodies

**Speciality:** Financial Consultant

**Date of interview:** 5 February 2021

General	
<b>Story</b>	<p><i>The banks want it easy. They recognise that they are not house builders. They get their assurance from a surveyor in the case of a second hand house. They get their assurance from an EPC in the a case of a green product. That is the only thing they look at, they don't look outside of energy efficiency. Once you send in your EPC or your SEAL grant, then you get the discounted rate. So at the moment the only stamp they need is energy efficiency. I understand the HPI is trying to broaden that definition. But will they go beyond that from a skills perspective and look at skills recognition? Until it's proven that the wider quality issue is financially relevant, there are so many other building regulations that have to be met. They'll go for the lowest common denominator. Until regulations come in to force them to look broader they will go for the easiest option. At the moment the BER is the easiest option. As the EU Sustainable Finance Taxonomy comes in, it's not in law yet, what it currently says is a green building is that it has to be 20% better than local nZEB regulations as determined by a EPC. In addition it also has to do no significant harm. It has to meet certain water standards, certain recycling of waste etc. Most of that is in line with national regulations anyway. That is what we are trying to argue with the HPI that once the EU Sustainable Finance Taxonomy goes beyond energy efficiency, which it will do, then the banks will look for certification of that. So the EU SFT is going to say what is green for finance purposes. So if they want to issue a green bond it will have to be invested in green houses in line with the taxonomy or if they want to say it's a green mortgage product it will have to be in line with the taxonomy. So at the moment it doesn't go beyond energy efficiency so they will continue to rely on the EPC. But as it tightens up they will need a stamp. But the stamp will still be on the house, not on the skills.</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• Once the EU adopts Sustainable Finance Taxonomy there will be more things to consider than just an EPC. This might lead to a requirement for testing and recognising energy skill.</li></ul>

<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• Banks are aware of sustainable building but only in terms of EPC</li> <li>• They are not interested in skills of workforce they want a stamp like EPC to sign off a green loan.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• Banks are interested in quality assurance but only through another professional such as surveyor.</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• /</li> </ul>

#### 4.4.11 Training providers – WWETB

Barry Madigan, Michael Dalton and Joss Power of WWETB.

General	
<p><b>Best and worst part about boom years?</b></p>	<p><b>Mick-</b> Good money, but no care for workers in terms of manual handling, just get the job done.</p> <p><b>Barry-</b> Agrees with Mick, no such thing as tele-loaders, everything was man handled. Best times- money. Worst- pressure; rush rush rush. But good that he got many apprentices through.</p> <p><b>Michael-</b> Money, holidays. The world was opened up, he knew he had plenty work to come back to. Worst- pressure. Did a lot of price work with South East plumbing and was semi self-employed. Also, bad workmanship from different trades. Houses were not finished properly, they then had to fix problems, everything was slapped together and poor organisation.</p> <p><b>Joss-</b> Money, holidays. The young lads thought it wouldn't end, didn't come in on a Monday and were gone Thursday night. Spent all around. Pressure- E.g. 14 houses to be built in 3 months but they never thought of the rain, they were always trying to get ahead. The way they built certain details is all wrong now. Are all these expensive houses rotting inside?</p> <p><b>Mick-</b> we need to accept that construction is a constantly evolving sector. New technologies and know how will constantly emerge.</p> <p>PRESENT</p> <p><b>Mick-</b> Overview: What we're dealing with in the present is trying to recruit young people into this industry.</p>
<p><b>How is WWETB recruiting people into your field? What type of people? (To Barry)</b></p>	<p><b>Barry-</b> 6 years ago the numbers were very low- just coming out of bad times with 5/6 in a class when they should've been taking 14. Over the years they promoted it- TYs etc, &amp; once a year they have college awareness week in the centre. They bring schools in and show them the trades. Big success every year. They are pushing it, but there's more space for advertising (tv). They're not at full capacity in plastering.</p> <p><b>Mick-</b> We are lacking in wet trades. Should we be starting in primary?</p> <p><b>Barry</b> agrees. At a workshop he did in WIT, he asked the designers/builders what they do to get more people in wet trades. A builder said there will be no need for plasterers &amp; block layers in the future because houses will be ready made.</p> <p><b>Barry</b> responded that they'll be needed for conservation &amp;</p>

	retrofits, to which the builder agreed. Wet trades will always be needed.
<b>Have you seen how they're promoting the blockwork trade? Is it working? (To Joss)</b>	<p><b>Joss-</b> The money incentive isn't there yet 'Too many subbies, they won't pay wet time'.</p> <p>Back in the boom they were guaranteed 40 hours of a wet week. If it rained for the week, they would still have a wage. In the downturn the builders took over &amp; it was all subcontractors. It would be fine if they paid their men and their pensions, but they were on a price and if it rained, they wouldn't be paid. Josh knows block layers who were travelling from Galway to Athlone for work, but if the rain didn't clear they'd have to turn around and go home with no pay. He says it needs to be looked at, maybe by the unions or CIF. 'At least give a man a wage'.</p> <p><b>Joss'</b> brothers who work in big factories may not have a top wage, but they have discount shopping, health insurance etc. Thinks the building needs to go down that road.</p> <p><b>Mick-</b> Trying to entice young people into an area with no job security must be looked at.</p>
<b>Are the plumbing apprentices coming in? (To Michael)</b>	<p><b>Michael-</b> Opposite issue. 2/2.5-year backlog. They're trying to speed it up, and get lads through, but if they're too quick then some might not have enough training. NZEB is included in the training. With passive houses being build more often, they will start doing mechanical ventilation. The course is very popular, he thinks it's the money (top paid). More space within training centres would fix the backlog but there should also be an interview to get into the course so only have those who are good enough can come through.</p>
<b>Women in the construction sector? Are there many qualified women in plastering? (To Barry)</b>	<p><b>Barry-</b> "I've never came across any on site in 25 years." However, there's been 2 women apprentices over the years, he thinks that it was during the boom. They were excellent. When the school tours came into the centre, the girls were a bit taken aback when he said it's not just for men, that girls can do it.</p> <p><b>Mick-</b> If women aren't seen on the sites by girls, it doesn't seem achievable. It will take a very good campaign to get the first women in plastering. Should we introduce the idea in primary school?</p> <p><b>Barry-</b> Agrees. Equal opportunities, it just needs to be pushed.</p> <p><b>Mick-</b> There's a stigma in society with trades versus college degrees. Was talking to a builder in Dublin who said that we need to "Stop belittling the trades and start bigging up the trades".</p> <p><b>Barry-</b> When he was younger, a trade was the thing to have after school. It's all college college now. Do the kids not know</p>

	that the option is there for apprenticeships? But in the last 2-3 years he has seen a swing towards apprenticeships.
<b>Women in construction, particularly young women? (To Joss)</b>	<b>Joss</b> has never seen a girl bricklaying in 40 years. At the time they might have shied away from heavy lifting- the 6-inch block was a common thing. The lifting isn't as tough now with the timber frame, teleporters etc. Doesn't see why they couldn't try it. He's had girls on his course laying kerbs no problem. They have manual handling now which he never had when he was younger. Thinks you could go to schools, (1st, 2nd, 3rd years & TYs) show them what's there and what they can earn (show figures).
<b>Same question to Michael.</b>	He has never met a female plumber. In domestic plumbing especially there's no reason why they couldn't. You can go technical as well, it's not all about the physical.  <b>Mick-</b> Government goal of putting 600,000 heat pumps in by 2030. If plumbers specialise in heat pumps there will be serious demand.
<b>Regarding all the recruitment now, has the NZEB started encroaching on your teaching? (Plastering) (To Barry)</b>	Yes. Especially external wall insulation in the last 10 years. It has been introduced into the new curriculum. Most new houses are being done with external wall insulation. Going back to women being involved, it would be easier as it's much lighter to use. Insulated boards are half the weight of plaster. "NZEB is coming quick, whether we like it or not, and we just need to move with it".  <b>Mick-</b> Will there be a module that is an overview of all the trades and why they must be on the same page when it comes to NZEB?  <b>Barry-</b> Agrees that all trades should work together. E.g. plumber needs to know how to penetrate external wall insulation. They should "All work off the same module/hymn sheet". "With NZEB they're trying to bring us all along the same track".
<b>Opinion on NZEB? (Bricklaying) (To Joss)</b>	<b>Joss-</b> A lot must be done with the bricklaying. If they have the full fill, show them the right way to put it in. 150mm full fill is a totally different way of laying. A big overhaul needed in bricklaying. You have thermal blocks now. An apprenticeship would be the best way to show them. If the suppliers could weigh in it would be good (Roadstone, Xtratherm, Electric Ireland). "I've seen meter boxes hammered into place" (Brick layer's job). You could have a model of a house and bring in the different trades. Theory is no use to them (learning where

	<p>cement is made etc), they just want to understand it and know how to lay it. Keep it broad.</p>
<p><b>NZEB in Plumbing? (To Michael)</b></p>	<p><b>Michael-</b> They have started a new curriculum integrating NZEB.</p> <p>“There’s chaps going out on site there and they’re just cutting big holes in the airtight membranes and they don’t have a clue. They don’t fix it behind themselves. They don’t actually know if they have to fix it...We’ll train them, they’ll know they need to get the right tape, tape it up, they can’t just use ordinary gaffer tape and things like that”.</p> <p>Also insulating pipes, HRV will be a big thing. “NZEB...it’s all on the way. It’s a very good idea, keep up their standard of how things are done and done properly.”</p> <p><b>Mick-</b> Curriculum more technical because of new technology. Are the students taking it in?</p> <p><b>Michael-</b> Half the class will, half won’t. Plumbing is like electrical, if you don’t take on theory very well you should maybe do industrial (read drawings) rather than calculating space heating etc. You can go down a technical or non-technical direction with plumbing.</p>
<p><b>From your experience of knowing &amp; delivering NZEB &amp; being on construction sites, are there reoccurring practices happening where people are repeatedly breaking NZEB philosophy? (To Michael)</b></p>	<p><b>Michael-</b> Was working for a general builder doing extensions and large houses. Architect was sending out specifications, so they were building from drawings. Didn’t really know what they were doing. “We were actually doing the requirements of NZEB without knowing it. Insulation was just pushed in rather than trimmed...then foamed up with the proper foam. It’s the small little things that make the difference at the end of the day when the pressure test comes along”.</p> <p>Thinks NZEB should be advertised more. Six months ago, he asked the builder he used to work for had he done any courses, and the builder didn’t know what NZEB was. He’s 50/55 years old, talks to architects every day and has built plenty- he still doesn’t know. Architects just send out drawings without specifying that it should be NZEB compliant and the small things that need to be done.</p> <p><b>Mick-</b> Electrician was telling him that an issue with new heat pump installations is flow rate. Plumbers are putting too many bends in the return pipes, which causes a restriction that inhibits proper flow.</p> <p><b>Michael-</b> The pipes that go in the ground come in lengths and are in coils. If you cut a length off them, they won’t balance. You must keep the coil, use extra coil if you have to. He thinks plumbers are cutting the coils off. “You need lads who know what they’re doing, to control the lads that are throwing the pipes in the ground”.</p>

