NEWCOM New qualification schemes to build high quality

REPORT ON STRATEGIES TO IMPROVE MARKET UPTAKE OF CROSS-CRAFT SCHEMES

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Abstract

The goal of this report was the development of a set of strategies to improve market uptake of cross-craft schemes for roofs, ventilation, problem areas regarding nZEB and building inspection. To achieve these strategies, the identified market barriers and opportunities have been used as a starting point. The developed strategies for the establishing of course schemes for both blue-collar workers and inspectors provided input for the dissemination of strategies through organised workshops. The resulting communication strategy and dissemination action plan provide optimal involvement and support of all different stakeholders. As a result a broadly discussed set of strategies for improved market uptake on national and EU-level is available at the end of the NEWCOM project.

Contents

1 Introduction

The NEWCOM project has set itself the task of ‘upgrading‘ existing training offers for the correct execution of the building envelope and building services in nearly zero energy buildings (nZEBs), especially focusing on total quality control accompanying the planning and construction process for new construction of nZEBs and renovation to nZEB level in Austria, Hungary, the Netherlands and Slovakia. The goal was to implement these missing professional qualifications and certifications into existing curriculum. The NEWCOM consortium developed, together with national stakeholders, multiple training courses that would be required to receive a voluntary certificate based nZEB, which would mean a competitive advantage on the market. The courses needed to reach qualification or certification are focused on blue-collar workers and building inspectors who will then be qualified for the construction, renovation and quality control of nZEB buildings. One of the main goals of NEWCOM is to give these education and certification schemes a basis to be mutual recognizable between the participating member states.

1.1 Previous research

At the beginning of the project, within the task: the Identification and evaluation of existing certification schemes and implementation methods for blue-collar workers and building inspectors, the need for missing training offers and/or modules; and underlying qualification schemes has been determined. This evaluation was based on desk research and surveys. Based on these findings in next steps in the project (focusing on ‘Development of missing certification schemes for blue-collar workers and building inspectors’) qualification schemes for the involved occupations were developed. Together with a database of common descriptors for skills, knowledge and competences, a platform of available existing training material and an overview on relevant trainings and training needs was developed. Next step

was setting up Train the Trainer courses. This was done on the basis of an analysis of available courses and Train the Trainer materials.

Figure 1: Roadmap for the implementation high quality trainings (steps 1-3)

Based on these progress blocks, each country implementing nZEB trainings in NEWCOM, carried out Train the Trainer sessions with a goal to realize the national implementation of the in NEWCOM drafted qualifications. This was done in the form of course(s) or training(s) at national level based on the national status quo and in dialogue with the stakeholders. By using the same NEWCOM ULOs and qualifications, those recipes became comparable and ready for mutual recognition.

This was part of next steps (4 and 5, in the below chart) of the roadmap for the implementation of high quality nZEB trainings. The results of the Train the Trainer sessions were used as input for further refinement of the developed strategies for establishing the created course scheme in the national markets, including the method of involving relevant stakeholders, educational institutions, important administrative bodies and authorities. This was done in task 'Creating demand, communication and dissemination' where the strategies were further elaborated and brought into practice in an advertising and marketing campaign, strengthening the effort of the training institutes.

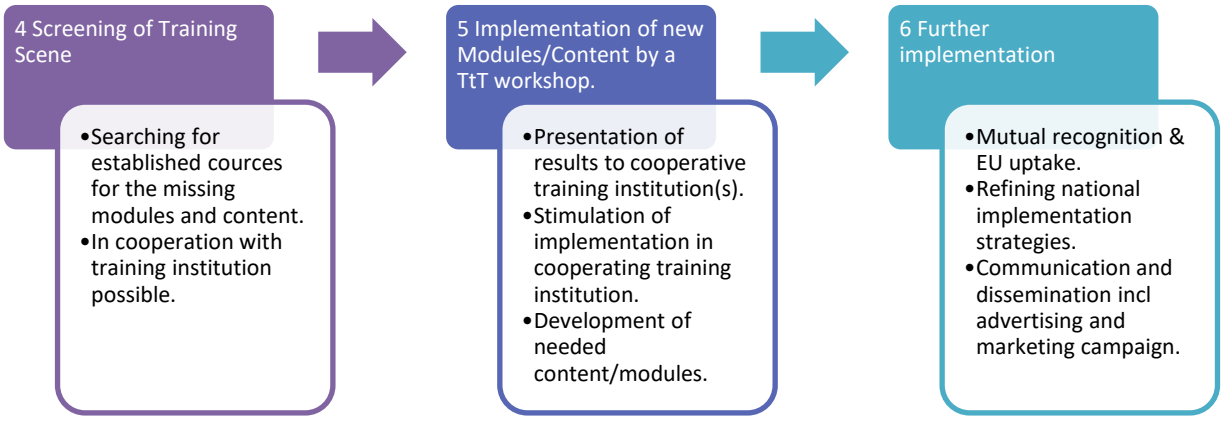

Figure 2: Roadmap for the implementation high quality nZEB trainings (steps 4 - 6)

The last part of the NEWCOM project, dealed with the identification of market barriers towards the developed certification schemes as well as with ways to overcome these barriers to create the respective needed market demand. Analysis of these barriers at the start of the NEWCOM project was the starting point. The result of this work was an inventory and analyses of the opportunities and barriers towards cross-craft schemes. This was done both on a national and European level. It is notable that numerous similarities regarding the implementation of cross-craft trainings among the different countries were revealed during this research. The created overview of identified opportunities and barriers formed the basis to give shape to suitable strategies. As it is important that opportunities are properly harnessed, and that barriers are clearly recognised and surmounted with the uptake strategies.

1.2 Formulating uptake strategies

The analysis of the market barriers towards cross-craft schemes, form the stepping stone for formulating strategies to overcome these barriers and generate as much uptake as possible. The strategies are described in this report with the following aim: 'Development of strategies to improve market uptake of cross-craft schemes.' For the dissemination of these

strategies the guidelines set in earlier work, have been taken into account. For instance, the focus established in the identification and evaluation of existing certification schemes and implementation methods for blue-collar workers and building inspectors, was on specific specialisms for which the certification schemes were created which forms one of the guidelines. This means the uptake strategies target: Roofs, ventilation and the inspection of nZEB buildings. The recommendations of the previous report of the project on market barriers towards cross-craft schemes are summarized in Chapter 2 of this report.

Strategies for an improved and sustainable market uptake for cross-craft schemes in the participating countries are elaborated on national- and EU-level. Representatives in each of the participating countries developed their own national strategies. The strategies for implementation of the developed certification schemes are analysed and implementation of the most feasible (on the different levels) certification schemes have been prepared in the last phase of the NEWCOM project.

The dissemination of strategies includes the formation of round-table groups at national level. This was done in the workshops organised, with the goal to accelerate implementation of the developed certification schemes. Elements of the strategies can be simplified testing methodologies, uptake in quality performance procedures, addressing certification in public tendering, etc.

In the final phase of the NEWCOM project at EU-level, face-to-face meetings with involved EU-level stakeholders have been organised to develop strategies to strengthen or accelerate the implementation of strategies on national level. The respective outcomes are and will be presented at European conferences and European wide events, the organisation of which will have to be planned pro-actively and timely. As result, a broadly discussed set of strategies for improved market uptake on national and EU-level are available. According to this strategy, it has to be guaranteed that all relevant stakeholders are actively involved in the development process of the certification schemes.

Furthermore, to assist the chosen strategies, the NEWCOM communication strategy has been further refined, to guarantee continuous involvement by all the different stakeholders during the development process of mentioned certification schemes and methods. Involvement of the stakeholders is important to make the certifications successful and relevant for these stakeholders. Communication and dissemination happened on both EU-level and national levels. National and international press articles were provided by the respective partners for their national stakeholders and public. The communication strategy also supports the market uptake of the developed training schemes.

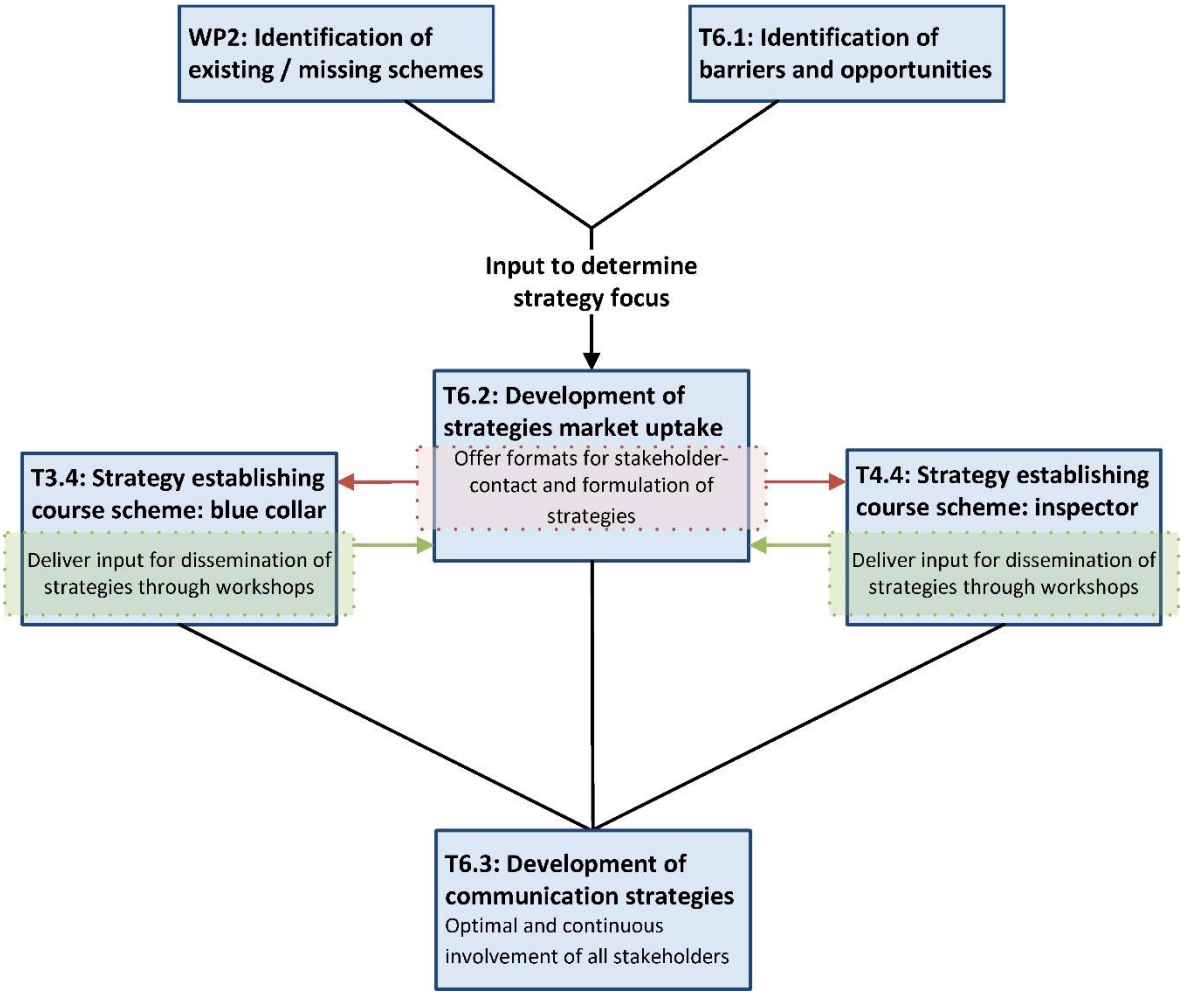

Figure 3: Process flowchart with the different project activities and their interconnections.

Concisely, the goal of this report is the development of a set of strategies to improve market uptake of cross-craft schemes for roofs, ventilation, problem areas regarding nZEB and building inspection. To achieve these strategies the identified market barriers and opportunities, have been used as a starting point. The developed strategies for the establishing of course schemes for both blue-collar workers and inspectors provided input for the dissemination of strategies through organised workshops. The resulting communication strategy and dissemination action plan provide optimal involvement and support of all different stakeholders. As a result, a broadly discussed set of strategies for improved market uptake on national and EU-level is available at the end of the NEWCOM project.

2 Background

The conclusions in this chapter are drawn according to the findings of the national chapters, the national barrier inventories and the research results of other European projects. The national barrier inventory recognised the following categories: market, governmental policy and education (initial and further education). By harmonizing the results in these categories, a good overview is given which barriers and opportunities are similar in different countries.

The conclusions are mostly on general issues, with a focus on barriers for further education in the construction sector. Obviously, education in this context is understood as education in sustainable (and cross-craft) specialisations. The International Energy Agency (IEA) stated earlier that: *"Non-technical barriers are the single biggest challenge in the market – as they are the main reasons why energy efficiency technologies are not implemented. The IEA Market reports show that if all cost effective Best Available Technologies (BAT) were fully implemented, savings in excess of 80% could be achieved."*[1] This chapter will show that indeed most of the found barriers are 'non-technical'.

The conclusions and recommendations will be viewed in two parts. First, the conclusions and recommendations for each individual country will be reviewed. In the second part, we will look at the harmonized conclusions and recommendations on a European level.

2.1 National conclusions and recommendations

There seems to be many similarities regarding implementation of cross-craft trainings between the different countries. Most of the identified barriers and opportunities are not unique for a certain country, but are mentioned in a similar scope or form in the inventories of the other countries.

[1] Evaluation of building projects under the Intelligent Energy Europe II Programme Final Report

2.1.1 Austria

Austria is confronted with growing shortage of skilled craftsmen; therefore most of construction work is carried out by semi-skilled workers. For the construction of nearly zero-energy buildings and renovation to according to the required nZEB level the workers and professionals need to have a cross craft understanding. On one hand, often the end consumer is not aware of the quality standards of such buildings and therefore does not ask for it and on the other hand, the instruments for quality control in nZEB are lacking. Both construction companies and craftsmen are hard to motivate to have their employees trained (especially participating at longer courses). In order to raise the quality of work, the demand for upskilled workers and thus high quality execution has to be raised. A lot can be gained from promoting the different aspects of quality assurance on all levels: from end consumers to blue-collar workers and construction companies. To accomplish this, quality requirements and control of executed works need to be enhanced.

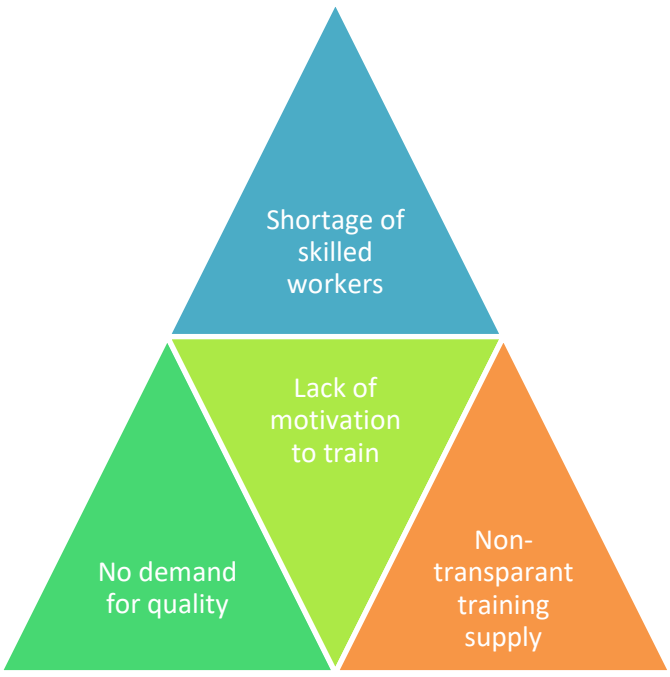

Figure 4: Overview of challenges for Austria

In Austria, there are already many opportunities for improving skills of craftsmen through education and training schemes. These courses are being offered by construction schools,

further educational institutions and guilds. Nevertheless, the major problem is that the construction companies are not willing to send their employees for further education as mentioned before. On the other side energy efficiency is a secondary goal in the courses and the number of courses in the areas of energy consulting, energy efficiency and renewable energies for blue-collar workers are rather limited. This reduces the benefits of available courses regarding energy efficiency. Furthermore, a comprehensive quality management for the construction regarding nZEB is needed, but this is costly and training providers are unwilling to be transparent and to participate in course evaluations. The gained competences in further education market in Austria are hard to demonstrate for trainees. The importance of further education and clear training descriptions need to be communicated to the market. To ensure high quality trainings, evaluation of available trainings, collaboration between training providers and the dissemination of cross craft knowledge are essential.

2.1.2 Hungary

High quality nZEB solutions are not common yet in Hungary. These are only mandatory for renovation of public buildings. However, since market demand is not there yet, skill, training and certifications are also lacking. Regulations concerning obligatory nZEB solutions changed in 2018 and will change in 2020; this might change the market demand. Furthermore, more subsidies are created to support the funding of nZEB renovations.

Hungary only knows short, voluntary and informative trainings concerning nZEB solutions. Blue-collar workers are unlikely to participate in voluntary trainings. The result is that many craftsmen work without proper qualification. To improve the uptake of trainings, national and European regulations are needed. Another opportunity is cooperation with existing course providers in Hungary.

