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nZEB Roadshow
Bulgaria | Croatia | Romania | Greece | Italy

# Monitoring report with case studies and best practice example for conducting an nZEB Roadshow

**Deliverable 6.1 of the NZEB ROADSHOW project**

**Responsible partner: UNIZAG GF**

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**WWW.NZEBROADSHOW.EU**

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# 1. *EXECUTIVE SUMMARY*

The current document presents an overview of realized interactive national, regional and/or local nZEB weeks and nZEB days in project partner countries, undertaken during the whole project duration period. Its main objectives are as follows:

- To monitor and evaluate project's success indicators and achieving qualitative and quantitative goals.
- Based on monitoring activities to develop national case studies and best practice examples serving both promotional and dissemination functions.
- To produce recommendations for EU-wide replication purposes.

This document covers questions of significant relevance for the replication of the activities as for example which aspects of the developed nZEB Roadshows were successful, what are the lessons learned, which aspects of the process and final events are reproducible, and which parts depend on the specifics of each country. Recommendations for sustainable replication of Roadshow events and their activities aim to provide basic guidance for all interested parties, and they are free to adjust them better to their specific needs.

Potential scenarios for organization and conduction of nZEB weeks / days were envisioned to offer project partners various options and approaches which they could tailor to their possibilities, capacities, and certain national specifics. The same applies for the development of training facilities, gamification instruments and equipment, and most important for their implementation during nZEB weeks / day. These reports are available at the "Publications" section of the nZEB Roadshow website. As it is shown in these current documents, realized nZEB weeks / days differ among project partners, but even for the same project partner, creating an inspiring mosaic for specific stakeholder groups (e.g. local authorities, professional chambers and associations, training providers) interested in continuation of the initiative.

## 2. *METRICS FOR ROADSHOW EVENTS: PROJECT AND NATIONAL KPIs*

The nZEB Roadshow partners have committed to conduct at least 15 large scale nZEB weeks or on average 3 initiatives per country, combining exhibitions, demonstrations, trainings, consultations, and debates. Partners strived to spread the nZEB weeks into 3 to 5 days, however, if this is not applicable the events were broken down into nZEB days, targeted at specific stakeholders and combining appropriate activities.

Some of the project KPIs directly related to the work on NZEB Roadshow events and the average national targets for the planned activities are presented below in Table 1.

**Table 1** Overview of project and national targets related to Roadshow events

| SCOPE | ACTION | PARAMETER | PROJECT TARGET | NATIONAL TARGET |
|---|---|---|---|---|
| **Raising awareness of home and building owners and tenants** | NZEB roadshows | No of events | 15 | **3** |
| | | No of visitors | 3000 | **600** |
| **Partnerships with producers and retailers** | Collaboration at events | No of joint activities | 250 | **50** |
| | Cooperation agreements | No of Memoranda | 50 | **10** |
| **Support to public authorities** | Collaboration at events | No of joint events | 15 | **3** |
| | Procurement support | No of trainings for municipal projects | 10 | **2** |
| **Reduction of the performance gap** | Training courses at roadshows | No of courses | 25 | **5** |
| | | No of trainees | 500 | **100** |
| | Demonstrations | No of visitors | 1200 | **240** |

# 3. *REALIZED NZEB ROADSHOW EVENTS – NATIONAL CASE STUDIES*

Project partners were required to provide a comprehensive summary of their conducted NZEB Roadshow events in a clear tabular format. Each event should then be presented concisely, covering the following aspects:

1. **Event Details**:
   - Location and date of the event, including the duration of the event.
2. **Event Type:**
   - Specify whether the event was a joint effort or an independent one.
   - If it was a joint event, list the collaborating partners or local organizations involved.
3. **Event Concept:**
   - Briefly describe the concept of the event, such as whether it was conducted online or live, whether it followed the "open doors" principle, and if it involved lectures, live demonstrations, guided tours, gamification tools, or any other engaging elements.
4. **Target Groups:**
   - Identify the specific target groups for the event, such as architects, engineers, students, building owners, developers, etc.
5. **Number of Participants:**
   - Clearly state the number of participants who attended the event.
   - Mention how this number was recorded or documented, whether through registration, sign-ups, or any other method.
6. **Client Consultations and KPIs:**
   - Highlight any client consultations or training courses that took place during the event.
   - Mention any Key Performance Indicators (KPIs) that were set for your country in the Grant Agreement and how they were met or surpassed.
7. **Event Photos:**
   - Include few photos from each event, capturing its key moments and participant engagement.
8. **Event Agenda (if available):**
   - If there was an agenda for the event, provide a link or summary of the topics and activities that were covered.
9. **VIP Participants:**
   - Note whether any important national or international political figures visited or participated in the event.
10. **Success Parameters:**
    - Include any other parameters, not necessarily official KPIs, but indicative of the event's success at the national level, such as awards, recognitions, media coverage, etc.
11. **Lessons Learned:**
    - Share any valuable insights or lessons learned from organizing and conducting the event.

By following this format, the report presents a clear overview of the realized nZEB events, while the subsequent concise descriptions provide additional context and highlights for each specific event.

## 3.01 BULGARIA

### SUMMARY

In Bulgaria, 9 different nZEB Roadshow events were realized in total. Type of each event (nZEB week, nZEB day or continuous event), date and location are summarized in Table 2. All events were organized in collaboration with different partners (companies from construction industry, educational institutions, professional associations, etc.) but some events were conducted as independent events, while others were conducted as joint events. More information about each event is provided further in text.

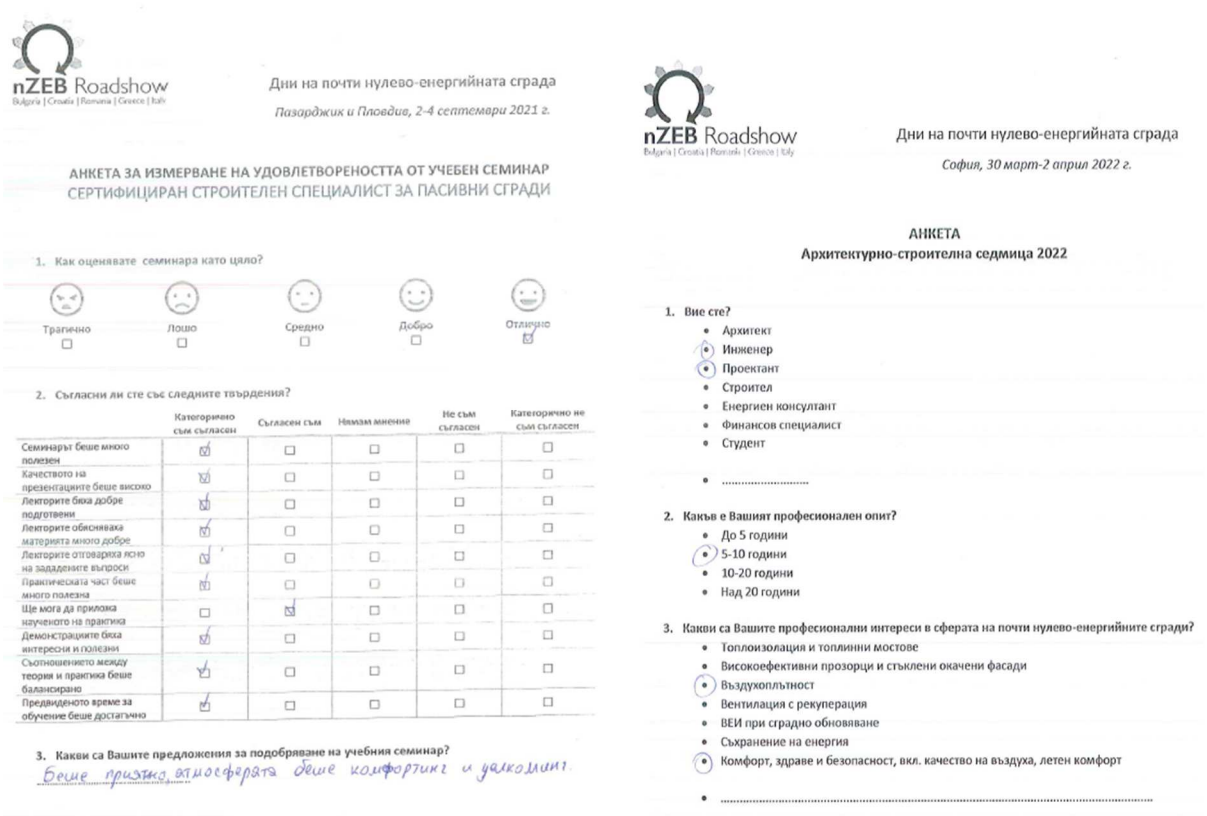
**Table 2** Summary of nZEB Roadshow events conducted in Bulgaria

| No | Event type | Event name | Date | Location |
|---|---|---|---|---|
| 1 | nZEB days | Nearly Zero Energy Building Days | 02.09.2021<br>03.09.2021<br>04.09.2021 | Pazardzhik, Professional High School of Architecture and Construction<br>Plovdiv |
| 2 | nZEB days | Sustainable Heating and Construction Days | 23.09.2021<br>24.09.2021<br>25.09.2021 | Smolyan, city center and municipal hall |
| 3 | nZEB days | Bulgarian Architecture and Construction Week 2022 | 30.03.2022<br>31.03.2022<br>01.04.2022<br>02.04.2022 | Sofia, Inter Expo Center |
| 4 | nZEB days | Sustainable funding for energy efficiency and renewable energy projects | 02.06.2022<br>03.06.2022<br>04.06.2022 | Burgas, Expo Center “Flora” |
| 5 | nZEB days | Gabrovo nZEB Roadshow | 07.07.2022<br>08.07.2022<br>09.07.2022 | Gabrovo, city center and municipal hall |
| 6 | nZEB days | The Leaders Who Build! | 28.09.2022<br>29.09.2022 | Sofia, UACEG |
| 7 | nZEB days | Bulgarian Architecture and Construction Week 2023 | 29.03.2023<br>30.03.2023<br>31.03.2023<br>01.04.2023 | Sofia, Inter Expo Center |
| 8 | nZEB days | Switch to Green | 21.04.2023<br>22.04.20223<br>23.04.2023 | Ring Mall, Sofia |
| 9 | nZEB days | ‘Zero-energy buildings: the future is now’ | 31.05.2023<br>01.06.2023<br>02.06.2023 | Burgas, Expo Center “Flora” |

## Monitoring and evaluation approach

In Task 2.4 (part of the deliverable D2.3), there were different types of activities planned, which were monitored and evaluated following tailor-made criteria for the nZEB Roadshows (both in-person and online). In Bulgaria all nZEB Roadshows were organized with varying specifics – different locations, venues, target audiences, duration, etc. This allowed for the opportunity of featuring different components when possible – seminars for non-specialists (e.g., homeowners, municipal staff), policy conferences, discussion roundtables, tours to relevant nZEBs/passive houses, technical universities visits, joint collaboration with other relevant initiatives/projects.

Participants could register on-site and online prior to the events. In all cases, there was the opportunity of attending certain sessions online as well (such as the training courses for designers and construction professionals, seminars for non-specialists, etc.). Attendance numbers were obtained through registration forms as well as attendance lists on-site, especially during smaller events, where this could be easily controlled, such as the pilot nZEB Roadshow in Pazardzhik. When necessary, information from the events hosting organization obtained via cameras and general registration figures has been investigated to make informed assumptions for the visitors at the nZEB Roadshow stands. This approach was mostly applied for the visiting numbers at larger complex events, such as the ones during the Architecture and Construction Weeks, or at UACEG in Sofia. Both paper-based and interactive surveys were prepared and distributed.


nZEB Roadshow
Bulgaria | Croatia | Romania | Greece | Italy

Дни на почти нулево-енергийната сграда

*Пазарджик и Пловдив, 2-4 септември 2021 г.*

АНКЕТА ЗА ИЗМЕРВАНЕ НА УДОВЛЕТВОРЕНОСТТА ОТ УЧЕБЕН СЕМИНАР
СЕРТИФИЦИРАН СТРОИТЕЛЕН СПЕЦИАЛИСТ ЗА ПАСИВНИ СГРАДИ

1. Как оценявате семинара като цяло?

Трагично ☐ Лошо ☐ Средно ☐ Добро ☐ Отлично ☑

2. Съгласни ли сте със следните твърдения?

| | Категорично съм съгласен | Съгласен съм | Нямам мнение | Не съм съгласен | Категорично не съм съгласен |
|---|---|---|---|---|---|
| Семинарът беше много полезен | ☑ | ☐ | ☐ | ☐ | ☐ |
| Качеството на презентациите беше високо | ☑ | ☐ | ☐ | ☐ | ☐ |
| Лекторите бяха добре подготвени | ☑ | ☐ | ☐ | ☐ | ☐ |
| Лекторите обясняваха материята много добре | ☑ | ☐ | ☐ | ☐ | ☐ |
| Лекторите отговаряха ясно на зададените въпроси | ☑ | ☐ | ☐ | ☐ | ☐ |
| Практическата част беше много полезна | ☑ | ☐ | ☐ | ☐ | ☐ |
| Ще мога да приложа наученото на практика | ☐ | ☑ | ☐ | ☐ | ☐ |
| Демонстрациите бяха интересни и полезни | ☑ | ☐ | ☐ | ☐ | ☐ |
| Съотношението между теория и практика беше балансирано | ☑ | ☐ | ☐ | ☐ | ☐ |
| Предвиденото време за обучение беше достатъчно | ☑ | ☐ | ☐ | ☐ | ☐ |

3. Какви са Вашите предложения за подобряване на учебния семинар?
Беше приятно, атмосферата беше комфортна и уютна.

nZEB Roadshow
Bulgaria | Croatia | Romania | Greece | Italy

Дни на почти нулево-енергийната сграда

*София, 30 март-2 април 2022 г.*

АНКЕТА
Архитектурно-строителна седмица 2022

1. Вие сте?
- Архитект
- (•) Инженер
- (•) Проектант
- Строител
- Енергиен консултант
- Финансов специалист
- Студент
- .....

2. Какъв е Вашият професионален опит?
- До 5 години
- (•) 5-10 години
- 10-20 години
- Над 20 години

3. Какви са Вашите професионални интереси в сферата на почти нулево-енергийните сгради?
- Топлоизолация и топлинни мостове
- Високоефективни прозорци и стъклени окачени фасади
- (•) Въздухоплътност
- Вентилация с рекуперация
- ВЕИ при сградно обновяване
- Съхранение на енергия
- (•) Комфорт, здраве и безопасност, вкл. качество на въздуха, летен комфорт
- .....

**Figure 1** Examples of events' evaluation form and a questionnaire for professionals

Interviews with participants were conducted (some have been recorded and broadcasted on Facebook, others featured on written reports). The professionals from the construction sector could also fill in more detailed questionnaires, which were created for the purpose of obtaining their attitudes, impressions, preferences, etc.

Attendance has been well-documented, using both photos and videos (at the events carried out in 2023 a drone was used for additional interesting visual representations). Materials from all events were also posted on all available social media of the project as well as at EnEffect's and EcoEnergy websites, Facebook and LinkedIn pages.

### Total number of people visiting Bulgarian nZEB Roadshow events

**Table 3** shows the number of visitors to the Bulgaria nZEB Roadshow events (per event and in total for all 9 events) considering all four monitoring and evaluation approaches mentioned above.

**Table 3** Number of visitors/participants at Bulgarian Roadshow events shown through used monitoring approaches

| No | Event type | Event name | Date | Location | NUMBER OF VISITORS/PARTICIPANTS | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Attendance list | Official event report | Photos | Survey |
| 1 | nZEB days | Nearly Zero Energy Building Days | 02.09.2021<br>03.09.2021<br>04.09.2021 | Pazardzhik, Professional High School of Architecture and Construction; Plovdiv | 72 | Available | Available | 15 |
| 2 | nZEB days | Sustainable Heating and Construction Days | 23.09.2021<br>24.09.2021<br>25.09.2021 | Smolyan | 115 | Available | Available | Not available |
| 3 | nZEB days | Bulgarian Architecture and Construction Week | 30.03.2022<br>31.03.2022<br>01.04.2022<br>02.04.2022 | Sofia, Inter Expo Center | / | 350 | Available | 30 |
| 4 | nZEB days | Custainable funding for energy efficiency and renewable energy projects | 02.06.2022<br>03.06.2022<br>04.06.2022 | Burgas, Expo Center "Flora" | 215 | Available | Available | Not available |
| 5 | nZEB days | Gabrovo nZEB Roadshow | 07.07.2022<br>08.07.2022<br>09.07.2022 | Gabrovo | 109 | Available | Available | 24 |
| 6 | nZEB days | The Leaders Who Build! | 28.09.2022<br>29.09.2022 | Sofia, UACEG | / | 240 | Available | 30 |
| 7 | nZEB days | Bulgarian Architecture and Construction Week | 29.03.2023<br>30.03.2023<br>31.03.2023<br>01.04.2023 | Sofia, Inter Expo Center | / | 500 | Available | 35 |
| 8 | nZEB days | Switch to Green | 21.04.2023<br>22.04.2023<br>23.04.2023 | Ring Mall, Sofia | / | 250 | Available | Not available |
| 9 | nZEB days | 'Zero-energy buildings: the future is now' | 31.05.2023<br>01.06.2023<br>02.06.2023 | Burgas, Expo Center "Flora" | 141 | 230 | Available | Not available |
| | | | | | Attendance list | Official event report | Photos | Survey |
| | | | **SUM PER CATEGORY** | | **652** | **1570** | | **134** |
| | **NUMBER OF PEOPLE VISITING AND PARTICIPATING IN ROADSHOW EVENT ACTIVITIES** | | | | | | | **2081** |

### No. 1 event: Pilot Roadshow event Nearly Zero Energy Building Days (02-04.09.2021, Pazardzhik and Plovdiv)

The opening roadshow in Bulgaria targeted the vocational education and training providers and their role for the constant improvement of the supply of quality knowledge content on the nZEB market. Various activities were planned at the premises of the Professional High School for Construction and Architecture, including a product exhibition, training courses for both designers and construction workers, roundtable events with representatives of the Ministry of Education and Science and its regional offices, the Agency for Vocational Education and Training, together with representatives from professional associations, service providers and manufacturers. There was also a guided tour to one of the few Passive House-certified buildings in Bulgaria. Given the COVID-19 health restrictions in place, in-person participation was limited, there was also an opportunity to join in online the discussion seminars, and overall there were 72 participants in all the planned events which exceeded expectations.

Companies and trades: SIGA, YTONG Bulgaria, ATREA, Viessmann, Pichler, Meesenburg Bulgaria, D1.construction, Energomonitor

**Figure 2** Photo of Bulgarian 1st event (Pilot Roadshow Pazardzhik and Plovdiv)

# The nZEB Roadshow

*Проект на „Хоризонт 2020", предназначен да увеличи търсенето на квалифицирани строителни специалисти*

## Почти нулевоенергийни сгради навсякъде...

**Звучи прекалено хубаво, за да е истина нали? За съжаление, все още сме далеч от това да виждаме качествени и енергийноефективни сгради на всеки ъгъл. Каква е причината? Битува схващането, че строителните специалисти нямат необходимите ЗНАНИЯ, УМЕНИЯ и ОПИТ, за да осигурят качествено изпълнение на проекта.**

**Истината обаче е друга: да, все още ни липсват квалифицирани специалисти, но най-вече ни липсват информирани местни пазари. Това, от което наистина се нуждаем, са ПАЗАРИ, ВОДЕНИ ОТ ТЪРСЕНЕТО НА КАЧЕСТВЕНИ СГРАДИ: такива, които не само пестят енергия, но подобряват вашия комфорт и здраве, карат ви да се чувствате щастливи и доволни от добре изразходваните средства.**

**Без информирани пазари няма търсене на квалифицирани строителни специалисти.**

## The nZEB Roadshow

NZEB Roadshow се стреми да отвори местните пазари чрез най-семлите и интуитивни инструменти, да говори с хората и да ги остави да видят, докоснат и усетят предимствата на качествените сгради. Оперирайки успешна мрежа от центрове за обучение в Югоизточна Европа, партньори от 5 държави поемат по пътя да реформят местните пазари и да изградят общности, способни да продължат инициативата, така че добрите почти нулевоенергийни сгради да са навсякъде.

В следващите 3 години ще се ангажираме с не по-малко от 25 седмици посветени на почти нулевоенергийните сгради в България, Хърватия, Гърция, Италия и Румъния. Освен това ще имаме онлайн съдържание, което си струва да видите на www.nzebroadshow.eu. А още по-добре, можете да станете наш нов партньор! Като начало следвайте ни на www.facebook.com/nzebroadshow и www.twitter.com/nzebroadshow.

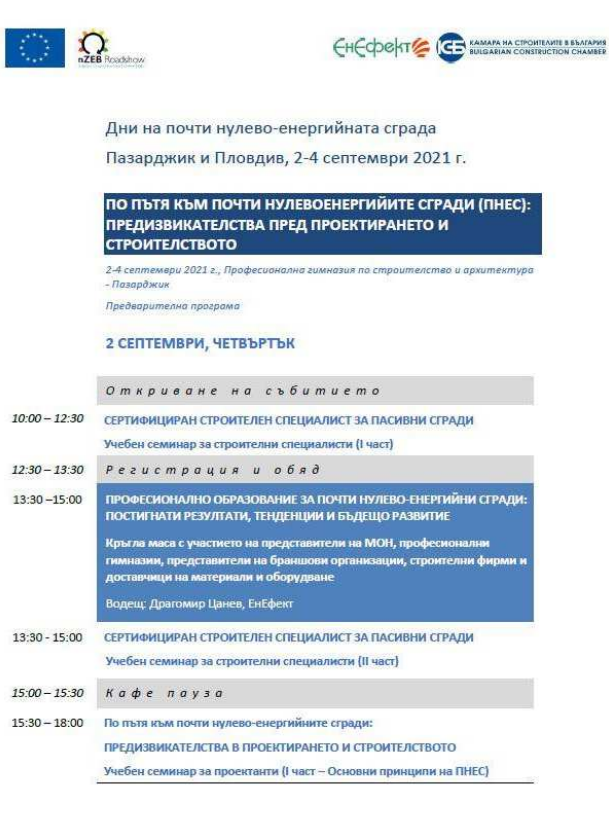
## Какво може да ви предложим::

- ✓ **Мащабни събития с богата и атрактивна програма за конференции**
- ✓ **Мащабни събития с богата и атрактивна програма за конференции**
- ✓ **Мобилни демонстрационни и обучителни секции**
- ✓ **VR демонстрации с помощта на BIM**
- ✓ **Курсове за обучение на проектанти, строителни специалисти и инвеститори**
- ✓ **Обучение на място и подкрепа за текущи проекти на местните власти**
- ✓ **Панаири за работа и събития за кариерно ориентиране**
- ✓ **Много забавления! Между другото все още търсим кетъринг за вино ...**

Координатор: EnEffect

Партньори:

Този проект е получил финансиране от програмата за изследвания и иновации на Европейския съюз „Хоризонт 2020" съгласно Споразумение за безвъзмездна финансова помощ № 892378



Дни на почти нулево-енергийната сграда

Пазарджик и Пловдив, 2-4 септември 2021 г.

**ПО ПЪТЯ КЪМ ПОЧТИ НУЛЕВОЕНЕРГИЙНИТЕ СГРАДИ (ПНЕС): ПРЕДИЗВИКАТЕЛСТВА ПРЕД ПРОЕКТИРАНЕТО И СТРОИТЕЛСТВОТО**

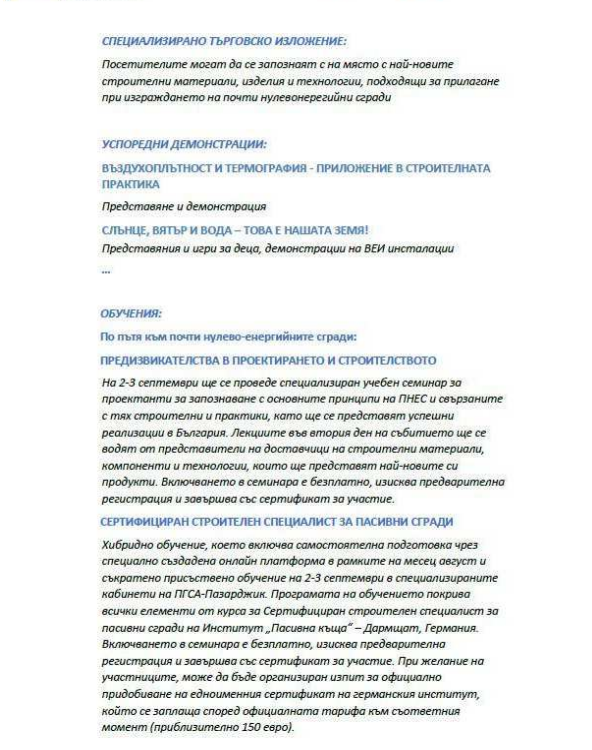
*2-4 септември 2021 г., Професионална гимназия по строителство и архитектура - Пазарджик*

*Предварителна програма*

**2 СЕПТЕМВРИ, ЧЕТВЪРТЪК**

| | |
|---|---|
| | *Откриване на събитието* |
| *10:00 – 12:30* | СЕРТИФИЦИРАН СТРОИТЕЛЕН СПЕЦИАЛИСТ ЗА ПАСИВНИ СГРАДИ<br>Учебен семинар за строителни специалисти (I част) |
| *12:30 – 13:30* | *Регистрация и обяд* |
| 13:30 –15:00 | ПРОФЕСИОНАЛНО ОБРАЗОВАНИЕ ЗА ПОЧТИ НУЛЕВО-ЕНЕРГИЙНИ СГРАДИ: ПОСТИГНАТИ РЕЗУЛТАТИ, ТЕНДЕНЦИИ И БЪДЕЩО РАЗВИТИЕ<br>Кръгла маса с участието на представители на МОН, професионални гимназии, представители на браншови организации, строителни фирми и доставчици на материали и оборудване<br>Водещ: Драгомир Цанев, ЕнЕфект |
| 13:30 - 15:00 | СЕРТИФИЦИРАН СТРОИТЕЛЕН СПЕЦИАЛИСТ ЗА ПАСИВНИ СГРАДИ<br>Учебен семинар за строителни специалисти (II част) |
| *15:00 – 15:30* | *Кафе пауза* |
| 15:30 – 18:00 | По пътя към почти нулево-енергийните сгради:<br>ПРЕДИЗВИКАТЕЛСТВА В ПРОЕКТИРАНЕТО И СТРОИТЕЛСТВОТО<br>Учебен семинар за проектанти (I част – Основни принципи на ПНЕС) |





*СПЕЦИАЛИЗИРАНО ТЪРГОВСКО ИЗЛОЖЕНИЕ:*

*Посетителите могат да се запознаят с на място с най-новите строителни материали, изделия и технологии, подходящи за прилагане при изграждането на почти нулевонегрегийни сгради*

*УСПОРЕДНИ ДЕМОНСТРАЦИИ:*

ВЪЗДУХОПЛЪТНОСТ И ТЕРМОГРАФИЯ - ПРИЛОЖЕНИЕ В СТРОИТЕЛНАТА ПРАКТИКА

*Представяне и демонстрация*

СЛЪНЦЕ, ВЯТЪР И ВОДА – ТОВА Е НАШАТА ЗЕМЯ!

*Представяния и игри за деца, демонстрации на ВЕИ инсталации*

...

*ОБУЧЕНИЯ:*

По пътя към почти нулево-енергийните сгради:

ПРЕДИЗВИКАТЕЛСТВА В ПРОЕКТИРАНЕТО И СТРОИТЕЛСТВОТО

*На 2-3 септември ще се проведе специализиран учебен семинар за проектанти за запознаване с основните принципи на ПНЕС и свързаните с тях строителни и практики, като ще се представят успешни реализации в България. Лекциите във втория ден на събитието ще се водят от представители на доставчици на строителни материали, компоненти и технологии, които ще представят най-новите си продукти. Включването в семинара е безплатно, изисква предварителна регистрация и завършва със сертификат за участие.*

СЕРТИФИЦИРАН СТРОИТЕЛЕН СПЕЦИАЛИСТ ЗА ПАСИВНИ СГРАДИ

*Хибридно обучение, което включва самостоятелна подготовка чрез специално създадена онлайн платформа в рамките на месец август и съкратено присъствено обучение на 2-3 септември в специализираните кабинети на ПГСА-Пазарджик. Програмата на обучението покрива всички елементи от курса за Сертифициран строителен специалист за пасивни сгради на Институт „Пасивна къща" – Дармщат, Германия. Включването в семинара е безплатно, изисква предварителна регистрация и завършва със сертификат за участие. При желание на участниците, може да бъде организиран изпит за официално придобиване на едноименния сертификат на германския институт, който се заплаща според официалната тарифа към съответния момент (приблизително 150 евро).*

**3 СЕПТЕМВРИ, ПЕТЪК**

| | |
|---|---|
| 10:00 – 17:30 | НОВИ СТРОИТЕЛНИ КОНЦЕПЦИИ, МАТЕРИАЛИ И ИЗДЕЛИЯ |
| 10:00 – 12:30 | СЕРТИФИЦИРАН СТРОИТЕЛЕН СПЕЦИАЛИСТ ЗА ПАСИВНИ СГРАДИ<br>Учебен семинар за строителни специалисти (III част) |
| *12:30 – 13:30* | *Обяд* |
| 13:30 – 15:00 | По пътя към почти нулево-енергийните сгради:<br>ПРЕДИЗВИКАТЕЛСТВА В ПРОЕКТИРАНЕТО И СТРОИТЕЛСТВОТО<br>Учебен семинар за проектанти (II част – Сградна обвивка) |
| *15:00 – 15:30* | *Кафе пауза* |
| 15:30 – 17:00 | По пътя към почти нулево-енергийните сгради:<br>ПРЕДИЗВИКАТЕЛСТВА В ПРОЕКТИРАНЕТО И СТРОИТЕЛСТВОТО<br>Учебен семинар за проектанти (III част – Сградни системи) |

**4 СЕПТЕМВРИ, СЪБОТА**

| | |
|---|---|
| | УСПЕШНИ СТРОИТЕЛНИ ПРАКТИКИ И ДЕМОНСТРАЦИИ |
| 10:00 – 12:00 (Пловдив) | УСПЕШНИ ПРАКТИКИ В БЪЛГАРИЯ: ПОСЕЩЕНИЕ НА ПАСИВНА СГРАДА В С. МАРКОВО, ПЛОВДИВ (до 12 участника, с предварителна регистрация)<br>*Инж. Николай Ставрев, Оберон Концептбау* |
| 10:00 – 13:00 (Пазарджик) | ВЪЗДУХОПЛЪТНОСТ И ТЕРМОГРАФИЯ - ПРИЛОЖЕНИЕ В СТРОИТЕЛНАТА ПРАКТИКА<br>*Представяне и демонстрация* |
| | СЛЪНЦЕ, ВЯТЪР И ВОДА – ТОВА Е НАШАТА ЗЕМЯ!<br>*Представяния и игри за деца, демонстрации на ВЕИ инсталации*<br>*Водещи: Ралица Йорданова, Теодора Станишева* |
| | ДЕМОНСТРАЦИИ НА ФИРМИ |

***НА ВНИМАНИЕТО НА ВСИЧКИ УЧАСТНИЦИ:***

**Figure 3** Agenda of Roadshow event organized in Pazardzhik and Plovdiv

## No. 2 event: Sustainable Heating and Construction Days (23-25.09.2021, Smolyan)

The second roadshow in Bulgaria was conducted in the city of Smolyan, in the heart of the Rhodopes mountain. This time there was another approach applied - the product exhibition and demos took place out in the open air in the city center, displaying the latest products and services of companies as SIGA, YTONG Bulgaria, ATREA, Viessmann, Pichler, Meesenburg Bulgaria, D1.construction, Sofia Energy Agency SOFENA, Energy Agency of Plovdiv, NEDSTAR Ltd and Raykov Service Ltd, as well as the Municipality of Smolqn itself. There were also demonstrations and games for children foreseen.

The exhibition was combined with on-site and online training courses for both building professionals and non-specialists, and attracted an extensive media interest. With the support by the municipality, the seminars were organized in its administrative building, where during the nZEB Days, additional seminars for municipal administrations, investors, energy agencies, building owners, and professional facility managers took place, too. With respect to the current COVID-19 healthcare safety regulations, in-person participation was restricted to 30 people at a time, with a total of 115 participants for the whole time of the event.

**Figure 4** Few photos of Bulgarian 2nd event (Smolyan)

| | |
|---|---|
| 11:30 - 12:00 | **Отопление, охлаждане и вентилация в ПНЕС**<br>Инж. Александър Станков, ЕнЕфект |
| 12:00 - 12:30 | Въпроси и отговори |
| 12:30 - 13:30 | Обяд |
| 13:30 - 14:00 | **Предизвикателства пред строителството на ПНЕС в България. Сградна обвивка**<br>Инж. Васил Манолов, ЕнЕфект |
| 14:00 - 15:00 | **Предизвикателства пред строителството на ПНЕС в България. Сградна обвивка**<br>Фирмени презентации |
| 15:00 - 15:15 | **Модели на едно гише за обновяване на жилищни сгради**<br>Милена Агопян, Енергийна Агенция- Пловдив |
| 15:15 - 15:30 | Кафе пауза |
| 15:30 - 16:00 | **Предизвикателства пред строителството на ПНЕС в България. Сградни системи**<br>Инж. Александър Станков, ЕнЕфект |
| 16:00 - 17:00 | **Предизвикателства пред строителството на ПНЕС в България. Сградни системи**<br>Фирмени презентации |

## ОСОБЕНОСТИ ПРИ ИЗПЪЛНЕНИЕ НА ЕНЕРГОСПЕСТЯВАЩИ МЕРКИ

**Обучение**

за домоуправители и собственици на сгради

**Организатор**

Център за енергийна ефективност „ЕнЕфект"

| | |
|---|---|
| 17:00-17:30 | Регистрация на участниците |
| 17:30 - 19:00 | **ОСОБЕНОСТИ ПРИ ИЗПЪЛНЕНИЕ НА ЕНЕРГОСПЕСТЯВАЩИ МЕРКИ – част 1**<br>Инж. Александър Станков; арх. Ралица Йорданова<br>Топлоизолация на стени<br>Вътрешна топлоизолация на стени<br>Топлоизолация при основи |

## Дни на устойчивото отопление и строителство

**23 – 25 септември 2021 г.**

гр. Смолян, бул. „България" № 12, Сесийна зала на Община Смолян

и онлайн в ZOOM

***Изложение и професионални обучения***

Организатори:

**Черноморски изследователски енергиен център**

**Център за енергийна ефективност „ЕнЕфект"**

**Камара на строителите в България**

## ПРОГРАМА

### 23 септември 2021 г., четвъртък

## ПРЕДИЗВИКАТЕЛСТВА В ПРОЕКТИРАНЕТО И СТРОИТЕЛСТВОТО

**Семинар**

за проектанти и строителни специалисти

**Организатор**

Център за енергийна ефективност „ЕнЕфект"

| | |
|---|---|
| 09:30 - 10:00 | Регистрация на участниците и кафе |
| 10:00 - 10:10 | Откриване |
| 10:10 - 11:10 | **Концепция за строителството на ПНЕС;**<br>**Влияние на формата и ориентацията на сградата; основни принципи на ПНЕС**<br>Арх. Ралица Йорданова, ЕнЕфект |
| 11:10 - 11:30 | **Вътрешна топлоизолация**<br>инж. Васил Манолов, ЕнЕфект |

| | |
|---|---|
| 14:30 - 14:40 | **Когенерационни и топлофикационни системи**<br>инж. Илия Николаев |
| 14:40 - 15:00 | **Системи за интегрирано автоматизирано управление на ВЕИ инсталации**<br>инж. Велизар Проданов |
| 15:00 - 15:20 | Кафе пауза |
| 15:20 - 16:00 | **Себестойност на топлинната енергия от различни източници. Екологични показатели на горивата. Режими на топлоснабдяване – особености и управление. Критерии за избор на системи за отопление и топла вода**<br>Илия Николаев |
| 16:00 - 16:15 | **Интелигентните градове в действие и ролята на енергийно позитивните зони в градското развитие, проект CityXChange**<br>Ина Карова, Енергийна Агенция - Пловдив |
| 16:15 – 16:30 | **Платформа EN-TRACK в помощ на устойчивото финансиране на проекти за сградно обновяване.**<br>Станислав Андреев, ЕнЕфект |
| 16:30 - 17:00 | Въпроси и отговори |
| 17:00 – 17:15 | **Проект PowerPoor - работа с енергийно бедни граждани**<br>Лили Щамлер, СОФЕНА |

## ОСОБЕНОСТИ ПРИ ИЗПЪЛНЕНИЕ НА ЕНЕРГОСПЕСТЯВАЩИ МЕРКИ

**Обучение**

за домоуправители и собственици на сгради

**Организатор**

Център за енергийна ефективност „ЕнЕфект"

| | |
|---|---|
| 17:00 - 17:30 | Регистрация на участниците |
| 17:30 - 19:00 | **ОСОБЕНОСТИ ПРИ ИЗПЪЛНЕНИЕ НА ЕНЕРГОСПЕСТЯВАЩИ МЕРКИ – част 2**<br>Инж. Александър Станков; арх. Ралица Йорданова<br>Топлоизолация на покриви<br>Прозорци<br>Въздухопътност на сградната обвивка |

### 24 септември 2021 г., петък

## ТЕХНОЛОГИЧНИ РЕШЕНИЯ ЗА ДЕКАРБОНИЗИРАНЕ НА БИТОВОТО ОТОПЛЕНИЕ

**Обучение**

за общински администрации, инвеститори, енергийни агенции, консултанти и домакинства

**Организатор**

Черноморски изследователски енергиен център (ЧИЕЦ)

| | |
|---|---|
| 09:30 - 10:00 | Регистрация на участниците и кафе |
| 10:00 - 10:10 | **Откриване**<br>Марин Захариев, Заместник кмет, Община Смолян |
| 10:10 - 10:30 | **Проект REPLACE - Ефективно, достъпно и чисто отопление и охлаждане за европейските потребители**<br>Ангел Николаев, ЧИЕЦ |
| 10:30 - 11:00 | **Защо отоплението и охлаждането с възобновяеми източници в домакинствата е важно? Европейски и национални цели, тенденции, финансиране, иновативни схеми**<br>Генади Кондарев, ЧИЕЦ |
| 11:00 - 11:20 | **Термопомпи за енергоефективно отопление, охлаждане и топла вода**<br>инж. Петър Камбуров |
| 11:20 - 11:50 | **Особености при проектиране, монтаж и експлоатация на слънчеви топлинни инсталации**<br>инж. Виктор Камбуров |
| 11:50 - 12:20 | **Възобновяеми енергийни източници – икономическа ефективност**<br>инж. Петър Камбуров |
| 12:20 - 12:40 | Въпроси и отговори |
| 12:40 - 13:40 | Обяд |
| 13:40 - 14:00 | **Ефективни системи за оползотворяване на биомасата**<br>инж. Илия Николаев |
| 14:00 - 14:30 | **Фотоволтаични системи**<br>инж. Велизар Проданов |

25 септември 2021 г., събота

ТЕХНОЛОГИЧНИ РЕШЕНИЯ ЗА ДЕКАРБОНИЗИРАНЕ НА БИТОВОТО ОТОПЛЕНИЕ

Обучение

за инсталатори, проектанти и доставчици на отоплителни системи

Организатор

Черноморски изследователски енергиен център (ЧИЕЦ)

| | |
|---|---|
| 09:30 - 10:00 | Регистрация на участниците и кафе |
| 10:00 - 10:10 | Откриване |
| 10:10 - 10:30 | Проект REPLACE - Ефективно, достъпно и чисто отопление и охлаждане за европейските потребители<br>Ангел Николаев, ЧИЕЦ |
| 10:30 - 11:00 | Защо отоплението и охлаждането с възобновяеми източници в домакинствата е важно? Европейски и национални цели, тенденции, финансиране, иновативни схеми<br>Генади Кондарев, ЧИЕЦ |
| 11:00 - 11:30 | Особености при проектиране, монтаж и експлоатация на слънчеви топлинни инсталации<br>инж. Виктор Камбуров |
| 11:30 - 12:00 | Термопомпи за енергоефективно отопление, охлаждане и топла вода<br>инж. Петър Камбуров |
| 12:00 - 12:30 | Въпроси и отговори |
| 12:30 - 13:30 | Обяд |
| 13:30 - 14:00 | Ефективни системи за оползотворяване на биомасата<br>инж. Илия Николаев |
| 14:00 - 14:30 | Фотоволтаични системи<br>инж. Велизар Проданов |
| 14:30 - 14:40 | Когенерационни и топлофикационни системи<br>инж. Илия Николаев |
| 14:40 - 15:00 | Системи за интегрирано автоматизирано управление на ВЕИ инсталации<br>инж. Велизар Проданов |
| 15:00 - 15:30 | Възобновяеми енергийни източници – икономическа ефективност<br>инж. Петър Камбуров |
| 15:30 - 15:50 | Кафе пауза |
| 15:50 - 16:30 | Себестойност на топлинната енергия от различни източници. Екологични показатели на горивата. Режими на топлоснабдяване – особености и управление. Критерии за избор на системи за отопление и топла вода<br>Илия Николаев |
| 16:30 - 17:00 | Въпроси и отговори |

*Дните на устойчивото отопление и строителство се организират в рамките на проектите REPLACE и nZEB Roadshow, финансирани от програмата за научни изследвания и иновации „Хоризонт 2020" на Европейския съюз, с любезната подкрепа на Община Смолян.*

*Специално участие в обученията ще вземат проектите PadovaFIT Expanded и +CityxChange, финансирани от програма „Хоризонт 2020" на ЕС.*

**Figure 5** Agenda of Roadshow event organized in Smolyan

### No. 3 event: Bulgarian Architecture and Construction Week 2022 (30.03-02.04.2022, Inter Expo Center, Sofia)

The 3rd event was at the Bulgarian Architecture and Construction Week. Apart from the product exhibition and demos, there were also training courses for designers and construction workers, as well as games for the youngest. The event featured also a training session with 9 manufacturers, as well as a circularity in construction roundtable with the Bulgarian Construction Chamber. During the last day of the event, there was a session dedicated to the official announcement of Renovate Bulgaria coalition with MEP Radan Kanev and the executive director of the Sustainable Energy Development Agency, Ivaylo Aleksiev, and the executive director of the Bulgarian Association for Construction Insulation and Waterproofing. The event saw 350 participants in total for the whole period.

**Figure 6** Few photos of Bulgarian 3rd event (Sofia)

### No. 4 event: Sustainable funding for energy efficiency and renewable energy projects (02.06-04.06.2022, Expo Center Flora, Burgas)

The nZEB Days later landed their Bulgarian "birthplace" - Expo Centre "Flora" in Burgas, where the national nZEB conference was carried out in 2018 and 2019. Policy conference focusing on the future Decarbonisation Fund was combined with product exhibition and training for both building professionals and homeowners. The product exhibition featured the names of Adverso, Passive house shop, Meesenburg, Knauf Insulation, Saint Gobain Isover, Schock Isocorb, JAF Group, Steico, NED Star EOOD, Energy Effect EAD, Energyprom EOOD, and SOFENA, with additional representatives from other firms joining in as lecturers.

The agenda featured VR demos, games and activities for children, as well as a tour to passive houses in the region.  A total of 315 participants joined in both in person and online.

**Figure 7** Few photos of Bulgarian 4th event (Burgas)

### No. 5 event: Gabrovo nZEB Roadshow (07.07-10.07.2022, Gabrovo)

The 5th event for the nZEB roadshow is in central part of the country - Gabrovo. The event blended discussion forum focused on sustainable financing of RES and EE projects, product exhibition and training for both building professionals and homeowners. It was organized together with Leaders Academy - a training format that matches students with leading companies in the construction sector. Their summer school program kicked in alongside the nZEB Days, with the aim to inspire and motivate young people aged 16-19, who are just taking one of the most important steps in their lives. There were practical trainings, demos and activities with the full arsenal of equipment, and of course, games for all ages to participate in.

Project exhibition featured firms such as Passive house shop, Meesenburg, JAF Group, Atrea, Gaztek EOOD, Switch home, and SOFENA. Specialized lectures took place at the building of the Technical University - Gabrovo, and participants could also visit PV installments. A total of 109 participants attended the several days of activities.

**Figure 8** Few photos of Bulgarian 5th event (Gabrovo)

### No. 6 event: The Leaders Who Build! (28.09-29.09.2022, UACEG, Sofia)

The autumn nZEB Days in Bulgaria took place at the largest interactive event in architecture and construction - The Leaders Who Build.

The event featured discussion panels and workshops, and participants could visit over 30 interactive stations and meet representatives from the most active firms in the construction sector. EnEffect's team shared a stand with D1.Construction - a forthcoming construction firm, at the University of Architecture, Civil Engineering and Geodesy.

The event was aimed at students, current and prospective professionals in the sustainable construction industry. Visitors could try VR sets, participate in any of the professional seminars and demos freely, and also express their attitudes and opinions via surveys. A total of 240 participants were engaged in the university throughout the events.

**Figure 9** Few photos of Bulgarian 6th event (Sofia)

### No. 7 event: Bulgarian Architecture and Construction Week 2023 (29.03-01.04.2022, Inter Expo Center, Sofia)

The 7th nZEB Days event in Bulgaria once again joined the Bulgarian Architecture and Construction Week in Inter Expo Center, Sofia on 29th March - 1st April.

During one of the biggest product exhibitions, visitors were able to visit various mock-ups, participate in specialized demos and games, the mobile nZEB caravan, familiarize with different technical components and materials and receive individual consultations on building related topics.

There was also a training session for nZEB construction and several high-level conference sessions, organized by the Bulgarian Construction Chamber.

It was the most popular among the events, with 500 participants.

**Figure 10** Few photos of Bulgarian 7th event (Sofia)

### No. 8 event: Switch to Green (21-23.04.2023), Ring Mall, Sofia

For the 8th nZEB event, the aim was to reach non-specialists, too, going to a popular shopping destination - one of the biggest malls in Sofia. Given the International Earth Day, it made sense to carry out the event on the weekend so that more people can join in such an initiative raising awareness about EE and nZEBs. All available mock-ups, equipment and sets developed during the project were available for participants to learn and experience first-hand the benefits of sustainable construction practices, materials and the necessary skills.

There were nZEB presentations, visits to the nZEB Caravan organized, as well as personal consultations provided about particular questions related to building construction and renovations.

A total of 250 people attended for the whole period. This event was also awarded the second prize of the annual “b2b media awards” for best educational initiative.

**Figure 11** Few photos of Bulgarian 8th event (Sofia)

### No. 9 event: 'Zero-energy buildings: the future is now' (31.05-02.06.2023), Expo Center Flora, Burgas

Last nZEB Days event in Bulgaria took place on 31 – 2 June in Burgas under the title 'ZERO-ENERGY BUILDINGS: THE FUTURE IS NOW'. The first day of the national conference was dedicated to knowledge, skills and competences for zero-energy buildings, with the latest information about current training schemes and educational opportunities, and discussion sessions on developing a system for continuing professional development. The firms attending the exhibition and lectures were Alukönigstahl, Passive house shop, Meesenburg, Knauf Insulation, Schock isocorb, JAF Group, Re-energy geothermal systems, Energomonitor, School for Solar Professionals.

As always, there was a specialized expo and demonstrations and company presentations of the latest building materials, products and technologies. Featured on the agenda were also policy sessions on financing of nZEBs, municipal seminar for RES and EE investments conducted by EIB, as well as a training seminar for designers and construction professionals, and a seminar for home managers and homeowners. There were further seminars to introduce renewable energy financing programs and technologies, discussions on the feasibility of energy cooperatives in Bulgaria, geothermal energy information sessions, as well as energy auditors training.
A total of 230 participants joined in.

**Figure 12** Few photos of Bulgarian 9th event (Burgas)

## LESSONS LEARNED

Since the pilot nZEB Roadshow in Bulgaria, there's been a steep learning curve for the entire project team. Except for the Architecture and Construction Week, all nZEB Days have taken place at various locations, which made room for different approaches to be tested, refining the process of organizing each following event, as the content grew richer.

Aside from the technical aspects of event organization and preparation, such as coordination of nZEB caravan logistics, choice of venue, sound system, exhibition location and set up, etc., content-wise, establishing a concrete outcome and knowing the audience have proven to be crucial for the design and delivery of relevant and interesting core features of the agenda (such as the training courses for designers and construction professionals, demos and exhibitions) and supporting activities (seminars for non-specialists, policy conferences, games, etc.). The demand for such training and educational schemes for construction professionals, as well as for energy efficiency services, is invariably tied to the availability of financing for building renovation projects in the country. Naturally, this has been the greatest driver of interest to nZEB Roadshow events, as evidenced from the greater popularity of the latest nZEB Days in Sofia and Burgas, where funding opportunities arising from the launch of the

National Programme for the renovation of residential buildings were in the spotlight (the latest round of the programme was announced in December 2022). However, the lack of continuity of such programmes, together with an absence of a nation-wide qualification scheme for professionals in the construction sector, have been major impediments in the sustainable building renovation process in the country, thus subjects of continuous advocacy campaigning with the relevant central and local stakeholders.

Having taken care of all technical and content details, the overall success of the event goes hand in hand with a well-developed and timely executed communication strategy, aimed at raising the awareness, informing, and engaging all key stakeholders well ahead of time. Having regular social media presence and sound media coverage with higher quality of outputs generates greater interest and understanding of the wider benefits of nZEBs in both citizens and investors, and, not the least, it boosts morale of the participants, sending an important message to the policymakers and markets – the future of nZEBs is already here and we are serious about it.

## 3.02 CROATIA

### SUMMARY

In Croatia, 14 different nZEB Roadshow events were realized in total. Type of each event (nZEB week, nZEB day or continuous event), date and location are summarized in Table 4. All events were organized in collaboration with different partners (companies from construction industry, educational institutions, professional associations, etc.) but some events were conducted as independent events, while others were conducted as joint events. More information about each event is provided further in text.

**Table 4.** Summary of nZEB Roadshow events conducted in Croatia

| No | Event type | Event name | Date | Location |
|---|---|---|---|---|
| 1 | nZEB day | Pilot Roadshow event – MUZA opening (closed event) | 16.06.2021 | Zagreb, Technical Museum Nikola Tesla (TMNT) |
| 2 | nZEB week | European Mobility Week "Safe and Healthy with Sustainable Mobility!" | 16.09.2021<br>17.09.2021<br>22.09.2021 | Zagreb, TMNT |
| 3 | nZEB week | 8th Assembly of Croatian builders: "Construction and Climate change" | 03.– 05.10.2021 | Vodice, Hotel Olympia |
| 4 | nZEB week | ArhiBau 2021: “Fair on construction culture and sustainable development” | 07.– 09.10.2021 | Zagreb, Arena Zagreb sports hall |
| 5 | nZEB day | Importance of education in the field of energy efficiency and sustainable building | 03.11.2021 | Koprivnica, University North Campus |
| 6 | nZEB week | 24th International fair SASO 2021 | 10.– 13.11.2021 | Split, Spaladium sports hall |
| 7 | nZEB days | Healthy and comfortable living – NZEB | 01.12.2021<br>03.12.2021 | Varaždin, Faculty of Geotehnical Engineering, University of Zagreb |
| 8 | NZEB days | SUPEUS Case Study | 09.-12.12.2021 | Zagreb, Faculty of architecture, Faculty of mechanical engineering and naval architecture, Faculty of Electrical Engineering and Computing all from University of Zagreb |
| 9 | Continuous event | Polish students – field excursion | 17.06.2021 | Zagreb, TMNT |

| | | | | |
|---|---|---|---|---|
| | | "Summer at Tesla" – a series of workshops for children, youth and adults. | 23.08.2021 | |
| | | Building Physics course at FCE-UNIZAG | 09.12.2021<br>16.12.2021 | Zagreb, Faculty of Civil Engineering, University of Zagreb |
| 10 | nZEB week | NZEB Roadshow project and MUZA visiting Osijek | 25.– 29.04.2022 | Osijek, Faculty of Civil Engineering and Architecture, University J.J. Strossmayer |
| 11 | nZEB week | Science festival 2022 | 02.– 07.05.2022 | Zagreb, TMNT |
| 12 | nZEB day | Closed event for window professionals | 22.09.2022 | Trakošćan, Hotel Trakošćan |
| 13 | nZEB week | ArhiBau.hr 2022: "Fair on construction culture and sustainable development" | 05.– 08.10.2022 | Zagreb, Arena Zagreb sports hall |
| 14 | nZEB week | University of Zagreb Fair for students | 10.– 12.11.2022 | Zagreb, Zagreb Fair |

### Monitoring and evaluation approach

In Task 2.4 (part of the deliverable D2.3), a wide range of the activities were foreseen based on which robust monitoring and evaluation scheme is developed for different scenarios of nZEB Roadshow events (offline/live and online). All Croatian nZEB Roadshow events were realized live, thus proposed monitoring approach was carefully tailored and adapted depending on the specifics of Croatian events (duration of the event, targeted audience, concept of the event, independent or joint event).