<b>Is there stuff you've seen with plastering? (To Barry)</b>	<p><b>Barry-</b> So many people who haven't heard of NZEB. They just know things are changing. The professionals know, but "the soldiers on the ground don't really know enough about it".</p> <p>Insulated slabs, insulated boards are not being fitted properly, not meeting at junctions, you have gaps. "These 10mm gaps in corners and junctions they're making a huge difference". They don't know any different, they need to be brought in on day courses and brought up to speed.</p>
<b>Have you seen things? (To Joss)</b>	<p><b>Joss-</b> Full fill takes longer. Price work on site affects a lot. A lot of guys try to put it in as fast as they can and cut corners. You'd want a clerk of works on site every day.</p> <p><b>Mick-</b> In the uk there is elements of building control. In his experience it never fully came in in Ireland.</p> <p><b>Joss-</b> Up to late 70s it worked. The clerk of works came up the scaffolding with his torch and checked. But "In the boom, I could have built a house upside down and nobody checked it". Worked for a major company who hired their own engineer, but they just suited themselves, it didn't work. Thinks you need an independent body.</p>
<b>To get half a million homes upgraded in the next 10 years, what should we do about the lack of workers? (To Barry)</b>	<p><b>Mick-</b> 2030 targets for retrofits. Goal is to deep retrofit (fabric first approach &amp; heating system) half a million homes.</p> <p>To get half a million homes upgraded in the next 10 years, what should we do about the lack of workers? (To Barry)</p> <p>Not enough centres of excellence for NZEB in the country. Get them set up quickly.</p> <p>NZEB needs to be advertised in schools, tv, radio.</p> <p>Should be put into the apprenticeship curriculum asap. An NZEB module.</p>
<b>Same to Joss.</b>	<p>Agrees that it should be brought into apprenticeships. But thinks you can't get the older lads in for 3 days, it'll cost them time and money. Can it be shown online plus a one-day practical course? Show them what to do.</p> <p>Also sell it to the customers. E.g. instead of telling them it costs 30,000, tell them what they spend on coal can be put onto their electric Ireland bill instead for next 20 years.</p> <p><b>Mick-</b> The financing of the deep retrofits is a hot topic.</p>
<b>Same to Michael.</b>	Agrees with Joss and Barry.

	<p>Maybe show the customers what an NZEB house is like. Have a show house, maybe in every big town, that they can walk into and experience on a cold/warm day. Let people see what they're buying in order to sell the product. If you can sell the product the trade should follow. No one wants to spend money on something that they don't know what it'll be like when it's done.</p> <p><b>Barry-</b> Could we maybe have a safe pass system with the current workforce? A 3-day course, you're then qualified, get your card and you can go on site. That you must show this card and you can't go on site without it.</p> <p><b>Michael:</b> Thinks it's going to take time to get done. We may have to add 5-10 years onto the 2030.</p>
	Stories, anecdotes, experiences
<b>Comments on the past.</b>	<p>Barry:</p> <p><i>"The change from traditional build to timber frame...it was a big changeover at the time...we had to do the insulation with no training for all the world".</i></p> <p>Michael:</p> <p><i>"I've seen a different side of things to what I was used to. NZEB was a thing we'd never really heard of on private, small housing schemes...But I'm learning and enjoying it."</i></p> <p>Joss: (During the boom)</p> <p><i>"There was no one watching anything... I've seen guys bust aeroboard with a hockey stick...where the meter box is, y'know there? Cut it 5 inches short or the nearest piece they'd find...no finishing off... No one checked it so no one cared."</i></p> <p><i>"I've seen changes that we had to change on the timber frames, say no this doesn't work anymore...people paid hundreds of thousands for these houses, are they rotten inside now?"</i></p>
<b>Attraction to the trades</b>	<p>Barry:</p> <p><i>"I finished a course in WIT last year...they brought in different builders and designers and I asked what they do to get more people involved in the wet trades. And one builder said 'there'll be no need for plasterers or block layers in the future...with all these houses that are coming ready-made'...and I said what about your conservation work and your retrofits?...he was taken aback a bit then, he obviously didn't think too much about it...there always will be a need for wet trades, they are starting to rise."</i></p> <p>Joss:</p>



	<p><i>"The money incentive isn't there...they won't pay wet time...I know block layers who were travelling from Galway to Athlone...80 miles of a trip...they often turned around at 11 o'clock in the morning, it's not getting fine, might as well go home. They got nothing for the day, the builders didn't care...at least give a man a wage."</i></p> <p>Michael: (About plumbing course)</p> <p><i>"The class of stuff we're teaching them...there's more interesting stuff in it now and a bit more technical, and the NZEB is a nice touch on top of that."</i></p>
<b>Women in the industry.</b>	<p>Barry:</p> <p><i>"I've never come across any (women plasterers) on site in 25 years...there has been 2 women apprentices over the years...they were excellent."</i></p> <p>Joss:</p> <p><i>I'm forty one years now in bricklaying and never seen a girl bricklaying...at the time it would have been very heavy lifting, maybe they might have shied away from that...the 6 inch block was a common thing back then...timber frame houses now it's not as tough...you have teleporters and all this for lifting...don't see why they couldn't try it."</i></p> <p>Michael:</p> <p><i>"Personally myself I have never met a female plumber...I don't understand why...you can go technical in it as well it doesn't have to be all about the physical."</i></p>
<b>Training in NZEB</b>	<p>Barry:</p> <p><i>"NZEB is coming in quick, whether we like it or not, and we just need to move with it".</i></p> <p><i>"Each trade has to work together...for example external wall insulation, when we're finished that, the plumber has to know how to penetrate it and things like that, getting services through. We all need to work off the same hymn sheet...With NZEB they're trying to bring us all together along the same track".</i></p> <p>Michael:</p> <p><i>"There's chaps going out on site there and they're just cutting big holes in the airtight membranes and they don't have a clue. They don't fix it behind themselves. They don't actually know if they have to fix it...We'll train them, they'll know they need to get the right tape, tape it up, they can't just use ordinary gaffer tape and things like that".</i></p> <p><i>"NZEB...it's all on the way. It's a very good idea, keep up their standard of how things are done and done properly."</i></p>

<p><b>Anecdotes: Breaking NZEB philosophy.</b></p>	<p>Michael:</p> <p><i>“I was working for a general builder doing extensions and fairly big houses. The architect was sending out the specifications, so we were building houses off drawings... We didn’t really know what we were doing but we were actually doing the requirements of NZEB without knowing it. Insulation was just pushed in rather than trimmed...then foamed up with the proper foam. It’s the small little things that make the difference at the end of the day when the pressure test comes along”.</i></p> <p><i>“It needs to be advertised a bit more...I asked that builder (that he used to work for) six months ago ‘have you done an NZEB course yourself?’...and he didn’t know what NZEB was...this man is 55 years of age or in around that age group. He should know by now, he’s after building plenty, and talking to architects every day of the week...I think the architects have taken it on board, and they’re sending out the drawings... and that’s it. They’re not letting us know that this house should be NZEB compliant, and there’s little things that need be done, the small things that make the difference.”</i></p> <p>In relation to heat pump systems being installed incorrectly:</p> <p><i>“The ones you put in the ground, they come in a length... and are in coils. If you cut 6ft off one of them, then they won’t balance. You have to keep the coil...you put extra coil in if you have to. I think the plumbers are cutting the coils off, that’s the problem...You need lads who know what they’re doing, to control the lads that are throwing the pipes in the ground”.</i></p> <p>Barry:</p> <p><i>“The amount of people I’m saying it to about NZEB and they’re saying, ‘what’s that?’. They just know things are changing but they don’t know what NZEB is. The site managers and engineers and architects all know what it is... the soldiers on the ground don’t really know enough about it, they’re not being educated enough”.</i></p> <p><i>“Mistakes I’ve seen being made are the likes of insulated slabs, insulated boards, they’re not being fitted properly, not meeting at junctions... you have gaps...you have the air escaping through. They don’t know any different, they’re just fitting them and plaster them up but these 10mm gaps in corners and junctions they’re making a huge difference... they have to be brought in on day courses... brought up to speed.”</i></p> <p>Joss:</p> <p><i>“I’d be talking to my buddies and they do be giving out about the full fill because they can’t earn what they were earning</i></p>
--	---

	<p><i>the week before that came in because it's slower... A lot of guys respond to money, they'll put it in as quick as they can and cut the corners... A clerk of works would have to be marching on the site- not calling along every Friday. You'd nearly want a guy on site every day."</i></p> <p><i>"In the early 80s/the late 70s it worked. He (the clerk of works) came up the scaffolding and he checked your cavities; he had his torch... But in the boom, I could have built a house upside down and nobody checked it... I worked for a major company and they hired their own engineer but he was only doing things to suit them, it didn't work. You need an independent body or something."</i></p>
--	--

## 4.5 Spain

### 4.5.1 Professional organisation (independent workers)

**Informant:** María Lladró (early 40s)

**Stakeholder group:** Independent workers

**Speciality:** Professional training and academic coordinator at FEVEC

**Date of interview:** 10.12.2020

General	
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• Although FEVEC has a training activity license, they need financial support to plan and develop the training sessions.</li><li>• This financial support depends on the public authority call requirements. For example, they determine the type of courses and the contents to be developed as a condition to receive the funds.</li><li>• The courses funded with public grants are free of charge for the attendees.</li><li>• The diploma or certificate is sent by email, as a PDF file. Due to the COVID epidemic, most of the courses are online now.</li><li>• FEVEC can run training sessions on its own, choosing the training type and contents. To make them useful, questionnaires are delivered among its associates to know their preferences and needs.</li><li>• Few courses about energy efficiency have been held during the last years, mainly for 2 reasons: the current situation of many companies due to the consequences of the economic crisis and the cost of elaborating and updating the energy efficiency contents needed to run the training sessions.</li><li>• These training sessions could be held and coordinated by professional associations and nationwide associations.</li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• FEVEC associates (construction companies) are demanding better trained energy efficiency experts.</li><li>• People are not aware of all this issue. Advertising campaigns or other promotion activities among the population are key to stimulate the demand.</li><li>• It is necessary to run a full diagnosis of the construction sector before launching any kind of initiative.</li></ul>

<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• If competent authorities promote these kinds of skilled professional profiles, companies will increasingly demand them. They will receive more requests from citizens and companies will be able to train their workers in this area to have more job opportunities.</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• Renewable energy expert is a promising career and in high demand in the labour market so it allows the EE-skilled professionals to join the job market almost immediately and more and more professionals of this profile will be needed. It is a job on the rise. The European Commission has set goals for 2030 and this is a motivation.</li> <li>• Companies must adapt their way of working to the sustainable development goals. Many of them are lost in the adaptation process. There has been a huge surge in demand for sustainability courses.</li> <li>• In the end, the change in the construction sector is not going to be so much of its own free will but because the product that is being required from a regulatory point of view, is much more in line with sustainability than what existed up to.</li> <li>• In the construction sector there is a lack of professionalization and there is a lot of intrusion. Companies need to bet on sustainability to differentiate from competitors and get an added value.</li> <li>• About construction professional awareness and commitment: In the organisation they have involved companies of all sizes and freelancers who work on their own. SMEs are committed and the self-employed are focused on survival.</li> <li>• There is no training offer, regarding the energy efficiency, adapted to already skilled professionals. We should bear in mind the difference between a student who is taking a professional training/lesson at the university and the need of accrediting skills for other purposes. We should know how to discern between a continuous training and short courses to acquire specific competences.</li> <li>• In reconverting the workers of a company, the tax declaration is essential for the training to be economically viable.</li> </ul>
<b>Integration of new technologies and</b>	<ul style="list-style-type: none"> <li>• FEVEC agrees with the development of an app that gives access to every user to their training credits.</li> </ul>