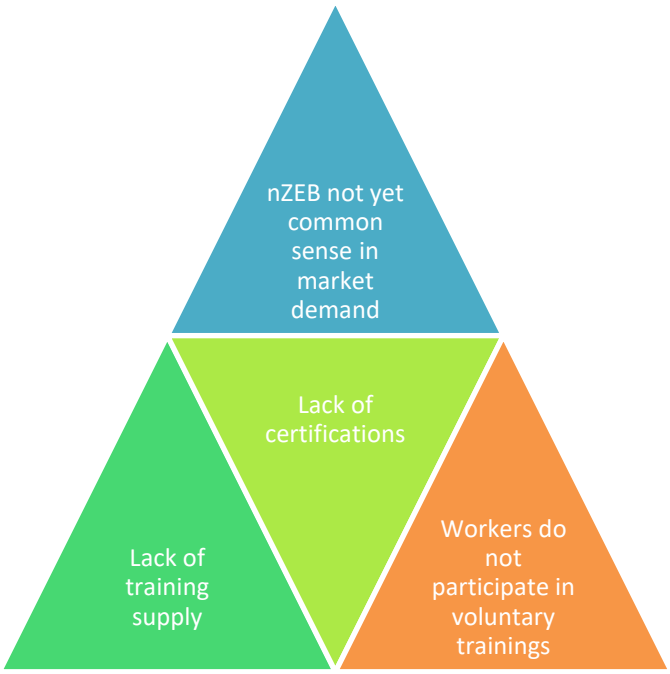

Figure 5: Overview of challenges for Hungary

2.1.3 Slovakia

The energy renovation market has not developed yet in Slovakia. Therefore, this has caused the lack of quality demand from end consumers and government. The fact that over 50% of the on-site workers are sub-contracted and the companies and blue-collar workers have limited interest for training only adds to this. The construction sector is inward looking and not likely to take up innovations. Furthermore, the system of regulations is very complex and public procurement is still based on lowest price policy. The earliest opportunity for the uptake of nZEB (solutions and certifications) in Slovakia is the renovation of public buildings. To achieve this, the control on quality of energy performance measures and the related skills and knowledge of craftsmen are essential.

Cross-craft qualification or partial qualification is very new for Slovakia. The first certifications are being realised, but the cross-craft approach and understanding will need continuous development and promotion. Until recently Slovakia did not have any relevant certification schemes, the BUILD UP Skills and ingREeS projects are the first steps for the change. Still 50% of the workers are unskilled. More training needs to be developed, including increasingly

ambitious curricula. To make these trainings a broad success, financial support (from ESF and government) is needed. Currently governmental support is very low.

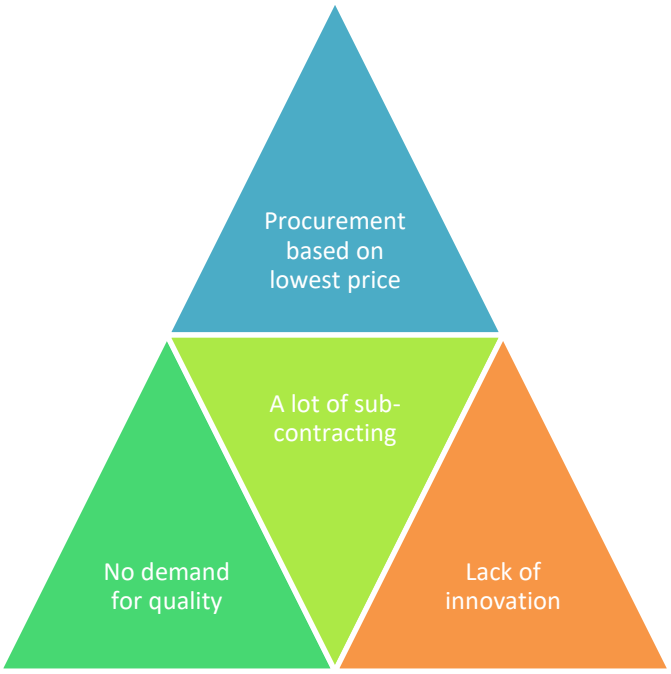

Figure 6: Overview of challenges for Slovakia

2.1.4 The Netherlands

Construction companies in the Netherlands generally does not work with focus on the end user. Furthermore, end consumers have little interest in energy efficiency measures. The result is an nZEB market which is not very developed. Regulations slow down innovation and lead to sub optimization, while they could instead boost the uptake of quality frameworks. Legislation and national initiatives are raising the demand for nZEB solutions in the Netherlands though (even when quality control plays no part). The government also supports these measures with subsidies. Hopefully demand for energy efficient buildings, will raise demand for the needed quality measures and qualifications for blue-collar workers.

Post initial education is organized by private training providers in the Netherlands. Most craftsmen don't follow post-initial education in a systematic way after entering the labour market. This results in many companies and blue-collar workers with knowledge gaps in nZEB solutions. Still, the Netherlands already know a well-developed system for personal

certification schemes in the building services sector (as a result of RES and EPBD-Directives). However, these schemes are voluntary, so many companies and craftsmen don't put any effort in earning them. Concerning the construction sector, personal certification schemes are severely lacking. Updating existing training schemes and cooperating with existing trainings could be a good opportunity.

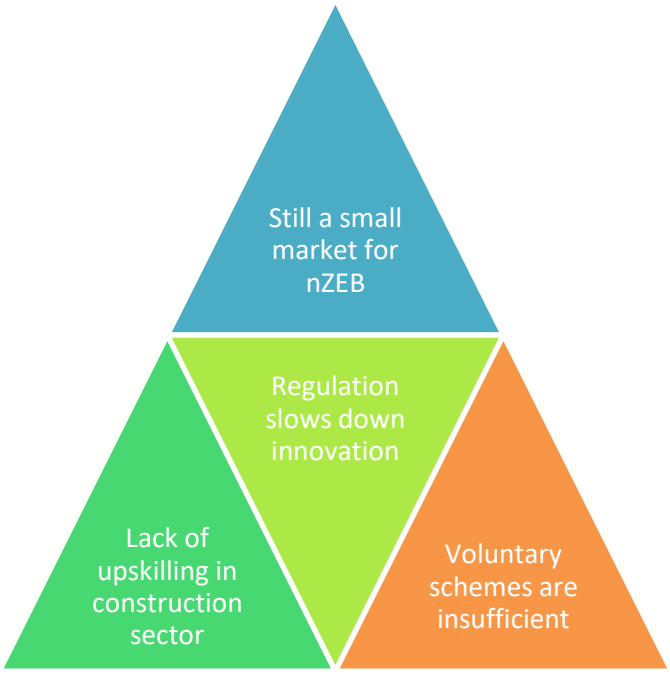

Figure 7: Overview of challenges for the Netherlands

2.2 Conclusions on European level

In all partner countries the government is steering towards a more sustainable focused policy. This is stimulated (or enforced) by new policies and subsidies. Also across all involved countries, current governmental policy seems to be not pro-active enough. Legislation is not focused on quality and control: existing nZEB schemes are almost always voluntary. Furthermore, the sustainability goals are still mostly concerned with new buildings. Governmental policy gives insufficient quality control and coordination on: executed construction work, training certification, unambiguous building regulations (innovations) and needed education. This is the case for all four partners' countries and means that poor or

missing regulation and standards (and the enforcement of the existing laws) are still major barriers.[2]

There are also barriers in the market. The inventories showed that at least the construction companies in Austria, Netherlands and Slovakia do not embrace innovation, sustainable development and high-quality execution and construction by themselves. Furthermore, most companies are inward looking and cooperation with other sectors or professionals is limited.[3] The lack of a common sector strategy and the lack of appropriate coordination amongst stakeholders, are mentioned as barriers for a large number of projects (namely in 33 of 61 projects for both barriers).[4]

The decision for low cooperation is mostly risk related. The building sector is very competitive, so most barriers are connected with monetary or financing issues, time or logistics. Some examples are: training location is too far away; good qualified employees ask for higher salary; smaller companies need employees on-site; multi-day courses and trainings are not manageable for smaller enterprises. In addition, a big number of the on-site workers are sub-contracted. Construction companies are not forced to adapt, since governmental policy is with low obligation for high quality nZEB solutions. The fact that there are no reputation mechanisms in place to stimulate best practice only adds to the issue. This means companies or clients do not consider certification as the main guarantee of work quality, they prefer to rely on references.[5]

Not only construction companies are not setting the bar high enough; among building owners (consumers) the demand for high quality sustainable construction is also lacking. Information barriers experienced by managers, occupants of buildings and/or policy makers and advisors, were the top barrier according to Intelligent Energy Europe II report (respectively 49 and 41 of 61 projects).[6] And also mentioned (although less often: 29 and 25 projects), were the

[2] Evaluation of building projects under the Intelligent Energy Europe II Programme Final Report
[3] This is also mentioned in the PROF/TRAC Roadmap and BUSNL Roadmap.
[4] Evaluation of building projects under the Intelligent Energy Europe II Programme Final Report
[5] BUILD UP Skills Technical working group 4 Market acceptance (incl. marketing and communication)
[6] Evaluation of building projects under the Intelligent Energy Europe II Programme Final Report

information barriers faced by real estate agents and investors.[7] Most consumers are not familiar with nZEB solutions. Consumers miss critical information about nZEB, sustainable solutions and funding possibilities. They are not aware of the benefits. Because of this, the higher investment costs become a barrier and consumers will not ask for high quality nZEB solutions. This barrier is mentioned in the inventory for all four partner countries.[8] Consumers also do not ask for evidence of good performance.

Some of the most important barriers are in education. In all countries there is a certain amount of courses available relating to construction and requirements of nZEB. The attainable certifications differ from country to country. However, for all partner countries the available schemes for nZEB solutions are not enough or suitable. Professionals do not see training as a means to give extra value to them; they see it as an economic disadvantage, because the costs involved cannot be calculated for the client. In the Netherlands most existing certifications are for building services specializations (solar, ventilation); for construction there are barely any. Hungary has two nZEB focused voluntary trainings: architect training and passive house training. Austrian further education possibilities are differentiated for the areas of energy consulting, energy efficiency and renewable energies, but if this is narrowed down to blue-collar workers as target group, then the number of offered courses is rather limited. Furthermore, the cross-craft elements in most of the available courses are almost non-existent. Cross-craft understanding is very slowly developing in all four countries. Most available trainings still focus on one specific target group and on one technique or concept.[9] So it could be stated that there are not enough suitable courses or schemes for (cross-craft) nZEB specializations.

Most blue-collar workers are not motivated to achieve voluntary certifications; this seems to be an issue for all partner countries.[10] The result is a very small percentage of the labour force with a certification in nZEB. An important question is, if this will be any different for cross-craft certification. The concern is this that blue-collar workers from different specializations will not

[7] Evaluation of building projects under the Intelligent Energy Europe II Programme Final Report
[8] This barrier is also mentioned in BUILD UP Skills Technical working group 1 Finance (sustainability)
[9] PROF/TRAC Roadmap
[10] The barrier concerning incentive is also mentioned in BUILD UP Skills Technical working group 1 Finance (sustainability)

feel like they are the target group for this course, because of its cross-craft nature. In addition, even if a professional is motivated, in most cases he or she lacks the right information on available qualifications and training materials to make a good choice.[11] The unwillingness to participate in trainings, results in a mismatch between the present available and needed skills as well as managerial capacity of professionals due to the lack in specific training and education. Many professionals in the building sector have only limited training and skills in energy efficient building design and nZEB principles.[12] Research shows that the lack in skills and lack in fitting training and education, results in poor compliance with efficiency and construction standards.[13] Considering this, it will not be a surprise, that the lack of skilled professionals is an important barrier for achieving good nZEB quality. Another research showed that lack of skilled architects, engineers, designers etc. was mentioned in 23 of 61 projects as a barrier. [14] The lack of skilled craftsman was mentioned in 15 of 61 projects as a barrier and the lack of skilled energy certification experts in 10 of 61 projects.[15] Interestingly enough, the last (least encountered) barrier was mentioned most often as 'not effectively addressed' during the project.

Apart from the available courses, there are some barriers for the course providers. The course providers have limited funds, so they by themselves are not able to develop cross-craft courses. In the Netherlands, the structure of the education system is not flexible enough for cross-craft training or for making the link between initial and further education or for reskilling/retraining.[16] But at the same time, there is limited willingness among the providers to increase transparency (share course materials for instance) and for course evaluation (they are afraid they will lose clients in the case of bad evaluations). Across all countries, there are also issues with the current curriculum of the offered courses: the content is not useful enough (especially regarding energy efficiency of the buildings) to guarantee participation of trainees,

[11] PROF/TRAC Roadmap
[12] PROF/TRAC Roadmap
[13] HERON Working paper
[14] Evaluation of building projects under the Intelligent Energy Europe II Programme Final Report
BUILD Up Skills: Evaluation of the BUILD UP Skills initiative under the Intelligent Energy Europe Programme, Final Report
[15] Evaluation of building projects under the Intelligent Energy Europe II Programme Final Report
BUILD Up Skills: Evaluation of the BUILD UP Skills initiative under the Intelligent Energy Europe Programme, Final Report
[16] BUSNL Roadmap

the benefits are too small; also sustainability and energy efficiency is of secondary importance in the trainings. Training materials are now created on an ad-hoc basis without consensus on an underlying qualification framework. The result is a number of available training materials are on unqualified basis and fragmented.[17] The insight that a building which is built according to the minimum requirements of the regulation, is not necessarily a healthy building, is not taught in initial or further education. Besides, inventories showed that free product trainings are a rival for payed courses in at least Hungary, Austria and Slovakia. These trainings have the risk to be biased; the solution might be to involve manufacturers in 'independent' trainings to improve training quality.[18] Still this shows that the price of certification of trainings (cost and affordability for company or employee), becomes another barrier.[19]

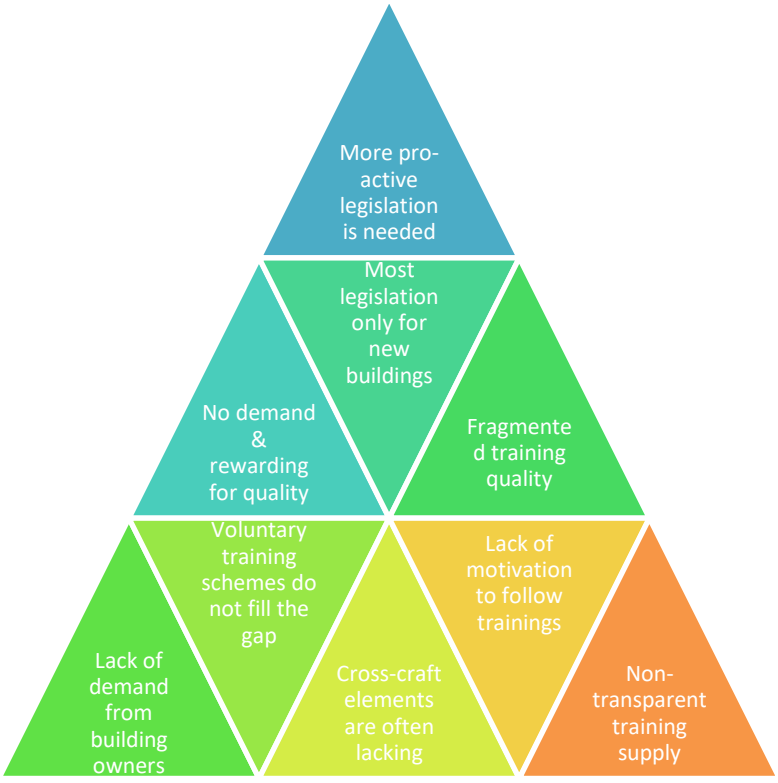

Figure 8. Identified challenges

[17] PROF/TRAC Roadmap
[18] E.g. Croatia, BUILD UP Skills Technical working group 4 Market acceptance (incl. marketing and communication)
[19] BUILD UP Skills Technical working group 1 Finance (sustainability)

It is clear that course providers need to be stimulated and supported to overcome these barriers. At the same time we will need the course providers to get the cross-craft schemes implemented. Involvement of course providers in design of the training could help with matching the scheme to market needs/demands and promotion (through social media).[20] The inventories and research results of other European projects also showed plenty of opportunities to increase demand and uptake for cross-craft nZEB skills and knowledge.

2.3 Recommendations on European level

Legislation, concerning sustainability, energy sources and required minimal building quality, is changing in most countries, nZEB standards will be more and more enforced in the near future. This creates possibilities of mandatory additional trainings related to nZEB and cross-craft skills. Governments could effectively promote quality of energy renovations through promoting (or enforcing) further qualification schemes for building professionals. Financial funding for nZEB buildings could also increase demand, and thus increase certification uptake. The enhancement of control and evaluations on executed works might improve the spreading of best practice. A good example is the upcoming Dutch legislation (private quality assurance), which will make the contractor responsible for the performance of the building. National initiatives could also stimulate the implementation of nZEB and energy-saving measures. Making connection with organisations that are active with nZEB solutions might improve the uptake of the cross-craft schemes.

Awareness should be raised concerning the context between quality of execution, low operating costs and good living comfort of nZEB. This way, quality requirements could also be established. Simultaneously the awareness about ESCOs, funding opportunities and payback time is instrumental to give nZEB solutions the much needed boost. The promotion or creation of informative platforms could be means to reach this goal. Moreover, low costs sensors, meters, Internet of Things (IoT) enable end-users to become aware of performance of indoor air quality and energy performance and to benchmark this. But not only end consumers are a

[20] E.g. Lithuania, BUILD UP Skills Technical working group 4 Market acceptance (incl. marketing and communication)

target group for promotional activities. Architects and engineers can also be encouraged to only work with companies whom employ skilled and knowledgeable craftsmen. This will provide a higher quality of works for the client.[21] When energy and comfort in combination with nZEB dwellings (both retrofit and new) are delivered as a service, it will provide the need for qualified craftsmen and inspectors (Energyleap program).