Monitoring and evaluation approach targeting Roadshow event participants consisted of four main segments:

1) Onsite or pre-site registration
2) Live (interactive) survey through QR codes
3) Surveillance cameras installed on MUZA
4) Detailed documentation using photos and videos

#### 1) <u>Onsite or pre-site registration</u>

It has been shown that on-site or pre-site registration can be required and implemented only for events where attendees are easier to control (events without high fluctuation of large number of visitors). Such events are closed events such as the Pilot roadshow event - MUZA opening for professionals (1st event) or public events for which visitor groups have been announced and agreed upon in advance (e.g. European Mobility Week "Safe and Healthy with Sustainable Mobility!" – 2nd event).

## 2) Live (interactive) survey through QR codes

Similar to the use of attendance lists, it was difficult to motivate and "catch" each visitor to scan the code QR with their smartphones and participate in the interactive survey at events with a high fluctuation of visitors (e.g., events at different trade fairs). Therefore, we focused primarily on the announced groups of students and encouraged them to participate in our survey, which can be clearly seen in the age group of the respondents (Question 11 in Figure 25). Figure 13 shows the appearance of the QR code and some of the positions on (or around) the mobile house MUZA.

**Figure 13** QR code for accessing the short survey and collecting visitors feedback

Feedback survey consisted of 11 short questions with answers already offered in advance (all in Croatian). The main aim was to get basic information about the responders (age group/ professional expertise), their current knowledge about nZEB buildings and to get feedback about MUZA. Attendees of the nZEB Roadshow events were invited to scan the QR code with their smartphones and complete the survey after all the activities, demonstrations, and presentations around (and inside) MUZA were conducted.

During all 14 nZEB Roadshow events in Croatia, a total of 350 participants joined the survey. The results are summarized for all events and shown for each question in Figure 14 – Figure 25. For the sake of brevity, only main conclusions derived from survey results are presented in the next paragraph.

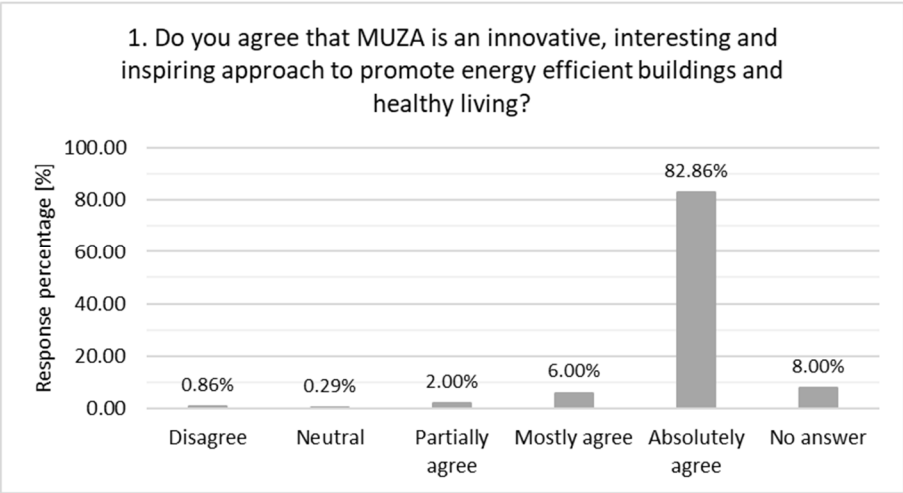



**Figure 14** Feedback of participants on their overall view of the nZEB mobile house MUZA

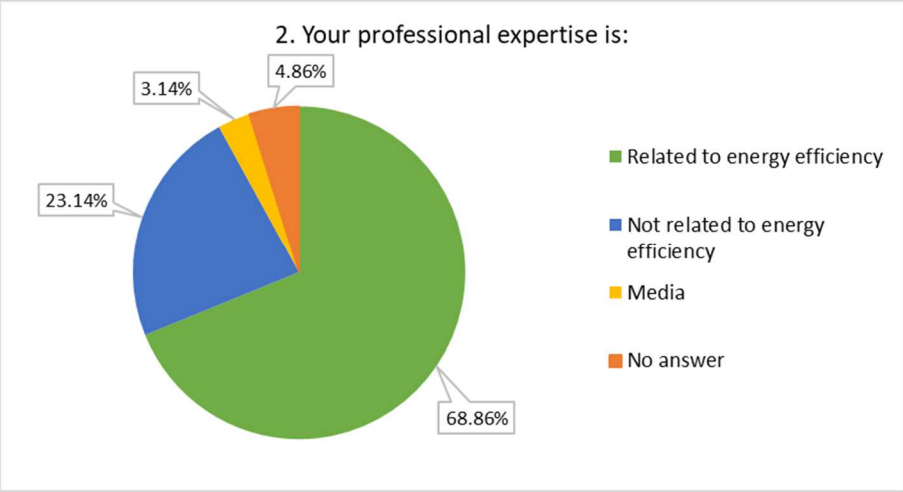



**Figure 15** Feedback of participants on their professional background

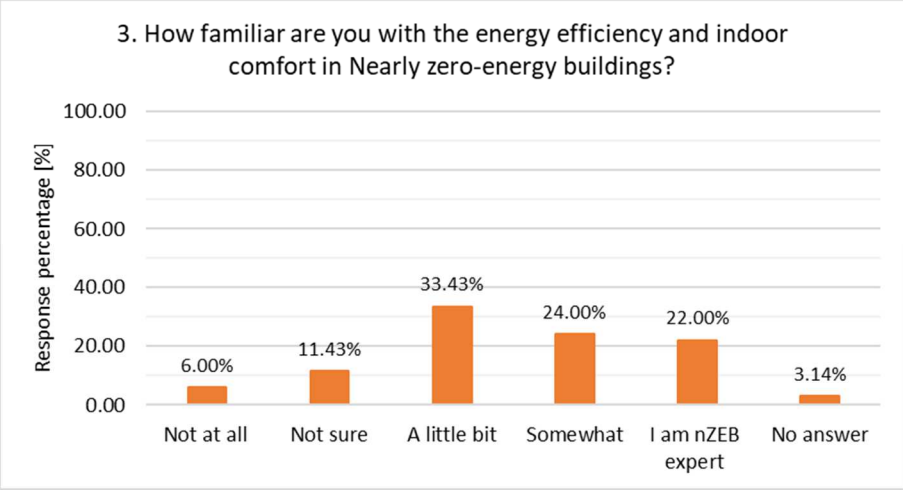


**Figure 16** Feedback of participants on their knowledge about energy efficiency and indoor comfort in NZEBs

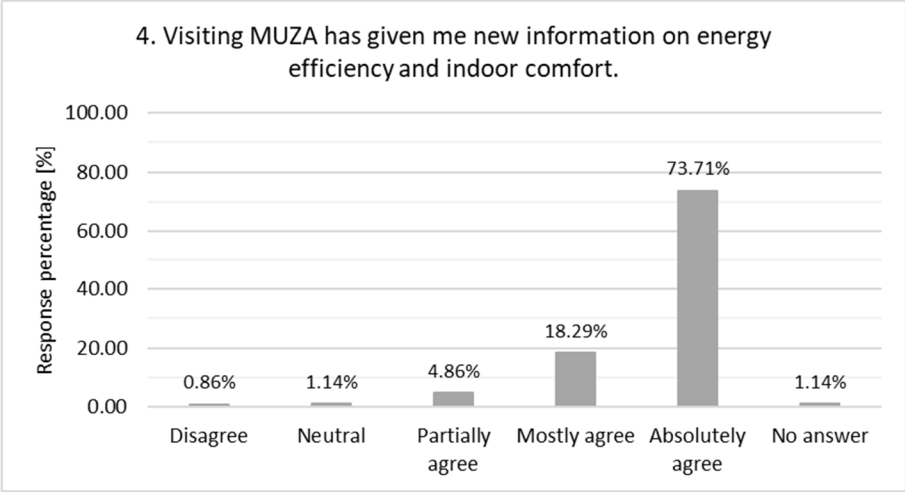



**Figure 17** Feedback of participants on the progress of their knowledge during the Roadshow event activities focused on MUZA

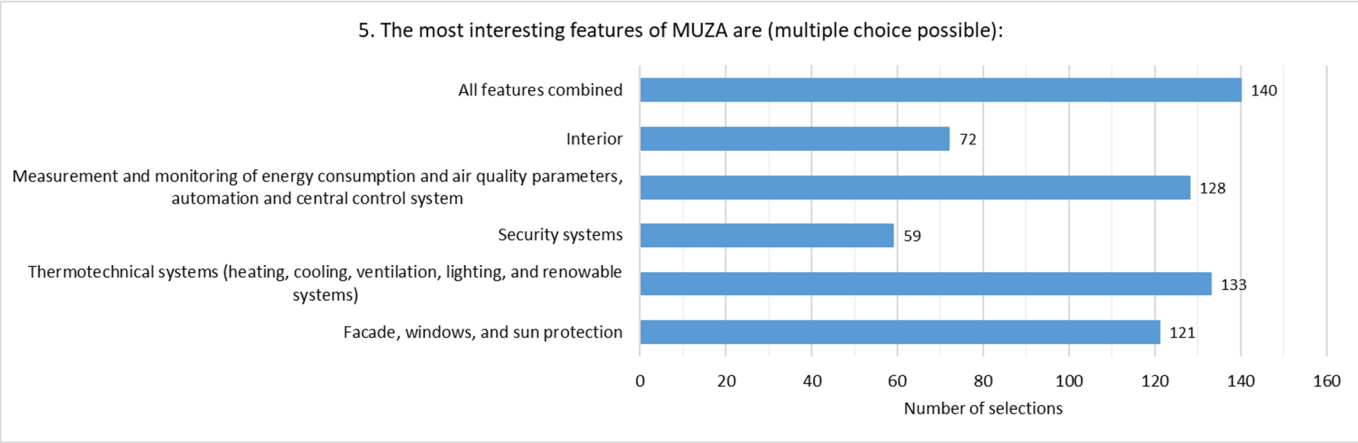



**Figure 18** Feedback of participants on the most interesting aspects of MUZA

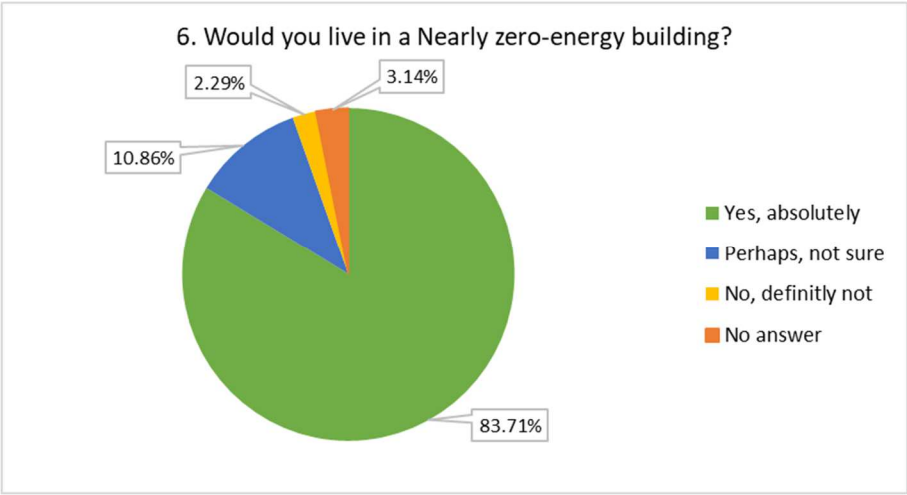



**Figure 19** Feedback of participants on whether they would like to live in a NZEB

For the participants who answered that they definitely would not live in a nZEB, a main reason is following: “I believe that energy consumption and living comfort have not been significantly improved in Nearly zero-energy buildings”.

On the other hand, participants who answered that they were not sure if they would live in a nZEB were offered a multiple-choice question to explain their attitude (Figure 20).

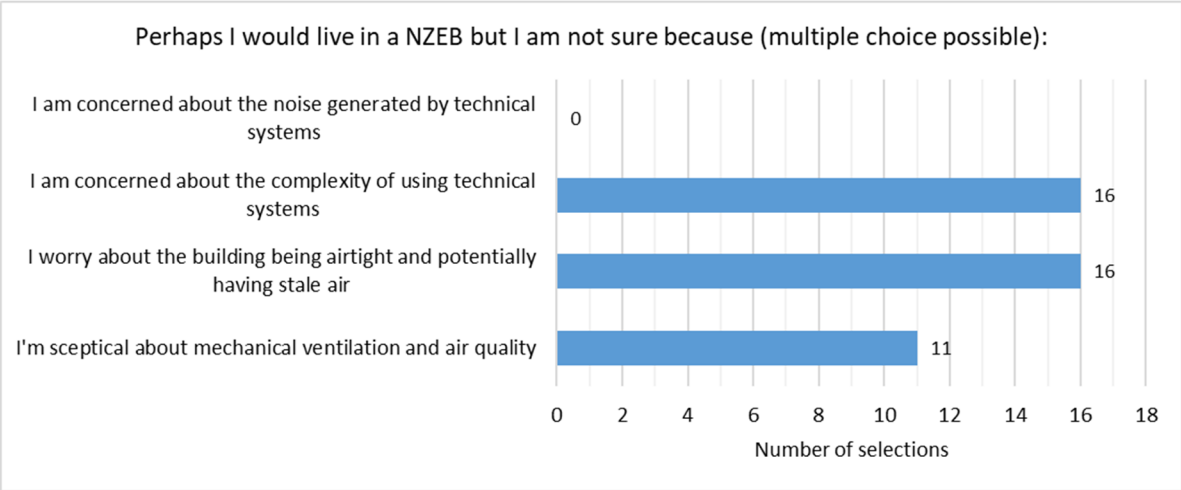



**Figure 20** Feedback of participants who declared that they are not sure whether they would live in a nZEB

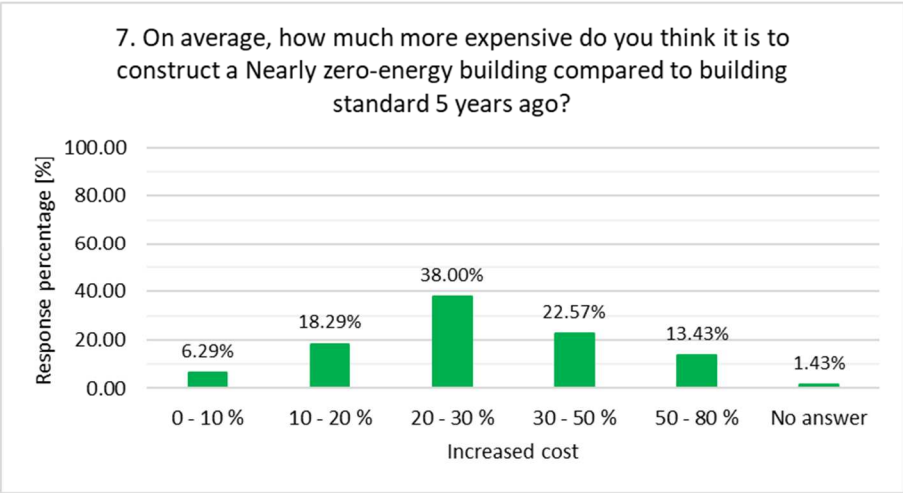



**Figure 21** Feedback from participants on their view of the increased cost of constructing NZEB buildings

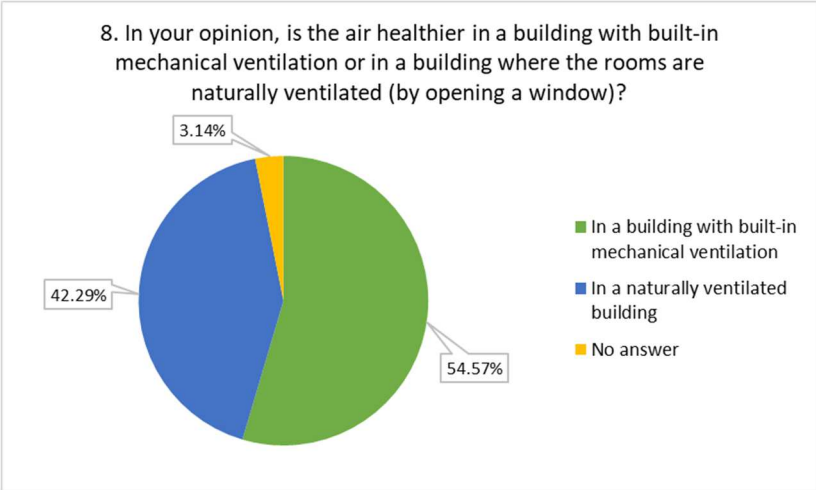



**Figure 22** Feedback from participants on the air quality in mechanically vs. naturally ventilated buildings

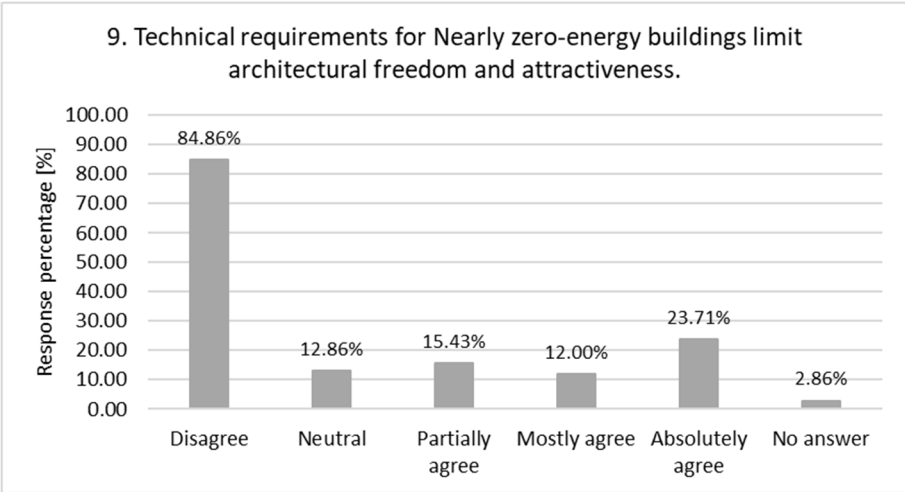



**Figure 23** Feedback from participants on their view of collision between technical requirements for NZEB and architectural expression

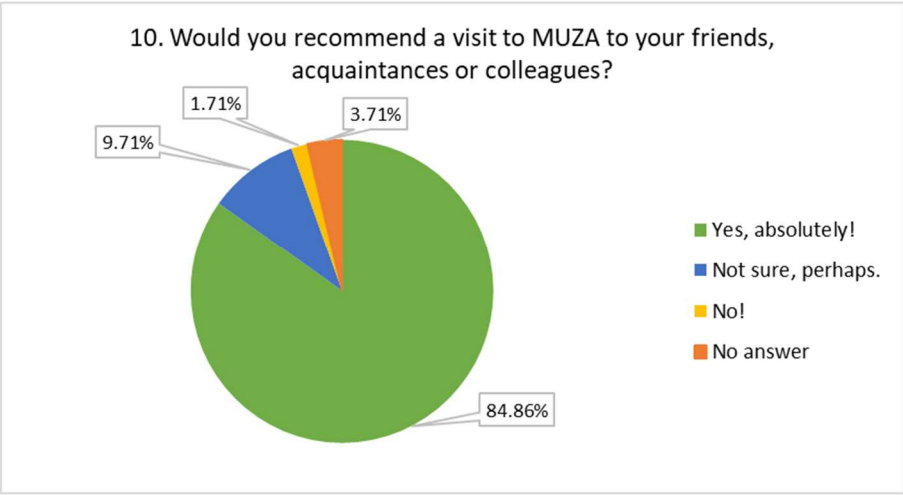



**Figure 24** Feedback from participants on their willingness to recommend a visit to MUZA

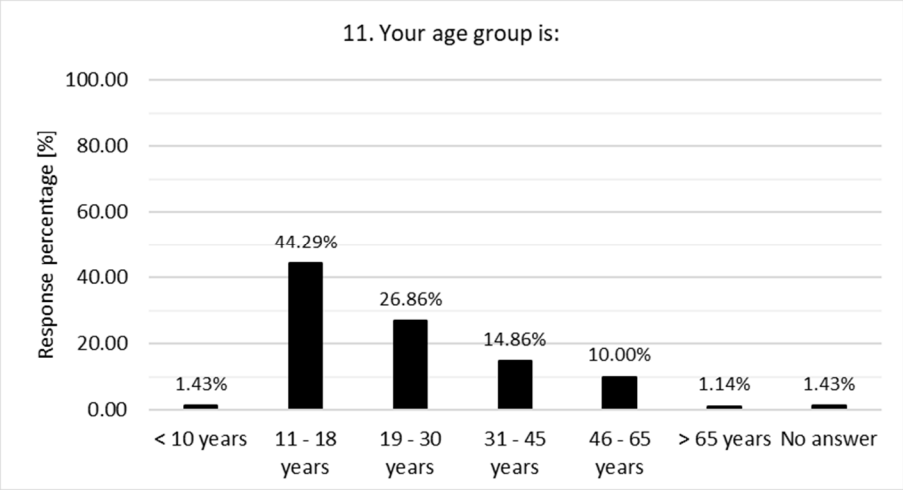



**Figure 25** Feedback from participants on their age group

It is evident from the survey results that 82.9% participants feel that MUZA is innovative, interesting and inspiring approach to promote energy efficient buildings and healthy living which is a good indication of their view of the necessity of this education and raising awareness approach. This is additionally confirmed by the fact that for 73.7% of them visiting MUZA has given them new information on energy efficiency and indoor comfort. Participants replied that they would absolutely (83.7%) or perhaps but not sure (10.86%) live in a NZEB building, while only 2.3% of them would never live in a NZEB building. Aversion and fear of living in a NZEB house are mainly "based" on suspicion that energy consumption and living comfort have not been significantly improved in NZEBs, as well as concerns about the complexity of using technical systems and the building being airtight with stale air. These insights are valuable information and strong validation of the necessity for the de-stigmatization of NZEB which is being carried out through the Roadshow activities. The age group of participants (44.3% in 11 – 18 y/o, 26.9% in 19 – 30 y/o, 14,9% in 31 – 45 y/o) is very encouraging since they will be future professionals, investors and generally citizens with different mindset, appreciating more sustainable, healthy and energy efficient living. They need to become "critical mass" that will make the change, and education together with public raising awareness is essential to achieve that ultimate goal.

The quality of the Croatian Roadshow activities focused on/ around NZEB mobile house is best rated if participants disseminated and recommend the Roadshow events to their colleagues, friends and associates, and in the case of Croatian Roadshow events, 84.9% of participants declared they would definitely be willing to recommend a visit to MUZA among their contacts.

### 3) Surveillance cameras installed on MUZA

Depending on the specifics of certain events (e.g. events organized as part of different trade fairs) it was not possible to register each event participant with an attendance list or interactive survey. Therefore, a different approach was used to count the number of MUZA's visitors. Surveillance cameras (two outdoor and one indoor camera) counted the number of people entering MUZA during the NZEB days/weeks. These people participated in events, demonstrations or NZEB cafe consultations. There are screenshots available and full video from the cameras taken during the events. It is clear that surveillance cameras' count slightly overestimates the number of people visiting MUZA since it is clear that the same person entered and exited MUZA several times during the event.

For some events like trade fairs, it was not possible to track people in any other way but using surveillance cameras fitted to MUZA. Knowing that camera count overestimates the number of visitors, we correlated the numbers of people visiting MUZA during the events where the numbers are known and the numbers from the surveillance cameras. Thus, the number of people at trade fairs was estimated using this methodology.

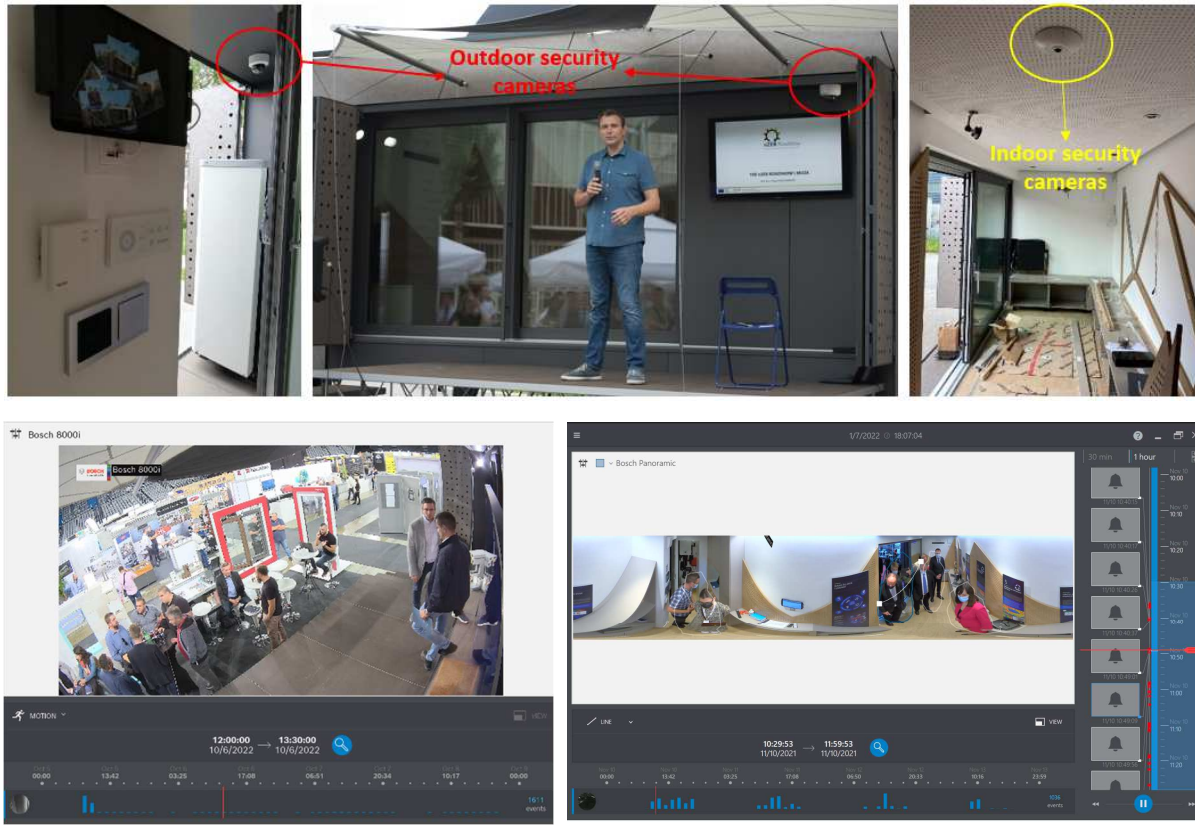



**Figure 26.** Positions of surveillance cameras (first row) and example of outdoor and indoor recording (second row)

### 4) Detailed documentation using photos and videos

Detail photo gallery of each event is available on official MUZA website https://www.muza-nzeb.com/ under the section "Crtice s događaja" (https://www.muza-nzeb.com/crtice-s-dogaaja) which can be translated as "Glimpses from the events". MUZA's website is in Croatian since it is primarily aimed at interested groups at the national level.

Moreover, video from the 1st event and videos recorded for different TV show can be found on MUZA's Youtube channel "MUZA The nZEB Roadshow" under the section Videos (https://www.youtube.com/channel/UCSVTGajtbIAZvJEPWupRbNw/videos). Video from the 1st event is also available on the official project website https://www.nzebroadshow.eu/nzeb-days.html

Photos and videos of all Croatian events were also posted on other social networks of the project (Instagram and Facebook). MUZA's visitors were informed about project's social networks through QR codes visible on the main entrance (Figure 27) and by MUZA's brochure.

**Figure 27** QR codes informing MUZA's visitors about project's social networks

### Total number of people visiting Croatian nZEB Roadshow events

Table 5 shows the number of visitors to the Croatian nZEB Roadshow events (per event and in total for all 14 events) considering all four monitoring and evaluation approaches mentioned above.

**Table 5** Number of visitors/participants at Croatian Roadshow events shown through used monitoring approaches

| No | Event type | Event name | Date | Location | NUMBER OF VISITORS/PARTICIPANTS | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Attendance list | Official event report | Surveillance camera | Photos | Survey |
| 1 | nZEB day | Pilot Roadshow event – MUZA opening (closed event) | 16.06.2021 | Zagreb, Technical Museum Nikola Tesla (TMNT) | 83 | / | Not available | Available | 53 |
| 2 | nZEB week | European Mobility Week "Safe and Healthy with Sustainable Mobility!" | 16.09.2021<br>17.09.2021<br>22.09.2021 | Zagreb, TMNT | 209 | / | Available | Available | 137 |
| 3 | nZEB week | 8th Assembly of Croatian builders: "Construction and Climate change" | 03.–05.10.2021 | Vodice, Hotel Olympia | / | 350 | Available | Available | 20 |
| 4 | nZEB week | ArhiBau 2021: "Fair on construction culture and sustainable development" | 07.–09.10.2021 | Zagreb, Arena Zagreb sports hall | / | / | 1163 | Available | 47 |
| 5 | nZEB day | Importance of education in the field of energy efficiency and sustainable building | 03.11.2021 | Koprivnica, University North Campus | 81 | / | Available | Available | 27 |
| 6 | nZEB week | 24th International fair SASO 2021 | 10.–13.11.2021 | Split, Spaladium sports hall | / | / | 1088 | Available | 2 |
| 7 | nZEB days | Healthy and comfortable living – NZEB | 01.12.2021<br>03.12.2021 | Varaždin, Faculty of Geotehnical Engineering, University of Zagreb | 112 | / | Available | Available | 45 |
| 8 | SUPEUS Case Study | SUPEUS CASE STUDY x nZEB ROADSHOW | 09.-12.12.2021 | Zagreb, Faculty of architecture, Faculty of mechanical engineering and naval architecture, Faculty of Electrical Engineering and Computing all from University of Zagreb | / | / | 36 | Available | Not available |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 9 | Continuous event | Polish students – field excursion | 17.06.2021 | Zagreb, TMNT | / | / | Not available | 20 | Not available |
| | | "Summer at Tesla" – a series of workshops for children, youth and adults. | 23.08.2021 | | / | / | Not available | 5 | Not available |
| | | Building Physics course at FCE-UNIZAG | 09.12.2021 | Zagreb, Faculty of Civil Engineering, University of Zagreb | 34 | / | Not available | Available | Not available |
| | | | 16.12.2021 | | 36 | / | Not available | Available | Not available |
| 10 | nZEB week | NZEB Roadshow project and MUZA visiting Osijek | 25.–29.04.2022 | Osijek, Faculty of Civil Engineering and Architecture, University J.J. Strossmayer | 326 | / | Available | Available | 19 |
| 11 | nZEB week | Science festival 2022 | 02.–07.05.2022 | Zagreb, TMNT | 139 | / | Available | Available | Not available |
| 12 | nZEB day | Closed event for window professionals | 22.09.2022 | Trakošćan, Hotel Trakošćan | / | / | Available | 120 | Not available |
| 13 | nZEB week | ArhiBau.hr 2022: "Fair on construction culture and sustainable development" | 05.–08.10.2022 | Zagreb, Arena Zagreb sports hall | / | / | 1611 | Available | Not available |
| 14 | nZEB week | University of Zagreb Fair for students | 10.–12.11.2022 | Zagreb, Zagreb Fair | / | / | 1061 | Available | Not available |
| | | | | | **Attendance list** | **Official event report** | **Surveillance camera** | **Photos** | **Survey** |
| | | | **SUM PER CATEGORY** | | **1020** | **350** | **4959 (reduction due to double counting 3703)** | **145** | **350** |
| | **NUMBER OF PEOPLE VISITING MUZA AND PARTICIPATING IN ROADSHOW EVENT ACTIVITIES** | | | | **5218** | | | | **350** |

## No. 1 event: Pilot Roadshow event – MUZA opening (16.06.2021, Zagreb – TMNT)

The first Roadshow event in Croatia was organized as an independent and closed event for professionals in collaboration with Technical Museum Nikola Tesla (Figure 28). The event was organized in form of a closed event due to ongoing COVID situation and because it was intended as an official presentation of the nZEB Roadshow project and nZEB mobile house MUZA to industry partners who have supported design, development, construction and commissioning of MUZA (Figure 29). More than 30 companies from building industry and associations supported MUZA and thus implementation of nZEB Roadshow project in Croatia. Some of them who participated in Croatian pilot Roadshow event are:

- Companies and trades: A1 Hrvatska, Aluplast GmbH, Baumit, EJOT Spojna Tehnika, Elgrad, Fibran, Fritz Egger GmbH, Grič Automatika, HUST, IPRO-Inženjering, JUB, Knauf, Knauf Insulation, Krovopokrivački-građevinski obrt Makoter, Lipapromet, Marlex, Ravago Building Solutions Croatia, Robert Bosch, Rockwool Adriatic, Schneider Electric, Velux Hrvatska, Wienerberger, Würth-Hrvatska, Ytong Porobeton, Žbuka Čakarić
- Financial institutions/ Public authorities and Associations: The Environmental Protection and Energy Efficiency Fund, Croatia Green Building Council, Croatian solar energy professional association

**Figure 28** Few photos of Croatian 1st event (Pilot Roadshow event – MUZA opening)

**Figure 29** Agenda of Pilot Roadshow event – MUZA opening

For this first event, except the functional thermo-technical systems, automation options and monitoring systems in MUZA itself, no other gamification tools and interactive exhibition were available. Therefore, MUZA itself was used as a demonstration unit. Guided tour around and inside MUZA was organized after presenting participants "The nZEB Roadshow" project and details about MUZA (the whole process from idea, design, construction, commissioning to transport) in the light of nZEB, healthy living and sustainable modular construction.

After this first event, the development and upgrade of gamification and exhibition tools for future events has begun. This first pilot project has also shown to be a good teacher for organization of future events – how to organize tours around and inside MUZA, raised awareness of dependence on external weather, willingness of industrial partners to take active role in future events, feedback from industrial partners who had the role of participants in this pilot event, etc.

Number of participants was monitored by on-site attendance list, detailed photographing and video recording. During this first event, surveillance cameras were not in function. Around 63% of participants have filled out survey.

After the pilot event, European Commission recorded video about MUZA and incorporate it, as one of the best practice example, into its official video stockshot "Energy efficient renovation: houses" showing examples of renovation works on houses, some funded by EU projects and programmes. Video is available at https://audiovisual.ec.europa.eu/en/video/I-208773 and MUZA part is around 07:37 minute.

### No. 2 event: European Mobility Week "Safe and Healthy with Sustainable Mobility!" (16.09.2021, 17.09.2021 and 22.09.2021, Zagreb – TMNT)

The 2nd event was organized as a joint event with TMNT during European Mobility Week themed "Safe and Healthy with Sustainable Mobility". TMNT, as a host of the event, was in charge of contacting vocational high schools and inviting them to participate in Roadshow activities at MUZA. The urgent

need for advancing formal vocational education is clearly visible from great response and interest shown by both high school students and their teachers (Figure 30). In total 9 classes from Architectural Technical School Zagreb (Graditeljska tehnička škola Zagreb) and Mechanical Engineering School Faust Vrančić participated in 2nd Croatian Roadshow event. The visit of each class was announced in advance, and they had their own time slot (Figure 31). After the general welcome and brief presentation of "The nZEB Roadshow" project, each class (group of students) was divided into three smaller sub-groups and they rotate through three positions. Two positions were outside MUZA and one position was inside the MUZA, each of them was guided by project team member and covering different aspects of nZEB as follows:

- 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), Blower Door test, Heat pumps (principle and external unit), Photovoltaics
- Position 3 (inside MUZA): Mechanical ventilation, Heat pump (principle and internal units), Automation and control, Smart lighting, Monitoring of energy consumption, energy production, IAQ parameters and hygrothermal performance of building envelope elements.

At each position adequate gamification tools were used to demonstrate previously mentioned nZEB aspects and to actively engage students. All gamification tools and mock-ups developed by Croatian team are presented in Deliverable 3.2 Report on the training facilities designed and produced in the pilot countries under Section Croatia. MUZA itself was also used as demonstration unit (detailed description also available in Deliverable 3.2).

Between time slots reserved for high school students, MUZA was open for public and Croatian team was available to all interested individuals.

**Figure 30** Few photos of Croatian 2nd event (European Mobility Week "Safe and Healthy with Sustainable Mobility!")

Sveučilište u Zagrebu Građevinski fakultet

nZEB Roadshow

EUROPSKI TJEDAN MOBILNOSTI
Tehnički muzej Nikola Tesla Zagreb, 16. – 22. rujna. 2021.

muza
mobilna | učinkovita | zdrava | arhitektura

| 16. rujna 2021. | |
|---|---|
| 11:00 – 12:00h | Otvorena vrata MUZA-e za javnost |
| 12:00 – 13:00h | NZEB radionica zatvorenog tipa: Graditeljska tehnička škola Zagreb – 4.C |
| 13:00 – 14:00h | NZEB radionica zatvorenog tipa: Graditeljska tehnička škola Zagreb – 4.A |
| 14:00 – 15:00h | NZEB radionica zatvorenog tipa: Graditeljska tehnička škola Zagreb – 2.C |
| 15:00 – 16:00h | NZEB radionica zatvorenog tipa: Graditeljska tehnička škola Zagreb – 2.B |

| 17. rujna 2021. | |
|---|---|
| 11:00 – 12:00h | Otvorena vrata MUZA-e za javnost |
| 12:00 – 13:00h | NZEB radionica zatvorenog tipa: Strojarska tehnička škola Fausta Vrančića, Zagreb – 3.C |
| 13:00 – 14:00h | Otvorena vrata MUZA-e za javnost |
| 14:00 – 15:00h | NZEB radionica zatvorenog tipa: Graditeljska tehnička škola Zagreb – 3.C |

| 22. rujna 2021. | |
|---|---|
| 11:00 – 12:00h | NZEB radionica zatvorenog tipa: Graditeljska tehnička škola Zagreb – 3.B |
| 12:00 – 12:30h | Otvorena vrata MUZA-e za javnost |
| 12:30 – 13:30h | NZEB radionica zatvorenog tipa: Graditeljska tehnička škola Zagreb – 3.D |
| 13:30 – 14:30h | NZEB radionica zatvorenog tipa: Graditeljska tehnička škola Zagreb – 3.A |

*Prilikom otvorenih vrata MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

EUROPSKI TJEDAN MOBILNOSTI
16. – 22. RUJNA 2021
Krećimo se održivo!
Ostanimo zdravi!

Grad Zagreb se i ove godine uključio u EUROPSKI TJEDAN MOBILNOSTI (ETM), vodeću kampanju Europske komisije za podizanje svijesti o održivoj urbanoj mobilnosti koja ove godine slavi svoju 20. godišnjicu!

Stoga smo i mi ( učenici STŠ Fausta Vrančića u pratnji prof. Magdalene Ajduk posjetili Tehnički muzej Nikole Tesle u kojem se povodom istog održavaju zanimljive radionice i predavanja

Sudjelovali smo na dva predavanja, prošetali muzejom i I upoznali povijesni razvoj mobilnosti kroz stalni postav muzeja

Prezentaciju klasičnog autobusa ZET-e sa ulaznom rampom za osobe s invaliditetom i specijaliziranog vozila za prijevoz osoba s invaliditetom organizirao je Zagrebački električni tramvaj , Tehnički muzej Nikola Tesla i Društvo distrofičara RH

Predstavljena nam je MUZA - Pametna mobilna kuća koja troši gotovo nula energije
Organizator: Tehnički muzej N. Tesle i Građevinski fakultet, Zagreb

I na kraju šetnjom kroz postav Tehničkog muzeja Nikola Tesla saznali smo puno o povijesnom razvoju mobilnosti kod nas i općenito...
voditelj: Branimir Prgomet, Stalni postav Tehničkog muzeja Nikola Tesla.

**Figure 31** Agenda of Roadshow event organized within the European Mobility Week "Safe and Healthy with Sustainable Mobility!"

Number of participants was monitored by attendance list prepared by their accompanying teachers, surveillance cameras and detailed photographing. Around 65% of participants have filled out survey.

### No. 3 event: 8th Assembly of Croatian builders: "Construction and Climate change" (03.– 05.10.2021, Vodice – Hotel Olympia)

The 3rd event was organized as a joint event with Croatian Association of Civil Engineers during the conference "8th Assembly of Croatian builders" dealing with topics on construction and climate change. This was focused on professionals, primarily civil engineers working in different areas of construction sector such as design, construction, supervision and maintenance of buildings, but there were also construction products manufacturers, HVAC producers etc. During the whole conference, MUZA was located outside the conference hotel and various Roadshow activities included:

- MUZA interactive tour and gamification tools
- Live demonstrations around MUZA (Figure 33) – RAL installation of windows, testing of security windows, Blower Door testing, fire testing of non-combustible thermal insulation, etc.
- Education/training for heat pump installers at MUZA
- Exhibition of construction materials and products for nZEBs around MUZA
- One conference round table session organized in collaboration with Croatia Green Building Council
- Croatian team members participated in other conference sessions as moderators or as speakers

All above mentioned activities around MUZA were realized thanks to the active participation of MUZA's industrial partners (Robert Bosch, Aluplast GmbH, Marlex, Schneider Electric, Ravago Building

Solutions Croatia, EJOT Spojna Tehnika, Knauf, Knauf Insulation, Würth-Hrvatska, Fibran, Wienerberger, Ytong Porobeton, Rockwool Adriatic).

**Figure 32** Few photos of Croatian 3rd event (8th Assembly of Croatian builders: "Construction and Climate change")

Sveučilište u Zagrebu Građevinski fakultet

nZEB Roadshow

**8. SABOR HRVATSKIH GRADITELJA, Vodice, 03. – 05. 10. 2021.**

muza mobilna | učinkovita | zdravo | arhitektura

| 04. listopada 2021. | |
|---|---|
| 09:00 – 12:30h | **OTVORENA VRATA MUZA-e:** Slobodan obilazak MUZA-e, obilazak izlagača, networking |
| 12:30 – 13:00h | **SCHNEIDER ELECTRIC:** Demonstracija EcoStruxure Building rješenja primijenjenog na MUZA-i i koncepta Building Management System |
| 13:00 – 14:00h | **MARLEX, ALUPLAST GmbH i WÜRTH:** Demonstracija načina provale prozora i usporedba protuprovalnosti različitih prozora. Prikaz RAL ugradnje prozora. |
| 14:00 – 18:30h | **OTVORENA VRATA MUZA-e:** Slobodan obilazak MUZA-e, obilazak izlagača, networking |

| 05. listopada 2021. | |
|---|---|
| 09:00 – 13:00h | **ROBERT BOSCH:** Edukacija servisera za dizalice topline na primjeru sustava implementiranog u MUZA-u<br>**Napomena: edukacija će se odvijati unutar prostora MUZA-e, ali svim ostalim posjetiteljima biti će omogućen obilazak izlagača, networking i vanjski obilazak MUZA-e* |
| 13:00 – 14:00h | **OTVORENA VRATA MUZA-e:** Slobodan obilazak MUZA-e, obilazak izlagača, networking |
| 14:00 – 14:20h | **FIBRAN I RAVAGO BUILDING SOLUTIONS CROATIA:** Vođeni obilazak i predstavljanje proizvoda i sustava ugrađenih u MUZA-u |
| 14:20 – 16:00h | **GRAĐEVINSKI FAKULTET SVEUČILIŠTA U ZAGREBU:** Demonstracija Blower Door ispitivanja popraćenog snimanjem infracrvenom kamerom |
| 16:00 – 18:00h | **OTVORENA VRATA MUZA-e:** Slobodan obilazak MUZA-e, obilazak izlagača, networking |

***Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.***

Građevinar 10/2021

8. SABOR HRVATSKIH GRADITELJA

MUZA je okupila brojne znatiželjnike da se informiraju o prednostima i specifičnostima nZEB kuća

U sklopu 8. Sabora hrvatskih graditelja predstavljen je projekt MUZA, koji Građevinski fakultet Sveučilišta u Zagrebu zajedno s partnerima provodi od 1. lipnja 2020. do 30. studenoga 2022. Predavanje o projektu održao je doc. dr. sc. Bojan Milovanović. Radi se o mobilnoj nZEB kući koja služi kao informativni i pokazni centar za podizanje razine svijesti o prednostima i specifičnostima nZEB-a. Kuća je bila dostupna posjetiteljima Sabora, a montirana je ispred hotela *Olympia* te su partneri bili na raspolaganju sudionicima za sva pitanja. Ideja je da takva mobilna kuća ponudi stvarno iskustvo nZEB zgrade, koja je opremljena svim tehnologijama potrebnima za pružanje cjelovitih informacija o procesima relevantnima za izvedbu zgrade u smislu udobnosti, o parametrima kvalitete unutarnjeg zraka i o potrošnji energije.

O okolišnim, društvenim i socijalnim kriterijima u sklopu energetske obnove projekta BUILD UPON2 govorio je Benjamin Petrović, voditelj projekata iz Hrvatskog savjeta za zelenu gradnju. BUILD UPON2 jest važna inicijativa u usmjeravanju kampanje *Renovation Wave* Europske komisije na lokalnoj razini. Kroz višerazinski okvir energetske obnove koji proizlazi iz projekta i koji su testirali brojni europski gradovi BUILD UPON2 pruža alat za praćenje kvalitete energetskih obnova te bilježenje ključnih podataka iz ekonomske, okolišne i društvene perspektive kako bi se ostvario važan pomak u kvaliteti energetskih obnova, u razvoju lokalnih politika i praksi te konačno u smanjenju štetnih emisija i potrošnji energije koje proizlaze iz zgrada.

Tanja Herr, dipl. ing. arh., iz tvrtke *Fibran d.o.o.* govorila je o prednostima i zamkama ozelenjivanja krovova i fasada u urbanim sredinama.

U kasnim popodnevnim satima prvoga dana skupa paralelno su održana izlaganja u sklopu sekcija Građevni materijali i Organizacija građenja te okrugli stol "Doprinos inženjerske struke u ostvarivanju ciljeva strategije razvoja RH".

Moderatori izlaganja u sklopu sekcije Građevni materijali, koja su održana u dvorani *Aqua*, bili su doc. dr. sc. Bojan Milovanović i prof. dr. sc. Nina Štirmar. Prvo izlaganje održao je Sanjin Gumbarević, koji je predstavio BIM kao alat za ubrzanje i povećanje točnosti iskaza elemenata vanjske ovojnice zgrade koji su potrebni za procjenu energetskoga ponašanja. Mergim Gaši govorio je o utjecaju toplinskih mostova u zgradama podvrgnutima protupotresnoj obnovi, dok je tema trećega izlaganja bio razvoj bescementnih hidrauličnih veziva s otpadnim pepelom drvne biomase, o čemu je govorila Jelena Šantak Bajto. Sonja Cerković održala je predavanje o inovativnim građevnim proizvodima s pepelom drvne biomase. Tehno-ekonomsku analizu mikrokogeneracijskih postrojenja na biomasu u zgradama prikazao je Marko Mimica. Zadnje predavanje održao je doc. dr. sc. Bojan Milovanović, koji je govorio o mogućnostima i ograničenjima energetske obnove kao o sastavnome dijelu integralne obnove zgrada kulturne baštine nakon potresa.

**Okrugli stol "Doprinos inženjerske struke u ostvarivanju ciljeva strategije razvoja RH"**

U dvorani *Olympia* održan je okrugli stol "Doprinos inženjerske struke u ostvarivanju ciljeva strategije razvoja RH", koji je moderirao Dalibor Pudić, predsjednik Hrvatske stručne udruge za plin.

Panelisti su bili Zdravko Jurčec, predsjednik Hrvatskog inženjerskog saveza, mr. sc. Mladen Jakovčić, predsjednik Hrvatskog mjeriteljskog društva, prof. dr. sc. Lovre Krstulović Opara, predsjednik radne skupine HIS STEM WG, Mladen Novaković iz tvrtke *Tehnokom d.o.o.*, prof. dr. sc. Tomislav Josip Mlinarić, dekan Fakulteta prometnih znanosti Sveučilišta u Zagrebu, Davor Trupković, ravnatelj u Ministarstvu kulture i medija, i Dražen Arbutina, predstavnik Društva arhitekata Zagreb.

GRAĐEVINAR 73 (2021) 10 1045

**Figure 33** Agenda of Roadshow event organized within the 8th Assembly of Croatian builders: "Construction and Climate change"

Vodice event with professionals revealed that engineers were hesitant to use VR, which can be connected to ongoing COVID situation and using the same pair of glasses. Therefore, due to precaution measures, VR was not used as gamification tool on other Croatian Roadshow events. Suggestion that derived from this experience is that using different VR platforms with disposable cardboard glasses (such as Google cardboard) could raise higher interest rates. Moreover, disposable cardboard glasses can be used as dissemination material.

Due to the event concept (conference) the fluctuation of participants was extremely high, and it was not possible to require an attendance list at MUZA itself. The official conference report published in journal Građevinar – Journal of the Croatian Association of Civil Engineers 73 (2021) 10, pp. 1039 – 1053 (Figure 33) stated that 350 engineers participated in conference and supporting activities, including Roadshow activities. Video recordings from MUZA's surveillance camera are available for this event, as well as a detailed photo gallery. As mentioned, the extremely high fluctuation of participants made it difficult to encourage them to complete the survey.

### No. 4 event: ArhiBau 2021: "Fair on construction culture and sustainable development" (07.– 09.10.2021, Zagreb – Arena Zagreb sports hall)

The 4th event was organized as a joint event with Zagreb Society of Architects during the construction trade fair ArhiBau 2021 entitled "Fair on construction culture and sustainable development". The fair itself targeted all participants of construction sector but also civil society and public authorities.

The focal point of Croatian Roadshow week (4th event) was again nZEB mobile house MUZA located in front of the sports hall Arena Zagreb (trade fair venue). The agenda (Figure 35) consisted of MUZA's "open door", guided tours through MUZA, demonstrations (Blower Door, infrared thermography, testing security windows) and nZEB café for consultations. Parallel to these activities, exhibition of construction products and materials was organized by MUZA's industry partners (Robert Bosch, Aluplast GmbH, Marlex, EJOT Spojna Tehnika, Knauf Insulation, Knauf, Fibran, Würth-Hrvatska, Rockwool Adriatic, Hansgrohe) who were also at disposal for consultations to all interested individuals.

**Figure 34** Few photos of Croatian 4th event (ArhiBau 2021: "Fair on construction culture and sustainable development")

**Figure 35** Agenda of Roadshow event organized within the ArhiBau 2021: "Fair on construction culture and sustainable development")

Due to event concept (trade fair and Roadshow activities at two different locations – MUZA outside the sport hall and exhibition of industry partners inside the sports hall), the fluctuation of participants was extremely high and it was not possible to require attendance list at MUZA and at exhibition place of industry partners. Video recordings from MUZA's surveillance camera are available for this event, as well as detailed photo gallery. As mentioned, extremely high fluctuation of participants made it difficult to encourage them to complete the survey. Dislocated event activities showed to be quite demanding for Croatian project team members trying to cover them simultaneously.

During the official opening of the Arhibau 2021 trade fair, the Prime Minister of the Government of the Republic of Croatia Mr. Andrej Plenković visited MUZA and got informed about "The nZEB Roadshow project" and activities conducted at national level (Figure 34).

### No. 5 event: Importance of education in the field of energy efficiency and sustainable building (03.11.2021, Koprivnica – University North Campus)

The 5th event was organized as a joint event "Importance of education in the field of energy efficiency and sustainable building" in collaboration with Regional Energy Agency North and City of Koprivnica. As shown in Figure 37, this one-day event was divided into two parts: first part reserved for professionals (pre-registration was required) while the second part was reserved for students (university and elementary school) and citizens. In the first part series of lectures derived from projects REACT, nZEB Ready, Green AURA and nZEB Roadshow. In the second part of the event, guided tours

were organized around MUZA and energy retrofitted buildings of University North campus as best practice examples. Additionally, electromobility was demonstrated by electrical cars, bicycles and charging station.

During guided tour around MUZA, participants had opportunity to get informed about green roofs systems thanks to the presentation and mock-ups prepared by industry partner Fibran.

