



# Technical Working Group 4

## Market Acceptance

Final output

**Contract details**

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**Disclaimer**

The views expressed in this report are purely those of the writer and may not in any circumstances be regarded as stating an official position of the EASME.



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## Executive Summary

This executive summary is intended as the primary output of this Technical Working Group (TWG). It summarises the key content and findings from the work we have carried out over four meetings, and in-between these meetings.

### Collation of best practice

The first two meetings of the group, and a survey circulated among the participants at the Athens Meeting, resulted in the following best practices being highlighted. This is a summary of the points raised in these best practices, along with an indication of where the best practice examples that support these points came from. The body of the report contains more details of each example.

### Accelerators - what causes demand for training courses in sustainable construction to grow?

- *Legislative obligation* - e.g. Luxembourg, passivehaus standard for new housing , EE refurbishment of 5% of state owned buildings / year (Bulgaria), construction industry commitment to 50% reduction in CO<sup>2</sup> by 2025 (UK)- makes all comply
- Availability of finance - e.g. Finance for energy certification and retrofitting (including via EU structural funds) - attracts interest (e.g. Croatia, Bulgaria). Support schemes for RES and EE (CZ), direct funding for skills development (Sweden), Dutch energy agreement (NL)
- Concerns over quality of ee/res construction and the ‘performance gap’ between as designed and actual - skills highlighted as a major issue - should increase demand (UK)
- Falling prices for sustainable technologies - but some far prices will still drop further and others unwilling to act without client request.

### Challenge and solution - what challenges have the BUS projects faced in marketing their courses and how have these been addressed?

- Much of the training on offer is direct from manufacturers (specific to their product) risks being seen as biased. Address by involving these manufacturers in ‘independent’ training (e.g. to provide demonstration models and check content). This improves the perception and quality of the training. (e.g. in Croatia).
- Lack of interest among construction companies (employers), leads to low take up of courses - direct engagement with the companies to present the benefits of training (use leading companies as examples). (e.g. in Lithuania)
- Concerns about training and qualification scheme matching market needs/demands. Involve companies in the design of the training, with promotion via multiple media channels (e.g. Lithuania)
- Energy one issue among many in construction training (multiple specialisations) and too many initiatives focused on standalone training with no demand- incorporate (mainstream) energy into core construction training (e.g. Swe, UK),
- Difficulties in attracting workers to extended off site training - make training in-house, arranged directly with companies and embedded in existing training schemes, offer short courses, (Austria) offer free and short basic courses with follow up to longer courses - empowers individual workers (NL), Train trainers to provide shorter on site courses - ideally with some recognised certification (It)

- Poor image / reputation of construction and training programmes - build personal stories, promote best examples, engage with as much media as possible. Involve professional association for QA of training. (e.g. Bulgaria)
- Lack of insight amongst training providers on future markets - use national labour market research to create regional opportunity maps. (NL)
- Risk from low energy prefabricated / industrial construction, high potential (and large skilled worker demand) but risk of over promising before cost and demand are mature.
- Delivering a professional marketing campaign on low cost / free publicity - work with trade fair organisers to best reach craftsmen and their employers, work with producers and/or suppliers (e.g. free training materials and free training for their clients)

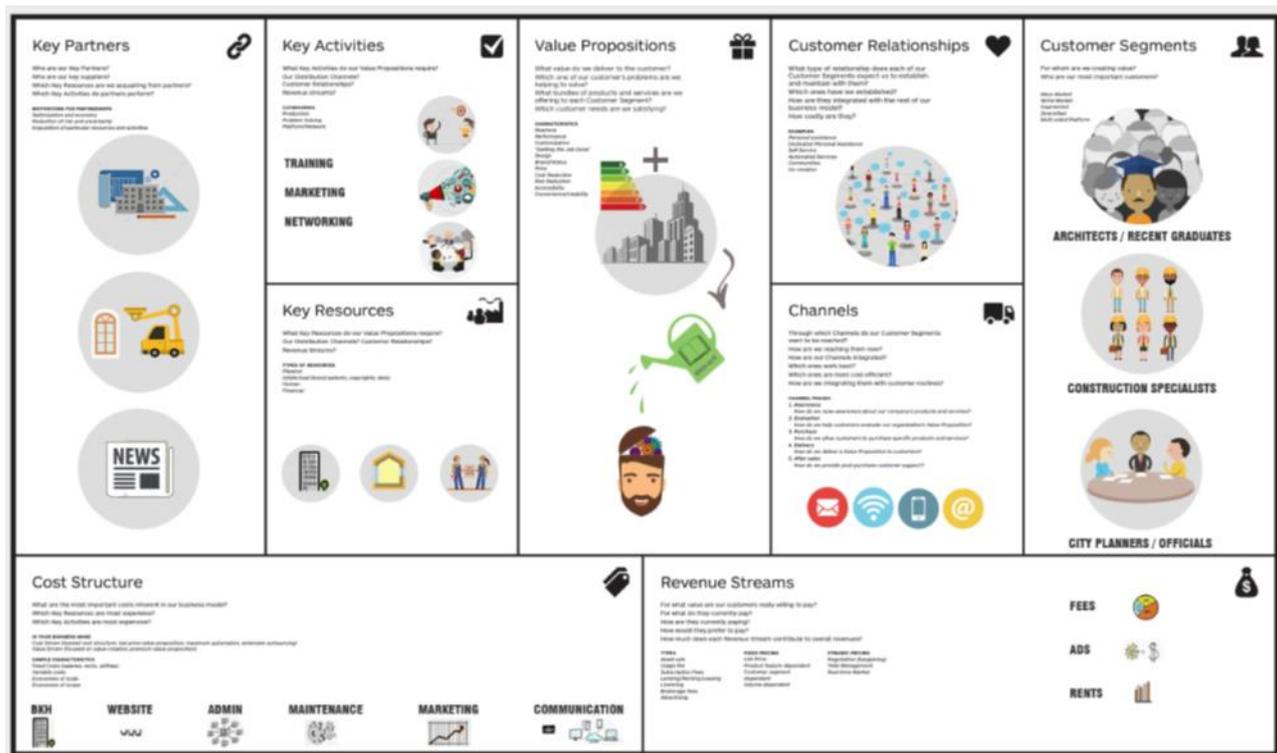
#### **Successful Tools / campaigns - what approached have BUS projects used to successfully increase the uptake of their outputs?**

- Using leading companies to report on the market opportunities (ambassadors approach) - convincing speakers, brings more on board. (e.g Lux), promoting examples of NZEB projects (Bulgaria) The ambassadors may benefit from training to improve their presentation and confidence (NL)
- Mobile marketing (road show) to localise and engage a larger number of construction workers. (e.g. in Croatia), conferences and publications aimed at specific markets (e.g. LAs / Municipalities).
- Phone app, with a 'game like' test on EE and RES construction skills, includes a revision guide on EE certification test - attracts interest (and possible participation in training) and provides a platform to share knowledge. (e.g. in Croatia)
- Create a national register of certified workers, with associated accredited training centres and programmes. (e.g in Croatia)
- BUILD UP Skills Advisor app - provides multiple short basic courses with certification and the ability to create a personal (informal) skillcard - creates awareness and helps attract trainees to longer courses. (NL)
- Too many regional initiatives (fragmentation) - try to get them all engaged and use their contacts, economies of scale make training more affordable (NL), include new competencies in existing regional and centrally verified courses (It)
- Builders book - simple guide to addressing on site energy performance in new build houses(UK)
- Sustainable building training guide - lists learning outcomes related to sustainable building, to support the development of content for standards and training (UK)
- Construction Design Management (CDM) wizard app - free app that includes the top 5 health and top 5 safety risks associated with various types of construction work - simple tool which is of practical use, and helps compliance with legal obligations.

#### **The Business Plan Canvas and Value Proposition**

The third meeting involved the presentation and trialling of a process designed to make the BUS projects consider what it is about their projects that should make them attractive to their customers. This process highlighted a number of interesting common issues among the projects. A number of TWG4 participants presented their experience of using the approach in practice at the fourth meeting. There was agreement that the process was very useful in project planning, and should be done as early as possible in the planning process as it was an excellent way of identifying how (and if) a project was

going to work (and how it should be marketed). There are more details of the process in the body of the report but the example business plan canvas below illustrates how it is intended to work.



### Recommendations

The final meeting included a review of the work to date and a discussion of the key learning points that the TWG4 members took for themselves and felt were of relevance to others. The discussions can be summarised as follows:

#### What did the individual BUS projects learn?

- There are many different approaches to the market introduction of BUS-products.
- Creating business models (especially value propositions) is very valuable. It has been used in implementation in more than one project. There is a need to use it / do it to learn and benefit. However, it can learnt quickly and investing half a day of time to learn it pays off.
- If the business model had been done, then it is possible that many courses would not have gone forward. Preparing a value proposition gives key insights to the market demand.
- There is clear added value from involving manufacturers in developing and delivering training and there are a number of successful approaches to involving them.
- The power of storytelling. Hearing stories from other projects (and craftsmen) acts as inspiration and as a benchmark - so the projects know what is possible.
- It is important to remember the prime motivation for doing the course. Ultimately the answer to “why we are doing this?” comes down to a desire to help people - so they get better buildings. This is very important in considering the approach to marketing and should lead to an emphasis on a more consumer / end user focussed approach.
- It is important to remember the long term perspective of the change towards more energy efficient buildings. Demand is expected to peak in 10 to 15+ years. This timing needs to be considered when evaluating ‘sustainability’.

- There are new solutions emerging. These include marketing and delivery tools, such as apps, social media. These are now much more important, although this varies by MS. Some traditional engagement techniques (e.g. free food and beer at events) still works everywhere.

#### **What did we learn together?**

- Many of the challenges we meet have the same ingredients, but the recipes for success always need a variation in “seasoning”.
- BUT there is much more similarity than expected, especially in methodologies.
- There are risks (and some evidence) of duplication. However, the balance needs to be struck between initiatives of local use and learning from best practice.
- The BUS actions need to be placed in a much longer timeframe. For example, the market for nZEB renovations will become a mass market in many countries around 2030.
- This implies that analysis done and lessons learnt in BUS-projects need to be reviewed and maybe also updated in the period after 2020
- BUS has moved from a research to implementation stage. This implies the need for additional players - e.g. more from construction industry and final users. It also needs additional implementation and selling skills.
- Can the platform be used better? Needs effort and input to make it work - change (from roadmap creation) to target / involve more companies? More of a club / stakeholder network

#### **Recommendations for BUS projects and policy makers**

- Make use of business modelling in the writing phase of a new proposal (to get a much sharper dissemination and communication strategy).
- Involve manufacturers in future projects.
- The EU gives a high importance to sustainability of the actions. However, we learned that most of the consortia are not experienced in bringing products/results to the market, to sustain their actions.
- Therefore, in future there is a good case for providing professional training/advice/support (for example at the exchange meetings) on bringing results to the market. This could also be done via a route such as the ESS-service, but it would ideally need an extra upskilling component.
- Most of the BUS roadmaps end around 2020. By then the only market where low energy will have become the norm (mass market) is new buildings. There is therefore a need to update the roadmaps in order to cover the still immature building renovation market
- The programme should continue - if it is stopped now the good work will be lost. There is a need to reflect the long-term nature of the expected growth in demand
- Would like more time for the TWGs in the exchange meetings and would retain the external facilitator as they are very useful.