Companies (professional market parties) should be persuaded to invest in quality training for their employees. Staff policy should be focused on the structural improvement of skills, linked with common practice to ensure the offered knowledge is relevant. Practitioner education tracks - students learn while they work - could present itself as an opportunity here. Lack of interest among construction companies and poor image of training programmes, could be improved by using direct engagement with leading companies as best examples (ambassador approach). By building personal promotional stories, (the employees of) other companies could be stimulated to participate in trainings.[22] These steps would help to increase the demand for quality training and quality workforce and emphasize the importance of skilled workers. Furthermore, cross-sectoral and cross specialist cooperation should be promoted, along with an increased focus for the building sector on energy efficiency as a central point of a future-oriented, sustainable construction method.

By developing a market for nZEB level energy renovations, an opportunity is created for providing training on EE (Energy Efficiency) and RES (Renewable Energy Sources). In all partner countries, there are already existing voluntary schemes for certain specializations. Collaboration with the training providers of these schemes might be a good way to get missing cross-craft certifications implemented. Cooperation could greatly increase promotion and public recognition of the schemes. The benefits of collaboration and evaluation of courses should be made clear to course providers. To make promotion work, descriptions of trainings should be clear. Furthermore, courses should be free of charge for workers; which means the costs should be placed somewhere else. Adaptation of relevant subsidies, better collaboration

[21] BUILD UP Skills Technical working group 1 Finance (sustainability)
[22] BUILD UP Skills Technical working group 4 Market acceptance (incl. marketing and communication)

and cooperation between governmental institutions and educational institutions or course providers could be a step stone.

Certification and recognition of the course will provide value to the construction workers.[23] Proof of completion and a system for the presentation of gained further education should be arranged and implemented because this is important for self-belief and encouragement into further training. A skills register could resolve this. Alongside the visibility of competence, smart phone apps with game like tests on EE (energy efficiency) and RES (renewable energy sources) construction skills can attract interest and possible motivation for construction workers to participate in trainings. Similar apps have been trailed in Croatia and the Netherlands.[24] The Dutch BUILD UP Skills Advisor app also provides the ability to create a personal (informal) skill card.

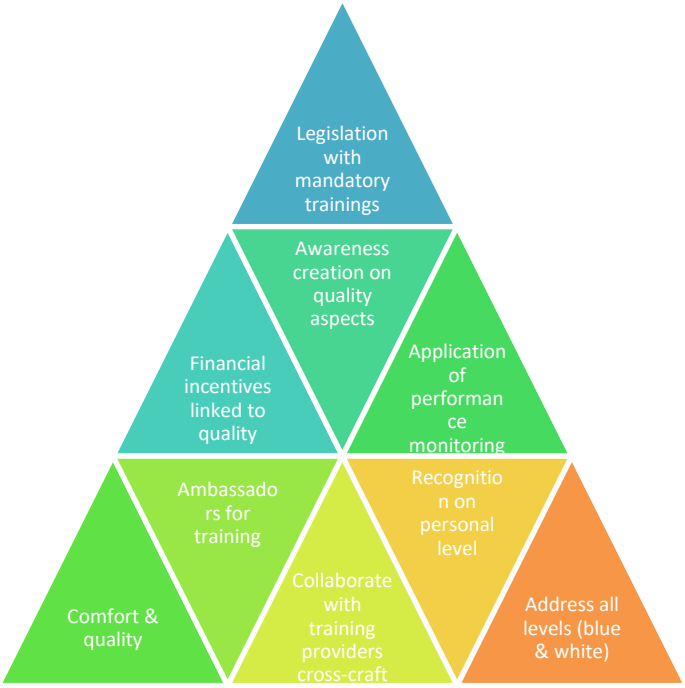

Figure 9. identified needs

Completely closing the skill gap through better training, was too big of a challenge for the BUILD UP Skills initiative. Synergies and follow up initiatives have been sought out and

[23] BUILD UP Skills Technical working group 1 Finance (sustainability)
[24] BUILD UP Skills Technical working group 4 Market acceptance (incl. marketing and communication)

encouraged, but these have mostly remained isolated. Nevertheless, the final report provided some valuable recommendations concerning the training format: 'it is better to have hands-on training than classroom training; keep the training practical, regional and short; the training course shall preferably be in the morning, not in the afternoon; start with motivated workers/frontrunners/ambassadors; make it clear to the employers what the benefits of trained workers are'.[25] Another recommendation was, to not only look at the education level of workers, but more so to their function. And to include all workers active on the building site into the scope for training (for example: site foremen and quality assessors).[26] The question is how broad the scope ultimately should be, since the knowledge gap also exists for white-collar workers and building users.

[25] BUILD Up Skills: Evaluation of the BUILD UP Skills initiative under the Intelligent Energy Europe Programme, Final Report
[26] BUILD Up Skills: Evaluation of the BUILD UP Skills initiative under the Intelligent Energy Europe Programme, Final Report

3 Exploitation Methods

The barriers and opportunities for each country are quite clear. Fitting strategies have to be linked to these barriers and opportunities to either overcome or reinforce them. To accompolish this, all partners worked according a specific research method to develop a set of uptake strategies.[27] The goal of these so called uptake strategies is to stimulate adoption of the NEWCOM project results by the different target groups. In other words: how can the NEWCOM results best be presented and promoted to the national and European stakeholders in order to accelerate market uptake. The core elements of the method are briefly summerized in the first part of this chapter to clearify the structure and content of the two strategy chapters.

Furthmore, all partners worked together to make a first overview of the Key Exploitable Results (KERs) the NEWCOM project would produce.[28] These KERs are a first implementation of the research methode, and help formulating concrete and measurable uptake strategies. The Key Exploitable Results are discussed in the second part of this chapter.

3.1 Research methode

The used method consists of a number of steps to guide the development. Each step aims to guide the research towards complete formulated strategies.

Step 1: What has to be in place

This step is about what is needed to have the NEWCOM training certifications accepted in the national markets. It describes the main actions so far, why these have been undertaken or developed and what the project hopes to achieve.

Step 2: What can/can't we influence

[27] http://www.iwmi.cgiar.org/Publications/Other/PDF/How_to_develop_uptake_strategies_as_part_of_reserach_projects.pdf
[28] This was done during a ESS workshop in Bratislava (19th - 20th September 2019) by the NEWCOM consortium partners.

In this step we summarized what we can influence in the timeline of the NEWCOM project and what has to be left behind. This in relation to target groups, activities and (communication) tools.

Step 3: Where on the timeline are critical uptake points

When the target groups are clear, it can be decided when we should try to stimulate uptake among these different groups. These moments to influence are so called ‘uptake points’. An uptake point is a moment on which uptake is stimulated for a certain target group by using specific activities or tools. Each uptake point needs it own strategy. Both step 2 and 3 are described in the same paragraph.

Step 4: Develop uptake strategy

After determining the different target groups and the most important uptake points, a strategy is formulated for each one. In other words: how are we planning to influence the different target groups mentioned in the previous step on the most fitting uptake points.

Step 5: Collate strategies

There will be overlaps in the strategies for different target groups, or overlaps in the tools and activities which will be used for these strategies. To maximize the effectiviness and the potentional for each strategy, it is important to find these overlaps and combine the target groups and strategies where possible. This is done in step 5.

Step 6: Update strategies during project

New insights or changing situations could lead to refining old strategies or formulating new ones. This is why strategies should already be updated during the project. The monitoring which is needed to accomplish this, is described in step 7.

Step 7: Develop a monitoring and evaluation (M&E) plan

As soon formulated strategies are implemented, these strategies should be monitored and evaluated on their effectiveness. In this step it is described how and when this evaluation will take place. Steps 5-7 are described in the same paragraph.

Step 8: Develop an implementation plan

How are the different strategies going to be implemented? This step is the culmination of all the previous ones. The target groups, uptake strategies, monitoring and evaluation are all linked together in this step. Furthermore, the implementation is added in the mix: who is responsible for a specific action and when will it be carried out. All developed strategies are documented in Chapter 5 and 6 of this report.

3.2 Key Exploitable Results

Part of a successful implementation or uptake, is the development of a businesscase in order to secure and sustain the certification schemes on a national and European level. Development of this businesscase wil be based on the strategies developed in this report. Feasibility will be discussed and if possible endorsed in round-table discussions on national and EU-level, this as part of the implementation of national and EU strategies. To determine the key final results which would have to be adopted by the market (hence to usage of uptake strategies), and also include a successful businesscase, the exploitable results of the NEWCOM project had to be determined. Two Key Exploitable Results (KERs) as results for NEWCOM were distinguished:

1. NearZeroEnergyBuildings Competence Database

    a. Unique Value Proposition: The “proven NZEB-Competence Database” allows you to leverage on the required competence levels to win your NZEB related subsidy calls / tenders. It also facilitates the dialog between suppliers and branch associations, trade unions on the required competence levels.

    b. Exploitation model: We sell the service to implement and use the database. The to be registered companies or workers pay for the registration of proven competence. ISSO provides and maintains the database as Software as a Service (SAAS). National implementation partners provide the implementation services at National level.

2. NearZeroEnergyBuildings educational tools

    a. Unique Value Propositions: NEWCOM training helps to improve the quality of the nearly zero energy buildings. We do this by reducing the failure rate on new construction and installation technologies.

       We improve the impact of skilled workforce in the construction sector by implementing learning from the experience approach tested in front running countries and by making the new competences transparent and comparable throughout Europe.

    b. Exploitation model: Training provided as a service by using a toolbox packaging curricula, training material, assessment methods, train the trainer courses and implementation consultancy.

To dive a little bit deeper in both of the key results, the different aspects for these results are described in the next two paragraphs: for which problems does it ofer a solution, what are the USP's, what does the potentional market looks like, etc.

3.2.1 Key Exploitable Result 1 – nZEB Competence Database

What is the nZEB Competence Database? (description)

Database that compares competences. It provides in a structured and easy to access for:

- Comparison of the levelled qualifications;
- Accreditation certification;
- Registration of recognised persons (followed training connected to a qualification).

What are the problems?

There is a lack of awereness regarding the complexity of nearly zero emission buildings by blue-collar workers on construction sites.

There also is a limited availibility of further education in the construction sector in many countires across Europe, especially with the focus on mutual recognition. Not only this, but the

offer of courses on certain topics is also severly lacking. Among these topics are: cross craft understanding, lifelong services approaches, continuous controlling and monitoring or Building information modeling (BIM) tools.

Lastly, there is an absence of transparency on competences gained with further education courses and there is no transparency on the level of quality delivered by a company or craftsman.

What are the Unique Selling Points (USPs)?

The database will provide fast and easy access to nZEB competences and make them transparent to the market. Also easy access to information schowcasing educational offers concerning nZEB competences that can be earned.

What does the market look like for the database?

When looking at the (potentional) market for the database, one can look at the different target groups, potentional competitors, market size and use models.

Target market:

1. Government: to enable proven obligation according to NZEB;
2. Building owner: to find qualified NZEB (technology) supplier gain insight what he can expect;
3. Construction company: to be prepared for the competition on quality (including to guarantee the quality in the long run);
4. Insurance companies of construction companies or building owners.

To reach this target market, it is smart to address the specific customers first to attract them as early adopters of the database. In this case, early adopters can be innovative companies in developing markets, or government (institutions) who have to fullfill their nZEB obligations and can facilitate the market to be able to provide the needed quality by promoting the database. Sales agents also get complaints about poor nZEB quality.

Competitors can be branch- en technology organisations, who make their own quality rules for nZEB standerds, which can diverge from the ones in the nZEB database.

What is a possible use model for the database?

The most straightforward usemodel is by direct sale of the service to implement and use the database. This can be done on multiple levels of usage:

- Government will pay for implementing an advisory service to make NZEB competences visible;
- Innovative companies will pay to get advice to get competent on NZEB (construction & installation);
- Companies or workers pay for the registration of proven competence.

What does the go to market look like?

All NEWCOM project partners deliver know-how as input for the database. ISSO implements the BUILD UP SKILL advisory app and its maintenance environment (in which the NEWCOM competence database is included). For the user this is will result in a functioning Competence Database combined with recognition functionality. From the end of the project, the estimation is that it will take about two years after the NEWCOM project is finalized to make the database as a service fully usable for the government. For frontrunner professional companies and training institutes, the database will be usable already during the project duration.

3.2.2 KER No 2 – NZEB educational tools

What are the NZEB educational tools? (description)

A toolbox with educational materials and tools to integrate NZEB and quality aspects into existing trainings in the construction sector. Includes Train the Trainer aspects and educational materials for students.

What are the problems?

The quality of craftsmen competences does not match with the complexity and requirements of NZEB buildings. This is also because there is a lack of existing education and trainings,

which address these structures and cross craftsmanship. The competences and skills of trainers related to NZEB are, in many cases, also not up to the task. Furthermore, consciousness about the importance of quality assurance and quality control (which both effects the performance of buildings) is also severely lacking.

Is there an alternative solution for these problems?

Existing standards and practices could be adopted. A skilled trainer could improvise on the spot, if he/she has enough knowledge about NZEB.

What are the Unique Selling Points (USPs)?

Educational and technical aspects can be brought together in these educational tools. This can also mean combining energy consulting and construction skills, which will lead to completely new insights/understandings for students. The NEWCOM training results in sets of competences that are comparable about training entities throughout the EU.

What does the market look like for the educational tools?

When looking at the (potentional) market for the database, one can look at the different target groups, potentional competitors, market size and use models. For the educational tools the main groups are the vocational education market and the construction sector. These can be broken down to specific segments:

1. Training institutes;
2. Innovative professionals and installers in construction (flat roofers, ventilation installers and building inspectors);
3. Public sector (government, municipalities, etc.);
4. Private investors;
5. Manufacturers;
6. Insurance companies.

Of these segments, a couple of customers could function as early adopters. For the training materials some of the early adopters can be: training institutes in countries like Austria and the

Netherlands, Austrian labour agencies and Hungarian manufacturers and construction companies.

On a national level there are practically no competitors for these educational tools.

What is a possible use model for the database?

For the educational toolbox, there are a couple of different use models possible. Each of them focus on a different (kind of) transaction:

- Professionals/training institutes pay for this new training, to gain a new kind of competence (mandatory in Hungary);
- Service to update materials for new standers and guidelines;
- Include trainings in educational curricula;
- Trainings made by educational institutes, supported by government and manufacturers (can be the case for Hungary and Austria).

What does the go to market look like?

For the go to market, the specific usemodel will have to be determined for each country. But one can think of a launch discount for the educational toolbox when these are released.

4 Exploitation on national level

In this report we will look at uptake strategies on two levels. The first are the Broad-macro efforts, the second are the Targeted-Micro efforts. The Broad-Macro efforts are intended to reach as many people as possible and make the information and research results as easily as possible available to them. In the uptake strategies will have to be determined if a 'broad public' also includes groups like consumers and clients, or if this is limited to the professionals and professional companies in the respective fields. Targeted-Micro efforts are focused on the uptake of the information by specific target groups. Just awareness and availability is not enough to really create uptake for the NEWCOM results, namely the qualification and certification schemes. For this reason, it has to be taken into account what problems can be fixed or which opportunities can be created for each specific target group. The results of earlier research will be our stepping stone, since we described the opportunities and barriers quite extensively in previous NEWCOM reports.

Both levels of efforts are complementary and essential to maximize impact and uptake of our research. Each level needs its own strategy; there can also be overlaps in tools and activities which can be used for both.

In this Chapter a few steps will be described to achieve formulation of the different uptake strategies. These steps will be taken for each country individually. After that, all countries will work together to do the same for the European level uptake strategies in Chapter 6.

4.1.1 Austria

4.1.1.1 Undertaken actions: 2018-2019

Development and implementation of the training schemes and certification in Austria is only possible in cooperation and with engagement of the training and further education institutions, chambers and construction guilds. Since the beginning of the project, the Austrian partners have met with different stakeholders in workshops and face-to-face meetings, explaining the

importance of the correct construction and installation of building elements (windows, walls and roofs as well as heating and ventilation systems) in nearly zero-energy buildings - buildings to be built after 2020. In addition, during the national fairs and conferences the content of the project have been presented and discussed with participants (mainly building professionals, architects, ingineers and experts).

Since there are certified courses regarding the construction of walls (external thermal insulation composite system - ETICS) and the producer of the windows offer courses for the correct installation of their products, the contents of NEWCOM project in Austria had to be aimed at the next important trade: the roofers. The aim was to update the courses to fit the NZEB requirements and green roofs. Regarding the quality of NZEB buildings, there are courses available for energy consultants or construction managers. Therefore it was decided to prepare the courses in modular form so that the existing schemes could be combined according to the needs and missing parts.

In Austria, there is no market for further education on ventilation at present due to the already saturated market structure. Therefore, compiling further education program for the ventilation installers was not pursued and no train the trainer session was carried out but the content of courses has been elaborated and is available on www.newcomtraining.eu.

Together with the Institute for Flat Roofing and Waterproofing (Institut für Flachdachbau und Bauwerksabdichtung - IFB) the training for the building professionals in this sector was further developed. Train the Trainer sessions have also been held with the leading manufacturers with long year experience.

In Austria, the implementation of a new profession with the job description “Building Inspection” did not have the chance to be accepted on the market. Neither the training institutions have an interest in providing such a training, nor do the trainees of the future target group have an interest in, or expect benefits from, this new profession on the job market. Therefore, the existing training schemes were extended with additional modules according to the identified ULOs in NEWCOM. In collaboration with educational institutions such as ARGE EBA and the

BAUAkademie Österreich (Construction Academy) these modules are being offered on the market (the module contains of “quality assurance” based on NEWCOM in the course “construction supervisor or Bauleiter” and with the length of one day) starting in 2020.