**Figure 36** Few photos of Croatian 5th event ("Importance of education in the field of energy efficiency and sustainable building")

**VAŽNOST EDUKACIJE U PODRUČJU ENERGETSKE UČINKOVITOSTI I ODRŽIVE GRADNJE**

3. studenoga 2021.
Kampus, trg dr. Žarka Dolinara

*REA Sjever u organizaciji s Gradom Koprivnicom i Građevinskim fakultetom Sveučilišta u Zagrebu*

PROGRAM

1. ENTER KOPRIVNICA, Trg dr. Žarka Dolinara 18
* namijenjeno za stručnu javnost – ograničen broj sudionika
Potrebna je prijava putem obrasca na sljedećem linku: https://forms.gle/axFEM5rebq8Awdao7

| | |
|---|---|
| 10:00 - 10:05 | Pozdravni govor Gradonačelnika<br>*Grad Koprivnica* |
| 10:05 – 10:30 | Edukacija u području energetske učinkovitosti i izazovi koje nose nZEB – projekti REACT i nZEB Ready<br>*Regionalna energetska agencija Sjever* |
| 10:30 – 10:50 | Programi i inicijative - Zelena budućnost gradova<br>*Ministarstvo prostornog uređenja, graditeljstva i državne imovine* |
| 10:50 – 11:05 | Uloga Fonda u provedbi mjera vezanih uz klimatske promjene<br>*Fond za zaštitu okoliša i energetsku učinkovitost* |
| 11:05 – 11:15 | *Pauza za kavu* |
| 11:15 – 11:40 | Zelena gradnja u srcu Europske budućnosti<br>Okvir energetske obnove projekta BUILD UPON2 - okolišni, društveni i socijalni kriteriji<br>*Hrvatski savjet za zelenu gradnju* |
| 11:40 – 12:00 | Green AURA – predstavljanje projekta<br>*Regionalna energetska agencija Sjever* |
| 12:00 – 12:15 | nZEB Roadshow – prezentacija mobilne kućice MUZA<br>*Građevinski fakultet Sveučilišta u Zagrebu* |
| 12:15 – 13:30 | *Ručak* |

2. VANJSKI PROSTOR KAMPUSA – Study tour, Trg dr. Žarka Dolinara
*namijenjeno za građane, studente i učenike

| | |
|---|---|
| 10:00 – 13:00 | Prezentacija nZEB mobilne kućice |
| | Study Tour<br>Primjeri dobre prakse nZEB i energetski učinkovite gradnje |
| | Prezentacija ELEKTROMOBILNOSTI<br>Električni automobili, bicikli, punionice |

**Figure 37** Agenda of Roadshow event "Importance of education in the field of energy efficiency and sustainable building"

The number of participants was monitored by attendance list (pre-registration for the first part of event and attendance list of students prepared by their accompanying teachers), surveillance cameras and detailed photographing. Around 34% of participants have filled out survey.

### No. 6 event: 24th International fair SASO 2021 (10.– 13.11.2021, Split – Spaladium sports hall)

Similar as the 4th event (ArhiBau 2021), this nZEB week was organized in the framework of the 24th International Trade Fair SASO 2021 in Split, which is one of the most important trade fairs in the region for construction, wood and metal industry, tools and equipment, electronics, energy and telecommunications, crafts and small business.

The nZEB mobile house MUZA was placed inside the sports hall Spaladium Arena and all Roadshow event activities, but also official program activities of SASO 2021 trade fair, were organized in and around the MUZA. Even the official opening of the SASO 2021 trade fair by the Mayor of the city of Split Mr. Ivica Puljak took place at MUZA's stage. This 6th event was organized in collaboration with SASO 2021 Trade Fair, as well as MUZA's industry partners who participate actively as exhibitors around MUZA. Together with Croatian Roadshow team members, industry partners (Robert Bosch, Aluplast GmbH, Marlex, Ravago Building Solutions Croatia, EJOT Spojna Tehnika, Knauf Insulation,

Fibran, Wienerberger, Rockwool Adriatic, Velux, Ytong, Hansgrohe) were also at disposal to all fair visitors for consultation on energy efficiency, energy renovation and nZEB buildings.

Education/training for heat pump installers was organized at MUZA in collaboration with Robert Bosch, while one session within the professional development education was partnered with Croatia Green Building Council. In collaboration with Aluplast GmbH and Marlex, window safety demonstrations attracted the attention of many visitors (Figure 38). Students from Faculty of Civil Engineering, Architecture and Geodesy from University of Split, as well as students from vocational high school School of design, graphics and sustainable construction (Škola za dizajn, grafiku i održivu gradnju), joined our activities at this Roadshow event.

Detailed agenda is presented in Figure 39.

**Figure 38** Few photos of Croatian 6th event ("24th International fair SASO")

mobilna
učinkovita
zdrava
arhitektura

muza

**24. MEĐUNARODNI SAJAM SASO 2021**

**Split 10.-13.11. 2021.**

Srijeda 10. STUDENOG 2021. (radno vrijeme sajma 9.30 – 19.00 h)

| | |
|---|---|
| 10:00 – 11:30 h<br>MUZA | **OTVARANJE SAJMA** |
| 12:00 – 13:30 h<br>MUZA | **ODRŽIVA GRADNJA I KLIMATSKE PROMJENE**<br>Moderator: Tanja Marković, zamjenica direktora, Hrvatski savjet za zelenu gradnju<br>**PROGRAMI I INICIJATIVE - ZELENA BUDUĆNOST GRADOVA**<br>Irena Križ Šelendić, Načelnica sektora, Ministarstvo prostornoga uređenja, graditeljstva i državne imovine<br>Ines Androić Brajčić, Načelnica sektora, Ministarstvo prostornoga uređenja, graditeljstva i državne imovine<br>**ULOGA FONDA U PROVEDBI MJERA VEZANIH UZ GRADNJU I KLIMATSKE PROMJENE**<br>Maja Rajčić, načelnica Sektora za energetsku učinkovitost, Fond za zaštitu okoliša i energetsku učinkovitost<br>**ZGRADE GOTOVO NULTE ENERGUE POTROŠNJE - PREDSTAVLJANJE PROJEKTA MUZA**<br>doc. dr. sc. Bojan Milovanović, Sveučilište u Zagrebu, Građevinski fakultet<br>**OKVIR ENERGETSKE OBNOVE PROJEKTA BUILD UPON2 - OKOLIŠNI, DRUŠTVENI I SOCIJALNI KRITERIJI**<br>Benjamin Petrović, voditelj projekata, Hrvatski savjet za zelenu gradnju<br>**OZELENJAVANJE KROVOVA I FASADA U URBANIM SREDINAMA - PREDNOSTI I ZAMKE**<br>Tanja Herr, dipl.ing.arh.,Fibran d.o.o.<br>**PROJEKTI SPLITSKO-DALMATINSKE ŽUPANIJE IZ SEKTORE ENERGETIKE I PRILAGODBE KLIMATSKIM PROMJENAM- PEFMED PLUS, Join_SECAP, PROSPECT2030 i dr.** |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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učinkovita
zdrava
arhitektura

muza

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| | Martin Bučan, Splitsko-dalmatinska Županija |
| 14:00 – 16:30 h Konferencijska dvorana sajma | **13. DAN GRAĐEVINARA – AGLOMERACIJA SOLIN-SPLIT**<br>Organizator UGIS |
| 16:30 – 19:00 h<br>MUZA | **TEORETSKO I PRAKTIČNO ŠKOLOVANJE SERVISERA/INSTALATERA ZA BOSCH DIZALICU TOPLINE Compress 6000**<br>Nebojša Stojadinović, Robert Bosch d.o.o. |
| Događaji uz MUZA-u | |
| 10.00 – 19.00 | **IZLOŽBA MATERIJALA, SUSTAVA I TEHNOLOGIJA INTEGRIRANIH U MUZA-u**<br>(prije te između i nakon specifičnih događaja) |
| 14.30 – 16.30 | **NZEB cafe - KUTAK ZA PITANJA**<br>Sekcija s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike) |
| | **POSJETE GRUPA IZ ŠKOLA I/ILI FAKULTETA** |

Četvrtak 11. STUDENOG 2021. (radno vrijeme sajma 9.30 – 19.00 h)

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| 10:00 – 12:00 h<br>Konferencijska dvorana | **OBALNI POJAS I ODRŽIVI TURIZAM**<br>Turistička Mreža<br>Predavanja |
| 10:00 – 10:05 h<br>Konferencijska dvorana | **POZDRAVNE RIJEČI ORGANIZATORA**<br>Sanja Vuković Vrić, direktorica<br>Stipe Čogelja, zamjenika Župana Splitsko-dalmatinske Županije |
| 10:05 - 10:50 h<br>Konferencijska dvorana | **PREZENTACIJE**<br>- **PROJEKT „POMORSKO JE DOBRO"** |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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nZEB Roadshow

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zdrava
arhitektura

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| | Matea Dorčić, pročelnica UO za turizam i pomorstvo Splitsko-dalmatinske županije<br>- **OBALNI PLAN – KAKO SAČUVATI OBALU OD GRADNJE?**<br>Gojko Berlengi, izrađivač Obalnog plana SDŽ (Zadruga Granum Salis)<br>- **NASIPANJE NAŠE SVAGDAŠNJE - SPAŠAVA LI ILI UNIŠTAVA NASIPANJE NAŠE PLAŽE**<br>Ivana Birčić, Podvodno istraživački klub Sveučilišta u Splitu |
| 10:50- 11:35 h<br>Konferencijska dvorana | **Panel:**<br>**„Obalni pojas i održivo upravljanje pomorskim dobrom za budućnost hrvatskog turizma"**<br>Sudionici:<br>- Gojko Berlengi, izrađivač Obalnog plana SDŽ (Zadruga Granum Salis)<br>- Matea Dorčić, pročelnica UO za turizam i pomorstvo Splitsko-dalmatinske županije<br>- Domagoj Lažeta, Ravnatelj JU More i krš<br>- Joško Stella, direktor TZ SDŽ<br>- Gorana Jelić Mrčelić, Pomorski fakultet u Splitu<br>- Ivana Birčić, Podvodno istraživački klub Sveučilišta u Splitu<br>- Marin Peršić, Zeleni servis d.o.o.<br>Moderator: **Marko Bertolino** - predsjednik Udruge građevinskih inženjera Split |
| 11:35 – 11:40 h<br>Konferencijska dvorana | **ZAKLJUČUJUĆI I ZAVRŠETAK KONFERENCIJE** |
| 13:00 – 14:30 h<br>MUZA | **STRUČNO USAVRŠAVANJE ZA INŽENJERE I ARHITEKTE**<br>**BOSCH STRUČNO PREDAVANJE BOSCH VRF SUSTAVI ZA KLIMATIZACIJU I GRIJANJE**<br>Antonio Vidović, Robert Bosch d.o.o.<br>**VELUX RJEŠENJA ZA RAVNI KROV**<br>Saša Kecerin, VELUX Hrvatska d.o.o.<br>**ROCKWOOL DOPRINOS KRUŽNOM GOSPODARSTVU KROZ RECIKLIRANJE MINERALNE VUNE S GRADILIŠTA**<br>Božo Matijević, Andelka Toto Ormuž, ROCKWOOL Adriatic d.o.o. |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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| Događaji uz MUZA-u | |
| 09.30 – 19.00 | **IZLOŽBA MATERIJALA, SUSTAVA I TEHNOLOGIJA INTEGRIRANIH U MUZA-u**<br>(prije te između i nakon specifičnih događaja) |
| 13.00 – 14.30 | **PRAKTIČNE DEMONSTRACIJE UŽIVO**<br>Ispitivanje zrakopropusnosti, infracrvena termografija, proširena (AR) i virtualna (VR) stvarnost, demonstracije proizvoda i sustava raznih proizvođača partnera MUZA-e<br>Demonstracija protuprovalnosti prozora (Marlex i Aluplast) |
| 14.30 – 16.30 | **NZEB cafe - KUTAK ZA PITANJA**<br>Sekcija s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike) |
| | **POSJETE GRUPA IZ ŠKOLA I/ILI FAKULTETA** |

Petak 12. STUDENOG 2021. (radno vrijeme sajma 9.30 – 19.00 h)

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| 11:00 – 12:00 h<br>MUZA | **Predavanja HGK ŽK SPLIT**<br>**PANEL RASPRAVA TRŽIŠTE NEKRETNINA**<br>Sudionici:<br>- Predstavnici agencija za promet nekretnina<br>  - Jasminka Biliškov – Biliškov nekretnine d.o.o. (predsjednica Strukovne grupacije posrednika u prometu nekretnina HGK ŽK Split)<br>- Zamjenici predsjednice Strukovne grupacije posrednika u prometu nekretnina HGK ŽK Split<br>  - Anita Buškulić – Nekretnine Anita Tim d.o.o.<br>  - Marko Plazonja – Nekretnine Lav-promet d.o.o.<br>  - Ervin Poljaković – Plexus d.o.o.<br>- Predstavnik bankarskog sektora |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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muza

- Ivan Vuko – glavni analitičar u uredu direktora regije – Privredna banka Zagreb; uža specijalnost: stambeni krediti i krediti vezani uz poticaju izgradnju
- Predstavnici vanjskog i unutarnjeg uređenja nekretnina
  - Katarina Kavain Škare – projektant dizajner

Moderator: **Saša Ljubičić**, Slobodna Dalmacija

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| 16.30 – 19.00 h | **STRUČNO USAVRŠAVANJE ZA INŽENJERE I ARHITEKTE**<br>**Predavanje sponzora sajma Saso 2021**<br>- Beton Lučko<br>- Roca<br>**IMA LI GRADA ISTOČNO OD RAJA?**<br>Ante Kuzmanić, Arhitektonski biro Ante Kuzmanić<br>**INTEGRACIJA OBNOVLJIVIH IZVORA ENERGIJE U NZEB ZGRADE**<br>doc.dr.sc. Miro Bugarin, dipl.inž., Fakultet elektrotehnike, strojarstva i brodogradnje, Sveučilište u Splitu<br>**ZELENI PROJEKTI : ARHITEKTONSKI PRIKAZ PROJEKTA GRADSKE PLAŽE ŽNJAN U SPLITU**<br>Ante Kuzmanić, Arhitektonski biro Ante Kuzmanić<br>**ZELENI PROJEKTI : ARHITEKTONSKI PROJEKT HIBRIDNE BIO PERGOLE**<br>Jakov Matas, mag.ing.arch. i Grgur Butigan, mag.ing.arch., ZA1-BÜRO d.o.o. |

Događaji uz MUZA-u

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|---|---|
| 09.30 – 19.00 | **IZLOŽBA MATERIJALA, SUSTAVA I TEHNOLOGIJA INTEGRIRANIH U MUZA-u**<br>(prije te između i nakon specifičnih događaja) |
| 13.00 – 14.30 | **PRAKTIČNE DEMONSTRACIJE UŽIVO**<br>ispitivanje zrakopropusnosti, infracrvena termografija, proširena (AR) i virtualna (VR) stvarnost, demonstracije proizvoda i sustava raznih proizvođača partnera MUZA-e<br>Demonstracija protuprovalnosti prozora (Marlex i Aluplast) |
| 14.30 – 16.30 | **NZEB cafe - KUTAK ZA PITANJA** |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji sisjl iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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nZEB Roadshow

mobilna učinkovita zdrava arhitektura

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| | Sekcija s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike) |
| | **POSJETE GRUPA IZ ŠKOLA I/ILI FAKULTETA** |

Subota 13. STUDENOG 2021. (radno vrijeme sajma 9.30 – 19.00 h)

Događaji uz MUZA-u

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|---|---|
| 09.30 – 19.00 | **IZLOŽBA MATERIJALA, SUSTAVA I TEHNOLOGIJA INTEGRIRANIH U MUZA-u**<br>(prije te između i nakon specifičnih događaja) |
| 13.00 – 14.30 | **PRAKTIČNE DEMONSTRACIJE UŽIVO**<br>ispitivanje zrakopropusnosti, infracrvena termografija, proširena (AR) i virtualna (VR) stvarnost, demonstracije proizvoda i sustava raznih proizvođača partnera MUZA-e<br>Demonstracija protuprovalnosti prozora (Marlex i Aluplast) |
| 14.30 – 16.30 | **NZEB cafe - KUTAK ZA PITANJA**<br>Sekcija s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike) |
| | **POSJETE GRUPA IZ ŠKOLA I/ILI FAKULTETA** |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji sisjl iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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nZEB Roadshow

**Figure 39** Agenda of Roadshow event organized within the "24th International fair SASO"

Regarding the monitoring of number of participants at this Roadshow event, the same problem as at the ArhiBau 2021 fair appeared – how to register each visitor/ participant due to large fluctuation? Therefore, surveillance camera and detail photographing were applied as monitoring approaches.

## No. 7 event: Healthy and comfortable living – NZEB (01.12.2021 and 03.12.2021, Varaždin – Faculty of Geotehnical Engineering, University of Zagreb

Varaždin event was organized as an independent event in collaboration with Faculty of Geotechnical Engineering from University of Zagreb. This event was focused exclusively to university students and high school students (Figure 40) accompanied by 8 University professors (Dean, vice deans etc. all experts in mechanical engineering, RES, civil engineering) and 7 high school teachers (also engineers in the field of architecture, civil engineering or mechanical engineering), but there was also an organized event solely for the architecture bureau "Kogl & Plavec" with 5 architects (designers) having an NZEB café event – MUZA tour and discussions.

For university students lecture was given at their faculty and then supported with MUZA tour and gamification tools. For high school students MUZA tour and gamification tools were tailored to their level of knowledge. The same principle was applied as during 2nd Croatian Roadshow event (European Mobility Week) – dividing students into smaller sub-groups and rotating them through three positions.

During our event, students from Electromechanical School Varaždin have recorded short video titled "What are nZEB buildings?" for their Prva Školska Televizija (eng. First School Television), and it is available at https://www.youtube.com/watch?v=MIpgmBT-Kec

**Figure 40** Few photos of Croatian 7th event ("Healthy and comfortable living – NZEB")

Figure 41 contains agenda only for December 1st, as it was originally planned to have just one-day event in Varaždin. However, due to interest shown and requests for additional MUZA tours, we have prolonged Varaždin event also for December 3rd.

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**ZDRAVO I UGODNO STANOVANJE – NZEB**

**Varaždin**
**Geotehnički fakultet**
**01.12.2021.**

Srijeda 01. PROSINCA 2021.

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| 11:00 – 11:30 h<br>Predavaonica<br>(predavanja zatvorenog tipa za studente Geotehničkog fakulteta – COVID mjere) | **ZGRADE GOTOVO NULTE ENERGIJE POTROŠNJE - PREDSTAVLJANJE PROJEKTA MUZA**<br>doc. dr. sc. Bojan Milovanović,<br>Sveučilište u Zagrebu, Građevinski fakultet<br>**KAKO GRADITI SIGURNO, ENERGETSKI UČINKOVITO I ZELENO?**<br>Robert Filipović, Fibran d.o.o. |
| 11:30 – 12:30 h<br>MUZA<br>(obilazak zatvorenog tipa) | **IZLOŽBA MATERIJALA, SUSTAVA I TEHNOLOGIJA INTEGRIRANIH U MUZA-u za studente Geotehničkog fakulteta**<br>Vođeni obilazak uz demonstracije |
| 12:30 – 13:30 h<br>MUZA<br>(obilazak zatvorenog tipa) | **IZLOŽBA MATERIJALA, SUSTAVA I TEHNOLOGIJA INTEGRIRANIH U MUZA-u za djelatnike Geotehničkog fakulteta**<br>Vođeni obilazak uz demonstracije |
| 13:30 – 18:00 h<br>MUZA<br>(obilazak otvorenog tipa) | **OTVORENA VRATA MUZA-e za opću i stručnu javnost**<br>Mogućnost vođenog obilaska MUZA-e za sve zainteresirane pojedince i grupe (opća i stručna javnost)<br>**NZEB cafe – KUTAK ZA PITANJA za opću i stručnu javnost**<br>Mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost i za profesionalce (inženjere, ali i obrtnike, radnike) |

KONTAKT OSOBA:

doc. dr. sc. Bojan Milovanović

bojan.milovanovic@grad.unizg.hr

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji služi za projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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nZEB Roadshow

**Figure 41** Agenda of Roadshow event "Healthy and comfortable living – NZEB"

The number of participants was monitored by attendance list (attendance list of students prepared by their accompanying teachers and pre-registration via mail for "Kogl & Plavec" architects), surveillance cameras and detailed photographing. Around 40% of participants have filled out the survey.

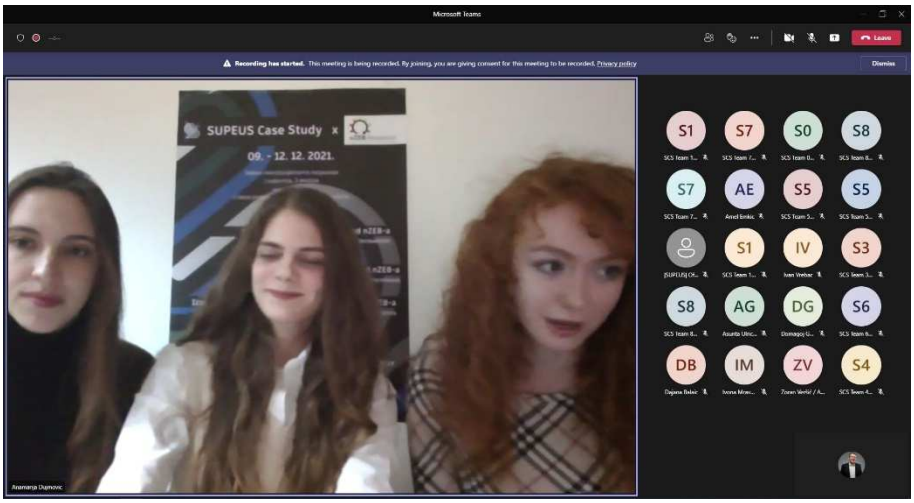
## No. 8 event: SUPEUS Case study (09.-12.12.2021 in Zagreb and on-line

SUPEUS Case Study event was organized in cooperation with “Student association for promoting energy efficiency and consulting” – SUPEUS. SUPEUS is an interdisciplinary association of students whose work raises awareness of the importance of energy efficiency, sustainable solutions and the necessity of using renewable energy sources. The Supeus Case Study project was designed primarily for students from technical disciplines with the aim of promoting energy efficiency and connecting students with companies operating in this field. The Supeus Case Study event took place at technical faculties that have a spectrum of activities related to energy efficiency, i.e. Faculty of Architecture, Faculty of Electrical Engineering and Computing, Faculty of Civil Engineering, and the Faculty of Mechanical Engineering and Naval Architecture.

The project consisted of three workshops in which students were divided into teams and competed to solve tasks related to energy efficiency, sustainable construction, and renewable energy sources. In the first part of the workshop, students were presented with a specific subject by an expert lecturer and given a problem to solve in the second part Figure 42. The idea of MUZA team (NZEB Roadshow partners) and SUPEUS was to have interdisciplinary teams that attempt to participate in all three workshops. For this reason, the tasks were designed so that each student, regardless of their field of study, has an equal chance to find a solution based on the information gathered in the first part of the workshop and the lecture.

To enable students to attend all three workshops, the Case Study took place separately at each faculty on different days within the same week **Figure 43**.

Industrial partners form Wienerberger, Bosch, Rockwool and LipaPromet participated to the event together with professors from Faculties of Architecture, Mechanical Engineering and naval architecture and Electrical engineering and Computing, respectively.



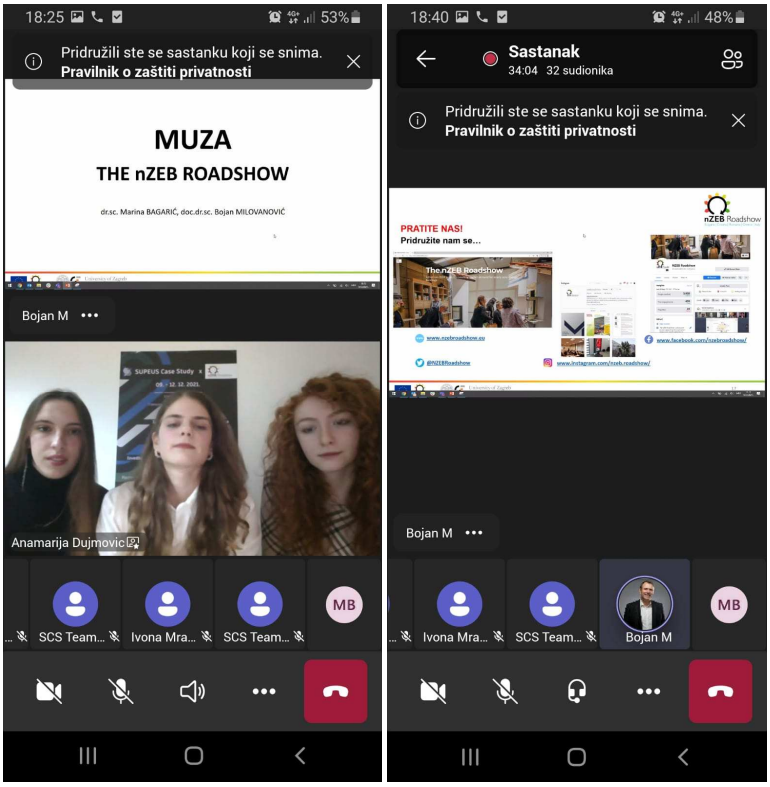


**Figure 42** Few photos from the SUPEUS Case Study event

**Figure 43** Agenda of Roadshow event "SUPEUS Case study"

The tasks set before the 36 students which participated to the event were to use gamification to learn, so one of the tasks was to record a video explaining functioning of the heat pumps, Figure 44. The number of participants was monitored using the preregistration approach.

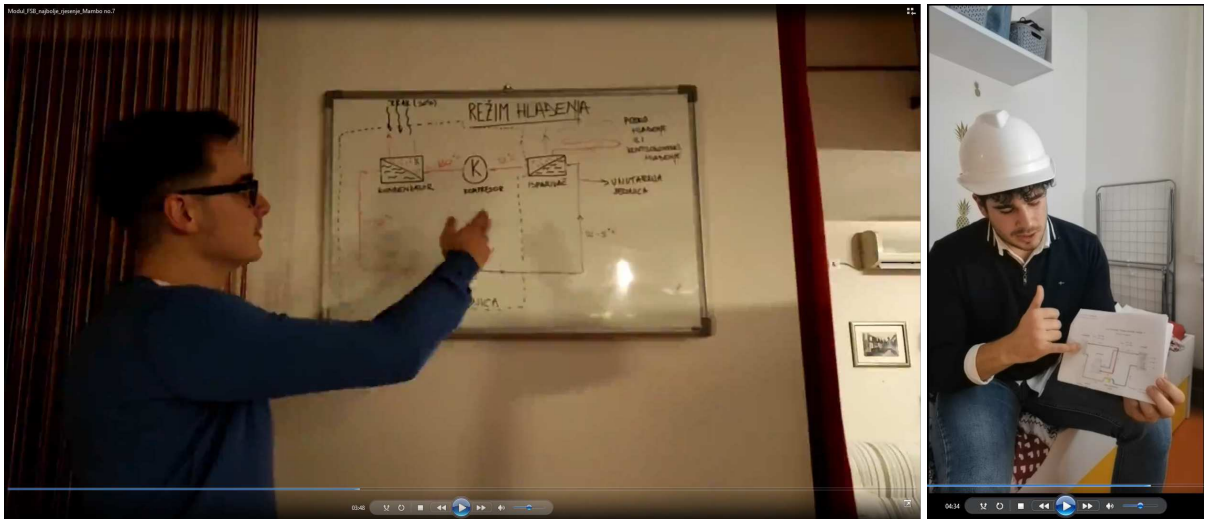



**Figure 44** Screenshots of the winning videos

### No. 9 event: Continuous event (17.06.2021 and 23.08.2021 at Zagreb – TMNT; 09.12.2021 and 16.12.2021 at Zagreb – Faculty of Civil Engineering, University of Zagreb

During the period 18th May 2021 – 02nd October 2021, nZEB mobile house MUZA was located in the courtyard of TMNT in Zagreb. During this period, besides organized one nZEB day (1st event) and one nZEB week (2nd event), MUZA and Croatian team members were available for all other interested museum visitors, so-called continuous event. When possible, the continuous event took place between the specific NZEB week and specific NZEB day. In case of direct inquiry and expressed interest, mobile house MUZA was used on the "open doors" principle (Figure 45 – Top left). Direct inquiry and expressed interested was coordinated with TMNT's employers. Moreover, continuous event covered different activities with university students at UNIZAG GF (Figure 45). Activities with university students at UNIZAG GF were based on "learning by doing" principle. Students were divided into different groups and their tasks were:

- To seal penetrations on models and install water vapour barrier
- Minimize thermal bridges on different construction details using Condetti creative system
- Explore large-scale 3D construction models with solved thermal bridge problems and try to translate those details on paper (2D)
- Observing live Blower door demonstration
- Use infrared camera and try to detect leakages and thermal bridges during Blower Door testing

**Figure 45** Few photos of Croatian 8th event (Top left – Continuous event in TMNT; Other figures – activities with university students at UNIZAG GF)

During this continuous event (the 8th Roadshow event), there was no formal agenda since all visits to MUZA were based on "open door" principle in case of expressed interest and all activities used gamification tools available in MUZA and MUZA itself, respectively. Activities for university students

at UNIZAG GF were organized only for students attending “Building Physics” course at master study in the field of Civil Engineering.

Number of participants at MUZA in TMNT was monitored using surveillance camera and photographing. Number of participants at UNIZAG GF activities was monitored using on-site registration and detailed photographing.

### No. 10 event: NZEB Roadshow project and MUZA visiting Osijek (25.– 29.04.2022, Osijek – Faculty of Civil Engineering and Architecture, University J.J. Strossmayer)

The 9th event was a nZEB week with 5 days filled with intense program (Figure 47), and it was the longest and most dynamic event organized by Croatian team. The host of MUZA was Faculty of Civil Engineering and Architecture from University J.J. Strossmayer, and they were actively involved in the whole program. This event covered large group of stakeholders (Figure 46), such as elementary school pupils and university students (architecture and civil engineering students), professionals (one education/training for heat pump designers, four continuous professional development courses for construction engineers and architects with theoretical lectures and practical demonstrations), interested citizens (nZEB café for consultations, MUZA’s “open doors”), etc.

**Figure 46** Few photos of Croatian 9th event (“NZEB Roadshow project and MUZA visiting Osijek”)

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**GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**

**Osijek 25.-29.04. 2022.**

Ponedjeljak 25. TRAVNJA 2022.

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| 11:00 – 13:00 h<br>MUZA | **NZEB cafe - KUTAK ZA PITANJA**<br>Otvorena vrata MUZA-e s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost.<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike). |
| 13:00 – 17:00 h<br>MUZA | **TEORETSKO I PRAKTIČNO ŠKOLOVANJE PROJEKTANATA ZA BOSCH DIZALICU TOPLINE Compress 6000**<br>Nebojša Stojadinović, Robert Bosch d.o.o. |
| 17:00 – 18:00 h<br>MUZA | **TinkerLab Đakovo**<br>- Interaktivne praktične radionice za učenike osnovne škole na temu obnovljivih izvora energije i energetske učinkovitosti u zgradama.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |

Utorak 26. TRAVNJA 2022.

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| 10:00 – 13:30 h<br>MUZA | **NZEB cafe – KUTAK ZA PITANJA**<br>Otvorena vrata MUZA-e s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost.<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike). |
| 13:30 – 14:30 h<br>MUZA | **OŠ Franje Krežme Osijek**<br>- Interaktivne praktične radionice za učenike osnovne škole na temu obnovljivih izvora energije i energetske učinkovitosti u zgradama.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |
| 15:00 – 17:00 h<br>Fakultetska predavaonica | **Stručno usavršavanje osoba ovlaštenih za provedbu energetskog certificiranja i energetske preglede zgrada**<br>- Teorijska predavanja o proračunima energetskog ponašanja zgrada gotovo nulte energije<br>Silvio Novak, Knauf Insulation d.o.o. |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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nZEB Roadshow

mobilna
učinkovita
zdrava
arhitektura

muza

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|---|---|
| 17:00 – 20:00 h<br>MUZA | **Stručno usavršavanje osoba ovlaštenih za provedbu energetskog certificiranja i energetske preglede zgrada**<br>- Stručni obilazak MUZA-e uz teorijska predavanja i demonstraciju ključnih aspekata projektiranja i izgradnje zgrada gotovo nulte energija.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu<br>- Demonstracija protuprovalnosti prozora<br>Boris Šimić, Aluplast GmbH ; Alen Pomper, Marlex d.o.o. |

Srijeda 27. TRAVNJA 2022.

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|---|---|
| 08:00 – 10:00 h<br>MUZA | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Preddiplomski sveučilišni studij Arhitektura i urbanizam, III. godina, Kolegij: Enterijer**<br>- Stručni obilazak MUZA-e uz praktične demonstracije NZEB kompatibilnih proizvoda, sustava i tehnologija integriranih u MUZA-u. Teorijske diskusije o principima projektiranja, izvođenja i korištenja NZEB zgrada, s naglaskom na ugodnost i kvalitetu unutarnjeg okoliša.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |
| 10:00 – 11:00 h<br>Fakultetska predavaonica | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Preddiplomski sveučilišni studij Arhitektura i urbanizam, I. godina, Kolegij: Arhitektonsko projektiranje**<br>- Teorijske diskusije o principima projektiranja, izvođenja i korištenja NZEB zgrada, s naglaskom na ugodnost i kvalitetu unutarnjeg okoliša.<br>Bojan Milovanović, Građevinski fakultet Sveučilišta u Zagrebu |
| 11:00 – 12:00 h<br>MUZA | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Preddiplomski sveučilišni studij Arhitektura i urbanizam, I. godina, Kolegij: Arhitektonsko projektiranje**<br>- Stručni obilazak MUZA-e uz praktične demonstracije NZEB kompatibilnih proizvoda, sustava i tehnologija integriranih u MUZA-u. Prikaz primijenjenih principa projektiranja NZEB zgrada.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |
| | *(slijedi nastavak programa za srijedu 27.04.2022.)* |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

Sveučilište u Zagrebu Građevinski fakultet

nZEB Roadshow

mobilna
učinkovita
zdrava
arhitektura

muza

| | |
|---|---|
| 11:00 – 12:00 h<br>Fakultetska predavaonica<br><br>12:00 – 14:00 h<br>MUZA | **USAVRŠAVANJE PROJEKTANATA ZA PROJEKTIRANJE I IZVEDBU VANJSKIH OVOJNICA ZGRADA GOTOVO NULTE ENERGIJE**<br>- Teorijsko predavanje o vanjskoj ovojnici zgrade gotovo nulte energije.<br>- Stručni obilazak MUZA-e uz praktične demonstracije NZEB kompatibilnih proizvoda, sustava i tehnologija integriranih u MUZA-u.<br>Silvio Novak, Knauf Insulation d.o.o. |
| 12:00 – 13:00 h<br>Fakultetska predavaonica | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Diplomski sveučilišni studij Građevinarstvo, I. godina, Kolegij: Potresno inženjerstvo**<br>- Predavanje na temu „Seismic temeljni jastuk"<br>Tanja Herr, Fibran d.o.o. |
| 13:00 – 15:00 h<br>Fakultetska predavaonica | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Preddiplomski sveučilišni studij Arhitektura i urbanizam, III. godina, Kolegij: Menadžment u arhitekturi**<br>- Teorijsko predavanje na temu „Izazovi pri izgradnji nZEB mobilne kuće – financijski aspekt"<br>Bojan Milovanović, Građevinski fakultet Sveučilišta u Zagrebu |
| 15:00 – 16:00 h<br>MUZA | **NZEB cafe – KUTAK ZA PITANJA**<br>Otvorena vrata MUZA-e s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost.<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike). |
| 16:00 – 18:00 h<br>MUZA | **OŠ Tordinci**<br>- Interaktivne praktične radionice za učenike osnovne škole na temu obnovljivih izvora energije i energetske učinkovitosti u zgradama.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

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nZEB Roadshow

mobilna
učinkovita
zdrava
arhitektura

muza

Četvrtak 28. TRAVNJA 2022.

| | |
|---|---|
| 08:00 – 10:00 h<br>MUZA | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Preddiplomski sveučilišni studij Građevinarstvo, II. godina**<br>- Stručni obilazak MUZA-e uz praktične demonstracije NZEB kompatibilnih proizvoda, sustava i tehnologija integriranih u MUZA-u. Prikaz primijenjenih principa projektiranja NZEB zgrada.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |
| 10:00 – 12:00 h<br>Fakultetska predavaonica | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Diplomski studij Građevinarstvo, I. godina, Kolegij: Održavanje objekata**<br>- Predavanje na temu „Ravni, ozelenjeni i obrnuti krovovi"<br>Tanja Herr, Fibran d.o.o. |
| 10:00 – 11:00 h<br>MUZA | **OŠ Retfala Osijek**<br>- Interaktivne praktične radionice za učenike osnovne škole na temu obnovljivih izvora energije i energetske učinkovitosti u zgradama.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |
| 11:00 – 12:00 h<br>MUZA | **NZEB cafe - KUTAK ZA PITANJA**<br>Sekcija s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike) |
| 12:00 – 13:00 h<br>MUZA | **TinkerLab Osijek**<br>- Interaktivne praktične radionice za učenike osnovne škole na temu obnovljivih izvora energije i energetske učinkovitosti u zgradama.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |
| 12:00 – 14:00 h | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Preddiplomski studij Arhitektura i urbanizam, III. godina, Kolegij: Završni rad**<br>- Predavanje na temu „Ravni, ozelenjeni i obrnuti krovovi"<br>Tanja Herr, Fibran d.o.o. |
| 10:00 – 16:40 h<br>Fakultetska predavaonica | **Stručno usavršavanje za arhitekte i inženjere „Projektiranje i izvođenje zgrada gotovo nulte energije"** *(detaljan program na kraju ove agende)* |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

Sveučilište u Zagrebu Građevinski fakultet

nZEB Roadshow

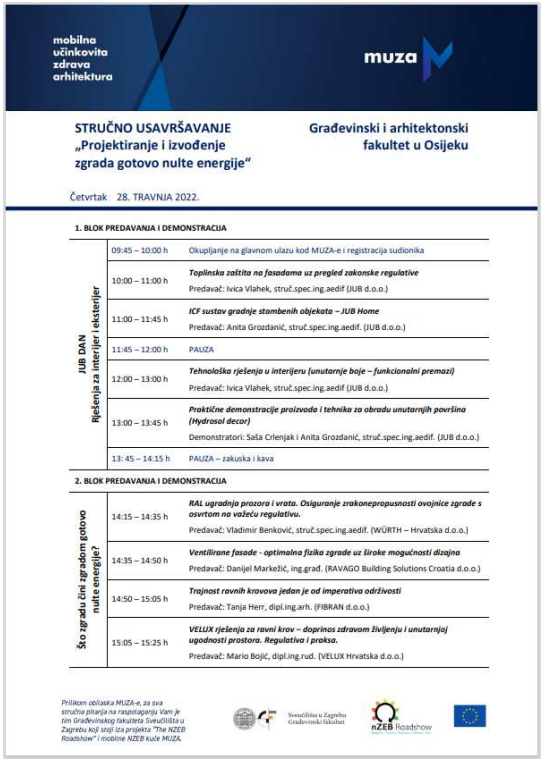
mobilna učinkovita zdrava arhitektura — muza

Petak 29. TRAVNJA 2022.

| | |
|---|---|
| 08:00 – 10:00 h<br>MUZA | **STUDENTI GRAĐEVINSKI I ARHITEKTONSKI FAKULTET OSIJEK**<br>**Preddiplomski sveučilišni studij Arhitektura i urbanizam, II. Godina, Kolegij: Fizika zgrade**<br>- Stručni obilazak MUZA-e uz praktične demonstracije NZEB kompatibilnih proizvoda, sustava i tehnologija integriranih u MUZA-u. Prikaz primijenjenih principa projektiranja NZEB zgrada.<br>Bojan Milovanović, Marina Bagarić, Mergim Gaši, Građevinski fakultet Sveučilišta u Zagrebu |
| 10:00 – 11:00 h<br>MUZA | **NZEB cafe - KUTAK ZA PITANJA**<br>Sekcija s mogućnosti konzultacija o energetskoj učinkovitosti i NZEB zgradama za opću javnost<br>Besplatne konzultacije za profesionalce (inženjere, ali i obrtnike, radnike) |
| 11:00 – 13:00 h<br>MUZA | **USAVRŠAVANJE PROJEKTANATA I IZVOĐAČA ZA PROJEKTIRANJE I IZVEDBU ELEMENATA ZGRADE KLJUČNIH ZA TOPLINSKU I AKUSTIČNU UGODNOST TE ZAŠTITU OD POŽARA**<br>- Teorijsko predavanje popraćeno stručnim obilaskom MUZA-e uz praktične demonstracije NZEB kompatibilnih proizvoda, sustava i tehnologija integriranih u MUZA-u.<br>Božo Matijević, Rockwool Ariatic d.o.o. |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji sisi iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

Sveučilište u Zagrebu Građevinski fakultet — nZEB Roadshow



mobilna učinkovita zdrava arhitektura — muza

**STRUČNO USAVRŠAVANJE „Projektiranje i izvođenje zgrada gotovo nulte energije“**

**Građevinski i arhitektonski fakultet u Osijeku**

Četvrtak 28. TRAVNJA 2022.

| | | |
|---|---|---|
| **1. BLOK PREDAVANJA I DEMONSTRACIJA** | | |
| JUB DAN Rješenja za interijer i eksterijer | 09:45 – 10:00 h | Okupljanje na glavnom ulazu kod MUZA-e i registracija sudionika |
| | 10:00 – 11:00 h | ***Toplinska zaštita na fasadama uz pregled zakonske regulative***<br>Predavač: Ivica Vlahek, struč.spec.ing.aedif (JUB d.o.o.) |
| | 11:00 – 11:45 h | ***ICF sustav gradnje stambenih objekata – JUB Home***<br>Predavač: Anita Grozdanić, struč.spec.ing.aedif. (JUB d.o.o.) |
| | 11:45 – 12:00 h | PAUZA |
| | 12:00 – 13:00 h | ***Tehnološka rješenja u interijeru (unutarnje boje – funkcionalni premazi)***<br>Predavač: Ivica Vlahek, struč.spec.ing.aedif (JUB d.o.o.) |
| | 13:00 – 13:45 h | ***Praktične demonstracije proizvoda i tehnika za obradu unutarnjih površina (Hydrosol decor)***<br>Demonstratori: Saša Crlenjak i Anita Grozdanić, struč.spec.ing.aedif. (JUB d.o.o.) |
| | 13: 45 – 14:15 h | PAUZA – zakuska i kava |
| **2. BLOK PREDAVANJA I DEMONSTRACIJA** | | |
| Što zgradu čini zgradom gotovo nulte energije? | 14:15 – 14:35 h | ***RAL ugradnja prozora i vrata. Osiguranje zrakonepropusnosti ovojnice zgrade s osvrtom na važeću regulativu.***<br>Predavač: Vladimir Benković, struč.spec.ing.aedif. (WÜRTH – Hrvatska d.o.o.) |
| | 14:35 – 14:50 h | ***Ventilirane fasade - optimalna fizika zgrade uz široke mogućnosti dizajna***<br>Predavač: Danijel Markežić, ing.grad. (RAVAGO Building Solutions Croatia d.o.o.) |
| | 14:50 – 15:05 h | ***Trajnost ravnih krovova jedan je od imperativa održivosti***<br>Predavač: Tanja Herr, dipl.ing.arh. (FIBRAN d.o.o.) |
| | 15:05 – 15:25 h | ***VELUX rješenja za ravni krov – doprinos zdravom življenju i unutarnjoj ugodnosti prostora. Regulativa i praksa.***<br>Predavač: Mario Bojić, dipl.ing.rud. (VELUX Hrvatska d.o.o.) |

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji sisi iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

Sveučilište u Zagrebu Građevinski fakultet — nZEB Roadshow



mobilna učinkovita zdrava arhitektura — muza

| | | |
|---|---|---|
| **2. BLOK PREDAVANJA I DEMONSTRACIJA (nastavak programa)** | | |
| Što zgradu čini zgradom gotovo nulte energije? | 15:25 – 15:45 h | ***Prednosti konzole od nehrđajućeg čelika u sustavu ventilirane fasade***<br>Predavač: Krešimir Stunja, dipl.ing.grad. (EJOT spojna tehnika d.o.o.) |
| | 15:45 – 16:05 h | ***MULTIPOR toplinska izolacija za sveobuhvatnu energetsku obnovu***<br>Predavač: Aleksandar Škurić, struč.spec.ing.grad. (YTONG porobeton d.o.o.) |
| | 16:05 – 16:40 h | MUZA – ***Demonstracija protuprovalnosti prozora***<br>Predavači: Boris Šimić, dipl.ing. (Aluplast GmbH), Alen Pomper (Marlex d.o.o.) |

**Mjesto održavanja:** Građevinski i arhitektonski fakultet u Osijeku, Vladimira Preloga 3, 31000, Osijek

**Dvorana:** II-S2

**Vrijeme održavanja:** 28.04.2022.

**Voditelja tečaja:** doc.dr.sc. Bojan Milovanović

**Maksimalni broj polaznika:** 60

**Prijave preko Seminario sustava:** http://projects.grad.hr/seminario/online

**STRUČNO USAVRŠAVANJE:**

Sudionici ostvaruju pravo na 5 akademskih sati iz stručnog područja i 1 akademski sat iz tehničke regulative u okviru stručnog usavršavanja za obveznike istog.

**KOTIZACIJA:**

Nema kotizacije

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji sisi iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

Sveučilište u Zagrebu Građevinski fakultet — nZEB Roadshow

**Figure 47** Agenda of Roadshow event “NZEB Roadshow project and MUZA visiting Osijek”

Continuous professional development courses were organized in cooperation with MUZA’s industry partners: Robert Bosch, Knauf Insulation, Aluplast GmbH, Marlex, Fibran, Rockwool Adriatic, JUB, Würth-Hrvatska, Ravago Building Solutions Croatia, Velux Hrvatska, EJOT Spojna tehnika and YTONG porobeton. Topics covered by continuous professional development courses, and its concept, is described in agenda (Figure 47).

Number of participants was monitored by attendance list (attendance list of pupils and students prepared by their accompanying teachers and pre-registration for continuing professional

development courses), surveillance cameras and detailed photographing. Around 6% of participants have filled out survey. MUZA and the nZEB Roadshow project were presented to Mayor of the city of Ilok Mrs. Marina Budimir, newly selected Rector of the University of Zagreb prof. Stjepan Lakušić, as well as newly selected Deans of UNIZAG GF (prof. Domagoj Damjanović) and Faculty of Civil Engineering and Architecture from University J.J. Strossmayer (assoc. prof. Hrvoje Krstić).

### No. 11 event: Science festival 2022 (02.– 07.05.2022, Zagreb – TMNT)

MUZA's return to the technical museum TMNT in Zagreb was marked by participation in the Science festival 2022 themed "Life!", and this was official 10th Roadshow event. In collaboration with TMNT, organized visits from elementary and high schools were realized (Figure 48 – first row figures).

Moreover, thanks to the direct inquiry MUZA and "The nZEB Roadshow" project were presented to Croatian female International council on large electric systems HRO-CIGRE (Figure 48 – second row figures), Deputy Mayor of the city of Križevci Mr. Danijel Šaško, as well as former Member of European Parliament prof. Davor Škrlec.

**Figure 48** Few photos of Croatian 10th event ("Science festival 2022")

mobilna
učinkovita
zdrava
arhitektura

muza

**FESTIVAL ZNANOSTI 2022**

**Tehnički muzej Nikola Tesla, Zagreb 02. – 07.05.2022.**

MUZA – istraži pametnu mobilnu kuću koja troši gotovo nula energije i saznaj kako izgleda zvuk u prostoru

**RASPORED AKTIVNOSTI NA MUZA-i U SKLOPU FESTIVALA ZNANOSTI:**

| | |
|---|---|
| PON 02.05.2022. | Otvorena vrata MUZA-e od 10:00 – 17:00 h I RADIONICE (termini po dogovoru) |
| UTO 03.05.2022. | Otvorena vrata MUZA-e od 10:00 – 17:00 h I RADIONICE (termini po dogovoru) |
| SRI 04.05.2022. | Otvorena vrata MUZA-e od 10:00 – 17:00 h I RADIONICE (termini po dogovoru) |
| ČET 05.05.2022. | Otvorena vrata MUZA-e od 10:00 – 17:00 h I RADIONICE (termini po dogovoru) |
| PET 06.05.2022. | Otvorena vrata MUZA-e od 10:00 – 17:00 h I RADIONICE (termini po dogovoru) |
| SUB 07.05.2022. | Otvorena vrata MUZA-e od 10:00 – 13:00 h I RADIONICE (termini po dogovoru) |

**OPIS RADIONICE:**

Kroz interaktivni pristup na primjeru stvarne mobilne kuće pokazati će se kakve trebaju biti današnje zgrade – energetski vrlo učinkovite, pametne, zdrave i jako ugodne za življenje. Kroz različite edukativne igrice objasniti će se koji su osnovni principi zgrada gotovo nulte energije. Budući da je buka jako veliki problem u današnjim zgradama, pokazati će se na koji način je moguće „vidjeti" buku i pratiti širenje zvuka.

**NAPOMENA: Za veće grupe potrebna je prethodna najava kako bi se mogle pravovremeno pripremiti i održati radionice.**

KONTAKT OSOBE:

doc. dr. sc. Bojan Milovanović bojan.milovanovic@grad.unizg.hr (Građevinski fakultet Sveučilišta u Zagrebu)

Branimir Prgomet branimir.prgomet@tmnt.hr (Tehnički muzej Nikola Tesla)

*Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta "The NZEB Roadshow" i mobilne NZEB kuće MUZA.*

Sveučilište u Zagrebu Građevinski fakultet

nZEB Roadshow

nekretnine

Festival znanosti

**Želite kuću gotovo nulte energije? Neka vam MUZA bude muza!**

Hrvatska mobilna kuća je primjer učinkovite i zdrave arhitekture. Ima formu pravilnog kvadrata, vanjskih dimenzija 9x2,9x3,15 metara, koja stoji na čeličnim teleskopskim stupovima i ima nosivu konstrukciju

Anita Budimir

Na turneji

MUZA želi pokazati stanovnicima Hrvatske da je moguće stvoriti dom kojim se malo utječe na okoliš

Za bolji život

HPB

OGLAS O PRODAJI NEKRETNINE U VLASNIŠTVU HRVATSKE POŠTANSKE BANKE, dioničko društvo



**Figure 49** Agenda of Roadshow event organized within the "Science festival 2022" (Left) and interview given by Croatian team members for Real Estate publication (part of one of the leading Croatian daily newspapers Jutarnji list)

Official agenda of 10th Croatian Roadshow event is presented in Figure 49 – Left, and Roadshow activities during Science Festival were recognized by one of the leading Croatian daily newspapers Jutarnji list (Figure 49 – Right).

The number of participants was monitored by attendance list (attendance list of pupils and students prepared by their accompanying teachers), surveillance camera and detailed photographing.

## No. 12 event: Closed event for window professionals (22.09.2022, Trakošćan – Hotel Trakošćan)

The 11th event was organized in cooperation with Aluplast GmbH company, which is one of the leading European producers of PVC windows. This event was a closed-event intended for very specific group of professional – window producers, installers and sellers. It was international event with participants from Croatia, Germany, Austria, Slovenia, Bosnia and Hercegovina. After the lecture on the latest technological developments in PVC windows industry, participants moved from the hotel conference room to MUZA and they were given a lecture on nZEB buildings and "The nZEB Roadshow". This lecture was followed by guided tour through MUZA (Figure 50).

**Figure 50** Few photos of Croatian 11th event ("Closed event for window professionals")

Since it was a close event, there was no formal agenda. Number of participants was monitored by surveillance camera and detailed photographing.

### No. 13 event: ArhiBau.hr 2022: "Fair on construction culture and sustainable development" (05.– 08.10.2022, Zagreb – Arena Zagreb sports hall)

This nZEB week was organized again in the framework of the trade fair ArhiBau in Zagreb. However, compared to the previous ArhiBau 2021 event, this time MUZA was located inside the Arena Zagreb sports hall (dislocation of activities avoided) and the entire 12th Roadshow event was organized in joint cooperation with the company Aluplast GmbH. Moreover, for this ArhiBau 2022 trade fair different approach was selected for tailoring Roadshow activities and attracting larger number of participants.

Since MUZA was placed inside the sports hall Arena Zagreb, all Roadshow activities were organized in and around the MUZA. This 4-day event (Figure 52) was divided into different practical segments that complement each other:

- 1st day – installation of two seismic foundation pillows (Fibran) and construction of two walls (brick – Wienerberger and autoclaved cellular concrete blocks – Ytong porobeton) with openings for windows
- 2nd day – window installation in wall openings (Aluplast GmbH, Marlex, Würth-Hrvatska, Fibran) according to RAL guidelines
- 3rd day – installation of ETICS façade system with EPS and MW thermal insulation (JUB, Rockwool Adriatic), installation of ventilated façade system (Rockwool Adriatic, EJOT Spojna tehnika, Ravago Building Solutions Croatia
- 4th day – window safety testing (Aluplast GmbH, Marlex)

All demonstrations were focused on solving critical details and followed by parallel theoretical lectures.

Besides these practical demonstrations, agenda (Figure 52) shows that there were number of other activities such as lecture on EcoStruxure™ Building Operation (Schneider Electric), presentation of project “NZEB and energy renovation” and consultations for interested citizens (Energy Institute Hrvoje Požar), “open doors” of MUZA, etc.