<b>addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• FEVEC also states that there should be a database where all the professional profiles are gathered and filtered to access the labour market, as an example.</li> <li>• In construction, the use of new technologies is being integrated. Autocad has gone down in history. The houses are made in an industrial warehouse that is why we talk so much about industrialization.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• Certainly, clients know more about this type of issues, they are more educated, also more aware of everything and they are more conscious about the living standard they want, so the matter of climate change in Europe is internalized. Young people are much more aware than other groups of people, since for example, they study what energy self-consumption is. Citizens need to know the benefits of energy efficiency.</li> <li>• Accreditation by experience is very necessary in the sector and should be strongly requested by companies and associations. FEVEC has been working on the workers certification for years, trying to launch an ambitious certification together with FLC and the Ministry of Spain.</li> </ul>
<b>Other notes:</b>	<ul style="list-style-type: none"> <li>• The current economic situation makes it difficult for construction companies to set internal CPD programmes to upskill their workforce talent. On the other hand, companies seem to be aware that sustainability should become a must in the business, not only from an ecological point of view but as a way of running companies.</li> <li>• It is very important to certify or support the current professionals working in the construction sector as the most part of them were not able to study and acquired their skills through working experience.</li> <li>• More effort from public institutions would be well received to continue creating awareness among the population and therefore, demand.</li> </ul>

#### 4.5.2 Building manager representative

**Informant:** Juana Blasco (early 50's)

**Stakeholder group:** Building managers (AAFF – Building managers association)

**Date of interview:** 14. 01. 2021

General	
<b>Adapt to the needs of our associates – A case for online learning</b>	<p><i>Due to the restrictions of the COVID19 pandemic we had to change our courses to online mode and ... it was a success. Our reach and number of people has skyrocketed.</i></p> <p><i>This shows that sometimes, it is not a lack of interest, but a lack of flexibility in the actions that we propose.</i></p> <p><i>The fact that many of our associates are attending our courses guarantees that they will be able to practice their profession with higher quality and this will contribute to a better service to the citizen.</i></p>
<b>The role of regulators</b>	<p><b>The role of the government is key.</b> It should pay special attention to information and awareness campaigns aimed at citizens and also to the training of professionals.</p>
<b>Condition on the market</b>	<p>There are few professionals in the construction sector with energy skills</p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• Currently they do not offer any platform of professionals but consider it very necessary since they still hire professionals recommended by other colleagues or friends.</li> <li>• Their objective is to create a platform for construction and renovation companies that work in the region. They would also be willing to join a third-party developed platform that meets their needs.</li> <li>• They imagine an online platform, supported by official bodies (Government, non-profit associations, professional associations, etc.) for greater confidence, and periodically reviewed to update the information of professionals (which is very changing). It is important that:             <ul style="list-style-type: none"> <li>○ the professionals themselves can upload the information under supervision,</li> <li>○ the platform is easy to use,</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ the requirements for registration do not discriminate against the small business (SMEs) or independent workers for low turnover,</li> <li>○ show the professional's knowledge, skills and competences but this is not always acquired with training.</li> <li>• Some associations offer lists of their associated professionals but do not value the quality of their work, so they are not useful</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• Professionals must be prepared but, above all, citizens must be made aware so that they demand more energy efficiency.</li> <li>• Citizens are already aware of hiring qualified professionals in general but not so much in professionals with energy skills.</li> <li>• When hiring a professional, the price criterion still prevails.</li> <li>• Awareness must be directed above all to citizens who are those who commission the work and to whom professionals must respond and satisfy.</li> <li>• But professionals must be prepared for when the time comes to act under energy efficiency parameters.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>• She considers that the role of the government is key and believes that it should pay special attention to information and awareness campaigns aimed at citizens and also to the training of professionals.</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• Due to the different backgrounds of its associates, AAFB offers assessment and many courses on different topics: legal advice, taxation, grants and subsidies, financing mechanisms, technical topics.</li> <li>• At present, and due to the restrictions derived from the COVID-19 pandemic, they have reconverted their courses to the online format (instead of face-to-face) and are really satisfied with the results obtained since the number of attendees has increased significantly.</li> <li>• In general, she considers that there are few professionals in the construction sector with energy skills. She believes that the existing courses are excessively complicated for the blue-collar workers and not adapted to their level of knowledge and real needs.</li> </ul>



<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• The shift of the sector towards digitization is inevitable but there is still a long way to go.</li> <li>• Independent workers and small companies should be supported in the progressive digitization, as they have fewer resources, and daily tasks do not allow them to spend time incorporating new features in their management.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• After explaining the action lines that the BUSLeague project is going to undertake, she has agreed with all of them: recognition, awareness, flexible training, public tenders and analyzing financing formulas.</li> <li>• As it is a more specific product, we have detailed the BUS app and she has expressed her enthusiasm for the idea and offered her collaboration.</li> <li>• Her daily activity is closely related to obtaining financing that will allow a community of owners to carry out the renovation of their building. She considers it interesting to include professional qualification requirements to the consumer loans offered by financial institutions.</li> </ul>
<b>Other notes</b>	<ul style="list-style-type: none"> <li>• Juana, on behalf of the AAFF association, offers to contribute to the project and makes her communication channels available to us to echo the achievements and results.</li> <li>• In addition to the web and social networks, the AAFF association publishes a biannual magazine (June / December) that it distributes to its 1,000 associates (on paper). This magazine is also available in PDF through its website.</li> </ul>
<b>Complicated courses</b>	The <b>existing courses are</b> excessively <b>complicated</b> for the blue-collar workers <b>and not adapted</b> to their level of knowledge and real needs.
<b>Awareness building</b>	<p>Special attention should be paid to building awareness through:</p> <ul style="list-style-type: none"> <li>• Publicly supported campaigns targeting citizens,</li> <li>• Publicly supported training of professionals.</li> </ul>
<b>Support to BUSLeague</b>	The AAFF association, offers to contribute to the project and makes her communication channels available to us to echo the achievements and results.

	<p>This includes both the <b>website</b> and <b>social networks</b>, as well as the <b>AAFF association's magazine</b>, which is published biannually (June / December) and distributed to its 1,000 associates (on paper). This magazine is also available in PDF through its website.</p>
--	---

### 4.5.3 Consumer association

**Informant:** Amparo Mocholí (mid 50's)

**Stakeholder group:** Building owners (TYRIUS – Consumer association)

**Date of interview:** 15. 01. 2021

General	
<b>Condition on the market</b>	TYRIUS receive many inquiries from associates asking for professionals to carry out home energy certifications.
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• These consultations are carried out because there is no reliable mean or platform in which the citizen can consult.</li><li>• Citizens consult the association because they trust it, just as they consult with family and friends.</li><li>• Private interests in existing public platforms detract from their trust.</li><li>• She considers the creation of a platform or registry of efficient professionals who offer a service with good value for money very useful.</li><li>• This registry should be endorsed by a public entity that gives it reliability.</li><li>• In addition, it must be updated periodically and exclude those professionals with complaints from consumers, which are very abundant in the sector, due to poor execution or abusive prices in emergency services (24 hours / Sundays and holidays).</li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• Information and training are key for consumer recommendations.</li><li>• The mission of the TYRIUS association is to inform the consumer in a clear and attractive language that arouses their interest in knowing more.</li><li>• It is in raising public awareness where TYRIUS can support the BUSLeague project.</li></ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"><li>• She considers that the role of the government is key and believes that it should pay special attention to information and awareness campaigns aimed at citizens.</li><li>• Financial grants and subsidies are also relevant for citizens to be able to undertake works in their homes.</li></ul>

	<ul style="list-style-type: none"> <li>• Every year they receive many inquiries about public aid from the Valencian regional government for the reform of bathrooms and kitchens, installation of efficient boilers and window changes.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• In order to adapt to new trends, TYRIUS spend more and more time communicating with their associates through digital channels: web, social networks. The future magazine will also be available in digital format.</li> <li>• It is necessary to advance in digitizing and offering online tools, but there is still a smaller percentage of citizens affected by the digital divide.</li> <li>• But in general, most citizens, including older ones, are motivated to adapt to the digital age and if they cannot access some tools and apps on their own, they ask for help from friends and family.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• Among its actions aimed at associates, TYRIUS organizes informative talks, training courses and creates content on its website and social networks.</li> <li>• In addition, TYRIUS will launch a magazine with relevant articles soon and she states that some BUSLeague proposals would be of interest to its associates.</li> </ul>
<b>Financial barriers (demand side)</b>	<ul style="list-style-type: none"> <li>• The consumer is reluctant to spend money on efficient solutions. Therefore, it is necessary to carry out an arduous work of information and awareness aimed at citizens.</li> </ul>
<b>Support to BUSLeague</b>	<ul style="list-style-type: none"> <li>• TYRIUS offers its resources to BUSLeague to inform and aware citizens but also to spread the results of the project that are useful to the consumer, such as the app.</li> </ul>

#### 4.5.4 Financial body

**Informant:** Jose María Díaz Rubio (mid 40s)

**Stakeholder group:** Financial body

**Speciality:** Financial Manager at Unidad de Gestión del Mediterráneo S.L.

**Date of interview:** 20.01.2021

General	
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• In the past, some entities linked a lower interest rate of mortgages to hire several financial products, but now there is new legislation to unlink it.</li><li>• At present, there is a specific banking institution that discounts the interest rate on mortgages based on the energy rating. The bank rewards you for buying optimal energy-efficient homes, but not all the institutions are still aware of these issues.</li><li>• He thinks it would be logical for insurance companies to improve the insurance premium by insuring more efficient homes.</li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• Nowadays, “home-staging” is more highly valued than energy efficiency arguments, so the price is not equated with the energy efficiency rating (EPC), but with other assessment criteria.</li><li>• Lack of awareness at all levels: clients and entities.</li><li>• Advertising and public grants are key to raising awareness.</li></ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"><li>• It would be interesting if public grants were given to developers or main contractors so that they could offer homes with a better EPC rating at the same price at those currently on the market.</li></ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"><li>• Their sources of information are the banks themselves. Now, they are not looking for innovative financing mechanisms in other sources because it is a very changing sector.</li><li>• Constant updating is truly important.</li></ul>

#### 4.5.5 Female worker

**Informant:** Marta (mid 30s)

**Stakeholder group:** Female workers

**Speciality:** Kitchen installer for Bauhaus

**Date of interview:** 26.01.2021

General	
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• She does not use any app or platform to promote her projects since she needs full time for her job as an installer for Bauhaus, but she considers it is fundamental, this is the future.</li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• Being aware of energy issues is mainly focused on household appliances. About the other elements, people do not ask, they think about the present investment, not the future.</li><li>• Clients do not usually undertake major reforms; they focus on the element that they need at that time.</li><li>• It is necessary to make the consumer aware so that they do not focus only on the aesthetic part.</li></ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"><li>• She believes that both professionals and manufactures of the products need to train/recycle periodically, even on a mandatory basis, as in health and safety training.</li><li>• She perceives a lack of training, especially due to the lack of time, but she considers that the means to make it possible and the contents already exist.</li><li>• Training in energy efficiency and the environment is essential. We are wasting a lot of energy every day.</li></ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"><li>• She considers public subsidies or fiscal measures to bet on building systems that reduce the ecological footprint are key to promoting energy efficiency.</li><li>• Public administration should launch, for instance, an awareness campaign.</li><li>• A greater awareness of the client on energy efficiency issues would be reflected in a requirement to the workforce.</li></ul>

<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>It is necessary to create systems or digital platforms where you can look for professionals and give you guarantees of their training through opinions, certificates, pictures, rating, comments from other clients and so on.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>Institutional support is needed to achieve a higher level of training, professionalism and legal stuff to increase trust in the process.</li> </ul>
<b>Other notes:</b>	<ul style="list-style-type: none"> <li>She is aware of the finance campaigns and grants, but her scope of works falls outside of it.</li> </ul>

#### 4.5.6 Regional Government

**Informant:** Nuria Matarredona Desantes (early 30s)

**Stakeholder group:** Regional Government

**Speciality:** General Director of Ecological Innovation in Construction. Valencia Regional Government (Generalitat Valenciana).

