



# PUBLIC RESULT-oriented report

Deliverable 1.3 of the NZEB ROADSHOW project

Responsible partner: Center for Energy Efficiency EnEffect

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[WWW.NZEBROADSHOW.EU](http://WWW.NZEBROADSHOW.EU)

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## FOREWORD

The nZEB Roadshow project embarked on a journey with a vision to ignite a transformation in the construction landscape of five South and East European countries: Bulgaria, Croatia, Greece, Italy, and Romania. This vision materialized through a multifaceted approach of organizing large-scale events that encompassed policy conferences, product exhibitions, practical demonstrations, skill-enhancing training courses, information sessions, and many more. Our aim was clear: to stimulate a surge in demand for qualified construction services and skills that would echo the harmonious rhythm of *nearly Zero-Energy Buildings* (nZEBs).

The nZEB Roadshow concept was built on the foundation of creating common understanding, shared interest, and informed demand among investors, homebuyers, owners, product manufacturers and all stakeholders investing in the real estate market. We set out to showcase the tangible benefits of nZEBs, infusing these structures with the promise of energy efficiency, sustainability, and a greener tomorrow. This report encapsulates our journey, unveiling the profound impact our collective endeavours have had on local markets, industry players, and the broader community.

Throughout the project, we faced unforeseen challenges, including the unprecedented COVID-19 pandemic and the ripples of economic and energy crises. Amid these trials, doubts sometimes clouded our path. Yet, today, as we present the key results of the nZEB Roadshow project, we reflect on the astounding 58 nZEB Roadshow events carried out across the five countries, imparting valuable knowledge and fostering the growth of energy-efficient building markets. These events drew the participation of over 20,000 attendees, each leaving with a deeper understanding of the possibilities that energy efficiency brings. A standout achievement emerged in the form of project-related training courses, which witnessed the enthusiastic participation of more than 4,000 attendees. Over 100 product manufacturers and suppliers lent their support to our cause, becoming instrumental in the success of the initiative. These collaborators sponsored mobile demonstration units and participated in product exhibitions, training courses, and career counselling sessions.

Yet, the reverberations of our efforts found their true essence in the extensive public outreach. We estimate that more than 50,000 stakeholders were touched by our local dissemination events, with an additional 6,000 stakeholders reached through international conferences. The power of media elevated our message to millions, with national TV channels capturing our mock-ups and demo units, further piquing interest in the topic.

Recognition followed closely. From challenging the building professionals at the main stage at the International Passive House Conference's closing ceremony to fervently advocating our approach and insights to key policy-makers at the EUSEW, we sought endorsement from all relevant stakeholders as part of our journey. Notably, the nZEB Roadshow earned the National Geographic award for the best educational project in Croatia and the prestigious b2b media award for innovative design in Bulgaria. These achievements speak to the indelible mark the nZEB Roadshow has left across Europe.

As we celebrate the successful completion of the nZEB Roadshow project, we extend our heartfelt gratitude to all partners, collaborators, stakeholders, and supporters who contributed to this remarkable journey. The pages that follow reflect our collective dedication, and we invite you to delve into the impact, inspiration, and innovation that the nZEB Roadshow embodies.

## PROJECT CONCEPT

### What is the nZEB Roadshow?

Zero-energy building performance all around us – in the offices, at school, in hospitals, back home... Too good to be true, isn't it? Unfortunately, despite the newly enforced EU legislation, we're still far from seeing those quality and efficient buildings we dream of at every corner. The reason? Some say building professionals don't have the knowledge, skills and experience necessary to deliver a quality project.

The truth is however somewhat different: yes, we still lack skilled professionals. But most of all, we lack informed local markets. What we really need are markets driven by the demand for quality buildings: ones that not only save energy, but improve for your comfort and health, make you feel happy and satisfied, with your money well spent.



#### **Without informed markets, there will be no demand for skilled building professionals.**

The nZEB Roadshow project was designed to stimulate the demand for qualified construction services and skills in five South and East European countries – Bulgaria, Croatia, Greece, Italy and Romania. The goal was achieved through organizing “nZEB days”: local multi-component events including policy conferences, exhibitions of building products and technologies, practical demonstrations and gamification in real and virtual reality environment, training courses for designers and construction workers, information sessions and consultations, on-site training, career orientation and construction job fairs. As a focal point of the events, the existing expert training centres in the focus countries - widely known as “Building Knowledge Hubs”, got on wheels: through the design and construction of mobile demonstration units, which continue to serve as information and demonstration centres for raising awareness of



the benefits and specificities of nZEB and, even more importantly, created the necessary prerequisites for effective communication between stakeholders and the involvement of key media channels. With very careful attention to exterior and interior design, these mobile demonstration and training centres offer real-life experience of a quality nZEB, and are equipped with all necessary technologies to provide full information of the processes with relevance to the building's performance in terms of comfort, internal air quality parameters, and energy consumption. In addition, the nZEB Roadshow adds to the current efforts to promote nZEB two very important but unfortunately still largely missing components: professional marketing services and strong media partnerships. Thus, the project concept has received strong support from a large number of stakeholders, with more than 45,000 people attending the various project's activities – among which state ministers, heads of national executive agencies, regional governors, mayors and deputy mayors, key representatives of national professional bodies, established business actors... Yes, including the EU Commissioner for Energy Kadri Simson, immediately after the project's finalization!

Based on this general approach, the progress of the work has led to organizing 58 dedicated nZEB roadshow events, attended on-site by more than 20,000 people and displaying a significant potential for sustainable continuation of the activities and attracting the interest of the key audiences. With this, the main project impact indicator was convincingly exceeded, but a number of other, no less important objectives, were also pursued and achieved.

## Project objectives

As described above, the overarching goal of the nZEB Roadshow project is to stimulate the demand for energy-related skills of construction workers and specialists in the involved countries. This was achieved through a streamlined marketing campaign involving the full range of stakeholders in series of on-ground events following a coherent script which can be replicated locally after the finalization of the project.

In order to complete this goal, the project sets itself the following specific objectives:

- 1.** To raise the interest in vocational training and education in the construction sector, especially as related to nZEBs and building-integrated RES, by delivering of at least 15 large-scale events in 5 countries.

A total of 58 events are organized in the 5 countries (Bulgaria: 9, Croatia: 14, Greece: 18, Italy: 12, Romania: 5). Full information is available at <https://www.nzebroadshow.eu/nzeb-days.html>

- 2.** To provide wider opportunities for vocational training, career counselling and retraining/upskilling of professional builders and help to realize and improve the communication between them and the respective construction companies-employers.

At all nZEB roadshow events, numerous opportunities for vocational training and upskilling of building professionals are offered. The participation of representatives of the national construction chambers and individual construction companies is ensured by the communication and stakeholder engagement strategies of each country. Career counselling is provided via the targeted involvement of multiple educational and training providers and by participating in University fair and student associations events (26 direct partnerships accounted so far).

- 3.** To inform about good practices for quality workmanship, the right approach for building and using the most suitable materials at nZEB, including through conducting training for 1000 building specialists.

Project-related training courses are visited by a total of 1126 attendees at nZEB days and 2987 attendees at other events. In each of them, quality assurance and cautious selection and use of materials and components have been taught, including with involvement of product suppliers.

- 4.** To improve the reputation of the construction profession, especially among young generations, through closely relating it to the modern environmentally-responsible lifestyles.

The young generations are specifically targeted by the project's activities, which is evidenced both by the dedicated activities in universities and schools and by the pictures of visitors at nZEB roadshow events in each of the countries. The relation to the modern environmentally-responsible lifestyles enabled by IT developments has been a key feature of the conducted event, both as practical demonstrations and as a part of the conducted training courses.

