



European
Commission

CORDIS Results Pack on **construction skills**

A thematic collection of innovative EU-funded research results

December 2019



**Equipping building professionals
with new skills to achieve
European energy targets**

Research and
Innovation

**SECOND
EDITION**

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Editorial

Equipping building professionals with new skills to achieve European energy targets

Through its BUILD UP Skills initiative, the EU aims to equip the next generation of construction sector workers – from on-site workers to design professionals and senior management – with the skills and knowledge needed to ensure building and renovation projects meet stringent energy-efficiency requirements. This updated CORDIS Results Pack presents EU-funded projects that have designed and implemented impressive upskilling programmes to turn this ambition into a viable reality across Europe.

The building sector offers a large untapped potential for cost-effective energy savings. Nearly zero-energy building (NZEB) standards become a mandatory requirement in Europe as from 2020. The most challenging aspect of reducing energy use in the building sector lies in increasing the rate, quality and effectiveness of building renovation, since the current rate of renovation is only 1.2% per year.

One significant barrier that hampers the development of NZEBs and effective renovations is the lack of adequate construction skills. Improving the skills of middle- and senior-level building professionals as well as the various trade professionals in the area of sustainable energy-efficient construction is therefore of key importance.

Showcasing the BUILD UP Skills initiative

Against this background, the EU launched the BUILD UP Skills initiative in 2011. It aimed to increase the number of qualified trade professionals by developing national qualification platforms and roadmaps, and providing training in the field of energy efficiency and renewable energy in buildings. The scope of the initiative has been expanded to other building professionals under Horizon 2020, with projects developing multi-country qualification and training schemes.

Upskilling towards energy efficiency and sustainable energy should be done throughout the entire value chain of the buildings sector (including designers, architects, engineers, building managers, technicians, installers, workers and apprentices).

All of these professions also need to be aware of new and upcoming challenges relating to nearly zero-energy buildings. These include new materials and products, the integration of renewable energy sources, new systems or processes, such as standardisation and common voluntary certification of buildings, and the use of building information modelling (BIM) tools.

Upgrading or setting up large-scale qualification and training schemes in these areas goes hand-in-hand with initiatives that increase the demand for skilled building professionals, creating new job opportunities and boosting Europe's economic competitiveness.

An updated and expanded Results Pack

This Results Pack focuses on 11 EU-funded projects based across Europe that have driven forward the BUILD UP Skills initiative.

New skills certification system for a BIM-savvy construction sector

To help prepare the architecture, engineering and construction sector for the double challenge of energy efficiency and digitalisation, the BIMcert e-learning platform puts the spotlight on building information modelling as an enabling tool to support the decarbonisation of buildings across their whole life-cycle.

Zero-energy buildings are hoped to become the norm by 2050 – with building information modelling (BIM) as a key enabler. However, while the train towards an energy-efficient Europe is already in motion, a large share of the architecture, engineering and construction (AEC) sector is

still trying to catch up. The problems they face? A lack of competences in sustainable construction; the slow uptake of digital construction skills; the absence of standards; and individual barriers such as a lack of motivation, time and money.



“BIM is becoming the backbone of a new, informed way of working in the construction sector. It can model energy consumption throughout a building’s life cycle and provide empowering tools for operators to work together,” says Paul McCormack, Innovation Manager at Belfast Metropolitan College and coordinator of



The most important outcome at the end of the project will be a construction sector workforce skilled at improving the sustainability of buildings.

the BIMcert project. “But while its potential is enormous, the use of BIM is still in its infancy. It varies from region to region and with the size of enterprises.”

McCormack knows this for a fact. Thanks to a survey capturing a total of 550 responses from both individual professionals and industry, the BIMcert consortium has found that 29% of compa-

nies believe that disappointing BIM adoption is due to a lack of knowledge. Another 38% attribute it to budgetary issues, and the same percentage to a lack of support among employees.

BIMcert tackles all three problems at once, with a comprehensive, easily accessible training and qualification platform aiming to level the playing field.

“We have developed training packages that, instead of a lengthy and rigid multi-module accreditation process, follow a digital micro-accreditation process. Such bite-sized micro-accreditation allows learners to follow their own learning path rather than a prescribed standardised journey,” McCormack explains.

An unexpected journey

The journey itself is quite different from usual training schemes. A key innovation lies in personalisation: the system automatically adapts to the experience of learning professionals to get them familiar with new BIM tools and related digital technologies. Comparisons between the various tools and technologies are also provided, emphasising their benefits at both individual and industry level.

Different modules exist for different participants (owners, facility managers, etc.) and different construction activities (new or renovated buildings). The project team has also devised specific content for public administrators and investors: “Their own upskilling will push industry stakeholders to engage in professional

development and implementation of digital and sustainable energy skills,” McCormack enthuses.

A digital CV

At the end of the learning process, the platform establishes a student profile listing newly-acquired skills. Users can compile their own digital CV (a BIM Skills Passport) and, thanks to the project’s third-party certification, can easily have their skills acknowledged anywhere in Europe. Such standardisation is expected to increase demand for BIM skills while ensuring that companies and workforces have enough incentives to invest in upskilling and professional development.

The consortium is now focusing on its commercial exploitation plan and has formed the BIMalliance to provide digital solutions, skills and training to the construction sector. “The most important outcome will be a construction sector workforce skilled at improving the sustainability of buildings. This is essential, as 70% of construction companies believe that those who do not adopt digital tools will go out of business,” McCormack concludes.

BIMcert will not only allow them to compete in a new construction environment driven by sustainability, it will also reaffirm BIM’s status as the most effective technology for a lower carbon footprint and increased energy efficiency in the construction sector.