**Date of interview:** 03.02.2021

General	
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• People are aware but they find problems when it comes to materializing it. There is a lack of knowledge about strategies and getting a sustainable response. "People want it but do not know how".</li><li>• The role of the Public Authorities is key for awareness and pedagogy.</li></ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"><li>• It is necessary training of professionals capable of providing the service demanded by citizens.</li><li>• She perceives motivation among Public Authorities staff.</li><li>• There is a need for continuous training and retraining in innovation issues in construction.</li><li>• To motivate the team is basic to make them see that this is a time of emergency, that there is going to be a paradigm shift.</li><li>• It is important to have a platform of qualified or certified companies.</li><li>• Getting employers to see that investing in worker training results in getting access to contracts that they would not otherwise be able to access.</li></ul>
<b>Others (financial mechanisms)</b>	<ul style="list-style-type: none"><li>• The regional government has just launched a financial product called "Plan ASTREA" aimed at SMEs and independent workers to renovate their offices and workspaces in a sustainable way.</li><li>• Plan ASTREA consists of a very low interest loan with a non- refundable tranche. The Plan lists 30 sustainable measures, some of them are mandatory and others are optional. These measures do not include the hiring of qualified professionals but could be added in the future as the measures will be reviewed periodically.</li><li>• At the end of 2020, the regional government launched the so-called "Plan IRTA" to co-finance sustainable</li></ul>



	<p>construction projects and works that promote innovation applied to the sector.</p> <ul style="list-style-type: none"> <li>• It consists of grants from 50% to 95% of the budget for the action. So far, 49 actions have been co-financed. In future calls, the inclusion of EE-skilled professionals could be evaluated.</li> <li>• All granted actions will be compiled in a publication during 2021. In this way, positive examples and references are provided that are inspiring to others and allow us to advance on the path of awareness and dissemination.</li> </ul>
<b>Others (public procurement)</b>	<ul style="list-style-type: none"> <li>• In 2020, the Valencia regional Government published the "Green Guide: Environmental measures in public procurement of buildings". This publication consists of fact sheets where environmental measures are described and examples are added.</li> <li>• This Guide supports the Generalitat Valenciana during the process of contracting and managing public sector contracts, with the aim that environmental criteria are incorporated into them.</li> <li>• The "Green Guide" includes passive design measures, active for the rational use of natural resources and sustainable or recycled products and services.</li> <li>• She would find it interesting to create a clause to incorporate blue collar-workers, but it is not recognized right now. She thinks that this is a way to foster it.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>• The construction sector must adapt to new times and integrate innovative products and systems offered by the market.</li> <li>• For this reason, the regional government is testing innovative solutions in three real buildings, which will serve as an example and inspiration to the sector.</li> <li>• Specifically, these 3 pilot experiences will be carried out in the construction of a new building in Valencia, the deep renovation of a building in Castellón, and the renovation of a building with heritage value in the city of Alcoi.</li> <li>• The regional government also promotes the organization of contests to learn about new ideas and discuss innovative approaches that respond to a changing society.</li> </ul>

<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>Regarding the proposed App, she thinks it is interesting but sees that the current examples do not quite work. An analysis about the reason why not should be carried out. Word of mouth is still working a lot, making it difficult for new profiles or companies to enter the market.</li> </ul>
<b>Conclusions</b>	<ul style="list-style-type: none"> <li>As stated above, the collaboration of the Generalitat Valenciana in the BUSLeague project can be carried out through: the 3 pilot buildings (case studies), Plan ASTREA (financial mechanism), Plan IRTA (financial mechanism + awareness), and Green guide (public procurement).</li> <li>For this, it will be necessary to advance in the planning of tasks and the creation of working groups in which staff from Generalitat Valencian and IVE participate.</li> </ul>

## 4.6 The Netherlands

### 4.6.1 Female worker

**Informant:** Johanna Binnenhuis, around 50

**Stakeholder group:** Female, manager at worker development fund

**Speciality:** Project Manager Diversity and Inclusion, Entrepreneurial Women

**Date of interview:** January 13th, 2021

General	
<b>Testimonial</b>	<p><i>“Everyone needs training. So not just the preliminary stage for side entrants and then letting them go. Also in them: keep investing. It is precisely these people who continue to include them in their work, the company and their development.”</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"> <li>• Less self-confidence: this is true for women, but not generally. Self-confidence is often related to knowing. Recognition can certainly play a role in this as proof of knowledge. Recognize for women, so this should definitely be done. Recognition certainly has added value, it can certainly work in training and self-image.</li> <li>• The place where the recognition is obtained is not important, but whether this fits well with work / living practice. It does not necessarily have to be on the construction site, or just outside work in a training center.</li> <li>• Employers are not fond of training: then they miss their people, then they cannot do the work.</li> <li>• Recognition can be done, for example, through inhouse schools/training centres. Breman is a good example, they provide further training as needed.</li> <li>• Linking recognition to further training as a reward works well and stimulates. This also makes it very attractive for employees to come in their free time, if this provides them with a tangible something that shows what they know and can do. And this will also help women to prove themselves. Also do this for small training parts, such as a toolbox meeting on a specific topic or technique.</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>• There is a big difference between electrical technicians and mechanical technicians: electrical technicians continue to learn and know that this is necessary, mechanical technicians are much less learnable, although there are always inquisitive early adapters there.</li> </ul>

	<p>Mechanical technicians need to be drawn much more to get them to learn and their employers don't push them</p> <ul style="list-style-type: none"> <li>• Women in the installation sector are often the owner's wife, especially in the SME sector. These women are a great entry point for learning and development, because they often find this an important theme. A factor in this is that the entire administration and HR framework (Johanna used the word 'HR-rimram', free translated by me: 'bullshit paperwork', about labour laws and rules, needed to have workers in your company) in organically grown companies often ends up with the wife of the entrepreneur.</li> </ul> <p>KEY: And they do find development important, conduct the evaluation interviews, etc.</p> <ul style="list-style-type: none"> <li>• An aspect of individuality in women is that they are much more likely to ask the why question when acquiring knowledge. Of course this can have a limit, but it is still necessary to ask questions.</li> </ul> <p>KEY: The background of asking about the how or why question is usually a need to understand the knowledge and the bigger picture. Sometimes uncertainty is the background, usually curiosity.</p> <ul style="list-style-type: none"> <li>• Language is also an issue: language appears to be necessary, especially with further training.</li> </ul> <p>CS: For VCA [course on basic safety rules; DW], the material on the construction site is available in 25 languages, but Dutch is still required for mutual communication. If someone in a security situation shouts 'Stoop', it must be understood. That is why we (the installation sector) work with language buddies: employees who work with language once a week and help with language problems, important! [Language buddies help with language, they are not teachers of Dutch as a second language; DW].</p>
<b>Other notes</b>	<p>KEY – including diverse groups in your company asks a safe environment, not only on labour themes (SHEQ) but also social. This topic was discussed in reaction to a question about female only activities.</p> <ul style="list-style-type: none"> <li>• But: Safety in the sense of SHEQ is already a challenge to organize, sometimes. Social safety is a big step further. Social safety involves perceived safety for everyone. The choice is whether or not to invest in this, as this determines the success rate of projects for inclusion, such as more women in technology.</li> </ul>

	<p>KEY: the choice to not invest results in don't profit from diversity and the added workforce from the different groups. Example: diversity gives a fresh sight. But to the existing workforce diversity and the fresh sight can feel unhappy unsafe.</p> <p>CS: SHEQ is a not completely correct translation of ARBO. ARBO is an abbreviation of 'Arbeidsomstandigheden', translated: 'working conditions'. ARBO is nearly the same as Safety and Health (the 'S' and 'H' from SHEQ). In The Netherlands, ARBO is a widely used term.</p> <p>KEY – diversity means that al different groups may be attended in an organization or company, inclusions means that everyone is included in all activities. Example: diversity means that women may work in the company, inclusion means that they have the same rights and opportunities, i.e. for personal development.</p> <ul style="list-style-type: none"> <li>• Inclusions means also: give attention to the worker as an individual. This has to be done by owners, HR-employees foreman etc. Connect to your target group. These women [the wives of the entrepreneurs as mentioned elsewhere; DW] give the employees the attention they need to make inclusion a success. This certainly pays off.</li> </ul> <p>CS: An example of individuality: if girls, just like boys, have to get a key for the toilet, then that is not nice. Certainly not if the cause is that the boys do not keep the toilet clean.</p> <p>KEY: This realization is particularly necessary when working on diversity and inclusion: everyone has their own needs, facilitate them in this. But let everyone fully participate at the same time.</p> <ul style="list-style-type: none"> <li>• In the interview the theme of female workers was broadened to all minorities, just as LHBQTI, workers with a migrant background, disabled people, 'zij instromers' ('lateral entrants'? These are people who work before their entrance to the installation sector in a complete different sector, just banking, nursing; DW) etc. For example, programs to make women work in the installation sector are being developed into a program to make migrants work in the sector. Reaching to female workers they are strengthened in who they are: you may take your own place. In the program for migrants, this part is complemented by work ethic and work habits. Example: in Uganda, when it rains, you stay at home and you don't come to work, because coming to work can be unsafe. In the Netherlands we continue to work, we do not just wash off the street and the street does not just play away.</li> <li>• Diversity means more than words, you (the entrepreneur of employer) should show it in pictures,</li> </ul>
--	--