- 5.** To raise interest in nZEB construction by using appropriate channels across different audiences and personalized communication.

As reported in D7.3, it is estimated that information about the project has reached more than 40,000 stakeholders via local dissemination events and around 6000 stakeholders via international dissemination events. This does not account for the general media outreach, as millions of media users have been reached via interviews and reports in the biggest national media. In most of the countries, mock-ups and demo units were filmed by major national TV channels, stimulating additional interest to the topic.

- 6.** To illustrate and demonstrate in practice the benefits, functioning principles and specifics of nZEB through interactive consoles, schemes, graphs and individual consultations for more than 100 clients.

The project team reports 211 individual consultations provided so far, including via the use of specialized equipment and methods such as blower door tests, infrared imaging, energy performance auditing and application of the related software.

- 7.** To build a positive image of nZEB as a modern solution and as a comfortable and healthier alternative to standard construction.

In all events and presentations, specific emphasis is put on the wider benefits of energy efficient buildings, including air quality, healthy environment and comfort of habitation. This is related to the assessment of the needs and value proposition for the target audiences as defined in D2.2, and on the tools for gamification and demonstrations used during nZEB roadshow events.

- 8.** To present the financial benefits and benefits of nZEB as an investment tool and demonstrate the effectiveness of such an approach.

The project's activities are closely related to the understanding of buildings' financial parameters by the general audiences, as this is understandably perceived as a key factor for the decision-making process. Financial information is provided via direct consultations and site visits during nZEB days, in training courses, as well as in presentations given at relevant external events. In certain cases, nZEB roadshows are directly correlated to parallel events on sustainable energy financing topics.

- 9.** To stimulate end-user demand for nZEB and help those already interested in nZEB construction to decide on the construction and implementation of a project using qualified specialists.

Special attention is paid to explanation of the reasons and potential negative effects of performance gaps, both in training courses and in discussions at nZEB fairs and exhibitions. The activities are supported by nZEB days demonstrations and site visits, as well as by on-site training conducted by some of the project partners. The results from airtightness tests of existing buildings and mobile units are successfully used as illustration of the impact of skilled labour.

**10.** To become a point of attraction for meetings and dialogue between different professionals, experts, producers of materials, investors, municipal representatives, regulatory and administrative bodies, service providers, media, citizens to quickly and easily realize nZEB construction projects.

Due to the highly successful communication campaign, exploiting both traditional and social media and participation in a significant number of national and international dissemination events, the nZEB roadshows have already become a recognizable trademark in the national event calendars and a point of attraction for all actors in the construction sector value chain. This is proven by the fact that they already attract the interest of potential hosts and supporters, both inside the partner countries and in the neighbouring countries, which proves the viability in the concept outside the project's support and duration.

## **Main Beneficiaries**

### ***Users of training: construction workers and specialists, employers, professional chambers***

Attending nZEB Roadshow with broad offering of energy efficiency and renewable energy training courses, exhibitions and demonstration activities provides construction experts of all levels of competence with opportunities to expand their knowledge, develop skills, network with industry professionals, access innovations, and ultimately contribute to more sustainable and efficient building practices, corresponding to the rising market demand for nearly zero-energy buildings. In addition, practical gains like access to relevant certification and actual cost savings due to avoidance of on-site mistakes and better understanding of clients' demands contribute to the perceived benefits for building professionals. For professional chambers, support for the implementation of the relevant regulations and standards and access to innovation also represent a major opportunity to directly influence the development of the industry and to promote the value of qualified construction services.

### ***Producers and suppliers of building materials and components, DIY stores***

Participating in energy efficiency exhibitions, trade fairs, and leading training courses within the promoted nZEB Roadshow concept offers producers and suppliers of building materials and components the chance to showcase their products, build brand awareness, gain market insights, foster collaborations, and contribute to the growth of energy-efficient construction practices. This eventually leads to enlarging their market share and profits through extensive application of their good-quality products, and avoiding mistakes at the building site compromising the performance of these products. The involvement of more than 80 different companies active on the buildings' energy efficiency market clearly proves the mutual benefits from the continued cooperation.

## ***Knowledge providers***

Standing at the heart of the construction value chain, knowledge providers at different qualification levels are the key to the energy transformation of the building sector. The new requirements for nearly zero-energy buildings and cost-effective deep energy retrofits already lead to significant changes in the design and construction practice, as the approach to the energy saving measures is becoming more and more important for the successful training and educational practices, also driven by increasing clients' demand. With the nZEB Roadshows, knowledge providers not only gain access to new competences and technological innovations, but also benefit from innovative training approaches stemming from the demonstration and gamification activities promoted by the project.

## ***Public authorities***

Attending the dedicated energy efficiency and renewable energy conferences, exhibitions, and trade fairs at the nZEB Roadshow events offers public authorities a range of benefits, including access to knowledge, networking opportunities, collaboration potential, policy insights, and the chance to contribute to the advancement of the ambitious EU energy-efficient practices and policies at national, regional and local level. While the expert contributions and public support for the adoption of the key EU legislation in the area is crucial for the national governments, local and regional authorities also benefitted from close engagement with the local community, actual support for energy planning and project implementation, and increased visibility in front of potential investors and local businesses.

## ***End users: the clients on the real estate market***

Last but not least: for the people active on the real estate market, attending nZEB Roadshow exhibitions, demonstrations, and information seminars provides a whole new set of knowledge, insights, and connections between the different stages of the investment process. This help them make informed decisions, realize cost savings, align their choices with their values and long-term financial goals, and contribute to environmental sustainability. This is far from all, though: the specifically designed gamification activities also help the children shape their personal and societal values and clearly associate buildings' efficiency with the increasingly pressing climate issues. Without any doubt, this has been the biggest reward for all involved in the nZEB Roadshow project.

## **SUMMARY OF PROJECT'S IMPLEMENTATION**

Back in 2018, we promised that we will do our best to organize no less than 25 events in Bulgaria, Croatia, Greece, Italy and Romania, featuring product exhibitions, job fairs, training courses, live demonstrations, games for children and, well, lots of fun... We did not know that we would face the COVID-19 pandemic, which will effectively block such public events, and we did not know that we would face a world economic and energy crisis that would block many investment intentions (but also bring on others). During these years, we often doubted if and how we would manage these challenges.

It seems we found our way, as today, we are proud to share the following results:

From remote mountain towns to national capitals, from small schoolyards to the biggest sport halls and exhibition centers, a total of 58 nZEB Roadshow events were organized in the 5 countries, all of them bringing valuable knowledge for the benefits of energy-efficient buildings and developing the local markets. The events were visited by over 20,000 people; project-related training courses only were attended by more than 4000 attendees. More than 100 product manufacturers and suppliers supported the initiative, either by sponsoring the mobile demonstration units or taking part in product



exhibition, training courses and career counselling. The project team reports over 200 individual consultations provided so far, including via the use of specialized equipment and methods as pressurization tests, infrared imaging, energy performance auditing and application of the related software. However, the most important impact is to be found elsewhere: it is estimated that information about the project has reached more than 50,000 stakeholders via local dissemination events, and around 6000 stakeholders through international conferences. This does not account for the general media outreach, as millions of media users have been reached via interviews and reports in the biggest national media. In most of the countries, mock-ups and demo units were filmed by major national TV channels, stimulating additional interest to the topic. And the recognition came: from taking over the main stage at the closing ceremony of the International Passive House Conference, through receiving invitation to present the project's approach and outcomes at the EUSEW, to winning the National Geographic award for best educational project in Croatia and the established b2b media award for innovative design in Bulgaria, the nZEB Roadshow has become a trademark of excellence across Europe.