# 1 Introduction

## 1.1 Document details

<b>Creation Date</b>	19/5/2017
<b>Date of Last Revision</b>	20/7/2017
<b>Description</b>	This report concerns the final deliverable of TWG4. The report focuses on synthesising the knowledge gathered by the TWG and based on that formulates a number of suggestions designed to help BUS projects market themselves and short-, medium- and long-term policy measures recommended in order to ensure the effective marketing of BUS projects.

## 1.2 Participants

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### Meetings

Brussels, 18 - 19 January 2016

Budapest, 2nd - 3rd June 2016

Athens - 6-7 December 2016

Rotterdam 30-31 May 2017



First meeting - Brussels

The TWG also held virtual meetings between the physical meetings. These discussed the work done between the meetings, for example the collation of best practices between the first and second meeting, and the drafting of the survey of other BUS projects between the second and third meeting. These meetings also discussed what should be covered during the physical meetings.

## 1.3 Purpose of TWG4

In order to have successful national qualification schemes for construction workers it is important to stimulate demand in addition to the supply. This concerns encouraging workers to participate in training and those responsible for selecting contractors / workers for construction projects to choose skilled workers.

At the first meeting each of the participants was asked to write their personal objectives for taking part in the TWG. The results of this exercise were grouped as follows:

#### *Output Driven*

- Make a marketing plan
- Concrete output useable in all MSs
- Improve business plan of our training centre

#### *Impact Driven*

- Increase the no. skilled on site workers

#### *Result Driven*

- Better understanding of the barriers in my country and in the other countries, which help me to develop solutions

- How to stimulate market demand for trained workers
- How to increase the interest of potential trainees
- Collect good ideas that may work in my country to (visibly) increase demand for BUS trained workers.
- Offer a forum for fruitful exchanges
- Exchange information and ideas on how to set acceptable goals in a project.
- To find and identify measures for market acceptance to get craftsmen to be educated in swebuild
- Find new ways to raise market demand - new voluntary trainings
- How to improve the awareness
- Stimulate demand for BUS trainers and trainings

## 1.4 Deliverables

Collation of knowledge, examples of successes, barriers, accelerators, success factors, lessons learnt (good and bad) - were split by the 3 groups (not aware/not convinced/ willing) by asking them:

- What are their problems (including market research to justify / quantify these)
- Communication routes - how they get their information, (internally - i.e. within companies, and externally)
- Methods to convince / engage them of the benefits of / need for training (this is a key issue)
- What options are open to the group and what can skills providers able to do to help - e.g. design of training programmes (short, web based etc.)

Ultimately, based on the knowledge gathered on the above points, the aim of TWG4 has been to come with an overview of potential measures - divided into short, medium and long term measures.

### 1.4.1 Links to other TWGs

The themes and work done within the four TWGs that have been moderated in the period running from the 7<sup>th</sup> EU Exchange Meeting in January 2016 to the 10<sup>th</sup> EU Exchange Meeting in May 2017 and are interlinked.

In terms of the scope of work for this TWG, and in consultation with a representative of TWG 3 who joined the first meeting to discuss the work they were doing (because they thought there may be some overlap - they were focussing on incentives to promote training), the decision was taken to retain a focus on workers and companies. This implies that TWG4 should avoid consideration of looking at ways of increasing demand via “pull” from end users, e.g. building owners asking for ‘high quality’ workers for high quality installations. This issue is being covered by TWG 3.

The long-term sustainability / continuation of projects (the main objective of TWG1) depends on availability of finance. However, there are non-financial aspects that can help steer finance. In fact, TWG1’s work is mainly linked with that of TWG2 on mutual recognition and TWG4 on market acceptance. These two aspects are non-financial incentives that help ensure the continuation or sustainability of projects. Aspects such as a good marketing strategy for training and market acceptance overall (dealt with in TWG4) should facilitate the market uptake of trainings and hence assist with the continuation of the BUILD UP Skills projects. In fact, enhancing the attractiveness of the courses and the good dissemination thereof, is crucial for obtaining funding. The work of TWG4 and in

particular the Business Model Canvas for trainings developed therein are therefore interesting for TWG1 as well. The link with TWG3 on training methods and materials is slightly more subtle - enhancing the attractiveness of the courses by initiating innovative methods, interactive techniques, using high quality materials etc are seen as important for increasing the attractiveness of trainings.

## 2 Accelerators and Barriers

The first meeting included an exercise where each of the meeting participants was asked to come up with some text and / or pictures to illustrate the key accelerators for the uptake of green construction skills in their Member State (i.e. factors which are increasing demand) and the key barriers (i.e. factors which are reducing / restricting demand). The post it notes were prepared in silence but then discussed in order that they could all be understood and grouped. The text below shows the grouping that emerged from these discussions (pictures of the post it notes are also shown).

### 2.1 Accelerators

- *Acceptance*
  - Acceptance for sustainable construction / development by craftsmen
  - Lack of skilled craftsmen
  - Need for upskilling is recognised
  - National Programmes for energy restoration of public buildings, private houses - 40% state funding
- *Companies*
  - High involvement of companies
  - Self-employed - need for quality (to differentiate)
  - High involvement of companies
  - Increasing interest of large construction companies to improve current VET market
- *Examples*
  - A few innovative companies
  - Impactful examples
  - Front runners are companies already building with highly educated workforce
  - NZEBs
  - First NZEB examples now visible
  - Increasing EE market
  - Small education providers are innovative and interested in new ideas
  - Motivation for end user - cutting costs
- *Innovations*
  - Web based education
  - BUS app
  - New training method - on site training - short / new / easy to attend
  - Timeframe - education needs to be short to let employers educate craftsmen
- *Procurement*
  - ESCOs
  - Demand from the side of developers
  - Support for energy performance contracting market
  - State procurement rules including requirements on building quality - link to financial mechanisms
- *Other*
  - Reducing bureaucracy
  - EU support works / is popular (subsidises other budgets)
  - Global warming (and international policy goal commitments)



## 2.2 Barriers

- *Awareness*
  - Lack of awareness
  - Incentives - why should an employer educate its workforce?
  - Not convinced of the demand for new skills
  - Construction company (or workers) not interested in quality buildings
  - Working at lowest price
  - Low interest to get EE training if there is no demand - vicious circle
  - Companies have to be persuaded that further education of their employees is useful.
  - Not convinced of the concept/ benefit of passivehaus
- *Lack of time and Money*
  - Lack of time to learn - too busy
  - Decreasing no. participants in each course
  - Time is money
  - Costs
  - Employers cannot afford to send their end their workers to training
- *Procurement*
  - Lack of knowledgeable designers / influencers of end users decisions
  - Get skills in procurement
  - Public sector cannot demand before there is a supply of trained workers
  - Legal documents - standards and quality
  - Public procurement - lowest price as election criteria
  - Large construction companies have their own education - not interested in SWEBUILD
- *Lack of examples*
  - Lack of good examples
  - No end market for NZEBs
- *Other*
  - Capacity - lack of trainers
  - Macho - 'learn by doing, not training'
  - No time for energy optimisation in a project - this is more ... construction phase



## 2.3 Addressing barriers and utilising drivers

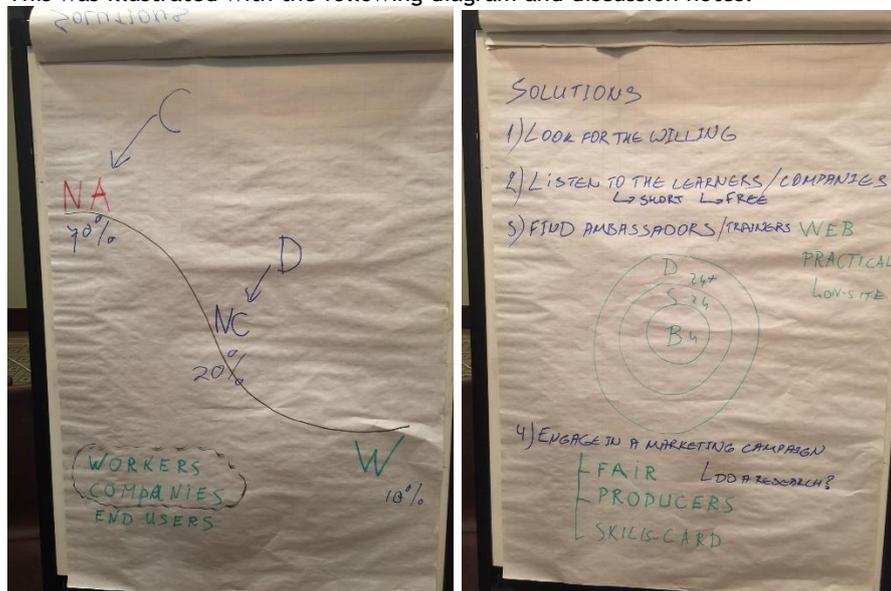
After this discussion the meeting (end of day one and day two) moved on to consider what outputs the TWG could usefully generate to help overcome the barriers and promote the accelerators.

Through discussion it was agreed that the potential market (of construction workers who could be trained), splits into 3 main groups:

- Willing - to take part in training (includes those who train themselves (about 10% of installers / potential users of training)
- Not convinced - includes those who have some bad experiences, of training or of low C technologies (or both). Around 20% of the market.

- Not aware - don't know about the courses. Includes the vast majority, If asked many would say they don't need training. Reflects over confidence in construction sector of their ability to respond to future increases in demand.

This was illustrated with the following diagram and discussion notes:



The potential solutions which emerged from the discussion were as follows:

1. Focus on the 'willing' - this means (for example) listening to the learners / companies and making the courses short / free. - e.g. in line with the Dutch ECOBUS project - short (free) initial training - then more specialised training (which requires more time) - then detailed / in depth training (at cost).
2. Find ambassadors / trainers
3. Engage in a marketing campaign (should be based on research - e.g. on what people want, where they look for information etc.). Some good examples of approaches - included:
  - Promotion at trade fairs (where the fair may well have budget, e.g. for prizes, to attract interest.
  - Involve producers (building products)
  - Use of skills-card - accrediting workers.

## 2.4 Survey on barriers, drivers and best practices

### 2.4.1 The key challenges to marketing low carbon construction skills projects.

There is a **lack of market pressure** (welcoming) to have accredited skills. The employers and clients don't consider accreditation as the main guarantee of work quality, they rather rely on references or their own impression.