	<p>actions, company policy etc. And therefore: don't disagree with the needs of a specific minority.</p> <ul style="list-style-type: none"> <li>• To include women and other minorities in the installation sector and in your company it is important to make your recruitment interviews done by a diverse commission.</li> <li>• A big problem is the prejudices about women: they get pregnant quickly, seduce my male staff and want to work part-time. To include women, these prejudices had to overcome. Johanna tells a story about a lecture she gave to some employers (all male, all from a SME):  <i>"They don't like the theme of female workers in the installation sector. But after telling that The Netherlands has less female workers than the masculine Italy, they go to another mode: we had to beat the Italians. From that point in the lecture the employers listened and in the next years start to diversifies their workforce."</i></li> </ul> <p>CS: NL is at the end of the rating lists of EU-countries when it comes to female workers in the technic sectors.</p> <ul style="list-style-type: none"> <li>• A safe environment is more than SHEQ, it is social. This means also to tell al new workers the unwritten rules. Johanna is from the south east of the Netherlands. An unwritten rule is: On your anniversary you buy flan from the bakery (not from the supermarket or a department store) to treat to your colleagues. When you buy them elsewhere, your colleagues will tell you your fault for an half year or so. That's not nice.</li> <li>• In practice, it appears that popi-jopi technicians often afford quite a lot towards minorities such as female employees or migrants. What is striking is that the behaviour of these technicians often coincides with good workmanship of these people, which means that employers do not take corrective action. Dealing with this therefore requires leadership to create a safe working environment for minorities.</li> <li>• An important factor in working on inclusion is to include existing employees in this. For them it is also a change in culture, sometimes no longer being able to speak and act as before, etc. So employers who consider that they want more with women or other minority groups will have to embed this in the development of the organization. So do not impose, but prepare, for example via a toolbox meeting.</li> </ul> <p>KEY: Let existing employees speak freely in small groups about what they think of new employees who bring diversity. It is precisely then that the opposition is invalidated.</p>
--	---

	<ul style="list-style-type: none"> <li>• Diversity is a fragile theme to build up: Yvonne refers to an article in the AD (a newspaper also read by blue collar workers) about women in technology. Many positive developments, stimulus helps. But a negative article, whether it's about being fired or about a woman who feels or has been treated unfairly, much of the stimulating work has been in vain.</li> <li>• When workers from minorities come to work in your company you have to give them a good start. How are newcomers triggered to participate and how are they consciously included in the culture, but also vice versa: how does the culture become such that newcomers also feel at home. And: This on boarding training, especially for minorities, also means: offering a place to ask questions, explaining unwritten rules etc.</li> <li>• But it is not only a good start: there has also to be a good follow up. The evaluation, after women have worked in technology for a period, shows, among other things: that the evaluation must take place earlier, that women are not taken for full but often even kept small: you have been hired for something and are therefore tolerated, but may not grow and not develop further, while the women want this. This therefore requires thinking differently in the company where they will be working. For the companies and the parties [mostly branch organizations; DW] with the women in technology projects the following therefore applies: keep a finger on the pulse (non-literal translated: stay alert), women have the same rights and therefore allow these to be there for them. Minorities, such as lateral entrants, must also be permanently included in work, the company and their development.</li> <li>• About the female only activities: don't do this. But it is important to create female only moments, so they can speak freely about female topics and working as a minority in the installation sector and the challenges this has. To reach the women, it is a good idea to join existing channels. Working regionally, for example around a company with an exemplary role, is a good one.</li> </ul>
--	--

#### 4.6.2 Training centre Rep's

**Informant:** Seth Enosson (end 50's)

**Stakeholder group:** Practical Training Centre, director

**Speciality:** director education

**Informant:** Nathan Joas (mid 40's)

**Stakeholder group:** Practical Training Centre, director

**Speciality:** director of a regional branch

**Informant:** Dave Jesseson (early 50's)

**Stakeholder group:** Practical Training Centre, Employee

**Speciality:** Business Developer

**Informant:** Jozef Jackson (mid 30's)

**Stakeholder group:** Practical Training Centre, Employee

**Speciality:** Manager Education & Training

**Date of interview:** January 19th, 2021 (all)

General	
<b>From the private life of Seth</b>	<p><i>And now I had a mechanic over here and he installed a beautiful new Vaillant boiler four or five ago and that was it. I did not have the presence of mind, [the boiler] should not be adjusted hydronic, because I did not know the whole word hydronic adjustment [...]. And I absolutely did not have the presence of mind, why is my extractor hood [above the hob] actually not working so well? Yes, that's because it has never been serviced for 15 years, so probably all the channels are silted up. If that man had visited me and he had said to me: Mr. Enosson, in addition to the fact that I am hanging a new boiler here, I will also adjust it on the water side, you can also do this, you can also do this, you can that too, then I would have said: do it. Of course I can also say that, because luckily I have a few pennies in the bank that I would like to spend that E 100 or 150. But he did not tell me, I did not have that consciousness at that time, I say that they [who tell] are the mechanics of the future.</i></p> <p><i>And then, in addition to the fact that on the one hand, we should perhaps try to train that technician more widely and give him advisory skills, and [...] then the customer should also stimulate that demand. Because if that technician doesn't say that, but at a certain point he starts getting that question from more and more customers, then he might go back to his boss, says: [...] who shouldn't even be doing ventilation, or we shouldn't do anything about hydronic balancing either, because a number of customers ask me about it. So we can now soon also in this project on the one hand train those mechanics more broadly, on the other hand, I say, should the government, or whatever, I say public</i></p>



	<p>campaigns be started that the public will go there that question set.</p>
<p><b>From the private life of Dave:</b></p>	<p><i>I would also like to add, to bridge the gap to the carpenter, for example, because a few months ago I got new interior doors from the kitchen to the hallway and from the pantry to the kitchen and that carpenter was going to hang those doors in my house. And then he said, he was measuring him. And then I said, how much crack do you leave at the bottom. He says: as little as possible because you want as little draft as possible. I say: I want 1.5 cm there, because I want a good flow. Then he sat looking at me, then he said: you are the first to ask. No, but in the meantime I had co-written the residential ventilation course, so I knew that it was according to the building code, I have natural ventilation with extraction above [system B, DW], that I had to have through-flow. But I, by which I mean to say, that carpenter does not know anything about it either.</i></p> <p><i>2 years ago I had new window frames installed with triple glazing. And I asked: shouldn't there be a [ventilation] grille somewhere? Then he said: no, sir, that gives only draught. There is a lot to do there, if you put it broadly, regardless of what Jan has about skills, so those soft skills are important. I am sure that our largest target group for the ventilation of homes is the central heating technicians, because they come by every year [for the annual maintenance, DW] and they could have said to me: you must have that strip under the door take away, because you take out all of your ventilation ... and so on.</i></p>
<p><b>Testing and recognition of Energy skills</b></p>	<ul style="list-style-type: none"> <li>• At this moment the interviewees don't do upskilling and or recognition on the workplace. But the idea seems very interesting to them.</li> <li>• Examination or testing of upskilling is done in a safe spot, i.e. the practical training centre. This makes testing easier and safer.</li> <li>• Jozef told: <p><i>"the quality of those training is expressed in the performance interviews that these people have: that man simply has to do his job well and not who can make the best report or the best knowledge test."</i></p> </li> <li>• Testing and recognition of upskilling for EE-skills gives a certificate, based on the showed craftsmanship for that skill. Dave told: <p><i>... you receive that [certificate] based on the trainer's judgment and that trainer's judgment is based on: I have I</i></p> </li> </ul>

	<p>been present all, 2 have I been active every day and 3 I have the practical assignments in which I show the skills I come for. Have I [...] completed it qualitatively well? And based on those three components, a trainer says: you will receive the certificate.</p> <ul style="list-style-type: none"> <li>And how has the instructor to test? Nathan told:           <p><i>“the basic idea is actually very simple with us. I always say to my instructors, if these mechanics are at your door tomorrow, regardless of whether he is a nice guy or not. But in terms of skills, you let him in or not. If you don't let him in, he could never have gotten his certificate.”</i></p> </li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>See the two stories on the page before. It is important to make the general public aware of all things possible to maintain and optimize in their house and why. This gives a strong boost on the questions the home owners ask to their installer and they know on which topics they had to ask for optimization, service or maintenance.</li> <li>A topic in the awareness campaigns should be the return on investment. Sometimes the public meaning is: it has to be cost neutral. But is that a fair point of view? Of course: when the NZEB installation is more expensive, a part of it should come back by lower exploitation costs. But maybe there is also an increase in comfort. And: on some stuff you lose always money, i.e. a new car or the new doors of Dave.</li> </ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"> <li>An important factor to choose for upskilling by the employees of HVAC installation companies is the existence of subsidy schemes for the upskilling. When governments or the Training and Development Fund have a subsidy scheme for training for a given topic, the installers recognize that training as important and are more willing to upskill on this topic.</li> </ul>
<b>Lack of motivation, time and trainings on the side of construction sector professionals</b>	<ul style="list-style-type: none"> <li>In the interview we spoke mostly about the HVAC or mechanical installers, not the electrotechnical installers. For this installers, they mainly start training in response to extrinsic stimuli. The intrusive motivation is often present in their speech, but this does not lead to actual training. Extrinsic factors include legislative changes, an increase in customer demand or new qualification requirements. But when the employees have followed the upskilling, mostly the reply something as:</li> </ul>

	<p><i>“yes, it helps me anyway. Not only is it necessary, I also see that it seems to improve quality.”</i></p> <ul style="list-style-type: none"> <li>The interviewees have different experiences with the motivation for upskilling. On the one hand the installers say: I’m busy, busy, busy, to busy, on the other hand: when the annually blue collar workers days are held at the training centers of Seth and Nathan, organized by the branch organization of the installers Nathan has at his own centre about 50 or 60 employees of installation companies, every evening.</li> </ul>
<b>Integration of new technologies and addressing new societal and technological trends</b>	<ul style="list-style-type: none"> <li>The following quote shows the need for further upskilling installers, not only on technical or single EE-measure topics, but also on soft skills as advising, guiding and integrated systems. <p><i>“so we have to do much more to raise awareness, how is that going. And you cannot sell a heat pump as an alternative to the central heating boiler, no you have to sell a system and there is much more to it than just that heat pump, only then can that thing be realized.”</i></p> </li> <li>For the interviewees it is important that they can develop their own upskilling and qualifications, not ruled by some formal institution or Ministry. Than they can work in a proper way, adjusted to the practical needs of the installation and building companies, on developing upskilling for NZEB.</li> <li>The interviewees want to keep it as simple as possible, as practical as possible and with only the need to know theoretical knowledge transferred during the upskilling. This is a trend against the bureaucratic high over way of thinking about qualification schemes and formal schooling.</li> </ul>
<b>Other notes</b>	<ul style="list-style-type: none"> <li>Collaboration is key: willing together investing and developing in short, practical, recognisable training. And put the energy in little, reachable steps in the field. Don’t loose energy on trying to change bureaucracy.</li> <li>Systems and structures of qualifications and recognition has to be interconnected. The problem is not that there are different systems, but that they cannot interact whit each other or that recognition cannot be exchanged between them. And part of the recognition will be that you can give evidence that you have learned on the spot, not only theoretically.</li> <li>Flexibility and modularity in training is important for the success and gives the possibility to make customized trainings and upskilling, adjusted to the needs of the employees and the companies. Both of the</li> </ul>