But the work is far from completed: as a result of the intensive stakeholder engagement campaign, in each involved country, nZEB Roadshow partners are recognized as key partners for the development of national policies, financial support programmes, educational standards, curricula and materials in the area of nZEB and deep energy retrofit – an achievement that already bears tangible results. On top, the interest in continuation of nZEB Roadshow events is clearly visible, with future initiatives already planned practically in each project country, demonstrating both the viability of the concept and the positive impact on the market as a result of the project's activities.

## KEY PROJECT OUTPUTS

### The concept of the nZEB Roadshow

As described above, the nZEB Roadshow project is designed with the goal to stimulate the demand for qualified construction services and skills in five South and East European countries – Bulgaria, Croatia, Greece, Italy and Romania. This goal was achieved through organizing local multi-component events including policy conferences, exhibitions of building products and technologies, practical demonstrations and gamification, training courses for designers and construction workers, information sessions and consultations for citizens active on the real estate market, on-site training at building renovation sites, career orientation and construction job fairs. Through the design and construction of mobile demonstration units and conducting of gamification activities during the nZEB Roadshow events, the project attracted the public and media attention and raised the awareness of the benefits of nZEBs to create common understanding, shared interest and informed demand among investors, homebuyers and owners, thus guiding and stimulating the whole market development.

In line with the overall project concept, nZEB Roadshow events were organized with the strong involvement of the pre-identified stakeholder groups, including industry actors, professional chambers and association, national and local authorities, training and education providers, energy consultants and many more, enabling them to present their nZEB-compatible products and solutions to their targeted users' profiles. The activities were closely monitored following a comprehensive scheme developed especially for this purpose, providing direct feedback for improving of the organization and optimization of the results not only for the project partners, but also for the external participants. In addition, serious attention was paid to various multipliers of the project's message, and specifically to media representatives, which contributed to the public recognition and wide endorsement of the initiative. This collaborative and very practical approach proved its worth by motivating a significant number

of requests for organization of nZEB days in various cities all around the pilot countries, as well as in other countries in the region. The results are explicitly described in the *“Monitoring report with case studies and best practice example for conducting an nZEB Roadshow”*, available at [www.nzebroadshow.eu/publications.html](http://www.nzebroadshow.eu/publications.html).

## Development of mobile demonstration units

The activities for development of mobile demonstration units were a major focus of the nZEB Roadshow project, concentrated on provision of the necessary equipment for organization of local nZEB days, and enabling functional and attractive conduction of the various stakeholder engagement activities. To this aim, mobile training and consultation centres were designed and constructed using the existing experience and capacity of the national project partners. These mobile units were equipped with transportable mock-ups, samples of building products and components, and measurement and diagnostics tools, which enabled the conduction of various upskilling courses, both off- and on-site, as well as multiple activities for engagement of end-users in specific consultations about the functioning, reliability and benefits of nZEBs.



To achieve this goal, detailed specifications for the mobile units in terms of design details, choice of building materials and spatial planning were prepared. In particular, potential issues related to mobile unit's weight, country traffic regulations, transportation ease, landing, storage and support mechanisms were taken into account, enabling the practical realisation and avoiding potential costly mistakes. Further on, numerous professional discussions enabled the adaptation of the concepts according to the countries' respective needs, while providing a baseline for a sustainable, reusable and reversible approach. As a final outcome of this process, "Guidelines for design and operation of mobile training and consultation units" were published, available for any interested party willing to build up the demonstration equipment for hosting the nZEB Days. The different national examples were also presented in the publicly available "Report on the training facilities designed and produced in the pilot countries", with both reports available at [www.nzebroadshow.eu/publications.html](http://www.nzebroadshow.eu/publications.html). In these extensive reviews, the different realisations by the partners are presented through description of the conceptual approach, design drawings, and information about technical equipment (HVAC, thermal envelope etc.) and used materials. In addition, guidelines about assembly, disassembly and reassembly of small mock-ups and demo-units for training purposes are also available for the professional audience.

## Gamification

As an initiative aimed at promoting sustainable and energy-efficient building practices in a non-orthodox way, nZEB Roadshow gamification techniques were specifically elaborated and used to teach students, professionals, engineers, and tradespersons about the basic principles of the nZEB design and construction. By using dedicated mobile mock-ups and demonstration equipment, they represent the key principles of energy efficient buildings, including excellent thermal insulation, airtightness, elimination of thermal bridges, appropriate window selection, and, importantly, use of a mechanical ventilation system with heat recovery (MVHR).

The use of gamification techniques helped to make the learning process regarding these principles more engaging and interactive for participants. By incorporating game-like elements such as challenges and awards, the nZEB roadshow was able to capture participants' attention and motivate them to learn more about the nZEB national standards and conceptual approach. This was thoroughly proven by the practice – from evidencing more than 3000 pupils passing through the nZEB workshop in Greece and receiving the original nZEBO comic book as a reward, to challenging experts at the dedicated stand at the European Sustainable Energy Week in Brussels, winning the accolades of both sustainable energy practitioners and policy-makers.



This is far from all though – it is worth noting that every single mock-up and gaming tool is freely available for everyone interested to replicate and use! Detailed descriptions are available in the nZEB Roadshow's "[Guidelines for games and demonstrations](#)", and direct expert support is provided to any interested educational institution, willing to step out of the well-trodden roads and look into the future of building (and training) techniques.

In conclusion, the use of gamification techniques proved to be one of the most effective ways to teach participants about the general principles of the energy efficient buildings and to explain the benefits



of the nZEB design and construction. By making the learning process more engaging and interactive, the nZEB Roadshow approach was able to promote sustainable and energy-efficient building practices in all participating countries and to encourage participants to adopt these practices in their future projects and, most importantly, in their everyday way of living and thinking about the built environment.

## COUNTRY HIGHLIGHTS

### Bulgaria

The nZEB Roadshow events in Bulgaria started in autumn 2021, with visits to the cities of Pazardzhik and Smolyan. The first event was hosted by the Vocational School of Civil Engineering and Architecture in Pazardzhik, where participants from the construction industry and sector associations in the region discussed opportunities for improving the professional qualifications of young people with representatives of the Ministry of Education and Science and the National Agency for Vocational Education and Training. The event was accompanied by practical training courses, some of which were broadcast live on the social media, and an exhibition, which was attended by representatives of some of the largest nZEB product suppliers and manufacturers.

A similar exhibition was organised in Smolyan later – in September 2021. There, the nZEB were accompanied by training courses for both professionals and homeowners' associations. A particular highlight of this exhibition was the attraction of students from the local high school who visited the exhibition and learned about the latest trends in energy efficiency.

The year 2022 was very active for the nZEB Roadshow project in Bulgaria. The activities started with participation in the Bulgarian Architecture and Construction Week in March, where a booth was organised together with the Bulgarian Association for Construction Insulation and Waterproofing (BACIW), presenting the latest products and advanced technologies aimed at optimal energy efficiency in buildings. A very well attended course on "Basic Principles of nZEB" was also held involving product manufacturers, attracting both pre-registered participants and many regular visitors of the event. This event also marked by the official announcement of the "Renovate Bulgaria" initiative with the participation of the Bulgarian MEP Radan Kanev, main rapporteur for the ENVI Committee in the European Parliament for the Energy Performance of Buildings Directive, and representatives of the key professional chambers, consultancy services and facility management associations.