A **lack of legal framework** leaves companies unlikely to invest time on training courses whilst the money they are going to lose for the time the workers are going to be away training can also repel companies (especially for small and micro companies). Also the fact that product providers offer training for the use of their materials (which they can use as a selling point) can lower interest from companies.

**Reaching the target group** for training employees. When assessing training demand, usually the employers are questioned but attendance of employees never matches the expectations. So we must find a way to question employees directly

**Low willingness** to pass any training connected with zero regulatory mechanisms.

#### Examples from projects

I-TOWN - Italy - Lack of interest, lack of funding, lack of regulatory pressure.

1) time absence from work - time missed in workplace. 2) No requirement for quality, no quality management systems in place.

CONSTRUYE 2020. The lack of funding for the final user to start up this change.

Qualibuild - getting time from work to carry out training. Costs for certain cohorts - who pays employer or employee? Providing hands on training at appropriate training centres.

Hungary - Lack of willingness to participate, regulatory pressures / funding, authority control in non-certified sector.

Lack of a proper regulatory environment to initiate a market rollout of accredited skills at the different levels of the construction labour force.

B2B. 1) Quality of the work becomes more important but has to be embedded more to convince employers and employees to spend more time in training; 2) Training only takes place when there is an urgent need e.g. a job which requires new skills, no training for the future; 3) Employees in building sector are not used to thinking about LLL (lifelong learning).

BRICKS - Lack of interest because messages are focussed on energy issues, rarely on health. The social impact of better performing dwellings is not perceived. These include: overcome energy poverty, better comfort, less ill people, improved productivity, better performance of workers and students, reduced environmental impact.

#### **2.4.2 Factors that are (or could be) key drivers in increasing demand for low carbon construction skills projects.**

- Inclusion of product manufacturers in their short marketing training creates interest in a more systematic training that would discuss several competitive solution and explain differences.
- Energy efficiency regulations and governmental grant schemes for energy upgrading of households and offices have increased the demand for more skilled personnel. For example, the strict position of the Ministry, realting to window frames, which requires installers to provide a CE mark for every window they install under a grant scheme.
- Government subsidies for consumers should help to create demand and reduce costs. Mass produced (and therefore cheaper) solutions (if necessary also Chinese imports), also help to create demand. Ambitious pioneers who create new business models.
- Create attractive training courses including new brands.
- Highly motivated leading company, helps to ‘train’ consumers in a positive way (though this is not the sole benefit of such companies).

- Key aims for demand - 1. Energy performance contracting (EPC) focussing on skills and companies that invest in these skills. 2. Requirement for training when receiving grants. 3. Motivated leaders doing
- A good way to increase market demand for training would be to include a specific requirement for skilled and certified workers in public tenders.
- Certification of the course. Platform to show / display skills and qualification values and being recognised by industry.
- Energy efficiency regulation on mandatory of defended / privileged certification. Quality control / reporting system based on measured results / data. Monitoring the whole (with EU/ Gov funded) project.
- NZEBS can help create job opportunities. This can be further advanced by the promotion and dissemination of good practice to highlight the need for targeted training and improving of skills.
- A need to reach a required quality standard, leads to a need to involve employers to improve the work (social innovation). Employers should then also be more inclined to retain their (trained) employees (to reduce the risk of a lack of skilled employees)
- Public procurement could foresee the compulsory use of qualified workers and professionals for any renovation of public buildings, this would act as a driver for increasing demand for skilled individuals in the private sector construction sector.

## 2.5 Discussion of best practices

An internet/ telephone conference call was held between the first two meetings which discussed the examples that the TWG members had shared with each other. The summary of this call is presented below.

### 2.5.1 Analysis of the examples submitted.

Dragomir discussed the examples submitted, and made the following points on common and important themes:

*Accelerators / drivers* - public support for near zero energy buildings is a strong motivator for creating demand for training in this area. Therefore it is important to convince and attract public authorities in any marketing campaign. Recognise that this is easy to say but hard to do!

*Challenges / drivers* - These are more complex and varied. Fragmentation of the training market is a problem. A potential solution is to proactively bring trainers together to pool resources. A perception of training being low quality (often combined with a lack of capacity of trainers) is another problem. An important part of the solution here is to maximise 'train the trainer' activity. Involving market players (building product manufacturers) is generally positive as they bring clear expertise to any training offer.

*Tools / campaigns* - There is a well-established need to make use of continuous campaigns via traditional media (tv, radio, newspapers, trade journals etc.). These are often combined with demonstration events. There is also an emerging theme of using innovative web / smart phone approaches, which are becoming more important.

### 2.5.2 Highlighting examples.

Jan explained that his selections (coloured gold on the table included in the annex to this report) were based on what personally inspired him, the idea being to present these at the next meeting. Therefore if anyone feels that a particularly strong example has been missed, please highlight this for potential inclusion. The author of each example was asked to briefly present what they had written.

*Christiane Conrady - recognition of the willing, who are most convincible speakers* . This was selected because picking front runners who are willing to present will tell the most convincing stories (as they have experience).

They identified companies who built passive houses to be part of an energy agency roadshow. The companies explained how they need to network to attract expertise - they changed the subject from technical to more of a company / organisation challenge - the company had to change their business process to get into a new market - this need for a business model change, has a training need attached.

*Irena Brnada - Solution: Turn competitors into partners - include the manufacturers in delivery of our training courses as trainers and/or providers of demonstration materials.*

When manufacturers provide training the end users often assume it should be free. Combine what the manufacturers could offer with the training centres, so the training centres get the company's resources (good quality), trainers and models. The practical aspects of the training are generally better with the companies involved. Companies get free publicity.

Dragomir supports this example with experience of a similar approach in Bulgaria, Romania, Turkey and Ukraine. Synergies between training provider and companies require lots of personal engagement to get it set up - the national platforms (which include companies and trainers) have been very useful in facilitating this.

*'Cheat-sheet' to facilitate revising, before testing for the EE certificate (possibility to upgrade professional orientation modules of the national Employment Service)*

This should improve the success rate in gaining certification - key facts help people pass the examination whilst it also helps in regards to the free of charge training.

*National registers introduced by the project: - certified workers & trainers; - accredited training centres & training programs*

Mutual recognition is difficult to achieve, but use of national registers could assist in garnering this useful knowledge. Training programs including an app as part of the campaign, currently looking for a sponsor to promote the idea, were included in national platform meetings. The app is formulated like a game, where the users are given an on-site type problem (to do with EE in building) and asked to solve it.

*Richard Bayliss (UK) - Discussion of use of apps.*

Bayliss stated that implementing apps can be useful, but they need to be something that the end user themselves find useful. He gave the example of the CDM wizard app in the UK that the CITB have developed<sup>1</sup> (CDM regs relate to health and safety plans and procedures on construction sites). This has been very popular because it does something that construction professionals very much want. Apps need to be like this to succeed. Likewise, Zoe Wilders stated that the Spanish BUS project is also producing an app.

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<sup>1</sup> <http://www.citb.co.uk/health-safety-and-other-topics/health-safety/construction-design-and-management-regulations/cdm-wizard-app/>

Jan Cromwijk stated that the NL BUS app which has multiple e-learning courses, is designed to bridge the gap between the skills of today's craftsmen and those of the future. Once these have been completed the learner is signposted to the most appropriate (longer) course for them (which should increase the demand for their courses). The app can also be used as a form of informal skills card, by showing which of the short courses an individual has completed.

*Mantas Jonauskis - Early involvement of market players in definition of technology processes and required competences*

To give these individuals some recognition of their knowledge. Involving technical companies (who have applied technology) in developing technical description is a good idea. Mantas offered to provide an email summary explaining the approach.

*Jiri Karasek - e-learning, practical exercises, equipment, innovative approach*

In order to help address the decreasing number of participants on courses, practical exercises can make the course more appealing whilst improving their quality. The personality / ability of the trainer is key to achieving this. To attract good trainers with practical experience, they are to hold a major train the trainers event. They got the first designers of near zero energy buildings in Romania to attend which helped attract high profile individuals (e.g. journalists with a good profile).

Questions on the sustainability of co-financed models often fail / stop when the public funding stops. There is a need for ongoing marketing to convince users of their benefits. Ideally, the content should be integrated into national curriculums to help sustain it.

*Per-Johan Wik. Swedish Energy Agency are financing or co-financing four initiatives for increasing competence in the building sector.*

The Energy agency also coordinates 3 other related projects in this area (e.g. a course focussed on white collar workers), which helps with targeting of potential participants.

This matches with the approach highlighted in Dragomir's examples - combining different approaches to address the barriers of attending 3-5 day courses (which are recognised as making the biggest impact on skills). On line courses on passive house (adapted to national situations) have designed a number of demonstration modules, with extensive input from companies.

*Georg Trnka. Implementing short onsite trainings in combination with air tightness tests.*

E-learning did not work that well in Austria as it is not popular with blue collar workers. Longer courses are also hard to sell. There is no legislative driver for an air tightness test (this would help, but its costly - currently under discussion). Similarly in Luxembourg, air tightness tests are currently voluntary (but get subsidy) - it is not clear if they would be compulsory in the future. This could be a good opportunity to promote training if they are, but they do impose costs which are not popular.

### 3 Best practices

The second meeting of TWG 4 began with presentations from the members on the successes and challenges faced in respect of marketing, by their BUS projects. A summary of the key points are as follows:

#### *ENERGOTRAIN - Mantas Jonauskis*

- Demand driven approach - looking at supply and demand side
- Start with customer requirements - what are the required skills?
- Focus on quality training
- Challenge - covering a lot of areas - different buildings and technologies
- Need to convince companies in the following ways:
  - Need for certified workers (competencies for various technologies, need to show value add)
  - Help companies to select appropriate workers (demand based supply)
  - For the workers - to prove their skills (personal impact)
- Main achievements: 14 technology competencies - training modules developed
- Challenge - to make it sustainable

#### *INGRES*

- Did market research on current training offer
- Most common, therefore most popular - 1 day courses
- Lack of courses on NZEB

#### *Train to NZEB - Dragomir Tzanev*

- Used an external market research company - to test level of demand
  - >2/3 of target group think they need training BUT
  - < 10% participate in training
  - Technological areas with lower levels of awareness (e.g. MVHR, airtightness) tends to be less well covered by training
- Success factors
  - Quality - the trainers need teaching skills and practical knowledge experience
- Approach varies by country
  - Czech Republic - linking with well-known existing training providers
  - Romania - long term vision - full scale research labs
  - Turkey - have facilities and infrastructure but need to upgrade them, legal issue - not able to charge for training, so need to build partnerships with construction industry (products)
  - Ukraine - successful implementation of NZEB training courses through MoUs with architecture and technical universities and companies (to combine their resources)
  - Bulgaria - cooperation among a large network of stakeholders - VET providers, universities, professional chambers and associations, the business sector. Lack of awareness on NZEB issues and hence - demand for training; as well as lack of links between construction and RES are an issue

#### *LuxBuild 2020 - Christiane Conrady*

- Trying to motivate / inform companies.
- The primary driver is new regulation from 2017 requiring all new housing to be passivehaus standard. Need to inform companies this is the case and make them aware of the challenges and solutions
- Two sets of objectives
  - Internal - for partners (in Lux) to work together, rather than competing with each other, and to jointly promote what they offer
  - External - raise awareness of new regulations (and their challenges), identify the willing companies, provide answers and solutions
- Use interviews with a 'willing' company - impact on companies, challenges on site. Impact on them as organisation (that they need to find partners, who can cover multiple aspects - e.g. air tightness)
- Proud or willing companies, they are very good advocates, collaboration with partners
- Concern - how to get more companies to turn up, still more sign up than turn up
- Companies have a concern of what is next after nzeb? Answer - probably nothing.