	<p>organizations of the interviewees are working on this. They do this in such a manner that if needed people also fit to the national qualification structure and can have there formal diploma (and not only certificates). [Formal diploma's show a specified level of education and are widespread recognised. Without formal diploma it is more difficult to show your work and think level, DW]. About modularity: Nathan told that when their students tell about which modules they start to follow, the colleagues of the students can also involve when there are not too much students enrolled in that training module in the practical training centre.</p> <ul style="list-style-type: none"> <li>• To stimulate upskilling both organizations are working on concepts of walking-in learning or all you can learn concepts. This means: you buy a given amount of upskilling for a year (i.e.: three days for each of your employees) and the employer or employee can follow the training they like or need. Hereby you can choose to walk in when the practical training centre is open for this to ask about something to learn it (i.e. working with connectors of floor heating systems)[this has something in common with toolbox meetings, DW] or choose a training from the scheduled trainings. It is important that this training is offered nearby, the 40 training centres of the organization of Seth and Nathan offer this possibility in the Netherlands.</li> <li>• Courses and upskilling training has to be short. Better a lot of short trainings or upskilling activities than one long one. And not only theoretical (this part of the training is possible by the BUS-app): every training should have a practical part in it, because doing and smelling or feeling what you do is the most important for the blue collar workers in the installation sector. This is not only a question from the people to be upskilled, but also from the companies where they work: there bosses know that the workers only want to learn the knowledge they need. When there is too much not needed knowledge or stuff in the training the attendees quit, at least in their mind. All interviewees have a strong aversion to the broad education advocated by the bureaucratic institutions.</li> <li>• To make upskilling activities a success it is needed they are adjusted to the needs of the companies who apply the EE measures and NZEB systems. The interviewees have learned this from the program for home ventilation they have developed in good cooperation with the manufacturers and appliers of the ventilation systems and their branch organization Binnenklimaat Nederland. In this case it works just fine and was key to the success. For upcoming needed upskilling they will again work closely to the appliers, installers and if needed the manufacturers and suppliers. Part of the</li> </ul>
--	---

	<p>communication with the field will be kind of certificating, testing and recognition of the skills and the needed qualification structure.</p> <ul style="list-style-type: none"> <li>• Upskilling is about being able to do in practice, not knowing how to do theoretically or knowing what is calculated by the system designers at the office of installation company.</li> <li>• We have a serious part of the interview spoken about the relation between the practical training centres and the product suppliers and manufactures on the impossible to organize collaboration between them for upskilling the appliers (installers etc.). One reason is the difference in mission of both type of organizations: practical training centres will well trained people, suppliers and manufactures will sell their products with as minimum as possible troubles, malfunctions etc. Theoretically it seems a good combination to split the upskilling for EE-measures and systems: the training centres train the basic and the needed theory in a general way and the supplier or manufacturer give the product specific training. But talking for years (sometimes 3 or 4) don't lead to a collaboration on training and upskilling. The main problem seems the complete different way of acting of the organizations and the costs of the basic part of the training at the training centres. Another difference between the suppliers and manufacturers and the training centres is that the first two train for their own product and the training centre for applying all types and manufactures of that EE technic.</li> <li>• For new products, just as heat pumps, the media are key to success. The organization of Nathan build some years ago training centres for heat pump training. Shortly after the opening of them, heat pumps were nagtive in the media and: subscription to the training for heat pumps drops seriously.</li> <li>• About needed skills: the employees (i.e. those who maintain or replace systems) should not only know their own expertise (i.e. Heating of Ventilation) but at least the basics of all the four kind of installations of the acronym HVAC and have the be aware of al quick fix action for a good performance of the existing systems and about possible upgrades towards NZEB</li> </ul>
--	--

#### 4.6.3 SME employee & professional energy advisor

**Informant:** Adam Sethsson, age: between 30-35 years old

**Stakeholder group:** SME employee; advisor, company who runs energy counters

**Speciality:** advisor energy counters to local governments

**Date of interview:** 28-1-2021

General	
<b>Adam about webinars</b>	<p><i>“But we actually see that remotely via webinars works quite well. There are more people who ask questions in a Webinar, at a physical meeting there are often a few people who are either very critical or ask a lot of questions. But a lot of people don't feel comfortable doing that. While online, yes, if we ask a question to the group, almost 80% answer such a question, say a poll. There is then again more chatting. There is actually more interaction, it almost sounds paradoxical. In terms of age, we also reach younger people. For example, people who do not come to physical residents' evenings because they have young children. They can now [have] the kids in bed, [or the children] play for an hour or so away [in the room] and they [the homeowners] check in on such a webinar, say an hour. So that actually has quite a lot of advantages from a distance.”</i></p>
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• In the Netherlands recognition and certification are on company level. This means that sometimes a company can show everything needed, but their workforce don't have live the certification and recognized skills. Adam is therefore searching for the best certification and recognition systems to differ the good from the bad. Only some skills are personally recognized, but this is mostly from a safety point of view. Adam also say it is very useful to know which certification or qualification tells the best about the skills who a blue collar worker have for a given EE measure.</li><li>• A way to offer qualified builders and installers is the use of a review system where home owners can give their experience with a builder or installer of a measure. For the organization of Adam, the reviews are the key measure. But it is not only a review system: the system has some kind of interaction, i.e.: when you choose the happy symbol by the review of the offer done to you, the system replies "Nice", when you choose the unhappy symbol, the system creates a call back request and the next day the unhappy home owner is called by a worker of the energy counter to solve the problem.</li></ul>

	<p>This makes it possible to redirect a bad experience with taking EE Measures into a good experience.</p> <ul style="list-style-type: none"> <li>• In the projects guided by Adams organization they don't use something like the NZEB clause. They also aren't working on upskilling or recognition of skills on the work spot.</li> </ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"> <li>• Raising awareness to home owners to take some EE-measures has the best results when at first the whole story is told about all the measures which are needed to come to NZEB and the why of NZEB. At second, one measure of the complete set of measures needed is brought to attention and offered to the home owner. Home owners can't oversee the complete picture of alle measures. But because most of them like to take action to sustainability, they have and want to be guided to take a specific measure. Adam told that this works fine, because people don't have to act with the complexity of all measures at once, they can put this complexity-problem out of their thoughts and focus on the measure they are able to take, guided by the energy counter.</li> <li>• •A huge topic in collective actions is building trust between the building / home owners and the installation or building company who will realise the EE-measure. Adam told they invest a lot of time and effort in this, by selecting companies with a system of about 60 or 70 criteria, building a relationship between the company and the building owners in advance of the project and giving clear and complete information, i.e.: our working hours are..., when we break up the pathway in your garden, we rebuild it, we use facemasks when we go inside your home etc.</li> <li>• To reach the general public, i.e. home owners, a group specific approach is needed. In the case of energy counters the organization of the interviewee has three different type of energy counters, for howe owners, for owners associations of apartment buildings and for SME's who own their building. Reasons are the difference in information needed and legislative differences.</li> </ul> <p>CS: Energy Counters have different goals:</p> <ul style="list-style-type: none"> <li>○ To create awareness</li> <li>○ To offer information and advice on request to single home owners, i.e. about EE-measures and</li> </ul>

	<p>builders or installers who can apply the measures. They guide the home owner or building owner, ending with a review of the applicant of the EE-measure. In the process, when the building owner choose to take an EE Measure, they handle over the building owner to an applicant as a warm lead. There is no contract for application a measure between Energy Counter and building owner.</p> <ul style="list-style-type: none"> <li>○ To make collective actions on one EE measure i.e. PV-systems, insulation, LT-heating or Heatpumps.</li> <li>• On collective actions the energy counter and local government use an active campaign to reach the building owners in a neighbourhood to take a specific measure. The energy counter guided the complete process from the first general information, selection of a contractor, financing etc. to the aftersales. By projects who are part of the wijkaanpak, Adam told that good and right information is also key. Only stakeholders who can together give just in time, just in place the right information, are able to create a successful project to transform a neighbourhood. [Of course there are other reasons due which a project fails, DWJ]. In case off the wijkaanpak, there is more pressure on the building owners to take the EE-measures then by the collective actions and the change in their way of live can be bigger, because in most neighbourhoods the aim of the wijkaanpak is to fade out the use of natural gas for heating and cooking.</li> </ul> <p>CS: wijkaanpak (literally: neighbourhood approach) is the action plan to transform the whole build environment to natural gas free. Every local government has made a plan for every neighbourhood which solutions are chosen (i.e. district heating or a heatpump for every building) related to the specific situation of the buildings in that neighbourhood. By development of the executing plan for a specific neighbourhood, involving the building owner is key to success.</p>
<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<ul style="list-style-type: none"> <li>• For the wijkaanpak, thus on the level of neighbourhoods, only the big installation and building company have the capacity to do this. And local government thus ask only them to realize the EE measure in an complete neighbourhood. The SMEs are only asked as a subcontractor, the request from the local government to them is therefore only indirect.</li> <li>• Subsidy schemes. None of the known local governments asks for recognized EE-skills in their subsidy schemes. It is not a topic in mind of the local</li> </ul>



	<p>governments. And when Adam and or his colleagues are asked for some advice it is about understandability of the rules and clearness of the information.</p> <ul style="list-style-type: none"> <li>• Subsidies are a kind of procurement, seen from a legal point of view. In normal procurement sometimes there is some attention for certifications or quality, but this is normally on the company level and about formal issues. Recognized EE-skills are never part of public procurement.</li> </ul>
<p><b>Integration of new technologies and addressing new societal and technological trends</b></p>	<ul style="list-style-type: none"> <li>• Huge attention has to be given to the integration of sustainable measures, because measures interact with each other: i.e. LT-heating needs a different heat delivery system (floor heating) than HT-heating. And in a bad insulated house, a LT-heating system is impossible. So, when a single measure is taken it can make the next step needed to bring a building to NZEB impossible. In most situations only with an integrated system approach NZEB is reachable. But home owners don't have the skills to handle this complexity, so they need good advice. When given good advice to the building owner and guided well, the complexity problem can be overcome.</li> <li>• The other problem of integrated concept is money: most of the home owners can pay the costs of a single measure. But the costs of realizing an integrated concept are usually too high for home owners, so financing or subsidies are needed, or, but that's technically not always possible, the measures are implemented one by one over a period of time.</li> <li>• Not only skills or knowledge for technical integration is needed, also skills for giving advice, building survey, guiding customers and building owners etc. And also in this softskills it is needed to think integrally about the EE-measures. Only with all these skills together it is possible to give people the good feeling to step into the unknown of taking EE-measures and to realise the EE-measures in a proper and sustainable way.</li> <li>• On collective actions, the builder or installation company has sometimes also to give some added service, i.e.: making the request for VAT-refund for the home owner.</li> </ul>
<p><b>Market demand and uptake of prospective BUSLeague solutions</b></p>	<ul style="list-style-type: none"> <li>• Installation companies are often chosen by relation: know I the owner of the installation company, know other people him or her? The question of recognition isn't asked in these situations, the most important selection criterion is: know we each other.</li> </ul>