Goal	Developed/actions
Integrating the Units of Learning Outcomes (content of the project) in the education of construction professions for flat roofing	The stakeholders (members of the educational institutions for flat roofing and building inspections) were invited to workshops and face-to-face meetings in order to develop the content of further education modules and to test and discuss the usability of the NEWCOM competence database. The final step was the implementation of the new content for flat roofing in the training schemes of the Institute for Flat Roofing and Waterproofing as well as in the further education schemes of the Austrian construction academies.
Integrating the Units of Learning Outcomes (content of the project) in the education of the construction professions for building inspection	Talks with several building institutions were performed. Especially with ARGE EBA, which is the most relevant stakeholder for the implementation of further education modules on building inspection in Austria. Also talks with TÜV-Akademie, the Bauakademie NÖ and others about a compact module "Quality Assurance" for site managers and / or foremen, which could take place during existing or upcoming courses in the year 2019 (also 2020) were perfomed. The idea was to create a kind of guide with checklists for the project / construction manager, asking, "When is there something to do, claim or control" and “who is responsible for what”? The netEB is a network for energy consultants acting in the Austrian federal state of Styria. All consultants included in the network are appropriately trained and undergo a given quality control. Through regular training and information, they are also up to date on all energy-relevant topics. They all agree to consistent quality guidelines and the education follows the guidelines of the ARGE EBA education. There were intense talks with this network under the patronage of EASt . The goal was to implement NEWCOM aspects into the continuing training for the members of the network. The Train the Trainer-course held in summer 2019 was an initial spark to show the network of energy consultants the contents of a potential additional module to be implemented in their education.
Using and implementing the NEWCOM competence database	The NEWCOM competence database and its functionality was explained within workshops during the finalisation periode. It is planned to include the

Goal	Developed/actions
for registration of the companies offering flat roofing services and Building inspection	trained trainers in the database for testing reasons. These trainers are all members of the netEB network. For netEB Styria the developed database could replace the present database for all members and a meeting to present the advantages with the responsible admistirative persons is planned. For flat roofers a registration of companies and not for the individual professionals is planned.

4.1.1.2 Scope of target groups and further actions

The content of the qualification schemes developed in this project are based on the recommendations of the national BUILD UP Skills roadmaps established in Pillar I and experiences with BUILD UP Skills Pillar II projects and also takes into account the European Qualifications Framework (EQF). A major step in promoting the developed training schemes is to communicate with the building industry (including construction companies, the blue-collar workers and building professionals) to demonstrate the clear advantages that course participants have in the market after successful completion of the developed courses.

Train the Trainer sessions

The project contains the execution of Train the Trainer sessions in order to test the contents and to receive feedback from trainers and experts attending the session.

In Austria Train the Trainer sessions were held for flat roofers and building inspections. The Train the Trainer (TtT) session on flat roofing was held in the “House of the Construction Industry” in Vienna, the head quarter of the Austrian construction industry, and supported by the federal guild for construction auxiliary trade.

Although, all of the trainers are long-year experienced trainers and experts in the field of flat roofing and waterproofing, the method of combining ULOs, assessment methods and learning activities was rather new for them. All attendees considered the training as an enrichment and consodered the instrument/method as very useful for their further training activities. All trainers agreed in taking part in the follow–up NEWCOM TtT course. The importance of the practical

work in the flat roofing (including the assessment of the acquired competences in a practical exam) was underlined. The training materials available in the NEWCOM–moodle platform, especially audiovisual material, helps to overcome the language barrier. The chances of using BIM and VR/AR technologies were also discussed as a further step to improve the quality of trainings.

In Austria, one main cooperation partner for the implementation of the building inspection course, is the training institution ARGE EBA (Arbeitsgemeinschaft EnergieberaterInnen Ausbildung = Workgroup Energy Consultancy Traineeship). There were several stakeholder meetings with representatives from the federal states Carinthia, Styria and Salzburg. ARGE-EBA is interested in the NEWCOM topics and is willing to implement interesting parts in their course program.

During the runtime of NEWCOM the Train the Trainer course for building inspection was set up as an experimental course with trainers evaluating the content and teaching methods. These Train the Trainer courses had an interactive setup with room for discussion and interaction in the workshop. All participants were members of the NET-EB network, trainers of the ARGE-EBA and energy consultants. The implemented Train the Trainer course was a three-day workshop with two days of theoretical lecture and a practical day at the construction site. The course content was practically orientated, and the correct use of measurement devices was a core element. Therefore, many measurement devices were shown and tested by the attendees.

On Basis of the feedback of the implemented Train the Trainer courses the module “Quality inspection of the building envelope in building phases” was adapted. The final goal is to implement the training content in the ARGE EBA F-course education or to create a recognized further training to it (development of a new stand alone C-Course).

The WIFI Steiermark is also interested in implementing the course content and respective talks were implemented. Furthermore, the local government of Styria was confronted with this new

course content to boost the creation of a funding infrastructure for consultation actions that can be done by attendees of the Module.

Further activities

Not only the stakeholders of the educational institutions and guilds are a target group in the project, but also the blue-collar workers and building professionals, construction companies, building owners and municipalities have to be informed of the possible new schemes. To reach these groups, other types of activities are planned. For this purpose more general information is prepared for these target groups. Therefore, dissemination activities focus on providing information on fairs and exhibitions, sending newsletter and invitation to events.

Within fairs, exhibitions and events also the energy experts and building professionals as well as further education institutions that were not involved in the process are contacted and invited to learn about the outcomes of the project. The complete activity plan can be found in *Chapter 7: Appendix A*, paragraph *7.1.1 Austrian activity plan*.

4.1.1.3 Strategies 2019, 2020 and beyond

The strategies for the sustainable implementation of the training content regarding flat roofing will be done in further cooperation with the Institut for Flatroofing and Waterproofing (IFB). This in order to implement the training scheme in a modular form and to get the courses certified. The companies in this field may use this certificate as a quality label for their services. Companies with a quality label could be listed in the IFB's quality database. Especially for the IFB the following two training modules were developed based on the developed training modules:

- The contribution of green roofs and water storage to climate change adaptation;
- Requirements of the new ÖNORM B3691, planning and execution of roof waterproofing (focus: energy efficiency).

Regarding the sustainability of the building inspection modules, a cooperation with relevant educational institutions (besides ARGE-EBA) is examined: e.g. TÜV-Akademie,

BAUAkademie. The compact module "Quality assurance" for foremen and site managers will be implemented in the courses starting in 2020 in the Bauakademie Lower Austria. After that, these course modules will befurther developed and spread to other Bauakademies.
Incorporation of the training contents into the further training programme of the Styrian Energy Consultant Network (netEB) is another step for the sustainability of the building inspection courses. This will be done as preparation of the linking of the training contents with a certificate for quality assurance in construction, which should be necessary in the future for the receipt of specific state subsidies (in cooperation with the Office of the Styrian State Government).

As mentioned before, the engagement of the stakeholders, especially the building professionals, is mainly enforced by providing information during events, reaching them per newletter or by face-to-face meetings. One of the main target groups is the group of professionals already engaged in different energy efficiency construction groups, such as representators of interests for innovative buildings, networks of professionals or the klimaaktiv[29] network. In this context, it has to be mentioned that the project outcomes have been presented within the klimaaktiv conference in Vienna in December 2019. Further communication with with relevant staekholdfers will be intensified within events and workshops till the end of the of the project duration.

According to the implementation strategies of the NEWCOM Competence Database It has to be stated that in Austria many employers in the construction sector do not agree to a presentation of their employees' competences because they fear of loosing them to competitors. As employers have a very strong position in this context, this presents a real challenge for the implementation of the NEWCOM Competence Database which requires an alternative solution.

Due to this situation the following adapation of the NEWCOM Competence Database was performed. At present it is also possible that the database also publicly displays only the company and the number of employees with the corresponding proof of competence, although

[29] Klimaaktiv is the climate protection initiative of the Federal Ministry for Climate Protection

the professional as well as the proof of competence are fully entered in the database or linked to the competence presentation methodology of the database. Nevertheless, the course graduate can download a proof of competence in the form of a "professional card". If the professional leaves the company, he/she can make his or her competence publicly visible in order to be found online by companies looking for employees.

The expectation is that succesfull implementation and usage of the NEWCOM Competence Database will lead to the following requirements and advantages for the different target groups:

- Professionals: Advantage in job search, better pay, more career opportunities;
- Employers: Proof of qualified personnel (if required for tenders);
- Companies (in search of employees): Competences are clearly recognisable;
- Companies as clients (general contractors): Possibility to shift out subcontractors who deliver poor quality;
- Training providers: Upgrade of own courses (which leads to more participants);
- Certification bodies: Representation of existing certifications;
- Quality Associations: Improvement of existing training systems (ETICS[30], flat roof);
- Agencies: Good opportunity to upgrade trainings to achieve GHG (Green House Gas) targets;
- Federal and state governments: Good opportunity to upgrade trainings to achieve GHG targets, potential demand as public procurers, field of action to implement government programmes in the field of climate and environmental protection.[31]

For the operationalization of the database specific rights, roles and responsibilities have to be determined. Professionals have to give their consent before their personal data can be processed in the database. Employers can support or encourage the listing by their employees. Training providers must confirm the competence of the graduates in the database The Chamber of commerce/Guilds have to give approval for the project, since flat roof

[30] External Thermal Insulation Composite System

[31] e.g.: Buildings: Sustainable and energy-saving heating, cooling, construction and refurbishment", contents of the former lighthouse 11 of mission#2030, Austrian climate protection document for 2030.

certification will be carried via IFB in the direction of the roofers' guild (ancillary building trades). Building academies (guild's own education centre) have to be keep in informed about the actiual implementation status of the database.

The roles of quality associations, agencies and states/federal government, together with the responsibilities described above can be found in the full overview of the database implementation in *Chapter 7: Appendix A*, paragraph *7.1.2 Austrian implementation plan*.

4.1.1.4 Monitoring and evaluation plan for developed strategies

The Austrian project partners will continue to communicate with the stakeholders - guilds and educational institutions- in order to provide the sustainability and further implementation of the developed traning modules. The project partner 17&4 (Organisationsberatung GmbH) works in close cooperation with the IFB and Building academies in Austria and project partner EASt works closely with ARGE-EBA. These stakeholders will be invited to the national closing event not only as participants, but also as contributers. The Austrian Energy Agency (AEA) as the manager of the programm klimaaktiv is very active in promoting the up-scaling of building professionals and in close contact with different certification and further-education institutes.

Regarding the NEWCOM competence database the main target group and institutions have been identified and contacted to enable the further implementation of the database in Austria.

4.1.1.5 Implementation plan for developed strategies

Regarding the strategy for national implementation of the NEWCOM Competence Database the environment of the different relevant stakeholders is in progress. Federal or local governments will be involved as a patron for the Competence Database. The IFB, ARGE EBA and building academies and quality groups are also involved to support the usage of the database and the further implementation of the training materials. Moreover, training providers and professionals are targeted to make use of both the database (register their candidates or themselves) and the training materials (implement/attend training).

Regarding the implementaion of the training schemes for flat roofing 17&4 will continue working with IFB for the certification of the courses and communication with the Bauakademies (Construction Academies).

At the 16th IFB-Symposium in 2019 on Flat roofing and water proofing in Vienna the trainings developed in the project were transmitted to the experts and professionals.

Image 1: The presentation of the project during the building exhibition in 2020 ©EASt

Project partner EASt (Energy Agency of Styria) will continue promoting and implementing the building inspections courses in cooperation with ARGE-EBA.

The Austrian Energy Agency will continue the dissemination of the project results to the different relevant stakeholders to support the further implementation of the developed course modules and the further implementation of the NEWCOM Competence Database. Also in this context, the tense cooperation with the IFB and the ARGE-EBA/netEB, the klimaaktiv network and the Federal Ministry of climate action has to be highlighted.

The complete implementation plan can be found in *Chapter 7: Appendix A*, paragraph *7.1.1 Austrian acticity plan and paragraph 7.1.2 Austrian implementation plan*.

4.1.2 Hungary

4.1.2.1 Undertaken actions: 2018-2019

During the implementation of the project, all three selected topics (flat roof, ventilation and building inspection) were addressed in Hungary.

Stakeholders were identified, contacted and involved in the work according to the following categories:

Flat roofs

The Hungarian Roofing Association (Épületszigetelők Tetőfedők és Bádogosok Magyarországi Szövetsége (ÉMSZ)) was a key stakeholder in the development of flat roof training and is important in the implementation of the trainings. Trading and manufacturer companies also play an important role since they are organising their own trainings regularly. Furthermore, stronger contractor companies (UNISZIG, TECTUM, TT Building) also provide two-three days training for their employees with invited external speakers and trainers as well. During the development of the training materials for flat roofers we collaborated strongly with the experts, who was involved the former trainings courses in the Veszprém Roofer School for more than hundred flat roofers. We collobareted TECTUM in the Train the Trainer courses held in the headquarters at ÉMI. The TtT session was organized by ÉMI on 13th of September 2019. The course took 8 hours. There were 16 participants and other relevant stakeholders also communicated strong interest. The participants organized a new event on 28th November 2019 to summarize the results and extend the stakeholders' group. The harmonized training materials were developed and finalized with the contribution of the experts of TECTUM.

Ventilation

In TRAINBUD project (BUILD UP Skills pillar II. in Hungary) the consortium established a Sustainable Construction Skills Alliance which featured members from different fields of the

construction market. In the SCSA representatives of authorities, associations, education institutions and trading and manufacturer companies participated. In TRAINBUD one of the main topics addressed, was ventilation. Therefore, a strong stakeholder base was ready to be included in the work performed in NEWCOM. Representatives of trading and manufacturer companies collaborated in the work and peer-reviewed the ULOs developed within NEWCOM, also provided expert help in gathering all relevant available training materials. The external expert working for A++ Energy Consulting Ltd. apart from participating in the adaptation of the ventilation material also held presentations during the Train the trainer courses.

During the Train the Trainers sessions the involved experts collaborated in the implementation of the courses. The training was organized at ÉMI Headquarters on 17th September 2019 with 17 participants. The trainers were selected according to their expertise in the field of ventilation. The technical advisors of the manufacturers were involved with their short presentations as well.

Building inspection

In Hungary currently there is no official, mandatory training for building inspectors. Some courses in higher education might address the subject, but not as thoroughly as it is needed. According to a current regulation in Hungary (*Law LXXVIII. of 1997. on The protection and forming of the built environment*), an exam must be passed in order to be able to work as a building inspector. But there is no mandatory training to participate in. However, there are voluntary trainings related to the topic, but these are not organized regularly. Trainers and professors working in higher education in the relevant fields were contacted and involved in the preparations. During the Train the Trainer courses, external experts collaborated in the implementation. Budapest University of Technology and Economics – Engineer Further Training Institution (BME Mérnöktovábbképző Intézet) is one of the main stakeholders, since they are the one organizing the trainings. ÉMI organized two Train the Trainers sessions related to building inspection on 23rd July (with 9 participants) and 3rd September 2019 (with 10 participants). ÉMI (Non-Profit Limited Liability Company for Quality Control and Innovation in Building) was invited to held lectures for building inspectors about the NEWCOM strategies

on 30th September and on 28th November 2019.To further implement the NEWCOM trainings, the following strategies were formulated. Maintaining strong contact with the relevant stakeholders is essential in this process. During the different discussions, it was clear that there is a demand for quality trainings in Hungary especially related to nZEB. Since in Hungary this topic is not thoroughly addressed in current trainings. Both the actors of educational institutions and the construction market are important parts of the strategy. During the development of the ULOs the gaps in available content were clarified. The aim is to fill these gaps with the materials developed within NEWCOM.

Goal	Developed/actions
Stakeholder engagement	ÉMI contacted and involved stakeholders related to each selected topics (flat roofs, ventilation, building inspection). ÉMI organized face-to-face meetings with manufacturers (especially those whon also organize their own trainings) and presented the aim of the project and discussed their existing trainings and the gaps that needed to be filled. From all three fields we had trainers to participate in the implementation of the TtT courses.
Development of training material related to flat roofs	Together with external experts (TECTUM) in roofing ÉMI developed the training material related to the nZEB requirements and tasks of flat roofs.
Implementation of Train the Trainers courses	ÉMI implemented TtT courses in all 3 selected fields with the collaboration of the external experts.

4.1.2.2 Scope of target groups and further actions

Since in Hungary we addressed all three selected fields, we need to differentiate between the three target groups. The two main target groups are blue-collar workers and building inspectors. Amongst blue-collar workers, flat roofers and ventilation installers are the two

subgroups. In defining the scope and timeline, not only the different target groups need to be taken into consideration, but also the existing courses and available materials.

Flat roofs and ventilation

At the stakeholder meetings and after the Train the Trainer courses, during the feedback sessions the invited participants (trainers and representatives of trading and manufacturer companies) clearly identified the problems of the sector. The quality of the work performed by lot of the blue-collar workers, indicate that there is need for better trainings with more practical examples. Inviting trainers and company representatives is not a problem, however addressing blue-collar workers is a challenge since they are less willing to participate in trainings (especially if it is not mandatory), because it means less time to work, which results in less income.

Building inspection

In Hungary, building inspectors are mainly architects and other professionals with higher education. Inviting them to trainings or discussions is easier than in the case of blue-collar workers. Since there is no direct mandatory training for building inspectors, filling the 'gaps' is difficult in this case. To be able to work as a building inspector, the exam must be passed according to the above mentioned regulation. Therefore, the demand is there to at least update their knowledge. Collaboration with the Budapest University of Technology and Economics – Engineer Further Training Institution (BME Mérnöktovábbképző Intézet) is important during this process and to adapt to their timeline in relation to trainings.

The complete activity plan can be found in *Chapter 7: Appendix A*, paragraph *7.1.3 Hungarian activity plan*.