**Figure 51** Few photos of Croatian 12th event (ArhiBau.hr 2022: “Fair on construction culture and sustainable development”)

mobilna
učinkovita
zdrava
arhitektura

muza

Arhi Bau

**ArhiBau**
sajam graditeljstva

**Zagreb, Arena Zagreb**
**05. – 08.10. 2022.**

**SRI 05.10.2022.**

- **09:00 – 11:00 h**
  **OTVORENA VRATA MUZA-e:**
  Slobodan obilazak MUZA-e uz interaktivne izložbe i demonstracije (Građevinski fakultet ZG), obilazak partnera MUZA-e (aluplast, Marlex)
- **11:00 – 12:00 h**
  **IZVEDBA SEISMIC TEMELJNOG JASTUKA ZA ZID OD OPEKE** – demonstracija uz predavanje (Fibran)
- **12:00 – 14:00 h**
  **IZVEDA ZIDA OD POROTHERM OPEKE** – demonstracija (Wienerberger)
- **14:00 – 15:00 h**
  **OTVORENA VRATA MUZA-e:**
  Slobodan obilazak MUZA-e uz interaktivne izložbe i demonstracije (Građevinski fakultet ZG), obilazak partnera MUZA-e (aluplast, Marlex)
- **15:00 – 16:00 h**
  **IZVEDBA SEISMIC TEMELJNOG JASTUKA ZA ZID OD POROBETONA** – demonstracija uz predavanje (Fibran)
- **16:00 – 19:00 h**
  **IZVEDBA ZIDA POROBETON BLOKOVIMA** – demonstracija uz predavanje (Ytong)
- **19:00 – 20:00 h**
  **OTVORENA VRATA MUZA-e:**
  Slobodan obilazak MUZA-e uz interaktivne izložbe i demonstracije (Građevinski fakultet ZG), obilazak partnera MUZA-e (aluplast, Marlex)

**ČET 06.10.2022.**

- **09:00 – 11:00 h**
  **OTVORENA VRATA MUZA-e:**
  Slobodan obilazak MUZA-e uz interaktivne izložbe i demonstracije (Građevinski fakultet ZG), obilazak partnera MUZA-e (aluplast, Marlex)
- **11:00 – 14:00 h**
  **ECOSTRUXURE BUILDING SUSTAV ZA UPRAVLJANJE PAMETNIM ZGRADAMA** – demonstracija uz predavanje (Schneider Electric)
- **14:00 – 15:00 h**
  **UGRADNJA PROZORA U IZVEDENE ZIDOVE**– demonstracija uz predavanje (aluplast, Marlex)
- **15:00 – 17:00 h**
  **MEHANIČKO PRIČVRŠĆENJE PROZORA I UGRADNJA TOPLINSKE IZOLACIJE PROZORSKE KLUPČICE** – demonstracija uz predavanje (aluplast, Marlex, Würth, Fibran)
- **17:00 – 19:00 h**
  **BRTVLJENJE UGRAĐENIH PROZORA PREMA RAL MONTAŽI** – demonstracija uz predavanje (Würth)
- **19:00 – 20:00 h**
  **ISPITIVANJE PROTUPROVALNOSTI RAZLIČITIH PROZORA** – demonstracija uz predavanje (aluplast, Marlex)

**PET 07.10.2022.**

- **09:00 – 10:00 h**
  **OTVORENA VRATA MUZA-e:**
  Slobodan obilazak MUZA-e uz interaktivne izložbe i demonstracije (Građevinski fakultet ZG), obilazak partnera MUZA-e (aluplast, Marlex)
- **10:00 – 13:00 h**
  **UGRADNJA ETICS SUSTAVA (EPS) NA IZVEDENE ZIDOVE** – demonstracija uz predavanje (JUB)
- **13:00 – 14:00 h**
  **UGRADNJA ETICS SUSTAVA (MW) NA IZVEDENE ZIDOVE** – demonstracija uz predavanje (JUB, Rockwool)
- **14:00 – 17:00 h**
  **UGRADNJA SUSTAVA VENTILIRANE FASADE NA IZVEDENE ZIDOVE** – demonstracija uz predavanje (Rockwool, Ejot, Ravapo)
- **17:00 – 19:00 h**
  **NZEB I ENERGETSKA OBNOVA,** predstavljanje projekta i konzultacije sa zainteresiranim posjetiteljima (Energetski institut Hrvoje Požar)
- **19:00 – 20:00 h**
  **ISPITIVANJE PROTUPROVALNOSTI RAZLIČITIH PROZORA** – demonstracija uz predavanje (aluplast, Marlex)

**SUB 08.10.2022.**

- **10:00 – 12:00 h**
  **OTVORENA VRATA MUZA-e:**
  Slobodan obilazak MUZA-e uz interaktivne izložbe i demonstracije (Građevinski fakultet ZG), obilazak partnera MUZA-e (aluplast, Marlex), networking
- **12:00 – 13:00 h**
  **ISPITIVANJE PROTUPROVALNOSTI RAZLIČITIH PROZORA** – demonstracija uz predavanje (aluplast, Marlex)
- **13:00 – 14:00 h**
  **NZEB CAFE KUTAK** za besplatno savjetovanje/konzultacije u području energetske učinkovitosti
- **14:00 – 15:00 h**
  **DEMONSTRACIJA BLOWER DOOR ISPITIVANJA popraćena** snimanjem infracrvenom termografijom (Građevinski fakultet Sveučilišta u Zagrebu)
- **15:00 – 17:00 h**
  **VOĐENI OBILAZAK MUZA-e:**
  Prikaz ugrađenih materijala, tehničkih sustava i tehnologije u MUZA-u pod stručnim vodstvom Građevinskog fakulteta Sveučilišta u Zagrebu
- **17:00 – 20:00 h**
  **OTVORENA VRATA MUZA-e:**
  Slobodan obilazak MUZA-e uz interaktivne izložbe i demonstracije (Građevinski fakultet ZG), obilazak partnera MUZA-e (aluplast, Marlex)

Sveučilište u Zagrebu Građevinski fakultet

aluplast

nZEB Roadshow

***Prilikom obilaska MUZA-e, za sva stručna pitanja na raspolaganju Vam je tim Građevinskog fakulteta Sveučilišta u Zagrebu koji stoji iza projekta „The NZEB Roadshow“ i mobilne NZEB kuće MUZA.***

**Figure 52** Agenda of Roadshow event organized within the ArhiBau.hr 2022: "Fair on construction culture and sustainable development")

Previously mentioned demonstration activities attracted large number of trade fair visitors and triggered their interest for nZEB compatible materials, products, technologies and generally nZEB buildings. Even the Mayor of the city of Split Mr. Ivica Puljak itself participated in window safety testing.

As it can be seen from Figure 53, Croatian team members also participated in scientific-professional conference at ArhiBau 2022 organized by Zagreb Society of Architects (official organizers of ArhiBau 2022).

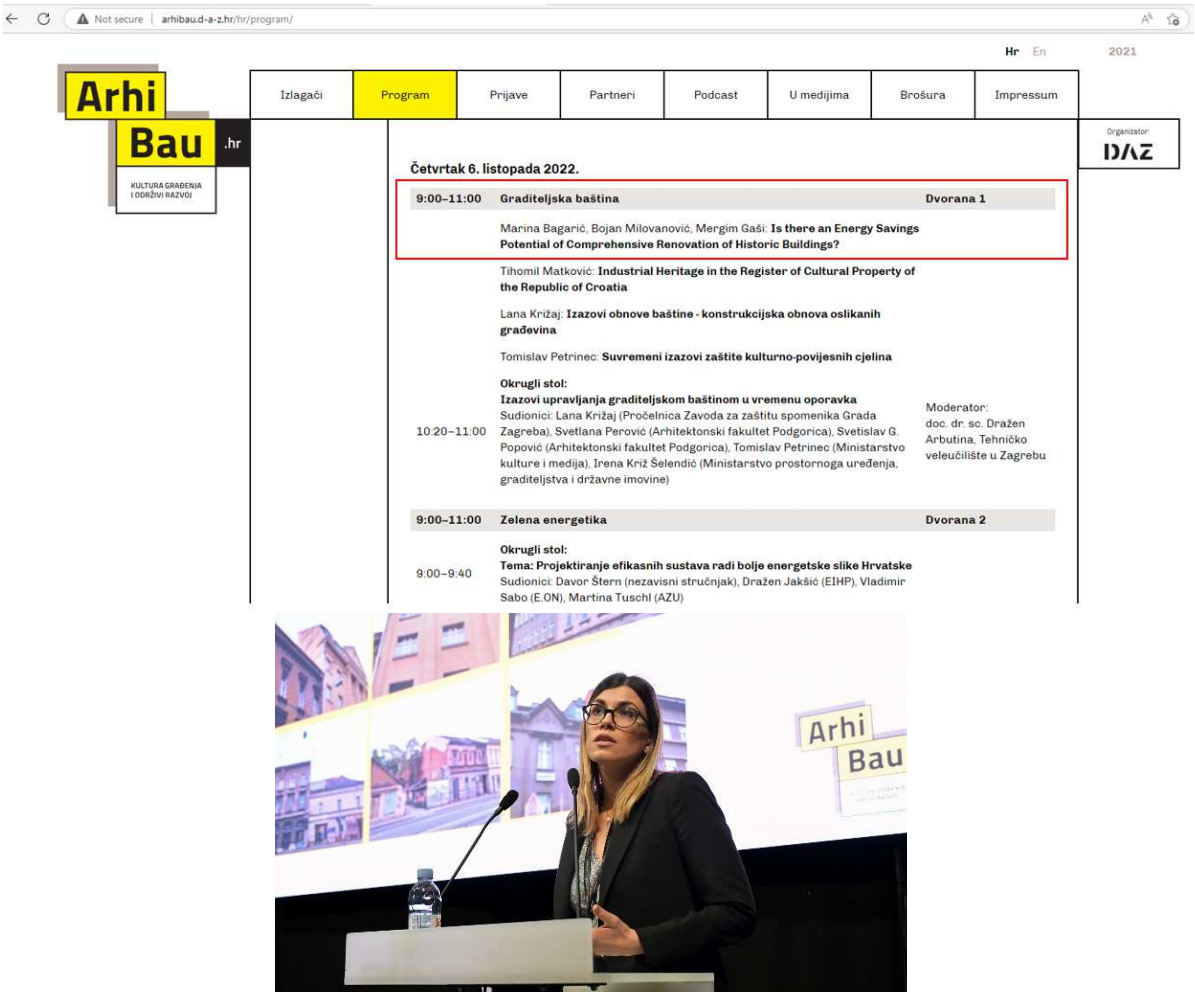



**Figure 53** Agenda of ArhiBau scientific-professional conference available on http://arhibau.d-a-z.hr/hr/program/ (top); Member of Croatian Roadshow team presenting the research on possibilities and limitation of integrated energy and seismic renovation of historic buildings (bottom)

The fact that MUZA and "The nZEB Roadshow" project were recognized by the organizer of the fair is also visible through two videos that the organizers recorded and posted on the official YouTube page of Zagreb Society of Architects (video called MUZA@ArhiBau.hr 2022 https://www.youtube.com/watch?v=kjUAQSlY_pY&list=PLxM3eUEGyXa_UYvxXHmMLqRHBWeoFSBDG&index=16 and video called ArhiBau.hr 2022 PODCAST – Marina Bagarić https://www.youtube.com/watch?v=AiViHdQmw_E )

Due to event concept (trade fair) the fluctuation of participants was extremely high, and it was not possible to require attendance list at MUZA itself or during live demonstrations. Video recordings from

MUZA's surveillance camera are available for this event, as well as detailed photo gallery. As mentioned, extremely high fluctuation of participants made it difficult to encourage them to complete the survey.

### No. 14 event: University of Zagreb Fair for students (10.– 12.11.2022, Zagreb – Zagreb Fair)

The NZEB mobile house MUZA and NZEB Roadshow project were part of the 27th University of Zagreb Fair for students. This annual educational event was held at the Zagreb Fair and was targeting high school graduates, university students and all other interested parties. The aim of the fair was to inform prospective students about study programmes, the faculties' achievements in fields of science and technical equipment, curricula, undergraduate, graduate and postgraduate study programmes, creative career opportunities, new opportunities offered by private entrepreneurs and companies, student accommodation in Zagreb, student life and many other interesting details.

MUZA, together with the stand located inside the fair venue, was representing the UNIZAG GF (Figure 54) with the main goal of promoting the profession of civil engineering and bringing modern construction, particularly nZEB and sustainability in building sector, closer to high school students, undergraduates and anyone interested. This was 13th official Croatian Roadshow event.

**Figure 54** Few photos of Croatian 13th event (University of Zagreb Fair for students)

There was no formal agenda for this event. Following the "open doors" principle, MUZA and their team were available to all interested participants of the fair.

UNIZAG GF received a Recognition Award in category "Innovation in Presentation" (Figure 55), which can largely be attributed to nZEB mobile house MUZA and its "learning by experiencing" concept.

**Figure 55** Recognition award for UNIZAG GF in category "Innovation in Presentation" given by the Rector of University of Zagreb prof. Stjepan Lakušić

Due to event concept (trade fair) the fluctuation of participants was high and it was not possible to require attendance list at MUZA itself. Video recordings from MUZA's surveillance camera are available for this event, as well as detailed photo gallery. As mentioned, high fluctuation of participants made it difficult to encourage them to complete the survey.

Student TV recorded video about all activities that took place at University of Zagreb Fair for students, as well as visitors feedback. MUZA is presented in video at time 10:09 (https://televizijastudent.com/index.php/televizija-student-za-htv4-39-2022 ).

## AWARDS AND RECOGNITIONS AS ADDITIONAL KPIs

Although not listed as official KPIs for project success, the Croatian efforts and innovation 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"** is given 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 (Figure 56 – left).
- **Recognition** for the Faculty of Civil Engineering of the University of Zagreb **in the category "Innovation in Presentation"** at the 27$^{th}$ 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 (Figure 55).
- **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 (Figure 56 – right)

a)

b)


**Figure 56** a) The Annual Award for Green Building and Sustainable Development by Croatia Green Building Council; b) The Award Yellow Frame for Sustainable Development, Science and Education by National Geographic Croatia and Adria Media Zagreb

## LESSONS LEARNED

Certain lessons were learned from each event, and the experience gained was used as a corrective measure to improve the next events from various points of view (MUZA's transportation, installation and deinstallation logistics, event organization, event execution, event dissemination, etc.). Lessons are learned only when mistakes are recognized, when what works is observed, when mistakes are documented and shared.

Things that Croatian team has learned throughout the 14 Roadshow events focused on nZEB mobile house MUZA:

1. **The venue for the Roadshow event should be selected carefully according to its accessibility by mobile house, the necessary infrastructure (power supply) and the possibility to hold the event even in bad weather conditions:**
    a. If possible, personally check the possibility of reaching the planned position with the mobile house and any potential restrictions on the way (height of overpasses, electric lines, etc.), but also at the planned position (enough space for maneuvering the flatbed truck with the mobile house which depends on the length of the flatbed truck, the load-bearing capacity of the position where the mobile house will be installed,

overhangs, high curbs - e. g. the floor capacity of the sports hall, whether there are any inclinations at the venue that would make it difficult for the flatbed truck to reach the position because the mobile house is only a few centimeters above the ground, etc.)

b. If is not possible for the project team to check the location in person (e.g., because it is in the other part of the country), check it with Google Street View and ask local collaborators (involved in organising the event) to check it for you, but give them specific instructions on what to look for in particular. If a transportation company is located near the location of your planned event, ask them to check it for you - they will be the best judge whether a flatbed truck with a mobile house can reach the location or not.

   Advice: even if you are "100%" sure that the flatbed truck and mobile house will successfully approach your planned location, try to have a backup option - at the same venue try to identify a possible second micro location. This will save you the unpleasant situation of having to figure out where to move the mobile house, whether you have enough cable to connect it to the power source, you will avoid additional costs (cables, transportation), and most importantly, you will not waste time that should be invested in preparing the mobile house for the event.

c. If the transport company proves to be reliable, you should continue cooperation with it, as they will be familiar with the specifics of loading the mobile house onto the flatbed truck, transporting it and unloading it from the flatbed truck, so that you do not have to repeat the whole procedure from the beginning every time a new event is planned.

d. Verify that adequate power connection is available for the mobile house at the proposed location and check the distance between the power connection and the mobile house. Preferably, the project team should check this in person. If this is not possible, communicate it with local collaborators.

   Advice: send them a description and pictures of the power connection needed (to make them easier to check on location ), but ask them to send you back pictures of what they discovered. In this way, you will avoid a "surprise" if you find an inadequate power connection despite verbal and written confirmation of the availability of the needed power connection. The distance between the power connection and the mobile house should be as short as possible to avoid excessive cable connections.

e. The Roadshow event venue and the mobile house micro location should be secured to prevent vandalism.

f. If the Roadshow event is held outdoors, be aware that the success of the event depends largely on weather conditions. No matter how enthusiastic participants are about nZEB and exploring the mobile house, most of them will not want to stand outside in cold, rainy, windy weather. Since the mobile house can only accommodate a small number of participants at a time, it would be advisable to have an alternate option at the venue (e.g., if the event is organised in collaboration with a university and the mobile house is located in their parking lot, ask for a classroom that can be used in case of bad weather).

**2. The more team members the better – loading and unloading the mobile house from the flatbed truck and preparing the mobile house for the event:**

a. This depends on the specific construction of the mobile house. In the case of MUZA, the Croatian team was involved in loading and unloading the mobile house from the flatbed truck (which was not the responsibility of the transport company), which

required at least 3 people, but ideally 4 people. There were exceptional situations when only 2 team members loaded and unloaded the MUZA, but this definitely proved to be too physically demanding and time-consuming.

b. When preparing the mobile house for the event, make a detailed list (procedure) of steps and equipment needed. In this way, you will avoid forgetting, for example, laptop or tablet, batteries for the microphone, pointers for presentations, comic books, cleaning supplies, etc.
c. Follow the weather forecast to determine whether or not to install a canopy.
d. Transport, installation of the mobile house and commissioning of all technical systems should be done at least one day before the event to check that everything is working well and to avoid unpleasant "surprises" (e.g. heat pump not working because it requires a change in working regime, no internet connection, minor damage to drywall due to transport vibrations and loading/unloading movements, etc.).
e. Aim for as much modularity as possible - portable stage platform, canopy ( shading device), chairs, landing gears, etc., so that most of the equipment can be easily assembled and disassembled and then packed inside the house and fixed for transport. This must be considered already in design phase so it may be helpful to pack all or nearly all of the equipment needed for the event and transport it inside the house.

3. **Conducting Roadshow event full of activities – be prepared to rely primarily on your close team members and possibly a few enthusiastic industry partners and/or other collaborators:**
   a. Regardless of the Roadshow event concept, at least 3, but preferably 4, team members should be actively involved in conducting event activities to prevent exhaustion, ensure adequate lunch/coffee/restroom breaks, and allow for handling of potential other work emergencies (calls, emails, etc.). For example, in events such as the Science Festival at TMNT, where a large number of groups of vocational students visited MUZA for several days in a row (with no break between groups or very short breaks), it has proven particularly beneficial to divide the larger group into two or three subgroups, each led by a team member in and around MUZA. In this case, the "free" team member(s) was responsible for photo documentation of the event, lunch/coffee/restroom break, conducting interviews, providing client consultations and rotation (role change) for the next large group.
   On the other hand, for events organized within trade fairs the "open doors" concept was more practiced, along with various demonstration and educational activities realized in collaboration with MUZA's industry partners. The "open door" concept required all team members to engage with visitors and adapt to their needs and interests (no predefined "scenario") and coordinate industry partners with demonstrations and education. The more team members present, the smoother and higher quality the event, while providing opportunities for brief refreshments.
   b. Be flexible and adapt to situations. Planning a Roadshow event and a large number of activities is one thing, but executing it in reality is quite another. Try to avoid a very tight time schedule at different micro-locations (e.g., a series of presentations delivered by one group of industry partners in classrooms, followed by a series of live demonstrations around MUZA delivered by another group of industry partners). There is a risk that the time slots for the lectures will be exceeded, resulting in fewer participants attending the live demonstrations.

c. It has been shown that for events that are conducted on an "open doors" principle, and thus have a large fluctuation of participants, it is impossible to register every participant and ensure that everyone participates in a survey. Therefore, official attendance lists were only used for events with organized groups, which were also easier to get to complete the survey.
d. Client consultations were also impossible to document at events with an "open doors" principle due to dynamic environment. People asked for advice in verbal conversations, and MUZA served as a demonstration variant of a nZEB "best practice" to support our answers and explanations. We encouraged participants to reach out for further advice via e-mail, Whatsapp messages, or other forms of written communication that would also help us document realized client advice consultations.
e. It has been shown that certain gamification tools are more or less interesting for specific target groups. For example, the Vodice event with professionals revealed that engineers were hesitant to use VR, which may be related to the ongoing COVID situation and using the same pair of glasses. Therefore, VR was not used as a gamification tool at other Croatian Roadshow events as a precautionary measure. A suggestion derived from this experience is that using another VR platform with disposable cardboard glasses (such as Google Cardboard) could generate higher interest. In addition, the disposable cardboard glasses can be used as dissemination material. Another possible reason could be the VR scenario (masonry competition), and perhaps a different, more attractive and educational scenario would increase the interest of the professionals.
f. The greater number of diverse activities will attract and engage more participants (from broader audiences), but be aware that for most events, all of the organization, administration, attracting participants, and coordination between industry partners and other collaborators will be handled by you. Although industry partners in Croatia expressed interest and participated in Roadshow activities, they preferred to come to already "prepared ground" and receive suggestions on how they could fit into the event. Only at three events (out of a total of 14) were they proactive and showed initiative – taking on some of the organization, coordinating other industry partners in designing demonstration mock-ups and conducting demonstrations, as well as attracting/ engaging event participants.
g. Try to avoid dislocation of activities that are being carried out at the same time, unless you have a sufficient number of team members to cover everything and maintain the pace for days (throughout the duration of the event).
h. During the first events, the Croatian team took the initiative and contact various media to disseminate information about the Roadshow events and MUZA as widely as possible. These efforts prepared a solid ground, because after that various other media started contacting the Croatian team and expressing their interest in recording reports in different format. Although it is great to achieve this kind of visibility in a broad media space, it requires spontaneity and adaptability from each team member (e.g., willingness to participate completely unprepared in a podcast set up by the fair organizers or to give an interview to a media company that just showed up at the event).

**4. Between the events:**

a. The mobile house should be stationed in a location considered safe (in a closed, secured area or in an open area subject to some supervision) between events to protect it from vandals, burglars, etc.

b. The location should be easily accessible to project team members or external collaborators (e.g., if the mobile house is not stationed in the same city as the project team members) so that they can intervene if necessary.
c. In winter, the mobile house should be connected to the power grid so that the technical systems do not freeze and get damaged. Therefore, the location where the mobile house will be stationed between events must have adequate infrastructure.

## 3.03 GREECE

### SUMMARY

In Greece, 10 different nZEB Roadshow events have been done in total. The type of each event (nZEB week or nZEB day), date and location are summarized in Table 6. Some of the events were organized in collaboration with different partners (companies from the construction industry, educational institutions, professional associations, municipalities etc.) but some events were conducted as independent events, while others were conducted as joint events. More information about each event is provided further in text.

**Table 6.** Summary of nZEB Roadshow events conducted in Greece until March 2023

| No | Event type | Event name | Date | Location |
|---|---|---|---|---|
| 1 | nZEB week | First nZEB Roadshow event in the city of Nafplio. | 16-19.09.2021 | Nafplio, Peloponnese @ Fougaro Artcenter |
| 2 | nZEB week | nZEB Roadshow event in the city of Trikala. The city known around Greece for the innovation that implements. At the same event, the results of the second Architecture Student Contest by HPHI, were announced. | 24-28.11.2021 | Trikala,Thessaly @ Tsitsanis Museum |
| 3 | nZEB week | nZEB Roadshow event in Patras. A lecture was given in the civil engineering department. | 17-20.03.2022 | Patra, Western Greece @ University Campus' Conference Center |
| 4 | nZEB day | One day nZEBRoadshow event during international children's book day. Event supported by the Hellenic Physicists Association. Demonstration of the 5 basic principles through the gamification process | 02.04.2022 | Athens, Attica @ Serafeio Hall |
| 5 | nZEB week | nZEB Roadshow event in the city of Kavala. Insulation and windows industry visits as well as visit to a Passive House and live certification wise blowerdoor test | 02-05.06.2022 | Kavala, Eastern Macedonia and Thrace @ Lucy Hotel |
| 6 | nZEB week | nZEB Roadshow event in the island of Aegina, near Piraeus. Demonstration of the 5 passive house principles through the gamification process and visit to a fully off-grid certified Passive House. | 07-09.07.2022 | Aegina, Attica @ Aegina's High School |
| 7 | nZEB week | nZEB Roadshow event in the city of Kalamata, in Peloponnese. Workshops and presentations of the Passive house | 06-09.10.2022 | Kalamata, Peloponnese @ Kalamata's |

| | | | | |
|---|---|---|---|---|
| | | standard took place, as well as two visits in a certified Passive House and in a structural materials store | | municipal music hall |
| 8 | nZEB week | nZEB Roadshow event in Kozani with visit in multilple Passive Houses, a lot of presentations and workshops and a lecture in the technical university | 15-18.12.2022 | Kozani, Western Macedonia @ Koventarios municipal library |
| 9 | nZEB day | One day nZEB Roadshow event in the new offices of HPHI with the fifth class of the 4th elementary school of Cholargos. | 22.03.2023 | Athens, Attica @ HPHI's headquarters |
| 10 | nZEB two-day forum, lecture and project meeting | A three-day nZEB Roadshow event presented as forum for insulation and windows. Plus, a lecture in the National Technical University of Athens the day before the forums | 15-18.05.2023 | Athens, Attica @ Innovathens, Technopolis |

### Monitoring and evaluation approach

In Task 2.4 (part of the deliverable D2.3), wide range of the activities were foreseen based on which robust monitoring and evaluation scheme is developed for different scenarios of nZEB Roadshow events (offline/live and online). All Greek nZEB Roadshow events took place live, thus proposed monitoring approach was carefully tailored and adapted depending on the specifics of Greek events (duration of the event, targeted audience, concept of the event, independent or joint event).

Monitoring and evaluation approach targeting Roadshow event participants consisted of three main segments:

1) Onsite or pre-site registration

2) Live (interactive) survey through QR codes and pin boards

3) Detailed documentation using photos and videos

**1) <u>Onsite or pre-site registration</u>**

It has been shown that on-site or pre-site registration can be required and implemented only for events where attendees are easier to control (events without high fluctuation of large number of visitors). This could be achieved in all the events that took place during the nZEB Roadshow in Greece. To do so, we used the Google form tool in order to pre-register every person that was interested in attending the event. We used our social media, as well as a lot of press releases and newsletters in order to aware the conferences. Anyone interested could fill the form, so we had all the necessary information about his profile. Plus, we created a QR code which directed to the Google form in case

someone didn’t fill it before coming to the event. By doing so, we were sure that every attendant was in our list. An example of attendance list is presented in Figure 57.

| Χρονική σήμανση | Επώνυμο | Όνομα | Διεύθυνση Ηλεκτρονικού Ταχυδρομείου | Κινητό Τηλέφωνο | Τόπος Κατοικίας | Ηλικιακή Ομάδα | Ανήκετε στα Μέσα Μαζικής Ενημέρωσης; | Εάν ανήκετε στο Επαγγελματικό Κοινό επιλέξτε την κατηγορία σας | Εάν ανήκετε στο Επαγγελματικό Κοινό αναφέρετε το Φορέα/ Γραφείο/ Εταιρεία όπου εργάζεστε. | Εάν ανήκετε στο Ευρύ Κοινό επιλέξτε την κατηγορία σας | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/12/2021 10:12:40 | ΠΙΣΠΑΣ | ΙΩΑΝΝΗΣ | giannispispas@gmail.com | 6945337673 | ΤΡΙΚΑΛΑ | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | ΠΙΣΠΑΣ ΙΩΑΝΝΗΣ | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/12/2021 11:42:25 | Μπάρδας | Δημήτριος | dimi.mpardas@gmail.com | 6978892176 | Τρίκαλα | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | Αυτοαπασχολούμενος Μηχανολόγος Μηχανικός | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/13/2021 13:01:52 | ΠΑΠΑΝΙΚΟΛΑΟΥ | ΘΩΜΑΣ | tech.pap@yahoo.com | 6948626513 | Τρίκαλα, Βενζέλου | 45 - 54 | Ναι | Μηχανικός ιδιωτικού τομέα | Τεχνικο Γραφείο Παπανικολάου | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/14/2021 17:27:45 | ΤΕΛΛΙΟΣ | ΑΘΑΝΑΣΙΟΣ | sakis1964gr@gmail.com | 6980577537 | ΓΡΙΖΑΝΟ | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/14/2021 17:30:57 | ΤΕΛΛΙΟΣ | ΒΑΙΟΣ | telliosath@gmail.com | 6976070752 | ΓΡΙΖΑΝΟ | 55 - 64 | Ναι | Κατασκευαστική Εταιρεία | | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/14/2021 17:39:21 | ΚΑΡΑΝΙΚΑΣ | ΠΑΝΑΓΙΩΤΗΣ | karanikaspa@gmail.com | 6981708817 | ΚΑΡΔΙΤΣΑ | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/14/2021 22:21:49 | Βογιατζή | Χρύσα | xrysa_vog@yahoo.gr | 6947898946 | Τρικαλα | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/14/2021 23:47:15 | Δομοξουδης | Μάριος | mdomoxoudis@domotek.gr | 6945870141 | Λάρισα | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/15/2021 8:15:40 | Κολότσιος | Γεώργιος | kolotsiosgeo@gmail.com | 6979457630 | Τρίκαλα | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | Ελεύθερος Επαγγελματίας | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/15/2021 8:18:37 | Μπούγλα | Βίκυ | info@bougla.gr | 6974760381 | Τρίκαλα | 45 - 54 | Ναι | Μεσίτης | Bougla Real Estate and More | Ιδιοκτήτης Ακινήτου | Τ |
| 11/15/2021 10:11:34 | Τσικρικάς | Φίλιππος | ftarchtek@gmail.com | 6972216214 | ΛΑΡΙΣΑ | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | ΑΡΧΙΤΕΚΤΟΝΙΚΟ ΓΡΑΦΕΙΟ ΤΣΙΚΡΙΚΑΣ ΦΙΛΙΠΠΟ | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/15/2021 10:47:33 | ΣΙΑΦΗΣ | ΑΡΙΣΤΕΙΔΗΣ | akissiafis@yahoo.gr | 6937034010 | ΠΑΤΡΑ | 45 - 54 | Ναι | Προμηθευτής Υλικών, Συστημάτων και Τε | UNISIOL Βιομηχανία πολυστερήνης Εμπορία δομ | 1 | Τ |
| 11/15/2021 12:48:11 | Νάτσης | Δημήτρης | natsisdimitris@hotmail.com | 6908908908 | Λάρισα | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | | Φοιτητής | Τ |
| 11/15/2021 22:20:22 | Καλτσά | Μαριάνα | Marianna.klts@hotmail.com | 6939520890 | Λάρισα | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | Ιδιώτης | Κοινό με Περιβαλλοντική Ευθύνη και | Τ |
| 11/15/2021 23:31:55 | Γελαδάρη | Ειρήνη | egel@hotmail.gr | 6972151951 | Αγία Κυριακή Τρικά | 25 - 34 | Ναι | Απόφοιτη ΠΜΣ "Αστικές αναπλάσεις, αστική ανάπτυξη κι αγορά ακινήτων" | | Κοινό με Περιβαλλοντική Ευθύνη και | Σ |
| 11/16/2021 14:39:59 | ΛΙΑΚΟΣ | ΝΙΚΟΛΑΟΣ | nickliakos@hotmail.com | 6942407156 | ΤΡΙΚΑΛΑ | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/16/2021 16:38:14 | Kostopoulou | Dimitra | dimkost2002@yahoo.com | 6976628311 | Trikala | 45 - 54 | Ναι | Μηχανικός Δημόσιου Τομέα | | Κοινό με Περιβαλλοντική Ευθύνη και | Τ |
| 11/16/2021 23:14:50 | ΤΖΙΑΡΑΣ | ΔΗΜΗΤΡΙΟΣ | dimtsiaras@gmail.com | 6934421347 | ΛΑΡΙΣΑ | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | Τεχνικό Γραφείο | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/17/2021 12:41:38 | Βράκας | Νικόλαος | vrakas_n@gmail.com | 6973327399 | Τρίκαλα | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | Αυτοαπασχολούμενος | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/17/2021 13:05:29 | Katsouta | Maria | mkota@yahoo.gr | 6932753922 | trikala | 45 - 54 | Ναι | Μηχανικός Δημόσιου Τομέα | Υπουργείο Υποδομών | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/17/2021 13:10:15 | ΤΖΙΜΟΥΛΗΣ | ΓΕΩΡΓΙΟΣ | gtzimoulis@yahoo.gr | 6974323331 | ΤΡΙΚΑΛΑ | 45 - 54 | Ναι | Μηχανικός ιδιωτικού τομέα | ΤΕΧΝΙΚΟ ΓΡΑΦΕΙΟ | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/17/2021 13:15:20 | ΓΚΟΥΛΙΟΠΟΥΛΟΥ | ΣΤΥΛΙΑΝΗ | st1970gr@otenet.gr | 6972698356 | ΦΩΤΑΔΑ ΤΡΙΚΑΛΩΝ | 45 - 54 | Ναι | Μηχανικός ιδιωτικού τομέα | ΑΤΟΜΙΚΗ ΕΠΙΧΕΙΡΗΣΗ | ΟΧΙ | Τ |
| 11/17/2021 13:44:44 | ΝΑΤΣΗΣ | ΚΩΝΣΤΑΝΤΙΝΟΣ | kosnat57@gmail.com | 6974036926 | ΚΡΗΤΗΣ & ΚΑΛΥΜ | 55 - 64 | Ναι | Μηχανικός ιδιωτικού τομέα | | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/17/2021 14:43:45 | Γιαννακός | Λάζαρος | giannakos.laz@gmail.com | 6976589552 | Τρίκαλα | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | e-trikala A.E. | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/17/2021 16:26:02 | ΜΕΛΙΔΗΣ | ΕΥΘΥΜΙΟΣ | melidis_themis@yahoo.gr | 6979787328 | ΤΡΙΚΑΛΑ | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | ΜΕΛΙΔΗΣ ΕΥΘΥΜΙΟΣ | Δεν ανήκω στο γενικό κοινό | Π |
| 11/17/2021 16:32:28 | ΣΧΟΡΕΤΣΑΝΙΤΗΣ | ΔΗΜΗΤΡΙΟΣ | sxoretsanitis@gmail.com | 6974844954 | ΤΡΙΚΑΛΑ | 55 - 64 | Ναι | Μηχανικός ιδιωτικού τομέα | | Ιδιοκτήτης Ακινήτου | Τ |
| 11/17/2021 16:39:48 | ΓΑΒΒΕΣ | ΜΑΝΩΛΗΣ | mgaves@gmail.com | 6936543958 | ΤΖΑΒΕΛΑ 43, ΛΑΡΙ | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | ΑΤΟΜΙΚΗ ΕΠΙΧΕΙΡΗΣΗ, ΑΒΡΑΝΑΣ ΑΤΕ, NEWPI | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/18/2021 15:18:44 | ΤΖΑΛΛΑΣ | ΔΗΜΗΤΡΙΟΣ | dtzallas@gmail.com | 6946501409 | Ηράκλειο | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | AT CONSTRUCTIONS | ΜΗΧΑΝΙΚΟΣ | Τ |
| 11/18/2021 16:05:07 | ΧΟΛΕΒΑΣ | ΗΡΑΚΛΗΣ | hholevas@gmail.com | 6982137230 | ΤΡΙΚΑΛΑ | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | ΙΔΙΩΤΗΣ ΜΗΧΑΝΙΚΟΣ | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/18/2021 16:57:46 | Παπαδήμα | Γεωργία | papadima17georgia@gmail.com | 6974627335 | Τρίκαλα | 25 - 34 | Ναι | Μηχανικός ιδιωτικού τομέα | Αυτοαπασχολουμενη | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/19/2021 8:53:03 | Πτυρήγκας | Αλέξανδρος | dieselpowergr@gmail.com | +306976436129 | Τρίκαλα | 35 - 44 | Ναι | Μηχανικός ιδιωτικού τομέα | | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/19/2021 9:02:31 | Βόστσιου | Εύη | evivo1994@gmail.com | 6971507512 | Βαλτινό Τρικάλων | 25 - 34 | Ναι | Δεν αποτελώ μέλος του Επαγγελματικού Κοινού | | Αγρονόμος Τοπογράφος Μηχανικός | Τ |
| 11/19/2021 14:59:54 | ΑΝΔΡΙΑΝΑΚΗΣ | ΚΩΣΤΗΣ | kostis.andrianakis@gmail.com | 6973801154 | ΗΡΑΚΛΕΙΟ | 35 - 44 | Ναι | Κατασκευαστική Εταιρεία | AT CONSTRUCTIONS | Δεν ανήκω στο γενικό κοινό | Τ |
| 11/19/2021 17:23:28 | Παπαπαστόλου | Ευάγγελος | vpapapa@gmail.com | 6944284436 | Τρίκαλα | 45 - 54 | Ναι | Μηχανικός ιδιωτικού τομέα | Εταιρεία | Δεν ανήκω στο γενικό κοινό | Τ |

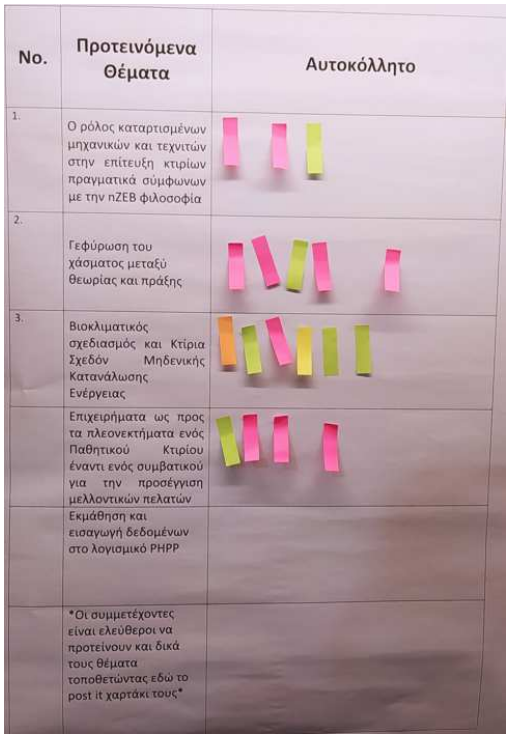
Συμμετοχές | 24 11 | 25 11 | 26 11 | 27 11 (10-15) | 27 11 (17-20) | 28 11 (10-11) | 28 11 (11-12) | 28 11 (13-14) | ΜΟΝΑΔΙΚΕΣ ΣΥΜΜΕΤΟΧΕ: ...

**Figure 57** Example of an attendance list from Greek nZEB Roadshow event in Trikala.

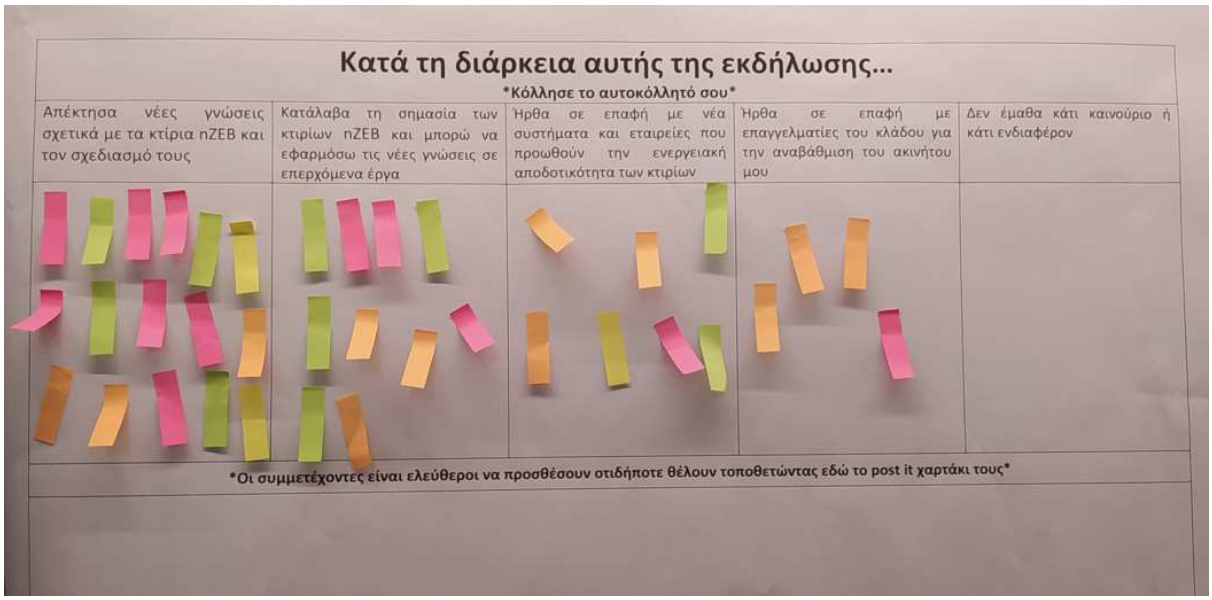
## 2) Live (interactive) survey through poster and bookmarks

It was not easy to force every attendant to scan the QR code and to fill the Google form. Especially the elderly people, who either didn’t have a smartphone with camera in order to scan the QR code or they didn’t know how it operates. So if we didn’t manage to take their emails via the google form, we wouldn’t be able to send them the evaluation form post the event. Therefore, we managed to have answers the majority of the attendants in our survey from different age groups, which can be clearly seen in the variance of ages of the respondents. In Figure 59 there are the posters, which were located to the exterior door of each conference room in order to be visible and usable. We encouraged every attendant to glue a bookmark in each field he/she found interesting. So, before the brakes we asked the participants to contribute to our map of interactions.

**Figure 58** QR codes informing the attendants about their ability to complete the form in order to join the event.



| No. | Προτεινόμενα Θέματα | Αυτοκόλλητο |
|---|---|---|
| 1. | Ο ρόλος καταρτισμένων μηχανικών και τεχνιτών στην επίτευξη κτιρίων πραγματικά σύμφωνων με την nZEB φιλοσοφία | |
| 2. | Γεφύρωση του χάσματος μεταξύ θεωρίας και πράξης | |
| 3. | Βιοκλιματικός σχεδιασμός και Κτίρια Σχεδόν Μηδενικής Κατανάλωσης Ενέργειας | |
| | Επιχειρήματα ως προς τα πλεονεκτήματα ενός Παθητικού Κτιρίου έναντι ενός συμβατικού για την προσέγγιση μελλοντικών πελατών | |
| | Εκμάθηση και εισαγωγή δεδομένων στο λογισμικό PHPP | |
| | *Οι συμμετέχοντες είναι ελεύθεροι να προτείνουν και δικά τους θέματα τοποθετώντας εδώ το post it χαρτάκι τους* | |



| Κατά τη διάρκεια αυτής της εκδήλωσης... *Κόλλησε το αυτοκόλλητό σου* | | | | |
|---|---|---|---|---|
| Απέκτησα νέες γνώσεις σχετικά με τα κτίρια nZEB και τον σχεδιασμό τους | Κατάλαβα τη σημασία των κτιρίων nZEB και μπορώ να εφαρμόσω τις νέες γνώσεις σε επερχόμενα έργα | Ήρθα σε επαφή με νέα συστήματα και εταιρείες που προωθούν την ενεργειακή αποδοτικότητα των κτιρίων | Ήρθα σε επαφή με επαγγελματίες του κλάδου για την αναβάθμιση του ακινήτου μου | Δεν έμαθα κάτι καινούριο ή κάτι ενδιαφέρον |
| | | | | |
| *Οι συμμετέχοντες είναι ελεύθεροι να προσθέσουν οτιδήποτε θέλουν τοποθετώντας εδώ το post it χαρτάκι τους* | | | | |

**Figure 59** Evaluation posters to be completed during the event

The official feedback survey which was distributed via emails to the participants after the event, consisted of 19 short questions with multiple choice answers already offered in advance for the majority of those questions (all in Greek). Plus, we had some posters with more general questions about the seminars which conducted during the events. The aim of the surveys was to get basic information about the responders (age group/professional expertise), their current knowledge about nZEB buildings and to get feedback about the Passive House standard and the procedure of the event. Attendees of the nZEB Roadshow events were invited to fill the survey that they would receive in the email address after all the activities, demonstrations, and presentations were conducted.

During all 10 nZEB Roadshow events in Greece, a total of 123 participants joined the survey, plus around 100 by completing the posters with the bookmarks. The results are summarized for all events and shown for each question in Figure 60 - Figure 69. Only the main conclusions derived from survey results are presented in the next paragraph.

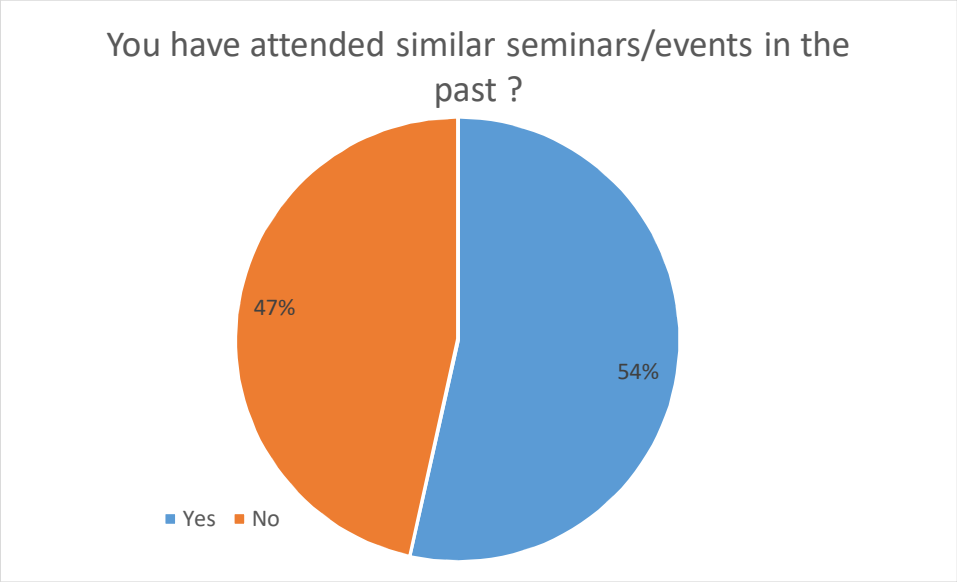



**Figure 60** Feedback of participants on their attending in similar seminars/events

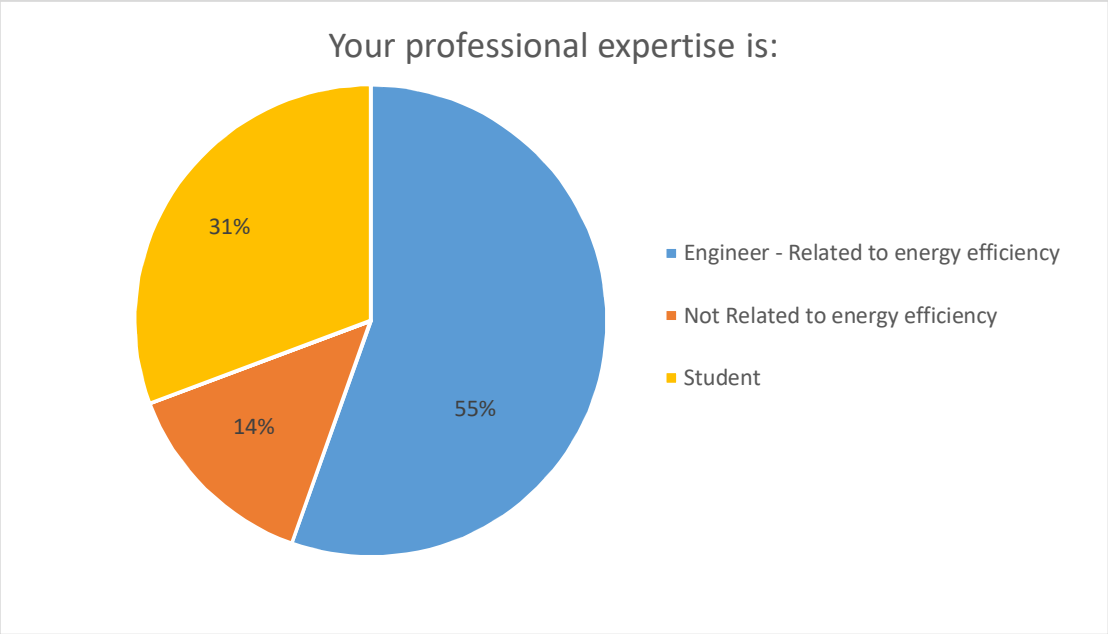



**Figure 61** Feedback of participants on their professional expertise

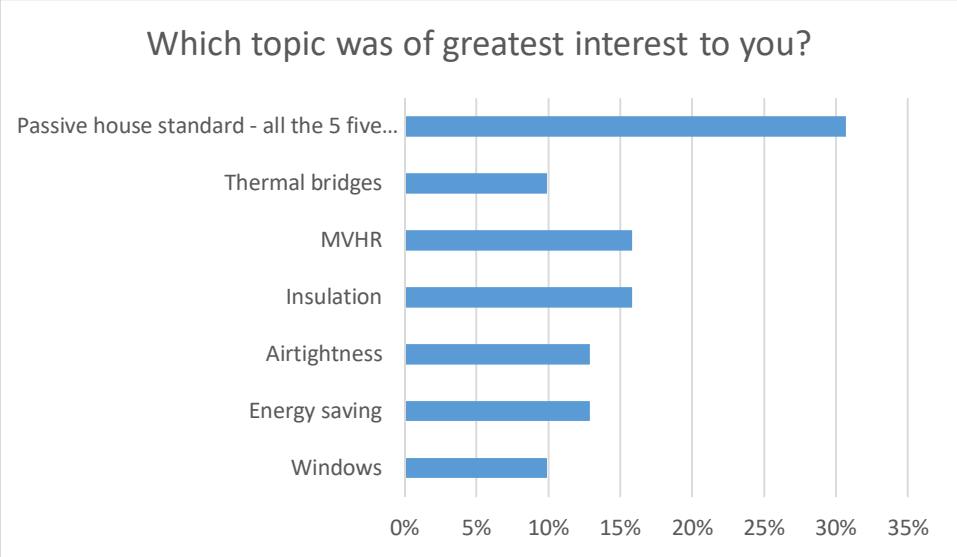



**Figure 62** Feedback of participants on their favorite presented topic about energy efficiency and indoor comfort in nZEBs