#### *SWEBuild - Per-Johan Wik*

- Idea is to train the trainers - from previous work 500 trainers should be enough to train all Swedish blue collar construction workers
- Offering 20-25 ttt (train the trainer) event per year
- General marketing done via partners - trade federations
- The website has online training available - but to get registered this training has to be completed with a 'trained' trainer.
- Website has a list of upcoming training opportunities (to train to be a trainer)
- Have 250 trainers trained - good progress
- Marketing plan has activities per partner, e.g. press releases .
- Low take up of press releases, use trade press - raises question of what is the best channel?
- Publicity based on a large 'need' for training not popular, makes the potential users look bad (unskilled)
- NL = about 80% of take up comes from personal direct marketing - so the general marketing is more use for general awareness - benefits of this hard to track.

#### *BUS - UK - Richard Bayliss*

- Uk approach reflects UK issues.
- Issue of built energy performance not matching what it should be according to design - skills gaps are the main reason why
- Need for a general upskilling / improvement of awareness
- Ideas to get some (relatively simple) energy aspects into all construction training (600,000 training event per year = so lots of opportunities) idea is to 'plant a seed' and slightly increase awareness of a lot of people - problem is that its hard to see the impact of this.
- Worked with Green construction board (govt. and industry partnership) to define a set of learning outcomes.
- These are embedded in other construction training - e.g. H+S test that is done by many

#### *BUS\_N@W - Jan Cromwijk*

- Focus on what installers and construction workers are proud of and the challenges

- BUS app - how to bridge gap between advisors and construction workers - on site knowledge and use is still very low
- The app has sectors, specialists and courses. Allows the production of a personal profile of training that's been completed (like a training passport)
- Using the app - you pick what trade you are, what profession, what technical area - there are 70+ technical assessments that can be done online - when they are done this signposts to other courses of various durations 0 with links to sign up to them. For each of these courses there is detailed information available - e.g length of course, detail on the content (e.g. for a PV course is it flat or pitched roof or both?)
- To get the view of accreditation users can log in via existing social networks (facebook, twitter, linkedin) - the detailed course content also has ratings by people who have done it. This rating covers the content and relevance
- Users can generate a list of courses they would like to do - that can be sent to their boss / HR department
- The skills records of users can be translated to e-portfolios
- Future - to make it sustainable some parts could be charged for - e.g. link to other courses, but some parts need to stay free - e.g. CPD, rating, short courses

## Day 2

### *BUILD UP Skills - CrossCraft - George Trnka (Irena Brnada)*

- Country-wide information & marketing campaign "Energy efficiency in motion" (CROATIA)
- Popularising the construction profession and ongoing training on EE, focus on 6 profiles defined in Pillar I Roadmap (bricklayer, carpenter, plasterer, roofer, joiner, housepainter)
- Target groups - construction workers (including unemployed, employers, students and teachers in VET, general public)
- 'Road show' - 3-4 hr 'open-door' events at 12 locations around Croatia (local VET school or central town location)
- Multiple promotion channels - builders associations - employed workers, professional chambers- employers, Croatian Employment Service - unemployed builders, Association of VET Construction Schools animates students and schools, local & national media - local community/general public
- Cooperation with local/regional authorities - increased media coverage
- Strengths - balanced combination of skills competition, education, information & entertainment. Detailed plan is made for each road-show location, coordinated with local counterparts (schools, companies, experts, sponsors).  
Each host school works out own concept and chooses construction professions most relevant for the local market/local community.  
Skills competition is attractive for the audience, filmed and used later as advertising and educational material.  
The events are opportunity to apply for the first test trainings (starting in autumn). Schools interested to host the events are potential future EE training centres.
- Issues - Difficult to get unemployed builders engaged. Need to synchronise events with training start dates - to help get people on the courses. Will promotion be enough to attract people to the training courses when they are no longer free?

**Weaknesses**

- Market research - would this pick up problems?
- Training providers could maybe do this better - especially if involved early in the process
- Examples of training provider modifying courses and getting a better response
- Pillar I should have been a type of market research - but not detailed enough - e.g. how short is a short course = 2 days? 2 hours?
- Training providers. Maybe more focussed on 'new sales' than quality - this is a risk
- Name of course - needs to be short and meaningful but not enough on its own.
- Market also changes rapidly - so market research can go out of date.
- Highest demand does not mean that what is delivered is the 'best' quality (or most use in terms of saving energy)
- Courses have a life cycle - so won't be most appropriate and 'sell' well forever
- Market research helps to identify relevant stakeholders - e.g. HR managers, had been ignored but they are very important - they are responsible for training in large companies - 1 HR manager could bring 100 trainees. E.g. NL HR managers all use the same HR platform, so if your course is not on this list (free to add) your course will not get approved.

**Weaknesses - market research**

- Short courses lead to longer? Not necessarily - post short course trainees think they know enough
- Back to reason - why do people train? 2 main reasons. 1. New requirement (e.g. better inspection requirement) 'forced' to learn a new skill. 2. Business opportunity - is they see a market for new skills (e.g. larger PV grant - opportunity to sell PVs - builders need trained installers). Much of what we are selling is training 'because it's good for you' - not likely to sell well - need to position it in line with ones of the two other motivations
- Not easy to make employers realise the link between a market growth area (possible because of new legislation) and the need for new skills
- PV market - large variation in quality, larger organisations active (typically good quality - assure quality to their customers) smaller installers less likely to do this QA - risk of them failing
- Is there a role for funding to 'educate' customers? Convincing employers that they need skilled workers
- System of certifying companies - problems of time consuming to administer
- Any subsidy into the market raises the risk of a future lack of sustainability - possibly needs to start as pilot and then convert into compulsory.
- SMEs (majority of builders) not known as strategic business developers - tend to develop then do not- an ongoing process

**Distribution channels?**

- Hard to know what works before you try it. Twitter, facebook can also have low response rates (like press release). Using trade associations is usually good.
- Should this (what channel is best) be part of market research? Yes!
- If society put a higher value on these issues, press releases would get more interest - ideal is to have high level political pressure to change public perception / interest level
- Network of trainers can help sell - relatively easy to contact and get materials to

**Importance of happy customers and onward recommendation?**

- Those who have training are good sellers, establishing / using them as a network is a good route - could use facebook or twitter with this group
- Need to keep social media group active, and going for an extended period of time - to keep the group live and active and topical - using the external situation as a marketing tool.

#### *Partnerships?*

- Involve governmental bodies? Any point in asking them to change legislative requirements? Easy to get them to speak at events - but can they do more? Lux - governmental policy is generally helpful - if you have a contact who is convinced, they will help create demand, but can't do more.
- Trade associations are a good route into policy making, better than going directly
- Need a clear idea of a policy before going to a policy maker - they can be a champion - but they won't directly generate demand for training - just help set the agenda.
- Government can have a role in general quality - if the policy is failing because of poor quality, this should get back to the government. - but speed of feedback will vary - quicker in small countries.
- SWE - examples of lack of follow up / consequence for poor implementation
- Enforcement of regulations often lacking
- Law suits on poor installation - NL - homeowner will win, as legislation specifies quality.
- Market research - 95% knew there was new legislation, but 95% thought enforcement would be lacking - general social issue.
- Home / building owner - if they know quality (enforcement) will be lacking - choice will be made on price - especially if not the owner/occupier
- If clients are offered the choice of quality vs. price, they will pick high quality and higher price (NL)
- SMEs in construction sector - highly likely to lack entrepreneurial skills (they have trade skills) - this could be area where training / changing their mind set could bring benefits (so they understand why they might benefit from high quality EE buildings) - better than talking about business plan to them.
- New business model discussion - what does it mean? May help to visualise existing model vs. new model (how its different and why its better?).
- Companies will have multiple business models - for different parts of the market. Visual tool can help with this - some examples can be provided of how to use.
- Relates back to impact on companies - market leading companies will do this - they are good examples to inspire other companies (they are excellent advocates for selling training - and for changing mind sets - inspirational people)

### **3.1 Summary - strong areas with examples**

#### *Market Research*

##### *Train-to- NZEB*

- Used an external market research company - to test level of demand
- >2/3 of target group think they need training BUT < 10% participate in training
  - Technological areas with lower levels of awareness (e.g. MVHR, airtightness) tends to be less well covered by training

ENERGOTRAIN, IngREes

- Demand driven approach - looking at supply and demand side
- Start with customer requirements - what are the required skills.

### *Positioning*

#### BUS UK

- Uk approach reflects uk issues. Idea is to get some (relatively simple) energy aspects into all construction training (600,000 training event per year = so lots of opportunities) idea is to 'plant a seed' and slightly increase awareness of a lot of people - problem is that its hard to see the impact of this.
- These are embedded in other construction training - e.g. H+S test that is done by many

### *Good areas - sales / conversion / retention strategy*

#### LUXBUILD2020

- Use interviews with 'willing' (leading / innovative) company - they are very good advocates

#### SWEBUILD

- General marketing done via partners - trade federations
- Publicity based on a large 'need' for training not popular, makes the potential users look bad (unskilled)

#### BUS\_N@W

- About 80% of take up comes from personal direct marketing - network of trainers and trainees
- App allows social rating and creation of a 'wish list' to send to HR manager
- Importance of happy customers and onward recommendation

### *Good areas - Partnership*

#### LUXBUILD2020

- Objective - for partners (two installer trade associations in Lux) to work together, rather than competing with each other, and to jointly promote what they offer

## 3.2 Weaker areas

### Partnerships - problems?

- The government also has a role in enforcement - could be via air tightness test - but what happens if performance fails? What's the stick?