4.1.2.3 Strategies 2019, 2020 and beyond

Within NEWCOM, the goal is to upskill the workers in the field of NZEB through trainings, therefore it is important to differentiate between the trainers and the trainees.

Regarding blue-collar workers, in the case of roofers and ventilation installers trainers are mainly vocational school teachers and representatives of trading and manufacturer companies (who also provide traingings). They are fully aware of the existing trainings, materials and also the most common problems/errors in construction related to their fields. For the flat roofers the Hungarian Roofing Federation (ÉMSZ) is the strategic partner organizing courses. Most likely it should be organized regionally. On the other hand, actual blue-collar workers are not always aware of possible trainings and especially not aware of their errors.

Trading and manufacturer companies are the most dedicated when it comes to avoiding failures since it is crucial to them that their products are correctly installed. This is one of the reasons that they regularly organize trainings presenting their products and their correct installation. It is their interest to have a quality workforce on the market. They are also blue-collar workers and installers whom are more likely to participate in company trainings even if it has a fee, than to attend courses in vocational schools. Moreover, usually companies provide the most up-to-date knowledge and best practices.

To attract participants to trainings, companies use their newsletters or professional events to inform workers about the possible trainings. It is important to collaborate with companies and use their marketing strategies also. During the discussions, they were open to include the content developed in NEWCOM and also collaborated in finding the gaps and identifying the needs in both flat roof and ventilation.

Collaboration with vocational schools is also important, since usually due to lack of budget and workforce, their training materials are not up-to-date. Therefore, they are open to include new materials in the curricula. In vocational schools, students can be targeted before they enter the labour market.

In the case of building inspectors the collaboration with BME is necessary. Attracting participants is easier, since they are obliged by law to pass an exam. However, this training is also voluntary.

Regarding administrative aspects, registering a training as mandatory in Hungary is a very long, expensive and complicated process and mostly not necessary. Voluntary trainings are more realistic, however registering these is almost equally difficult. In Hungary the best strategy is to find the gaps in available trainings (previously done during the development of ULOs) and fill the gaps with the content developed in NEWCOM.

4.1.2.4 Monitoring and evaluation plan for developed strategies

Monitoring the performed work and the strategy is only possible in collaboration with the stakeholders. The goal is to upgrade the knowledge of workers, which results in better quality work performed in practice. ÉMI has a strong relationship with the different companies and training institutions involved within NEWCOM as stakeholders or previously in BUS TRAINBUD as the members of the Sustainable Construction Skills Alliance. The stakeholders are happy to collaborate therefore during regular meetings they can inform us about the modules integrated, the feedback of the participants and further needs or gaps in the curricula related to nZEB.

We can also monitor the number of participants (adults and students in vocational schools) participating in the training.

4.1.2.5 Implementation plan for developed strategies

The aim in Hungary is to fill the gaps and upskill blue-collar workers and building inspectors within voluntary trainings. In Hungary after 2020 every new building must correspond to the NZEB requirements.

All three selected fields (flat roofs, ventilation, building inspectors) will be addressed in Hungary, in collaboration with the stakeholders. The implementation already started within the project by ongoing discussions with stakeholders and the Train the Trainers courses. Concerning flat roofs and ventilation, the focus will be on collaboration with vocational schools and trading and manufacturer companies. Collaborating with companies is easier since they

have the financial sources to adapt trainings, also it is in their interest to include new materials and educate blue-collar workers about best practices.

On the other hand collaborating with vocational schools is a challenge due to lack of financial resources, lack of human resources and rigid administrative background. In the case of vocational schools, less can be included in the curricula and it is mostly the teachers' choice to share additional information with the students.

To implement the building inspection modules, the key stakeholder is the Budapest University of Technology and Economics – Engineer Further Training Institution (BME Mérnöktovábbképző Intézet). They can integrate the materials according to the needs and missing content of the already available training, also the provisions of the regulation (*Law LXXVIII. Of 1997. On The protection and forming of the built environment*) determines the exact content. The Hungarian Engineers Chamber could be approached as strategic partner as well. All aforementioned stakeholders (including training providers, companies and training institutions) will be called upon for implementation and evaluation of the progress. They will receive access to the training materialsif they participate in the Train the Trainer events. If needed, experts from ÉMI can also assist in the implementation of the trainings. Feedback will be requested from all stakeholders and their trainers, including number of participants, time, date, location of the trainings and presented modules. This information will be needed in order to be able to monitor the implemented courses.

ÉMI will continue the dissemination of the project results to the different relevant stakeholders to support the further implementation of the developed course modules and the further implementation of the NEWCOM Competence Database. ÉMI has strong collaboration with the Hungarian Roofing Federation and several training institutions (HEIs and VETs) and trading and manufacturer companies and will continue to support and assist them in utilizing the NEWCOM traning material and competence database.

The complete implementation plan can be found in *Chapter 7: Appendix A*, paragraph *7.1.4 Hungarian implementation plan*.

4.1.3 Slovakia

4.1.3.1 Undertaken actions: 2018-2019

In 2012 and 2013, Slovakia participated in the Build Up Skills Pillar I project. The goal was to analyse the status quo in the level of competences available in the buildingsector. The project looked at future needs and obstacles for improvement of skills and knowledge of blue-collar workers, but the Slovak BUS team also addressed the needs for middle and senior level professionals concerning energy efficient buildings and renewable energy. It was felt these professions would also have a major impact in reaching and upskilling the blue-collar workers. The BUS National Roadmap was supported by universities, accreditation bodies, ministries in charge of education/energy politics/construction sector, social partners and manufacturers/suppliers.

In implementing the Roadmap, StavEdu, a National Qualification and Training Scheme about energy efficiency and renewable energy was set up for blue-collar workers. This resulted in 10 cross-craft further education training programmes. The BUS StavEdu project has shown that there is considerable demand for the training of installers of ventilation in nZEB buildings and in energy renovations aimed at nZEB standard (as soon required by law also for private dwellings). This demand was triggered by complaints of customers and negative image of energy renovations. But has also been noticed by self-employed craftsmen and construction companies. The key to the success is to offer the training during off-peak periods in the construction cycle (for example during the wintertime). Young professionals can take up vocational education and training (VET) at several VET schools that offer the high school training and practical vocational training for construction crafts.

A similar result was achieved during the BUS implemented ingREeS project (2014-2018, National Qualification and Training Scheme for Middle and Senior Level Construction Professionals on Energy Efficiency and Use of Renewable Energy Sources in Buildings.

ingREeS and StavEdu schemes are the only comprehensive and unbiased further education and training schemes available at this time in Slovakia. These two systems cover adequately

the needs specified for Building Inspector by NEWCOM. Nevertheless, the both systems are open to any new training institution that would implement the developed training programmes or new programmes that would complement and/or reinforce the objectives of developing skills and knowledge on energy efficiency and use of renewable energy sources in buildings.

The StavEdu and ingREeS training programmes are supported by a large number of different organisations and companies, whom deliver content, trainers, training locations and teaching aids/equipment for practical training. These same organisations will also be the main stakeholders to implement the NEWCOM training schemes/certification and the NEWCOM Competence Database. For instance, the trainers (network of trainers is maintained by SKSI for delivering ingREeS training) will review new content developed by NEWCOM project and complement the modules where necessary.

The full list of stakeholders can be found in the activity plan in *Chapter 7: Appendix A*, paragraph *7.1.5 Slovak activity plan*.

To achieve effective implementation of the NEWCOM certification schemes, the review of the StavEdu and ingREeS ULOs, training modules and certification was reviewed and the area of further development by using the outcomes of NEWCOM was identified.

This was discussed during the training of trainers. Further actions were identified:

- Improving the existing training programmes for hydro insulators and installers of ventilation based on the NEWCOM project outcomes;
- Implementing certification scheme in cooperation with vocational schools that will be included in the system of accredited certification bodies for prior learning recognition;

In August and September 2019, the training of trainers was organised inviting the trainers from ingREeS and StavEdu qualification and further training schemes set up by previous projects to present the NEWCOM programmes. During these training, the implementation of these programmes and certification schemes were discussed. Regarding flat roofing and ventilation, the following conclusions were made:

- Content of a Slovak programme for further education and training on installation of flat roofs (as follow-up to NEWCOM and outside of its scope) will be further developed using the NEWCOM ULOs, curriculum and control questions and the programme will have 32 teaching hours (18 theory, 14 practical training);
- The NEWCOM curriculum on ventilation will be used for reviewing the StavEdu programme already in place and well developed and the certification will be offered for prior learning recognition to craftsmen by institutions mandated by the Competent Authority (these mandates will be issued as part of a national project currently being implemented);
- The NEWCOM curricula on flat roof and ventilation will be taken into account in improving the programmes of vocational training at secondary level.

To achieve this, the following actions have been implemented:

- Set-up a network of vocational schools to support NEWCOM certification;
- Organise workshop with the vocational schools and UVS (only training institute aimed at delivering further education and training in the construction sector for craftsmen) to agree on practical steps of implementing NEWCOM certification schemes and to embed the project outcomes into vocational training and further education and training.

Goal	Developed/actions
Raising awareness of the project among the stekaholders	Presentation on professional card during the launch meeting of CraftEdu project (another project under H2020-constrcuction skills) to stakeholders on 16 January 2019.
NewCom project open day	Organised during the International Fair Coneco/Racioenergia 2019 on 27 and 28 March 2019.
Set up network of vocational schools to support NEWCOM certification	Organised in cooperation with vocational schools in March 2020.
Organise workshop with the vocational schools and UVS	Workhops organised in cooperation with vocational school in March/April 2020.

4.1.3.2 Scope of target groups and further actions

For the building inspector the following target groups were identified in Slovakia:

- Construction Site Supervisors;
- Sustainability/Energy Advisors;
- Assessors of the achieved EE.

4.1.3.3 Strategies 2019, 2020 and beyond

The exploitation of the project results will be at two levels:

- At **national level** – the relevant national implementation strategies will be implemented, including the follow-up actions;
- At the **regional level** (region covered by vocational schools and accredited certification bodies) – the project results will be disseminated and exploited by the targeted stakeholders;

The following key target groups will be addressed by the dissemination and exploitation plan:

- **Craftsmen** and workers working on construction building sites;
- Managers, **education professionals and marketing specialists** in the training and education organisations;
- **Competent authorities** and agencies responsible for managing national qualification frameworks, databases of qualifications and professions and ESF related national operational programmes.

For implementation of the Competence Database, the following requirements and advantages for the different target groups will be met:

- Professionals: Advantage in job search, better pay and more careeropportunities;
- Employers: Proof of qualified personnel (if required for tenders) for as long as qualified personnel remains in their company;
- Companies in search of employees: Clearly recognisable competences;

- Training providers: Upgrade of own specific courses; leads to more participants in these courses;
- Certification bodies: Existing certifications can be well represented in the database.

Operationalization of the database will require specific roles and actions for each group. Professionals will have to give their consent for processing of their personal data; this also includes an agreement on delivery of personal data with training providers. Training providers must confirm the competences of the graduates in the database; it would also be useful to enable a direct link or transfer of personal data from the training provider to the database. Certification bodies are one of the main target groups to make use of the data in the database, but they are not directly needed for operation of the database.

Detailed description of the target groups divided into areas of expected impacts and dissemination channels to be used are in the Table: ***The areas of impact, potential users of the project's results and channels of dissemination and interaction with potential users***:

Dissemination /exploitation level	Areas of expected impact	Potential users	Dissemination channels to be used
National level	Research	Education professionals	Workshops organised by competent authorities or Sector Skills Council, information days, partners' websites;
	Commercial	Managers, marketing specialists in the training and education organisations	NEWCOM training of trainers, workshop, Sector Skills Council meetings; ZSPS internal meetings
	Skills	Craftsmen and workers working on construction building sites	Employers organisations and their networks of operators, Including SMEs: guilds affiliating craftsmen and their networks, networks of members of the National Qualification Platform;
	Investments (in skills)	Stakeholders throughout the value chains for construction of new nZEB and energy renovation of existing buildings	ZSPS meetings and workshops for operators;

Dissemination /exploitation level	Areas of expected impact	Potential users	Dissemination channels to be used
Regional level	Research	Regional authorities and employment bureaux	Networks of contact of employers, vocational schools;
	Commercial	Managers, marketing specialists in the training and education organisations	National Qualification Platform's network of contacts, regional structure of ZSPS, NEWCOM website;
	Investments (in skills)	Operators in the value chains for construction of new nZEB and energy renovation of existing buildings	ZSPS regional networks;
	Environmental	Operators in the value chains for construction of new nZEB and energy renovation of existing buildings	"Building Future" initiative's network, vocational schools'network;
	Setting standards (qualifications)	Sector Skills Council	Sector Skills Council meetings:
	Policy making	Decision makers and decision makers	ZSPS meetings, official conferences, seminars with the competent authorities;
	Social	Health authorities (in charge of health and safety at work)	National Qualification Platform meetings;

4.1.3.4 Monitoring and evaluation plan for developed strategies

Consolidation has mostly been addressed in the previous chapter.

Involvement of the professional associations and manufacturers is ensured through StavEdu and NEWCOM schemes that were set up already under Pillar II BUS and previous H2020-cobstrcutcion skills projects.

ZSPS monitors and regularly evaluates the achievements in the area of vocational training (at secondary level) and further education and training (StavEdu and ingREeS). Within this monitoring and evaluation, the results of the NEWCOM certification schemes will be assessed.

4.1.3.5 Implementation plan for developed strategies

The implementation plan is focused on the targeted professionals and the organisations that represent them, as well as their employers and training institutes that market the training and certification services.

The focus will be twofold:

- On recognition of prior learning (formal, informal and non-formal) that provides clear benefit to the craftsmen that have extensive experience and received training before introduction of the NEWCOM certification scheme;
- On recognition of the training provided by the training providers that join the NEWCOM certification scheme.

As many planned face-to-face events (International Coneco/Racioenergia Fair 2020, NEWCOM workshop planned for March 2020, presentations at the workshops of relevant professional associations and guilds during the Conceo/Racioenergia Fair) were cancelled due to Covid-19 restrictions, the dissemination activities moved to webinars. The second wave of events was prepared for October-November 2020, but again cancelled due to worsening epidemiological situation. They will again be moved to webinars.

Nevertheless, the Slovak partner will continue with promoting exploitation of the project beyond expiry, as the situation should eventually improve and face-to-face events in this case cannot be fully replaced by webinars.

In section 7.1.6, the prioritisation of target groups is summarised in a table and the relevant uptake strategy is identified for each group.

The complete implementation plan can be found in *Chapter 7: Appendix A*, paragraph *7.1.6 Slovak implementation plan*.

4.1.4 The Netherlands

4.1.4.1 Undertaken actions: 2018-2019

One of the main focus points for the Netherlands has been to work together with the most important national stakeholders for each specialisation. Amongst there are: training institutions, professional associations, suppliers and other knowledge institutes. These organisations have been contacted through Train the Trainer meetings, personal interviews and round table meetings. Almost all undertaken actions have been focused on individual organisations (ambassadors). The contacted stakeholders see potential for the qualification schemes which are being developed, but are also critical of a whole new certification. Since this will add to the already existing (sometimes obligatory) certifications. We have kept this in consideration, and focused our uptake strategies primarly on the target groups which seem most willing to participate, considering and often extending the existing systems.

A couple of different kind of workshops and meetings, which each involved some professionals, have been conducted. Of course, this is just skimming the surface of the total projected target group.

For implementation of the Competence Database, is has been used as a tool to implement elements of the NEWCOM training schemes in existing (or revised) certification schemes of different organisations, both for roofing, building inspection and ventilation. Also, a cooperation with the Central Database for Technology (Stichting Centraal Register Techniek) has been realized. Furthermore, an experiment will be undertaken with exam institute Cito for micro-certification on specifiek skills and knowledge on a personal level. The database will also be used in the follow-up project BUSLeague.

All actions have been summarised in the table below.

Goal	Developed/actions
Involve trainers/experts	Train the Trainer workshops roofers[32]
Involve trainers/experts	Train the Trainer workshops ventilation[33]
Involve trainers/experts	Train the Trainer workshops building inspection[34]
Involve stakeholders	Interview with BDA Dak- en gevelopleidingen
Involve stakeholders	Interview with Brink Climate Systems
Involve stakeholders	Interview with Gevelscan
Involve stakeholders	Interview with Ministerie BZK
Involve stakeholders	Interview with Roof Update
Involve stakeholders	Interview with Tremco Illbruck
Involve stakeholders	Round table meeting FedEC
Involve stakeholders	Round table meeting KIK Campus
Involve stakeholders	Round table meeting DBCA
Involve stakeholders	Round table meeting NDA (Nederlandse Dakdekkers Associatie)
Involve stakeholders	Round table meeting VEBIdak
Involve stakeholders	Round table meeting Tectum
Involve stakeholders	Round table meeting VLA
Involve stakeholders/ professionals	Strategy meeting with contractors, ventilation manufacturers and developers.
Involve professionals	AIVC workshop with professionals interested in quality ventilation.
Involve stakeholders/ professionals	Horizon2020 Sphere workshop with contractors, BIM specialists and research institutes.
Involve stakeholders	Implementation of elements of the NEWCOM certification in the Groenkeur certification (Competence Database used as tool).
Involve stakeholders	Implementation of elements of the NEWCOM certification in the Building Inspection point system for upskilling by Sertum (Competence Database used as tool).

[32] Organizations in attendance: BDA Dak- en gevelopleidingen, Bouwradius, Tectum.
[33] Organizations in attendance: InstallatieWerk, Koppen BouwExperts, Eltag, ROVC.
[34] Organizations in attendance: TVVL, KIK-Campus, ZiN Groep | Wabo & Kwaliteitsborging, et al.