PROJECT

BIMcert – 1. Construction skills, 2. Energy efficiency, 3. Regulating supply chains, 4. Tackling climate change

COORDINATED BY

Belfast Metropolitan College in the United Kingdom

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/785155

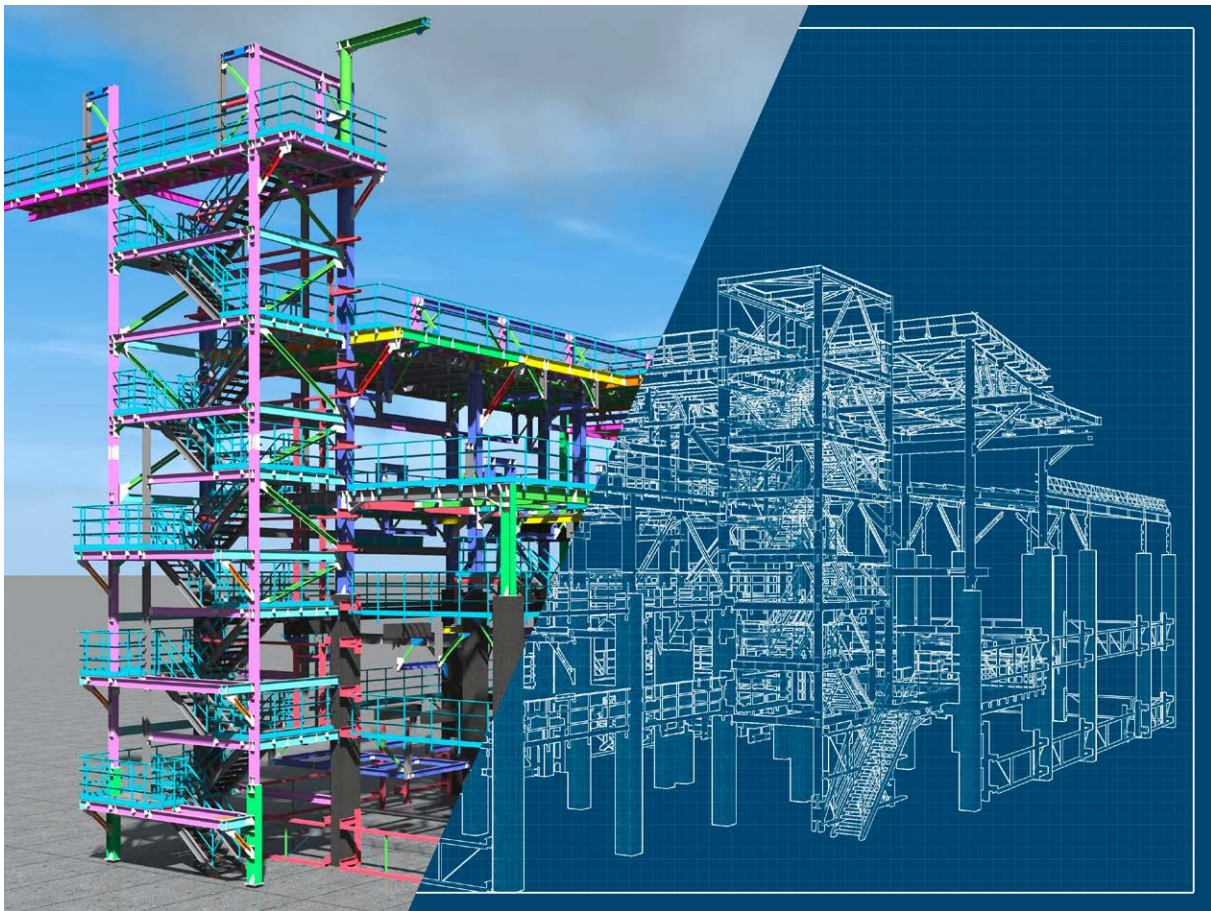
PROJECT WEBSITE

energybimcert.eu



Tailored BIM training for construction professionals

Looking for a training session in building information modelling that specifically meets your needs? The BIMEET project provides a first-of-its-type repository where construction and training professionals can find each other.



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As digitalisation and climate change collide, unmissable opportunities arise for the construction industry. Building information modelling (BIM) is one of these. By allowing stakeholders to collaboratively generate and manage building-related data across their entire life cycle, it can help the EU meet its targets for future energy consumption and carbon emissions.

This is where reality kicks in. The EU construction sector is highly fragmented, traditionally follows very linear workflows and historically comes out as adverse to risk. These all form barriers to digital transformation and the use of BIM, which regularly result in the likes of contractual issues (ownership of models), technical problems (interoperability) and higher costs.

"If we take all these factors into account, we realise that upskilling the construction workforce to use BIM requires two elements: a combination of national and EU-wide strategies, and a thorough understanding of the need for new skills in a technological and contractual context that is changing very fast," says Sylvain Kubicki, Senior Research and Technology Associate at the Luxembourg Institute of Science and Technology (LIST).

BIMEET (BIM-based EU-wide Standardized Qualification Framework for achieving Energy Efficiency Training) brings together universities and technology institutes from five EU countries (Finland, France, Greece, Luxembourg and the United Kingdom) to provide the sector with a better understanding of market needs, along with innovative training schemes. "Our objective with BIMEET is to enhance the skills, qualifications and capabilities of construction stakeholders from high-level professionals to 'blue collar' workers. Eventually, this will increase the market penetration and adoption of BIM," Kubicki explains.

BIM for energy efficiency

To get there, the consortium has developed a specific methodology to identify roles, skills and training needs in the field of BIM for energy efficiency. They used a repository of Twitter records to capture emerging skills and roles and developed a training portal that aggregates content from different BIM-related data sources. By using this tool, users can keep track of new trends and integrate them into future training content.



The training portal effectively acts as a repository source for information on BIM and energy efficiency, as well as a database of available BIM training.

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The training portal also provides personalised training opportunity recommendations to construction professionals. Specific features are similarly being developed for training professionals,

to help them fine-tune their content according to the characteristics of the market they focus on.

E-learning is at the very core of the project. It is a means, according to Kubicki, to enable more efficient training sessions while reaching professionals who are less likely to attend physical training sessions – such as blue collar workers. "One of the most important achievements of the project is a [matrix of learning outcomes](#) for BIM and energy efficiency, segmented into several disciplines and competency levels," Kubicki explains.

Widespread application

BIMEET is set for completion in February 2020. By this date, new training and e-learning schemes will be completed and released to the market under the BIMEET label. The platform and its associated tools are already being considered for further exploitation, while discussions are ongoing with several training institutes and a standardisation body to use it as a centralised repository for BIM training.