<p><b>Other notes</b></p>	<ul style="list-style-type: none"> <li>• Local governments asks often to include the voluntary Energy Coaches in the services of the Energy Counter.</li> <li>• CS: Energy Coaches are volunteers who give advice to home owners, how to make save energy or use sustainable energy sources.</li> <li>• The success of an energy counter is measured with different KPI's: how satisfied is the local government, how satisfied are the building owners / residents and: how big is the realized impact in CO2 reduction. The energy counter is thus part of a network and the local government not only assigns the energy counter, but remains involved.</li> <li>• Energy Counters have to tell the truth. This means: don't work with general information only, work case specific. This means: know the building, know the neighbourhood and know the policy of the local government for that neighbourhood. And: before a building company or installation company is asked for a deal and to take the EE-measure, the energy counter sends an advisor with specified skills to the building to know the specific context well and bring out a customized advice for the specific measure or the integrated concept. [The advisor needs the right skills for this! DW]</li> <li>• Local governments want all builders and installers in their municipality to benefit from the sustainability. The energy counter only wants to show good builders and installers on their platform to the homeowners, but cannot easily exclude them in case of bad service or no certification. Due to the previously described review system, the good and the bad are still separated from each other and Adam's organization overcomes the dilemma, without having to actively exclude parties by themselves.</li> <li>• To give every builder or installer a good change, Adams organization has an account manager who assist them to present themselves well on the platform, i.e. to show all their certifications in the right way. This gives the installer or builder a higher place in the ranking.</li> <li>• An integrated approach asks a lot of different knowledge. To much and to different to be held by one person or company. This brings in the need of working together to reach the proposed goals. I.e.: knowledge of advising home owners or making a integrated plan differs from applying a measure. For the organization of Adam this is the reason why they work together with other company i.e. on building surveys. And also the</li> </ul>

	<p>training of people is not done by the organization of Adam, they outsource this or they contract all experienced people in this area. After all, training is not the expertise of Adam's organization. By working together it is important that someone, in this case normally the Energy Counter, will have the overview of the project.</p> <ul style="list-style-type: none"> <li>• Due to the shortage of enough experienced workforce, Adam told that sometimes they did the planning or other assistance tasks for a collective action for an EE Measure. In this way the applier of the measure can do his specialism as much as possible in the given time.</li> </ul>
<b>Wijkaanpak – a Dutch transition strategy</b>	<p><b>wijkaanpak</b> (literally: neighbourhood approach) is the action plan to transform the whole build environment to natural gas free. Every local government has made a plan for every neighbourhood which solutions are chosen (i.e. district heating or a heatpump for every building) related to the specific situation of the buildings in that neighbourhood. By development of the executing plan for a specific neighbourhood, involving the building owner is key to success.</p>

#### 4.6.4 Policy advisors & professional organisation

**Informant:** Jesse Boazsen

**Stakeholder group:** policy advisor, employee of the branch organization for the building sector

**Speciality:** sustainability / energy transition

**Informant:** Lea Jackson (early 50's)

**Stakeholder group:** senior advisor, employee of the branch organization for the building sector

**Speciality:** education and labour market

**Date of interview:** February 1st, 2021

General	
<b>Testing and recognition of Energy skills</b>	<ul style="list-style-type: none"><li>• A struggle is to ask for qualified and recognized people by sourcing out work to subcontractors and independent professionals. About this topic, Lea told: "And that also gives you a slightly distorted image. Then perhaps the people who are in the company itself are professional and they receive additional training in sustainability, but if you look at the entire chain where the executive work is done by the subcontractors, then that is simply much less, or then they have no insight into it". ATT: the same topic is discussed in the interview with branch organization of the installers.</li><li>• There is a growing need for easy to find recognized workforce who can apply the EE-measures needed for NZEB renovation. To full fill this need there is also a qualification structure needed to make it possible to measure the quality of the skills, showed in the recognition.</li></ul>
<b>Awareness of both the general public and workforce</b>	<ul style="list-style-type: none"><li>• /</li></ul>
<b>Lack of support / request for the skilled professional by the Public Authorities</b>	<ul style="list-style-type: none"><li>• The professional to be skilled up is not yet involved and less action to the professionals and craftsmen is taken. Jesse told: <i>"You can also see that in the discussions you have with parties, from the government, interest parties and others involved at the table, all very much ..., it is all still a conversation, a lot is entrusted to paper, are quite invented"</i></li></ul>

	<p><i>and said a lot of things, of which, if you start thinking about it, then: "well what does this mean for practice?"</i></p> <ul style="list-style-type: none"> <li>In addition of the point Lea told about the BUS app for people who are now at home, she told: <p><i>"Well, because that is also seen by the unions, a plan has been forged, it takes some time and you have to sit on your hands every now and then, but well, we now have an investment plan, from have put the parity money aside and we will start with 5 points and 1 of those points is also: how do we deal with distance learning and how do we deal with the energy transition and all the things that are needed for it on the labour market."</i></p> <p><b>CS: parity money:</b> money brought together by the social partners in the building chain. For example, these are the branch organization, labour unions, schooling funds etc.</p> </li> </ul>
<p><b>Lack of motivation, time and trainings on the side of construction sector professionals</b></p>	<ul style="list-style-type: none"> <li>Jesse told: <p><i>"But if people have the idea that not much will change for me, they will not start working with people's competences. So there is also within the program [Continue to invest in development] quite a difficult issue, because you are actually, you want to prepare people for something that they themselves do not always have the idea that they already need it. That may sound a bit cryptic, but that is exactly the struggle we are dealing with, when we get to work with these themes."</i></p> </li> <li>An entrepreneur only now sees training for the energy transition when he sees the energy transition's earnings model for himself. As long as he cannot see that there is a return to be expected in his own company and now, he will not invest there either. It is therefore necessary to remove this ambiguity.</li> <li>Lea wonders: <p><i>"... that we ensure that we can also offer this via digital learning, so that people can take in that knowledge at their own time and at their moment."</i></p> </li> </ul>
<p><b>Integration of new technologies and addressing new societal and technological trends</b></p>	<ul style="list-style-type: none"> <li>Lea told: <p><i>"Where we said that you should actually look at the knowledge component, which [Jesse] also looks at very much from the content, but I am more on the [line]: "You also have a component skills and you also have a component attitude. And actually those three together, you need all three."</i></p> </li> <li>A struggle in the building sector is that in the past three years, for more than 30% of the construction site</li> </ul>

	<p>employees and for more than 40% of the UTA employees (<b>CS</b>: i.e. the management staff and the office staff) that percentage has changed in their work in the past three years. This asks for flexible solutions for training, development and upskilling.</p> <ul style="list-style-type: none"> <li>• Themes as energy transition and NZEB, digitalization and prefab building are taken by the larger companies. Companies in the range from small to medium are less working on these themes. A separate development in the sector are the start-ups: mostly young people who are taught about innovative and environment friendly building and bring it into practice.</li> <li>• There is an ongoing shift from talking and making plans to seeking for an answer on the question: "How can we realize this?"</li> <li>• What happens due to the energy transition is that techniques and professions touches each other: i.e.: PV-systems are related to the capacity of the electricity network, charging points for electric cars are also connected to it. Construction and installation are more and more related. People who haven't worked together ever are no pushed to do it and to know each other's work environment.</li> </ul> <p><b>ATT</b>: there is a growing need for people and supporting systems to give advice how to make your dwelling (more) NZEB. This advice is ongoing with the process from idea to evaluation of the work done on i.e. a house. This branch organization has developed a training and promotion to the public program (Sustainable supplier) for their members, but due to a lack of market demand it isn't a huge success. When BUSLeague can develop means to train skills needed by this type of advisors it will be an advantage.</p>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>• Looking for a way to upskill people who can't work at the moment. Lea told:  <i>"Can't we just let them learn a bit more from their own home, so that digi-learning is also ..., took a flight and then I contacted Jan Cromwijk again, hey, you have that beautiful app from BUS , isn't that something we all have to work on a bit more."</i></li> <li>• Lea said: I think that's the beauty of that App that is now available. Then you actually start abstract, but you end up quite like: these are the core skills that you want to have in-house and you can do the course there. The companies are interested in that.</li> </ul>
<b>Other notes</b>	<ul style="list-style-type: none"> <li>• Jesse told:</li> </ul>

	<p><i>"If you take a look at the implementation, think about making your house more sustainable itself, and then you personally think about what that means for what needs to be done in your house, whether things are all technically possible, or what kind of hassle that actually entails, that is of course quite a bit ignored, because the effect in reality, the practice of it all have not yet been experienced with each other and then it is quite difficult to ascertain: "Are we all ready? "</i></p> <ul style="list-style-type: none"> <li>• A specific topic is the fit for work training needed for people who make on a later stage of their career the switch to the building sector. This is always a specific training, fit for that person. It would be an advantage of the BUSLeague means (and all the BUS related means) if the can be used for flexible training programs. The Dutch government want the career switch to among others the energy transition related branches, but don't have no idea of the lots of energy it cost to make people fit for work in an different branch. <b>ATT:</b> this topic is also discussed in the interview with branch organization of the installers.</li> <li>• A further question on the fit for work discussion is: what kind of certification is needed? Sometimes a certification from a branch organization is enough, but companies often ask only the regular diploma's from the regular schooling system. There is a lot awareness creation needed about the worth of branch certification and recognition to overcome this challenge.</li> <li>• A third topic is: what have the people from other branches to learn? Do they need schooling in the regular schooling system? The branch says no, the government says yes. But the latter gives a waste of time and create an extra challenge to overcome.</li> <li>• <b>ATT:</b> this topic is also discussed in the interview with branch organization of the installers.</li> <li>• In the development of new programs, it appears that support from the management of an organization is very important. Network operators play a major role in making entire neighbourhoods more sustainable with collective heat networks. The network operators are highly bureaucratic organizations that determine how houses are connected to the utilities, such as a heat network. But now that they realize that they have to change, because the gas connection will lapse, the electricity connection may need to have more power and be able to feedback and there will be an additional heat supply from a heat network, their management has said: we are going to draw up new guidelines together</li> </ul>
--	---

	<p>with the construction and installation sector, and based on this also a new set of learning outcomes for the skills required for the new situation is made. <b>ATT:</b> this topic is also discussed in the interview with branch organization of the installers. They have a slight different view about the network operators.</p> <ul style="list-style-type: none"> <li>• A striking topic in the interview was the regional realization of projects related to innovation and the energy transition. The branche organization has a nationwide office, but has, to be close to its members [the companies in the construction industry], also regions in which they work. And it is precisely in the region that bottom-up projects are also emerging around the energy transition. Important points mentioned in the interview above: <ul style="list-style-type: none"> <li>○ The members in a certain region know each other, trust plays a role here.</li> <li>○ The members see the need for change in their own context. They know the local market. Clear and recognizable ambitions and objectives can then be formulated for this</li> <li>○ Collaboration takes place across the sector: in addition to the builders, the installers often also participate, whether or not from the regional departments of the sector organization for the installation companies. Completely different companies also join in, as does education for professionals in those regions.</li> <li>○ This innovative projects in the regions are key for the renewal of the sector in the direction of NZEB. <b>ATT:</b> this is also mentioned in the interview with branch organization of the installers.</li> </ul> </li> <li>• These spontaneous projects in the regions, so without direction from the national office, the government, etc., have also been noticed at the national office. That is why they have started a community of practice around how these regional projects and pilots are created and function, so that experiences can be collected and shared between the regions.</li> <li>• There is consensus among Lea and Jesse that, in addition to regional projects, national projects are also needed. Lea says: <p><i>“But in terms of strategy it is of course good to look above it, what do you need in the longer term if you look at it more broadly, and that usually goes a bit further than your own</i></p> </li> </ul>
--	---