Goal	Developed/actions
Involve stakeholders	Implementation of elements of the NEWCOM certification in the new ventilation certification (Competence Database used as tool).

4.1.4.2 Scope of target groups and further actions

Target groups have been selected carefully, since we could not expect to influence all groups during this project. At the same time it was valuable to still mention the target groups which fall outside of the scope of the project. This can be the basis for further implementation of the strategies, after the project is finished.

The easiest target groups to involve where the different stakeholders. For most of them, there is not really one single uptake point, they could be influenced or involved almost continously during the project. This has been done through interviews, round table meetings and so forth. One exception on point of uptake, are the training institutions. Some of these were already involved during the first Train the Trainer workshops. A logical second uptake point for these institutions is already planned out; namely the second round of Train the Trainer workshops. But even in the stakeholder category of target groups, choices will have to be made. Some stakeholders are more likely to be actively involved or implement the developed qualification schemes more readily than others. To make the distinction, the stakeholders are mentioned separately or put together in groups of possible, including the achievable activities and uptake points.

If we look directly at the professionals, it is most likely to get target groups involved whom are already active in existing and established professions about quality control or sustainable work. It will not be attainable to involve all of these target groups during the project. Since we are mostly reliant on partners to reach the professionals through communication, we will have to look which partners and professionals are most willing to participate in the NEWCOM project on a short term. The different groups of professionals are mentioned in the activity plan.

In earlier reports, the different customers of the professionalized specialists were mentioned as important target groups. It is very clear that these stakeholders are very important for a proper implementation, since they benefit from better building quality. But involving building owners and other customer target groups, will be really hard to achiev properly during the course of this project. Therefore, eventhough it is very important to involve these target groups for implementation, it is very unlikely we will be able to do so during the project. These target groups are relevant, but not achievable during the project. This is why they are mentioned in the activity plan, but no details are present. The customers will be involved after the NEWCOM project is finished.

To summerize the scope for the Netherlands, the following target groups will be involved: training institutions, manufacturers, professional associations, housing cooperation companies and the different groups of professionals. This will be done through Train the Trainer and implementation sessions, stakeholder meetings, communication channels (including the ones of our stakeholders), trial trainings and e-learning, BUS-app promotion and special interest magazines.

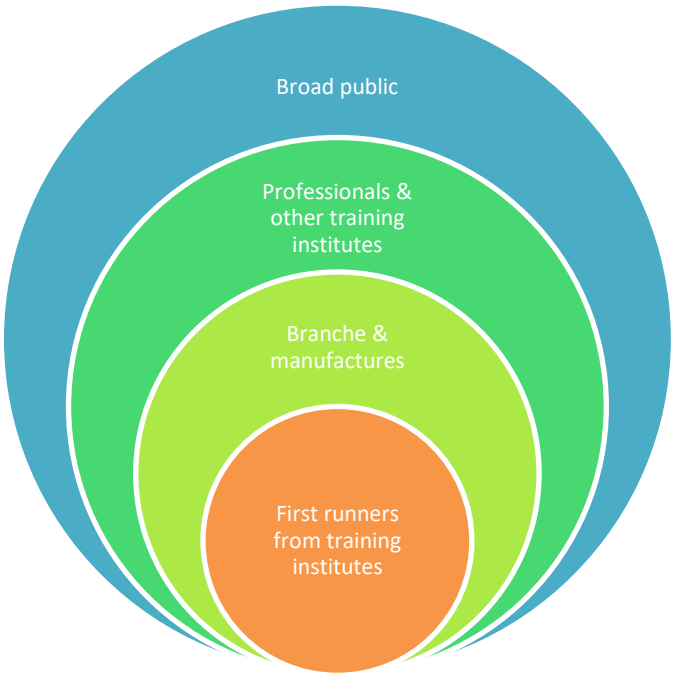

Figure 10. The dissemination target groups

The full list of stakeholders and activities/tools can be found in the activity plan in *Chapter 7: Appendix A*, paragraph *7.1.7 Dutch activity plan*.

4.1.4.3 Strategies 2019, 2020 and beyond

We are dealing with a great variety of target groups. Luckely there is a lot of overlap in the kinds of target groups between the 3 specialization scopes. This makes it easier to consolidate these target groups and align a lot of overlap between them. Priority for the different consolidated target groups should be the following:

1. Training instutions (ventilation, roofers, inspection, competence database);
2. Professional associations (Idem as above);
3. Manufacturers (Roofing, ventilation, personal recognition);
4. Professionals (ventilation, roofers, inspection, personal recognition).

This priority is based on which target groups can realistically be influenced the best during the NEWCOM project and which target groups fill a key role/position to support accelerated uptake.

Training institutions

It has become very clear how important it is to involve training institutions as much as possible. This is why they have already been effectively affiliated through the Train the Trainer programs. Their involvement makes that the trainers are already aware of the opportunity and according to the Train the Trainer evaluation scores, they generally speaking also understand the benefits. The training instutions are aware of the NEWCOM modules and have access to them. But there is still work to be done. Some trainers indicated that they are willing to implement the NEWCOM modules in their trainings (incentive), but not yet all of them. It seems a good idea to stimulate this further by follow-up Train the Trainer workshops. Most training institutions might have the knowledge to implement the NEWCOM modules. If not, we will need to support them, either by further workshops, individual assistance or combining strengths of multiple

organizations. Availability of resources might also be a problem. This can be the case for initial implementation of the modules, but even more so when we look at the sustainability of them. If we want the NEWCOM modules to stay relevant, they will need to be periodically updated. The same will be the case for the different sets of training materials. NEWCOM will not be able to give an solution for this during the project. A possibility after the project might be to update modules and training materials centralized, so training instutions can always rely on current materials. Either way, we need to support the trainers to the best of our capabilities, this will mostly be through sharing knowledge (with workhops and meetings) and make the needed materials as easely usable and accessible. For all three scopes there are some initiatives as a result from the Train the Trainer workshops which we can use as uptake moments. For building inspection four uptake moments are plannend. Three of these are implementation of the NEWCOM modules in existing courses of TVVL, Klimapedia, ZiN and Wabo. The fourth is the use of the NEWCOM qualification in the KIK-Campus maturity scan.

For the roofers, there is an opportunity to look at the implementation of the NEWCOM modules as gamified learning by Bouwradius.[35] We will need to support them as optimally as possible with knowledge and content (which includes the NEWCOM modules), as to increase the uptake chances.

For ventilation there are also plans to start implementing the NEWCOM modules into existing trainings, or start with new training programs. InstallatieWerk, ROC Tilburg and ROC Friese Poort are planning to make a new practice environment on ventilation in combination with air tightness. Furthermore, there is a cooperation by InstallatieWerk, VLA and Eltag which are planning to start a new ventilation training course on the first of September 2020. InstallatieWerk is making arrangements with ROVC about practical implementations of this course. We can work together with both initiatives to implement the NEWCOM ULO's at the same time. ISSO will also look to implement the NEWCOM ULO's in the new ISSO training materials on ventilation, which will be used by multiple training institutions.

[35] Atrivity (https://www.atrivity.com/en/).

Ideally the training instutions will actively support and use the NEWCOM Competence Database. Since their adapted trainings will result in registrations. The goal will be to involve the training institions as best as possible as to stimulate usage of the database, which will in turn increase its value. In order to reach that goal the training supply of the training institutes is added to the BUILD UP Skills advisor-app. Also a dialogue has started on how to validate recognitions from the competence database with Centraal Register Techniek.

Professional associations and manufacturers

In communicating to a substantial part of the professionals, the professional associations are key. They can reach many more people then we can ever hope to achiev on our own. Besides, the couple of professional associations for each scope, are easier to contact and involve than the countless professionals. This is why we need them to support our NEWCOM project. If the professional associations inform the professionals about the importance of quality of the works, the trainings with NEWCOM modules implemented will find more uptake amongst professionals. Even more ideally would be if the associations would promote/stimulate the following of courses to be able to attain this higher quality.

The first step to involve these associations has already been made, namely through (Train the Trainer) workshops. We will need to keep involving them this way (or by other kinds of meetings) during the NEWCOM project. This way they are aware of the opportunity and understand how the NEWCOM modules can be an answer to this problem. At the same time they are aware of what we produced and have access to this information. The incentive for these associations is a bit more difficult. Quality of the works is becoming more and more important in the Netherlands, which also means there are many other initiatives who are responding to this development. Most professional associations are acknowledging these issues more and more, and some are even starting to stimulate (or even impose) the adherence of improved quality on their members by certification or training. This means the acceptability and capacity for this chagen are starting to develop. But they also don't want to flood their members with new rules. So most likely, the best we can most likely hope for is the help of the associations by communicating to their members. To make it as likely as possible

they will do this, we will need to supply them with communication messages that they can use to forward to their members.

In the same spirit, the professional associaitions and manufacturers will be asked to promote/endorse the NEWCOM Competence Database as a tool to make nZEB craftsmenship visible. For example to connect the earned recognitions with their quality assurance protocols.

Furthermore, as a result from the workshops there are already some initiatives from some of the associations in connection with NEWCOM. For the roofers the possibilities for a collaboration will be explored with NDA and VEBIdak, especially on the guidelines that VEBIdak provides to roofers. If this turns out to be possible, it would be a great opportunity to implement the NEWCOM modules. A similar collaboration will be explored for the ventilation installers with TechniekNL[36] and the VLA[37].Together with these two large networks, the Dutch team will further explore the possibilities to strengthen the new recognition of design, installation and maintenance of ventilationsystems in houses and residential buildings.

The second opportunity shows that professional associations and manufacturers can work together on these issues and can support us in a similar way. Both can inform professionals in different parts of their job. This means we initially involve the manufacturers in a similar way as the associations: keep involving them in workhops and supply them with the right (communication) materials to increase their awereness and understanding. Most suppliers have an interest to have their systems properly implemented. If we give them awareness and acces to the right information (which includes the NEWCOM modules), hopefully their, already existing, incentives will drive them to implement this information and help us communicate to the professionals.

Professionals

Properly reaching the professionals will be the hardest to achieve during the project. Some professionals may see the problem we are trying to address in their day-to-day working life

[36] Branchorganization for HVAC installers.
[37] Branchorganization for manufacturers and suppliers of ventilation systems.

and will also acknowledge that it would be good to overcome these issues. But most of them are likely not aware of the opportunity the NEWCOM modules present to solve the problem, let alone the other factors which make a target group willing to change. If they are not aware of the opportunity, they will also not be aware of the information or have access to it. Incentive and acceptability are also difficult for professionals; they work in a conservative sector where capacity and resources are only sparsely directed to further education for improving the quality of the works. We will have to try to interest them and inform them about the benefits of further education and qualification. We will rely on our other target groups (training institutions, professional associations and manufacturers) to help us reach as many professionals as possible (ambassador approach). Ideally we would also involve the clients of the professionals, since they create the demand this can be a hugely influential target group. However, as mentioned in the previous chapter, we view this as outside of the possibilities of this project. Since we are not able to properly reach 'all' professionals directly, trying to include 'all' of their clients would be impossible with the time and resources we have. But this isn't to say we cannot do anything during the NEWCOM project to reach professionals. There is a number of strategies we can employ to get professionals informed and interested.

Firstly, is a two yearly trade fair in Februari, which is called the VSK. ISSO always has a general stand there. Informing all visistors about our projects and activities, fitting to the visitors interests, is one of the activities. Informing relevant parties about the NEWCOM modules has been taken up at the same time.

The BuildUpSkills app will be used as a promotional tool to offer short (free) e-learning courses to professionals. The App can also redirect these professionals to the different training providers that are registered in the App environment. This way we can generate interest and awereness for the NEWCOM modules and related trainings. In a second stage we can even use expanded e-learning courses as a timesaver. By delivering the theoretical information (or part of this information) of the course as e-learning in the BUS app, they will no longer need to treat these subjects in class or atleast not as much time, which potentially makes courses

shorter which means professionals will be back on the work floor quicker. This means following (more) trainings will become cheaper for professionals.

Furthermore, we can use a multitude of special interest professional journals to reach the different groups of professionals. For roofers these are Dakenraad and Dakweb and for ventilation installers these are Installatiezaken, VV+., Gawalo, Intech K&S and Henk & Fred. Most of these journals reserve space in each issue for submitted articles of other organizations. We can provide these journals with (about) the same communication materials as the professional associations and the manufacturers, but this time as articles for in their journals (or on their websites).

In the Netherlands we have special challenge concerning the building inspector. As mentioned in previous reports, we do not really have such a profession yet in the Netherlands. This means we will most likely have to work with multiple different target groups. At this point, we narrowed it down to the two groups, which are most likely to adopt the NEWCOM modules. These are the commissioners and the private quality controllers. Implementing the building inspector module with two kinds of professionals, means the work proces will be divided between the commissioner and the private quality controller. Each group is then responsible for a couple of main task fields. The commissioner gets involved in the project development and planning phase, while the private quality controller takes care of the execution phase, the handover and the operation. We have an important role to facilitate the communication between the different stakeholders (target groups) and assist with a clear division of roles. Thus, our focus should be to ensure that they can work together optimally. To achiev this we wil need close contact and cooperation with the different professional associations and training institutions.

Lastly, it would be a nice bonus if we could facilitate trial courses and share lessons from demonstration projects in cooperation with our partners. To be able to set up trial courses, we will need the help of the training institutions whom are already involved in the TtT programs. When we are nearing the end of the NEWCOM project, so at the start of or during the summer of 2020, these training instutions will hopefully be open to organize these trials together. We will work towards the needed cooperation to achieve this. In Heerhugowaard a consortium of

which TNO was a partner developed a demonstration building (“NeroZero”) to demonstrate and evaluate new ventilation concepts and total quality in residential buildings. This project will be upscaled to a 42-dwellings project whereby the first houses were sold in the end of 2019. Results from this project will be used to create further awareness and attractive user stories to inform professionals about the benefits of qualification.

In all these efforts, the Competence Database will be used as an incentive for professionals to follow the trial courses, e-learning or NEWCOM adapted trainingoffers, as to be able to show their new gained knowledge and skills. In the future we plan to add here micro-learning transactions, in order to reward small learning activities that where performed in order to keep knowledge and skills fresh and up-to-date. This will be done by connecting learning activities to subtasks (and related Unit of Learning Outcomes) in the competence database.

4.1.4.4 Monitoring and evaluation plan for developed strategies

Consolidation has mostly been addressed in the previous chapter. Overlap and aligned has been resolved by grouping the target groups from the different specialisations together in comprehensible groups with similar organizations. The organizations in each consolidated target group is in a similar current state/level of uptake and can be targeted with similar uptake strategies to improve this level.

Concering the monitoring and evaluation, for each target group we have planned a different evaluation moment to take stock of the progress. In February-March we have evaluated if the training institutions are involved enough through the suggested uptake strategies. If there is a reason to assume that the training instutions taking up the NEWCOM modules, we have made up adjustments accordingly.

Involvement of the professional associations and manufacturers have been evaluated in April-May. We addressed if they indeed support the NEWCOM project and undertake the necessary communication actions towards their members.

Since the professionals are the hardest to properly reach, the uptake strategies for these target groups are the ones that are the most pushed towards the end of the project. In May-June the amount of reached professionals for each specialism has been evaluated.

4.1.4.5 Implementation plan for developed strategies

Implementation for the Netherlands has extensively been summerized in paragraph 4.1.4.3. The complete implementation plan can be found in *Chapter 7: Appendix A*, paragraph *7.1.8 Dutch implementation plan*. This includes a full list of the entire broken down uptake strategies, with the respective stakeholders/target groups, which are relevant for the specific implementation strategy. Also, the moment or period for monitoring and evaluation is mentioned. And last but not least the implementation period and the consortiumpartner who is responsible for implementation of the strategy.

5 Exploitation on European level

The communication at national level took place by intensive direct involvement of the stakeholders. Mainly in collaboration and participation of educational institutions and policy makers, regarding the content and concept of trainings and database. At European level a different approach was chosen.

To achieve exploitation on European level, the approach need to be a little bit different. On the national level, it makes sense for the different stakeholdergroups to be able to actively use the key exploitable results from the NEWCOM project. Training institutions can use the educational tools and the database for their courses and registration. The national professional associations or manufacturers also have a more direct connection with professionals, maybe they even organise trainings or registration themselves. Which means they can mostly use the NEWCOM deliverables directly.

But European stakeholders will most likely not be direct users of the key exploitable results the (Competence database, and the nZEB traning modules) of the NEWCOM project.

Firstly, the actions already undertaken so far are summerized in chapter 5.1. Secondly, the strategies for European exploitation are described in chapter 5.2 with focus on the handled traning topics about ventilation, roofing and building inspection.

5.1 Undertaken actions 2018-2020

Before and during the project, the consortium identified stakeholders and platforms for communicating project's aims and outcomes in order to optimally exploit the results. These platforms include relevant conferences, websides and media (print or online). The objectives and results of NEWCOM were presented at many different events and conferences on national and uropean level by the members of the consortium.

At EU-Funding Event introducing EU-funded projects in cooperation with EMC-Construction SMEs Europe and UEAPME in November 2017 the first presentation of the project NEWCOM was provided for over 30 representatives of funded projects and the funding institutions. At BauZ! Conferences 2018 and 2020 the project objectives and developed training modules were presented to the broad public and experts in the field of sustainable buildings.

Image 2: The programme of the BauZ! Conference in Vienna 2018

The IEPPEC Conference (International Energy Policy & Programme Evaluation Conference) in Vienna 2018 became a platform to introduce the project goals to more than 50 experts in the energy efficiency sector around Europe.

At Future Urban Conference 2018 in Vienna NEWCOM was presented at the exhibition section of the conference.