PROJECT

BIMEET – BIM-based EU-wide Standardized Qualification Framework for achieving Energy Efficiency Training

COORDINATED BY

Luxembourg Institute of Science and Technology in Luxembourg

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/753994

PROJECT WEBSITE

energy-bim.com

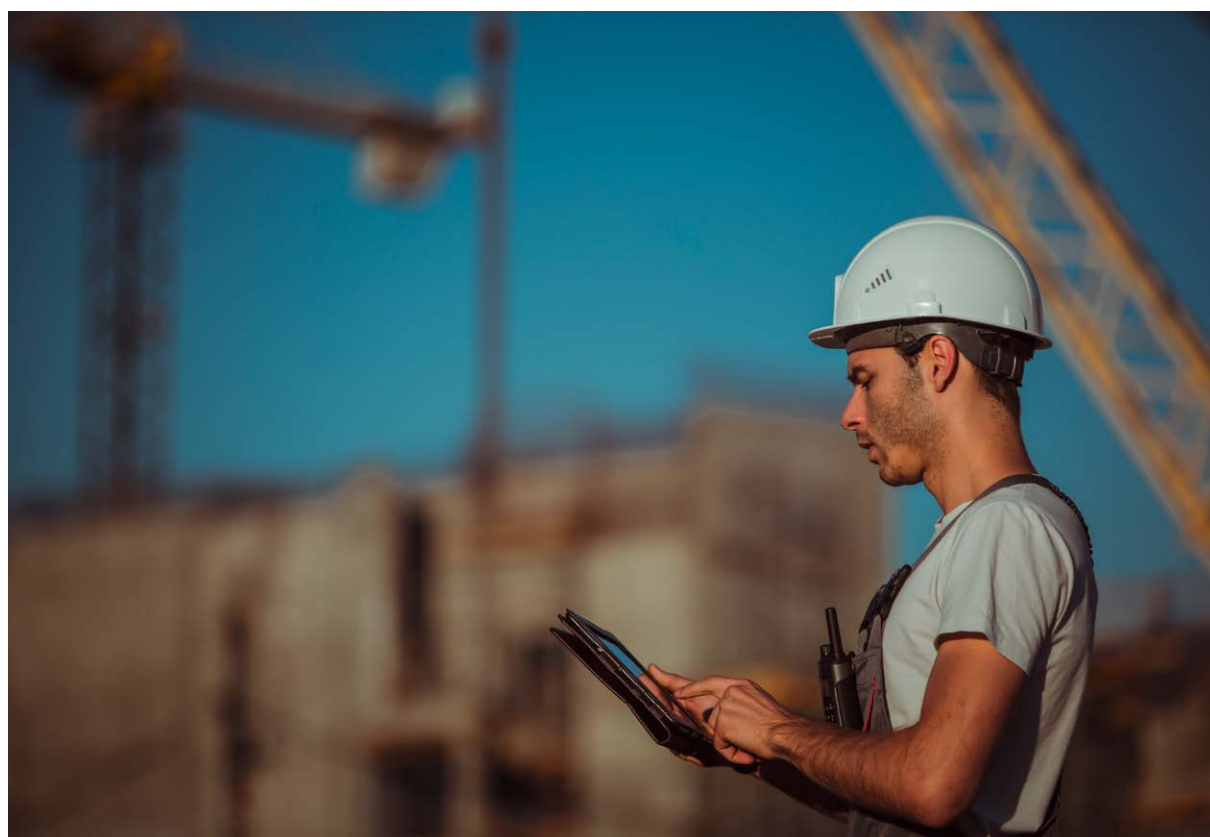


BIM-trained on-site workers deliver better nearly zero-energy buildings

Nearly zero-energy buildings tend to be more promising on paper than they are in real-life. To revert this trend, the EU-funded BIMplement project has been training on-site workers across Europe on how to use building information modelling.

This year marked a turning point for the construction and renovation sector. As of January, the Energy Performance of Buildings Directive effectively requires any new public building to be a

nearly zero-energy building (NZEB). By 2021, this obligation will extend to all new construction projects, while renovation works will also need to comply by 2050.



So, the march towards energy efficiency has begun. But as soon as you look closer, you realise it's not without stumbles. "There is still a considerable gap between designed and actual performance, in terms of both energy efficiency and indoor environmental quality," says Narjisse Ben Moussa, Sustainable Development and Europe Project Officer at Alliance Ville Emploi. "This has several explanations, one of which is the lack of a qualified workforce."

The answer, according to Ben Moussa, lies in building information modelling (BIM): Instead of the usual 2D plans, construction and site operators should now work with 3D representations enhanced with detailed schematics and documents, in a coordinated manner. This is particularly true for NZEBs which are much more complex than traditional buildings. Here, the smallest conflict or misunderstanding between the different actors involved can easily lead to major errors directly impacting energy efficiency.

Reaching the right stakeholders

This is where BIMplement (Towards a learning building sector by setting up a large-scale and flexible qualification methodology integrating technical, cross-craft and BIM related skills and competences) comes into play. "The project focuses on construction companies and on-site workers who have so far been mostly left behind in BIM process strategies. We strongly believe that they are in fact the very stakeholders who can guarantee that implementation complies with design," Ben Moussa explains.

The project focused specifically on ventilation and airtightness. The team developed different types of BIM-focused training depending on stakeholders and skill levels. From there, they selected several pilot labs (national or regional BIM-learning Centres or on-site construction projects) where the training and the first tests of [tools and learning methods](#) adapted to on-site workers would take place.

"This is an important step for approaching different actors of the construction value chain. BIMplement goes way beyond methodologies, tools and technical training: It considers social acceptance to guarantee successful implementation and appropriation by the targeted groups. Moreover, pilot projects are being developed to ensure that new tools are adapted to each partner's national or regional context. These first results will then be implemented and tested within so-called 'experimental sites', i.e. real construction projects, where they will be validated in different contexts," says Ben Moussa.

Raising awareness

Perhaps BIMplement's most critical endeavour is to raise awareness and convince stakeholders of the importance not only of using BIM in their projects, but also of conducting on-site training for manual workers with BIM models suitable for their needs. According to Ben Moussa, it is also one of the team's most difficult tasks.

"The rather low level of BIM maturity, and sometimes the low NZEB maturity of the whole value chain, makes it very difficult to interact directly with manual workers. In fact, convincing all involved stakeholders of the importance and added value of BIM and BIMplement has required much more time and effort than we initially planned," Ben Moussa points out.