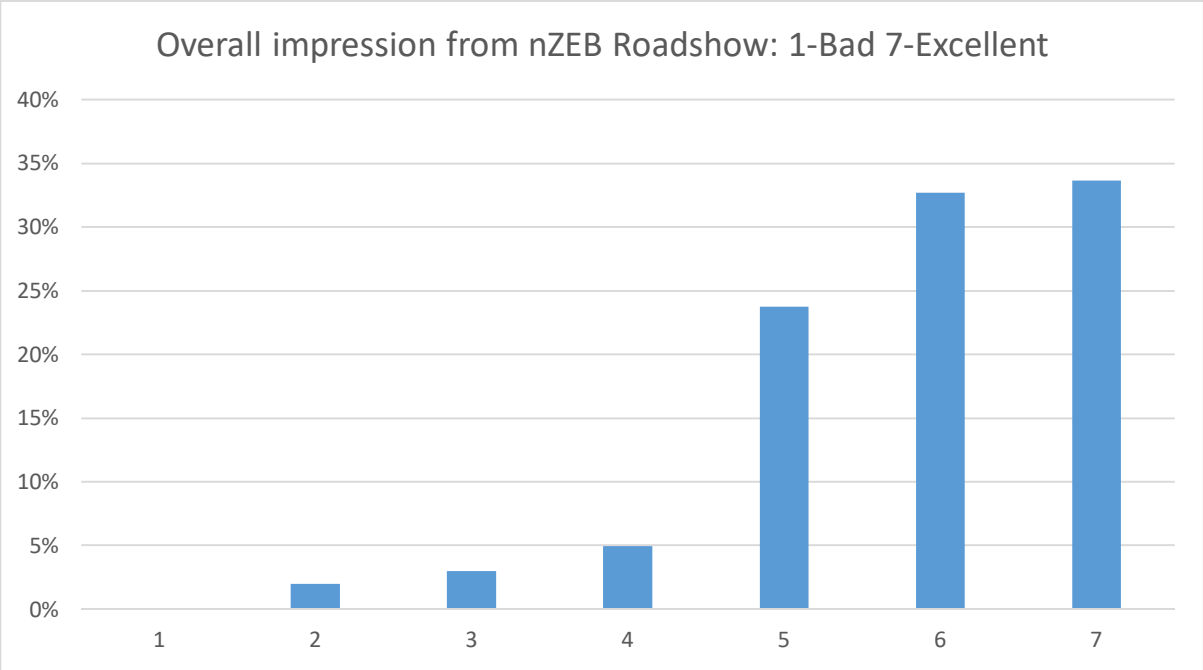



**Figure 63** Feedback of participants on the overall impression of the nZEB Roadshow week

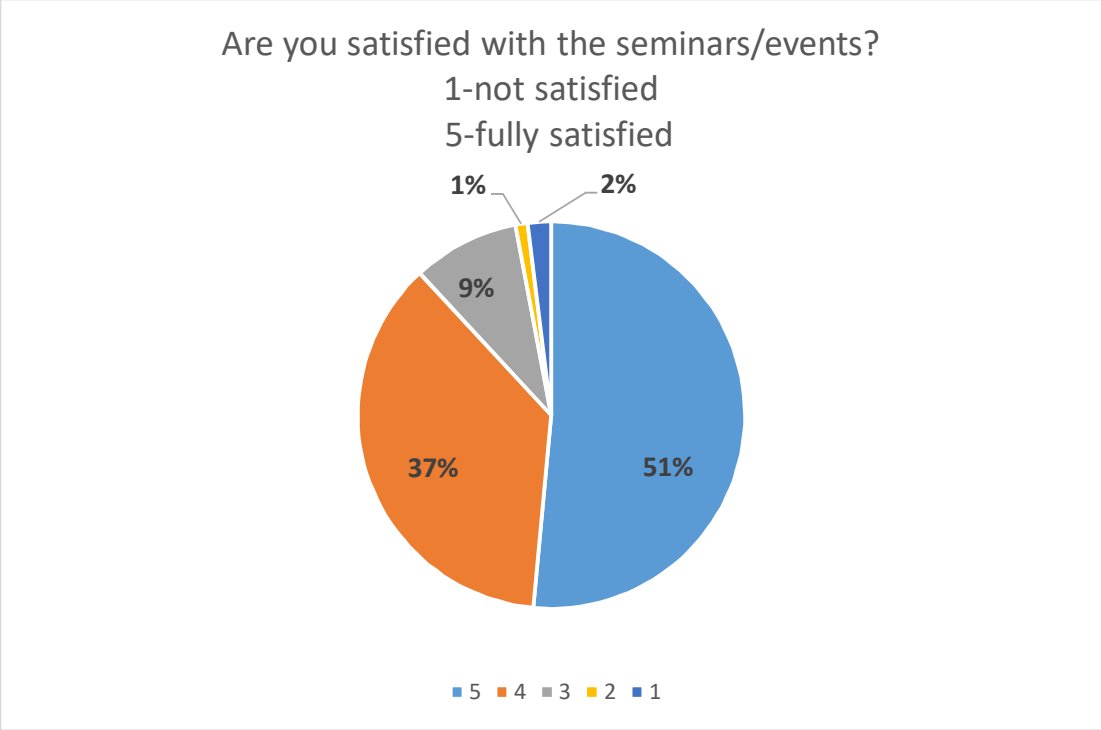



**Figure 64** Feedback of participants on their satisfaction about the seminars and the events

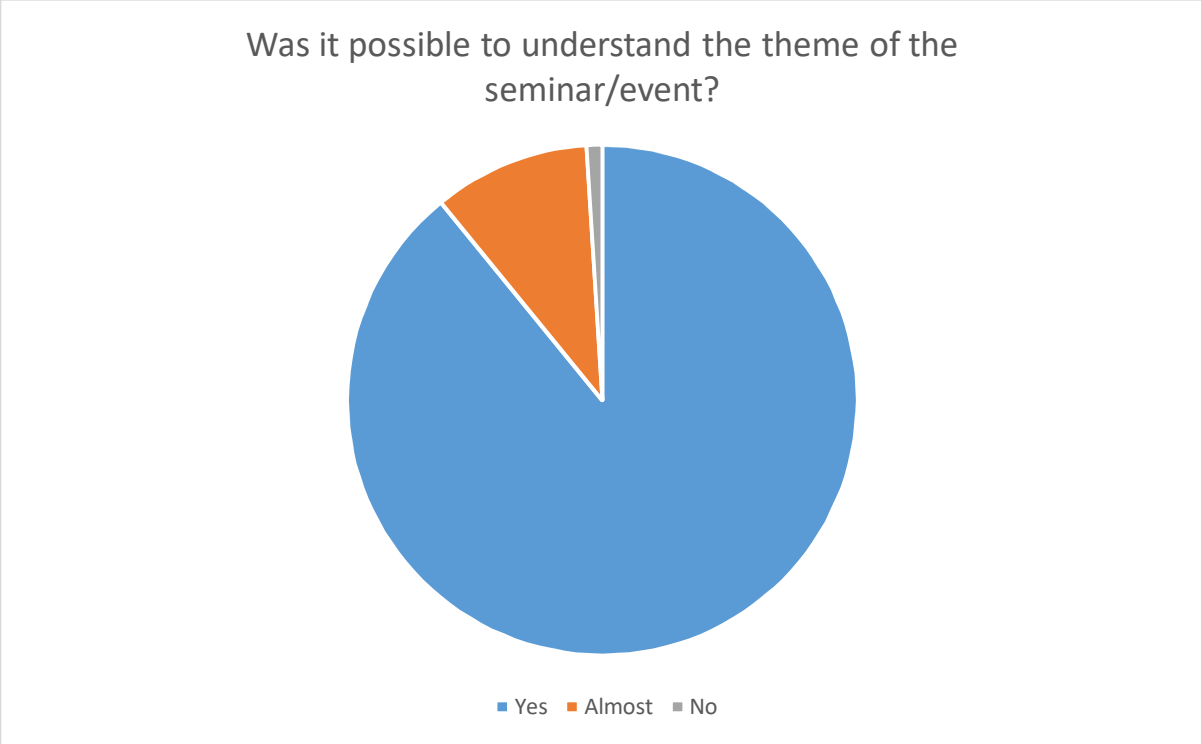



**Figure 65** Feedback of participants on understanding the theme of the event

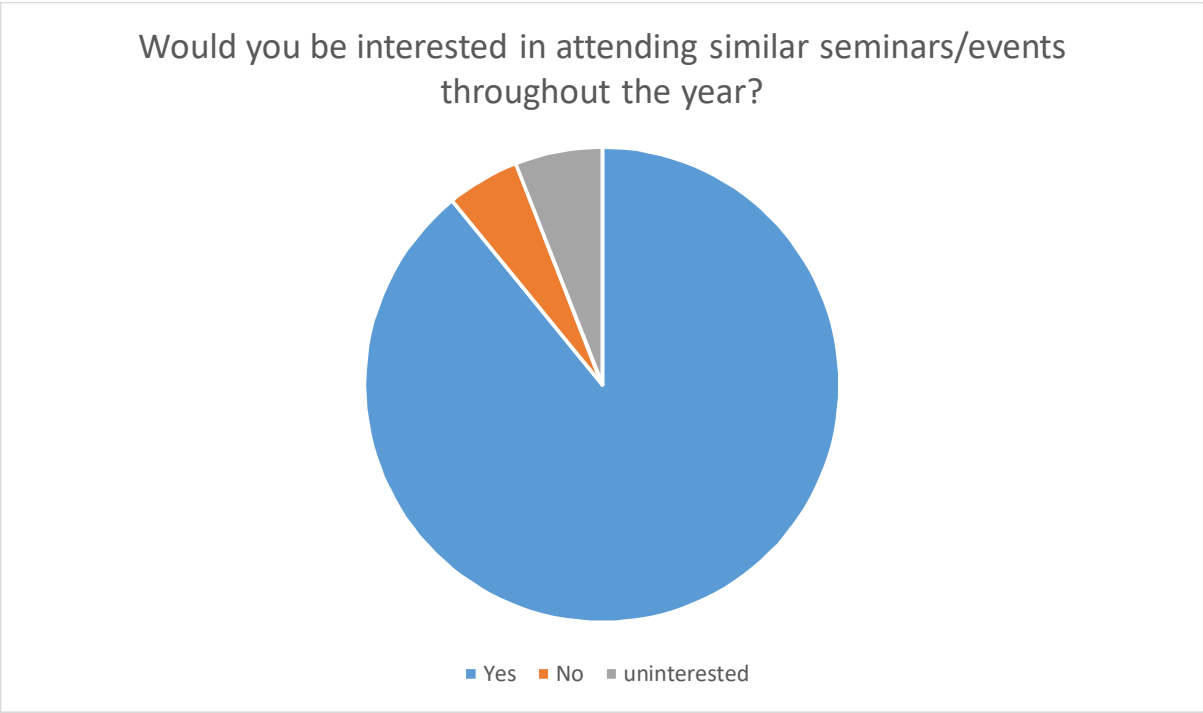



**Figure 66** Feedback of participants on their willingness to attend similar events.

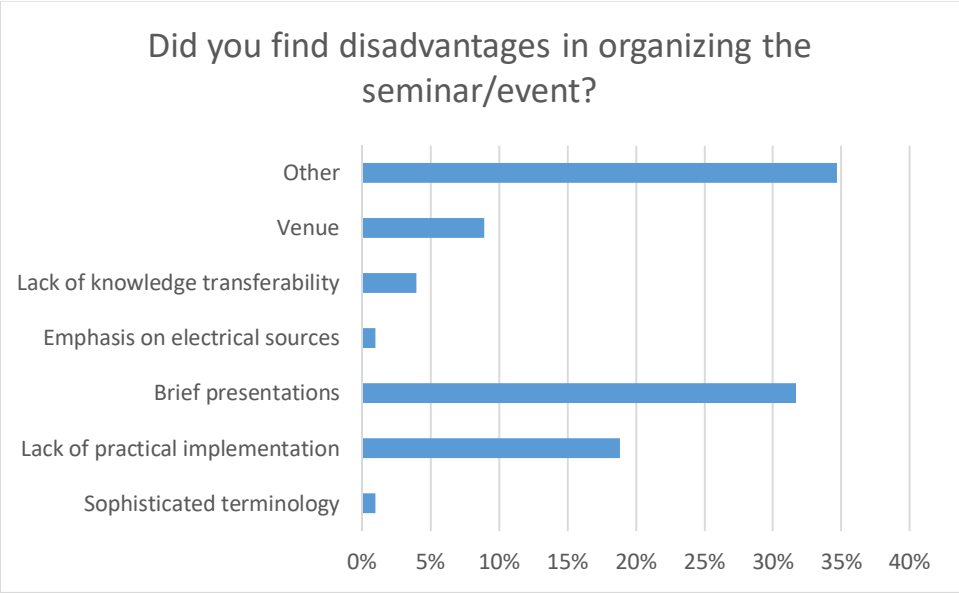



**Figure 67** Feedback of participants on the organizing of the events

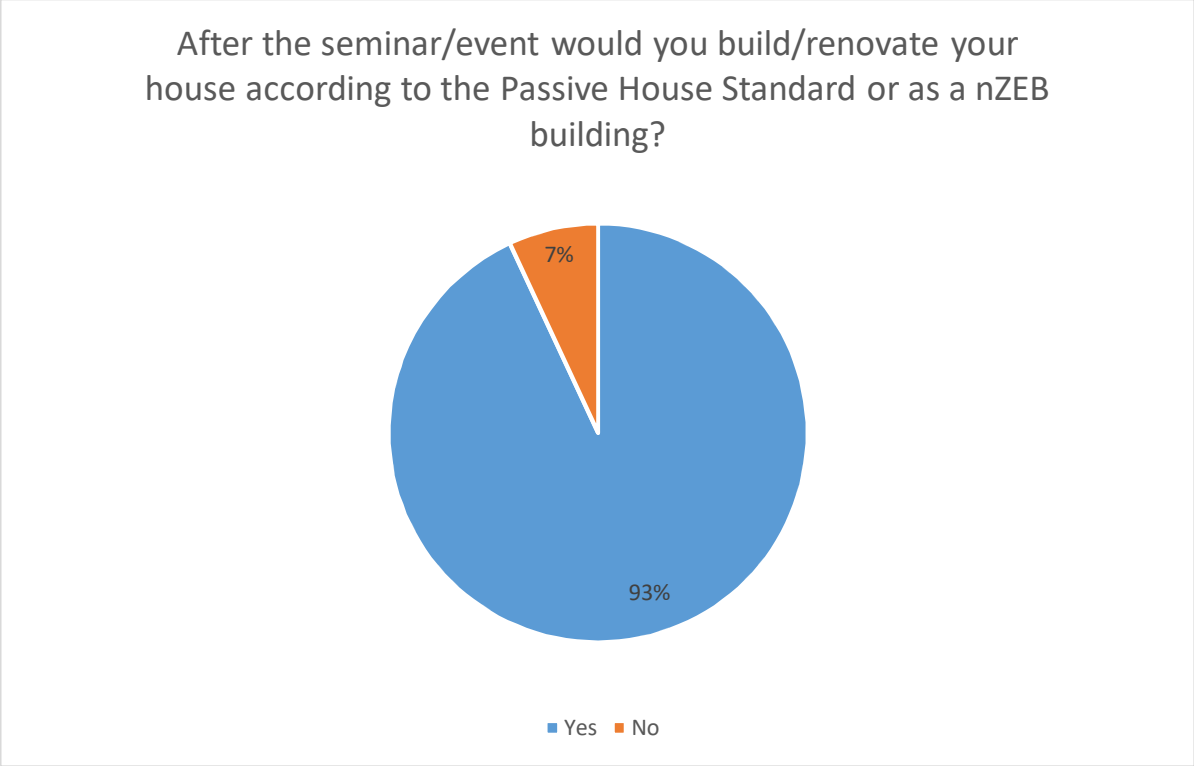



**Figure 68** Feedback of participants on whether they would like to live in a Passive House/nZEB, renovated or new.

The majority of the "no" answers were considering the cost of building/renovating to a Passive House high enough while others were puzzled with the installation of MVHR in a residential building.

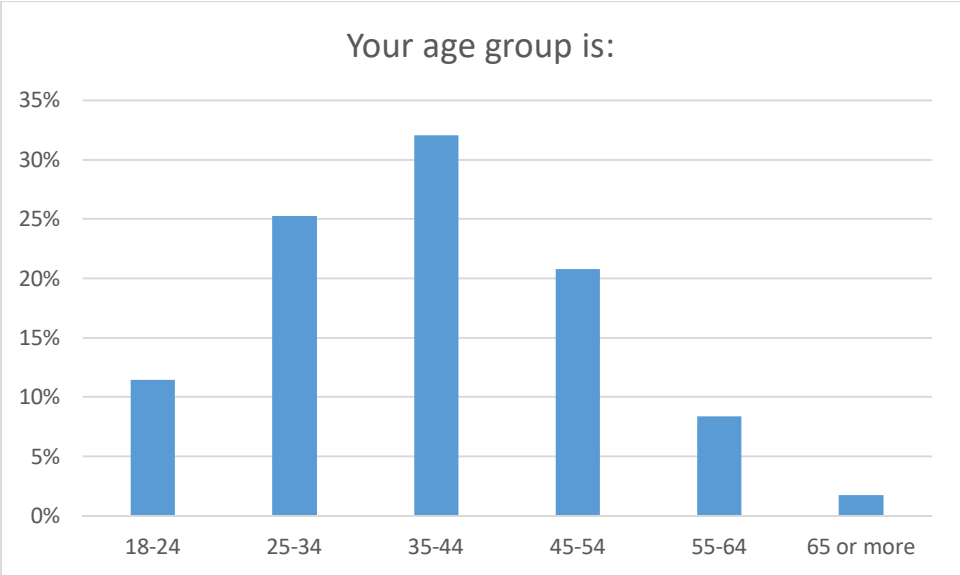



**Figure 69** Feedback from participants on their age group

It is clear from the survey results that participants feel that nZEB roadshow is innovative, interesting and inspiring. It is a great approach to promote energy efficient buildings and healthy living, which is a good indication of their view of the necessity of this education and raising awareness approach. The participants on average believed that out of 5, the nZEB Roadshows worth 4,3. This is a great score if we consider that a lot of people avoid to grade with the excellent 5. Participants replied that they would absolutely (93%) live in a NZEB building, while only 7% of them wouldn't live in a NZEB building considering the cost of such an upgrade or construction. The age group of participants with approximately 3000 children & students and 11% in 18–24 y/o, 25% in 25-34 y/o, 32% in 35-44 y/o, 21% in 45-54 y/o and the rest 10% being in 55+ y/o is very encouraging. Since the majority of the participants will be future professionals, investors and generally citizens with different mindset, appreciating more sustainable, healthy and energy efficient living. They need to become "critical mass" that will make the change, and education together with public raising awareness is essential to achieve that ultimate goal.

### 3) Detailed documentation using photos and videos

Detail photo gallery of each event is available on the HPHI's archives and is available for anyone interested after contacting info@eipak.org. Also, three videos from three different nZEB weeks can be found in the HPHI's YouTube channel. Video from Nafplio, first station. Video from Trikala, second station and the last video from Kozani, our seventh station can be found here.

Photos and videos of all Greek events were also posted on other social networks of the project (Instagram and Facebook).

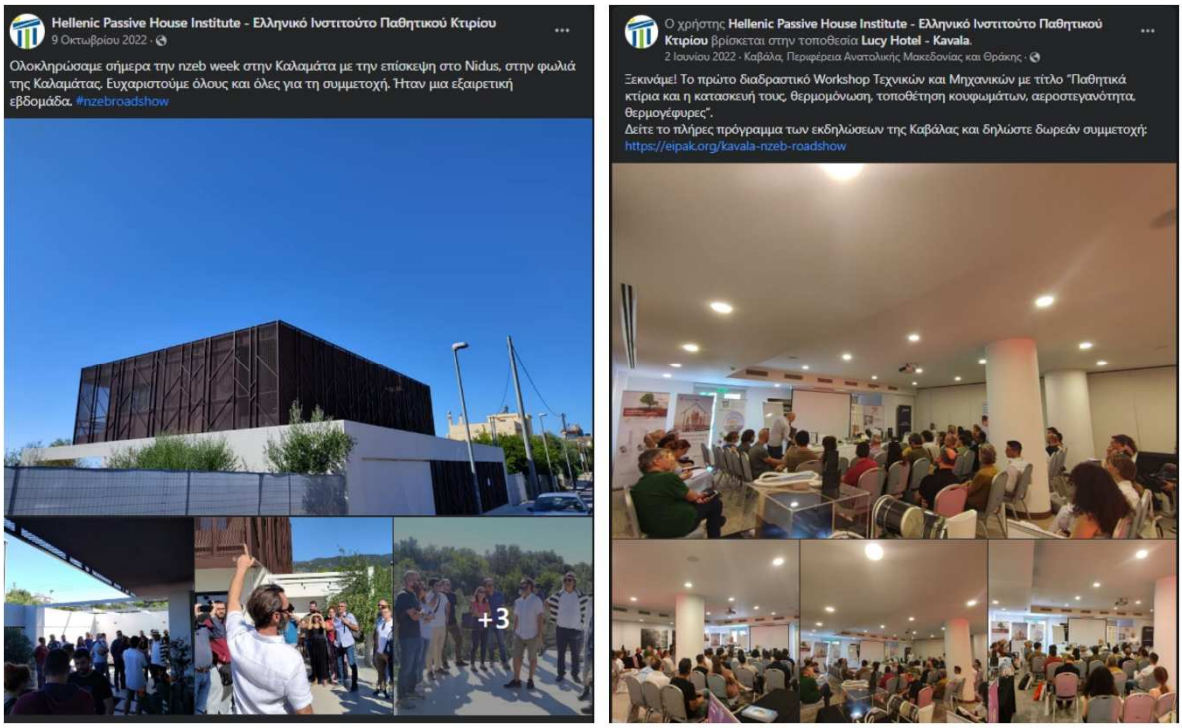



**Figure 70** Post on HPHI's facebook page about the events

### Total number of people visiting Greek nZEB Roadshow events

Table 52 shows the number of visitors to the Greek nZEB Roadshow events (per event and in total for all 10 events) considering all the registration lists that we have for each event plus the amount of visitors that didn't fill the form but we notice them on the events.

**Table 7** Number of visitors/participants at Croatian Roadshow events shown through used monitoring approaches

| No | Event type | Event name | Date | Location | Attendance list | Official event report | Photos/Videos | Survey |
|---|---|---|---|---|---|---|---|---|
| 1 | nZEB week | First nZEB Roadshow event in the city of Nafplio. | 16-19.09.2021 | Nafplio, Peloponnese @ Fougaro Artcenter | 45 | 61 | Available | 23 |
| 2 | nZEB week | nZEB Roadshow event in the city of Trikala. The city known around Greece for the innovation that implements. At the same event, the results of second Architecture Student Contest by HPHI, were announced. | 24-28.11.2021 | Trikala,Thessaly @ Tsitsanis Museum | 168 | 138 | Available | 32 |
| 3 | nZEB week | nZEB Roadshow event in Patras. A lecture was given in the civil engineering department. | 17-20.03.2022 | Patra, Western Greece @ Campus' Conference Center | 156 | 69 | Available | 49 |
| 4 | nZEB day | One day nZEBRoadshow event during international children's book day. Event supported by the Hellenic Physicists Association. Demonstration of the 5 basic principles through the gamification process | 02.04.2022 | Athens, Attica @ Serafeio Hall | Not available | 85 | Available | Not available |
| 5 | nZEB week | nZEB Roadshow event in the city of Kavala. Insulation and windows industry visits as well as visit to a Passive House and live certification wise blowerdoor test | 02-05.06.2022 | Kavala, Eastern Macedonia and Thrace @ Lucy Hotel | 112 | 124 | Available | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | nZEB week | nZEB Roadshow event in the island of Aegina, near the Piraeus. Demonstration of the 5 passive house principles through the gamification process and visit to a fully out of grid certified Passive House. | 07-09.07.2022 | Aegina, Attica @ Aegina's High School | Not available | 65 | Available | Not available |
| 7 | nZEB week | nZEB Roadshow event in the city of Kalamata, in Peloponnese. Workshops and presentations of the Passive house standard took place, as well as two visits in a certified Passive House and in a structural materials store | 06-09.10.2022 | Kalamata, Peloponnese @ Kalamata's municipal music hall | 85 | 55 | Available | 12 |
| 8 | nZEB week | nZEB Roadshow event in Kozani with visit in multilple Passive Houses, a lot of presentations and workshops and a lecture in the technical university | 15-18.12.2022 | Kozani, Western Macedonia @ Koventarios municipal library | 95 | 104 | Available | Not available |
| 9 | nZEB day | One day nZEB Roadshow event in the new offices of HPHI with the fifth class of the 4th elementary school of Cholargos. | 22.03.2023 | Athens, Attica @ HPHI's headquarters | 38 | 38 | Available | Not available |
| 10 | nZEB two-day forum, lecture and project meeting | Mainly a two-day nZEB Roadshow event presented as forum for insulation and windows. Plus, a lecture in the National Technical University of Athens the day before the forums | 15-18.05.2023 | Athens, Attica @ Innovathens, Technopolis | 147 | 73 | Available | Not available |
| In addition to the engineers and industry professionals, an impressive number of approximately **3,100** pupils also actively participated and followed us throughout the nZEB Roadshow journey. | | | | | Sum per category | | | |
| | | | | | 846 | 812 | Available | 123 |

### No. 1 event: The first nZEB Roadshow event – Nafplio (15-19.09.2021)

The first nZEB Roadshow event in Greece was organized as an independent and inclusive gathering for engineers, building industry professionals, energy-saving enthusiasts, and anyone interested in sustainable and energy-efficient building practices in a small city with 10.000 people nearby Athens. Despite the challenges posed by the COVID-19 pandemic, we successfully included schools in the event and attracted a decent number of attendees. Taking advantage of the situation as well as the pleasant September weather in Greece and set up all the company presenters outside to showcase their nZEB-related products. We also invited schools to visit us in the exterior space of the Fougaro exhibition hall, where we presented them with the 5 basic principles of a Passive House through interactive tablet games and experiments. As a souvenir, we provided the pupils with the comic book "nZEBO". Every evening, we held seminars for engineers as well as for anyone interested in the topic.

On Thursday, September 16$^{th}$, the first day of the nZEB Roadshow in Nafplio, we visited the 3rd and 5th primary public schools of Nafplio from 9:00 AM to 2:00 PM to educate the pupils on the five principles of a Passive House. We played interactive games related to Passive House and used gamification tools to make the learning experience more enjoyable. At the end of the visit, we provided the pupils with a comic book and a piggy bank, which was shaped like a house and constructed from EPS. This souvenir aimed to demonstrate that by insulating your house, you can save money. In the afternoon, from 3:00 PM to 5:00 PM, a virtual visit to the international Passive House conference systems and materials exhibition took place at the Fougaro exhibition hall. The participants had the opportunity to interact with companies, see their products, and ask questions. From 5:00 PM to 9:00 PM, an event for sustainable tourism and energy upgrades in tourist facilities was held, where a pilot project for energy upgrades in the Aegean was presented, followed by a discussion on sustainability and energy savings.

On Friday, September 17$^{th}$, the second day of the nZEB Roadshow, we continued visiting schools by visiting the 1st and 2nd junior high schools of Nafplio. Compared to the first day, a different approach to gamification was used, and informative material was provided to the students after the presentations. From 4:00 PM to 9:00 PM, a public presentation took place, starting with a technician's seminar on proper installation of insulation, windows, airtightness principles, thermal bridge solving, and Passive House principles in general. The seminar was attended by blue and white-collar workers, decision-makers from the public sector, and people from various specialties.

On Saturday morning, September 18$^{th}$, a seminar on Passive House standard, PHPP software, designPH, and a comparison between Passive House/nZEBs and KENAK, the national legislation and tool of energy commissioning, took place. At the same time, gamification experiments were held outside the exhibition hall to enrich the learning experience for kids. In the afternoon, presentations were given on a wide range of energy-related topics, from simple and less technical-oriented to specific energy-saving practices. The presentations included systems and companies such as MVHR, Aluplast, A Passive house in Nafplio, Systemair, Certified Passive House touristic houses in Kato Achaya, BOSTIK, chilled roofs, LANDVAC: vacuum glazing and polyester window frames, an economic evaluation of a Passive House and a nZEB according to local legislation, quality assurance through certification, and a live blower door test.

On Sunday, the last day of the nZEB Roadshow, visitors were divided into two groups, to minimize the risk of COVID spread, and afterwards they visited the Passive House located in the area.

A total of five companies from the building industry and associations supported the first nZEB Roadshow in Nafplio. These companies were:

- Aluplast
- Systemair
- Bostik
- getAir
- SIGA

Additionally, the entire event took place under the auspices of the Ministry of Environment and Energy, the National Bank of Greece, and the Technical Chamber of Greece.

**Figure 71** Few photos of 1st Greek event (nZEB Roadshow Nafplio)

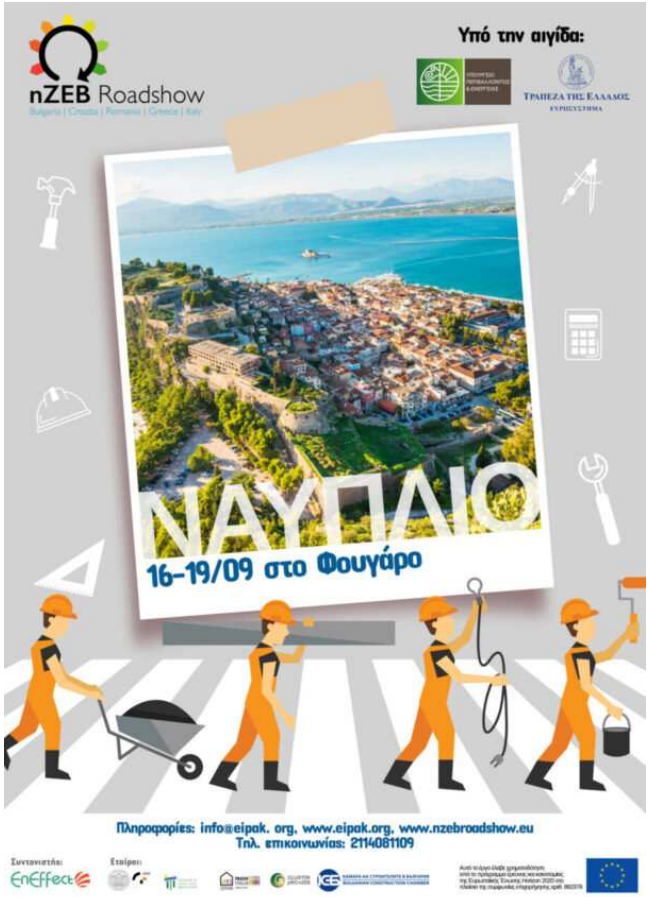



**Figure 72** Poster of the first nZEB Roadshow event in Nafplio

The number of participants was monitored by on-site attendance list and by the end of the event an email was sent to everyone attending, informing them about the evaluation survey.

The event was also posted online by multiple sites in order to spread it the most. Below you can see some snapshots from various sites.

**Figure 73** Various sites posting about the nZEB Roadshow event

The agenda of the event was publish in the site of Hellenic Passive House Institute. You can find it in the following link. Also there is a video about the event in youtube.

### No. 2 event: nZEB Roadshow event - Trikala (24-28.11.2021)

The second nZEB Roadshow event in Greece brought together engineers, building industry professionals, energy-saving enthusiasts, and anyone interested in sustainable and energy-efficient building practices. The event took place in Trikala (central Greece with 65.000 inhabitants) and was designed to be an inclusive gathering despite the challenges posed by the COVID-19 pandemic. We successfully included schools in the event and attracted a large number of attendees. However, due to the weather, we were unable to set up company presenters outside and had to maintain an attendance list to comply with COVID-19 restrictions. This was necessary as the measures at that time only allowed a certain percentage of the total room capacity to be filled. Instead of holding the gamification experiments outside, we took them to schools. We used interactive tablet games and gave the pupils the comic book "nZEBO" as a souvenir. Like in the first nZEB Roadshow, we held seminars for engineers and the general public every evening for the first three days of the nZEB Roadshow week.

Among the events in the city of Trikala, the awards ceremony for the winners of the Architectural Student Competition for the renovation of a rural warehouse according to the Passive House Standard and its conversion into a center for innovation and startups stands out on Friday afternoon at the V. Tzitsanis Museum. The nomination of the award was conducted by the mayor of the municipality of Trikala and president of the central union of municipalities of Greece, Mr. Papastergiou. The Student Competition last for 9 months where 21 teams and almost 180 students were trained for free in order to design the first Passive House Innovation Hub in Trikala.

But before this, the nZEB Roadshow began on Wednesday, November 24th, with an interactive workshop for engineers and technicians. The workshop covered the principles and topics of Passive Houses and their construction, proper installation of windows and insulation, airtightness, and thermal bridges.

For the rest of the days, we followed the schedule of the first nZEB Roadshow. Every weekday morning, we visited schools to promote the Passive House standard through non-formal education practices, and every evening until Saturday, we held seminars and workshops for everyone interested. On Thursday, November 25th, the second day of the nZEB Roadshow in Trikala, we visited the 2nd, 5th, and 30th primary public schools of Trikala from 9:00 AM to 2:00 PM to educate the pupils on the five principles of a Passive House. We played interactive games related to the Passive House and used gamification tools to make the learning experience more enjoyable. At the end of the visit, we provided the pupils with a comic book and a piggy bank shaped like a house and constructed from EPS. This souvenir aimed to demonstrate that by insulating your house, you can save money. In the afternoon, from 5:00 PM to 9:00 PM, we held a workshop mainly for engineers and technicians on the implementation of a MVHR system, best practices, and sizing of heat pumps, and all the specialties of the above systems.

On Friday, November 26th, we followed the same path, visiting the 5th and 7th junior high schools and the 8th high school of Trikala. Obviously, the presentations were adequately prepared for the students of that level of education. Friday evening was a special day due to the nomination of the winner of the second architectural student competition. Each of the five teams presented their proposal, and then the jury announced the results followed by the award.

On Saturday, November 27th, the foyer of the cultural center in Trikala was buzzing with activity as the Hellenic Passive House Institute set up a series of experiments for children to enjoy and learn from. Attendees had the opportunity to engage with knowledgeable staff and learn about passive house construction and energy efficiency. In the evening, the focus shifted to presentations related to the municipality of Trikala's energy transition efforts. Attendees were informed about the VILLAWATT European program, the energy upgrade of the 5th elementary school in Trikala, and a comparative analysis between a multifamily house designed using the PHPP and the energy simulation program, KENAK, which is mandated by Greek legislation. Additional presentations were given by companies that specialize in passive house components.

The nZEB Roadshow culminated on Sunday, November 28th, with visits to the 5th primary school in Trikala, which had undergone renovations to meet the passive house standard, and a passive house in Kalabaka. To ensure the safety of all attendees amidst the COVID-19 pandemic, the visits were divided into three groups, and all necessary safety protocols were followed.

Overall, the nZEB Roadshow was an informative and engaging event that provided valuable insights into the benefits of passive house construction and energy efficiency.

## Highlight

After this event the municipality in the framework of Vilawatt project collaborated with HPHI to design the Energy Transition Strategy for 2030 and 2050. Today (06.23) the city approved and adopted this strategy, deciding to build and renovate every building following the Passive House Concept. The city has already two certified Passive House designers in the Technical Service and already 3 Passive House Buildings.

**Figure 74** Few photos of 2nd Greek nZEB Roadshow event in Trikala. On the bottom left the Mayor of Trikala awards the first prize in the representative of the team CR8

The agenda of the second nZEB Roadshow event can be found on the site of the Hellenic Passive House Institute, in the following link. A short video about the event can be found here.

The number of participants was monitored once again by mentioning every participant attending the event for evaluation as well as for hygienic reasons.

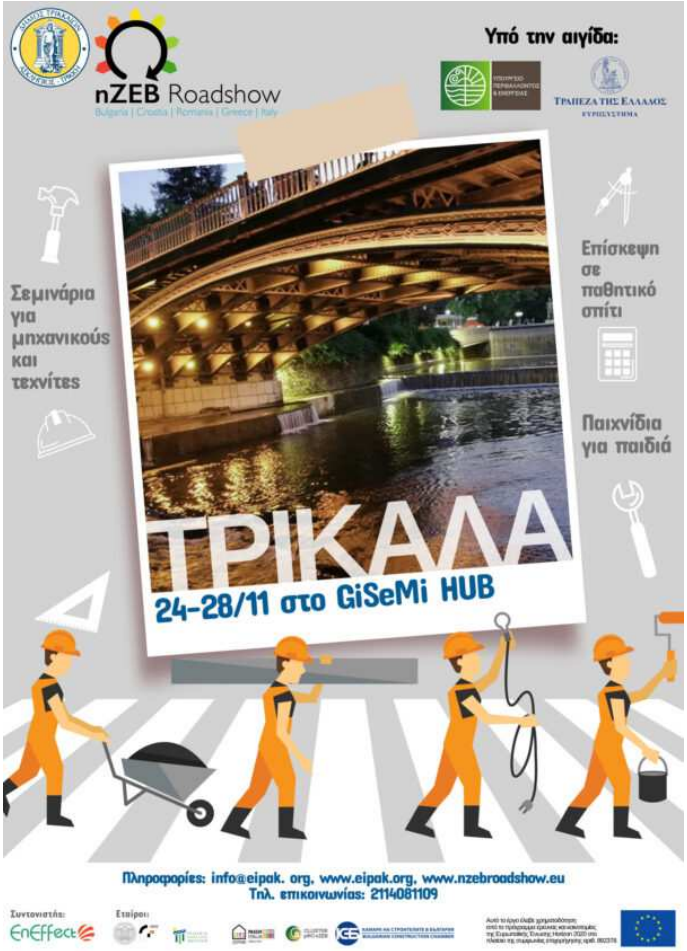



**Figure 75** Poster of the second nZEB Roadshow event in Trikala

A total of eight companies from the building industry and associations supported the second nZEB Roadshow in Trikala. These companies were:

- Aluplast
- Systemair
- Bostik
- Aries
- getAir
- SIGA
- Schock
- KnaufInsulation

Additionally, the entire event took place under the auspices of the Ministry of Environment and Energy and the National Bank of Greece.

The event was also posted online by multiple sites in order to spread it the most. Below you can see some snapshots from various sites.

**Figure 76** Snapshots from various sites promoting the nZEB Roadshow week in Trikala

### No. 3 event: nZEB Roadshow - Patras (17-20.03.2022)

The third nZEB Roadshow event in Greece took place in Patras (larger city in Peloponisos with 300.000 inhabitants), a city located in the western part of Greece. The event was successful, as it brought together numerous professionals who shared a common goal of promoting energy-saving practices. Attendees had the opportunity to engage with multiple sponsors who showcased their passive house technologies, which helped them to stay up-to-date with the latest industry trends.

The event was held at the conference center of the University of Patras, and although there were restrictions in place due to COVID-19, the event was able to attract a lot of schools (around 450 children) in the mornings. To ensure that students were safe, we set up gamification experiments in the foyer of the conference center and used different colored tapes installed in the floor to divide the total number of pupils into three different groups, reducing the risk of COVID-19 spread. Volunteers from the university helped us to organize the event, with almost 10 volunteers contributing to its success. Each student was gifted with a copy of the comic book "nZEBO" and a piggy bank in the shape of a house made from eps, at the end of the one-hour lesson and experiments.

The nZEB Roadshow event also included a presentation at the University of Patras in the civil engineering department. On Saturday, experiments were set up, and the staff of the Hellenic Passive House Institute was on hand to provide their knowledge to anyone interested. In the evening, there were several presentations related to the Passive house standard, including insulation companies, state-of-the-art brick manufacturers, and presentations from Systemair, Bostik hellas, and Aluplast. In between these presentations, there were several presentations of Passive House projects.

Throughout the four-day event, which ran from Thursday to Sunday, we held presentations and workshops in the evenings for engineers, tradespeople, and the general public. The focus of these sessions was on the Passive House standard, energy efficiency, and best practices for implementing passive house components. Attendees had the opportunity to engage with knowledgeable experts and learn about the latest advancements and techniques in the field of passive house construction.

Finally, on the last day of the event, we visited two Passive Houses, one that was in the implementation stage and one that was finished. The Enervillas was one of them, which was the first certified Passive House Premium tourist home in the world. This event presented a great opportunity to showcase the values of sustainability and energy-efficient building practices.

**Figure 77** Few photos of 3rd Greek nZEB Roadshow event in Patras. On the top left you can see on the floor the colored tapes that guided each students group

The agenda of the third nZEB Roadshow event can be found on the site of the Hellenic Passive House Institute, in the following link

The number of participants was monitored once again by mentioning every participant attending the event for evaluation as well as for hygienic reasons.

A lot of companies from the building industry and associations supported the third nZEB Roadshow in Patras. These companies were:

- Aluplast
- Systemair
- SIGA
- Unisol
- Bostik
- Aries
- getAir
- Schock
- KnaufInsulation
- BlowerDoor GmbH
- Enervillas
- Giannis Karavoulias - Γιάννης Καραβούλιας
- Meazon
- Panagiotopoulos brick industry – Παναγιωτόπουλος Κεραμοτουβλοποιΐα ΑΒΕΕ

Additionally, the entire event took place under the auspices of the Ministry of Environment and Energy, the National Bank of Greece and the Western's Greece department of Technical Chamber of Greece

The event was also posted online by multiple sites in order to spread it the most. Below you can see some snapshots from various sites.

**Figure 78** Snapshots from various sites promoting the nZEB Roadshow week in Patras

**Figure 79** Poster of the third nZEB Roadshow week in Patras

### No. 4 event: nZEB Roadshow - Athens (02.04.2022)

The 4th event was different from the previous three, as it was the first time that we were not the main organizers of the event, but we join the main event organized by the Hellenic Physicists Association. It was an event primarily focused to children. There were a lot of activities related to physics and technology. There were multiple presentations for the young students to watch and a lot of experiments. In that very well organized physics exhibition we join the Hellenic Physicists Association in order to promote the Passive House standard, which is an implementation of plain physics in our buildings. The gamification mockups as well as the presentation that took place to inform the students about the five basic principles of the passive house, had great resonance.

The event lasted just a few hours in the Serafeio cultural center of the municipality of Athens and it had a double meaning as it was organized at the international children book day. It was the perfect day to demonstrate our comic book.

There was no attendance list for this event and children were able to attend the exhibition without being necessary to fill any form.

**Figure 80** Photographs from the event

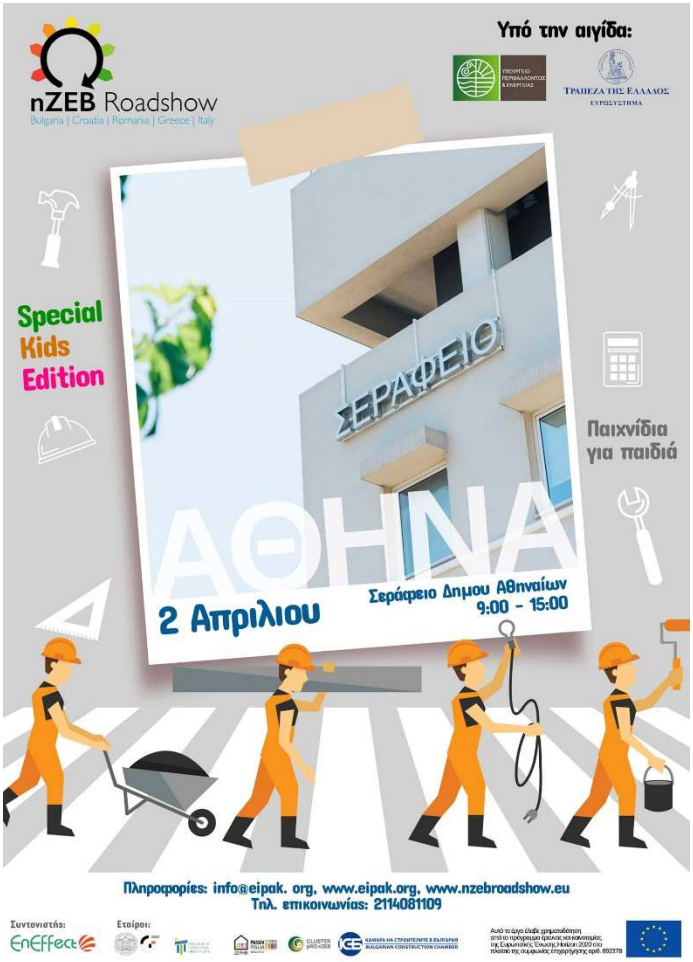



**Figure 81** The poster of the special event in Athens

### No. 5 event: nZEB Roadshow – Kavala (02-05.06.2022)

The 4th nZEB roadshow week was organized as a main event in collaboration with the company Thermoplastiki. Partners joined the event to promote their passive house related products. The event took place in the conference hall of the Lucy hotel, in Kavala from Thursday to Sunday.

The schedule followed the previous, already well executed nZEB Roadshows. That means that we set a time span every morning on weekdays, from 8:30am to 2:30pm, to host schools in our exhibition hall. Every evening until Saturday we hosted engineers, tradespersons and general public with energy saving consciousness in order to present the values and the advantages of the Passive House Standard, as well as to give the opportunity to our supporters and co organizers to present their products.

We would say that what stood out, was the unexpected attendance of the public. Much more engineers and people in general came to the event and that definitely had to do with the lift of the COVID-19 restrictions. So, people now were feeling more secure and relaxed, as from then there were no restrictions any more due to COVID. Except from that, the two Blowerdoor tests were also a big advantage in order to attract people to join the event. One took place in the conference hall, and the second one in the Passive House visit on Sunday morning.

But, let's start from the beginning. The first day, on 2nd of June we didn't expect much schools to join us as it was approaching the end of school year and the organizing of a school excursion was quite difficult, as the school managers stated to us after our communication. In the evening though we had quite a few people attending our interactive workshop. During the workshop we presented passive house projects and their construction procedure. The proper installation of windows, insulation, the ways to achieve airtightness as well as the elimination of the thermal bridges.

The second day, we remained at the disposal of every school that wanted to attend our experiments from 8:30am to 2:30pm. The evening we had a workshop with a more technical approach. The topics presented were related to the MVHR systems, the right sizing of a heat pump, the proper set up, and finally the most attention catching topic, which is the economical evaluation of the construction of a passive house. How much more or less do a passive house cost in order to be constructed compared to the nZEB standard according to the Greek legislation. The subject was deeply analyzed, beginning from the energy simulation study to the long term usage and ending with the payback period.

On Saturday morning even though we didn't expect much children to visit us, we had some visits, especially from younger children. The evening continued with the same interest as the previous days. We had a lot of presentations from our partners about passive house related systems and about passive house projects in the nearby area of Kavala.

Special achievement for us was the attending of three Professors from the local university of Kavala during all four days of the event. Unfortunately, it was exams period in the Greek universities and that consist an obstacle for the students that wanted to attend the events and the seminars.

Finally, the last day, we visited the Thermoplastiki's manufacturing unit of windows and insulation. The CEO and owner of Thermopastiki, Mr. Baloglou guided us through the factory and presented us all the innovations that they apply during the manufacturing of the windows and the insulation materials. After the visit to the factory, we continued to the last stop of the nZEB Roadshow in Kavala, the DIY Passive House project in Filippoi, Kavala. This project was designed and supervised by a non-engineering related Passive house enthusiast. The project was well executed and it was also the first time visited by the staff of Hellenic Passive House Institute, that went there also to complete the certification procedure by measuring the airtightness of the building. The testing was open to the public in order to live the whole experience from start to finish.

**Figure 82** Few photos of Greek 4th nZEB Roadshow week at Kavala

The agenda of the fourth nZEB Roadshow can be found in the website of Hellenic Passive House Institute, in the following link.

We have complete attendance list from the event but we couldn't manage to apply on site evaluation due to the lack of volunteers. We had a lot of tasks to do and we didn't have the necessary human resources. From the post event evaluation form we managed to gather 7 answers to the survey. Maybe the summer weather and the on-site presence of engineers during that period didn't offer them the spare time to fill the survey.

A lot of companies from the building industry and associations supported the fourth nZEB Roadshow week in Kavala. These companies were:

- **THERMOPLASTIKI**
- Aluplast
- Systemair
- SIGA
- Bostik
- getAir
- Schock
- BlowerDoor GmbH

Additionally, the entire event took place under the auspices of the Ministry of Environment and Energy and the National Bank of Greece.

The event was also posted online by multiple sites in order to spread it the most. Below you can see some snapshots from various sites.

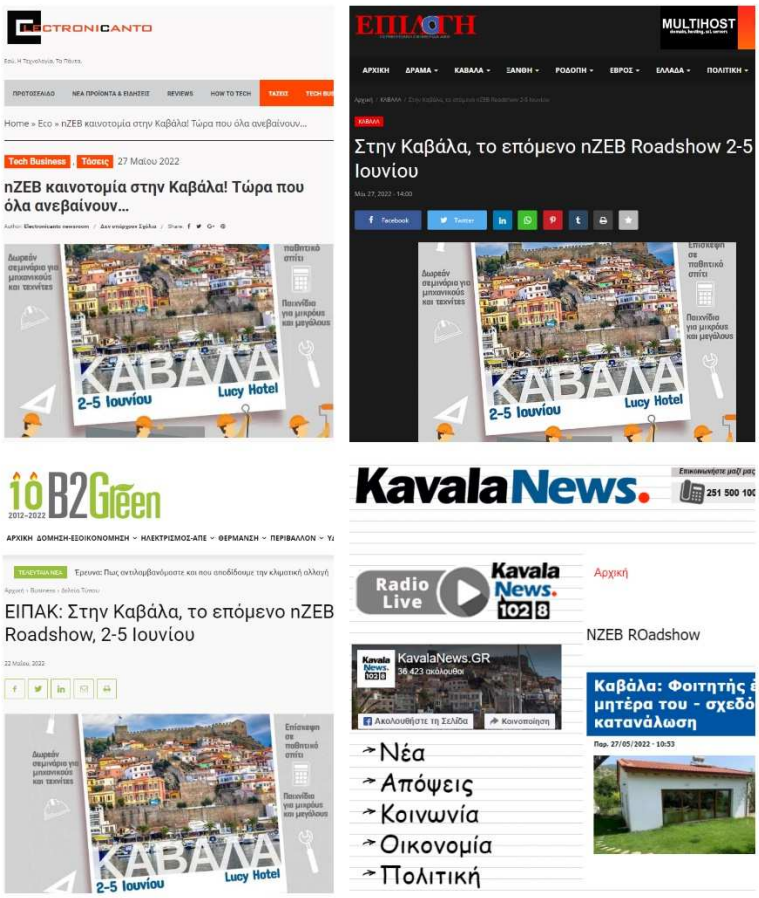



**Figure 83** Snapshots from various sites supporting the even in Kavala

**Figure 84** The poster of the fourth nZEB Roadshow week in Kavala

### No. 6 event: nZEB Roadshow – Aegina (07-09.07.2022)

The 6th Passive House event was held in collaboration with the Hellenic Physicists Association as a joint "Physics Summer School." The three-day event took place in the beautiful island of Aegina, located in the Argosaronicos gulf, and offered a unique opportunity to showcase the Passive House standard in an island setting for the first time. To ensure that the high standards set by the Hellenic Physicists Association were met, the event included a specially modified morning schedule. Attendees had the chance to engage with experts from both organizations and learn about the latest advancements and techniques in the fields of physics and passive house construction.

The schedule was modified in comparison with the previous roadshows. The first day, Thursday 7th of July, we had a presentation in the morning about “what cause a house to become cold during winter?” and at noon we had a presentation about the Passive House Standard to the parents of the kids that attended the morning presentation. The second day, Friday 8th, we had a presentation at noon open to the public, explaining the basic principles that conduct the Passive House standard. Unfortunately, maybe of the summer holidays and the lack of the construction interest in the island of Aegina, there were just few people, mostly all of them engineers, joining the event. On the contrary, the interest on the last day, Saturday 9th, was huge, especially for the first completely autonomous Passive House

Premium in the world. The house made by Vivacitas homes, located near the village Tzikides was the big attraction of the 5th nZEB Roadshow in Greece, and the 6th event total. All the students and their parents were impressed while there were several engineers this time from the Aegina island that visited the interesting home. The stunning views and beautiful interior, along with excellent indoor air quality, truly impressed the attendees.

**Figure 85** Photographs from the event in Aegina

The agenda list can be found as always in the site of Hellenic Passive House Institute, in the following link

There is no list of attendance, as the event was organized by the Hellenic Physicists Association.

A lot of companies from the building industry and associations supported the fifth nZEB Roadshow week in Aegina. These companies were:

- Thermoplastiki
- Aluplast
- Systemair
- BlowerDoor GmbH
- Aries
- Bostik
- Schock
- Meazon
- getAir
- Knauf Insulation

Additionally, the entire event took place under the auspices of the Ministry of Environment and Energy and the National Bank of Greece.

**Figure 86** Poster from the event in Aegina

### No. 7 nZEB Roadshow event – Kalamata (06-09.10.2022)

The nZEB Roadshow in Kalamata, organized by HPHI, was held from Thursday 6th to Sunday 9th of October in the municipal music hall. The event was attended by many students, who were easily able to attend as it was still early in the school year and directors could easily organize educational excursions. There was great interest overall in passive house design, as evidenced by the high attendance at seminars and workshops. On the final day, Sunday, the public turnout exceeded our expectations, likely due to the visit to the highly awarded and well-known passive house building, Nidus.

On the first day of the nZEB Roadshow, which was on Thursday, October 6th, we were delighted to welcome approximately 190 students during the morning session. The students ranged from 5th and 6th grade of elementary school to 3rd and last year of high school. It was a pleasant surprise for us to see that we also had students from technical schools who were very well prepared and had an excellent understanding of buildings and their construction.

At noon on the same day were held seminars for engineers and the general public. The engineers of the city of Kalamata, as well as engineers from the municipal technical branch attended the event.

On Friday, 7th of October, the event continued with the same success. In the morning we welcomed 130 students from different grades, as well 10 students with special needs. We were really happy to include everyone that wanted to attend our event. Also, in the morning the president of the Hellenic Passive House Institute with a local CPHD architect, visited the 11th primary school of Kalamata, and agreed to be renovated according to Passive House Standard. The energy balance simulation is going to be made for free, by architect Mario Gonzalez, as a diploma thesis.

The remaining days of the event included more seminars and workshops in the evenings, with the last day being a huge success due to the visit to a Passive House in the area. Numerous attendees were impressed with the architecture and simplicity of the Passive House.