At the BHÖ-Congress in Vienna 2019 under the title “Revitalisation and energy Efficiency in Europe” the project goals and actual results were introduced to more than 100 participants, mainly experts in renovation of heritage buildings.

At Build Up Skills exchange Meetings 2019 (Digital construction skills & selection of examples from EU-funded projects) in Barcelona and May 2020 (Renivation wave in Europe) as webmeeting due to the pandemic more than 100 experts received an overview on the

outcomes of the project and the importance of further training in contributing to increasing efficiency in the buildings of Europe.

At different EU-funded projects on education such as CraftEdu project meeting 2019 (Horizon 2020 program) in Austria, Sphere project 2019 (Horizon 2020 program) in Finland the sysnergies between outcomes of NEWCOM and the other European projects were examined.

Within the project workshop of “TABULA-Ukraine” in Kiev (February 2020) the importance of qualified construction professional was discussed with 60 representatives of ministries, municipalities, universities and energy experts.

Furthermore, there have been regular postings on the Build Up platform, relevant websites and social media to reach the Build Up community as well as the network of different stakeholdergroups (e.g. https://www.buildup.eu/en/news/newcom-competence-database and https://www.gezondebinnenlucht.nl/wonen/bij-keuken/afzuigkap/).

Images 3 and 4: Examples of social media activities

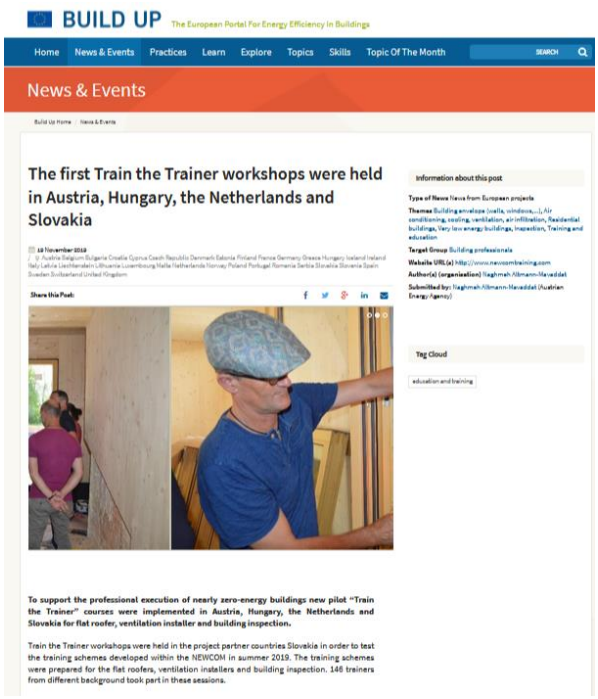

Image 5: Example of postings on Build Up platform

European stakeholders were informed also by article in May 2020 under the title "Strengthening the EU Building Sector through new qualification schemes" commisioned by EASME (https://ec.europa.eu/easme/en/news/strengthening-eu-building-sector-through-new-qualification-schemes).

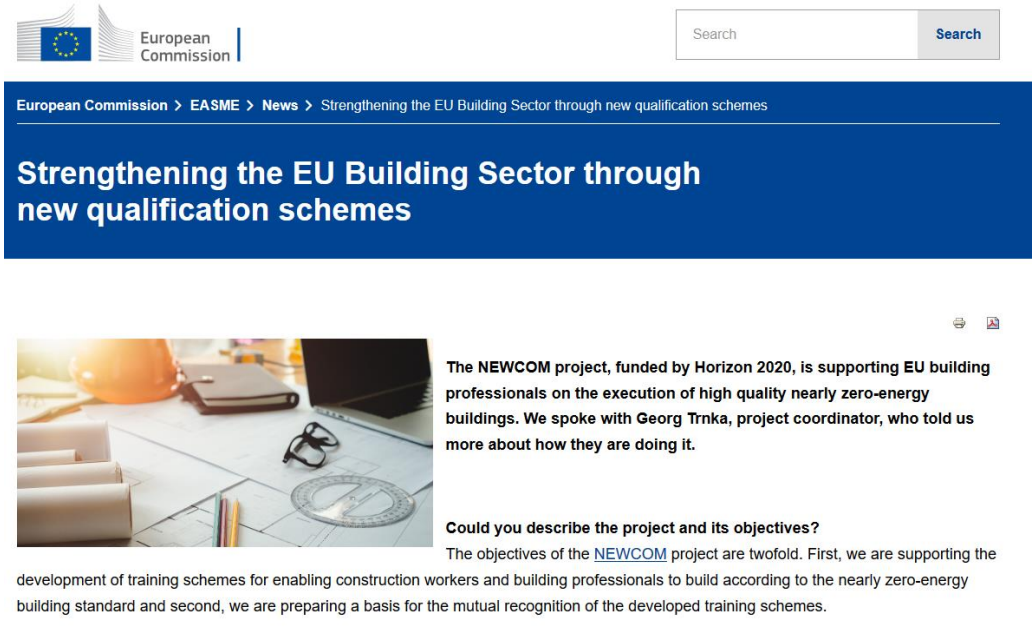

Image 6: Article by EASME in May 2020

Besides the communication in the form of conference presentations and articles, also some direct actions aimed directly aimed at specific European stakeholders have been undertaken. These, and the aforementioned communication actions, are summired in the actions table below.

Goal	Developed/actions
Awareness	Publication in relevant European Channels (Website, newsletter, etc).
Awareness	Ventilation: Presenting NEWCOM trainings in a workshop in Dublin focussed on NZEB buildings and ventilation, supported by the Air Infiltration and Ventilation Centre (EIA Annex V: AIVC). Paper and presentation in the 2019 AIVC Conference in Gent highlighting the developed NEWCOM trainings. Publication in the AIRBASE database of AIVC.
Engage	Contact and interest relevant European Associations and DG Grow.
Exploit	Preparing proposals for H2020 Construction Skills where the competence database and personal recognitions can be implemented in other EU memberstates: 1 granted during project duration BUSLeague 3 submitted & waiting for evaluation
Engage	Preperation in boardmeeting of 2020 of the Air Infiltration and Ventilation Centre (EIA Annex 5: AIVC) of a workshop in 2021 regarding novel airtightness methods, which are also included in the NEWCOM training methods and will be highlighted.
Cooperate	Connected with the Construction blueprint for sharing lessons learned.[38]
Awareness	Pro-active sharing of NEWCOM results with CA-EPBD and CA-RES.
Awareness	Presentations at events and conferences about the project objectives, training modules, progress and outcomes: **NEWCOM funding event** (2017), **BauZ!** (2018 and 2020), **IEPPEC Conference**

[38] http://constructionblueprint.eu/sectoral_skills_alliance/

Goal	Developed/actions
	(2020), **Future Urban Conference** (2018), **BHÖ-Congress** (2019), **BUS exchange Meetings** (2019 and 2020), **CraftEdu project meeting** (2019), **"TABULA-Ukraine" workshop** (2020).

5.2 Strategies and target groups

On top of the actions already undertaken, the strategies and target groups (stakeholders) were identified. Most of these have been or will be executed in the last year of the NEWCOM project, or after the project is finished. Most of the strategies on European level are, same as the already undertaken actions, focused on awareness amongst European stakeholders. This can be done by sharing the results, informing them about the outcomes, involve them in Competence Database Registration or by organizing workshops to teach them about the NEWCOM key exploitable results. By providing these stakeholders with information about the key exploitable results of NEWCOM, the goal is that they in turn will use their reach and channels to spread the information. This way the awareness and impact of NEWCOM is increased.

For each focus specialization (ventilation, roofing and building inspection) of the NEWCOM project, the main strategies and actions still to be implemented, are discussed in a separate paragraph. In the last paragraph of this chapter, all strategies and identified stakeholders for the European level are listed in two tables.

5.2.1 Ventilation

Concerning ventilation, TNO will be in the lead for directly involving specific European stakeholders. This is mostly focused on informing the relevant organizations, but in some cases also includes a more in depth explanation of the NEWCOM results and how these can be used. Several actions have been undertaken to give attention towards the training developed in NEWCOM.

In March 2019 a presentation has been given highlighting the NEWCOM training in Dublin. This presentation was for a group of professionals on quality of ventilation. The initiative was supported by the Air Infiltration and Ventilation Centre (EIA ANNEX 5: AIVC).

During the 2019 AIVC conference in Gent, a paper and an oral presentation were presented. Both of these highlighted the performance of ventilation and the need for training as developed in the NEWCOM project. The paper will be published on the AIVC website and AIVC AIRBASE database.

In the 2020 boardmeeting of the AIVC, a workshop is being prepared for 2021. In this workshop the novel airtightness methodes will be presented, which are also adapted in the new trainingmoduls of the NEWCOM project. TNO is aiming at a presentation spot at this boardmeeting, since it will be an excellent opportunity to raise extra attention towards the trainings developed in the NEWCOM project.

5.2.2 Roofing

ÉMI is the consortiumpartner who is at the front of promoting the exploitable results for roofing in the Eurepean playingfield. These efforts rely largy on cooperation with the IFD (International Federation for Roofing Trade), which has an IFD Working Group on Impermeability and Moisture Monitoring in Flat Roof Systems. Furthermore, ÉMI is part of the working group through the ÉMI membership of the Hungarian Roofing Federation (ÉMSZ), which is a full member of IFD.

Furthermore, there are strong Austrian representation in the working group as Gerhard Freisinger (Austrian Roofing Federation) and Wolfgang Hübner (IFB- Institut für Flachdachbau und Bauwerksabdichtung). The working group is developing the second part of the IFD guideline for design and installation of impermeability and moisture monitoring systems. These guidelines deal with the existing systems and its main characteristics. The working group met in 2020 three times so far (28 May , 28 July and 15 September). The working group gives new information for the intelligent monitoring systems module of the flat roof training programme, and gives opportunity to share the experiences of the trainings with the WG members and

influence the content of the guideline. The working group will continue functioning in the near future, this gives a good opportunity to exchange views and influence the development of the guideline dealing with the installation of the moisture monitoring a leakage detection systems, due in 2022.

The IFD commission of waterproofing (Flat roof and waterproofing on Structures), is working on the new guideline focused on the relevant issues about PV installation, threshold solutions at renovation projects and the correction of the inaccurate slope. ÉMI is part of the working group through the ÉMI membership of the Hungarian Roofing Federation (ÉMSZ) which is a full member of IFD. The commission met in 26 of May 2020 and 29 of July 2020. At the first meeting of this waterproofing comission, the NEWCOM training materials on roofing were discussed and its contents summarized. The commissions work, gives a unique opportunity to influence the content with the experiences and feedbacks of the NEWCOM trainings, and also to gain new ideas for the training materials. The guideline is due in 2021.[39]

5.2.3 Building inspection

For building inspection links wil be made to REVHA, in order to address and share the results of the NEWCOM project on Building inspection to their members and on PROF/TRAC. This with a focus on guaranteeing quality by making use of commissioning. The Dutch implementation by the DBCA will be presented as a frontrunner example. In this implementation the NEWCOM modules on building inspection are added as focussed training supply for commissioners in order to keep their personal cerficate as commissioner ‘fresh’.

[39] IFD Guidelines for the Design and Installation of Impermeability and Moisture Monitoring Systems - www.idf-roofs.com

5.2.4 Implementation plan for strategies and stakeholders

Target group	Uptake strategy	Uptake point (from-till date)	Responsible partner
Ventilation Professionals, ventilation manufacturers, and ventilation associations	• Workshop in 2021 regarding novel airtightness methods, which are also included in the NEWCOM training methods and will be highlighted organized by theAir Infiltration and Ventilation Centre (EIA Annex 5: AIVC) TNO will be presenter and highlight the NEWCOM trainings.	2021	TNO
EU-wide	• Article(s) on BUILD UP	2020	AEA & ISSO
Construction sector	• Exploring further cooperation with Construction Blueprint project, this through H2020 BUSLeague	2020-2021	ISSO
Roofing	• Implement NEWCOM results in the IFD working groups and their guidelines	2020-2021	ÉMI
Building inspectors	• Sharing NEWCOM outcomes with REVHA for dissemination to their members (all over Europe)	2020-2021	ISSO

Table of identified stakeholders at EU-level that are informed about the project results:

Category	Stakeholder group	Goal	Stakeholder
Flat roofing	Flat roofing and water proofing	Register companies/ professionals	IFB
	Green roof	Register companies/ professionals	European Federation Green Roofs & Walls
	Solar systems	Register companies/ professionals, Trainings, to get in touch with the EU federation	Federal Association Photovoltaic Austria
	Construction	Provide information	European Construction Industry Federation (FIEC)
		Provide information	European Federation of Building and Woodworkers (EFBWW)
	Contractors	Provide information	Confederation of International Contractors' Associations
Ventilation installing	Building services engineers	Register companies / professionals	Federation of European HVAC Associations (REHVA)
Building inspection	Housing associations	Provide information	Housing Europe
	EU-Chamber of architects and engineers	Provide information	Architects' Council of Europe
	European Construction Technology Platform (ECTP-E2BA)		

Category	Stakeholder group	Goal	Stakeholder
	European Housing Forum (EHF)	Inform stakeholders	Housing Europe, RICS
General information	CA EPBD	Inform stakeholders	Policy makers/ consultants
	Further education institutions	Inform stakeholders	Europäisches Zentrum für die Förderung der Berufsbildung (cedefop)
		Inform stakeholders	European training foundation (ETF)
	Mutual recognition	Inform stakeholders	Directorate General for Internal Market, Industry, Entrepreneurship and SMEs
	H-2020 projects	Further development & expand outcomes	BUSLeague
		Create synergies	CraftEdu
		Create synergies	IngREeS
		Create synergies	Train-to-NZEB
		Create synergies	Fit-to-NZEB
		Create synergies	StavEdu
	Div. Federations	Inform stakeholders	European Alliance of Companies for Energy Efficiency in Buildings

6 General conclusion and further perspectives

The most important goal of this report was to get a clear picture of the different stakeholders (target groups) and the needed strategies to involve these stakeholders into the NEWCOM project. Implementation of the strategies was also part of the project execution. This chapter will iterate the most important take-aways of Chapter 4 and Chapter 5 on a general level. Secondly, a first perspective for further exploitation is outlined.

To develop strategies for uptake or exploitation of the NEWCOM results, a lot of different stakeholders had to be taken into account. This was of course the case for the different countries of each consortium partner; each partner had to involve different organizations for their national strategies. But each country also had to keep the variety of stakeholders in mind. Each stakeholder group is involved in a different way in upskilling professionals and with another level of involvement and interest for doing so.

The most obvious stakeholder group are of course the training institutions and vocational schools, which are directly involved in educating and training (NZEB) professionals in the building and installation branches. These institutions and their trainers were involved into the developed training materials through workshops, face-to-face meetings and Train the Trainer sessions. These different kind of awareness-meetings were also really useful to test the content en receive feedback on it. Overall, these training sessions went really well. Training institutions responded positive about what they had learned and about the tools that were handed to them. For some countries, it was possible to involve influential national stakeholders whom were able to promote the usage of the NEWCOM training materials. In the case of Austria, some examples are: the IFB for flat roofing and the ARGE EBA for building inspection and local governments for all modules. For Hungary a couple of examples are: Hungarian Roofing Association and TECTUM for roofing, the TRAINBUD Sustainable Construction Skills Alliance for ventilation and Budapest University of Technology and Economics for building inspection. Slovakia made use of the partners and networks of other Horizon 2020

programmes like StavEdu and ingREeS to implement the training materials. In the Netherlands, no such overarching stakeholders existing, this was compensated by individually involve 10 to 15 training institutions, each active on one more multiple of the three specialisms

One of the more interesting strategies about getting the training materials implemented at the training institutions was to not develop completely new standalone trainings, but offer NEWCOM training modules as addition or adaptation for existing trainings. The involved educational partners will be kept informed and assisted in their usage of the NEWCOM training modules, even after the project is finished. Furthermore, the training materials will be further developed in the near future.

Leading manufacturers were also identified as an important stakeholder group in all partner countries. In face-to-face meetings, workshops and conferences, these manufacturers confirmed the problems in the sector, which NEWCOM tries to solve. In many cases, representatives were not only informed through personal contact, but also attended the Train the Trainer sessions. Support and promotion by the manufacturers of the NEWCOM modules and the Competence Database was considered as one of the key elements. This is why they were involved and will kept being informed.

Where possible, national and regional government, national authorities and professional associations were also informed or involved. In most cases these stakeholder groups had more distance from the actual implementation of the NEWCOM materials, but they all had a certain level of interest in the topic. Through conferences, meetings and news items these target groups have been informed about the NEWCOM training materials and the Competence Database. In general, the feedback, as far as received, was positive. In the same sense, certification institutes are important to give lasting value to the Competence Database. For instance by using it as a tool to check available competences at a company for certification. The certification institutes will not directly use the database at first, the purpose is to persuade them to lend their support to the database and implement the Competence Database into their work process. The goal regarding these target groups is to keep them informed and to try to get them to use their channels and influence to in turn spread the information to their partners,

members and followers and endorse usage of the training materials and the Competence Database.

Exploitation of the Competence Database proved a bit more difficult than was the case with the training materials. Some organizations proved to be willing to use the database to make their competences visible, like the netEB network in Austria, while in Slovakia the different competent authorities are the most important stakeholder for the success of the database. Nevertheless, in each country there were also obstacles for implementation. In Austria, companies fear they might lose their employees to competitors if their competences can be find publicly online. In the Netherlands an existing Central Database for Technology with a much broader scope than NZEB, is already under development. If the NEWCOM Competence Database has any hope for success in the Netherlands, lasting cooperation with this central registry is highly essential. According to this feedback, changes were made in the structure and usage of the database. This should take away some of the concerns, but the promotion of the competence database will have to continue to get these target groups onboard.