### Market research

- Training providers could maybe do this better - especially if involved early in the process
- Market changes rapidly - so market research can go out of date
- Highest demand does not mean that what is delivered is the 'best' quality (or most use in terms of saving energy)
- Courses have a life cycle - so won't be most appropriate and 'sell' well forever
- Market research helps to identify relevant stakeholders - e.g. HR managers, had been ignored but they are very important - they are responsible for training in large companies - 1 HR manager could bring 100 trainees

### Distribution channels

- What channel is best should be part of market research

- Distribution and communication channels are providing value only in relation to target groups' needs and regular communication/decision making patterns
  - If society put a higher value on these issues, press releases would get more interest
  - Network of trainers can help sell - relatively easy to contact and get materials to
- Hard to know what works before you try it. Twitter, facebook can also have low response rates (like press release)

### *3.2.1 Ideas for addressing the weaknesses*

- Weaknesses - ways to address these?
- Objective - optimum set of circumstances - success factors against these areas to get the best opportunity to market EE training
- Market research (enough done? Done well (right questions? right sample?) Do at national level?)
- Business models - does demand exist? The answer to this fundamentally changes the market research and what is the best thing to try and sell. Profit motive or 'for the good of the world'. NL - market currently dominated by early adopters/innovators - so it's not a surprise that we have to create demand - especially for existing building stock (2020 - 2030 market will grow)
- How to keep it up to date? Repeat process?
- Can we get external input on marketing approaches?

## 4 Business plan canvas

### 4.1 Introduction to the method

At the Athens Meeting Rob Williams described the purpose of the event and handed over to Andro Goblon (Slovenia), a group member and expert on the business canvas approach.

Andro gave an introduction to the nature of the approach. Everyone had been asked to look at the website <http://www.businessmodelgeneration.com/canvas/bmc> and a brief introductory video <https://www.youtube.com/watch?v=QoAOzMTLP5s> in advance.

#### 4.1.1 Exercise one - a business model for a tree

Andro asked everyone to try and quickly prepare a Business model for a tree (using a blank canvas and sticky notes). Andro gave some useful tips to those trying this. Such as one idea per sticky note, start where ever you like (in the structure), don't mix past and present. Different customer segments need to be done separately. Pictures can be better than words.



#### 4.1.2 Exercise two - Business model for Facebook

Andro then asked everyone (in groups of 3 to 4) to try and draft a business model canvas for Facebook. During this exercise, he provided more useful tips in the process, such as the use of 3 colours in the post it notes, to differentiate previous, present and future factors and issues.

### 4.2 Business models for BUS projects

Each participant was then asked to try and develop a business model for their own project.

A number of common issues emerged from the attempts to produce the business plans. Examples of these issues were:

- The importance of the need to put yourself in the shoes of your customer - so you can think about what they might want / get from the courses / services being offered.
- The important role played by numerous partners, including the media.
- The need to consider wider possible revenue streams, such as fees for training requires a market, private sponsors, use of facilities (rent when facilities not used) certification fees

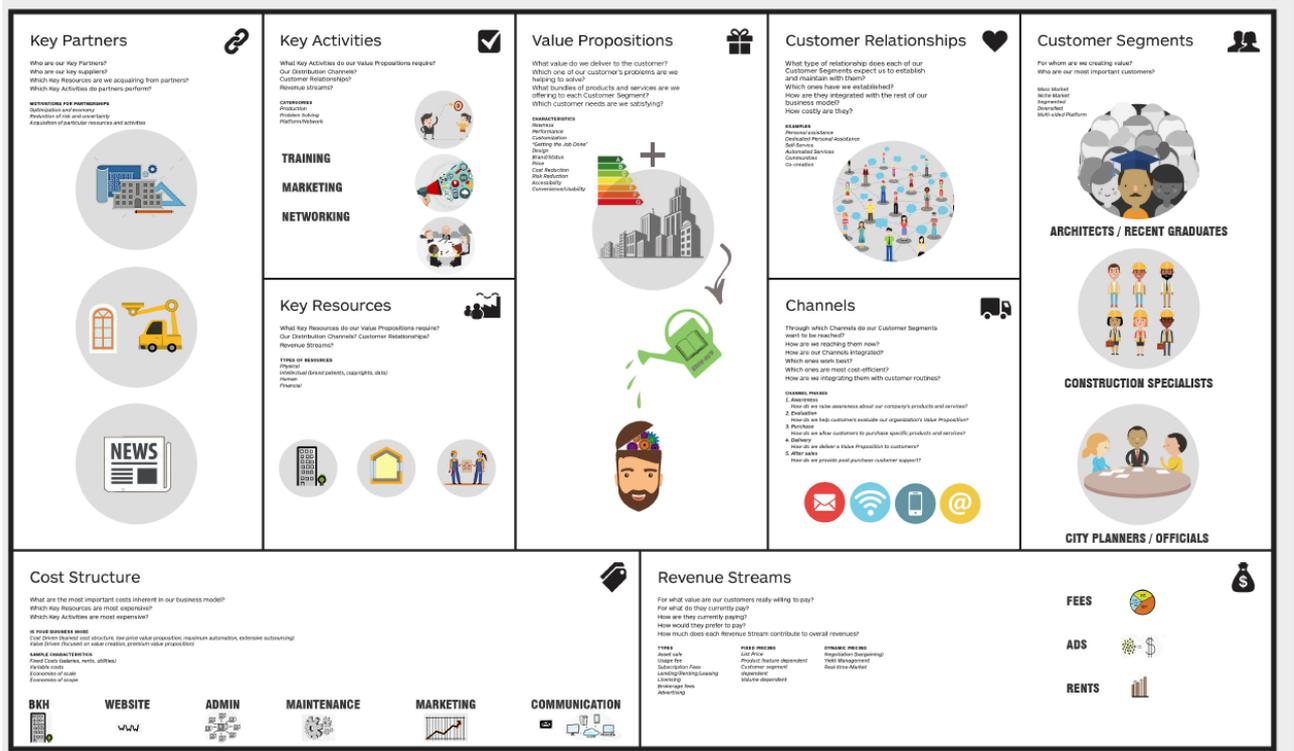
- The business plan should be considered as a dynamic process, what ever is written down does not need to stay that way for ever, change may be necessary, in line with external circumstances and customer needs (and wants).
- The business plan needs testing with real customers, the best delivery typically varies by end group.



Andro concluded the sessions by giving example of some wider analysis that can be done around the side of the business plan. For example a common follow on step from a business canvas would be a swot analysis

#### **4.2.1 Exercise one - presenting the business plan canvas**

The session began with a discussion of what had been achieved on day one and Andro also gave guidance on how the approach was useful for developing a short presentation (i.e. a pitch) for the projects. This process was helped by Dragomir presenting a canvas he had developed in advance for his own project.



**Exercise two - considering the value proposition in more detail**

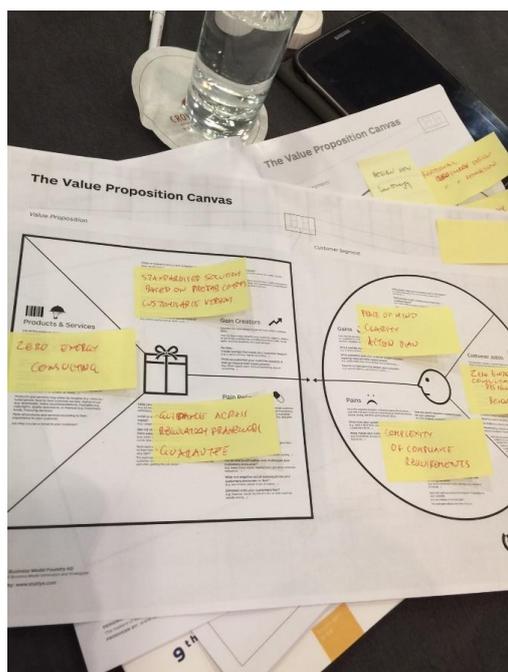
This exercise focussed on the value proposition - what the BUS projects offer and how this matches with the jobs (and pains and gains ) of the target audiences. This exercise required everyone to think about the value proposition of the BUS projects- what they are offering the users.

The point was also made that there is a wider group of influences outside the business plan canvas - economic, social, political etc. that need to be considered.

The participants split into 4 groups and prepared customer jobs, pains and gains for the following four customer groups - construction workers, small businesses (who employ construction workers), investors (those responsible for financing the construction of buildings), government agencies (responsible for much training and energy in buildings policy and regulation).

The exercise required the groups to think about the jobs of each group and then to prioritise these jobs. The groups then thought about the pains (the things which can go wrong / hinder these jobs) and gains (the things which make these jobs easier) of the top priority jobs.





Value proposition vs. jobs, pains and gains.

### 4.3 Using the Business canvas in real life

At the Rotterdam meeting in May 2017 a number of TWG members presented their experience of having gone away and used the approach.

#### Mantas presentation

Presented a summary of the project (Energotrain), then discussed how the business plan (and particularly the value proposition) had been used to help them refine what they want to 'sell' and why customers want to buy it.

*Key partners* -Three:

- Equipment and material manufacturers - because the project focussed on providing training in the most recent developments, it is key to involve them.
- Large employers - because if you meet their needs you are meeting a lot of the market needs.
- Training providers - need to be able to offer the training based on common standards across the country (and these are the people that can do that).

*Key attraction* - the industry changes quickly, so the course material needs to be kept up to date.

*Value proposition* - meeting the newest standards - which is good for employers and employees

Keeping the material up to date and relevant is best done via online tools, while involving all relevant stakeholders - this also reaches a big audience for a low cost. The costs include keeping the expertise up to date, many of the other costs can be outsourced. The income includes certification schemes - which workers or companies will pay for.

#### Jan - Presentation

Jan presented the BUS app and discussed why people would use it and what they could gain from it. For example, he described the fact that users get to rate their own skills and are signposted towards appropriate training.

Jan discussed the value streams within the app and stressed the need for users to invest social capital to make it successful. Users need to get some reward for this investment. Each user will have different needs, so the value proposition needs to reflect this need for personalisation. Each customer segment needs to have their own detailed value proposition.

#### **Jiri - Train-to-NZEB - Czech Republic**

Presentation focussing on attracting participants. A training centre was opened in Prague this March. A key feature is the use of physical models (cross sections of construction techniques).

Courses are run a number of times per year. There appears to be more demand in winter, especially for off-site training. The demand for training does not appear to be highly price sensitive - courses for €20 appear as popular as those for €80 (for two days courses).

The use of 'games' as a learning / training aid appears popular. For example courses with thermal imaging equipment are popular.

They offer three core courses - design, construction and a more general course on sustainable construction. They also will offer more specialised courses on demand (e.g. blow door and thermography) - these will be provided in cooperation with manufacturers.

Attracting attendees is done through a variety of methods:

- Social media; website, facebook, twitter - but not many come via this route.
- Direct emails and invites - this works better than social media. They got access to a 5,000+ database for a ABF foundation, also have access to a 30,000+ list of chartered engineers (half of which are involved in construction). They get an average response rate of 8-10% from targeted mailings.
- Positive feedback from participants - like models, games, interactive

Visually attractive certificates are important.

#### **Dragomir - Train-to-NZEB - Bulgaria**

A problem was that they only interact (promote to) with professional / specialised audiences. They have had no success in promoting to a wider / mainstream audience.