The detailed agenda can be found here. Also the video from the local media with the mayor of Kalamata, the president of Hellenic Passive House Institute, Mr. Stefanos Pallantzas and the local CPHD architect Mr. Mario Gonzalez is available here

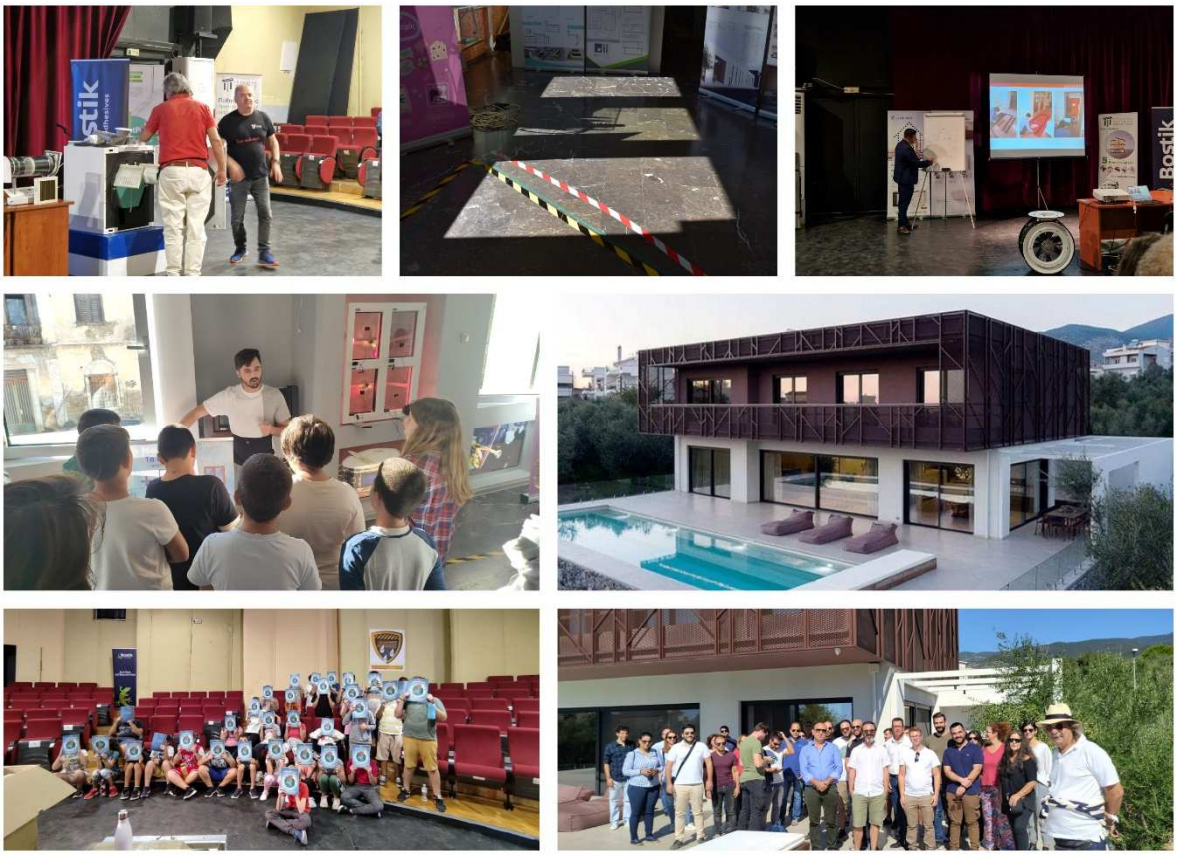


**Figure 87** Photographs from the nZEB Roadshow week in Kalamata

**Figure 88** Poster from the event in Kalamata

There is detailed list of attendance as well as evaluation report from the survey.

A lot of companies from the building industry and associations supported the sixth nZEB Roadshow week in Kalamata. These companies were:

- Katsos
- Aluminco
- Aluplast
- Systemair
- Bostik
- Aries
- Panagiotopoulos brick industry – Παναγιωτόπουλος Κεραμοτουβλοποιΐα ΑΒΕΕ
- BlowerDoor GmbH
- Schock
- Meazon
- getAir
- Knauf Insulation
- SIGA

Additionally, the entire event took place under the auspices of the Ministry of Environment and the Energy, the National Bank of Greece and the Peloponnese's department of Greece's Technical Chamber.

Also a lot of local media communicated the event as you can see below:

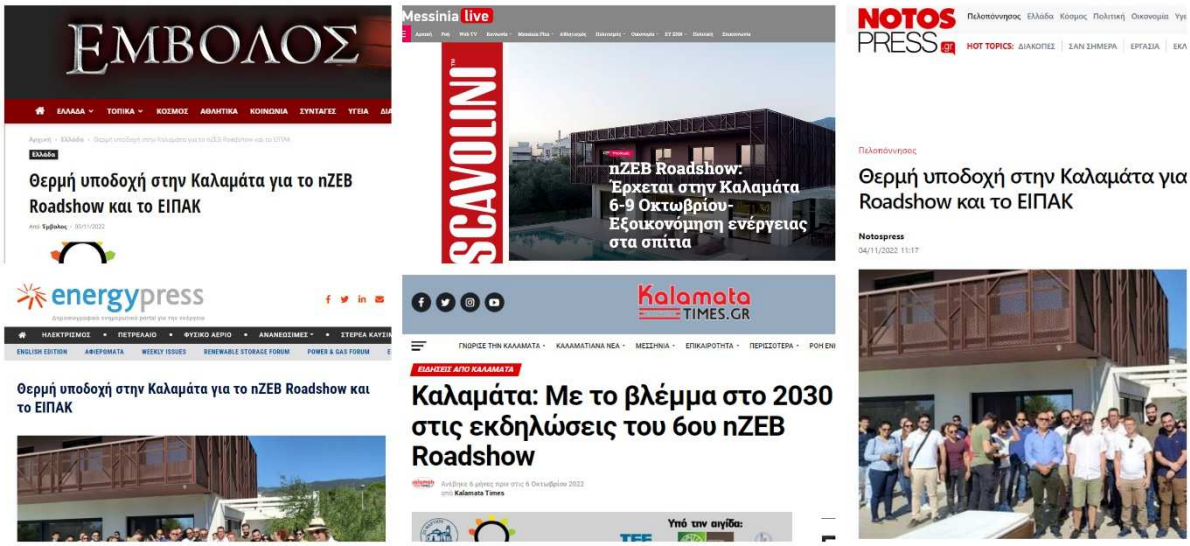



**Figure 89** Snapshots from sites supporting the nZEB roadshow actions in Kalamata

### No. 8 event: nZEB Roadshow – Kozani (15-18.12.2022)

The 8th nZEB Roadshow week took place in the city with the most passive houses in Greece, Kozani. The city is located at the region of Western Macedonia and it is of highly interest as it consists the area with the most energy production factories in Greece. So the area around of the city has a lot of emissions due to the power plants that has coal as the main fuel. Also, due to the latest legislation, the production of electricity with coal was prohibited. Unfortunately, the war made the Greek government to take back the policy for the coal and the coal fueled power plants came back to production. That said, promoting the nZEB buildings and the Passive House standard in one of the cities with the highest suburban pollution in a cold climate, was of high importance.

The venue was the municipal library of Kozani, the Koventarios library. On Thursday 15th we started with schools from all grades. Approximately 200 students from the near schools attended the nZEB Roadshow the first day and 115 the second day, Friday 16th. On the evenings, as usual we held seminars for the general public as well as workshops for everyone that wanted to widen his knowledge in the building sector and on the energy saving. One of the presentations that stand out was from the mayor, which presented their vision about making Kozani, one of the 100 climate neutral cities in Europe. On Saturday 17th, we change our regular schedule. Instead of being available on the library to demonstrate the 5 basic principles of a Passive House, for every kid that wanted to visit us, we decided to include visits in more Passive houses around the area and one visit in a local window manufacturer. So, after visiting and strolling through the production line of mr. Kechaidis production unit, we visited Passive houses in Ptolemaida, Kozani and the suburbs. On the evening of the same day we had multiple presentations from Certified Passive House Designers, who showcased their work and presented projects that took place on the area.

The last day, on Sunday 18th, we also visited Passive Houses around the Kozani area and we end up successfully testing the airtightness of a Passive House in the process of the certification.

Everything was captured in a detailed video, available here.

The agenda of the roadshow is available in our website.

**Figure 90** Few photos of the seventh nZEB Roadshow week in Kozani

There is detailed list of attendance from the 7th event.

A lot of companies from the building industry and associations supported the seventh nZEB Roadshow week in Kozani. These companies were:

- Kechaidis Window manufacturer
- Aluplast
- Systemair
- Bostik
- Aries
- Aluminco
- BlowerDoor GmbH
- Schock
- Meazon
- getAir

- Knauf Insulation
- SIGA
- Liakosmelkat.gr
- dteam.gr

Additionally, the entire event took place under the auspices of the Ministry of Environment and the Energy, the National Bank of Greece and the Municipality of Kozani.

Also a lot of local media communicated the event as you can see below:

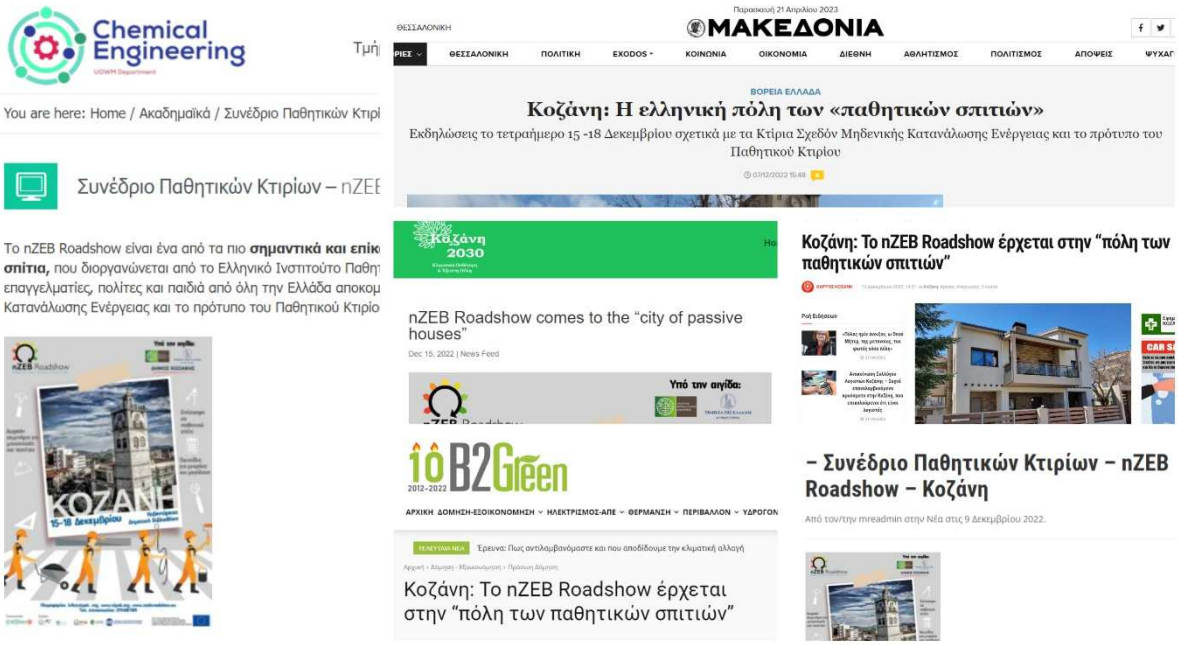



**Figure 91** Snapshots from sites supporting the nZEB roadshow actions in Kalamata

**Figure 92** The poster of the event

### No. 9 event: nZEB Roadshow – HPHI's headquarters (22.03.2023)

The 9th nZEB Roadshow action took place at the HPHI's offices and was about teaching the Passive House principles to the younger generation. We hosted the 4th elementary school of Cholargos with almost 35 pupils. It was a special day for us as it was the first action that took place in our new offices. Also it was great pleasure to be able to provide and pass the knowledge to a local school.

The pupils were taught about all the principles that consist a passive house and were given a comic book. The teachers were in charge of checking the answers in the comic book the following day at school.

**Figure 93** Photographs from the event

### No. 10 event: nZEB Roadshow – Athens (16-17.03.2023)

The most recent nZEB Roadshow event focused on windows and insulation was held in Athens, the city associated with HPHI.

The event commenced with a lecture on Monday, May 15th, delivered by HPHI executives. This lecture took place at the National Technical University of Athens as part of the postgraduate program "Energy Production and Management" within the course "Energy Management and Project Management" offered by the Faculty of Electrical Engineering. Professor of the Course and advisor to the government Dr. Doukas thanked personally HPHI and Mr. Stefanos Pallantzas for the contribution.

**Figure 94** The lecture in the National Technical University of Athens

During the two-day forum, the venue was set at Innovathens, conveniently located in the center of Athens. These two days were dedicated to exploring two crucial structural elements of buildings. The first day, Tuesday, May 16th, was dedicated to the insulation forum. We had the privilege of hosting several speakers from prominent companies in the insulation industry. Total all the companies had approximately 90 minutes to present their insights and expertise. Additionally, an inspection service for external thermal insulation systems was showcased, providing valuable insights into this aspect.

The day continued with a comprehensive presentation covering various topics such as the importance of better insulation, the selection of optimal insulation materials, methods for eliminating thermal bridges, and dispelling common myths surrounding insulation. The first day concluded with an enlightening discussion about the strategies employed by other European Union countries and an engaging conversation among the speakers regarding the proper selection and installation of insulation materials.

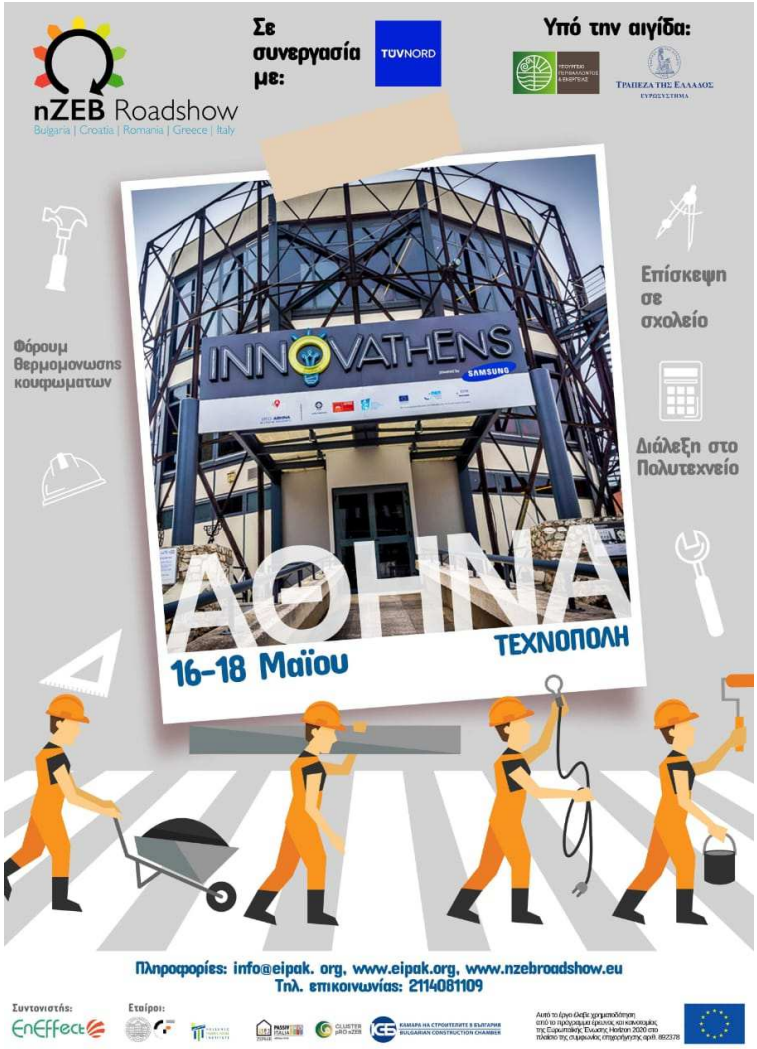



**Figure 95** The poster of the nZEB Roadshow in Athens

The second day of the nZEB Roadshow, which took place on Wednesday, May 17th, focused on windows as the central theme. Nine companies took the stage, providing a comprehensive overview

of various window technologies. The presentations covered a wide range of options, including aluminum, PVC, and energy-efficient timber window frames with traditional design.

Like the first day, a case study inspection was conducted, highlighting the transition of window frames from being potential areas of energy loss to becoming sources of significant energy demand. The technical details that distinguish energy-efficient windows were discussed, emphasizing the factors that make a difference in terms of performance.

**Figure 96** During the nZEB Roadshow in Athens

As the last leg of the nZEB Roadshow, the event concluded by sharing practices and experiences from other European countries, showcasing the sustainable aluminum systems. One example highlighted during the presentation was ALUMIL, illustrating the utilization of sustainable aluminum systems in achieving energy efficiency and environmental sustainability in building projects.

In conclusion, the final nZEB Roadshow proved to be a resounding success, attracting a significant number of attendees, primarily engineers, who actively participated in the two forum days. The event was organized in collaboration with TUV Hellas (TUV Nord), a renowned certification and inspection services provider, and received extensive support from various manufacturing companies specializing in insulation and windows.

The active involvement and support from these industry-leading companies played a crucial role in providing valuable insights, sharing best practices, and showcasing the latest advancements in insulation and window technologies. Their participation contributed to the overall success and impact of the nZEB Roadshow, fostering knowledge exchange and promoting sustainable building practices. Those are referred below:

- Aluplast
- Systemair
- Bostik
- Aries
- Aluminco
- Rizakos
- Thermoplastiki
- Blowerdoor
- Meazon
- getAir
- KnaufInsulation
- Siga
- Schock

**Figure 97** The venue of the two-day forum

The agenda of the roadshow is available in our website

After the end of all the public affairs of the roadshow, the last day, Thursday 18th of May, the project meeting between the partners of the program took place. Partners from Italia, Romania, Croatia and Bulgaria attended the project meeting which held in the HPHI headquarters.

Additionally, the entire event took place under the auspices of the Ministry of Environment & Energy and the National Bank of Greece.

**Highlight**

The biggest manufacturing companies in Greece, agreed that we need better buildings, better products and Passive House is the key solution.

Finally, a lot of local media communicated the event as you can see below:

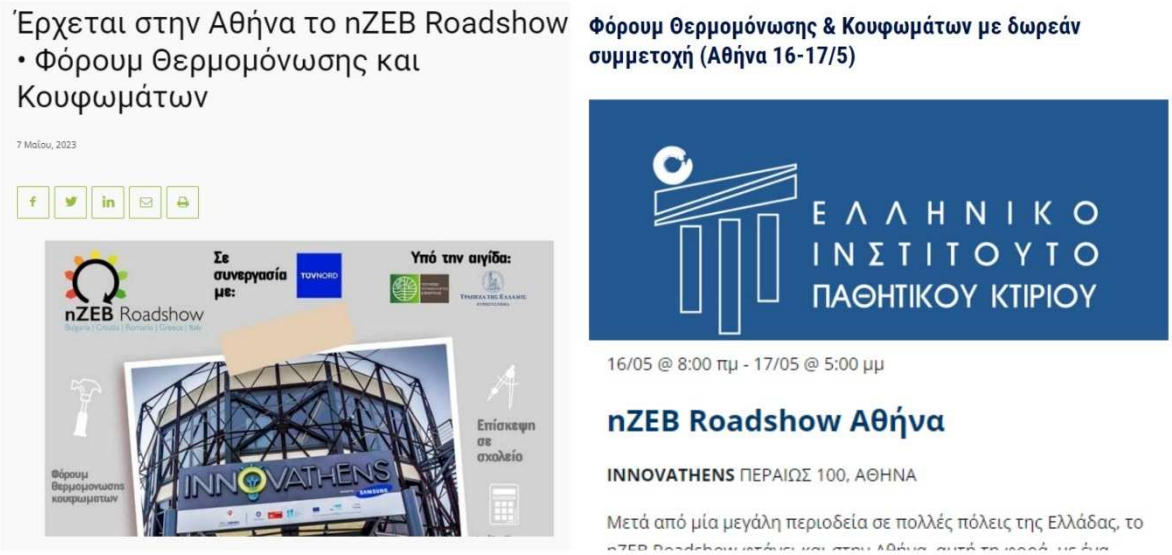



**Figure 98** Snapshots from various sites posting about the nZEB Roadshow in Athens

## LESSONS LEARNED

Every event offers an opportunity to learn and improve for the next one. Reflecting on past events, analyzing what went well and what didn't, and documenting these lessons learned can be a valuable source of information for future planning. Feedback and constructive criticism are important to be receptive to, and it's essential to strive for constant improvement and innovation in all aspects of event management, including mockup transportation, installation and deinstallation, event organization, execution, and dissemination. By acknowledging and sharing mistakes and successful strategies, events can continue to evolve and provide better experiences for participants.

Things the Greek team has learned throughout the 10 Roadshow events focused on nZEB events and organizing:

1. Organizing events in every part of Greece
2. Contacting and communicating with partners around Greece in order to organize the local events
3. Finding engineers and local media to spread the event
4. Finding the right vehicle to transport the necessary exhibition parts
5. Innovate through the designing of the exhibition mockups
6. Contacting the event in order to attract volunteers by giving contributory benefits
7. Attracting sponsors
8. Rely on your colleagues for the best possible conduction of the event

Delegation: It is highly important to delegate activities to key members and localize the events as much as possible.

Conferences: Key technical information has to be presented, but the most important aspect is to provide an educational toolset following a non formal interactive education and site visits.

Attract people: Unfortunately free events are not popular, even with high quality speakers. We have noticed that in expensive conferences we conducted we had three times more people than in the Roadshows. People unfortunately is interesting for qualifications and certification which we will provide in our next events

**Conclusion**

nZEB Roadshow gave HPHI the needed boost to continue the Passive House crusade finding important partners. nZEB roadshow will be continued after the end of the project with many more cities in Greece and abroad.

## 3.04 ITALY

### SUMMARY

The project started exactly before the COVID pandemic and many countries suffered serious consequences of this situation, in particular Italy was mainly affected by this disease. For this reason, the initial foreseen activities, mostly focused on live events, had to be modified accordingly: live exhibitions and construction fairs were suspended for more than a year, in-presence courses and workshops encountered big limitations, due to the several sanitary protocols, both in terms of space as well as of presence of people. The limitations were partially relieved during the summer months in the 2nd year of the COVID period, which allowed to organize some events, but it was impossible to achieve the big numbers of attendants, like in the past events organized by ZEPHIR.

Therefore, in order for the indicators to be achieved, it was decided to implement online marketing strategies and online platforms for hosting virtual events to attract people, let them engage and train them in the topics of energy efficiency and living comfort.

With the help of such instruments, the monitoring of attendance and engagement even became relatively easier, thus managing to highly overcome the expected impact.

In Italy, 12 different nZEB Roadshow events were realized in total. Type of each event (nZEB week, nZEB day, both virtual or in-presence), date and location are summarized in Table 8. More information about the major live events (marked with [*]) is provided further in text.

**Table 8.** Summary of nZEB Roadshow events conducted in Italy

| No | Event type | Event name | Date | Location |
|---|---|---|---|---|
| 1 | virtual nZEB Week | Course for Passivhaus Designers | 12-13.06.2020<br>19-20.06.2020 | online |
| | | Webinar with Wooden Construction Company CentroLegno | 06.06.2020 | online |
| | | Course for Passivhaus Designers about Thermal Bridges | 09-10.06.2020 | online |
| 2 | virtual nZEB Week | Webinar “Certifications of Sustainability: ARCA, PassivHaus, CasaClima” | 21.09.2020 | online |
| | | Talk at the 24th International Passivhaus Conference | 23.09.2020 | online |
| | | Talk at the Zero Build Forum '20 in Turkey | 25.09.2020 | online |
| 3 [*] | nZEB Week | Visit of a Passivhaus building under construction in Jesi | 06.07.2021 | Jesi |
| | | Visit of a Passivhaus building under construction in San Daniele nel Friuli | 17.07.2021 | San Daniele nel Friuli |
| 4 | virtual nZEB Week | Webinar for designers “SuperBonus at the microscope” | 03.11.2021 | online |

| | | | | |
|---|---|---|---|---|
| | | Course for Passivhaus Designers | 22-23.11.2021<br>29-30.11.2021<br>03-04.12.2021<br>13-15.12.2021 | online |
| 5 [*] | nZEB Week | Klimahouse Exhibition 2022 | 18-21.05.2022 | Bolzano |
| 6 [*] | nZEB Day | Visit of a Passivhaus building under construction in San Daniele nel Friuli | 27.06.2022 | San Daniele nel Friuli |
| 7 [*] | nZEB Week | Course for Passivhaus Practitioners | 29-30.09.2022<br>06-07.10.2022 | Forlì |
| 8 [*] | nZEB Days | Lectures at school and Gamification | 03-04.11.2022<br>23-24.02.2023 | Canale, Pergine Valsugana |
| 9 [*] | nZEB Week | 8th Italian Passivhaus Conference | 08.11.2022 | Rimini |
| | | Booth and live events at the Ecomondo Construction Fair | 08-11.11.2022 | Rimini |
| 10 [*] | nZEB Week | Klimahouse Exhibition 2023 | 08-11.03.2023 | Bolzano |
| 11 [*] | nZEB Week | Interviews for TV broadcast TeleRadioPace | 04.04.2023<br>27.04.2023<br>28.04.2023 | online |
| | | Course for Passivhaus Practitioners | 13-14.04.2023<br>20-21.04.2023 | Chiavari |
| 12 [*] | nZEB Day | Site visit at 2 Passivhaus retrofits | 11.05.2023 | Pergine Valsugana |

### Monitoring approach

In Task 2.4 several ways of monitoring and evaluation of the events were described, according to different situations. However, for the Italian case where people were mostly engaged online at virtual events or via marketing campaigns about energy efficiency and nZEB's, some of the purchased platforms in the framework of the nZEB Roadshow project allowed to perfectly monitor the users' interactions, hence providing a fine insight in the engagement rate.

For live events, in some cases a signed list of participants could be obtained, in some others the participants have been simply counted, elsewhere the attendance, especially at public fairs, exhibitions etc. was estimated based on the mean attendance provided by the organizers or on a reliable estimation according to pictures, videos etc.

**Table 9** Number of attendées/visitors/participants at Italian Roadshow events (pre-listed or estimated)

| No | Event type | Event name | Date | Location | NUMBER OF ATTENDÉES/VISITORS/PARTICIPANTS | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Attendance list / Present (live/online) | Estimated | Number of views online | Photos/Video | Link (if available) |
| 1 | virtual nZEB Week | Course for Passivhaus Designers | 12-13.06.2020 | online | 10 | | | Available, not public | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 19-20.06.2020 | | | | | | |
| | | Webinar with Wooden Construction Company CentroLegno | 06.06.2020 | online | | | 59 | Available | https://www.facebook.com/160629134092556/posts/1571540473001408/ |
| | | Course for Passivhaus Designers about Thermal Bridges | 09-10.06.2020 | online | 24 | | | Available, not public | |
| 2 | virtual nZEB Week | Webinar "Certifications of Sustainability: ARCA, PassivHaus, CasaClima" | 21.09.2020 | online | | 50 | | Available | https://mailchi.mp/e9e98333a310/ry2mryaxmd-429842?e=2d22bb65a3 |
| | | Talk at the 24th International Passivhaus Conference | 23.09.2020 | online | | 100 | | Available | https://www.facebook.com/passivhausitalia/posts/1669752819846839 |
| | | Talk at the Zero Build Forum '20 in Turkey | 25.09.2020 | online | | 30 | | Available | https://www.facebook.com/passivhausitalia/posts/1671567576332030 |
| 3 [*] | nZEB Week | Visit of a Passivhaus building under construction in Jesi | 06.07.2021 | Jesi | 12 | | | Available | https://www.facebook.com/nzebroadshow/posts/2945477912393899 |
| | | Visit of a Passivhaus building under construction in San Daniele nel Friuli | 17.07.2021 | San Daniele nel Friuli | 22 | | | Available | https://www.facebook.com/nzebroadshow/posts/2952272938381063 |
| 4 | virtual nZEB Week | Webinar for designers "SuperBonus at the microscope" | 03.11.2021 | online | 36 | | | Available | https://benessereabitativo.it/webinar-superbonus-110-corso |
| | | Course for Passivhaus Designers | 22-23.11.2021 29-30.11.2021 | online | 21 | | | Available | https://www.facebook.com/passivhausitalia/posts/2028008720687912/ |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 03-04.12.2021 13-15.12.2021 | | | | | | |
| 5 [*] | nZEB Week | Klimahouse Exhibition 2022 | 18-21.05.2022 | Bolzano | | 209 | | Available | https://www.facebook.com/passivhausitalia/posts/2158029744352475/ |
| 6 [*] | nZEB Day | Visit of a Passivhaus building under construction in San Daniele nel Friuli | 27.06.2022 | San Daniele nel Friuli | 22 | | | Available | https://www.facebook.com/nzebroadshow/posts/552079783277496 |
| 7 [*] | nZEB Week | Course for Passivhaus Practitioners | 29-30.09.2022 06-07.10.2022 | Forlì | 17 | | | Available | https://www.facebook.com/passivhausitalia/posts/549546217170561 |
| 8 [*] | nZEB Days | Lectures at school and Gamification | 03-04.11.2022 23-24.02.2023 | Canale, Pergine Valsugana | 46 | | | Available | https://www.facebook.com/passivhausitalia/posts/579575494167633 |
| 9 [*] | nZEB Week | 8th Italian Passivhaus Conference | 08.11.2022 | Rimini | 171 | | | Available | https://www.facebook.com/passivhausitalia/posts/489737773151406 |
| | | Booth and live events at the Ecomondo Construction Fair | 08-11.11.2022 | Rimini | | 201 | | Available | https://www.youtube.com/watch?v=Eht1eDlkzew |
| 10 [*] | nZEB Week | Klimahouse Exhibition 2023 | 08-11.03.2023 | Bolzano | | 227 | | Available | https://www.facebook.com/passivhausitalia/posts/688460609945787 |
| 11 [*] | nZEB Week | Interviews for TV broadcast TeleRadioPace | 04.04.2023 27.04.2023 28.04.2023 | online | | | 218 | Available | https://www.youtube.com/watch?v=w__1ab6FZMQ https://www.youtube.com/watch?v=d4EwhdbQ3WA https://youtu.be/7YCwfCA2RdM |
| | | Course for Passivhaus Practitioners | 13-14.04.2023 | Chiavari | 20 | | | Available | https://www.facebook.com/49000680312450 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 20-21.04.2023 | | | | | | 3/posts/719672533491261 |
| 12 [*] | nZEB Day | Site visit at 2 Passivhaus retrofits | 11.05.2023 | Pergine Valsugana | 24 | | | Available | https://www.facebook.com/490006803124503/posts/746558180802696 |
| | | | | | Attendance list / Present (live/online) | Estimated | Number of views online | | |
| | **SUM PER CATEGORY** | | | | **499** | **1739** | **713** | | |
| | **NUMBER OF PEOPLE PARTICIPATING IN ROADSHOW RELATED EVENT ACTIVITIES** | | | | **2951** | | | | |

## Social media activities and total engagement

In GA amendment it was agreed that part of the dissemination activities might have been conducted online, i.e. through virtual events and campaigns stimulating people's engagement towards energy efficiency and nZEB's.

Therefore, a number of posts on Facebook, Instagram, Google and LinkedIn as well as several videos published on Vimeo and YouTube were able to generate an enormous engagement which more than justify the use of the virtual means of communication described in the amendment.

Among others, ZEPHIR's main channels are Facebook, Instagram and YouTube, hence the impact of the awareness marketing campaign is only presented here for this 3 social media: in reality, it will be even bigger when considering all other social media.

From Table 10 it can be seen that with less than 200 posts related to nZEB's and energy efficiency published throughout the whole project period, a wide audience of more than 450k people could be reached, with roughly 25k people engaged. This means that about 140 people actively interact with each post with 5% mean conversion of the overall outreach (organic and paid audience).

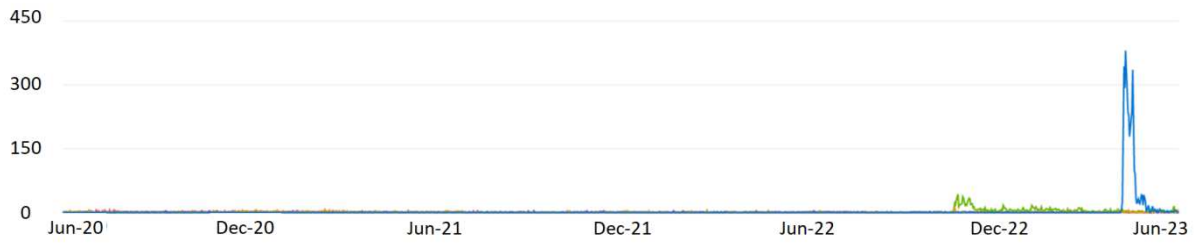
**Table 10** Number of posts, followers, total outreach and reactions on Facebook and Instagram related to nZEB's, energy efficiency and nZEB Roadshow

| MONTH | 4. Social media (Facebook, Instagram) | | | |
|---|---|---|---|---|
| | No° of Posts | Follower | Outreach | Reactions |
| Jun-20 | 8 | 672 | 8040 | 1017 |
| Jul-20 | 0 | 308 | 3698 | 529 |
| Aug-20 | 0 | 12 | 824 | 9 |
| Sep-20 | 9 | 588 | 7634 | 892 |
| Oct-20 | 3 | 200 | 2875 | 277 |
| Nov-20 | 0 | 318 | 3158 | 422 |
| Dec-20 | 0 | 110 | 1743 | 167 |
| Jan-21 | 2 | 357 | 4978 | 497 |
| Feb-21 | 0 | 36 | 884 | 44 |
| Mar-21 | 0 | 165 | 2393 | 226 |
| Apr-21 | 1 | 265 | 5387 | 346 |
| May-21 | 3 | 354 | 4524 | 493 |

| | | | | |
|---|---|---|---|---|
| Jun-21 | 2 | 196 | 1925 | 260 |
| Jul-21 | 6 | 155 | 2623 | 212 |
| Aug-21 | 0 | 78 | 1142 | 84 |
| Sep-21 | 6 | 157 | 2341 | 187 |
| Oct-21 | 0 | 46 | 1366 | 48 |
| Nov-21 | 1 | 304 | 4315 | 412 |
| Dec-21 | 0 | 97 | 1423 | 108 |
| Jan-22 | 0 | 0 | 0 | 0 |
| Feb-22 | 0 | 0 | 0 | 0 |
| Mar-22 | 0 | 0 | 0 | 0 |
| Apr-22 | 1 | 56 | 338 | 41 |
| May-22 | 5 | 2918 | 3857 | 814 |
| Jun-22 | 2 | 67 | 1161 | 64 |
| Jul-22 | 4 | 365 | 3747 | 147 |
| Aug-22 | 0 | 0 | 0 | 0 |
| Sep-22 | 4 | 173 | 2065 | 59 |
| Oct-22 | 46 | 3329 | 13932 | 2119 |
| Nov-22 | 28 | 2102 | 10711 | 1015 |
| Dec-22 | 12 | 165 | 2010 | 132 |
| Jan-23 | 13 | 1469 | 34533 | 1909 |
| Feb-23 | 4 | 660 | 22039 | 847 |
| Mar-23 | 14 | 1965 | 55329 | 2613 |
| Apr-23 | 6 | 3081 | 114212 | 3860 |
| May-23 | 5 | 4612 | 139714 | 5820 |
| | **No° of Posts** | **Follower** | **Outreach** | **Reactions** |
| **TOTAL** | **185** | **25380** | **464921** | **25670** |

Videos were being recorded during the whole pandemic period and started to be professionally post-edited and subsequently published at the end of 2022, as can be seen from the picture in Table 11, thus reaching a wide public through organic as well as paid campaigns: roughly 13k people viewed them and some of them decided to get a consultancy from ZEPHIR to explore the possibility to refurbish their buildings or build a new one with the nZEB/Passivhaus standard. The acquired equipment helped give them a first insight of the nZEB standard in order to facilitate their personal engagement towards energy efficiency.

**Table 11** Most viewed videos on ZEPHIR's YouTube channel (colors correspond to the videos listed below, e.g. the blue curve represents "Sabrina & Emilio […]", etc.)



| Contenuti | Views | | Avg. Watch Time | Avg. Watch Percentage |
|---|---|---|---|---|
| **Totale** | **13.322** | | **4:12** | **26,3%** |
| Sabrina & Emilio - Inquilini di un'abitazione Passivhaus ... | 3.366 | 25,3% | 3:14 | 30,3% |
| 7^ Conferenza Nazionale Passivhaus - 1. LUCA MERCA... | 1.322 | 9,9% | 15:25 | 27,9% |
| ZEPHIR PASSIVHAUS ITALIA in 60 secondi | 672 | 5,0% | 0:41 | 47,8% |
| ZEPHIR: la scelta giusta per la tua casa sostenibile! | 434 | 3,3% | 1:03 | 35,9% |
| 10_La gestione del cantiere e la Direzione dei Lavori ne... | 412 | 3,1% | 2:37 | 20,2% |
| Federica Barazzutti - Villetta unifamiliare passiva a San... | 400 | 3,0% | 3:51 | 34,5% |
| 05 VMC e aggregati compatti per PH Stefano Faganello | 374 | 2,8% | 6:20 | 29,9% |
| Emanuele Naboni a Restructura 2019 | 373 | 2,8% | 1:06 | 22,4% |
| Nicola Candusso - Villetta unifamiliare passiva a San D... | 336 | 2,5% | 1:39 | 42,5% |
| Passivhaus, la casa che crea valore: intervista a France... | 195 | 1,5% | 10:07 | 32,6% |
| Giancarlo Dalla Libera: i vantaggi di essere Progettista ... | 161 | 1,2% | 3:33 | 41,9% |
| Perché scegliere Passivhaus? La parola a chi abita nell... | 150 | 1,1% | 1:47 | 43,2% |

These stunning results (more than 13k views with an average watch time larger than 4 mins) show that the implemented equipment, software and video services are a valid instrument to reach people interested in energy efficiency, especially after the pandemic period as people got used to follow virtual events and get informed through social media and videos.

In the following, the main live events (marked with [*] in Table 8) are shortly summarized in the following with indication of the grade of success of the initiatives.

### Event #3: 1st live Roadshow event – Visit of 2 Passivhaus buildings under construction in Jesi and in San Daniele nel Friuli (06.07.2021, Jesi and 17.07.2021, San Daniele nel Friuli)

The first live Roadshow event in Italy was organized as an independent and closed event for professionals and mainly end users (Figure 99). This was organized as a closed event, as this was the very first occasion to meet after the COVID limitations were partially released. The visit at the first Passivhaus building under construction could gather together end clients, designers and a couple of public officers.

**Figure 99** Few photos of Italian 1st live Roadshow at Jesi's PH building ("Visit of a Passivhaus building under construction")

The Roadshow was the occasion to speak about the EU project, while focusing on the benefits of Passivhaus and nZEB standards, discussing about details and components' choices.

Overall the first visit at a Passivhaus building under construction in Jesi in the framework of the 1st Roadshow was satisfactory, taking into consideration the difficult health situation. In this case, no gamification or other demonstration material was used, as the components available on site fulfilled the scope of "training material" for the attendants.

The second visit of a Passivhaus building in San Daniele nel Friuli was also organized as an independent and closed event for professionals, end users and young people (Figure 100). Besides professionals and end users, this time product manufacturer and suppliers together with young architects and engineers were also invited.

**Figure 100** Few photos of Italian 1st live Roadshow at San Daniele nel Friuli's PH building ("Visit of a Passivhaus building under construction")

Construction companies and product suppliers took the opportunity to present their systems and solutions, in order for the participants to understand their applications in a practical manner.

By considering the general COVID situation which was increasingly becoming harsh again, in-presence events were further suspended until the limitations would have been released again.

### Event #5: 2nd live Roadshow event – Klimahouse Exhibition 2022 (18-21.05.2022, Bolzano)

With the forthcoming warm season, in 2022 it was decided to host the third live Roadshow event in Italy at a very popular construction fair, the Klimahouse exhibition in Bolzano. Historically, thousands of visitors used to attend the exhibition, mostly designers and stakeholders in the construction sector. However, this was the first time after the pandemics that so many people could gather together again to a big event, so concerns about the attendance in-presence were more than justified: despite the concerns, people still decided to attend the exhibition. Even with reduced visitors' number, the foreseen expectations were in fact met: 2/3 of the people visiting the ZEPHIR's stand were active professionals, 20% young students and the rest split between users of training and end users (Figure 101).

**Figure 101** Few photos of Italian 2nd live Roadshow ("Klimahouse 2022")

For this event, gamification tools were realized and for the first time used at a construction fair. The success was enormous and many people were standing in a line waiting for their turn to test themselves with a throwing bags game, each bag corresponding to a "pillar of energy efficiency". Besides the gamification tools, some quizzes and surveys about energy efficiency and nZEB's/Passivhaus buildings were organized for end users and technicians with a satisfactory engagement (Figure 102). Among the 35 participants, 85% of the answers were correct: a free consultancy with ZEPHIR's Team was offered in any case to discuss the results or explore further collaborations.

**Figure 102** Example of ZEPHIR's Passivhaus Quiz for technicians at the Klimahouse 2022 in Bolzano

Despite the highly fluctuating number of visitors, the attendance at the exhibition booth was mostly monitored by the compulsory GDPR documents required to all visitors as they first approached the booth.

All in all, in-presence events like the third Roadshow at big construction fairs allowed for more interaction and engagement, gamification tools could be successfully tested on a wide number of

participants and a lot more interactions could be made on the social media with appropriate posts, videos, pictures etc.

### Event #6: 3rd live Roadshow event – Blower-Door test on a Passivhaus building under construction in San Daniele nel Friuli (27.06.2022, San Daniele nel Friuli)

The third live Roadshow event in Italy took place again at the building site of the Passivhaus building in San Daniele nel Friuli. A Blower-Door Test was the perfect occasion for demonstrating the importance of the airtightness as a crucial step forward to hit the nZEB and Passivhaus target (Figure 103).

All tradespersons were present during the test, a leakage detection for the complete building was performed and participants could see in reality the effects of leaky envelopes with respect to energy efficiency. Among others, product suppliers, end users, users of training and young people were present at the pressure test.

**Figure 103** Few photos of Italian 3rd live Roadshow ("Blower-Door Test on a Passivhaus building under construction")

Due to the limited space, this event was organized as an independent and closed event but could demonstrate to the attendants the importance of airtightness in the spirit of low-energy buildings. The project nZEB Roadshow was also presented and flyers distributed to the participants.

### Event #7: 4th live Roadshow event – Course for Passivhaus Practitioners (29-30.09.2022, 06-07.10.2022, Forlì at Poletti headquarters)

The 4th live Italian Roadshow was organized as a nZEB Week at Poletti headquarters in Forlì, a window manufacturer specialized in low-energy buildings such as nZEB and Passivhaus (Figure 104). The 4-day workshop dealt with nZEB and Passivhaus pillars, window installation and thermal bridges, economic

viability of energy efficiency measures and exercises for the promotion of low-energy building standards.

In order to give a better and practical insight of the theoretical concepts which constitute the basis of a nZEB and Passivhaus building, a small scaled sample building was indeed realized. All course participants could then experience the learnt concepts by applying them onto a real wooden house. At the end of the practical measures undertaken on the building, a Blower-Door Test was performed and a thermal imaging camera was used to detect residual leakages through the airtight envelope.

**Figure 104** Few photos of Italian 4th live Roadshow ("Course for Passivhaus Practitioners")

The course was organized in collaboration with several industry partners (Poletti Serramenti, SIGA, Dinoxill, ZEHNDER and Röfix), who also showed their products and solutions, explained their use in practice and were at disposal to all course participants for consultation on energy efficiency, energy renovation and nZEB buildings.

For the limited available space at the window factory, a maximum of 20 course participants could be allowed, but more people could be attracted thanks to live streaming and social posting done directly from the course location.

### Event #8: 5th live Roadshow event – Gamification at school (03-04.11.2022, 23-24.02.2023, Pergine Valsugana at Primary School "Senesi")

The 5th live Italian Roadshow was organized in the framework of a project with a Primary School in Pergine Valsugana where a series of lectures about climate change and energy efficiency and gamification activities took place (Figure 105).

**Figure 105** Few photos of Italian 5th live Roadshow ("Gamification at school")

Pupils with an age of 10 showed themselves as very proactive and enthusiastic while listening to the lectures, watching a video about climate change, reading the nZEBO Book translated into Italian and playing with the gamification tools that had been created, including a portable version of the bags throwing game which had already been successfully presented at the construction fairs.

The experience was extremely positive, teachers, pupils and school director expressed their gratitude and appreciation for the initiative.

After each 2-days block of lectures, a video of the event was produced and published online on different social media, in order for the pupils' parents and relatives and for ZEPHIR's followers to be informed about the project and eventually be stimulated towards nZEB and energy efficiency.

This first initiative will be surely repeated in the coming years also after the project's end, as 4 more school including middle schools asked to host some gamification events after getting to know about the success of the first Roadshow at school.

### Event #9: 6th live Roadshow event – 8th Italian Passivhaus Conference and Gamification at Ecomondo Fair (08-11.11.2022, Rimini at Ecomondo Fair)

The 6th live Italian Roadshow took place in Rimini at Ecomondo/KeyEnergy construction fair, where ZEPHIR organized the 8th Italian Passivhaus Conference in November 2022 as opening ceremony of the fair (Figure 106).

**Figure 106** Few photos of Italian 6th live Roadshow - Conference ("8th Italian Passivhaus Conference")

Around 170 people attended the conference, mostly designers and stakeholder of the construction sector, who followed it with high interest until the end. The different panels spanned from different building standards such as nZEB, Passivhaus, GBC Italia, to the actual Italian market situation, with focus on the nZEB Roadshow project and its objectives of spreading the nZEB concept to all audiences.

Politicians and people from public institutions (e.g. National Energy Agency) as well as international speakers were invited (among others, the Croatian partner led by Prof. Dr. Bojan Milovanović). The event was a great success, besides typical organizational issues happening in such big events (e.g. missing speaker, replaced at the last moment by a new, valid one; audio and connection problems, then solved by the intervention of the audio service etc.).

Lots of streamlined content was also published on the social media in order to enhance the participation and motivation towards nZEB's, Passivhaus and energy efficiency in general. The campaigns started in October for the launch of the event as well as the streamlined and post-event edited videos could reach a wide range of public (around 18.000 people view and interacted with the posts on the social media). The choice of amending the GA towards a more hybrid concept for the Roadshow has been more than justified, as people during the pandemics got used to virtual events without neglecting the importance of in-person meetings, as this conference attendance showed.

In addition to the 8th Italian Passivhaus Conference, lots of events and information activities were hosted at ZEPHIR's booth at the Ecomondo/KeyEnergy construction fair in Rimini (Figure 107).

More than 200 people registered with the GDPR procedure, but due to trade fair fluctuation in numbers it can be estimated that around 300 people visited the booth, either asking questions or playing with the gamification tools with a subsequent consultancy for discussing about the results, thus motivating them for further investigations or actions such as exploring the possibility for their building to reach the nZEB/Passivhaus standard, subscribing to professional courses like CPHD (certified Passivhaus Designer course) etc.

**Figure 107** Few photos of Italian 6th live Roadshow - Gamification ("Gamification at Ecomondo Fair")

Gamification tools were highly appreciated and demonstrated to be a good way for attracting people while stimulating their engagement with energy efficiency.

The combination with the ongoing Passivhaus conference guaranteed more visibility, so that the booth at the fair constituted a reasonable follow-up of the topics discussed during the conference.

### Event #10: 7th live Roadshow event – Klimahouse Exhibition 2023 (08-11.03.2023, Bolzano)

The 7th Italian live Roadshow event took place again at the Klimahouse 2023 construction fair in Bolzano (Figure 108). On the day before the event, an official project meeting of nZEB Roadshow was organized in Bolzano, so that the partners of the project could attend the construction fair on the next day, with the possibility of getting in touch with the realized gamification tools at ZEPHIR's booth and visiting the trade fair, thus exploring commercial opportunities for the respective countries.

**Figure 108** Few photos of Italian 7th live Roadshow ("Klimahouse Exhibition 2023"). The picture below on the right hand side shows the partners at the project meeting the day before the event and above at the trade fair.

For this event, a big marketing campaign about energy efficiency, nZEB and Passivhaus was launched between January and March, 2023, reaching a wide audience (more than 100.000 contacts) with a high interaction rate (5000 interactions).

This also gave a good visibility for the event and brought many people (220 registered, 300 estimated) to ZEPHIR's booth. There, games and quizzes about Passivhaus and nZEB's were available and a similar attendance rate like for the Klimahouse 2022 event was indeed registered.

### Event #11: 8h live Roadshow event – Interviews in TV broadcast and Course for Passivhaus Practitioners (04/27/28.04.2023, 13-14.04.2023, 20-21.04.2023, Chiavari)

The 8th Italian live Roadshow event was organized as a nZEB Week at Professional High School IFTS Ente Forma in Chiavari, in collaboration with the non-profit association of practitioners Istituto Clima Liguria (Figure 109).

During this 4-days workshop, nZEB and Passivhaus pillars were presented, and a wide discussion about economic viability of retrofit high quality measures took place. Besides that, attendants were trained about window installation and thermal bridges, mechanical services in low-energy buildings, materials and suitable components for Passivhaus and nZEB's.

**Figure 109** Few photos of Italian 8th live Roadshow ("Interviews and Course for Passivhaus Practitioners").

Also in this case, a small scaled sample building in timber-frame was realized, in order for the attendants to test themselves with the theoretical concepts learnt in the first 3 days. At the end, a Blower-Door Test was performed with a leakage detection carried out with cold fog machine and thermoanemometer.

The course was organized in collaboration with several industry partners (Plazzi Serramenti, Naturalia Bau, BluMartin GmbH and Mapei), who also showed their products and solutions, talked about possible errors on the building site and gave a practical insight into their products for an application to nZEB and Passivhaus buildings.

The attendance was good with a mixture of designers and practitioners, and this gave the opportunity to confront and discuss about theoretical as well as practical aspects of the construction process.

In parallel, streamlined content and posts about the event on the social media, a couple of interviews on a national TV, TeleRadio Pace, in collaboration with Istituto Clima Liguria and a full service on the same TV broadcast at the end of the course made possible to reach an even wider audience, roughly 250.000 persons, with a relatively high interaction rate (about 10.000 interactions).

### Event #12: 9th live Roadshow event – Site visit of 2 Passivhaus retrofits (11.05.2023, Pergine Valsugana)

The 9th live Italian Roadshow was organized in Pergine Valsugana in collaboration with the Professional High School IFTS at Scuola Edile Artigiana Romagna (Figure 110). About 25 people visited ZEPHIR's headquarter and were led by ZEPHIR's Director Francesco Nesi to 2 Passivhaus retrofits, a multipurpose building and an office building.

**Figure 110** Few photos of Italian 9th live Roadshow ("Site visit of 2 Passivhaus retrofits").

After a short presentation of nZEB and Passivhaus concepts, the group showed high interest and motivation for the 2 projects, while ZEPHIR's Team kept on explaining the benefits of a low-energy approach. In the office building, the building's owner also expressed his feedback after the retrofit to the participants and could confirm the high quality of a Passivhaus retrofit.

## LESSONS LEARNED

Due to the high variability of events, either in-person or in virtual mode, it is difficult to draw some general statements, as events of different nature might lead to diverging expected results in terms of number of attendants, engagement rate and so on.

Despite the larger numbers of people interested in energy efficiency reached through online activities (roughly 40000 when considering all social media), the ca. 3000 persons who attended (in-person or virtual) live events show similar conversion numbers when considering the real follow-ups in the timespan of the project. Moreover, it could also open the possibility to produce interesting storytelling with videos, posts etc.

It must be said that the use of videos as a promotional tool for nZEB's/Passivhaus buildings could not express its powerful results within the project timespan, as a big amount of time was devoted first to record and secondly to post-edit them. The effect of the produced videos will be for sure even more relevant after embedding them into appropriate landing pages (LP's) through marketing funnels which will enhance engagement and conversion rates. The first textual and visual LP's already show this significant effect with hundreds of thousands of people reached.

## 3.05 ROMANIA

### SUMMARY

In Romania, 5 different nZEB Roadshow events were realized in total, each event following the format of nZEB week, date and location are summarized in Table 12. All events were conducted independently and were organized in collaboration with different partners (professional associations, companies from construction industry, educational institutions etc.). More information about each event is provided further in text.

**Table 12.** Summary of nZEB Roadshow events conducted in Romania

| No | Event type | Event name | Date | Location |
|---|---|---|---|---|
| 1 | nZEB week (6 days, Mon-Sat) | nZEB Week Bucharest | 12 – 17.07.2021 | Bucharest: INCD URBAN INCERC, EFDEN (UTCB), Romstal Academy |
| 2 | nZEB week (4 days, Wed-Sat) | nZEB Week Brasov | 04 – 07.05.2022 | Brasov, Sf. Ioan's Square |
| 3 | nZEB week (4 days, Wed-Sat) | nZEB Week Iasi | 29.06 – 02.07.2022 | Iasi, Palas Mall |
| 4 | nZEB week (4 days, Thu-Sun) | nZEB Week Cluj Napoca | 03 – 06.11.2022 | Cluj Napoca, BT ARENA first floor |
| 5 | nZEB week (4 days, Wed-Sat) | nZEB Week Timisoara | 10 – 13.05.2023 | Timișoara, Iancu Huniade Square, Senate Aula of Polytechnic University Timișoara |

### Monitoring and evaluation approach

In Task 2.4 (part of the deliverable D2.3), a wide range of the activities were foreseen based on which robust monitoring and evaluation scheme is developed for different scenarios of nZEB Roadshow events (offline/live and online). The majority of the Romanian nZEB Roadshow events were realized live, except for the opening nZEB Week in Bucharest which was conducted in a hybrid format (live + zoom conference + live streaming).

