The nZEB ROADSHOW PROJECT







The nZEB Roadshow project

Zero-energy building performance all around us - in the offices, at the 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 exhibitions of building products and technologies, practical demonstrations and gamification in real and virtual reality (VR) environment, training courses for designers and construction workers, information sessions and consultations, on-site training, career orientation and construction job fairs. Through the design and construction of mobile demonstration units, the project activities 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.

At a glance

As of May 2023, more than 40 dedicated nZEB days were organized, displaying significant potential for sustainable continuation of the activities and attracting the interest of the key audiences. The events were visited by over 20,000 people, and covered by the most popular national media. Cooperation with over 100 suppliers of construction materials and technologies was established in dedicated fairs. In most of the countries, the project reached practically all relevant institutions and educational establishments. But how did we do it?



We got on wheels

We designed and constructed mobile training and demonstration units that served as focal points of the nZEB days, raising awareness of the benefits of nZEBs and creating the necessary conditions for effective communication between stakeholders. With very careful attention to exterior and interior design, the centres offer real-life experience of quality nZEB and are equipped with all necessary technologies to provide full information for the buildings' performance in terms of comfort, internal air quality parameters and energy consumption.

We played



All humans start learning by playing... We had it all: gamification tools ranging from the ambitious "Ice Challenge", through big and small-scale mock-ups, hands-on demonstration models, VR programming and equipment, and even our very own comic book, were put into play during nZEB days, including in elementary schools, colleges and universities. The overall feedback was extremely positive, as gamification proves to be an excellent method for awareness raising for completely different target groups, starting with children and non-specialists, and reaching out to established nZEB designers who are perfectly happy explain and demonstrate their own approaches and work.



We talked to people

Yes, that's what we usually do. Policy conferences, seminars, workshops and training events – hundreds of them. But this time, also consulted real projects – more than 100 of them! Because real markets need real projects and real people behind them. And this is where nZEB Roadshow was at its best – in all of the involved countries!

But how did we do it?

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.

The key principles of energy efficient buildings include high levels of 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 partic-

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 rewards, the nZEB Roadshow was able to capture participants' attention and motivate them to learn more about the nZEB national standards and conceptual approach.

As an example, one of the key principles of the highly efficient buildings is the use of a mechanical ventilation system with heat recovery (MVHR). The MVHR mock-up system provides a constant supply of fresh air while recovering the heat from the outgoing air, resulting in significant energy savings. This was showcased with a mock-up made of Plexiglas, while using smoke to simulate the flow of airstreams inside the house. By doing so, it was easier for the attendants, and especially for students, to understand how the MVHR works.

Insulation mock-ups presented to pupils at nZEB Roadshow in Greece





Another important principle of the energy efficient buildings is the use of high levels of insulation. Proper insulation helps to minimize heat loss through the building envelope and reduces the need for heating and cooling systems. Through the specialized demonstration models, participants in the nZEB Roadshow were able to personally experience how the different types of insulation materials perform, to learn about installation methods, and to appreciate the importance of ensuring continuous insulation layer and avoiding thermal bridging.

Airtightness is another critical principle of the nZEB standard. Proper airtightness ensures that the building envelope is well sealed, reducing the infiltration of outside air and minimizing heat loss. Participants in the nZEB Roadshow were taught about the importance of airtightness testing and sealing, as well as about the potential risks of poor airtightness, such as moisture damage and indoor air quality issues. To make it easy for everyone to understand the principle, wooden house mock-ups were designed, using balloons to demonstrate the lack of pressure in unsealed envelope.

Window selection is also a key principle of high-performance buildings. Appropriate window selection can help to minimize heat loss, regulate solar gains, and improve thermal comfort. Participants in the nZEB Roadshow events were taught about the different types of windows available, as well as the importance of proper installation and the use of shading devices to control solar gains. The mock-up included 4 different glazing types with the same window frame that resulted in 4 different situations, easily detectable both by hand and by using thermometers.

Finally, the nZEB approach emphasizes the importance of eliminating thermal bridges. Thermal bridges are areas where the building envelope has lower thermal resistance, resulting in localized heat loss and potential condensation issues. Participants were taught about the different types of thermal bridges and how to design and install building components to minimize their impact. To make it clear to the students what a thermal bridge is, a metal construction similar to a building with typical balconies was used. One of the balconies, as in the majority in the existing building stock, is uninsulated, while the other uses a thermal break to min-



imize the thermal bridge. Thus, the students are able to detect the loss through the thermal bridge by thermal camera and even by hand, and see the difference with the properly designed element.