Their marketing analysis indicated that there is a large gap between those who assess themselves as needing some training (50-60%) and those that actually plan to take up some training (5-6%). It is hard to convince those that need some training to actually take it up.

With regard to price they have found that architects are willing to pay around €150, while manual workers are willing to pay around €95 (for 40-hour courses). For short 1 day course people expect low fees (€20-30), or even free / paid to go. Based on the targets for how many people they expect and what people seem willing to pay it is unlikely to be commercially viable to offer the courses.

Success factors - skilled trainers, practically orientated facilities (including models).

The value proposition focuses on promoting the following gains, and addressing the following 'pains':

A socio-psychological approach to the business model canvass was suggested, to add up to the previous example:

Gains - Being seen to belong to a lifestyle and/or a social group that is young, well-educated and modernising - being a leader / early adopter

Pains - looking ignorant, conservative. Lagging behind. Mistakes in construction which bring costs.

No single communications channel is enough, the communication should target both the general-audience media and professional circles.

**Questions / discussion**

- Still a big challenge on demand - has anyone looked at the benefits to the client and how this might drive demand? Much of what is done is user / learner focussed. The CITB (in the UK) have developed a supply chain tool which helps companies see the level of training in their suppliers (with the intention being that they will favour suppliers with better trained staff). Important to remember that the ultimate goal is better buildings.
- It is a challenge to make better quality visible to the client - much of it can only be seen with thermographs or blow-door tests.
- During periods of growth in construction, labour shortage leads to even less focus on quality.
- Even where legislative drivers push quality higher (e.g. passivehaus standard in Luxembourg) the client focus is on the extra cost.
- The majority of clients (70-80%) are happy with 'standard' performance levels. It is not easy to find more motivated clients. Real customers are often very good sales tools they can tell prospective clients of the benefits of 'improved quality'.
- The difficulties of convincing clients to act in their own long-term self-interest was discussed. This limits the numbers who will invest in EE/Res in buildings - addressing this is a job for wider education, and is not easy. Focussing on the negative (avoiding poor quality buildings) is often more successful - this market may increase if poorly constructed buildings attract negative coverage (and there are some examples of this happening - e.g. in UK).
- There are also skills gaps at higher level (white collar); the blue collar focus on most of BUS projects is often a surprise to many in the market.

## 5 Conclusions and Recommendations

### 5.1 Perspectives on future demand.

During the final meeting there were two presentations that considered the future demand and the lessons that can be learnt from past experience of scaling up training as demand increases.

#### Jan Cromwijk

Market uptake of low energy buildings remains relatively low and is still at the early adoption stage, however if the long term (2050) climate goals are to be met, this will change.

In order to look at the scale and pace of training needs implied by this move Jan has been involved with developing a number of scenarios of how the building stock in the Netherlands could be improved by 2050.

- Scenario A - move all dwellings to energy neutral in one step (if possible by taking a one-step 'industrialised' approach) - in the NL, this means 7 million dwellings - which means around 213 per day up to 2050. This approach would see market growth for 20 years, then a slow decline. During the growth phase this would need an extra 3,000 workers per year - peaking at an extra 4,500. Around two thirds of the market will stay using a step by step approach, (the e-renovation costs are too low to make a one-step-makeover possible).
- Scenario B - all to label A by 2030 then neutral by 2050. This removes the opportunity to massively industrialise the switch (losing some efficiencies) - but results in a continuously growing market up to 2050. In the NL it would create a demand for 5,000 extra workers over the next 7 years (which comes at a time when the workforce is ageing - so there would be a need to train some 15,000 in total each year). The key technology change for this scenario in NL is a move from gas to gas/elec heat pump / hybrid, then to all electric post 2035.
- Scenario C - All dwellings energy label B by 2040, with extra CO2 emissions cuts achieved by compensation (e.g. global emissions trading). Even this worst case scenario needs an extra 1200 jobs per year.

Illustrating that the dwelling stock has major upgrading needs. It is important to stress that BUS projects need to retain a long term perspective. Their efforts to date in massive use of the created training infrastructure will bear the most fruit in the period between 2025 to 2040.

#### Richard Bayliss - lessons learned on scaling up energy efficiency into the mainstream

A key point is that we have to be realistic about the market. Training infrastructure responds to market demand. The importance of a consistent policy framework cannot be understated.

The growth and subsequent contraction of energy efficiency actions in the UK has not helped the market. There have been some unintended consequences of poor quality retrofit / refurbishment of UK housing.

The cancellation of the Green Deal has also caused problems, due to expected market growth not materialising.

The CITB approach has been to try and embed sustainability in standard building training - the CITB's 'Sustainable building training guide'<sup>2</sup> lists training outcomes by trade.

<sup>2</sup> <http://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2017/03/Sustainable-Building-Training-Guide.pdf>

There is a need to adopt a customer focus - selling energy efficiency in a way that means something to the consumer'. In the UK this is being pursued by developing a quality mark for EE construction. The UK could be considered to be moving into early mass market from many EE and RES technologies.

## 5.2 Recommendations

During the final meeting of the TWG, a session was devoted to the discussion of the key points that emerged from all four meetings of the TWG. The discussion was started by Jan Cromwijk presenting his thoughts. These thoughts were then added to via group discussion, as follows:

### What did I learn

- Many different approaches on market introductions of BUS-products
- The value of creating business models (especially value propositions) - used in implementation in more than one project - need to use it / do it to learn and benefit (half a day of investment pays off)
- If the business model had been done, then maybe many courses would not have gone forward - value proposition gives a key to the market demand
- The added value of involving manufacturers and some successful approaches to involve them.
- The power of storytelling (hearing stories from other projects (and craftsmen) (as inspiration and as benchmark))
- Start with “why doing this?” - goal to help people
- Journey towards more consumer / end user approach
- Long term perspective is important 10-15+, important to consider this when evaluating ‘sustainability’
- New solutions emerging - marketing tools (e.g. apps, social media - now much more important) - varies by MS (food and beer works everywhere)
- We should group and condense the examples of drivers and barriers (table) that was produced after the first meeting

### What did we learn together?

- Many of the challenges we meet have the same ingredients, but the recipes for success always need a variation in “seasoning”
- BUT much more similarity than expected, especially in methodologies.
- Risks / evidence of duplication - balance between initiatives of local use and learning from best practice
- The BUS actions need to be placed in a much longer timeframe. For example, the market for nZEB renovations will become in many countries a mass market around 2030.
- So analysis done and lessons learned in BUS-projects need to be reviewed and maybe also update in the period after 2020
- BUS has moved from a research to implementation stage - needs additional players - e.g. more from construction industry and final users - also needs implementation and selling skills
- Can the platform be used better? Needs effort and input to make it work - change (from roadmap creation) to target / involve more companies? More of a club / stakeholder network

#### **What is a recommendation for myself**

- Make use of business modelling in the writing phase of a new proposal (to get a much sharper dissemination and communication strategy)
- Involve manufacturers in future projects

#### **What do we recommend to BUS projects and EASME / policy makers.**

- The EU gives a high importance to sustainability of the actions. We learned that most of the consortia are not experienced in bringing products/results to the market, to sustain their actions.
- Therefore, in future EU-Exchange professional training/advice/scaffolding on bringing results to the market will be highly appreciated.
- Services such as the ESS-service, but then with an extra upskilling component ;-)
- Change management (to change construction)
- Most of the BUS roadmaps are ending around 2020.
- But then only for new buildings the market has evolved to a mass-market
- Updates of the roadmaps are needed to cover the still in its infancy renovation market
- The programme should continue - if stopped now, good work will be lost, need to reflect the long-term nature
- Would like more time for the TWGs in the exchange meetings - retain external facilitator (useful)

## Annex 1: Survey Results

### a. Survey - Good practice examples on the marketing of low carbon construction skills projects, that address these challenges or utilise these drivers.

In cooperation with product manufacturers, they have agreed to deliver training centres information to the participant in their free events. As product representative training are usually recognised as professional certification the VTC training is.

For biomass small scale boiler installers, the regulation from the ministries through a voluntary law that will eventually be mandatory as well as accrediting a training and examining organisation.

We designed a teaser app that offered a basic assessment for your sustainable energy competences, and then directed you to training courses matching your needs. This way we could bypass the employers and reach the workers directly.

Detailed market research led to shortening the in-class training, increasing interactive sessions, e-learning, practical training and excursions.

Regional law that promotes the sustainability in buildings, linking public grants to quality of project and product, also with an attention to the professional quality of the enterprise. Interest of the construction companies to use the opportunity of the course.

1. Market leaders doing, 2, New requirements to each assets (measured and verified) energy savings. Guarantee on savings.

In my opinion before training workers it is absolutely necessary to stimulate demand from end users. Therefore any action that is willing to raise awareness (information points, platforms, ‘hot lines’, information routes etc.) would be valid for marketing training in turn.

Market research - meetings and general discussions with workers and companies to determining length of course and training needs for quality low energy buildings. Communication skills on site was also a barrier.

F gases / ODS based (517/2015/EU) certification system for both personnel and companies with mandatory registration works properly for many years in Hungary. (details in case study). Refrigerated handling is also a CO2 /low carbon and emissions controlling system.

Design of training courses based on market research results and extensive consultation with advisory groups of experts in the field. Support of training courses by respected CVT institutions. Good consideration of course structure and length to match the availability of the target groups.

We have plenty of projects e.g. <http://www.sbrcurnet.nl/projecten/kennispartnerproject-bouwbedrijf-van-der-weegen> success factors - contractor was quality conscious, involvement of suppliers with training on site, lean method, team work, This project was partly funded by sbrcurnet with money from the building sector.

On site training, developed in pilot action are very successful. But new social fund rules need to be promoted (i.e. at least 30% of EFS have to be used for ‘on site’ training) in order to scale up the pilot actions a European communication could be useful.

#### 1. The importance of certain actors to your good practice example(s).

Actors	Importance
a. European Commission	34

b. National public authorities (e.g. national government, Ministries, municipalities, regional employment offices)	36
c. Local or regional public authorities (e.g. Municipalities)	24
d. NGOs	13
e. Chamber of Commerce	27
f. Construction companies	28
g. Training centres	30
h. Media	29
i. Others - please specify:	
2. Material producers	1
3. The sectoral development funds	1
5 Consumers	1
10 Academia	1

Actors	Importance				
	Most	High	Med	Low	None
j. European Commission	4	4	3		
k. National public authorities (e.g. national government, Ministries, municipalities, regional employment offices)	6	2	3		
l. Local or regional public authorities (e.g. Municipalities)	1	2	6	2	
m. NGOs	1		4	1	1
n. Chamber of Commerce	1	5	4		
o. Construction companies	3	5		1	
p. Training centres	5	1	3	1	
q. Media	4	1	5		1
r. Others - please specify:					
3. Material producers	1				
4. The sectoral development funds	1				
5 Consumers	1				
10 Academia					

#### Most important actor?

- Both partners need to keep delivered information up to date.  
Companies will mostly all change the way of things they do mainly when there is a legal obligation
- Provided experts and funding for the app
- B. is creating the rules of the game. G is contacting the trainers, trainees and its transferring the knowledge

5. A - because it's a European problem (not only a world problem). B - They are in the strongest policy role C - If they are not this motivated, nothing to do. G - they can transfer the technical skills.