The monitoring approach was tailored and adapted depending on the specifics of Romanian events regarding concept of the designed activities, duration of the event, outdoor or indoor, targeted audience, synergies with other projects.

Monitoring and evaluation approach targeting Roadshow event participants consisted of three main segments:

1) Pre-site registration (online) - google forms and Eventbrite were used, detailed in the events description.
2) Onsite registration - google forms and Eventbrite
3) Detailed documentation using photos and videos

**Table 13** Monitoring and evaluation approach taken at different events in Romania

| | Bucharest | Brasov | Iasi | Cluj Napoca | Timișoara |
|---|---|---|---|---|---|
| 1) Pre-site registration (online) | yes, for the general public yes, for site visits | yes, for the general public yes, for site visits | yes, for the general public yes, for site visits | yes, for the general public yes, for site visits | yes, for the general public yes, for site visits |
| 2) Onsite registration | yes, on-site attendance list | yes, on-site attendance list | yes, on-site attendance list available on tablet for the general public | yes, on-site attendance list | no, due to the large scale of the event, located in an open/public space |
| 3) Detailed documentation using photos and videos | yes, using photos and videos well as print screens from zoom | yes, using photos and videos | yes, using photos and videos | yes, using photos and videos | yes, using photos and videos |

### No. 1 event: Pilot Roadshow event – Bucharest nZEB Week (12 -17.07.2021, Bucharest)

The first nZEB Roadshow event in Romania was organized as an independent event with a duration of 6 full days and was partially conducted in a hybrid format in Bucharest, during the pandemic.
For this first event the nZEB Roadshow mobile unit was not yet ready so all the activities were conducted in 3 different indoor locations: (1) the Building Knowledge Hub Romania, within INCD URBAN INCERC, (2) The EFdeN Sustainable City, within the faculty of Building Services Engineering, UTCB, and (2) Romstal Bucharest (Showroom and Romstal Academy).
The number of participants was monitored by pre-site registration and on-site attendance list, as well as detailed photographing.

- Companies and trades: Rockwool, RomeHome, Miradex, Velux, E-Acumulators, Renovata, DanProd, Alumil.

- Financial institutions/ Public authorities and Associations: EFdeN, UTCB, Bucharest Chamber of Architects, Districts 2 and 6 of Bucharest, Romanian Chamber of Deputies, TUD Group.

**Agenda Săptămânii nZEB** Caravana nZEB București

Luni 12 iulie: ONLINE

| | |
|---|---|
| 10:00 – 11:00 | **Deschidere Săptămâna nZEB**<br>Prezentare proiect nZEB Roadshow, prezentarea programului Caravana nZEB București și sesiune de întrebări și răspunsuri<br>*Pe baza de înregistrare, numărul de locuri limitat la 100 persoane |
| 11:00 – 13:00 | **Cum introductiv în Concept nZEB**<br>Reglementări și aplicarea nZEB în practică<br>*Pe baza de înregistrare, numărul de locuri limitat la 100 persoane |
| 13:00 – 14:00 | Pauză |
| 14:00 – 16:00 | **Cum introductiv în Concept nZEB**<br>Legislație și mecanisme de finanțare<br>*Pe baza de înregistrare, numărul de locuri limitat la 100 persoane |
| 16:00 – 18:00 | **Pregătirea profesionștilor pentru nZEB**<br>Workshop de consultare adresat de autorilor de reglementare și universității cu profil arhitectural, construcțiile, instalații<br>*Pe baza de înregistrare, numărul de locuri limitat la 100 persoane |

Marți 13 iulie: INCD URBAN INCERC: Sos. Pantelimon 266

| | |
|---|---|
| 10:00 – 11:00 | **nZEB și Casa Pasivă**<br>Workshop - programe de formare profesională pentru proiectanți/consultanți și profesioniști în execuție<br>*Pe baza de înregistrare, numărul de locuri limitat la 30 persoane |
| 11:00 – 13:00 | **Renovare la nivel nZEB: Este pregătită administrația publică locală pentru nZEB?**<br>Workshop de consultare cu administrația publică centrală și locală pentru pregătirea implementării nZEB<br>*Pe baza de înregistrare, numărul de locuri limitat la 30 persoane |
| 13:00 – 14:00 | Pauză |
| 14:00 – 15:00 | **Cum se măsoară performanța de etanșeitate la aer - Blower door test**<br>Demonstrație practică test etanșeitate<br>*Pe baza de înregistrare, numărul de locuri limitat la 30 persoane |
| 15:00 – 17:00 | **Detalii nZEB 1:1**<br>Prezentare și discuții detalii proiectare și execuție pe machete demonstrative<br>*Pe baza de înregistrare, numărul de locuri limitat la 30 persoane |

Miercuri 14 iulie: Academia Romstal: Soseaua Vitan-Bârzești 11A
Vizite șantier

| | | |
|---|---|---|
| 09:00 – 10:00 | | **Tur ghidat șantier clădire nouă și renovare nZEB**<br>Vizită Ipsil - Sector 6, București |
| 10:00 – 12:00 | **Tur ghidat Romstal (1)**<br>Soluții instalații pentru nZEB în incinta Romstal + prezentare Academia Romstal<br>*Pe baza de înregistrare, numărul de locuri limitat la 20 persoane | |
| 12:00 – 13:00 | Pauză | |
| 13:00 – 15:00 | **Tur ghidat Romstal (2)**<br>Soluții instalații pentru nZEB în incinta Romstal + prezentare Academia Romstal<br>*Pe baza de înregistrare, numărul de locuri limitat la 20 persoane | **Prezentare și discuții nZEB**<br>Detalii nZEB - sinteza pe instalații A-etanșeitate anvelopă - activitate interfața anvelopă-instalații clădiri nZEB (pentru demonstrare și cuiri cu cablul și conducte pentru etanșare)<br>Cluster PRO-nZEB, Romstal & RenoVATA<br>*Pe baza de înregistrare, numărul de locuri limitat la 30 persoane |
| 15:00 – 17:00 | **Workshop sisteme fotovoltaice Romstal**<br>Sesiune de 2 ore despre proiectare și execuție și legislație în domeniul panourilor fotovoltaice<br>*Pe baza de înregistrare, numărul de locuri limitat la 30 persoane | |

Joi 15 iulie: EFdeN Sustainable City: Bulevardul Pache Protopopescu nr. 66

| | | |
|---|---|---|
| 10:00 – 11:30 | **Solar Decathlon Wuppertal**<br>Prezentare Participare EFdeN la Ediția din 2022 a competiției Solar Decathlon Europe Germania | **Casa nZEB - Consultanță tehnică**<br>Discuții pe proiecte - sugerări optimizare conformare energetică<br>*Pe baza de înregistrare, sesiuni consultare pe proiecte 20 min |
| 11:30 – 13:00 | **L Hai în echipa Solar Decathlon Wuppertal!**<br>Discuții cu reprezentanții EFdeN pentru înscrierea în proiect | |
| 12:00 – 13:00 | Pauză | |
| 14:00 – 15:00 | **R. Hai în echipa Solar Decathlon Wuppertal!**<br>Discuții cu reprezentanții EFdeN pentru înscrierea în proiect | **Blower door test + Tur Casa EFdeN Signature**<br>Demonstrație practică test etanșeitate (60 minute) |
| 14:00 – 17:00 | | **Vizita ghidată a caselor EFdeN**<br>Vizita de 60 minute cu seri de max. 20 persoane |

Vineri 16 iulie: INCD URBAN INCERC: Sos. Pantelimon 266

| | | |
|---|---|---|
| 10:00 – 14:00 | **Cum concepem o casă nZEB?**<br>Conceptul nZEB și arhitectura bioclimatică - workshop suport pentru Apelul de idei 'Casă Bioclimatică Alumi', în colaborare cu Asociația de Arhitectură București 2021 - centre pentru un viitor sustenabil, elemente de proiectare cu respect pentru mediu, natură și eficiență energetică - discuții pe detalii nZEB<br>*Pe baza de înregistrare, 20 persoane | |
| 14:00 – 15:00 | Pauză | |
| 15:00 – 18:00 | **Workshop „Calificat pentru nZEB"**<br>Scheme de certificare / specializare nZEB și competențe specifice. Programe certificare competențe. Realizare test etanșeitate tipuri suflanți / Evaluare punți termice / Sisteme de ventilare recuperă și etanșeitate aer / Inspecție prin termovizoare<br>*Pe baza de înregistrare, numărul de locuri limitat la 30 persoane | |

Sâmbătă 17 iulie: EFdeN Sustainable City, Bulevardul Pache Protopopescu nr. 66

| | | |
|---|---|---|
| 10:00 – 13:30 | Prezentare Ghid nZEB + Sesiune întrebări și răspunsuri | **nZERO & friends:**<br>Jocuri pentru copii, demonstrații, machete și experimente |
| 10:30 – 11:00 | **Solar Decathlon 2023 - Înscriere Echipe din România** | **Vizita ghidată a caselor EFdeN**<br>durată 40 minute, seri de maxim 20 persoane |
| 11:00 – 11:30 | **EFdeN Sustainable cities - Prezentare și Sesiune Q&A** | **Detalii Machete nZEB 1:1**<br>Prezentare și discuții pe detalii procedeu și execuție |
| 11:30 – 12:00 | **Recrutare Solar Decathlon Wuppertal, 2022, Germania** | |
| 12:00 – 13:00 | Pauză | |
| 13:00 – 15:00 | **Casa nZEB - Consultanță 20 min x 5 sloturi**<br>Discuții pe proiectele participanților, sugerări optimizare conformare energetică<br>*Pe baza de înregistrare, sesiuni consultare pe proiecte 20 min | **nZERO & friends:**<br>Jocuri pentru copii, demonstrații, machete și experimente<br>**Vizita ghidată a caselor EFdeN**<br>Tururi de 30 minute cu seri de maxim 20 persoane |
| 15:00 – 15:30 | Prezentare Ghidul Proaspăturilor | **Machete nZEB 1:1**<br>Prezentare și discuții pe detalii procedeu și execuție |
| 15:30 – 16:00 | Închiderea săptămânii nZEB | |

**Figure 111** 1st event nZEB Week Bucharest Agenda

For 6 full days, from Monday to Saturday, 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, energy auditors and other experts whether working in construction or design, as well as public administration and all citizens, teachers and students interested in nZEB.

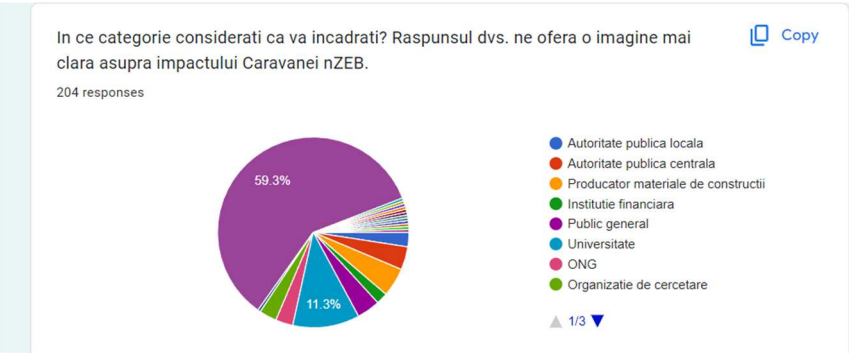



**Figure 112** Online registration
https://docs.google.com/forms/d/1Z5zupH5kiOe64SdU5KmETW09lb6hFk5l11DD-ssGPmQ/edit#responses

Lista participanților la Saptamana nZEB București, Miercuri 14 iulie 2021
Tur ghidat Retrofit la nivel nZEB Scoala 197, Str. Obcina Mare nr. 2, S6, București
și nZEB Scoala 117, Strada Fabricii nr. 22, S6 , București

Coordonator grup 1 – Iuliana Leca -0727825695
Prezentare șantier Scoala 117 - doamna Ionela Sibarnau, 0728.249.198
*Pentru accesul pe șantier vor fi puse la dispoziție echipamentele de protecție.

Coordonator grup 2- Monica Carlogea - 0752117852
Prezentare santier Scoala 197 - domnul Iulian Ciobanu, 0728.249.196

Grup 1, Coordonator Iuliana Leca: Scoala 197 ora 9 30, urmată de vizita la Scoala 117
Reprezentant tehnic TUD: Mihai Parauta

| Nr. crt. | Numa și prenume | E-mail | Organizație | Semnătură |
|---|---|---|---|---|
| 1 | Horia Petran | | | |
| 2 | Sonia Raetchi | | | |
| 3 | Andone Radu | | | |
| 4 | Calina Dumitru | | | |
| 5 | Lucian Dubalaru | | | |
| 6 | Mircea Sibarna | | | |
| 7 | Andra Panait | | | |
| 8 | Ion Chiricuță | | | |
| 9 | Lucian Calugarescu | | | |
| 10 | Oana-Marciana Ozmen | | | |
| 11 | Laurianne Phung | | | |
| 12 | Mihai Tudorancea | | | |
| 13 | Ioana Alexa | | | |
| 14 | | | | |
| 15 | | | | |

H2020 GRANT AGREEMENT 892378

Lista participanților la Saptamana nZEB București
Miercuri 14 iulie 2021 ROMSTAL

10 00 - 12 00 Tur ghidat soluții instalații pentru nZEB în incinta Romstal Vitan Barzesti 11A+prezentare Academia Romstal (20 persoane)

| Nr. crt | Email | Nume | Semnatura |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
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H2020 GRANT AGREEMENT 892378

**Figure 113** Onsite registration

The first day of the nZEB Week was organized with online events, facilitating the participation of a large number of interested people from academia, professionals (architects, energy auditors), and public administration representatives.

Dr. eng. Horia Petran (INCD URBAN-INCERC) opened the nZEB Week by presenting both the nZEB Roadshow project as a whole and its interference with other projects carried out in the past years in the Building Knowledge Hub Romania (nZEB Training and Consultancy Centre in Bucharest).

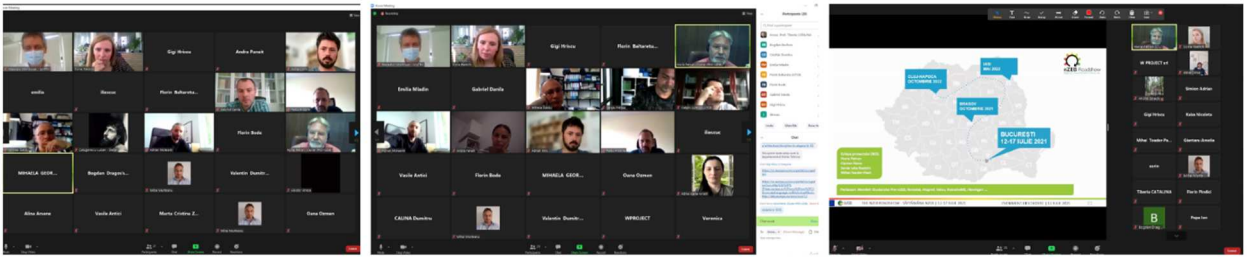


**Figure 114** 1st event nZEB Week Bucharest online discussions and presentations

The second day (Tuesday) took place at the Building Knowledge Hub within INCD URBAN-INCERC and included a diversified program starting from a presentation "nZEB and Passive House" qualification programs in collaboration with the Chamber of Architects Romania, to a workshop to present and discuss the renovation activity of existing educational buildings (showcase School 197) and the construction of a new after school (showcase School 117) - both in District 6, Bucharest, funded by the ELENA program - European Local ENergy Assistance).

**Figure 115** presentation by Bucharest district 6 representatives - ELENA program - European Local ENergy Assistance

Wednesday had two major directions. The first one was the guided visits to the construction sites of schools 117 and 197 in District 6, an excellent opportunity to observe the approach to increase the energy and environmental performance of public buildings, to improve the quality of the indoor environment in buildings, the project related to energy efficiency in schools implemented by PS 6 in Bucharest representing an example of good practice generated by the local public administration.

**Figure 116** Visits to Construction site for new nZEB Afterschool 197 (District 6, Bucharest)

The second perspective was given by the collaboration with Romstal, where a series of activities aimed at increasing the level of knowledge on the implementation of the nZEB concept were held - from the presentation of nZEB installation solutions, a guided tour of the Romstal Academy, to a very informative workshop on photovoltaic systems to discussions on nZEB details with a focus on tear-offs and envelope sealing (solutions provided by Renovata on Miradex timber frame structure).

**Figure 117** Activities at Romstal Academy

On Thursday, July 15, the International Youth Day took place under the auspices of EFdeN Sustainable City, at the UTCB Installations campus. This included presentations on EFdeN's participation in the Solar Decathlon Wuppertal and Solar Decathlon 2023, guided tours of the solar houses and a Blower Door test for the EfdeN Signature house.

**Figure 118** Blower door test at EFdeN

Also worth mentioning are the discussions on 1:1 scale models (made with partners such as Rockwool, RomeHome, Miradex, Velux, E-Acumulators, Renovata), which facilitate the understanding of the principles of a high-performance building envelopes, adapted to the nZEB standard.

On Friday 16 July, participants benefited from a full day, starting from the supporting lecture for the "Alumil Bioclimatic House" Call for Ideas in collaboration with the Chamber of Architects Bucharest, to a full tour of the Building Knowledge Hub with the presentation of nZEB 1:1 scale models and nZEB installation solutions. The day ended with an informal discussion on the topic „Qualified for nZEB", which deserves a broader framework due to the impact it can have on the market.

The nZEB Bucharest week ended on Saturday 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.

Given the great interest of the participants in the debate, further meetings on this topic were planned be organized in the next period, trying to involve all the categories interested in the nZEB topic.

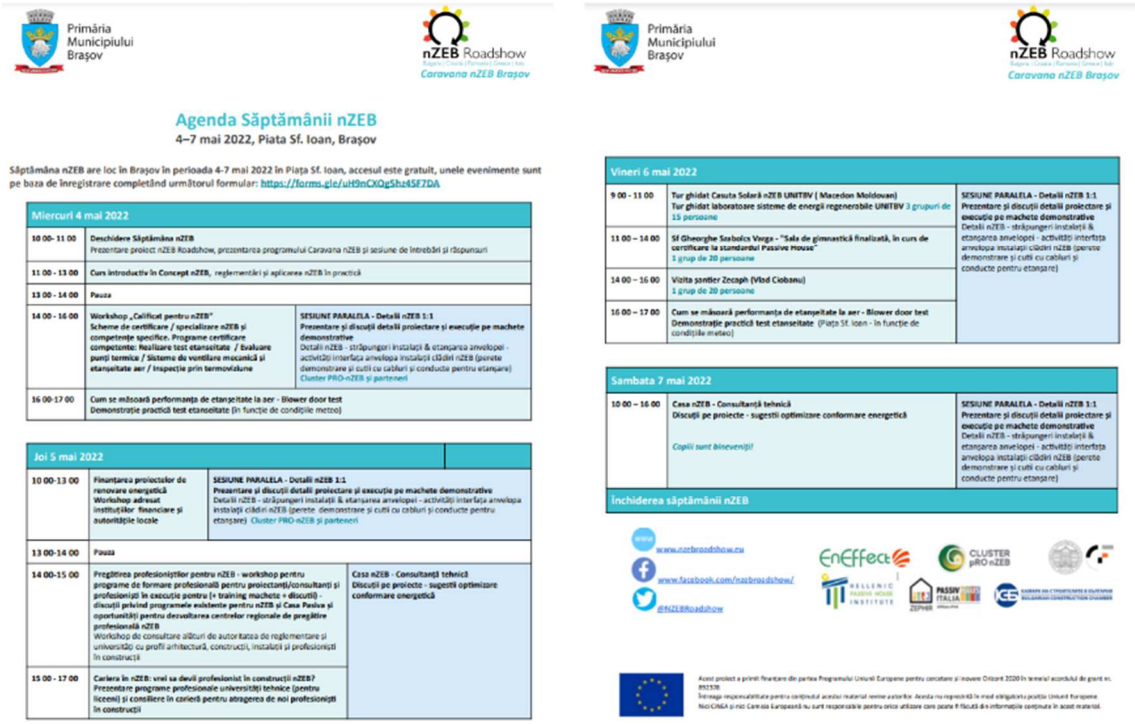
## No. 2 event: Pilot Roadshow event – Brasov nZEB Week (04 -07.05.2022, Brasov)

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 - Sf. Ioan Square. The nZEB Brasov week was the first event in this series that allowed less restricted 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.

- Companies and trades: Rockwool, Saint Gobain, Knauf Insulation, RomeHome, Miradex, Velux, E-Acumulators, Renovata, DanProd, Inginerie Creativa, Zecaph, SORAL Technik, Renovata,

- Financial institutions/ Public authorities and Associations: Brasov City Hall, Transilvania University Brașov, Chamber of Architects Brasov



Primăria Municipiului Brașov

nZEB Roadshow
Caravana nZEB Brașov

Agenda Săptămânii nZEB
4–7 mai 2022, Piata Sf. Ioan, Brașov

Săptămâna nZEB are loc în Brașov în perioada 4-7 mai 2022 în Piața Sf. Ioan, accesul este gratuit, unele evenimente sunt pe baza de înregistrare completînd următorul formular: https://forms.gle/uH9nCXOgShz4SF7DA

| Miercuri 4 mai 2022 | | |
|---|---|---|
| 10 00- 11 00 | Deschidere Săptămâna nZEB<br>Prezentare proiect nZEB Roadshow, prezentarea programului Caravana nZEB și sesiune de întrebări și răspunsuri | |
| 11 00 - 13 00 | Curs introductiv în Concept nZEB, reglementări și aplicarea nZEB în practică | |
| 13 00 - 14 00 | Pauza | |
| 14 00 - 16 00 | Workshop „Calificat pentru nZEB"<br>Scheme de certificare / specializare nZEB și competențe specifice. Programe certificare competente: Realizare test etanseitate / Evaluare punți termice / Sisteme de ventilare mecanică și etanșeitate aer / Inspecție prin termovizione | SESIUNE PARALELA - Detalii nZEB 1:1<br>Prezentare și discuții detalii proiectare și execuție pe machete demonstrative<br>Detalii nZEB - străpungeri instalații & etanșarea anvelopei - activități interfața anvelopa instalații clădiri nZEB (perete demonstrare și cutii cu cabluri și conducte pentru etanșare)<br>Cluster PRO-nZEB și parteneri |
| 16 00-17 00 | Cum se măsoară performanța de etanșeitate la aer - Blower door test<br>Demonstrație practică test etanseitate (în funcție de condițiile meteo) | |

| Joi 5 mai 2022 | | |
|---|---|---|
| 10 00-13 00 | Finanțarea proiectelor de renovare energetică<br>Workshop adresat instituțiilor financiare și autorităților locale | SESIUNE PARALELA - Detalii nZEB 1:1<br>Prezentare și discuții detalii proiectare și execuție pe machete demonstrative<br>Detalii nZEB - străpungeri instalații & etanșarea anvelopei - activități interfața anvelopa instalații clădiri nZEB (perete demonstrare și cutii cu cabluri și conducte pentru etanșare) Cluster PRO-nZEB și parteneri |
| 13 00-14 00 | Pauza | |
| 14 00-15 00 | Pregătirea profesioniștilor pentru nZEB - workshop pentru programe de formare profesională pentru proiectanți/consultanți și profesioniști în execuție pentru (+ training machete + discuții) - discuții privind programele existente pentru nZEB și Casa Pasivă și oportunități pentru dezvoltarea centrelor regionale de pregătire profesională nZEB<br>Workshop de consultare alături de autoritatea de reglementare și universități cu profil arhitectură, construcții, instalații și profesioniști în construcții | Casa nZEB - Consultanță tehnică<br>Discuții pe proiecte - sugestii optimizare conformare energetică |
| 15 00 - 17 00 | Cariera în nZEB: vrei sa devii profesionist în construcții nZEB?<br>Prezentare programe profesionale universitățile tehnice (pentru liceeni) și consilierе în carieră pentru atragerea de noi profesioniști în construcții | |

| Vineri 6 mai 2022 | | |
|---|---|---|
| 9 00 - 11 00 | Tur ghidat Casuta Solară nZEB UNITBV ( Macedon Moldovan)<br>Tur ghidat laboratoare sisteme de energii regenerabile UNITBV 3 grupuri de 15 persoane | SESIUNE PARALELA - Detalii nZEB 1:1<br>Prezentare și discuții detalii proiectare și execuție pe machete demonstrative<br>Detalii nZEB - străpungeri instalații & etanșarea anvelopei - activități interfața anvelopa instalații clădiri nZEB (perete demonstrare și cutii cu cabluri și conducte pentru etanșare) |
| 11 00 – 14 00 | Sf Gheorghe Szabolcs Varga - "Sala de gimnastică finalizată, în curs de certificare la standardul Passive House"<br>1 grup de 20 persoane | |
| 14 00 – 16 00 | Vizita șantier Zecaph (Vlad Ciobanu)<br>1 grup de 20 persoane | |
| 16 00 – 17 00 | Cum se măsoară performanța de etanșeitate la aer - Blower door test<br>Demonstrație practică test etanseitate (Piața Sf. Ioan - în funcție de condițiile meteo) | |

| Sambata 7 mai 2022 | | |
|---|---|---|
| 10 00 – 16 00 | Casa nZEB - Consultanță tehnică<br>Discuții pe proiecte - sugestii optimizare conformare energetică<br>*Copiii sunt bineveniți!* | SESIUNE PARALELA - Detalii nZEB 1:1<br>Prezentare și discuții detalii proiectare și execuție pe machete demonstrative<br>Detalii nZEB - străpungeri instalații & etanșarea anvelopei - activități interfața anvelopa instalații clădiri nZEB (perete demonstrare și cutii cu cabluri și conducte pentru etanșare) |
| Închiderea săptămânii nZEB | | |

www.nzebroadshow.ro
www.facebook.com/nzebroadshow/
@NZEBRoadshow

EnEffect
CLUSTER pRO nZEB
HELLENIC PASSIVE HOUSE INSTITUTE
PASSIV ITALIA
ZEPHER
BULGARIAN CONSTRUCTION CHAMBER

Acest proiect a primit finanțare din partea Programului Uniunii Europene pentru cercetare și inovare Orizont 2020 în temeiul acordului de grant nr. 892536
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**Figure 119** Agenda for the nZEB Week Brasov

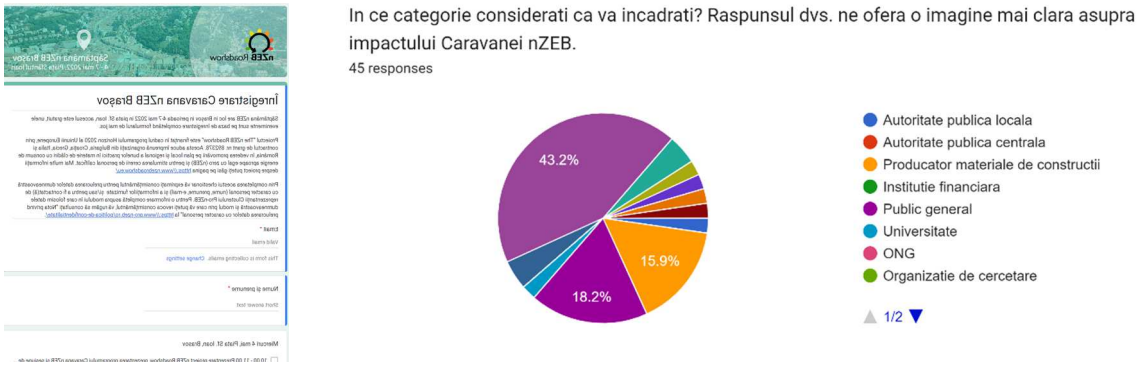


**Figure 120** Online registration

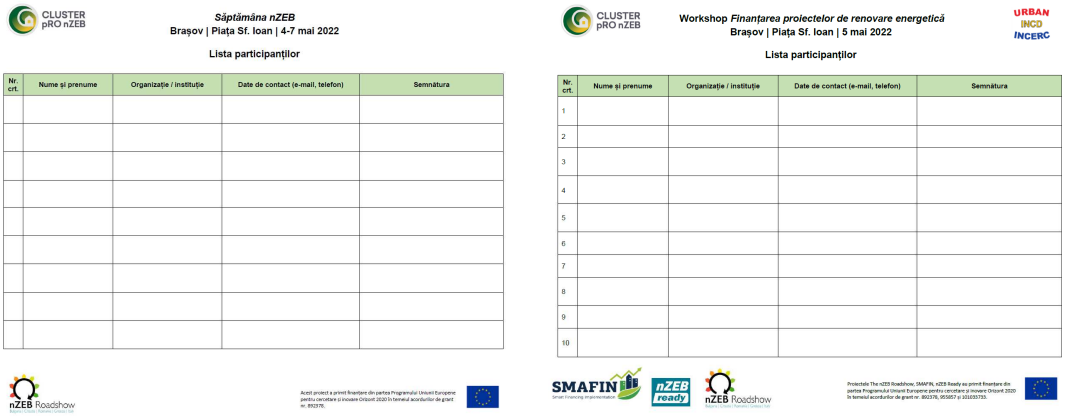


**Figure 121** Onsite registration

On Wednesday, the first day of the Brasov nZEB Roadshow the following activities were conducted:

- Presentation of the nZEB Roadshow project, presentation of the nZEB Caravan program and Q&A session,
- Introductory course in nZEB concept, regulations and application of nZEB in practice,
- Workshop "Qualified for nZEB" nZEB certification / specialization schemes and specific competences. Competence certification schemes: leak test / thermal bridge assessment / mechanical ventilation and air tightness systems / thermal inspection,
- How to measure air tightness performance – demonstration of a Blower door test.

**Figure 122** discussions and presentations opened to the public regarding the 1:1 nZEB mockups

Thursday, the second day of the event the main activities were focused on workshops and training sessions as follows:

- Financing energy renovation projects – a joined SMAFIN and nZEB Ready Workshop addressed to financial institutions and public authorities,

- Training professionals for nZEB and Career in nZEB: do you want to become an nZEB construction professional?
- nZEB House - Technical consultancy on ongoing projects

**Figure 123** a young reader enjoying nZEBO (left), presentation of the nZEB Roadshow program and Q&A session (center), Workshop "Qualified for nZEB" (right)

On Friday, along with the ongoing exhibition in Sf. Ioan's Square featuring 1:1 mockup models and demonstrations from partners, with support from local partners the following tours were organised:

- Guided tour of the nZEB UNITBV Solar House and research facilities (Prof. Macedon Moldovan)
- Guided tour of the gym being certified to Passive House standard, Sf Gheorghe (Dr. Eng. Szabolcs Varga)
- Guided tour - ZecaPH site visit (Eng. Vlad Ciobanu)

**Figure 124** guided tours (left nZEB UNITBV Solar House, right and center Passive House standard Gym in Sf. Gheorghe)

**Figure 125** Group photo with (remaining) team and partners rallying at the Mobile unit (Brasov)

### No. 3 event: Roadshow event – Iasi nZEB Week (30 - 02.07.2022, Iasi)

The third nZEB Roadshow event brought together experts in the fields of building and energy efficiency, suppliers of solutions and technologies for building with high energy performance, academia, local public authorities, real estate developers, students, young people, children and the general public for four days in the Palas Mall Central Garden in Iasi. nZEB Roadshow Iasi was organized with the support of the Moldova branch[1] of Cluster pRO-nZEB .
The event was organized adjacent to Palas Mall, Iasi, in an urban square with high pedestrian traffic.

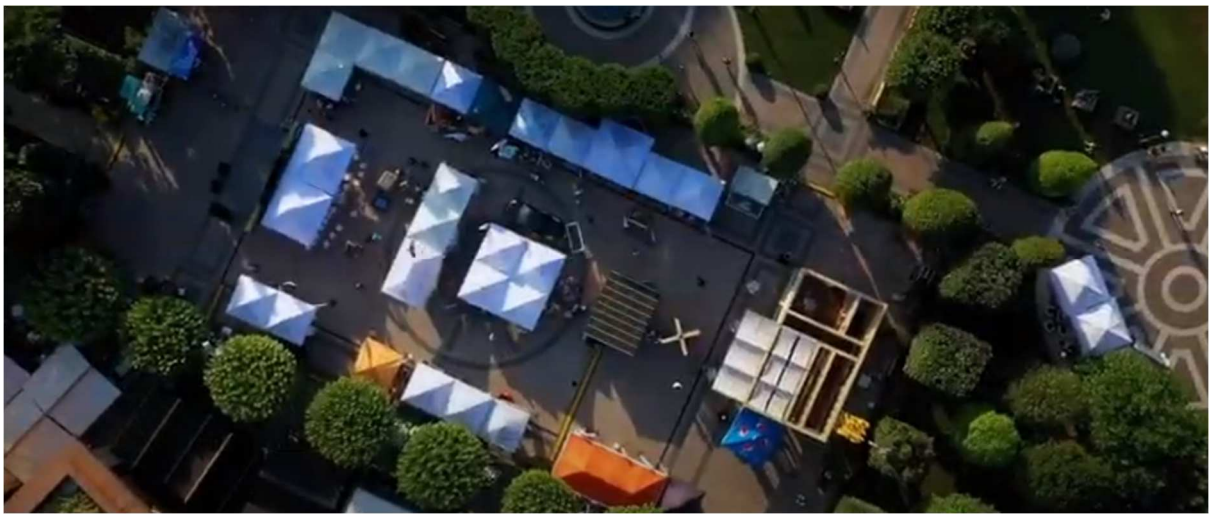

**Figure 126** Aerial view of the Iasi nZEB Roadshow event - Palas Mall, Iasi

Keeping in line with the format established in Brasov, the first day of the event (Wednesday) included the following:
Opening of nZEB Week

- Opening words, nZEB Roadshow project presentation, nZEB Iasi Caravan program presentation Q&A session

[1] https://www.youtube.com/watch?v=D3I0BwrIPz4 interviews with some of the partners and exhibitors

- Introductory course in nZEB Concept
- Regulations and application of nZEB in practice
- Workshop "Qualified for nZEB" nZEB certification / specialization schemes and specific competences. Certification programs skills: leakage test (door blower door) / Thermal deck assessment / Systems, Mechanical ventilation and air tightness / Thermal inspection

The second day of the Iasi nZEB Roadshow included the following:

- Round Table - How can we implement the nZEB concept in practice? Event in partnership with the University Technical University Gheorghe Asachi - Iasi
- A Career in nZEB: Do you want to become a professional in nZEB construction?
  Overview of professional programs for technical universities (for high school students) and career counseling for attracting new construction professionals (in collaboration with the Students League)
- nZEB 1:1 details - Presentation and discussion of design and execution details on demonstration models
- Guided tour of the construction site - Braharu House Bear Valley SMART & PASSIVE HOUSE

On Friday, the third day of the Iasi nZEB Roadshow, the following activities were scheduled:

- Consultation workshop with the and universities with an architectural profile, building, construction, installation and building professionals
- Workshop for financial institutions and local authorities
- Technical advice: discussions on projects - suggestions and optimization for energy compliance
- nZEB 1:1 details Presentation and discussion of design details and execution on demonstration models
- Thermal insulation solutions that can reach the nZEB standard, nZEB details - installation penetrations & envelope sealing activities
- How to measure sealing performance air tightness - ''Blower door test" Practical air tightness test

On Saturday, the closing day of the event:

- Guided tour: Low Energy House - MIOLK, CREATIVE ENGINEERING & LITARTH,
- Kids' corner nZEBO & friends: Children's games, demonstrations, models and experiments,
- How to measure airtightness performance - Blower door test, Practical air tightness test demonstration,
- Presentation and discussion of design and execution details on demonstration models – PRO-nZEB cluster and partners.

**Figure 127** Guided tour of Low Energy House - MIOLK Design office, CREATIVE ENGINEERING & LITARTH

PRO-nZEB cluster and partners

The activities included in the program 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.

- Companies and trades: Smart & passive House, Atelier nZEB, Rockwool, Knauf, Velux, QFort, Civilis, Saint gobain, Inginerie creativa, Renovata, nZEB Shop, TermoHidroFonica Grup, Academia Soflete, Xella, Meesenburg, Ratiotherm, Sistema, Romstal, EcoKit, RomeHome, Class Meister, Zecaph, Genida, Danprod, MMTherm, Litarh, Isogreen, Termoplast, Adaptativ, Rothoblaas, CELCO, Constant Energy, studio SDAC, E-acumulatori,
- Financial institutions/ Public authorities and Associations: Technical University of Civil Engineering Bucharest, RoGBC, Iași City Hall, Technical University „Gh. Asachi" Iași, Romanian Association of Energy Auditors for Buildings.

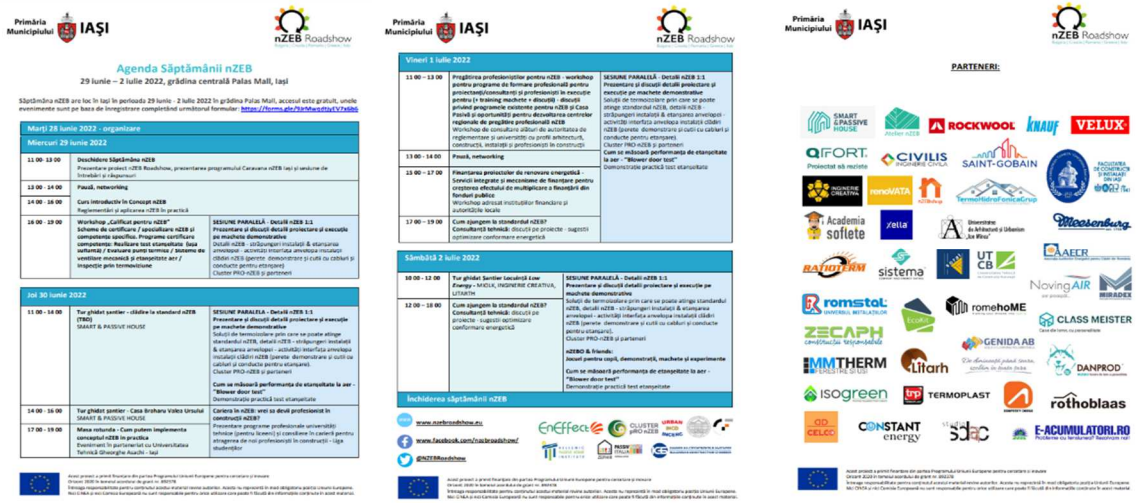


**Figure 128** Agenda for the nZEB Week Iasi along with logos from all the partners and exhibitors

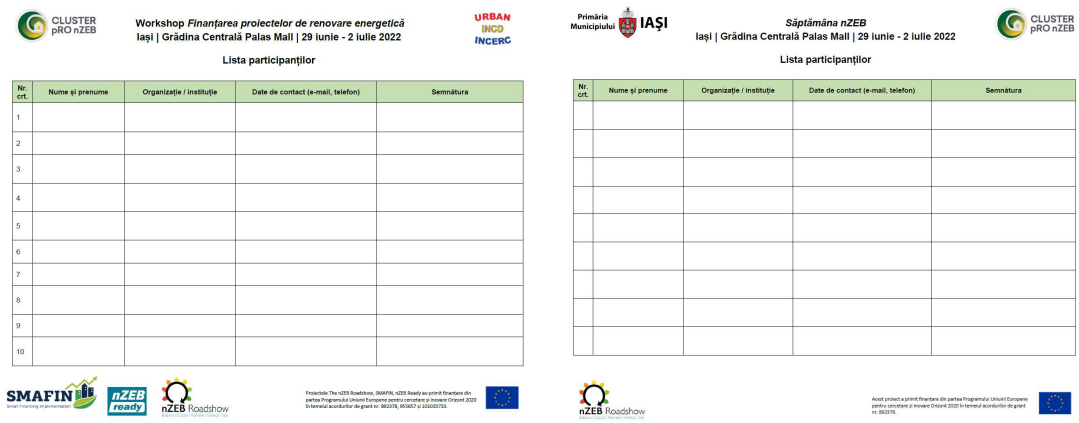


**Figure 129** Onsite registration

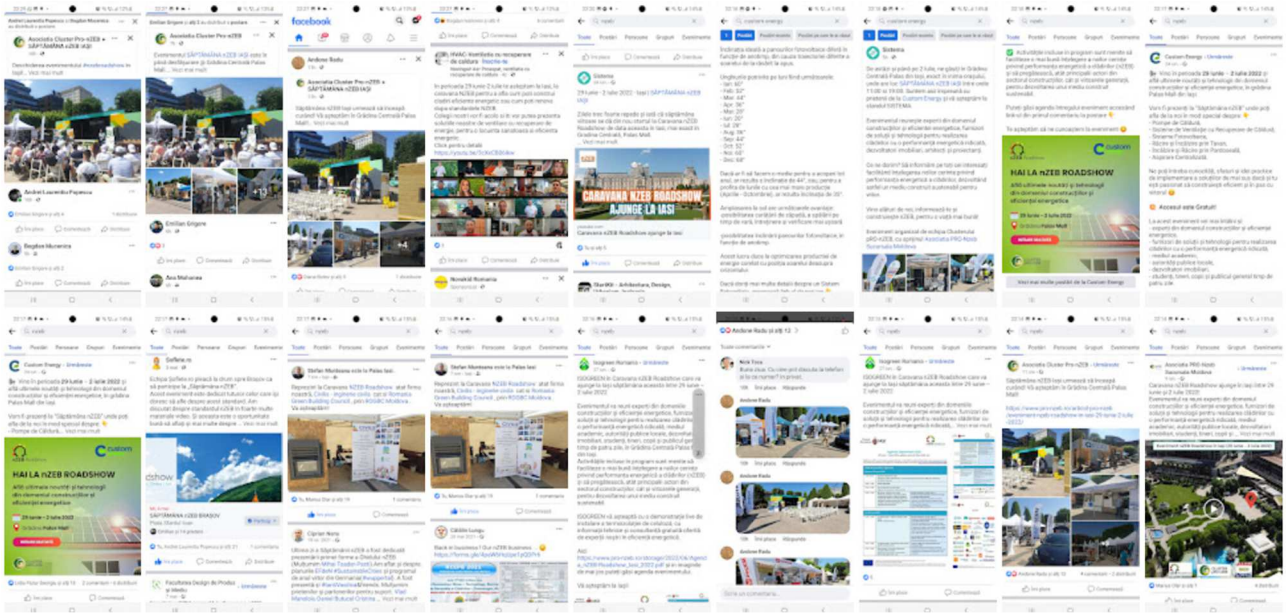

**Figure 130** Online promotion for the event nZEB Roadshow Iasi

SMAFIN

nZEB ready

nZEB Roadshow

Caravana nZEB Brașov

Workshop adresat instituțiilor financiare și autorităților locale

*Finanțarea proiectelor de renovare energetică*

5 mai 2022, Piața Sf. Ioan, Brașov

## Agenda

Atelierul de lucru urmărește să identifice modalitățile de depășire a barierelor și de a minimiza riscurile legate de creșterea ratelor de investiții pentru proiectele de eficiență energetică din România.
În plus, vor fi examinate politicile naționale și schemele de finanțare financiară privată și publică disponibile, iar propunerile de îmbunătățire vor fi evaluate și discutate.
Principalele subiecte de discuție care se așteaptă să fie abordate în această secțiune sunt:

- Instrumente de finanțare pentru Valul de Renovare și Implementarea LTRS,
- Mecanisme de sprijinire a eficienței energetice în clădiri,
- Planuri de creștere a efectului de multiplicare a finanțării publice pentru renovare energetică.

| Parte introductivă | |
|---|---|
| 10:00 – 10:15 | **Înregistrare participanți** |
| 10:15 - 10:25 | **Cuvânt de introducere** |
| **Sesiunea 1:** | **Prezentare inițiative europene și naționale** |
| 10:25 – 11:30 | **Prezentarea proiectelor (elemente generale, activități specifice în România)**<br>• **SMAFIN- SUPPORTING SMART FINANCING IMPLEMENTATION FOR ENERGY EFFICIENT BALKAN BUILDINGS**<br>• ***nZEB Ready - ENHANCING MARKET READINESS FOR nZEB IMPLEMENTATION*** |
| **Sesiunea 2:** | **Sesiune de consultări** |
| 11:30– 12:45 | **Dialog și consultări cu părțile interesate:**<br>• Mecanisme de sprijinire a eficienței energetice în clădiri, instrumente de finanțare pentru implementarea Strategiei de Renovare pe Termen Lung<br>• Posibilități de creștere a efectului de multiplicare a finanțării publice pentru renovare energetică<br>• Bariere în calea unor investiții mai largi în renovare, în conformitate cu prioritățile și oportunitățile naționale. |
| 12:45 – 13:00 | **Concluzii generale, contribuții pentru un plan de acțiune pentru implicarea părților interesate în proiectarea politicilor publice și a soluțiilor de piață în domeniu, atragerea capitalurilor private și creșterea investițiilor în eficiența energetică** |

Proiectele The nZEB Roadshow, SMAFIN, nZEB Ready au primit finanțare din partea Programului Uniunii Europene pentru cercetare și inovare Orizont 2020 în temeiul acordurilor de grant nr. 892378, 950857 și 101033733.
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nZEB Roadshow

Bulgaria | Croatia | Romania | Greece | Italy

Săptămâna nZEB Iași

Palas Mall - Grădina Centrală

29 iunie - 2 iulie 2022

CLUSTER pRO nZEB

URBAN INCD INCERC

*Aflați mai multe despre soluții pentru clădiri cu consum redus de energie de la specialiști în domeniile construcțiilor, eficienței energetice și energiei din surse regenerabile.*

*Începând cu anul 2021 toate clădirile noi trebuie proiectate și executate la standard "nZEB" - clădire cu performanță energetică foarte ridicată, al cărei consum de energie este aproape egal cu zero și pentru care necesarul de energie este acoperit, într-o foarte mare măsură, din surse regenerabile.*

https://www.pro-nzeb.ro/

Acest proiect a primit finanțare din partea Programului Uniunii Europene pentru cercetare și inovare Orizont 2020 în temeiul acordului de grant nr. 892378

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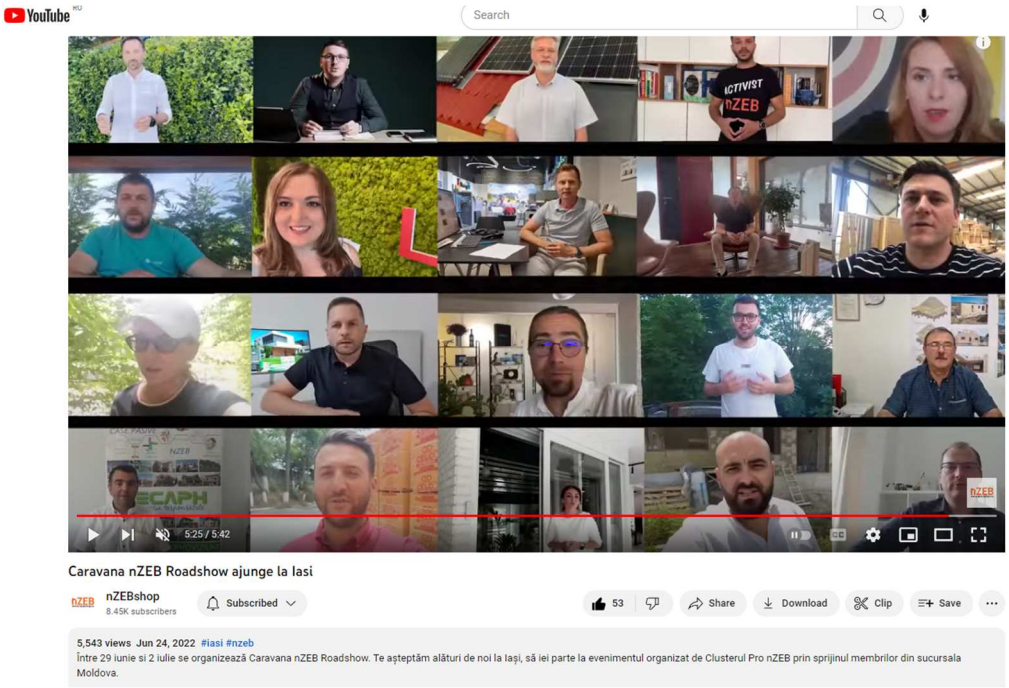



**Figure 131** Promotional video for the nZEB Roadshow Iasi
https://www.youtube.com/watch?v=3cXxCB06Ikw&t=145s

**Figure 132** Glimpses from the nZEB Roadshow Iasi

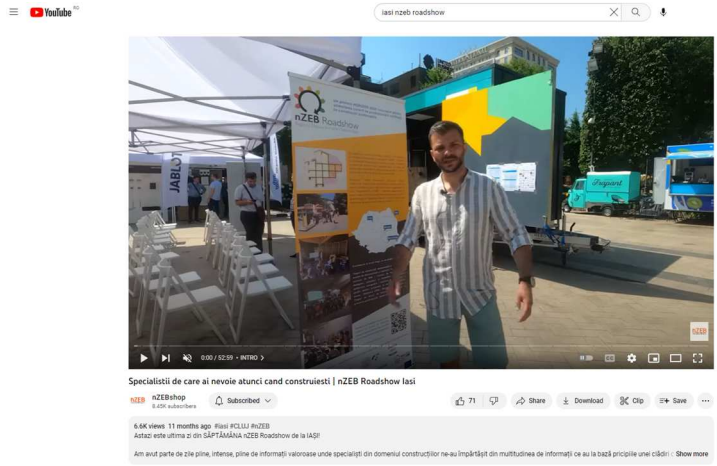



**Figure 133** Promotional video for the nZEB Roadshow Iasi
https://www.youtube.com/watch?v=A4zoQX0hQGw

**Figure 134** Group photo with team and partners at the Mobile container (Iasi)

## No. 4 event: Roadshow event –Cluj Napoca nZEB Week (3 - 06.11.2022, Cluj Napoca)

The last nZEB Week of 2022 took place in Cluj-Napoca from 3-6 November 2022 at the Multipurpose Hall "BT Arena", resulting in 4 intense days, 4,000 estimated participants, around 50 exhibitors and 60 theoretical sessions, workshops, conferences, demonstrations and applied presentations.

**Figure 135** Agenda for the nZEB Week Cluj-Napoca

Conceived as an accelerator for the implementation of the nZEB concept, the nZEB Week Cluj-Napoca brought together all the actors interested in energy efficiency in buildings, creating the framework for a constructive and topical dialogue between beneficiaries and professionals - architects, engineers, builders, energy auditors, NGOs, universities, professional associations, manufacturers and distributors, public administration (central and local) - and offered a complex experience through a veritable marathon of highly diverse activities aimed at facilitating a better understanding of the new requirements for the energy performance of buildings and preparing both the main actors in the building sector and future generations for the development of a sustainable built environment.

*"Together, public institutions, the private sector and society, we have a duty to have sustainable, energy-efficient buildings, but we need to raise the level of understanding t 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. We also have a transportable unit just on the platform, a mobile container that we take to trade fairs in various locations. Where this is not possible, we use smaller scale models,"*
says Horia Petran, president of the pRO-nZEB Cluster.

The pRO-nZEB Cluster, together with the Soflete team, managed to organize the event in Cluj-Napoca on a much larger scale compared with all nZEB Weeks already organized, which Marius Soflete, co-organiser of the event, summarized as follows:
*"We included demonstrations of building tightness, thermal imaging, construction areas, installations, know-how, even a "materioteca" to test various specific building materials. For the first time in Romania, we brought photovoltaic tiles, produced in Hungary. There were also presentations on the correct rehabilitation of old buildings. We want this concept that we have brought to life in Cluj to become an international benchmark that we can set as an example for other countries in Europe."*

**Figure 136** Online registration Cluj Napoca

**Figure 137** Onsite registration Cluj Napoca

**Figure 138** Glimpses from the nZEB Roadshow Cluj Napoca

**Figure 139** Group photo at the ending of Cluj Napoca nZEB Week  with team and partners

## No. 5 event: Roadshow event –Timisoara nZEB Week (10 - 14.05.2023 Timisoara)

The fifth nZEB Roadshow was set in Timisoara, European capital of Culture in 2023.

The event was realised in partnership with the PORTIC Association team as co-organizer, along with Timișoara City Hall and Polytechnic University of Timișoara, and took place in Iancu Huniade Square, between 10-13 May 2023.