No matter how difficult, this convincing is crucial for the future of the sector. Skilled on-site workers will help avoid errors and improve the quality of buildings, and ultimately they are key to meeting the EU's energy efficiency objectives by 2050.



The project focuses on construction companies and on-site workers who have so far been mostly left behind in BIM process strategies. We strongly believe that they are in fact the very stakeholders who can guarantee that implementation complies with design.

PROJECT

BIMplement – Towards a learning building sector by setting up a large-scale and flexible qualification methodology integrating technical, cross-craft and BIM related skills and competences

COORDINATED BY

Alliance Villes Emploi in France

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/745510

PROJECT WEBSITE

bimplement-project.eu



Increasing energy efficiency with building information modelling

By providing training in building information modelling, the Net-UBIEP project is helping the building sector, building owners and public authorities make energy-informed decisions.

The offices we work in, the stores we shop in and the houses we live in consume a lot of energy. In fact, buildings are responsible for nearly 40 % of Europe's total energy consumption. As Europe looks to reduce its carbon footprint, the building sector must increase its energy efficiency and performance. One way of doing this is with building information modelling (BIM).

"By taking into account all the energy aspects of a building's entire lifecycle – design, construction, management, maintenance and demolition – BIM helps decrease a building's environmental impact," says Anna Moreno a senior researcher at [ENEA](#), the Italian National Agency for New Technologies, Energy and

Sustainable Economic Development. Moreno also serves as the coordinator of Net-UBIEP (Network for Using BIM to Increase the Energy Performance), an EU-funded project working to increase the use of BIM in the building sector.

A change in mindset

Using a range of different tools and technologies, BIM creates digital representations of the physical and functional characteristics of a building. Applied to energy efficiency, it allows building professionals to study and predict a building's energy consumption.



“BIM is a change in mindset, one that requires seeing a building not as a finished structure, but as a series of stages,” explains Moreno. “As a building’s energy performance changes throughout its lifecycle, building professionals can use BIM to predict a

building’s energy performance at each lifecycle stage and, based on this information, implement proper energy-saving solutions.”

But before the building sector starts making such energy-informed decisions, they must first embrace the BIM process – which is where the Net-UBIEP project comes in. “Each technician, public officer, designer, constructor and

facility manager must understand how the information they manage could be used by someone else further down the building’s lifecycle,” says Moreno. “Our project aims to reach all of these professionals and provide them with the training and motivation to implement the BIM process.”

The project has developed BIM training, qualification and certification schemes that specifically address the building sector’s lack of energy competency. By completing the schemes, a professional will be deemed competent as either a BIM evaluator, facility manager, coordinator, expert or user.

Comprehensive training

All Net-UBIEP materials are publicly available via the [project website](#) in eight languages (Croatian, Dutch, English, Estonian, Italian, Lithuanian, Slovakian and Spanish). An [e-learning course](#) is also available for technicians, who typically do not have the flexibility to follow a face-to-face course.

Although a work-in-progress, when complete, the project hopes to have increased the energy performance competency of over

2 000 building professionals. Project researchers are encouraging Member States, universities and professional associations to promote the uptake of the Net-UBIEP qualification courses.

“The project has laid the foundation for the digitalisation of the building sector,” adds Moreno. “Now it is up to the Member States to build on our work by pushing both the public and private sectors to use BIM in all construction projects.”

The Net-UBIEP team is also working with public administrations to make BIM training and certification a requirement within the public procurement process.

Finally, on 28 October 2019, Net-UBIEP signed a Memorandum of Understanding with Building Smart International (bSI), allowing for the inclusion of the Net-UBIEP qualification scheme as a new module of the bSI Individual Qualification Programme. This is significant because, once achieved, any country in the world will be able to access the Net-UBIEP qualification through its national bSI chapter.

PROJECT

Net-UBIEP – Network for Using BIM to Increase the Energy Performance

COORDINATED BY

National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) in Italy

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/754016

PROJECT WEBSITE

net-ubiep.eu



Training construction workers on energy-efficient building practices

The EU-funded BUStoB project worked to assist the construction industry acquire the skills needed to make Europe's building stock greener.



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The BUStoB (BUILD UP Skills to Business) project worked on addressing the skills gap in the Netherlands. The project's main goal was to develop a large number of training modules covering a range of subjects related to green skills for the building and installation workforce. "The project went beyond just designing training courses," says project coordinator Peter Smulders. "To ensure a sustainable building environment, researchers also sought new ways to stimulate demand so that more workers would participate in the green skills training."

In addition to designing and promoting the training modules, the project developed quick skill assessments. "These assessments help raise awareness among the workforce about the importance

of energy-efficient building design, identify skill gaps and promote the need for training," explains Smulders. "They're meant to serve as an easy way to highlight the need to participate in the full training."

There's an app for that

In total, the project developed 65 new e-learning modules, covering 79 thematic areas on such topics as NZEB technologies, quality assurance and interdisciplinary skills, among others. Many of these courses are available via online media, including the [BUILD UP Skills Advisor app](#). "We incorporated the app's 'Learning

from Building Errors' module into several of our trainings," says Smulders. "Our trainers are using these short sets of questions to enhance the impact of their training."

In addition to an assessment tool, the app also offers seamless and free access to all BUStoB's e-learning modules, along with job-specific overviews of other learning opportunities. "Our online instruments for disseminating and promoting the training have proved to be of great value for projects of this sort," adds Smulders. He notes that the app was funded in large part by OTIB, a project partner. OTIB donated the app to the consortium at project closure, thereby making it available for other EU projects and further development.



As the project is closed, we embrace the challenge of getting employers and employees to use the developed means and materials. After all, it's one thing to raise awareness, but another to translate this awareness into concrete action and an upskilled workforce.

From demand to action

Thanks to its focus on practical information and regional partnerships, the project successfully triggered an increase in demand for green skills training. "We are very proud of the alliances we forged during the project, such as those between the building and installation sector, vocational training institutes and local and national governments," says Smulders. "As a result, the training resources developed during the BUStoB project are playing a

central role in the human capital agenda of our country's National Energy Agreement."