	<i>interests and your own company and then you can you can also look further.”</i>
--	--

#### 4.6.5 Professional organization

**Informant:** Miriam Jonassen (end 40's)

**Stakeholder group:** program manager, employee of the branch organization for the installation sector

**Speciality:** development, schooling and labour market

**Informant:** Nathan Ezekias (end 30's)

**Stakeholder group:** program manager, employee of the branch organization for the installation sector

**Speciality:** development, schooling and labour market

**Informant:** Debora Salmonson (early 50's)

**Stakeholder group:** program manager, self-employed by the branch organization for the installation sector

**Speciality:** procurement, energy transition

**Date of interview:** 2. 2. 2021

General	
<b>Stories, anecdotes, experiences etc.</b>	<p>Miriam about a meeting with some directors:</p> <p><i>"I can remember a discussion, that is more on the employer side, remember a discussion with a director of large service and maintenance companies, [...] do you have to [...] well have this population, more than half MBO2 or lower educated [...], at that moment, you have to burden them with all kinds of requirements and training, etc. We said that, we are not going to demand that they do training courses. We mainly rely on their craftsmanship, as much as possible. So as few trainers as possible are needed. But they [the directors] said, these people work, do they want to go along [with upskilling]? To which I said: what will happen if these people do not go along with that development. What good is it to these people in a while and is it not the case that you will soon need these gas technicians for other types of work, such as indeed other types of heating installation in your house, etc. and do you want those people with you, too, in that change? I say, if you ask them to take a small step now, in each case you have an image and you have [...] access to them. In any case, you have them in a development mode to also make the upcoming changes that are needed in the energy transition. And then literally one of the [...] directors said: yes, yes, that's right, yes, you're right. Then the penny dropped at that employer too: I can't do anything now, but then I will soon have a challenge with these low-skilled people as well.</i></p>

	<p><b>CS:</b> MBO2 or lower educated: this are the lower level blue collar workers</p>
<p><b>Testing and recognition of Energy skills</b></p>	<ul style="list-style-type: none"> <li>• For installation branch normally skills are valued and validated, based on a qualification scheme. Only when legislatively needed or when branch parties ask for it, a formal way of recognition is created, i.e. a certification system with a register. In other words: keeps the recognition as simple as possible.</li> <li>• Testing and recognition: for the interviewed branch organization it is not the method but the result (if trustworthy) that counts. In the future they will experiment with different forms: on the job, by a colleague, by a boss, by a external examiner, by working with a portfolio, and so on.</li> <li>• Testing of recognition of skills needs a good qualification. TNO is working on a taxonomy and ontology to describe the skills. An advantage of this is that for people who change their career from an different sector to the installation sector, it is easy to make a training program for them to be fit for work with only the content they need, because it is easy possible to investigate what that already know and which skills and competences they have.</li> <li>• <b>CS:</b> TNO is an independent research organisation in The Netherlands (<a href="http://www.tno.nl/en">www.tno.nl/en</a>).</li> <li>• To system mentioned above is part of the Skills Passport. In the development of this system is the branch organization for the builders also involved. This passport shows the skills, knowledge and competences of a worker. The first reason to develop this was to reward the workers and making them proud again about what know, can do, have and who they are and the second is the reason mentioned above: to make it easier to pull people from other sectors to the installation sector.</li> </ul>
<p><b>Awareness of both the general public and workforce</b></p>	<ul style="list-style-type: none"> <li>• /</li> </ul>
<p><b>Lack of support / request for the skilled professional by the Public Authorities</b></p>	<ul style="list-style-type: none"> <li>• Because the sector organization is already strongly committed to craftsmanship in general and to the energy transition, especially to keep employees 'fit for</li> </ul>

	<p>the future', the role of the government in promoting craftsmanship is not an issue. came in the interview.</p> <ul style="list-style-type: none"> <li>• The request for the skills is mentioned by Debora; she told she works on new ways of public procurement as part of the neighbourhood approach, but the request for the skills in procurement was not a topic for this interview.</li> </ul>
<p><b>Lack of motivation, time and trainings on the side of construction sector professionals</b></p>	<ul style="list-style-type: none"> <li>• A negative trigger for the motivation to upskill is coercion, for example from the national government when they create for a new technique or skill a mandatory certification.</li> <li>• The overcome the negative attitude against training, it is needed to learn people to learn. This can be done by at first taking little steps on CPD, so when a bigger step in upskilling i.e. a new technology is needed, craftsman are familiar with following training and know the advantages.</li> <li>• In order to make training organized and affordable, it is necessary that there is a certain group size of participants that can be expected. For this it is necessary that sector organizations pay attention to triggers in policy, the market, etc. that affect a larger group and then take action on them. These actions are twofold: actively approach the SMEs and organize the solution for the required upskilling together with a training center. Even without the action of the sector organizations, the market feels that something must be done, but it remains too fragmented, so that no joint demand arises. And without this joint question, no training (in any form whatsoever) will be organized.</li> <li>• The development of upskilling: develop it two steps ahead of the market, not five steps, because then they, the SMEs and the craftsman, no longer recognize it: it is out of their view.</li> <li>• To overcome the lack of enough suitable training the branch organization want to make the market for upskilling more open, so more and different training suppliers can offer their trainings, e-learnings, micro learnings etc. An aim is to have more capacity on trainings who need only a little investment in time, off-work training and so on.</li> </ul>
<p><b>Integration of new technologies and addressing new societal and technological trends</b></p>	<ul style="list-style-type: none"> <li>• The technicians who are still working on the existing installations and techniques in homes in the coming years will also need to know what the new techniques entail and how they affect their work on the existing systems. So this group will also have to acquire a certain</li> </ul>

	<p>basic craftsmanship with regard to sustainability. Part of this basic craftsmanship is also, to reach a good quality of NZEB, that people go to their boss when they see that when they follow the design of the installation, they have to build a wrong installation or apply a measure in a wrong way. A little story about this:</p> <p><i>“We talked about failure costs at a large, reputable company, because they had fire-resistant sleeves in an NZEB, which had been incorrectly modelled by the BIM modeller and which therefore could not be made by the skilled person. But a professional is by nature like this: “We’re going to fix it anyway.” So all those fire-resistant sleeves weren’t good, and that’s quite an expensive problem.</i></p> <p><i>And then it is not in the skills that they do not know how to make a fire-resistant sleeve, because if we ask the professionals: “Do you know how to do that?” They say: “Yes of course we know how”. But is it in the skill that you have to address this to the person above you?” The answer on the last question was in this case no.”</i></p> <ul style="list-style-type: none"> <li>• When introducing energy transition craftsmanship, the question is: who should have this profession. Miriam therefore asked the question: "But that may be at a higher level than for the blue-collar worker."</li> <li>• [In one of the other interviews the ‘neighbourhood approach’ is explained]. The neighbourhood approach leads to a different value chain, one who is more horizontally organized and is more collaboration than with customers, contractors and subcontractors. And in this new situation, Debora comes to the conclusion that <p><i>“...but it is the installer who takes the leading role in the design, development and approach [of the work to be done], because technology has also become one of the more important parts of such a project.”</i></p> </li> <li>• This creates a new role for the installer, one in which he is at least equal to all other parties involved in the EE-project. But this new role gives a demand for new skills.</li> </ul> <p><b>ATT:</b> Just as in other interview in the Netherlands, also the interviewees in this interview mention the value of regional working on project to upskill the sector and to take up innovations and innovative approaches just as the neighbourhood approach.</p> <ul style="list-style-type: none"> <li>• A big issue are the subcontractors. Subcontracting is not highly valued and therefore the demand for their craftsmanship. While they are essential for the success of the energy transition, for example through the</li> </ul>
--	--

	<p>neighbourhood approach, to have sufficient professionals. This issue isn't only addressed by the branch organization, but also by the larger installation companies.</p> <ul style="list-style-type: none"> <li>In the neighbourhood approach and in other projects there are some parties who think more about safety and other about craftsmanship. These two topics are separate. When they are mixed, both don't get the attendance they need. But at the same time, they are interrelated and can strengthen each other. The problem for the installation sector is that safety rules are made by the network providers (i.e. for heating). And this type of organizations are in The Netherlands very bureaucratic. They planned to make a strong certification system for persons, but the branch organization has taken their role, which leads to a dividing of craftsmanship on personal level and safety and responsibility on organization level. To overcome the problem of window dressing of a certification on organizational level, part of the responsibility is that all the employees of an SME are well trained for their job, including skills on safety and responsibility for their job.</li> </ul>
<b>Market demand and uptake of prospective BUSLeague solutions</b>	<ul style="list-style-type: none"> <li>/</li> </ul>
<b>Other notes</b>	<ul style="list-style-type: none"> <li><b>ATT:</b> Nathan told:  <i>"but around such a big theme as the energy transition they [the SMEs, DW] are also like: what should I do then. Because it may almost be them sometimes ... the idea is too big to be concretely manageable for them."</i> </li> </ul> <p>And Miriam confirms:</p> <p><i>"you really do have to take it by the hand, sometimes, in the case of SMEs. Step by step, market by market."</i></p> <p>This gives a request for pragmatic solutions on upskilling to reach the SME's.</p> <ul style="list-style-type: none"> <li>And on a latter moment in the interview, we talked about the installer journey's, a program offered by the branch organization to the SME's to develop themselves to be fit for the future. In this program the branch organization give guidance to the SME owners. Debora explains:  <i>"It actually starts with orienting yourself towards this future, for that you need information as an installer, what it was still about, what information, what will happen, what will happen in my region in 10 years and what will not happened in 10"</i> </li> </ul>

	<p><i>years. And then next: what kind of company am I and what suits me and the opportunities that will come, even if that is only a few years from now, what am I going to do now to move up step by step.”</i></p> <ul style="list-style-type: none"> <li>• Also, in this program the too big idea of developing a new future for your SME in the energy transition is cut down in little and manageable steps, which the SME owner can take by himself, eventually assisted by an advisor. The choices made, touches the needed upskilling for the future.</li> <li>• People are all very different in their view on the development of craftsmanship: some see it as a kind of evolution. But with a broader scope sometimes it is not evolution but a disruption. And people, i.e. the owners of SME's, who don't mention that, could have a problem after some years, because they are not connected to the new reality of an NZEB build environment.</li> <li>• By upskilling there is a huge difference between the building sector and the installation sector: builders wants to know where in the process of upskilling of following the training their employees are. Installers only want to know when they have reached to expected goal, i.e. your employee has become his certificate about this technique.</li> <li>• Also in this interview we talked about the EE-advisor and the skills needed for EE-craftmanship on different levels. The integration of techniques needed for NZEB ask attention from every level. On the lower level it is about awareness and the attitude to ask the right person in your company, on higher levels good softskills are key. And on the level of the advisor to the home owner it is about softskills and only general knowledge, not about how to build or apply EE-measures.</li> </ul>
--	---



This project has received funding from the European Union's h2020 framework programme for research and innovation under grant agreement no 892894. The information in this publication does not necessarily represent the view of the European Commission.

© BUSLeague. All rights reserved. Any duplication or use of objects such as diagrams in other electronic or printed publications is not permitted without the author's agreement.