This year's events continued with visits to the cities of Burgas and Gabrovo. Burgas hosted the traditional national nZEB conference, organized in the city by EnEffect since 2018. Once again, the highly diverse trade fair was supported by a number of training courses for construction professionals, planners and students from the local vocational school, as well as by a roundtable on financing energy efficiency projects. A highlight of this event was a visit to passive buildings under construction in the Burgas area, organized with the support of the specialized local company "D1 Construction".



Following this event, the nZEB Roadshow moved to the city of Gabrovo where, together with the municipality, product exhibition and demonstrations of nZEB products were organized at the main city square, where “Leaders Academy” was holding its annual open-air construction workshop for students at the same time. In parallel, intensive discussions were held, focused on the role of local authorities in delivering of streamlined energy and climate policies.

The last event of the year was held at the University of Architecture, Civil Engineering and Geodesy (Sofia), where in cooperation with “Leaders Academy”, a dedicated “TED-talk”-type lecture for university students was held. Demonstrations with virtual reality equipment as well as presentations of advanced energy efficiency technologies and components were held at the EnEffect booth, while the most established construction companies in the country provided career orientation services for hundreds of young people.

Perhaps the most ambitious events in the nZEB Roadshow project took place at the beginning of 2023, when again Architecture and Construction Week hosted a policy conference with the participation of MEP Iskra Mihaylova, multiple professional discussions and a dedicated training course. The event also showcased the tools developed for delivering a gamification approach to training, using the models developed earlier in the project.

A few weeks later, an exhibition was organised in Sofia's largest shopping centre, Ring Mall, mainly targeted to end-users. Again, efforts to engage children and youths in energy efficiency topics were in the focus, with a number of demonstrations and games organised to attract the attention of the local community and the media. Within this cooperation, further efforts for involving the shopping centre as a whole and the local construction DIY store are expected to result in future events in the autumn of 2023.





In all these events, the nZEB mobile house made by EnEffect played a major role, raising great interest and attracting the attention of both professionals and end users to the topics of energy efficient buildings and the importance of knowledge and skills to achieve optimal results in terms of energy savings, comfort and healthy living conditions. The mobile house deservedly won the plaudits from experts and media alike, and was invited for visits to multiple universities and specialized training establishments as BauAcademy, where it was situated before the journey to the last nZEB roadshow event in Burgas on 31<sup>st</sup> May 2023.

All these efforts naturally attracted media attention. As a result of the implementation of the team's communication strategy, the project events and other related initiatives were extensively covered by the largest national media, public radio and television, and the most popular online platforms in the country. The impact of the project was also recognized by the business community, with EnEffect receiving the established b2b media awards for innovative design (1<sup>st</sup> place) and best educational initiative (2<sup>nd</sup> place).



## Croatia

In Croatia, as many as 14 different nZEB Roadshow events were carried out. All of them were organized in collaboration with different partners (companies from construction industry, producers of construction products and systems, educational institutions, professional associations, etc.); some were conducted as independent events, while others were conducted jointly with other forums. All Croatian nZEB Roadshow events were conducted live even during the COVID situation, with all precaution measures taken into account.

The activities in Croatia were focused around the mobile demonstration facility MUZA as a focal point. The mobile house offers a "first-hand" experience of what an nZEB building should be, what it feels

like to live in such a building (indoor air quality, thermal and acoustic comfort, low energy consumption), and what options are available in terms of design, building materials, technologies, technical systems, automation, and so on. Therefore, it was used as the main tool for education and for promoting the nZEB-related professions, but at the same time as a tool for raising public awareness due to its aesthetic appearance and attractiveness.



MUZA itself was also used as a demonstration unit, as in three different locations, specific topics were presented and discussed:

- **Position 1:** Thermal envelope and thermal insulation materials, Windows and their function from thermal and acoustic protection aspects, Shading devices and their role, Different facade types (ETICS and ventilated façade), Sound insulation
- **Position 2:** Airtightness (its role and how to achieve airtight layer), Pressurisation (“Blower-Door”) test, Heat pumps (principle and external units), Photovoltaic systems
- **Position 3** (inside MUZA): Mechanical ventilation, Heat pumps (principle and internal units), Automation and control, Smart lighting, Monitoring of energy consumption, Energy production, IAQ parameters, and Hygrothermal performance of building envelope elements.

Some of the events were organized at the Technical Museum “Nikola Tesla” in Zagreb, where MUZA was displayed for several months. This marked the participation of MUZA at the 2022 Science Festival themed “Life!”; multiple events were organized during this period to bring the topic closer to ordinary people, young families, school children and all other interested parties.

The collaboration of the nZEB Roadshow team with more than 30 industry partners supporting the design, development, construction and commissioning of MUZA proved to be extremely successful and beneficial also to project educational and dissemination activities, as the majority of the industrial partners also joined the nZEB Roadshow events. After the first events gaining strong publicity, a significant number of new industry partners asked to join the project activities.

The nZEB Roadshow collaborated also with NGOs as Croatia Green Building Council and energy agencies as REA North, governmental bodies as the Environmental Protection and Energy Efficiency Fund, and associations as Croatian Solar Energy Professional Association, Croatian Association of Civil Engineers, or Society of Architects of Zagreb, which organized several trade fairs, hosting MUZA and nZEB roadshow events.



As an exceptional success of the project, the Croatian partners extremely proud of the number of school children and VET students and their teachers, who participated to nZEB Roadshow events around Croatia, proving once again the urgent need for advancing formal vocational education practices. In this respect, the development and use of gamification and exhibition tools during the events proved to be beneficial when organizing events for children and students, efficiently demonstrating the previously mentioned nZEB aspects and actively engaging all visitors. For professionals – architects, engineers and installers, MUZA as a full-scale nZEB demonstration unit with the latest technologies incorporated was the most attractive point of interest.

**During the nZEB Roadshow events, a broad range of activities were organized, such as:**

- MUZA interactive tour and gamification sessions
- Live demonstrations around MUZA – RAL installation of windows, testing of security windows, Blower Door testing, fire testing of non-combustible thermal insulation, noise, airtightness, lighting experiments, smart building technologies, augmented and virtual reality, etc.
- Education/training for heat pump installers at MUZA, training courses for architects and engineers
- Exhibition of construction materials and products for nZEBs around MUZA
- Conferences and round table sessions
- Public nZEB café sessions, where citizens could ask questions related to energy efficiency or ask for advice related to nZEB, RES, electric mobility, etc.
- Guided tours to renovated buildings and new nZEBs.

One of the highlights during the official opening of the Arhibau 2021 trade fair was the visit of the Prime Minister of the Government of the Republic of Croatia Mr. Andrej Plenković to MUZA where he was informed about the nZEB Roadshow project and activities conducted at national level.

The efforts and innovative approach of the MUZA nZEB mobile house in diffusing nZEB knowledge at the national level have been recognized by other parties and received two prizes and one recognition:

- **The Annual Award for Green Building and Sustainable Development** in the **category "Project of the Year"**, presented by the Croatian Green Building Council to the nZEB mobile house MUZA for its special contribution to the promotion of green building and sustainable development in the Republic of Croatia in 2021.
- **Recognition** for the Faculty of Civil Engineering of the University of Zagreb **in the category "Innovation in Presentation"** at the 27<sup>th</sup> University of Zagreb Fair for students. The nZEB mobile house was a key segment of UNIZAG GF's innovative presentation at the University of Zagreb Fair for students in the academic year 2022/2023.
- **The Award Yellow Frame for Sustainable Development, Science and Education** for the nZEB mobile house MUZA in the **category "Industry, Innovation and Infrastructure"** for the year 2022, awarded by **National Geographic Croatia** and **Adria Media Zagreb** to individuals, companies and institutions that make the greatest contribution to sustainability in Croatia.