Since the formal end of the project, there have been over 2 500 downloads of the BUILD UP Skills Advisor app and around 550 trainers/ambassadors have been fully trained. The BUILD UP Skills analysis methodology is currently applied to address the skills related to a circular construction economy and the effect of digitisation in the construction sector.

The challenge is to ensure continued momentum and uptake. The app has been further developed and enriched thanks to follow-up H2020 projects and also projects at national level.

PROJECT

BUStoB – BUILD UP Skills to Business

COORDINATED BY

OTIB in the Netherlands

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/649737

PROJECT WEBSITE

buildupskills.otib.nl



Setting the standard for energy-efficient construction and renovation

The EU-funded CEN-CE project has set up standard-based qualification and training schemes in energy efficient construction for heating and cooling professionals.

Nearly 35% of all buildings in the EU are over 50 years old, of which approximately 75% are energy inefficient. Even though renovating existing buildings could substantially reduce energy consumption (by up to 60%), only 0.4 to 1.2% are renovated each year. Of those that are, just 15% incorporate significant energy-efficiency improvements.

This, in large part, is due to the fact that most of the building sector, including heating, ventilation and air conditioning

(HVAC) professionals, lack the necessary skills to perform energy-efficient renovations and retrofits. "HVAC professionals play an important role in energy efficiency, especially in renovation where heating and cooling systems are replaced or upgraded first," says Johann Zirngibl, an engineer at CSTB, the French national organisation providing research and innovation, consultancy, testing, training and certification services to the construction industry.



Zirngibl also serves as the coordinator of the EU-funded CEN-CE (CEN standard Certified Experts EU-wide qualification and training scheme based on EPBD mandated CEN standards) project, which is dedicated to setting up qualification and training schemes in energy-efficient construction for HVAC professionals.

Immediate and long-term focus

The CEN-CE training schemes are based on standards set by the [European Committee for Standardization](#) (CEN) and are related to the European Commission's [Energy Performance of Buildings Directive](#) (EPBD). The EPBD requires all new construction to be nearly zero-energy buildings (NZEBS) as of 31 December 2020. The European Commission charged CEN with the task of issuing standards to support the implementation of EPBD requirements.

"Whereas some of these standards relate to the daily work of HVAC professional, others relate to upcoming challenges like global cost calculation and integrating renewable energy sources," says Zirngibl. "That's why simply providing training on individual technical topics is not enough and complementary training on transversal know-how is also needed."

CEN-CE developed training programmes covering both individual standards and 'big picture' issues like adopting a holistic approach to assessing a building's energy performance. Each training includes a presentation on the fundamentals of the standard, a handbook on calculation procedures, and an Excel-based tool for evaluating the impact of different parameters.

The training and qualification schemes are targeted towards middle and senior-level professionals. "These training schemes equip architects, system designers and installers with the latest in energy-efficient building techniques at the international level," explains Zirngibl.

CEN-CE certification

Following the training, participants can take a test to become a CEN-CE certified expert. Once complete, the participant will have their name added to the CEN-CE list of certified professionals. This list is publicly available to the industry, which can use it to easily find a qualified HVAC professional for their building construction or renovation project.

"The CEN-CE training and qualification scheme completes existing offers by equipping HVAC professionals with the know-how and skills they need to meet tomorrow's challenges in building design and retrofitting," adds Zirngibl.

With the training scheme launched, the project now focusses on taking it to the market and promoting its uptake amongst industry and existing training providers.



HVAC professionals play an important role in energy efficiency, especially in renovation where heating and cooling systems are replaced or upgraded first.

PROJECT

CEN-CE – CEN standard Certified Experts EU-wide qualification and training scheme based on EPBD mandated CEN standards

COORDINATED BY

Scientific and Technical Centre for Building in France

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/785018

PROJECT WEBSITE

cen-ce.eu



Green training for construction managers

Partners with the EU-funded ingREeS project have developed training programmes on energy efficiency and using renewable energy in buildings specifically for middle and senior level construction professionals.

The project was dedicated to achieving two objectives. First, it analysed the construction industry's knowledge about energy efficiency and using renewable energy sources in buildings. Second, it reviewed the skills that were lacking and what needed to be done to deliver these skills to construction professionals.

"If our objectives were to be achieved, we realised that it wouldn't be enough to limit our focus to those who build the

buildings," says project coordinator Frantisek Doktor from the project ingREeS (Setting up Qualification and Continuing Education and Training Scheme for Middle and Senior Level Professionals on Energy Efficiency and Use of Renewable Energy Sources in Buildings). "The objective of this project was to ensure that the designers, decisions makers and site managers who lead the construction efforts are equipped with the skills and knowledge needed to make energy efficiency and renewable energy use a part of their day-to-day procedures."



Accredited training programmes

The project developed national qualification standards and training programmes on the use of renewable energy sources in buildings specifically geared towards Czech and Slovak middle- and senior-level construction professionals. By the end of the project, five qualification standards in total had been developed along with 16 training modules. The training is delivered via a combination of in-class lessons, distance learning and practical demonstrations. At the end of the programme, participants are assessed using online testing and, based on the results, receive an official certification.



The objective of this project was to ensure that the designers, decisions makers and site managers who lead the construction efforts are equipped with the skills and knowledge needed to make energy efficiency and renewable energy use a part of their day-to-day procedures.

Getting the managers to the training, however, was no simple task. For example, in Slovakia, partners had to overcome the country's missing culture of continuing education and training among civil engineers. In the Czech Republic, although the culture of continuing education was already developed, training on energy efficiency was notably lacking. "To succeed, we had to pay extra attention to the innovativeness of the programmes, ensure easy access to the training and focus on the quality and value of the content being delivered," says Doktor. "As the information had to be up-to-date, we built the system so it can be easily updated and adapted to the latest news and developments."

A new class of accredited professionals

The efforts paid off. So far, 51 trainers have been trained, alongside 739 trained and qualified trainees. In Slovakia alone, 222 stakeholders have achieved improved capacity as a result

of the project's focus on training. Furthermore, feedback from these participants shows that over 60% of the information they learned was completely new, while the rest of the information provided a deeper understanding of concepts they were already familiar with. "Participants will now use this information in their daily work as architects, site managers, supervisors and sustainability counsellors," adds Doktor. "This will not only lead to a marked improvement in the quality of their work, but also ensure that the buildings they are responsible for achieve their energy performance targets."