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.

MOBILE DEMO 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 by the most experienced project partner ZEPHIR, based on its prior engagement with the Roaming Passivhaus module units called BiosPHera 1.0 and 2.0. 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. Additionally, 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 these 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.

In the next phase of the project, the main purpose to stimulate people's engagement and build awareness on the benefits of nZEBs was achieved via the practical realisations by the nZEB Roadshow partners. During times of harsh pandemic restrictions, practical visualization of the mobile units were used in virtual events; after the withdrawal of the restrictions, the already built mobile units hosted multiple training sessions for construction workers, designers and potential clients, increasing the impact of the nZEB Roadshow action on the partners' construction markets.

The different national examples were also presented in the publicly available "Report on the training facilities designed and produced in the pilot countries". In this extensive review, 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 developed by ZEPHIR are also available for the professional audience.

With such careful preparation, it is not surprising that the realised mobile units attracted huge interest themselves: from award-picking in Croatia, to filling out sports halls in Romania, visiting shopping centres, DIY stores, universities and construction exhibitions in Bulgaria, reaching schools and construction sites in every corner in Greece and Italy. In short, the nZEB Roadshow concept in practice – and at full speed.

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 branch 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 broadcasted 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.

2022 was a very active year 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 for achieving 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 streamlinedenergy 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, which 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 is situated before the journey to the last nZEB roadshow event in Burgas on 31st 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.





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The activities in Croatia were focused around the mobile demonstration facility MUZA.

man large

CROATIA

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 popularising 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 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, gov-

ernmental 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 in 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 27th 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 approached 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 sparkled 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.

GREECE



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 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.

Successful series of events actively involving schoolchildren

- 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.
- 2 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.



3 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. Nafplio Trikala Patras Kavala Athens Island of Aegina Kalamata Kozani





4 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.

5 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.



- 6 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.
- 7 The nZEB Roadshow in Kalamata was organized by HPHI and held in the municipal music hall from Thursday, October 6th to Sunday, October 9th 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 eighth 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 vis-



its, 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 Cholargos. 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. 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

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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 as training courses and webinars, and online informational activities as direct marketing, funnels, videos, proper landing pages, etc. This however turned 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 solutions.

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 released, in 2021ZEPHIR 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 the 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 at 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 8th 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 26th 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 broadcasted on a national TV channel to mark the occasion.

ROMANIA



3 - 6 Noiembrie 2022 - BT Arena

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 INCD URBAN-INCERC in Bucharest. Even though initially the team signed up for 4 nZEB weeks from the capital of Bucharest to Brasov, lasi, and Cluj, due to enormous demand, a bonus nZEB Week în Timișoara was added.

URBAN

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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 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 CARA-VAN 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)

Experts in the fields of building design and energy efficiency.



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 IN-DOOR FAIR EXPERIENCE (3-6 NOVEM-BER 2022)

Taking place at the Multipurpose Hall "BT Arena", the last nZEB week of 2022 resulted in 4 days of intense activities, 4,000 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 Iancu Huniade



KEY RESULTS

From remote mountain towns to national capitals, from small schoolyards to the biggest sport halls and exhibition centres, more than 40 nZEB Days 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 visited by more than 4,000 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 150 individual consultations provided so far, including via the use of specialized equipment and methods as pressurisation 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 25.000 stakeholders via local dissemination events, and around 10,000 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, the nZEB Roadshow has become a trademark of excellence across Europe.

NEXT STEPS

Due to the highly successful communication campaign, exploiting both traditional and social media, and through the participation in the most established national and international events in the area of sustainable building design and construction, the nZEB roadshows have already become a recognisable 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 region, which proves the viability in the concept outside the project's support and duration, and promises continuation of the large-scale nZEB days events for years to come. Thus, with the network of Building Knowledge Hubs developing at fast pace, the project team is positioning itself as one of the most recognized zero-energy building training cooperation, offering world-class upskilling courses customized to the local needs and in close collaboration with the construction industry.

However, the work is far from completed, with new and more ambitious building regulations coming into force, policy instruments being developed, and innovation chains constantly unveiling new solutions and technologies. Within the BUILD UP Skills initiative and beyond, the nZEB Roadshow team remains deeply involved in the process, as our mission remains intact: to constantly increase the competence and skills of the building professionals to deliver high quality zero-energy buildings in an ever more informed market environment.



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