The Croatian nZEB Roadshow team proactively approach the media, with the public interest being enhanced by the MUZA attractiveness and the story behind it. Afterwards, a good event concept and high-quality activities sparked the interest of media representatives, so that they started approaching MUZA and Roadshow events on their own, which resulted in numerous media publications in the most popular national and professional communication channels in the country.

More information about the project in Croatia can be found at [www.grad.unizg.hr/en](http://www.grad.unizg.hr/en).

***Dear Professor and Respected Assistants,***

*I wanted to tell you that I'm not sorry to have enrolled building physics, in contrary...*

*I am thrilled with the course and effort you invest in providing us with a quality education:*

- high quality live lectures with current examples and videos*
- bring specimens and samples of the systems to lectures*
- organize live experiments and tests for us*
- organize guest lectures and technical visits*
- you listen to the students' thoughts and criticisms*
- you encourage the writing and presentation skills of us students through seminars and pitch presentations*
- developed models with the full scale (1:1) details which are installed in the yard building*

***Keep doing it!***

***Krešimir Kolesarić, student Faculty of Civil Engineering, University of Zagreb***



## Greece



tal Athens, where the local partner

Hellenic Passive House Institute (HPHI) is located, and implemented 9 events in total. Most of the events were multiday gatherings with hundreds of engineers, environmentally curious people, and students attending the public activities. In total, almost a thousand pupils were educated about the Passive House principles and the nZEB standard in general.

The nZEB roadshow in Greece conducted a successful series of events that aimed to promote the nearly zero-energy building standard based on the Passive House concept and to educate the public on the five basic principles of energy efficient building design and construction. The roadshow visited 7 locations in Greece away from the capital

*„It's is very important to see exactly how to install correctly a window or how to prevent mould and condensation in walls. It's also very useful to learn the commissioning of a residential ventilation system. For me as a building physicist this was all known in theory, but new in praxis. So it was very important to participate in a TTT course and get ready to share this knowledge with technicians and construction workers in our new facilities in the future.”*

***Dimitris Pallantzias, Certified PH Designer,***

The events started in Nafplio, a city in eastern Peloponnese. The nZEB Roadshow event in Nafplio aimed to educate engineers, building industry professionals, energy-saving enthusiasts, and anyone interested in sustainable and energy-efficient building practices. Despite the challenges posed by the COVID-19 pandemic, the event successfully included schools and attracted a large number of attendees. The event featured outdoor showcases of nZEB-related products, interactive tablet games and experiments for schoolchildren. Seminars were also held for engineers and other professionals interested in the topic. The event spanned over four days and included visits to schools, a virtual exhibition, seminars, and presentations on various energy-related topics, culminating in a visit to a Passive House on the last day.

Then the nZEB Roadshow went to Trikala, a very active municipality that adapts quickly to new technologies and is currently the most recognizable municipality in Greece in terms of environmental awareness and responsibility. Despite COVID-19 restrictions, the reaction and participation of the Trikala people were overwhelming, making the event a huge success. The third event took place at the University of Patras, in the northern-western part of Peloponnese, and had the most volunteers of all the events. The event was also a great success, with students applying for volunteers and attending seminars to learn about new technologies they will face as professionals. The informational sessions attracted many engineers and technicians, as on the previous two, while the last day study visits were organized at two passive houses – one already occupied, and the other in construction phase.

The fourth event was different from the previous three as the organizers joined the main event organized by the Hellenic Physicists Association, which focused on children and had various physics and technology-related activities, presentations, and experiments. The organizers promoted the nZEB standard and provided information to the students about the five basic principles of a Passive House using gamification and mock-ups. The event took place in the Serafeio cultural centre of the municipality of Athens.

The fifth event took place in Kavala, the first event in the northern part of Greece and an area where the first Passive House was a DIY project. The event was a huge success, with many visitors attending, despite COVID-19 restrictions. The organizers visited the factory unit of ThermoPlastiki and saw the exhibition of the window systems. On the last day, a live blower door test took place in the DIY passive house, following the requirements of the typical certification process.

The sixth nZEB Roadshow event was held in collaboration with the Hellenic Physicists Association as a joint "Physics Summer School" on the island of Aegina. Attendees had the opportunity to engage with experts from both organizations and learn about the latest advancements in the fields of physics and nZEB design and construction. The event was modified from previous roadshows, with presentations in the morning and at noon, including an explanation of the basic principles that formulate the Passive House concept. Interest in the event was high on the last day, with many attendees visiting the first completely autonomous Passive House Premium in the world, located near the village of Tzikides. The attendees were impressed with the stunning views, beautiful interior, and excellent indoor air quality of the house.





The nZEB Roadshow in Kalamata was organized by HPHI and held in the municipal music hall from Thursday, October 6<sup>th</sup> to Sunday, October 9<sup>th</sup>, 2022. The event was attended by many students, and there was a great interest in nZEB design, as evidenced by the high attendance at seminars and workshops. The final day saw a public turnout that exceeded expectations, likely due to the visit to the highly awarded and well-known Passive House building, Nidus. The remaining days included more seminars and workshops, with the last day being a huge success due to the visit to other energy efficient buildings in the area.

The seventh nZEB Roadshow week was held in Kozani, Greece, which has the most passive houses in the country. Despite high emissions from coal-fuelled power plants, promoting nZEB buildings and the Passive House standard has become a priority in the area. The event included school visits, seminars, workshops, and visits to local passive houses and a window manufacturer. The mayor presented the vision for Kozani to become one of the 100 climate-neutral cities in Europe, while certified Passive House Designers presented their work and projects in the area. The event concluded with the successful testing of the airtightness of a passive house in the certification process.

Finally, the last nZEB Roadshow event took place in Athens and involved teaching the principles of nZEBs to 35 pupils from a local elementary school in Cholongos. The event was held in the HPHI's new offices, and the students were given a comic book to learn about the main principles of energy efficient buildings, with their teachers checking their answers the following day at school.

## Italy

Despite the foreseen activities related to live events and nZEB Days, the serious pandemic situation in Italy forced the local partner ZEPHIR to modify its planned activities, which – especially in the initial phase of the project – had to be oriented towards virtual events such as training courses and webinars, and online informational activities like direct marketing, funnels, videos, proper landing pages, etc. This however turned out to be a very successful approach, as communication messages about the benefits of energy efficient buildings reached various audiences in the midst of the most ambitious Italian renovation campaign, driving the interest towards more efficient building solution. During the pandemics, a movie about sustainability with national outreach was produced, and ZEPHIR's director Dr. Francesco Nesi recorded a chapter about sustainable buildings; besides that, multiple training courses were performed, recorded and disseminated with the help of the project.



As the COVID limitations started to be eased, in 2021 ZEPHIR managed to organize 2 nZEB Days in Jesi and in San Daniele del Friuli, directly on the building sites where 2 Passive House buildings were being built, using the construction activities as the perfect setting for training courses for building professionals.

In May 2022, ZEPHIR took part in one of the biggest national building exhibitions in Bolzano, attracting a wide public that got interested in nZEB and Passive House concept thanks to some gamification elements developed within the nZEB Roadshow project.

In June 2022, ZEPHIR got the opportunity to host another nZEB Day at a construction site where a pressurisation (“Blower-Door”) test had to take place, bringing together many different stakeholders in one place and using the occasion for dedicated training activities. After a two-year pause, a Certified Passive House Tradespersons course was organized in Forlì in collaboration with a window manufacturer, where people could experience hands-on how to implement concepts, materials and components on a real-sized wooden demonstration house, again using the established nZEB Roadshow training approach.