Even with the project now officially closed, the training goes on, given by organisations including the Slovak Chamber of Civil Engineers, the Czech Building Academy and the Czech Association of Construction Entrepreneurs. "Project partners not only continue to deliver the training, but also continue to improve its contents and expand its impact," adds Doktor. "For example, we are adding training on how construction professionals can implement building information modelling into a building's entire life-cycle."

PROJECT

ingREeS – Setting up Qualification and Continuing Education and Training Scheme for Middle and Senior Level Professionals on Energy Efficiency and Use of Renewable Energy Sources in Buildings

COORDINATED BY

Slovak Chamber of Civil Engineers in Slovakia

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/649925

PROJECT WEBSITE

ingrees.eu/en



Developing energy-efficient competencies of tomorrow's building professionals

The EU-funded MEnS project developed specialised training to teach building professionals such as architects and engineers, how to retrofit housing stock to meet nearly-zero energy building standards. An additional important focus was to work with women and unemployed in the building sector.



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The EU-funded MEnS (Meeting of Energy Professional Skills) project focuses on developing the skills that building professionals need to create and to operate more energy-efficient buildings. "I do care a lot about this project. It is so important to develop professional skills, and particularly those of women pursuing a

career in architecture and engineering," says project coordinator Daniela Melandri. "We accomplished this by providing a series of [accredited training activities](#) that have been developed by nine universities and three leading market players in the field of nearly zero-energy buildings, or NZEB."

The integrated, interdisciplinary MEnS training programme combines nationally accredited professional courses, e-learning and webinars and real case studies. The bulk of the training focusses on teaching these professionals how to retrofit housing stock for NZEB standards. Through the training, the project aimed to increase the use of renewables by at least 29 GWh/year.

Project researchers also worked closely with the PROF-TRAC project, another EU-funded project focusing on providing training to future NZEB trainers. Considering the complementary nature of their activities, the two projects organised several joint activities.

Big numbers

In total, the MEnS project provided 30 training courses, successfully increasing the knowledge and skills of over 200 building professionals located in 10 European countries. Of particular note is the project's focus on developing the skills of female or unemployed professionals. 47 % of the training participants were women and 35 % were unemployed. "This was an amazing result, well over what we had initially expected," says Melandri.

To disseminate the project's outcomes, MEnS produced a range of audio-visual material, including training videos, webinars and live broadcasts of the conferences and documentaries of the case studies – many of which were also shared via Facebook. These actions significantly expanded the project's reach. On Facebook alone the videos were watched by 28 000 viewers and more than 1 500 people followed the webinars.

Work continues

Even after the project's close, its impact continues. For example, some of the university partners in the project have committed to continuing to provide training on NZEB.

Furthermore, to secure the project's legacy, an e-learning platform was created during the project time and is being kept live and accessible over the next few years. This platform consists of 11 national portals to promote distance learning and to keep encouraging a real debate between stakeholders.

Finally, MEnS could also rely on the existing USE Efficiency Association for the exploitation of MEnS training courses. Founded in 2012, following a winning European project named USE Efficiency, the Association brings together European organisations, including some MEnS partners, in the challenge of providing formal and non-formal education and awareness for better quality of our environment.



I do care a lot about this project. It is so important to develop professional skills, and particularly those of women pursuing a career in architecture and engineering.