Consumers - common people that understand the utility and can share with friends etc.

The EC must govern the whole process that should be applied by national authorities afterward. VET providers and companies should deploy the system, Finally media should spread the systems.

To regulate legally the certificate procedure and mandatory monitoring (see F gases RES Directive)

The experts from construction companies and commerce and technical chambers. In all cases collaboration among all stakeholders is necessary to maximise impact.

In our projects we try every way to improve the sustainable employability of the employees in the building sector. Through the employers through the training centres, through the trade unions and through individual or small groups of construction companies. There is no one way, but we have to do them all.

With our projects we could mainly promote a bottom up approach which reached only a few key national actors, with a top down approach our position could be enforced and a scale up of good practices could be enhanced.

## Annex 2: Best practice examples

The goal is to identify and map the results already achieved and the challenges ahead together with (foreseen) solutions. examples of: market successes, accelerators, barriers, success factors, lessons learnt (good and bad), suitable communication channels and key actors.

In the last three columns, please indicate the (hypothetical) impact of the specific activity/measure on the three general target groups: not aware / not convinced / willing.

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
<b>Ms Christiane Conrady LU LuxBuild2020</b>						
Accelerator / driver	obligation of passive house standard for new residential buildings	Stimulating the demand for passive houses	Ministry, national energy agency	I can't ignore it anymore	I'm still not convinced	They will consider the obligation as a confirmation of their innovative approach
Challenge & Solution	Information campaign: experienced companies report on the market opportunities of high energy-efficient buildings and the influence of the organisation of the company	Lessons learnt: + stimulating a discussion about the market opportunities - low interest in the events - we didn't reach the not aware	The willing companies became ambassadors of the advantages energy-efficient buildings = ambassadors of innovation	Low impact for so far	They start to discuss about the problems and the opportunities of the prescription	recognition of the willing, who are most convincing speakers
<b>Ms Irena Brnada (Hungary / Croatia) CROSKILLS II</b>						
Accelerator	National energy renovation programs: (1) family houses and residential buildings; (2) public buildings. 40-80% public co-financing provided for energy certification and/or actual retrofitting work	Quality of construction work Savings after renovation	Environment Protection & Energy Efficiency Fund, national authorities, municipalities, construction companies Media	I will wait and see	I don't believe I would get any different quality than with standard renovation; I don't know if there will be any savings later; We can't afford to invest now, even if our contribution is only 60%.	My building needs renovation - I'd better get it cheaper and achieve more savings later (quality is not primary concern)

Type	Short Description		Success Factors	Key Actors / Communications	Target Groups		
					Not aware	Not convinced	Willing
Challenge / Solution	<b>Challenge:</b> A lot of existing training courses for construction workers offered by manufacturers, for installing their own products	<b>Solution:</b> Turn competitors into partners - include the manufacturers in delivery of our training courses as trainers and/or providers of demonstration materials.	Jointly designed & implemented courses that consider a building as a system Recognisable manufacturing companies help the attractiveness of trainings	Manufacturers of construction materials/technologies Training centers	All these courses sound similar to me	Courses by manufacturers are simpler and more accessible	I will get better quality training if more experts are involved; if manufacturers are involved, it must be something good
Tool / Campaign	Country-wide Marketing campaign with 'road-show' promo events (construction skills competition, lectures, entertainment program, training announcements)		Quality implementation of the activities, locally customised content of each event, good turnout of target groups - workers, unemployed, companies, local general public, VET schools Media sponsorship	Media; Local authorities Employers and workers Regional employment offices	I may attend an event if program is interesting	We are too busy to go to promo events	I want to hear more about energy efficiency and training opportunities
Tool / Campaign	Info-campaigns on energy renovation and offer of certified workers		Regular participation/presentations in specialised events Media coverage	Professional associations, NGOs National authorities Media	Create awareness	I will wait and see.	Learning opportunity - will attend on any occasion possible
Tool / Campaign	Media work - targeted articles in specialised media, TV/radio appearances (announcing training		Good media coverage (nationally and regionally)	Specialised media Media for general public	Create awareness	I will wait and see.	I want to know more about energy efficiency and training opportunities

Type	Short Description		Success Factors	Key Actors / Communications	Target Groups		
					Not aware	Not convinced	Willing
	events and the overall training scheme)						
Tool / Campaign	Sponsored contest to develop smartphone apps: - Game formulated as a construction task - for adults and students	'Cheat-sheet' to facilitate revising, before testing for the EE certificate (possibility to upgrade professional orientation modules of the national Employment Service)	Apps are free for use Interest to develop the apps Many interested users among different target groups	Sponsoring companies Students (app creators) Social networking Professional associations, construction companies (content creators)	Tickle them and create awareness	Create interest and provide realistic perspectives for action Getting certified may not be so difficult.	Creates a platform to share lessons learned Can act as creators of content
Tool / Campaign	National registers introduced by the project: - certified workers & trainers; - accredited training centers & training programs			Cro. Chamber of Civil Engineers (manages register online); Agency for VET and Adult Training; national authorities	New career opportunities as trainer, worker New business opportunity as training centre	Investors & employers: It might be too expensive to hire trained workers Employers: trained workers will go to work abroad anyway. Edu. institutions: might be too expensive to get accredited as	Better career options; opportunity to hire educated workers Image improvement for training centers

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
					training center, difficult to attract trainees to make it cost-efficient.	
<b>Mantas Jonauskis, Lithuania, Build Up Skills ENERGOTRAIN</b>						
Challenge & Solution	<p>Low interest of companies to allocate more qualified staff to trainings and certification</p> <p><b>Solution:</b> Engage with companies through calls and meetings and presentation of specific benefits of Training and Qualification schemes for particular company Communication of success stories of pilot customers</p>	Number and qualification of workers participating in trainings and certification	Construction and installers' companies	I will wait and see the quality of the trainings and certification scheme	I would better rely on qualifications of engineers rather than workers	I will have a quality label for my workers thereby having better chances to win public or private tenders for construction works
Challenge & Solution	<p>Doubts if proposed Qualification scheme will meet market needs</p> <p><b>Solution:</b> Early involvement of market players in definition of technology processes and required competences Using different media channels to make potential users aware of the project activities, planned results and ambitious goals.</p>	<p>Number of companies involved in the project activities</p> <p>Number of companies aware of Qualification scheme and its value added proposition</p>	<p>Construction and installers' companies</p> <p>Media</p>	I will wait and see the initial results of the Qualification scheme	I will participate only if it is obligatory.	I see a big opportunity to differentiate against competitors and ensure better quality of construction works.

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
<b>Mr Jiri Karasek CZ IngREes</b>						
Accelerator / driver	Supporting schemes for RES and Energy Efficiency	Disposable financial sources, positive experience	Ministries (Industry and Trade, Environment)	I will wait and see	Individual communication process	Leaders
Barrier	Decreasing number of participants in the courses	e-learning, practical exercises, equipment, innovative approach	Training centres	Information campaign	Attractiveness of courses	More skills, better quality, best practice, good example experience
Challenge & Solution	Lack of really experienced and skilled professionals in nZEBs <b>Solution:</b> Support of training courses for professionals	Higher number of skilled professionals in nZEBs	Professionals associations, Training centres	Information campaign	Creation of the new jobs	Construction companies should want to have an educated and skilled professionals
Barrier	Insufficiently pace to fulfil the required energy efficiency targets	Improvement the legislative process and its accelerating	National Government, industries	I will wait and see	Individual communication process	Leaders, our ambition should be higher
Barrier	nZEBs remain only on the paper due to the poor quality of the construction works	Rising number of skilled craftsmen in nZEB	Construction companies	I will wait and see	It is too expensive, Individual communication process	Leaders, we want only high quality buildings
<b>Mr Per-Johan Wik SE BUILD UP Skills SWEBUILD</b>						
Campaign	A detailed marketing campaign with marketing activities to each education occasion.	That the communication will be done and information sent out for each event.	Partner organisation in project.	Hopefully some will be more aware.	I will wait and see.	Will attend education occasion.
Accelerator/driver	Swedish Energy Agency are financing or co-financing four initiatives for increasing competence in the building sector.	Endorsement, National Stakeholders	Swedish Energy Agency and the coordinators of each project.	I will wait and see	Maybe a bit more convinced.	Are of the opinion that it is good a lot of effort are done for more efficient buildings.

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
Challenge/ Solution	Challenge: Energy is only one of many things that are addressed for education in the building sector. Solution: The EUBPD NZEB for 2019 and 2021 stressing the importance for education in energy efficiency.	That the national level for NZEB is set to such a level that the stakeholders in the building sector feels it is necessary with energy education.	Swedish National Board of Housing, Building and Planning	I will wait and see	Think they can build energy efficient without education	We need more education to build energy efficient.
<b>Mr Georg Trnka AT BUILD UP Skills CrossCraft</b>						
Challenge & Solution	The implementation of the two to four days off-site trainings has proven to be exceptionally difficult all over Austria.	Increase efforts to identify building companies in order to register for in-house trainings by raising the bilateral exchanges with potentially interested companies	Construction companies		X	
Success Story /Solution	Strong market demand exists for short on-site trainings.	Implementing short onsite trainings in combination with air tightness tests.	Construction companies			X
Challenge & Solution	The implementation of the two to four days off-site trainings has proven to be exceptionally difficult all over Austria.	Integration of longer trainings in already existing trainings schemes.	National ministries in charge for craftsmen education.		X	
<b>Mr Dragomir Tzanev BG Train-to-NZEB</b>						
Accelerator / driver	National Renovation Programme (100% public financing for retrofitting of multifamily buildings). Part of the national strategy for building renovation	Quality of construction works Actual savings after renovation	National Government Municipalities Construction companies	I will wait and see	I don't believe in quality works which I'm not paying for I don't know what I'll get as end result	My building needs renovation - I'd better get it for free (no quality concerns)