In November 2022, two-day lessons at school offered to ZEPHIR the possibility to host games developed within the project and present the nZEBO comic book, translated into Italian and distributed among the pupils. This activity was complemented in 2023 by another two-day discussion about the book and its contents, a short video about climate change, and the nZEB Roadshow workshop for children explaining the main nZEB principles with demonstration models.

In November 2022, as an opening session at the fair Ecomondo-Key Energy in Rimini, the 8<sup>th</sup> Italian Passivhaus conference was organized by ZEPHIR with a participation of over 200 people. The main conference panel was dedicated to international guests, including the Croatian partner who presented the nZEB Roadshow project and the results achieved with MUZA. Besides the conference, the participation with its own stand at the fair allowed ZEPHIR for further dissemination activities, while proving the reliability of the gamification approach not only with pupils and students, but also with adults and potential clients interested in the nZEB and Passive House approach.





In March 2023, ZEPHIR attended the construction fair Klimahouse in Bolzano, where again gamification (bags throws, quizzes for end users and for designers) was the main attraction to the stand, where ZEPHIR's technicians could explain and increase the engagement for energy efficiency of potential customers. In the same week, ZEPHIR's director Dr. Francesco Nesi presented the gamification approach within nZEB Roadshow in an invited talk at the closing plenary session of the 26<sup>th</sup> International Passive House Conference in Wiesbaden, Germany.

In April 2023, another course for Certified Passive House Practitioners was organized in Chiavari, together with several product manufacturers and wood construction companies. A couple of interviews were also broadcast on a national TV channel to mark the occasion.

## Romania

In Romania, the nZEB Roadshow project builds on the results obtained in previous projects such as Train-to-nZEB and Fit-to-nZEB, developed within the nZEB Training and Consultancy Centre ("The Building Knowledge HUB") located at INCĐ URBAN-INCERC in Bucharest. Even though initially the team signed-up for 4 nZEB weeks from the capital of Bucharest to Brasov, Iasi, and Cluj, due to enormous demand, a bonus nZEB Week în Timișoara was added.

### **nZEB Week Bucharest – first stop of the nZEB Caravan (12-17 July)**

The first public activity of the "nZEB Roadshow" project was the organization of the nZEB Bucharest Week. The objective was to initiate contact with different actors in the market to increase the level of information and education in Romania about the nZEB concept, especially as from 2020 all new public buildings had to be nZEB in order to receive the building permit, a criterion that became mandatory from 2021 for all new buildings.



For 6 days, a series of presentations, workshops and practical activities were held on the present and future of Nearly Zero Energy Buildings (nZEB) in Romania. The activities were addressed to private professionals, architects, engineers working in construction or design, as well as to public administration and all citizens, teachers and students interested in nZEB. The event included both online and face-to-face training activities, multiple site visits, and workshops with participation of industrial partners, touching upon topics of various envelope solutions, nZEB installation specifics and integration of PV systems. In many of the activities, full-size demonstration models constructed with partners such as Rockwool, RomeHome, Miradex, Velux, E-Acumulators, Renovata were used, facilitating the understanding of the principles of a high-performance buildings. In addition, visits and lectures around projects involved in the Solar Decathlon initiative were organized, involving many students and young professionals.

The nZEB Bucharest week ended in a relaxed setting with a series of activities for parents and children at EFdeN Sustainable City. Here, the structure of an nZEB Guide to facilitate the implementation of the nZEB concept by all the actors involved was brought up for open discussion.

#### **nZEB Week Brasov – the nZEB Caravan hits the road (4-7 May)**

Due to a good relationship with the City hall of Brasov, the nZEB Caravan benefited from a central location in the heart of the old town of Brasov – St. Ioan Square. The nZEB Brasov week was the first event in this series that allowed live interactions between organizers, partners and participants, thus allowing an organic growth for subsequent events.

This is also where the complex agenda of the nZEB Weeks crystallized – from lectures, to workshops and interactive demonstrations, to consulting and networking to visits to nZEB sites and activities for children.

#### **The key moments of the Brasov nZEB week were:**

- Introductory course in nZEB concept, regulations and practical application
- Workshop "Qualified for nZEB" on nZEB certification
- How to measure airtightness: demonstration of a pressurisation ("blower-door") test
- "Financing energy renovation projects" workshop, addressed to financial institutions and public authorities
- Training professionals and career counselling for nZEB



- Guided tour of the nZEB UNITBV Solar House (prof. Macedon Moldovan)
- Guided tour of the gym being certified to Passive House standard (eng. Szabolcs Varga)
- Guided tour – Zecaph site visit (eng. Vlad Ciobanu)



### **nZEB Week Iasi – nZEB in the heart of the city (29 June – 2 July 2022)**

The third Romanian nZEB week brought together experts in the fields of building design and energy efficiency, suppliers of solutions and technologies for high-performance buildings, academia, local authorities, real estate developers, students, young people and children for four days in the Palas Mall Central Garden in Iasi.

The activities included in the programme were aimed at facilitating a better understanding of the new requirements for the energy performance of buildings (nZEB) and to prepare both the main actors in the building sector and future generations for the development of a sustainable built environment.

Participants also had the opportunity to have study-visits in 3 different locations: Low Energy House – Miolk, Creative Engineering & Litarth, guided tour of the construction site – Braharu House Bear Valley, and Smart & Passive House.



### **nZEB Week Cluj-Napoca – the indoor fair experience (3-6 November 2022)**

Taking place at the Multipurpose Hall "BT Arena", the last nZEB week of 2022 resulted in 4 days of intense activities, 4000 estimated participants, 50 exhibitors and 60 theoretical sessions, workshops, conferences, demonstrations and applied presentations. Conceived as an accelerator for the implementation of the nZEB concept, the Cluj-Napoca nZEB Week brought together all the actors interested



in energy efficiency in buildings, creating the framework for a constructive and topical dialogue between beneficiaries and professionals, and offered a complex experience through diverse activities aimed at facilitating better understanding of the new requirements for the energy performance of buildings.



"Together, public institutions, the private sector and society, we have a duty to produce sustainable, energy-efficient buildings, but we need to raise the level of understanding on the part of people, which is why we created this event. We have invited architects to show them that it is possible to build sustainably, local government representatives, building material manufacturers, but we also have demonstrations for the general public, interactive activities for children – "serious games". After all, we all have a common goal: more energy efficient buildings, a higher quality of life, a safer environment for us and our children", said Horia Petran, president of the PRO-nZEB Cluster.

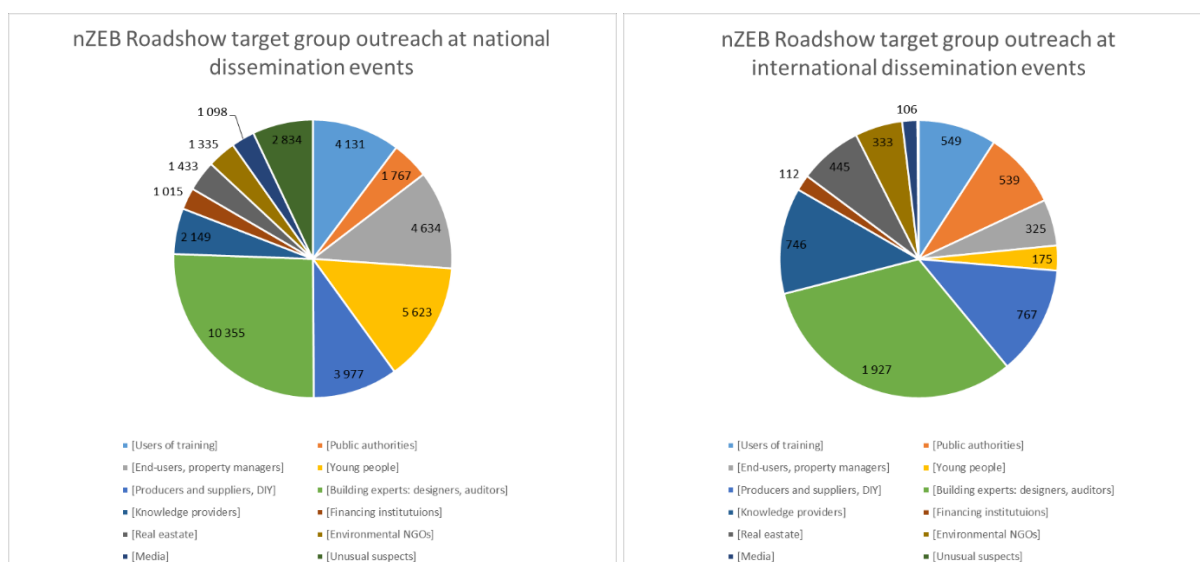
#### **nZEB Week Timisoara – expanding the culture of nZEB (10-13 May 2023)**