The larger stakeholder groups like the professionals, construction companies and building owners were hardest to reach. During the project, general information was prepared to create awareness on the NEWCOM topics amongst these target groups. For the most part these groups were not actively involved during the project, apart from providing information during events and conferences. Communication directed at these target groups will continue after the project is finished.

Exploitation on a European level has mostly been focused on awareness and communication. To achieve this, plenty of conference presentations and news articles have been presented. The main goal was of course to stimulate the dissemination of the NEWCOM results. However, this is not all that has been or will be done. The different consortium partners aim to involve specific international stakeholders for the sector in which their respective networks are developed the best. TNO has the lead in presenting the NEWCOM results for ventilation in multiple meetings (workshops, conferences, etc.) with the AIVC. ÉMI will do the same for the international roofing stakeholders, through their membership of the IFD to get the NEWCOM results implemented in their guidelines. ISSO will share the NEWCOM outcomes with REVHA

for dissemination to their members. Keeping these and other international stakeholders informed, will be an important goal for the near future.

In general can be concluded, that a multitude of stakeholders have been informed, involved or contacted about the NEWCOM results. This will certainly help the acceptance and adoption of the training materials and the competence database created in the NEWCOM project. However, these stakeholders will need to be kept informed and in some cases continued support with their usage of the NEWCOM materials. Only then, we can be sure of any lasting impact of the knowledge and tools, which have been created and this is exactly what the consortiumpartners are aiming for the next couple of months.

7 Appendix A: activity tables

7.1 Explotation on national level

7.1.1 Austrian activity plan

Target group	Achievable activities/tools	Uptake point (from-till date)	During project (Yes/No)
Construction companies	• Meetings • Events	After Database implementation until August 2020	Yes
Educational institutions	• Events • Newsletter • Meetings	After Database implementation until August 2020	Yes (and after project is finished)
Energy experts	• Events	After Database implementation until August 2020	Yes
Building owners and managers	• Exhibitions and fairs	In Jan. or Feb. 2020	Yes
Klimaaktiv network	• Newsletter • Events	After Database implementation until August 2020	Yes (and after project is finished)
Municipalities	• Newsletter • Events	After Database implementation until August 2020	Yes
Blue-collar workers and building professionals	• Newsletter • Events	After Database implementation until August 2020	Yes

7.1.2 Austrian implementation plan

NEWCOM Competence Database implementation for flat roofing

Responsibility level	Responsibilities	National stakeholders	Project partner
Federal/state (patronage)	National patronage of the database or official nomination of the organization for lead operation	Federal ministry (klimaaktiv database)	AEA
Operational organisations	Responsible for the quality and topicality of the entries in the database Support of further education institutions in the development of a suitable presentation of competences for their further education Support of training providers in the introduction of new training modules or certifications into the database	Building academies and quality groups	17&4, AEA (ISSO)
Training providers	Registration of personal data of graduates in the database Confirmation of the competence of the graduate	Building academies and quality groups	17&4
Professional	Consent to the processing of his personal data **OR** Direct entry of his personal data into the database		

NEWCOM Competence Database implementation for building inspection

Responsibility level	Responsibilities	National stakeholders	Project partner
Federal/state (patronage)	National patronage of the database or official nomination of the organization for lead operation	State Styria	EAST
Operational organisations	Responsible for the quality and topicality of the entries in the database Support of further education institutions in the development of a suitable presentation of competences for their further education Support of training providers in the introduction of new training modules or certifications into the database	ARGE eba	EAST, AEA (ISSO)
Training providers	Registration of personal data of graduates in the database Confirmation of the competence of the graduate	ARGE eba	EAST
Professional	Consent to the processing of his personal data **OR** Direct entry of his personal data into the database	Energy expert/advisor	EAST

Further implementation of the developed further education modules for flat roofing and building inspection:

Segmented/ prioritized target group/person	Uptake strategy	M&E	Responsible project partner
IFB	Implementation and Certification of the courses [KER1]	Direct contact with IFB by AT-partner 17&4 and evaluation of the implemented courses	17&4
ARGE-EBA/netEB	Implementation of the schemes and modules and the database [KER2]	Register the trainees for the: database of the province of Styria (netEB) and for the NEWCOM database. Implement the developed modules in existing courses (A and F-Kurs).	EASt
Market	Direct contact with educational institutions and with klimaaktiv management. Dissemination	Markt observation of the training programs and courses offered by training institutions	AEA, EASt, 17&4

7.1.3 Hungarian activity plan

Target group	Achievable activities/tools	Uptake point (from-till date)	During project (Yes/No)
Flat roofers[40]	• Integrate nZEB related modules developed within NEWCOM into trainings organized by companies.	Jun 2020-April 2020	Yes
Ventilation installers	• Integrate nZEB related modules developed within NEWCOM into trainings organized by companies and vocational schools.	Jan 2020 – Jun 2020	Yes
Building inspectors	• Discussions with BME and integrate content in their program	Sept 2019-Aug 2020	Yes
Trading and manufacturer companies[41]	• Integrate nZEB related modules developed within NEWCOM into their own trainings.	Sept 2019-Aug 2020	Yes
Vocational schools	• Possible Integrating ULOs into existing nZEB related trainings (mainly into the curricula of training institutions participated in TRAINBUD (BUS pillar I. Hungary)	Sept 2019-Aug 2020	Yes
Ventilation training institutions[42]	• Possible Integrating ULOs into existing nZEB related trainings	Sept 2019-Aug 2020	Yes
Roofing training institutions[43]	• Possible Integrating ULOs into existing nZEB related trainings	Sept 2019-Aug 2020	Yes
BME[44]	• Possible Integrating ULOs into existing nZEB related trainings	Sept 2019-Aug 2020	Yes
Hungarian Roofing federation	• Stakeholder meetings: strategic partner to promote the different tools	Sept 2019-Aug 2020	Yes

[40] PREFA Hungary Ltd., BRAMAC, TECTUM Ltd. , SIKA, MAPEI, BAUDER.
[41] AERECO, DAIKIN
[42] ROSENBERG.
[43] PREFA Hungary Ltd, BRAMAC, TECTUM Ltd, SIKA, MAPEI, BAUDER.
[44] Budapest University of Technology and Economics – Engineer Further Training Institution (BME Mérnöktovábbképző Intézet)

7.1.4 Hungarian implementation plan

Segmented/prioritized target group/person	Uptake strategy	M&E	Implementation (Who, When, Costs)
Roofing companies	Materials can be used in company trainings. According to discussions relevant modules will be shared with them. [KER2]	Number of craftsmen reached	Companies on their own cost within their regular trainings (results/feedback) will be shared with ÉMI
Ventilation companies	Materials can be used in company trainings. According to discussions relevant modules will be shared with them. [KER2]	Number of craftsmen reached	Companies on their own cost within their regular trainings (results/feedback) will be shared with ÉMI
BME[45], Hungarian Chamber of Engineers.	Moduls can be integrated into existing training. [KER2]	Number of craftsmen reached	BME on their own cost within their regular trainings (results/feedback) will be shared with ÉMI

[45] Budapest University of Technology and Economics – Engineer Further Training Institution (BME Mérnöktovábbképző Intézet)

7.1.5 Slovak activity plan

Target group	Achievable activities/tools	Uptake point (from-till date)	During project (Yes/No)
Craftsmen	• Recognition of prior learning through certification; • Training for craftsmen (as per implementation plan);	2020-2021	Partially
Training and education institutions[46]	• Implementing the certification schemes; • Implementing training programme for craftsmen.	2020-2021	Partially
Competent Authorities, Sector Skills Council	• Update of relevant qualification standards – proposal.	2019-2020	Yes
Professional associations and guilds, employers association in the construction sector	• Implementing the certification schemes; • Implementing training programme for craftsmen.	2021-	No

[46] Stredná odborná škola stavebná, Nitra, Innovia, s.r.o., Stavoinvesta Dunajská Streda, s.r.o., Ipeľské tehelne, a.s., STU BA, Stavebná fakulta, Slovenergookno, n.o., SCHIEDEL Slovensko, s.r.o, STRABAG Pozemné a inžinierske staviteľstvo, s.r.o., Chemostav, a.s., Stredná odborná škola stavebná – ÉszKI, Cech strechárov Slovenska, Kerkotherm, a.s., STU BA, Stavebná fakulta, IMOS – Systemair, a.s., HERZ, spol. S.r.o., Ústav vzdelávania a služieb, s.r.o., VIEGA, s.r.o., ZEUS PB, s.r.o., Beztech, s.r.o., TERRASTROJ spol. S.r.o., KUHN – SLOVAKIA, s.r.o., MTS – com, s.r.o.

7.1.6 Slovak implementation plan

Segmented/prioritized target group/person	Uptake strategy	M&E	Implementation (Who, When, Costs)
Craftsmen	Raising awareness using employers' organisations and their networks of operators, Including SMEs: guilds affiliating craftsmen and their networks, networks of members of the National Qualification Platform;	Number of craftsmen reached	ViaEuropa, February to August 2020
Managers, marketing specialists in the training and education organisations and vocational schools	Implementation of the certification schemes and programmes to be discussed and agreed during NEWCOM training of trainers, workshop, Sector Skills Council meetings; ZSPS internal meetings [KER1] & [KER2]	Number of certification schemes implemented/ updated	ViaEuropa, March 2020
Managers, marketing specialists in the training and education organisations, Education professionals, Sector Skills Council	Raising awareness by organising project open days and presentation on 2020 Coneco/ Racioenergia International Fair, deliver presentation at Sector Skills Council	Number of targeted persons participating in the events	ViaEuropa in cooperation with UVS, December 2019 to March 2020
Stakeholders throughout the value chains for construction of new nZEB and energy renovation of existing buildings	Raising awareness at ZSPS General Assembly	Number of participants in the event	ZSPS, March 2020

Competence Database implementation for flat roofing and ventilation installer

Responsibility level	Responsibilities	National stakeholders	Project partner
Federal/state (patronage)	There is no responsibility in official capacity at national level. The government and/or agencies do not intervene in private initiatives as NEWCOM database.	N/A	N/A
Operational organisations	Support to further education and training institutes and recognition providers in developing suitable presentation of competences for their further education	Association of Construction Entrepreneurs of Slovakia, UVS – training institute	ViaEuropa
Training providers	• Registration of personal data of graduates in the database • Confirmation of the competence of the graduates	UVS – training institute	ViaEuropa

Competence Database implementation for building inspectors

Responsibility level	Responsibilities	National stakeholders	Project partner
Federal/state (patronage)	There is no such profession/function in Slovakia. Only regulated professions can be included in a formal system of recognition.	N/A	N/A
Operational organisations	Support to further education and training institutes and recognition providers in developing suitable presentation of competences for their further education activities to support competences linked to quality of the construction works and services	Association of Construction Entrepreneurs of Slovakia, UVS – training institute	ViaEuropa
Training providers	Use of unauthorised professional title like “Building Inspector” is not permitted in Slovakia.	N/A	N/A

7.1.7 Dutch activity plan

Target group	Achievable activities/tools	Uptake point (from-till date)	During project
Inspection training institutions[47]	• Follow up TtT workshops • Implementation sessions	Nov '19 – Nov '20	Yes
EPA training institutions		After Project	No
Ventilation training institutions[48]	• Follow up TtT workshops • Implementation sessions	Nov '19 – Nov '20	Yes
Roofing training institutions[49]	• Follow up TtT workshops • Implementation sessions	Nov '19 – Nov '20	Yes
Roofing manufacturers[50]		After Project	No
Ventilation manufacturers[51]	• Stakeholder meetings • Follow up TtT workshops • Communication to professional	Nov '19 – Nov '20	Yes
Roofing professional associations[52]	• Follow up TtT workshops • Communication to professional	Nov '19 – Nov '20	Yes
Ventilation professional associations [53]	• Follow up TtT workshops • Communication to professional	Nov '19 – Nov '20	Yes
Quality assurance professional associations [54]		After Project	No
Housing cooperation companies		After Project	No
Energy advisors		After Project	No

[47] TVVL (commissioning), ZiN Groep/Wabo & Kwaliteitsborging (private quality control), KIK-Campus (private quality control). Secundary: PAO Techniek en Management, BOB opleidingen, Berghouser Pont Academy, Envire, BNA Academie, Bouwforum and HabiTask
[48] ROVC, VET providers (ROC Tilburg, ROC Friese Poort, InstallatieWerk).
[49] Tectum, BDA opleidingen, Bouwradius.
[50] Solatube.
[51] Brink Climate Systems, Zehnder, Ihto Daalderop, Technische Unie, Rensa.
[52] VEBIdak, NDA (Nederlandse Dakdekkers Associatie).
[53] VLA, TechniekNL
[54] Dakmerk, DIAC dakadvies (daughter organization of NDA).

Target group	Achievable activities/tools	Uptake point (from-till date)	During project
Building commissioners	• Communication through partners. • Trial trainings. • BUS app promotion.	March – Nov	Yes
Private quality assurers	• Communication through partners. • Trial trainings. • BUS app promotion.	March – Nov	Yes???
Roofers	• Communication through partners. • Trial trainings. • BUS app promotion. • Special interest magazines.[55]	March – Nov	Yes
Ventilation professionals	• Communication through partners. • Trial trainings & e-learning. • BUS app promotion. • Special interest magazines.[56]	March - Nov	Yes
Clients[57]		After Project	No
Contractors[58]		After project	No
Strategic stakeholders[59]		After Project	No

[55] Dakenraad (https://www.dakenraad.nl/) and Dakweb (http://www.dakweb.nl/).
[56] Installatiezaken, Gawalo, Intech K&S and Henk & Fred
[57] Building owners, developers, investors, government institutions.
[58] Site manager, general contractor, construction companies, architects.
[59] Governmental institutions (RVO.nl), municipalities, NGO's.

7.1.8 Dutch implementation plan

Segmented/prioritized target group/person	Uptake strategy	M&E	Implementation (Who, When)
All target groups	VSK fair (incl ATT-tester introduction & award)	Done	ISSO & TNO Feb
Training institutions, P.A.'s, Manufacturers	Follow-up TtT on Ventilation, Roofing and Building Inspection [KER2 new materials]	Done	ISSO & TNO June
Training institutions on Ventilation , Roofing and Building Inspection	Individual assistance/knowledge providing [KER2 consultancy]	Done	TNO & ISSO Nov-Aug
Training institutions TVVL & Klimapedia	NEWCOM BI in post HBO quality assurance course [KER2 consultancy]	Done	ISSO April
TVVL	NEWCOM BI in commissioning course [KER2 consultancy]	Done	ISSO January
ZiN, Wabo (follow-up)	NEWCOM BI in quality assurance course [KER2 consultancy]	Cancelled	ISSO May
KIK-Campus (follow-up)	NEWCOM BI in scan for quality assurers [KER2 consultancy]	Done in BIMplement QA	ISSO March
12Skills	NEWCOM Ventilation in gamified learning [KER2 new materials]	Sept-Nov '20	ISSO & TNO June
Tectum	TtT as summerschool course [KER2 TtT]	Done	ISSO Summer 2019
InstallatieWerk VLA, Eltag	NEWCOM Ventilation in new practice environment [KER2 new materials]	Done	TNO & ISSO Sept
InstallatieWerk, VLA, Eftag	NEWCOM Ventilation in new ventilation courses [KER2 new materials]	Done	TNO & ISSO September 2020
VEBIdak	Stakeholder dialogue NEWCOM roofing in VEBIdak roofing guidelines [KER2 consultancy]	Done	ISSO June

Segmented/prioritized target group/person	Uptake strategy	M&E	Implementation (Who, When)
TechniekNL, VLA	Stakeholder dialogue Improve recognition of quality of works on ventilation [KER1 awareness]	Done	ISSO & TNO June
Professionals	Make use of stakeholder networks (incl Linkedin)	Discussing progress at bi-monthly national team meetings	TNO & ISSO March-Aug
Professionals	BUS-app as promotional tool (and as timesaver) incl update of ventilation e-learning starter [KER1 cross-selling]	Discussing progress at bi-monthly national team meetings	ISSO & TNO March-Aug
Professionals	Interest professional journals for publishing articles	Discussing progress at bi-monthly national team meetings	TNO Jan-Aug
Professionals & broader public	National web-event together with National project SecureVent	Done	TNO & ISSO

8 Literature

BUILD UP Skills Technical working group 4 Market acceptance (incl. marketing and communication)

BUILD UP Skills Technical working group 1 Finance (sustainability)

BUILD Up Skills: Evaluation of the BUILD UP Skills initiative under the Intelligent Energy Europe Programme, Final Report

BUSNL Roadmap

E.g. Buildings: Sustainable and energy-saving heating, cooling, construction and refurbishment", contents of the former lighthouse 11 of mission#2030, Austrian climate protection document for 2030.

E.g. Croatia, BUILD UP Skills Technical working group 4 Market acceptance (incl. marketing and communication)

E.g. Lithuania, BUILD UP Skills Technical working group 4 Market acceptance (incl. marketing and communication)

Evaluation of building projects under the Intelligent Energy Europe II Programme Final Report

HERON Working paper

Kane-Potaka, J., How to Develop Uptake Strategies as part of research projects (2009)

PROF/TRAC Roadmap

ABOUT NEWCOM

NEWCOM sets up large-scale professional qualification and certification schemes for of blue-collar workers and building professionals. The special focus is on the mutual recognition between different European Member States. These schemes will enable the building workforce to be qualified for the construction, renovation and inspection of the nearly zero-energy buildings 2020.

www.newcomtraining.com

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