PROJECT

MEnS – Meeting of Energy Professional Skills

COORDINATED BY

EnerGia-Da Srl in Italy

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/649773

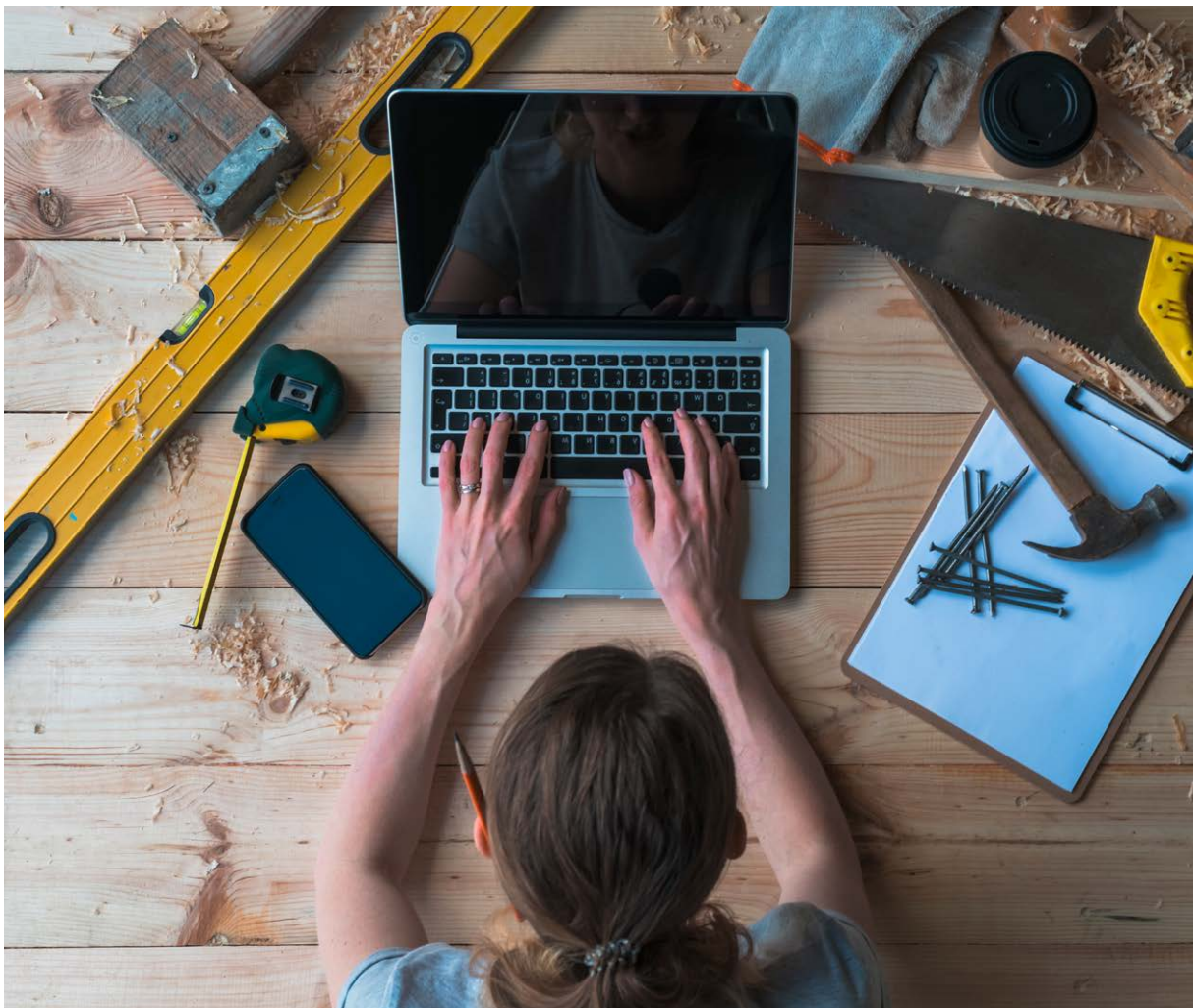
PROJECT WEBSITE

mens-nzeb.eu/en



New platform delivers zero-energy training resources

Building professionals can improve their energy efficiency skills using a new EU-funded online platform. Training materials are freely available to help architects, engineers and other professionals improve their design and building of low-energy constructions.



The PROF-TRAC (PROFessional multi-disciplinary TRaining and Continuing development in skills for NZEB principles) project has developed an open [training platform](#) that is both free to use and continuously updated. It includes a voluntary EU-level [training and qualification scheme](#) that can be adapted at the national level to suit specific needs, as well as information about the professional profiles needed to achieve nearly zero-energy buildings (NZEB). The platform also offers free [self-assessment tools](#) for professionals to evaluate their skills and identify knowledge gaps, as well as [train-the-trainer programmes](#) and webinars.

“This is a training material repository,” explains PROF-TRAC project coordinator Peter Op ‘t Veld from Huygen Installatie Adviseurs in the Netherlands. “Construction professionals can first use our methodology to map their skills and identify training gaps, and then select the materials that best suit them.” Completed in February 2018, the Platform is already being used by other EU-funded H2020 projects like BIMplement and TripleA-reno as a valuable training resource.

Upskilling professionals

The PROF-TRAC project was launched in 2015 to address the need for upskilling building professionals, such as architects and engineers, in zero-energy construction and renovation. “PROF-TRAC came out of a previous project in which we developed educational material specifically targeted at encouraging interdisciplinary NZEB design,” explains Op ‘t Veld. “What were missing though were tools to encourage collaboration between so-called white-collar professionals, like architects and engineers.”

The project therefore sought to develop courses that bring together NZEB architectural principles with, for example, mechanical engineering challenges. To do this, the project team worked with three key European umbrella organisations: the Architectural Council of Europe (ACE); REHVA (representing

engineers in building services); and Housing Europe, the European federation of public, cooperative & social housing. “For Housing Europe there was an acknowledgement that facility managers should be trained and upskilled for the operational phase of zero-energy buildings, as well as in maintenance and procurement,” says Op ‘t Veld.

Addressing skills gaps

The project began by developing an effective methodology to map the professional skills needed for NZEB. This helped to identify gaps in skills and knowledge, which could then be bridged through the development of training programmes.

The project went on to develop European qualification schemes for professionals involved in NZEB. “This has been worked on throughout the project and was the final task to be completed,” says Op ‘t Veld.

The project also carried out training sessions for teachers. “We took the approach of training the trainers rather than conducting large-scale sessions,” explains Op ‘t Veld. “The idea is that these trained experts can then design national courses and conduct training sessions on the national scale. These trainers will act as ambassadors of the PROF-TRAC project and can create a kind of snowball effect by initiating new training.”



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Five training sessions were held in total with members of national chapters of the architectural and engineering umbrella organisations involved in PROF-TRAC. The project successfully trained 128 certified NZEB trainers from 23 countries, who have since gone on to train over 1 300 architects, engineers and site managers. A further two training sessions took the form of online webinars.

A list of certified PROF-TRAC trainers and training organisations across Europe is available on the platform.

“The training materials and resources available on the PROF-TRAC platform will contribute towards reducing the skills mismatch for professionals and increase managerial capacity to support innovation and sustainable energy use in buildings,” comments Op ‘t Veld.

PROF-TRAC courses will continue, with at least 50 courses foreseen to take place in the next 5 years with around 1 700 more professionals to be trained, using the open source training material repository that was developed by the project. “Thus, although officially over, this will ensure

that PROF-TRAC’s legacy will be felt for many years to come,” concludes Op ‘t Veld.

PROJECT

PROF-TRAC – PROFeSSIONAL multi-disciplinary TRaining and Continuing development in skills for NZEB principles

COORDINATED BY

Huygen in the Netherlands

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

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PROJECT WEBSITE

proftrac.eu



Promoting hands-on energy efficiency training

World-class energy efficiency training facilities and innovative new teaching programmes have been established at five Central and East European countries. This will enable the next generation of construction professionals to develop the skills and expertise needed to meet growing demand for nearly zero-energy buildings.



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The [Building Knowledge Hubs](#) form part of a growing international network of training centres that combine theoretical lessons with practical hands-on exercises. The network also aims to increase interest in and awareness of nearly zero-energy buildings (NZEBs) and stimulate market demand for optimal energy efficiency in new buildings and renovations.

“New NZEB standards are being developed at the national level,” explains Train-to-NZEB (The Building Knowledge Hubs) project coordinator Dragomir Tzanev, from the Centre for Energy Efficiency – EnEffect, Bulgaria. “Meeting these new standards requires changes in how both designers and construction workers are trained. We also need to change the way we think about buildings, and this has to trickle down to end users. Consumers are the real change agents in this process, as unless there is demand from the market, there will be no demand for training.”

At the end of the 3-year project, there were seven Building Knowledge Hubs in Bulgaria, the Czech Republic, Romania, Turkey and Ukraine that are putting Train-to-NZEB [courses](#) into practice.