The nZEB Timisoara Week is organized by the PRO-nZEB Cluster together with INCD URBAN-INCERC, also involving PORTIC Association, Timisoara City Hall and Timișoara Polytechnic University. At Ianacu Huniade Square, for all those who want to learn how to build more efficiently and reduce energy costs, there will be exhibition stands, workshop areas, areas dedicated to consultancy sessions, demonstration of materials and technologies, and full-scale training models. All participants - professional associations, public officials, NGOs, universities, building professionals, manufacturers and distributors, will this time be challenged to a constructive and topical dialogue focused on the implementation of the nZEB concept, a mandatory standard in Romania. For the children, workshops and demonstrations will be organized in a dedicated "nZEBO & friends" Kids Corner, with the support of De-a arhitectura Association and PORTIC.

## COMMUNICATION AND DISSEMINATION ACTIVITIES

Continuing the tradition of multiple EU-supported BUILD UP Skills and Construction Skills projects fostering the dialogue between the national authorities, construction industry, energy sector and the VET providers, the nZEB Roadshow project took the communicative action regarding nearly zero-energy buildings in the partner countries to an entirely new level. Project partners participated in more than 160 national networking events reaching over 40,000 people, and entered the mainstream TV, radio and online media with messages that had hardly received any attention before, spreading over 410 documented publications. The social media presence was also overwhelming, with conservative estimations of more than 140,000 engagements of project-related content. These activities, expectedly, lead to tangible results:

- In Bulgaria, project-related content was present in all national TV and radio stations, including the three biggest national channels – BTV, Nova TV and the Bulgarian National Television, Bulgarian National Radio and the online platform DIR.bg with more than 1 million unique daily visits.
- In Croatia, besides featuring on some of the most popular national TV and radio stations and attracting the attention of the prime minister and mayors of the biggest cities, nZEB Roadshow and the mobile demonstration unit “MUZA” won the National Geographic award for best educational project in the country.
- In Greece, the communication activities supported the organisation of nZEB Roadshows around the whole territory of the country, always featuring visits to elementary and high schools and games and workshops with students. Thus, more than 3000 pupils were reached, which represents a key milestone for the whole project.
- In Italy, the national Passive House conference was resumed, bringing skills-related issues to the attention of hundreds of participants from all over the world. In parallel, an innovative online marketing campaign was undertaken to spread the message to business-oriented audiences, which are typically difficult to reach by traditional communication activities.
- In Romania, local stakeholders and businesses took active part in the development of the nZEB Roadshow approach, paving the way for large scale acceptance of the concept and organizing the biggest events of the project. Thus, the nZEB roadshow in Cluj gathered around 4000 participants in the new sports hall of the city, while in Timisoara the organizing team alone numbered 200, with nearly 50 exhibitors occupying the main square of the European Capital of Culture for 2023.



## ENSURING EU-WIDE IMPACT

From the EU Sustainable Energy Days to the International Passive House Conference, nZEB Roadshow demonstrated its potential to attract the attention, inspire and motivate various stakeholders' groups to embrace the concept of nearly zero-energy buildings and appreciate the importance of skilled labour and qualified construction services. Here are some of the highlights from just the last few months of the project:

- The nZEB Roadshow concept and insights took the main stage at the closing plenary of the 26<sup>th</sup> International Passive House Conference on 10<sup>th</sup> and 11<sup>th</sup> March 2023 in Wiesbaden, promoting the gamification approach to training and education and providing an interactive and highly engaging experience to the strictly professional audience;
- At the C4E forum in Samorin, Slovakia on 22-25 May 2023, the project team organized one of the most interactive and best visited workshops sessions, providing hands-on training experience for multiple stakeholders from practically all countries of Central and Eastern Europe;





- The last international project conference in Athens on 18-19 May 2023 exemplified the overall approach of the project, bringing around the table competitors from different industries, speaking in one voice for stricter control over the implementation of the national nZEB regulations and the importance of qualified services for achieving a dependable final result;
- On 20-22 June 2023, the nZEB Roadshow exhibition found its way to the EC Charlemagne building in Brussels for the EU Sustainable Energy Days. It was accepted fondly by both professionals and policy makers, with EU Commissioner for Energy Kadri Simson personally enjoying a full-scale visit. In parallel, a dedicated workshop was organized and conducted, demonstrating the project experiences at national level and arguing on the importance of continued support for skills development through regulatory and financial measures;



- The success story of the Building Knowledge Hubs network and the nZEB Roadshow in particular were also recognised by the United Nations Economic Commission for Europe, with project coordinator Dragomir Tzanev invited to speak at dedicated events at the COP26 in Glasgow and at a session of the Group of Experts on Energy Efficiency in Geneva.
- Last but not least, the project team has been very active in cooperation with other “sister projects” promoting the importance of skilled construction services financed by the Horizon 2020 and LIFE programmes of the EU, organizing common workshops and actively contributing to BUILD UP Skills EU exchange meetings organized by CINEA.

## IMPACT AND PROJECT PERFORMANCE INDICATORS

### PRIMARY ENERGY SAVINGS TRIGGERED BY THE PROJECT (IN GWH/YEAR)

Following the conservative approach used for the calculation of the expected impact in the nZEB Roadshow project proposal and based on the achieved outcomes during the reporting period, the triggered savings of primary energy were calculated. The following assumptions were used:

- nZEB building performance and retrofit requirements per country (in primary energy, kWh/m<sup>2</sup>/a),
- 50% of trainees will use the results from the training and actually affect the reduction of the performance gap,
- Energy Performance Gap between predicted (nZEB standard) and actual = 50%. The parameter is decreased from 100% as in the Grant Agreement after revision of the reference sources, thus delivering more conservative results,
- Total m<sup>2</sup> of projects affected completed by trainee during project duration = 500 m<sup>2</sup> for new buildings and 1000 m<sup>2</sup> for retrofit,
- Training will reduce the performance gap by 4% (assumption of gap due to building intrinsic factors of 5% decreased to 1%)
- The number of trained experts achieved so far.