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
			National and professional media			
Accelerator / driver	Operational Programmes (Region in Growth 2014-2020): energy efficiency in public buildings	Quality of construction works Actual savings after renovation	National Government Municipalities Institutions' directors (schools, hospitals, kindergartens, etc.) Networks of local authorities	n/a (public authorities)	It's too complicated and I may not get my money back if I fail I'll do business as usual and won't care much about savings	These are free money for schools and kindergartens - that's what voters want!
Accelerator / driver	Plan for annual EE refurbishment of state-owned buildings - 5 % renovated state-owned buildings per year	Available financing Energy targets Quality of construction works	National Government National media	n/a (state authorities)	It's too complicated and I may not get my money back if I fail I'll do business as usual and won't care much about savings	I'll do something visible and get better comfort
Challenge & Solution	No real NZEB projects <b>Solution:</b> Involve and promote the first actual NZEB projects	Engaging frontrunners Finding motivated building professionals	Architects / Designers Innovative construction companies National and professional media	I will wait and see, in Bulgaria it will happen later than everywhere else	That's money for nothing, EE is overrated This is politicians' swagger We are poor, EE is for the rich	That's the future, we have to get going!
Challenge & Solution	Low reputation of the profession <b>Solution:</b>	Build personal stories Promote best practice examples	Media Architects / Designers	Construction workers are illiterate and	It's nothing special to put some insulation	We need to provide quality to our buildings

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
	Engage with national media to increase the interest in quality buildings	Find popular promoters	Policy makers Popular figures	should only do simple things Buildings were build and we know how it's done	It's all too expensive, and trained workers will go to work abroad No one wants quality, they all go for lowest price	Even the best design could be compromised by bad construction works
Challenge & Solution	Low quality of the existing trainings <b>Solution:</b> Create new brands Involve professional associations for QA	Quality training programmes and materials/content Marketing campaign	Trainers Professional associations Professional media	Trainings are done only by pressure from the authorities	Trainings are done by teachers with no practical knowledge Trainings are done just to tick off the obligation	We need to learn how to implement EE measures in a quality manner
Tool / Campaign	Municipal Energy Efficiency Network EcoEnergy conferences and publications	Cooperation with local authorities Support of pilot/demonstration projects by LA	EcoEnergy managing board Municipalities	n/a	I'll do business as usual and won't care much about savings	EE in public buildings improves the reputation of LA EE provides better public services and local economic growth
Tool / Campaign	The Train-to-NZEB training centre and media campaign	Quality implementation of the activities New attractive training schemes and offers	Professional associations Construction companies Media, NGOs	No interest to further knowledge buildings	This is not for us, it's too specialized NZEBs are for the rich	I want to build/live in a NZEB and I want to see how it's done.
<b>Mr Jan Cromwijk</b> <b>NL</b> <b>BUS_N@W</b>						
Accelerator/driver	The Dutch Energy Agreement	Endorsement, National Stakeholders	National Government Municipalities	I will wait and see	Discussions about barriers	Our ambition is higher

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
	This is a combination of targeting regulation issues, unlocking financing and collaboration between the most powerful national initiatives.		Professional associations Networks of local authorities Industries			
Accelerator/driver	Sustainable technologies are becoming cheaper due to developing mass markets.	Prices are becoming affordable	Industries	I will wait till the client asks	How do I know that the prices will not fall down further	Yes, my propositions will be more attractive!
Challenge & Solution	<p><b>Challenges:</b></p> <ul style="list-style-type: none"> <li>- to many specialisations possible</li> <li>- I need to ask my boss</li> <li>- Google says...</li> </ul> <p><b>Solution:</b> Free and short basic courses with redirection to follow-up and most times longer courses</p>	Empowers individual workers (tackles the unwilling management barrier)	Employers and employees	To tickle them	To train them fact based	Do not need it anymore. They provide course content and examples
Tool / Campaign	BuildUpSkillsAdvisor app This app unlock available free basic courses by providing assessments, links to the free courses and links to follow up paid courses. The personal profile also can be used as a personal recognition of skills (SkillCard)	<p>One portal</p> <p>Due to the assessment functionality relevant content is shown (content within reach of the learner)</p> <p>Can be used as an 'informal' SkillsCard</p> <p>EU-wide usable (national or regional content)</p>	Employees EU-network	To tickle them and to create awareness in their SkillGap	<p>Create awareness and provide realistic perspectives for action</p> <p>Recognition of skills</p>	Creates recognition of skills and a platform to share lessons learned (act as creators of training content)
Challenge & Solution	<b>Challenge:</b> To many regional initiatives (fragmentation)	Regional networks have the best contacts with the regional SME's.	Regional PPS networks	To connect with their networks	To coach them	To connect them to best practices in other regions

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
	<b>Solution:</b> hook on to regional driving forces or initiatives	By bundling training requests an affordable training approach become possible				
Challenge & Solution	<b>Challenge:</b> not enough confident ambassadors and trainers <b>Solution:</b> Train trainers and ambassadors	Spreading the best practices and lessons learned. Helps in creating a sense of urgency	Trainers and educational institutes	Can be reached only by ambassadors in their own network. Or by procurement rules and legislation	Create awareness and address their questions with proven examples. When successful they become ambassadors	Enable them to professionally share their experiences. Some of them will act as active ambassadors. Some of them will act as trainer
Challenge & Solution	<b>Challenge:</b> Training institutes are lacking insight in the training market of the future <b>Solution:</b> Translate National labour market research into regional opportunity maps	Helps training institutes to redefine their business models. Creates awareness on market maturity	Training providers	For creating awareness	To help them to get a clear view on opportunities	Prepare upscaling
Challenge & Solution	<b>Challenge:</b> Stroomversnelling (rapids), focusses on retrofitting based on the current energybill. The result is a zero energy bill building. Their approach is industrialisation. Challenge for BUILD Up Skills is the change in craftsmanship needed. The need for lower skilled workers will decline fast. Many prefab fitters are needed (mostly upskilled carpenters).	It is a big hairy goal. This unifies many frontrunners in an ambitious competition to be the best.  Due to the fact that it is a big and hairy goal there are many promises and a danger of over confident market actors.	Industry, Installers, Builders	Too expensive, they will wait and see	Creates a lock-in for future technologies. The big renovation has a payback time of 30 years. They will wait and see.	Prices will be far lower due to industrialisation. Unlocks billions of €'s for the building industry

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
	<b>Solution:</b> Open dialog on the challenge with the drivers behind it.					
Challenge & Solution	<p><b>Challenge:</b> Delivering a professional marketing campaign based on free publicity</p> <p><b>Solution:</b> looking for ideas and best practices</p> <p><b>Experiment:</b> Work together with a trade fair organiser to reach the craftsman and their supervisors</p> <p><b>Possible solution:</b> Work together with producers and/or suppliers. For example for free training materials and free trainings for their clients</p>	Using existing networks	All involved partners in the BuildUpSkillsNL Qualification Platform	Create awareness	Amplify the sense of urgency	Drive together
Mr Matteo Clemente      Italy      BRICKS						
Challenge	<b>In Italy there are 20 Regions with different qualification schemas and never consider the energy skills for building workers</b>	The new competences can be included in the training courses of the accredited regional VET centers	The regional departments forVET, energy and housing on one side and VET centers on the other side		They are not convinced that the workers will be interested if not compulsory	They start to be willing to unify the qualification system in the energy sector
Solution	<b>Review all the regional qualification schemas and propose the integration with new “energy competences”</b>	The same competences should be included also in the national qualification system which is still under revision	Ministry of labor and ministry for development	Ministry of development has delegated the regions while a national view		Ministry of labor are interested to update the national qualification framework and consider BRICKS really important

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
				should be necessary		
Challenge	The workers are against time consuming courses to get a qualification which nobody ask for. The companies fears that the qualified workers would either ask for a better salary and/or go away to open a new company.	Find a new way to train workers and provide qualifications	SMEs and installers organizations		Some are very convinced others aren't.	
Solution	Training the trainers and the building site trainers	Provide the training material for the "on site training" and agree with VET centers to provide the qualification at the end of the on site training	SMEs, instalelrs and VET centers	It is difficult to reach the target which is "disperse" in many small organization even at province level (more the 100)		VET centers are willing to start the process.
<b>Dr Richard Bayliss UK Build Up Skills UK</b>						
Accelerator/driver	Construction industry commitment to 50% reduction in CO2 from the built environment by 2025 (Industry Strategy)	Political commitment Skills gaps to be addressed	National governments Professional Bodies Trade Feds Training providers	It doesn't affect me	Government lack commitment to make it happen	We need the tools to make it happen (policies etc)
Accelerator/driver	Widespread industry concern about the "Performance Gap" between designed energy performance and as-built energy performance in new build and retrofit, with skills and	Better data on building performance needed Skills gaps need to be addressed by widespread	National Governments Industry Clients	Still just doing what I've always done	If it's not in the Building Regulations I don't need to do it	We need better tools to make it happen (better data etc)

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
	knowledge highlighted as a major causal factor.	improvement in industry energy awareness Clients demanding better performance				We need to totally reform our education programmes
Challenge & Solution	<b>Challenge:</b> Too many initiatives have focussed on creating standalone training solutions which have little demand <b>Solution:</b> Embed energy awareness across all relevant standards, qualifications, apprenticeships and training	Engaging the training infrastructure	Training Bodies Professional Bodies Trade Feds	I don't understand how this 'sustainability' stuff is relevant for me	If employers really wanted to know this stuff they would ask for it	The training infrastructure is too complex to influence change
Challenge & Solution	<b>Challenge:</b> Training providers unable to adapt to emerging training needs. <b>Solution:</b> we don't currently have one in place	Engaging the training infrastructure to help address the problem	Training Bodies Professional Bodies Trade Feds Industry	It doesn't affect me	There isn't enough employer demand to justify investment in my staff	We need accessible training for staff
Tool / Campaign	<b>Builders' Book</b> - straight forward guide to addressing onsite energy performance issues on domestic new build sites. 2331 downloads July-Dec 2015	Gives builders what they want - supports them delivering 'quality' construction	Housebuilders	I've always done it this way	The UK Gov is not committed to Zero Carbon	We need more of this for different building types
Tool / Campaign	<b>Sustainable Building Training Guide</b> - provides Learning Outcomes relating to "sustainable building" to support the development of content for standards, qualifications	Effective dissemination Buy-in from employers and providers	Government departments Training Bodies Training Developers	I already know everything that a competent person in my trade needs to know	Sustainable Building is not important to my trade	How do we fully embed this in training?

Type	Short Description	Success Factors	Key Actors / Communications	Target Groups		
				Not aware	Not convinced	Willing
	apprenticeships and training courses.					
Tool / Campaign	<p><b>Construction Design Management (CDM)* Wizard App.</b> Freely available app which produces a Construction Phase Plan that includes the top 5 safety and top 5 health issues associated with the type of work being undertaken. The approach and technology could be used to produce a site-specific sustainable building plan (like an energy audit)</p> <p>*CDM is the UK implementation of the “Temporary or Mobile Construction Sites (TMCS) Directive 92/57/EEC”</p>	<p>It has achieved over 50,000 downloads across all platforms</p> <p>It has given employers a tool that will help them do their job and meeting their legal requirements</p>	<p>Health and Safety Executive</p> <p>Training Bodies</p>	Awareness raising needed	All feedback I have seen has been positive	Can the app be developed further?



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