The aim at the outset was to train 90 trainers in total, a target that has been reached. “We also reached our aim of training 2 400 construction workers through 112 courses and we’ve also successfully trained 614 qualified professionals, such as designers and engineers, through 40 individual courses,” says Tzanev. “On top of that, we’ve also trained 894 specialists with decision-making functions through 36 individual courses.”

Whilst these numbers are excellent and deserve to be celebrated, Tzanev expresses his particular pride about the very impressive work that the training centres in Turkey and Ukraine have been carrying out.

Hands-on experience

The now completed Train-to-NZEB project began in 2015 with a preliminary analysis of the training gaps that exist, and how these could best be addressed. Leading research and training institutions from Germany (Passive House Institute) and Ireland (Passive House Academy and Limerick Institute of Technology) were identified as ideal partners for transferring knowledge and experience. “Ireland has a lot of experience in combining standard classroom training with practical courses,” says Tzanev. “Hands-on experience is a really important part of the learning process.”



Consumers are the real change agents in this process, as unless there is demand from the market, there will be no demand for training.

Both Germany and Ireland also have well-established certification schemes for both designers and tradespeople. “Offering a variety of training courses will enable training facilities to really offer something different to the market and meet the diverse training demand,” adds Tzanev. Training courses tailored to builders, designers or end users focus on basic concepts such as

energy saving, NZEB and the implementation of new building standards, and offer practical experience with innovative materials and tools.

Expanding network

Tzanev hopes that the Train-to-NZEB network concept will continue to be further developed and expanded. The EU-funded project [Fit-to-nZEB](#) extended the network of training centres to Croatia, Greece and Italy, where the focus was on energy-efficient building renovation.

“The goal here was to offer training programmes at all levels, from high school leavers to professionals,” Tzanev says. “This project builds on the Train-to-NZEB idea of sharing and

developing programmes together, and it really shows that we are building a culture of exchange. This is the only way we can improve and ultimately meet the demands of customers.”

As their profile rises, Tzanev hopes that network training facilities will begin to take on more consultancy work on actual construction projects. He also predicts that blended learning – a combination of online distance learning with hands-on experience at training centres and classroom learning – will be an important fixture in the future. However, as Tzanev says: “Training for professionals working in remote areas is only possible through good distance learning. By engaging with as many stakeholders as possible and broadening our training offer, we can ensure that our model is sustainable.”

PROJECT

Train-to-NZEB – The Building Knowledge Hubs

COORDINATED BY

Centre for Energy Efficiency – EnEffect Foundation in Bulgaria

FUNDED UNDER

H2020-ENERGY

CORDIS FACTSHEET

cordis.europa.eu/project/id/649810

PROJECT WEBSITE

train-to-nzeb.com



Innovative training on energy-efficient building renovations

To help increase the nearly zero-energy building retrofitting competence of building professionals, the Fit-to-nZEB project developed a range of educational programmes, training facilities and train-the-trainer opportunities.

If Europe is to achieve its 2020 and 2030 energy and climate objectives, the construction sector must deliver high-energy performing renovations and nearly zero-energy buildings (NZEB). But doing so requires having qualified NZEB specialists – something the sector currently lacks due to a scarcity of quality training on energy-efficient solutions for building renovations.

To increase the NZEB retrofitting competence of building professionals in Austria, Bulgaria, the Czech Republic, Greece, Ireland and Italy, the EU-funded Fit-to-nZEB (Innovative training schemes for retrofitting to nZEB-levels) project developed a range of educational programmes, training facilities and train-the-trainer opportunities.



“Our goal was to set up a full range of innovative qualification and training schemes for deep energy building retrofitting supported by renewable energy sources,” explains Dragomir Tzanev, Executive Director of the [Centre for Energy Efficiency – EnEffect](#) and Fit-to-nZEB project coordinator. “To do so, we developed the materials and facilities needed to provide world-class practical training on building renovations aimed at NZEB levels.”

A range of training opportunities

Based on a thorough review of existing training programmes and an analysis of the training gaps in the involved countries, researchers developed a [compendium](#) covering the knowledge, skills and competences required for deep energy retrofit. Using this compendium, researchers identified the key topics of relevance to the NZEB retrofit process and, based on these, developed a set of 17 high-quality practical training programmes to address them.



The project paves the way towards mutual recognition of NZEB-related skills and competences.

“These programmes, which include notes, exercises, test questions and references, are [freely available](#) to any interested vocational education provider,” explains Tzanev. “By encouraging open cooperation in the sector and by providing a shared knowledge base, the project paves the way towards mutual recognition of NZEB-related skills and competences among an increasing number of countries.”

The project also established fully equipped training facilities in each of the involved countries. Here, building professionals can get hands-on experience with many of the skills and theories taught during the training programme.

“It’s very important to see how to correctly install a window or how to prevent mould and condensation in walls,” says Dimitris Pallantzas, a certified passive house designer and education officer at the Hellenic Passive House Institute, who participated

in one of Fit-to-nZEB’s training facilities. “As a building physicist, this was all known in theory but new in practice, so it was very useful to gain the knowledge I need to go back and teach the technicians and construction workers of the future.”

Setting the standard

In total, the project has trained over 180 educators, who are now delivering the Fit-to-nZEB training programmes at the project’s training facilities. Furthermore, over 20 pilot courses have been conducted at universities, professional high schools and vocational training centres; and more than 10 Memoranda of Understanding have been signed with education and training providers to use the project’s training materials. To date, this has resulted in 350 workers, 100 university students and 120 school students being trained.

“The project has quickly positioned itself as one of the most recognised NZEB training programmes in Europe, offering world-class upskilling courses customised to local needs and in collaboration with the construction industry,” adds Tzanev.

PROJECT

Fit-to-nZEB – Innovative training schemes for retrofitting to nZEB-levels

COORDINATED BY

Centre for Energy Efficiency – EnEffect Foundation in Bulgaria

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Editorial coordination

Zsófia TÓTH, Silvia FEKETOVÁ

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RESULTS PACK ON THE CIRCULAR ECONOMY

This Results Pack focuses on how the Circular Economy can help reduce Europe's waste problem. Innovative solutions are being researched through the EU Horizon 2020 funding programme and this interdisciplinary CORDIS Results Pack highlights some of the most exciting projects that are busy promoting waste reduction and improved resource efficiency in the textile, construction, photovoltaic, steel industry, bulky and urban waste sectors.



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