Country	Trainees	Relevance	New Build Projects	Retrofit Projects	nZEB Standard	Standard Retrofit	Energy Performance Gap	Impact on EPG New Build	Impact on EPG Retrofit	Total Savings - New Build	Total Savings - Retrofit
Unit	#	%	m2	m2	kWh/m2/a	kWh/m2/a	%	%	%	GWh/yr	GWh/yr
BG	210	50%	500	1000	95	190	50%	4%	4%	0,10	0,40
HR	2366	50%	500	1000	93,75	112,5	50%	4%	4%	1,11	2,66
GR	766	50%	500	1000	37,6	75,1	50%	4%	4%	0,14	0,58
IT	142	50%	500	1000	80	140	50%	4%	4%	0,06	0,20
RO	620	50%	500	1000	90	200	50%	4%	4%	0,28	1,24
<b>Total</b>	<b>4104</b>									<b>1,69</b>	<b>5,07</b>
<b>Total GA</b>	<b>1000</b>									<b>0,79</b>	<b>2,87</b>

The total number of trainees exceeds the initially planned over four times (4104 vs 1000), mostly due to the very successful campaign in Croatia. Thus, although the lower Energy Performance Gap used for the calculations, the results achieved within the project lifetime exceed the initially planned impact.



## REDUCTION OF THE GREENHOUSE GASES EMISSIONS (IN TCO2-EQ/YEAR)

The reduction of CO<sub>2</sub> emissions is calculated based on the energy savings triggered during the reporting period and the country specific emission factors. The results are as follows:

Country	Total Savings - New Build	Total Savings - Retrofit	Emission reduction New Build	Emission reduction Retrofit
Unit	GWh/yr	GWh/yr	tCO <sub>2</sub> /yr	tCO <sub>2</sub> /yr
BG	0,10	0,40	41,96	167,86
HR	1,11	2,66	224,59	539,03
GR	0,14	0,58	144,01	575,27
IT	0,06	0,20	26,13	91,45
RO	0,28	1,24	69,75	310,00
<b>Total</b>	<b>1,69</b>	<b>5,07</b>	<b>506,44</b>	<b>1683,61</b>
<b>Total GA</b>	<b>0,79</b>	<b>2,87</b>	<b>311,70</b>	<b>1168,86</b>

## INVESTMENTS IN SUSTAINABLE ENERGY TRIGGERED BY THE PROJECT (IN MILLION EURO)

During the project period, the targeted 100 consultations were twice exceeded, with a final number of 211 consultations performed by the project partners (see figures above).

Assuming that 20% of the consulted clients (42 out of 211) will invest 10% more than initially planned to improve buildings energy characteristics, the average area per project is 1000 m<sup>2</sup>, and the average construction cost in the participants countries is 750 EUR/m<sup>2</sup> the investments directly triggered by the project are in the range of 42\*1000\*75 = 3.2 million Euro. Comparison between the expected project impact and the actual achievement is presented in the following table.

	Consulted clients	Influenced clients	Area per project	Average cost	Additional investments	Total triggered
Unit	#	#	m2	EUR/m2	%	mil EUR
Total GA	100	20	1000	750	10%	1,5
Achieved	211	42	1000	750	10%	3,2

## PROGRESS BEYOND THE STATE OF THE ART

Thanks to an incredibly effective communication campaign that leveraged both traditional and social media, combined with active participation in prominent national and international sustainable building design and construction events, the nZEB roadshows have emerged as a prominent fixture in national event calendars. They have become a focal point for all stakeholders across the construction sector value chain. The success of these roadshows is evident in the growing interest they have garnered from potential hosts and supporters, both within partner countries and the broader region. This interest not only validates the concept's viability beyond the project's scope and duration but also indicates the promise of sustaining large-scale nZEB day events for the foreseeable future.

With the rapid development of the Building Knowledge Hubs network, the project team is establishing itself as a prominent player in zero-energy building training collaboration. The team is committed to

delivering world-class upskilling courses that are tailored to local needs and developed in close partnership with the construction industry.

Nevertheless, the journey is far from over. As new and more ambitious building regulations are being enforced, policy instruments are being refined, and the innovation landscape continually introduces fresh solutions and technologies. Amidst the BUILD UP Skills initiative and beyond, the nZEB Roadshow team maintains deep involvement in this ongoing process. Their mission remains resolute: to consistently enhance the competence and skills of building professionals, ensuring they can navigate the evolving market landscape and deliver top-quality zero-energy buildings. This will be done through the following range of activities:

- 1. Annual nZEB Roadshow Events:** Organizing annual nZEB roadshow events focused on sustainable building design and construction, bringing together industry experts, professionals, policymakers, and stakeholders to share knowledge, showcase innovations, and promote best practices.
- 2. Expansion of Building Knowledge Hubs:** Continuously expanding the network of Building Knowledge Hubs in various regions, creating local hubs for knowledge exchange, training, and collaboration among construction professionals and stakeholders.
- 3. Advanced Training Modules with Use of Virtual Reality:** Developing advanced training modules using the cutting edge VR technologies that delve into specific aspects of zero-energy building design and construction, catering to professionals seeking specialized expertise in areas such as energy-efficient materials, renewable energy integration, and smart building technologies.
- 4. Online Learning Platform:** Exploiting the existing online learning platform that offers a range of courses on zero-energy building topics, making education accessible to a wider audience of professionals and enthusiasts.
- 5. Collaboration with Manufacturers:** Collaborating with manufacturers of building materials and components to ensure the availability and accessibility of energy-efficient products that align with zero-energy building goals.
- 6. Industry Certifications:** Establishing industry-recognized certifications for professionals who complete comprehensive training programs, enhancing their credibility and validating their expertise in zero-energy building practices.
- 7. International Collaborations:** Establishing international collaborations and partnerships with organizations, institutions, and experts from other countries to share experiences, lessons learned, and best practices in sustainable building design and construction.
- 8. Policy Advocacy and Guidance:** Continuously engaging with policymakers to advocate for supportive regulations, incentives, and policies that encourage the adoption of zero-energy building practices. Providing guidance to policymakers based on industry insights and trends.

**9. Research and Innovation Support:** Supporting research and innovation in the field of sustainable building by partnering with research institutions, universities, and industry players to identify and develop cutting-edge solutions and technologies.

**10. Demonstration Projects:** Collaborating with construction companies to undertake real-world principles and technologies.

These actions can contribute to the sustained growth, impact, and influence of the project's objectives in promoting zero-energy building practices and enhancing the skills and knowledge of professionals in the construction industry.

## Further information

For those interested to find out more about the activities and training opportunities available through the nZEB Roadshow project and the Building Knowledge Hubs network, the final publication of the project delivers a complete set of information regarding the project activities.

**Available online at**

<https://www.nzebreadshow.eu/publications.html> and at all events organized by project partners – you're more than welcome to take a copy and meet us in person!



### Find us on the web:

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

[www.facebook.com/nzebreadshow](https://www.facebook.com/nzebreadshow)

[www.twitter.com/nZEBRoadshow](https://www.twitter.com/nZEBRoadshow)

[www.instagram.com/nzeb.roadshow](https://www.instagram.com/nzeb.roadshow)

[www.linkedin.com/groups/8482751](https://www.linkedin.com/groups/8482751)

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T: +359 2 963 17 14  
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## Project partners

### **Coordinator of the project:**

Center for Energy Efficiency EnEffect – Bulgaria, [www.eneffect.bg](http://www.eneffect.bg)

### **Project partners:**

Bulgarian Construction Chamber, [www.ksb.bg](http://www.ksb.bg)

Association Cluster for Promoting Nearly Zero Energy Buildings (Pro-nZEB), Romania, [www.pro-nzeb.ro](http://www.pro-nzeb.ro)

URBAB-INCERC, Romania, [www.incd.ro](http://www.incd.ro)

University of Zagreb, Faculty of Construction Engineering, Croatia [www.grad.unizg.hr/en](http://www.grad.unizg.hr/en)

Zero Energy and Passivhaus Institute for Research (ZEPHIR), Italy, [www.zephir.ph](http://www.zephir.ph)

Hellenic Passive House Institute, Greece, [www.eipak.org](http://www.eipak.org)

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