**Figure 140** Online Brochure for nZEB Week Timisoara https://www.pro-nzeb.ro/articol-pro-nzeb/saptamana-nzeb-timisoara-10-13-mai-2023/prezentare (left), aerial view during the event (right)

**Figure 141** map for nZEB Week Timisoara (left), exhibitors (right)

**Figure 142** Agenda for the nZEB Week Timisoara

For four days, a marathon of activities took place in Iancu Huniade Square, aimed at facilitating a better understanding of the requirements for energy performance of buildings and preparing both the main actors in the building sector and future generations for the development of a sustainable built

environment. Experts from the fields of building and energy efficiency, suppliers of solutions and technologies, academia, local public authorities and real estate developers participated in the dialogue that took place in the public space, at the more than 50 stands, as well as in the Aula of the Polytechnic University of Timisoara, where 6 sessions of communications, workshops and debates were held.

As part of the nZEB Caravan, the UPT Senate Hall is hosting a series of workshops dedicated to energy efficiency:

- "nZEB, between need and obligation: the challenges of nZEB implementation" - an interactive panel discussion between local public administration and specialists (urbanism + investment directorates, West RDA, OAR Timis, specialists);
- "Financing energy renovation projects" - integrated services (one-stop-shop) and financing mechanisms to increase the leverage effect of public funding, a workshop for financial institutions and local authorities;
- "Qualified for nZEB", a workshop aimed at developing certification/specialisation schemes for nZEB and specific skills, development of regional centres for nZEB skills, organisation of nZEB training courses;
- A thematic paper session with academic presentations on nZEB;
- Energy efficiency in non-residential architecture - panel discussions with architects and engineers involved in the implementation of high energy efficiency projects in Romania and abroad;
- "nZEB challenges in real estate developments" - a panel with speakers (real estate developers and specialists) and a Q&A session with the audience.

On Friday and Saturday, a series of "What is a Passive House?" workshops designed for the little ones were held in partnership with De-a arhitectura, where children (9-12 years old) learned in a simple and interactive way, through different games and from the nZEBO puppy - the main character of the comic book House of the Future - about the importance of energy performance and the principles of the passive house.

**Figure 143** "What is a Passive House?" workshops in partnership with De-a arhitectura

On Thursday and Friday, those interested - curious or professionals in the field - could visit a series of nZEB buildings, some new, others under construction, to see first-hand how such a building is designed and executed. During the nZEB Week Timisoara, 5 guided tours were organized with the support of local partners:

- 11 May (09:00) - VOX GREEN TECHNOLOGIES
- 11 May (11:00) - Mixed functions block
- 12 May (09:00) - Civiplex
- 12 May (11:00) - Chemistry lab
- 13 May (10:00) - Ghiroda Passive House

**Figure 144** Glimpses from the nZEB Week Timisoara

**Figure 145** Group photo with the partners and exhibitors, nZEB Roadshow Timisoara

**Table 14** Number of visitors/participants at Romanian Roadshow events shown through used monitoring approaches

| No | Event type | Event name | Date | Location | NUMBER OF VISITORS/PARTICIPANTS | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Attendance list | Official event report (dif.) | Photos | Survey |
| 1 | nZEB week | nZEB Week Bucharest | 12 – 17 July 2021 | Bucharest: INCD Urban INCERC, EFdeN (UTCB), Romstal Academy | 150 | 400 | Available | - |
| 2 | nZEB week | nZEB Week Brasov | 04–07 May 2022 | Brasov, Sf. Ioan Square | 60 | 140 | Available | - |
| 3 | nZEB week | nZEB Week Iasi | 29 June–02 July 2022 | Iasi, Palas Mall | 150 | 350 | Available | - |
| 4 | nZEB week | nZEB Week Cluj Napoca | 03–06 Nov. 2022 | Cluj Napoca, BT ARENA first floor | 1300 | 700 | Available | 2000 |
| 5 | nZEB week | nZEB Week Timisoara | 10–13 May 2023 | Timișoara, Iancu Huniade Square, UPT Aula | 80 | 1420 | Available | - |
| | | | **SUM PER CATEGORY** | | **1740** | **3010** | | **-** |
| | **NUMBER OF PEOPLE VISITING AND PARTICIPATING IN ROADSHOW EVENT ACTIVITIES** | | | | **4750** | | | **-** |

## LESSONS LEARNED

By traveling the country in organizing 5 different nZEB Roadshows across Romania, we improved on each iteration doing more of what we did better, tweaking everything to optimize in terms of costs and impact. Amongst the lessons we learned, are the following:

**nZEB Roadshow Venue and logistics**

- The roadshow venue requires careful selection regarding vehicle accessibility (for mobile container unit and loading and unloading trucks), pedestrian accessibility (an attractive pedestrian area insures foot traffic and general public participation), infrastructure (like power supply), sufficient parking spaces in the vicinity (for exhibitors as well as visitors).
- A general layout for the exhibition part of the roadshow must be drafted and provided in advance for the exhibitors (including access points, positioning for the mobile container, individual exhibitors).
- At the fifth event (Timișoara) an area of around 2000 sqm was enough for the mobile container (acting as a scene), the organizers tents and mobile units for about 50 exhibitors.
- For indoors events (e.g., Cluj Napoca and Bucharest) clear access points have to be specified.
- For outdoors events - it has to be taken into account the possibility to hold the event even in bad weather condition (rain in Brasov, heatwave in Iasi) - large tents.
- For site preparations at least 1 day is needed in advance of the Roadshow, for closing the event and removing the exhibitions at least half a day is needed.
- A local partner (co-organiser) is essential for logistics and organization.
- Because of the pandemic situation, there were great delays for the mobile unit construction regarding both materials and workforce.
- Multiple locations means a more dynamic event, but are difficult to manage logistically.
- Stage and equipment to ensure projection onto a screen large enough for those watching the presentations and adequate sound, wireless microphones etc.
- Sun or rain protection, especially for those watching the presentations.
- Chairs and tables (as needed for partner stands, presentation areas, consultation areas etc.).
- Shading and landscaping systems (tents, parapets, boundary strips, fencing for stands, presentation areas etc.).
- First aid kits and fire-fighting equipment.
- Equipment or machinery for unloading and loading of models (partners will be consulted on dimensions and weights of models, displays etc.).

**nZEB Roadshow Activities**

- 4 days seems to be the right duration for conducting a successful nZEB Week, while providing the whole range of designed activities (from Wednesday to Saturday).
- Make sure to have complementary activities for the different stakeholders' groups, with the general public centered activities left for the weekend.
- We received good feedback from the consultation meetings, which require a minimum of 1 hour / case to delve in depth.
- Career counseling - is difficult to involve universities, we had more success reaching Students Leagues and Associations.
- NGO's partners like *De-a arhitectura* are instrumental for implementing the gamification work package.

**nZEB Roadshow Communication**

- The events were announced late, relaying on email and social media (1 week prior to nZEB Week in Bucharest, 2 weeks in Brasov, Iasi, Cluj, 3 weeks Timișoara). The attendance rate grew from one event to the next in large part due to the "nZEB influencers" - companies and people who promoted the event incessantly.
- The best practice is to announce the date for the next nZEB weeks at the end of the current one.
- Online registration works great, but confirmation has to be provided.
- One of our online events reached an audience of around 3000 people (distributed on Facebook by the chamber of architects).
- A video presenting one of our mockups has reached 2400 people (YouTube).
- Focus on local media for at least 2 weeks prior to the event.
- Pre-site and on-site registration should be required and implemented only for events where attendees are easier to control (events without high fluctuation of large number of visitors) for example - site visits, indoor conferences, workshops, consultations.

Conclusions:

The agenda has been designed to include a variety of activities aimed at facilitating a better understanding of the new requirements for the energy performance of buildings (nZEB) and to prepare both key players in the building sector and future generations for the development of a sustainable built environment. Thus, the event days brought together experts from the fields of building and energy efficiency, suppliers of solutions and technologies for building high energy performance buildings, academia, local public authorities, real estate developers, students, young people, children and the general public.

The handbook defines the concept of the nZEB Roadshow event and covers organizational, communication and financial aspects, setting out the principles and working rules for organizations involved in organizing the event. The role of the handbook is to facilitate a better understanding of the event concept and to support a better organization of the event.

The nZEB Roadshow in Romania evolved organically into a complex event - part construction fair, part networking event, part academic and professional conference, part nZEB buildings Open Days but furthermore, a community. The event evolved naturally to an „nZEB Festival" for all stakeholders, supporting the readiness of the market for a sound nZEB implementation.

There is a market need for such events expressed repeatedly by different types of stakeholders.

# 4. *EVALUATION OF REALIZED PROJECT AND NATIONAL KPIs*

The conduction of the national NZEB Roadshow weeks was crucial for achieving the expected project outcomes, as it is directly related to stimulating demand for skilled workers and specialized training and education services, but also increases public awareness of NZEB. Therefore, the success of conducted Roadshow week (both at national and project level) was evaluated by comparing the targeted KPIs and the realized performance, Table 15.

**Table 15** Comparison of planned and realized KPIs for Roadshow events (at both the project and national levels)

**Raising awareness of home and building owners and tenants**

| Action | Parameter | BG | HR | GR | IT | RO | Achieved | Target |
|---|---|---|---|---|---|---|---|---|
| nZEB roadshows | No of events | 9 | 14 | 18 | 12 | 5 | 58 | 15 |
| | No of visitors | 2 081 | 5 218 | 4 300 | 2 951 | 4 750 | 19 300 | 3 000 |

**Partnerships with producers and retailers**

| Action | Parameter | BG | HR | GR | IT | RO | Achieved | Target |
|---|---|---|---|---|---|---|---|---|
| Collaboration at events | No of joint activities | 66 | 74 | 65 | 9 | 198 | 412 | 250 |
| Cooperation agreements | No of Memoranda | 7 | 38 | 6 | 0 | 29 | 80 | 50 |

**Support to public authorities**

| Action | Parameter | BG | HR | GR | IT | RO | Achieved | Target |
|---|---|---|---|---|---|---|---|---|
| Collaboration at events | No of joint events | 3 | 9 | 7 | 2 | 10 | 31 | 15 |
| Procurement support | No of trainings for municipal projects | 2 | 2 | 4 | 1 | 0 | 9 | 10 |

**Reduction of the performance gap**

| Action | Parameter | BG | HR | GR | IT | RO | Achieved | Target |
|---|---|---|---|---|---|---|---|---|
| Training courses at roadshows | No of courses | 5 | 9 | 18 | 3 | 14 | 49 | 25 |
| | No of trainees | 175 | 169 | 466 | 51 | 265 | 1126 | 500 |
| Demonstrations | No of visitors | 300 | 458 | 1100 | 1504 | 843 | 4205 | 1200 |

As advice to others considering conducting similar Roadshow events, the following section presents best practices derived from the experiences of project partners in conducting Roadshow events at the national levels.

# 5. *BEST PRACTICES FOR PLANNING AN NZEB ROADSHOW EVENT*

Experience that project partners gained in organization and conduction of nZEB Roadshows at national levels enabled the production of recommendations for EU-wide replication purposes. Sustainable replication of such nZEB Roadshow activities in other EU countries would strongly boost current efforts to promote nZEB.

## 5.01 BULGARIA

All nZEB Days conducted in Bulgaria features certain core elements in the agenda - there were product exhibitions with some of the best performing businesses involved, plentiful of mock-ups and tools, training courses for both designers and workers, demos, and games for youngsters, as well as the possibility of using VR set. On certain occasions participants could take a tour to active construction sites or already finalized nZEB projects. There was space to advocate for financial schemes and educational reforms at dedicated policy conferences, while different seminars and training events for non-specialists were also carried out. Without a doubt, one of the most attractive features of the nZEB Days in Bulgaria has been the nZEB mobile caravan, gathering more and more interested specialists and non-specialists alike. However, aiming to get to the wider public, and engage the latter group, the idea arose to enter a space where we had not considered before – at the premises of a shopping mall!

With the advent of the International Earth Day, it made sense to carry out the event on the weekend surrounding it, so that more people can join in such an initiative raising awareness about EE and nZEBs. We worked alongside a professional PR agency, who supported the team spreading the word ahead of time, invite journalists from national TV and radio channels, and promote the event with catchy messages and attractive visual identity on the social media pages.

We chose one of the biggest shopping centers in Sofia – the Ring Mall, and given the limited amount of time, we had to act quickly in securing the transportation of the nZEB Caravan first. After numerous calls with the manager of the mall, as well as other consultants, decisions on positioning of the mockups, guaranteeing there are seats for visitors who want to participate in the nZEB presentations, opportunities for personal consultations and room for product exhibitions, we were only concerned with the weather forecast, as there were chances for potential showers. To avoid any problems, we decided to park the caravan at the parking lot of the mall. Although it didn't rain, it turned out to be the best decision, as it would attract even more attention, next to different fancy electro mobiles and what not. During the event itself, all available mock-ups, equipment, and sets developed during the project were available for participants to learn and experience first-hand the benefits of sustainable construction practices, materials, and the necessary skills. A total of 250 people attended for the whole period, and what was most important was personal contact and the conducted consultations about particular problems that were shared. On the 19$^{th}$ of July 2023, the event was awarded the second prize of the Annual "b2b media awards" for best educational initiative!

**Figure 146** Pictures from “Switch to Green” nZEB event at the Ring Mall

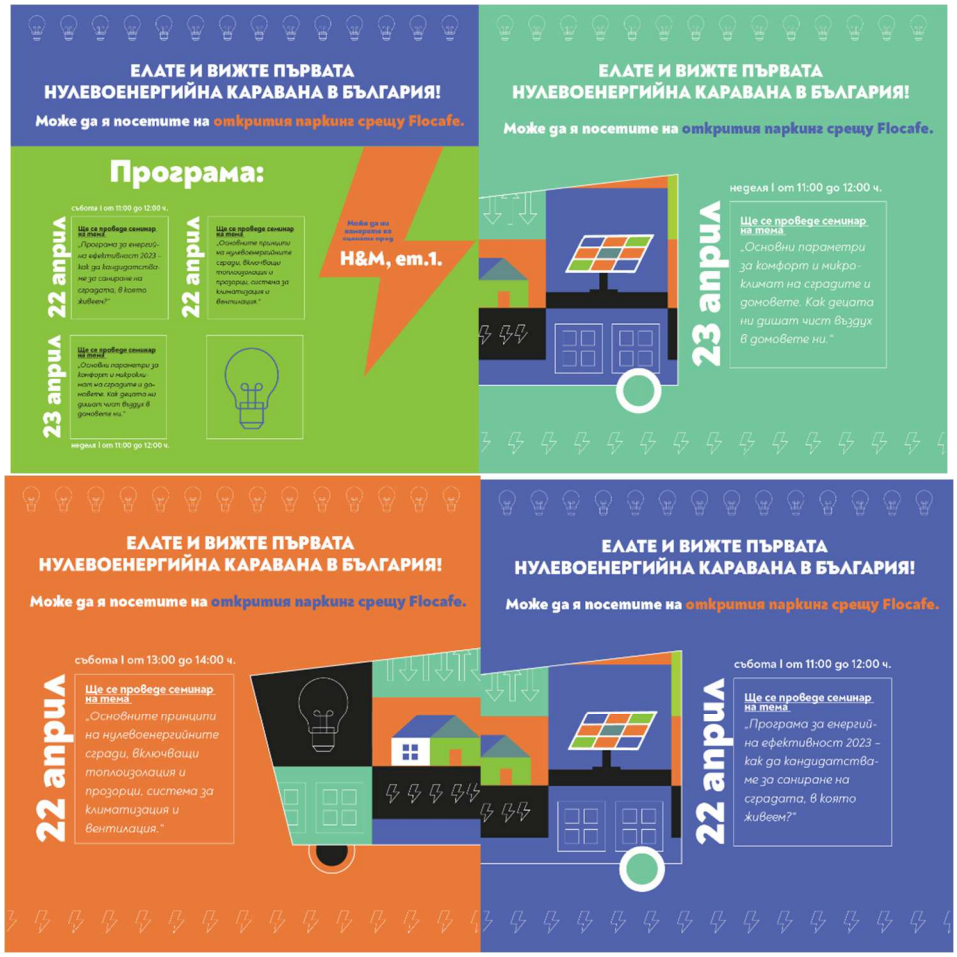
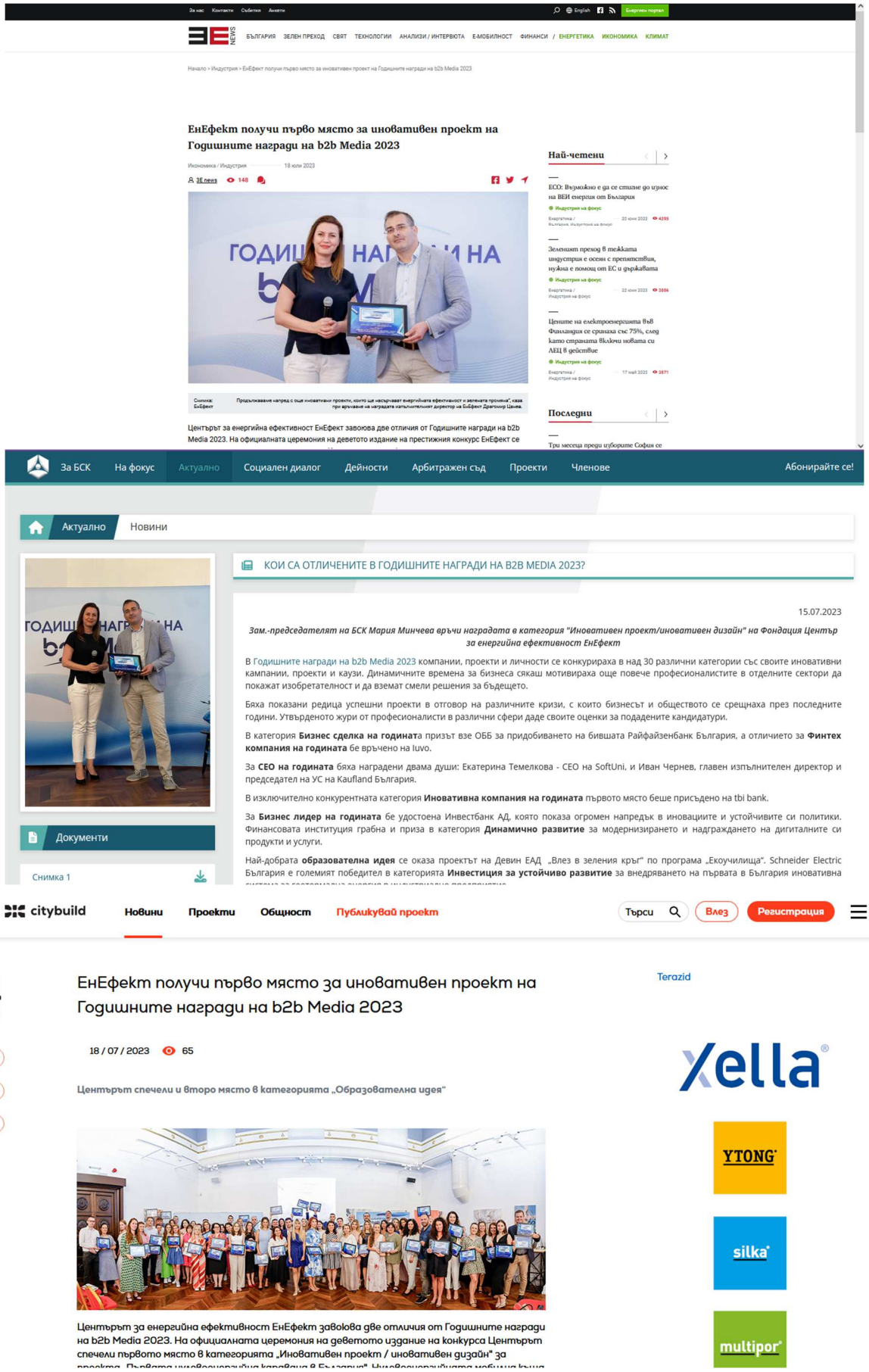



**Figure 147** Social media promotional posts before the event

**Figure 148** Dragomir Tzanev, EnEffect, with the Innovative Educational Idea award at the b2b Annual Awards Ceremony



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Начало > Индустрия > ЕнЕфект получи първо място за иновативен проект на Годишните награди на b2b Media 2023

**ЕнЕфект получи първо място за иновативен проект на Годишните награди на b2b Media 2023**

Икономика / Индустрия 18 юли 2023

3E.news 148

Снимка: БиЕфект — Продължаваме напред с още иновативни проекти, които ще насърчават енергийната ефективност и зелената промяна", каза при връчване на наградата изпълнителният директор на БиЕфект Драгомир Цанев.

Центърът за енергийна ефективност ЕнЕфект завоюва две отличия от Годишните награди на b2b Media 2023. На официалната церемония на деветото издание на престижния конкурс ЕнЕфект се

**Най-четени**

ECO: Възможно е да се стигне до износ на ВЕИ енергия от България — Индустрия на фокус — 20 юни 2023 — 4395

Зеленият преход в тежката индустрия е осеян с препятствия, нужна е помощ от ЕС и държавата — Индустрия на фокус — 22 юни 2023 — 3886

Цените на електроенергията във Финландия се сринаха със 75%, след като страната включи новата си АЕЦ в действие — Индустрия на фокус — 17 май 2023 — 3871

**Последни**

Три месеца преди изборите София се

За БСК | На фокус | Актуално | Социален диалог | Дейности | Арбитражен съд | Проекти | Членове | Абонирайте се!

Актуално > Новини

**КОИ СА ОТЛИЧЕНИТЕ В ГОДИШНИТЕ НАГРАДИ НА B2B MEDIA 2023?**

15.07.2023

*Зам.-председателят на БСК Мария Минчева връчи наградата в категория "Иновативен проект/иновативен дизайн" на Фондация Център за енергийна ефективност ЕнЕфект*

В Годишните награди на b2b Media 2023 компании, проекти и личности се конкурираха в над 30 различни категории със своите иновативни кампании, проекти и каузи. Динамичните времена за бизнеса сякаш мотивираха още повече професионалистите в отделните сектори да покажат изобретателност и да вземат смели решения за бъдещето.

Бяха показани редица успешни проекти в отговор на различните кризи, с които бизнесът и обществото се срещнаха през последните години. Утвърденото жури от професионалисти в различни сфери даде своите оценки за подадените кандидатури.

В категория **Бизнес сделка на годината** призът взе ОББ за придобиването на бившата Райфайзенбанк България, а отличието за **Финтех компания на годината** бе връчено на Iuvo.

За **CEO на годината** бяха наградени двама души: Екатерина Темелкова - CEO на SoftUni, и Иван Чернев, главен изпълнителен директор и председател на УС на Kaufland България.

В изключително конкурентната категория **Иновативна компания на годината** първото място беше присъдено на tbi bank.

За **Бизнес лидер на годината** бе удостоена Инвестбанк АД, която показа огромен напредък в иновациите и устойчивите си политики. Финансовата институция грабна и приза в категория **Динамично развитие** за модернизирането и надграждането на дигиталните си продукти и услуги.

Най-добрата **образователна идея** се оказа проектът на Девин ЕАД „Влез в зеления кръг" по програма „Екоучилища". Schneider Electric България е големият победител в категорията **Инвестиция за устойчиво развитие** за внедряването на първата в България иновативна

Документи

Снимка 1

citybuild | Новини | Проекти | Общност | Публикувай проект | Търси | Влез | Регистрация

Сподели

**ЕнЕфект получи първо място за иновативен проект на Годишните награди на b2b Media 2023**

18 / 07 / 2023 65

Центърът спечели и второ място в категорията „Образователна идея"

Центърът за енергийна ефективност ЕнЕфект завоюва две отличия от Годишните награди на b2b Media 2023. На официалната церемония на деветото издание на конкурса Центърът спечели първото място в категорията „Иновативен проект / иновативен дизайн" за

Terazid

Xella

YTONG

silka

multipor

**Figure 149** Examples of media publications related to the awards

## 5.02 CROATIA

Croatian 14 Roadshow events can be summarized in a procedure that could help all interested parties who want to organize a similar nZEB event, the focal point of which would be a mobile house. 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 (design, building materials, technologies, technical systems, automation, etc.). Therefore, it should be used as the main tool for education and for popularising the nZEB profession, but at the same time as a tool for raising public awareness due to its aesthetic appearance and attractiveness.

To help the sustainable replication of nZEB event with mobile house (MHU – Mobile Home Unit), following scheme has been developed, Figure 150. It needs to be highlighted that this scheme is developed based on specifics of nZEB mobile house MUZA (described in detail in Deliverable D3.2).

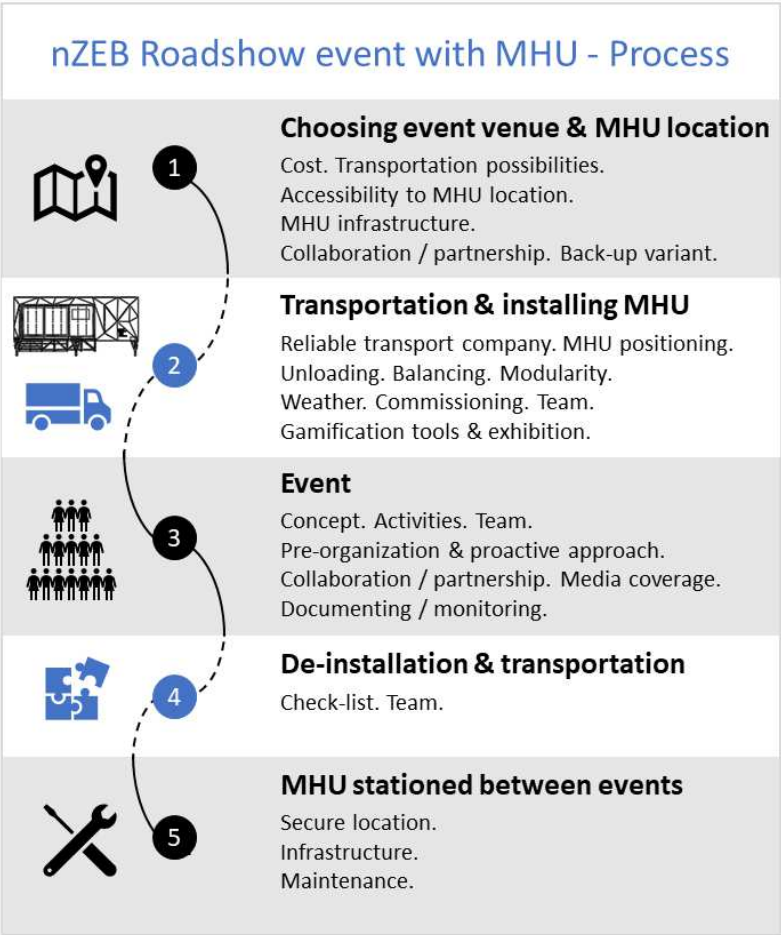


**Figure 150** Graphical representation of the process of organizing an nZEB Roadshow event with a mobile home unit (MHU)

Each step (phase) of the process is characterized by some keywords describing general guidelines and approaches that can facilitate all interested parties in the organization and conduction of successful Roadshow events with MHU:

1. **Choosing event venue & MHU location**

- COST – Even though organizing multiple Roadshow events across the country is preferable, it can be financially very demanding, and most of the cost is just for transporting the MHU. It is difficult to give the unit price of transportation per kilometer even for national transportation, as it depends on the distance of the potential venue from the place where the MHU is stationed, as well as on the duration of the event itself. Possible variations include the flatbed truck leaving empty after unloading the MHU and returning to the venue after the event is over, or waiting nearby throughout the event period if the venue is too far away (e.g., in another part of the country) and it is not profitable for the transportation company to return with an empty truck, or if it has not arranged other transportation in that area. If the flatbed truck has to wait during the whole event period, additional costs will be charged (daily wage for the driver per day). Police escorts, temporary road closures, temporary disconnecting electric lines, or other permits may be required for access to the event venue and MHU location. In addition, MHU team member accommodation, travel costs and daily wages must also be considered when projecting costs for the potential venue. If an international event is planned and the MHU moves to another country or state, permits may need to be obtained for each individual territory it enters or passes through. Road freight regulations should be checked for each country. The cost of accommodation, travel costs and daily wages for MHU team members should also be adjusted.
- TRANSPORTATION POSSIBILITIES – The route from the MHU site to the potential event venue should be checked for critical points, especially entrances and exits from cities (e.g., via Google Maps, in person by MHU team members or event collaborators), such as the height of overpasses, power lines, etc. If critical points are discovered, they should be reviewed by the transportation company to determine if it is possible to pass them with MHU on a flatbed truck. The type of flatbed truck should be selected so that, together with the loaded mobile unit, it does not exceed the requirements of road freight. However, this largely depends on the dimensions of the MHU itself, and this should be considered as one of the main design requirements during the initial MHU design phase.

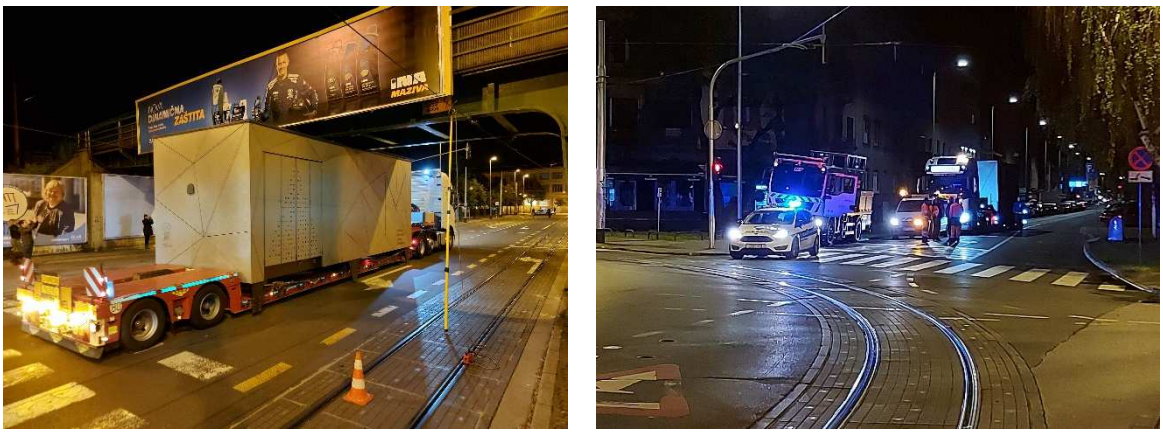

**Figure 151** MUZA passing a critical overpass in the center of Zagreb (left) under police escort and intervention of the Zagreb Electric Tram company (right)

- ACCESSIBILITY TO MHU LOCATION – The location of the MHU implies its exact micro-position at the venue. This micro-position should be carefully determined based on flatbed truck accessibility and available infrastructure. The flatbed truck must have sufficient space to maneuver and unload the mobile unit to turn around if necessary

and leave the location. Consideration should be given to whether there are high curbs, overhangs, or other obstructions that could prevent the truck from reaching the planned location of the MUZA at the venue. This will largely depend on the overall dimensions (height, length) and total weight of the flatbed truck loaded with MHU. For example, the minimum height of the MUZA on the truck is 4.07 m so the access should allow at least this height. The truck with trailer is 16 m long (in the best case, but sometimes it was longer) and needs additional space for maneuvering when pulling out the trailer after unloading and when pulling in the trailer during loading (a perfectly straight space of about 35 m would be ideal). The weight of the MUZA is 13 tons, so the micro-position at the venue should allow this weight plus the weight of the truck (about 30 tons total) to be brought to the intended location. This is approx. the weight of the fire trucks, so it should generally not be a problem, but nevertheless this should always be checked with the authorities (e.g. load-bearing capacity of the floor in the sports hall, access ramps, etc.). The MUZA itself requires an area of 9 × 6 m (with access stairs and the stage, which require an additional 2 m) when unloaded and installed.

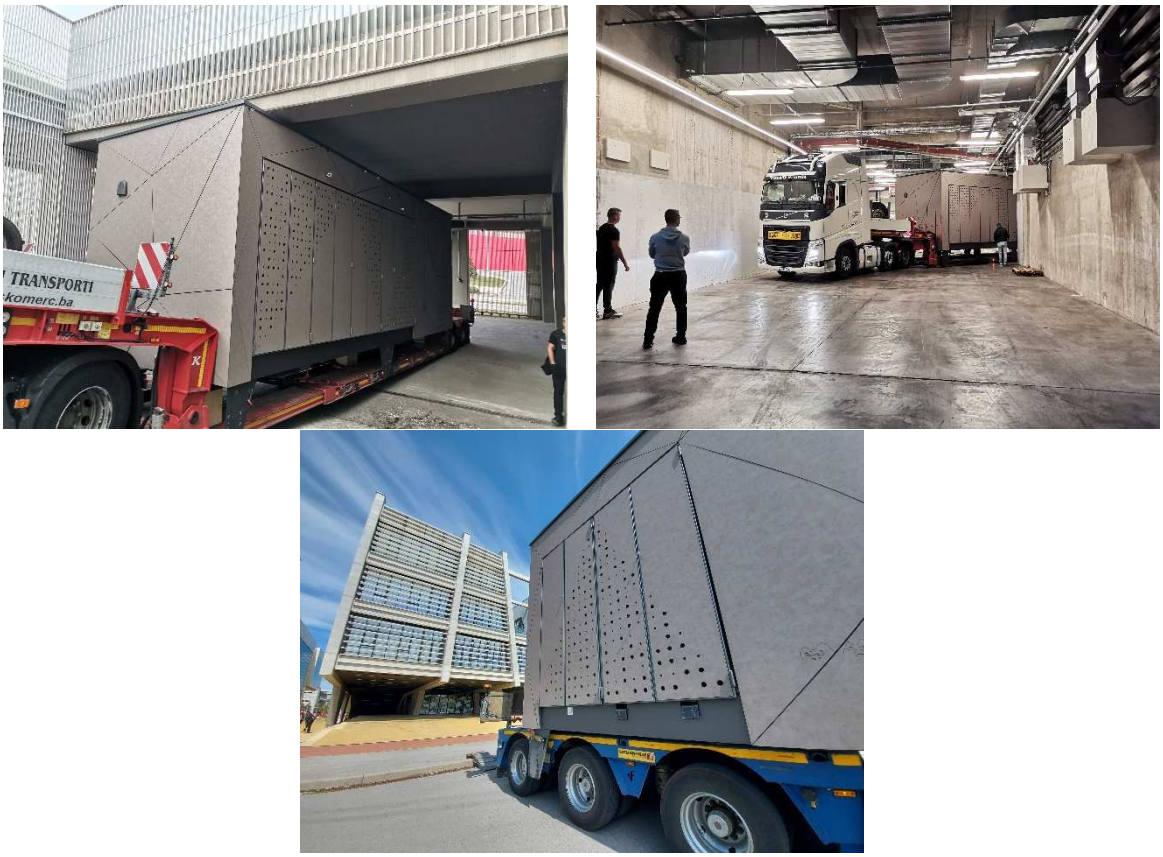


**Figure 152** Some of the obstacles MUZA had to deal with: overhang and inclined access ramp in the Arena Zagreb sports hall (1st row - left), L-shaped freight entrance in the Spaladium sports hall in Split (1st row - right), high curbs and ramp with unknown load-bearing capacity (2nd row)

- MHU INFRASTRUCTURE – The proposed MHU location must have adequate infrastructure to connect the MHU to the electric grid. In the case of MUZA, the requirement is an IP44 industrial socket connector, 32 A, 5 pin connection to the power grid (3P+N+E). So, the first pre-requisite is an adequate power connection, but the second pre-requisite is the shortest possible distance between the power connection and the MHU. In this way, excessive cable lengths and multiple cable-to-

cable connections are avoided. Reducing the number of cable connections increases safety and at the same time reduces costs (cables for this type of power connections are quite expensive). Adequate protection of cable connections is required to prevent event participants from accessing them.

**Figure 153** Industrial socket connector for MUZA (left), excessive cable length due to re-location of MUZA (right)

- COLLABORATION / PARTNERSHIP – Look for collaborators / local partners who can host Roadshow event and help you organize and execute the event. Local collaborators / partners can greatly reduce the time and effort needed for inspecting previously mentioned keywords. Carefully communicate your needs and support your requirements with photos to help local collaborators / partners better understand it.
- BACK-UP VARIANT – Be prepared for surprises, despite detailed inspection of transportation possibilities, MHU location accessibility, and available infrastructure. Try to have a backup MHU location at the venue in case the flatbed truck, for whatever reason, cannot reach the planned location. For example, MUZA had to be re-located from the planned indoor position in the Arena Zagreb sports hall to the nearby parking lot (the access ramp could not be passed due to the steep slope and height restriction), and also MUZA had to be re-located from the planned position at the access ramp in front of the Faculty of Civil Engineering and Architecture in Osijek to the nearby parking lot (due to the high curbs and unknown load bearing capacity of the access ramp). A back-up variant for the MHU relocation defined before the transport saves time and stress in case such a situation occurs, and avoids additional complications (distance to the power connection, whether the cable length is sufficient, possible additional costs for the transport company, etc.).

  In addition to the back-up option for the MHU re-location, you should also consider the back-up option for the event concept in case of bad weather. Choose a venue that can provide you with an enclosed space (classroom, conference room, corridor of the sports hall, etc.), or at least covered external area, if needed. Focusing entire event around the MHU requires good weather, as few enthusiasts will be willing to freeze around the MHU on rainy and windy, cold days, and the MHU cannot accommodate a large group of participants (the MUZA can accommodate up to 10 people). Therefore, an enclosed space combined with the MHU would be optimal in case of bad weather, but it require an adjustment to the overall event concept.

**Figure 154** Overhang next to MUZA as a shelter from rain during the Roadshow event in TMNT (left), Croatian Prime Minister Andrej Plenković, who enthusiastically visited MUZA despite the cold rainy weather (right)

2. **Transportation & Installing MHU**
    - RELIABLE TRANSPORT COMPANY – A reliable transportation company and an experienced flatbed truck driver are key to the successful transportation of MHU. A reliable transportation company will personally inspect MHU and learn about the specific unloading and loading procedures, who will discuss and check in person (if needed) transportation possibilities and accessibility to MHU location, and advise you whether or not the transportation can be realized. In addition, a reliable transportation company will check and arrange for all necessary permits, police interventions etc., if required. The experienced driver will have the courage to do "impossible things", such as moving MUZA from an extremely unfavorable position in front of the industrial hall where it was built. Thanks to that successful action and successful transportation for other MHU events, as well as good communication, the Croatian team always relied on the same transportation company. Since they were already familiar with MUZA, there was no need to repeat the procedure and MUZA's specific for each event.

**Figure 155** Extraction of MUZA from the production hall – with an experienced and persistent driver nothing is impossible

- MHU POSITIONING – If the MHU has a stage platform and its positioning at the micro-location (at venue) is defined, it is necessary to predict how the MHU will be loaded (oriented) onto the truck and how the truck will approach the venue and micro-location to reach the desired position of the stage. If there are other exhibitors

present at the same venue, arrivals must be coordinated because the truck loaded with MHU requires a lot of space to manipulate. In most cases, this means arriving earlier (before the other exhibitors, maybe even few days earlier) and leaving later (after the other exhibitors).

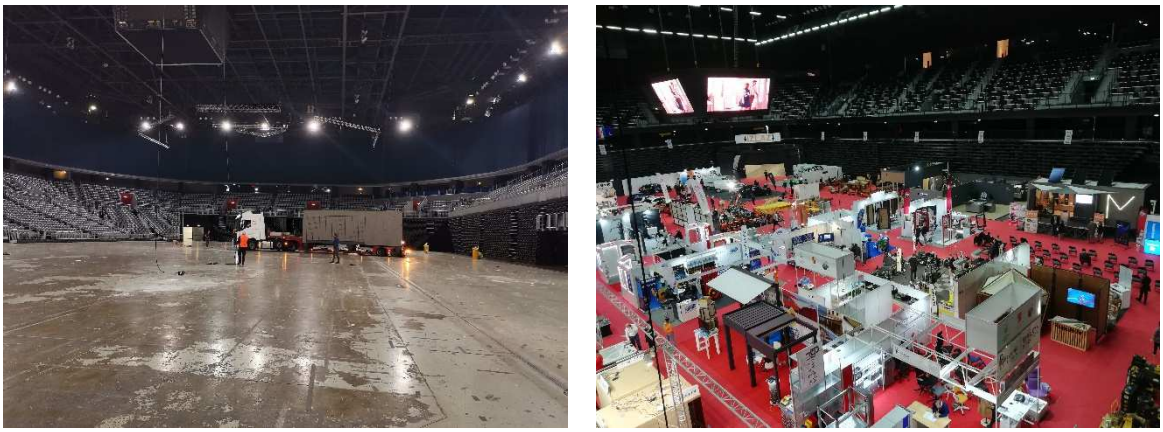

**Figure 156** MUZA enters sports hall a few days before other exhibitors and is the last one to leave

- UNLOADING – Unloading the MHU from the flatbed truck, as well as loading, is not the responsibility of the transportation company. The MHU team members are responsible for this physically demanding part. The whole process, the time and how physical demanding it will be, depends on the MHU specific support system. The MUZA support system consists of six landing gears that are removed for transport (see Deliverable D3.2 for more information). The key is well-coordinated team members who simultaneously install and deinstall landing gears.

**Figure 157** Landing gears installed on MUZA (left) and deinstalled during transportation (right)

- BALANCING – After unloading the MHU from the truck, depending on the terrain on which it is located (certain slope, etc.), the height of each landing gear must be balanced so that the MHU itself can be levelled. A laser leveller can be used, but the best indicator is whether the doors close well (there are no gaps and they do not slide by themselves). If the doors do not close well, there is a possibility that the contact magnets, which are responsible for shutting down the technical system when the doors are open, will not work either. Moreover, staying in the MHU is not pleasant if it is not levelled.
- MODULARITY – Aim for as much modularity as possible - portable stage platform, canopy (shading device), chairs, landing gears, etc., so that most of the equipment can

be easily assembled and disassembled, but also packed inside the MHU and secured for transport. This must be considered already in design phase, since it will be helpful to pack all or nearly all of the equipment needed for the event and transport it inside the MHU.

**Figure 158** Example of MUZA's modular stage platform and canopy (left) and all equipment packed inside MUZA for the transportation (right)

- WEATHER – The dependence of the Roadshow event focused around MHU on weather conditions and the need for a backup variant has already been pointed out. In addition, weather should also be considered in the context of MHU installation. Follow the weather forecast, because unloading and balancing of MHU, as well as installation of the stage platform, canopy and photovoltaic system is more challenging and risky on rainy days. Moreover, if strong winds wind and storms are forecasted, do not install canopy, because it could break and damage the facade.
- COMMISSIONING – Commissioning all technical systems should be done at least one day before the event to check if everything is functioning well and to avoid any unpleasant "surprises" (e.g. heat pump not working because it requires change of working regime, no internet connection, etc.). Have a good communication with technical systems and internet provider.
- TEAM – All stages of this phase in the process of organizing an nZEB roadshow event with an MHU require a well-coordinated team with at least 3 members, but 4 members would be optimal (based on experience with MUZA). Good coordination and an adequate number of team members will speed up each stage described in this phase of the process, reduce safety risks, and distribute work so that no team member is overloaded. Any additional help from event collaborators / local partners or industry partners is always welcomed and appreciated.

**Figure 159** Croatian core and extended team – key for successful Roadshow events

- GAMIFICATION TOOLS & EXHIBITION – All gamification tools and exhibitions (within MUZA exhibits include samples of various building materials and products, posters describing nZEB principles) should be transported within the MHU and prepared at least one day before the event to verify that everything is in place and working properly.

**3. Event**

- CONCEPT – Define the concept of the event depending on the target groups and whether the event is organized as an independent event or as a joint event in collaboration with other institutions, organizations, industry partners, etc. - concept of "open doors" for the public (suitable if the event is part of a fair or congress), concept of closed event (for some specific (sub)specialized groups), public event for pre-registered groups (enables better control of event and preparing activities tailored to the background of participants), combination of different concepts.
- ACTIVITIES – Choice of activities is closely related to selected concept of the event and number of team members:
  - Guided tours for larger groups around and inside MHU with active demonstration of all installed materials, products, and technologies require good team organization and defining the tour details. In the MUZA example, a general welcome and brief presentation of "The nZEB Roadshow" project was given first, after which the group was divided into three smaller subgroups that were led to three positions on a rotating basis. Two positions were outside the MUZA and one position was inside the MUZA. Each of these positions was led by a member of the project team and covered different aspects of nZEB as follows:

Position 1: Thermal envelope and insulation materials, Windows and their function in terms of thermal and sound insulation, Shading devices and their role, Different types of façades (ETICS and ventilated façade), Sound insulation.

Position 2: Airtightness (its role and how to achieve an airtight layer), Blower Door test, Heat pumps (principle and external unit), Photovoltaics.

Position 3 (inside the MUZA): Mechanical ventilation, Heat pump (principle and internal units), Automation and control, Smart lighting, Monitoring of energy consumption, energy production, IAQ parameters and hygrothermal performance of building envelope elements.

Appropriate gamification tools were used at each station to demonstrate the aforementioned nZEB aspects and actively engage participants.

- Live demonstrations of best practices in the construction of nZEBs (special attention to critical construction details, thermal bridges, etc.).
- Lectures/ trainings for continuous professional development of professionals.
- Use of various gamification tools and encouragement of participants to engage. In the MUZA example, the Croatian team prepared those gamification tools that could be transported within the MUZA and that they could prepare themselves (more information is available in Deliverable D3.2). Advice: less is sometimes more, because too many gamification tools can have the opposite effect - participants cannot fully engage with them and understand them.
- nZEB consultations.
- In the case of the "open doors" concept, be available for questions and tailor your approach to the needs of visitors.

**Figure 160** Example of possible activities during Roadshow events

- TEAM – At this phase of the process of organizing an nZEB roadshow event with an MHU, the team again plays the crucial role. The team is responsible for the organization and operational execution of the event, which includes distributing roles and tasks in realizing all planned activities, coordinating event collaborators / local partners and industry partners, substituting for each other so that one can take a break and rest, coordinating interested media, documenting the entire event, etc.
- PRE-ORGANIZATION & PROACTIVE APPROACH – Success depends not only on how attractive and advanced the MHU is and how many fantastic gamification tools are available, but success mainly depends on how many participants are actually present at the events and how many of them actively participate and what their feedback is. In addition, success is also reflected by the recognition of the media, or rather their presence. This requires a proactive approach and great effort before the event itself. Pre-organization is the key to a successful event. Depending on the target audience for the event, contact local vocational schools, universities, elementary schools, professional associations, local authorities, etc. and invite them to the event. Contact local media and spread the word that MHU and the Roadshow are on their doorstep. If the event is organized in collaboration/partnership with local institutions, associations, companies, etc., they can be a great help in attracting local professionals and the general public.
- COLLABORATION / PARTNERSHIP – All the advantages of joining forces with local collaborators / partners (schools, universities, NGOs, professional association, industry, authorities, etc.) have already been mentioned. However, the main responsibility for the organization and realization of the event remains with the MHU team.
- MEDIA COVERAGE – Excellent approach to increase visibility of Roadshow events and attract participants, but also to raise awareness locally and nationally about nZEB. In the beginning, the MHU team needs to proactively approach the media, but a good event concept and high quality activities will soon sparkle the media's interest so that they will start approaching MHU and Roadshow events on their own. This also means that the MHU team must be ready and flexible for unannounced or last minute announced media visits, for interviews and participation in podcasts without sufficient preparation time, etc.

**Figure 161** MHU and Roadshow events as the perfect coulisse for the media demystification of the nZEB

- DOCUMENTING / MONITORING – If it is necessary to document the event and monitor the number and/or feedback of participants, the approach depends largely on the

event concept. In the case of an "open doors" concept (e.g. event within a trade fair), it is very difficult to use official attendance lists due to the high fluctuations of visitors. In this case, the use of surveillance cameras that have the ability to "count" the number of people entering and leaving MHU is the more appropriate approach. In the case of a closed event or an event with pre-registered groups, official attendance lists can be used as well as surveys to obtain feedback from attendees. Detailed photo and video recordings of the event are essential for documenting the event.

**4. De-installation & Transportation**

- CHECK-LIST – A well-developed procedure is required for uninstalling MHU components (what is removed and in what order, how to stack it inside the MHU, and how to secure it to prevent slippage during transport and possible damage to the MHU). A detailed checklist can be very helpful (but of course it can only be developed based on the experience after the first transport and event).
- TEAM – The team is also an indispensable part in this phase.

**5. MHU stationed between events**

- SECURE LOCATION – The MHU should be stationed at location considered secure between events (in a closed, secured area or in an open area subject to some supervision) to protect it from vandals, burglars, etc. The location should be easily accessible to MHU team members or external collaborators (e.g., if the MHU is not stationed in the same city as the MHU team members) so that they can intervene if necessary.
- INFRASTRUCTURE – In winter, the MHU should be connected to the power grid so that the technical systems do not freeze and get damaged. Therefore, the place where the MHU will be stationed between events must have adequate infrastructure. In addition, this "quiet" time between events could be used for various research activities using the monitoring system installed in the MHU (energy consumption, energy production, hygrothermal performance of envelope elements, etc.).
- MAINTENANCE – The time between events provides the opportunity for maintenance work on the MHU, e.g., interventions on the technical systems, repair of damage to the plasterboard walls (caused by transport vibrations and the loading and unloading of the MHU), potential upgrading of technical systems and automation, etc.

## 5.03 GREECE

Almost everything is related to the venue and the installation of everything needed into that as the transportation until now was the same every time.
So beneath we are going to present the bullets that we had to fulfil in every event in order to be adequately prepared to welcome the visitors:

- **Choosing the right venue place**
  We need at least 2 main rooms. One for the gamification set up with the mock ups and one more in order to make the presentations and the interactive workshop. Ideally, we would look for a venue with three main rooms in order to be more agile with the installation of the tables and all the samples (workshop) and the presentations were we only need a lot of chairs and a nice projector or scene in order to present.

**Figure 162** The venue of nZEB Roadshow in Athens, Innovathens

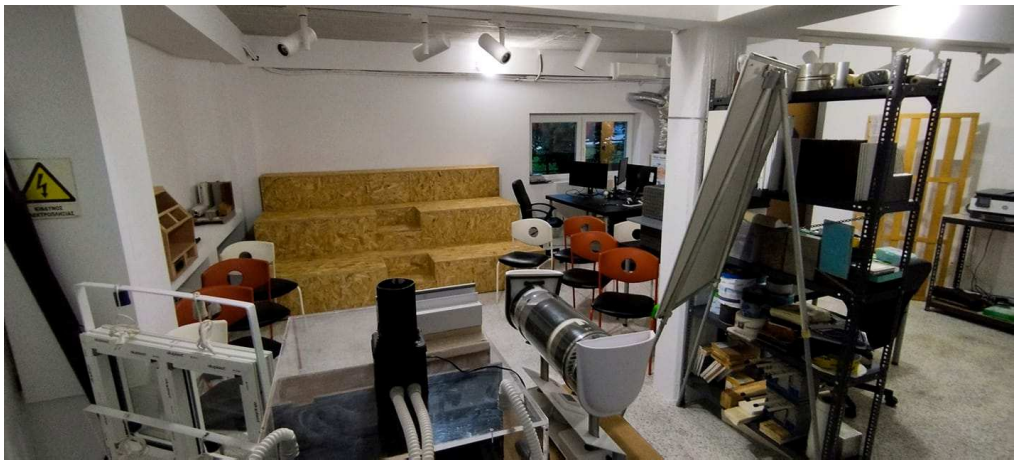

**Figure 163** The venue of nZEB Roadshow at HPHI's headquarters

**Figure 164** The venue of nZEB Roadshow in Kozani, Koventarios municipality library of Kozani

- Transporting the essentials was done by renting or lending a van in order to have the adequate space to transport everything needed.
- Informing engineers and tradespersons before the event with lists that we would find from the local technical chamber and the register of energy inspectors.
- Informing the general public through the municipality, local media & sites
- Informing schools and universities via emails
- Informing our sponsors about the upcoming event so they would decide if they were going to be present in the show presenting their components live
- Informing and attracting speakers (local engineers and partners)
- Searching for new sponsors mainly locally but also nationally
- Informing the owners of the local passive houses in order to showcase their houses.
- Informing the HPHI's followers through the social media (Facebook, Instagram, Twitter, Site and newsletter)
- Organizing the event: the talks and the timeline
- Hiring a photographer or sharing the need to the municipality/co-organizer in order to hire one for the event.
- Manage the volunteers (if they exist)

## 5.04 ITALY

In Italy, events were organized both in presence and in an online form (standalone content or live event).

As far as the live Roadshows are concerned, it is worth noticing that in Italy, unlike in the past, nowadays it appears quite difficult to organize big joint events in collaboration with strong industrial partners. Recently, many big companies even quit their participation at the most relevant construction exhibitions in Italy, due to significant shrinks in the marketing budgets. For this reason, besides the courses for Passivhaus practitioners, all the other Italian Roadshows were organized independently with sporadic participation of partners.

Because of this difficult economic situation, getting MoU's with partners targeted at hosting common events, working synergically for shared goals and disseminating knowledge about energy efficiency looks basically impossible in the current market situation.

On the other hand, more interesting and promising are the implemented marketing strategies which can be replicated for different targets and actions. In order to give a deeper insight of the marketing instruments to attract people in target with energy efficiency, a rough overview of the steps is given in the following (Figure 165).

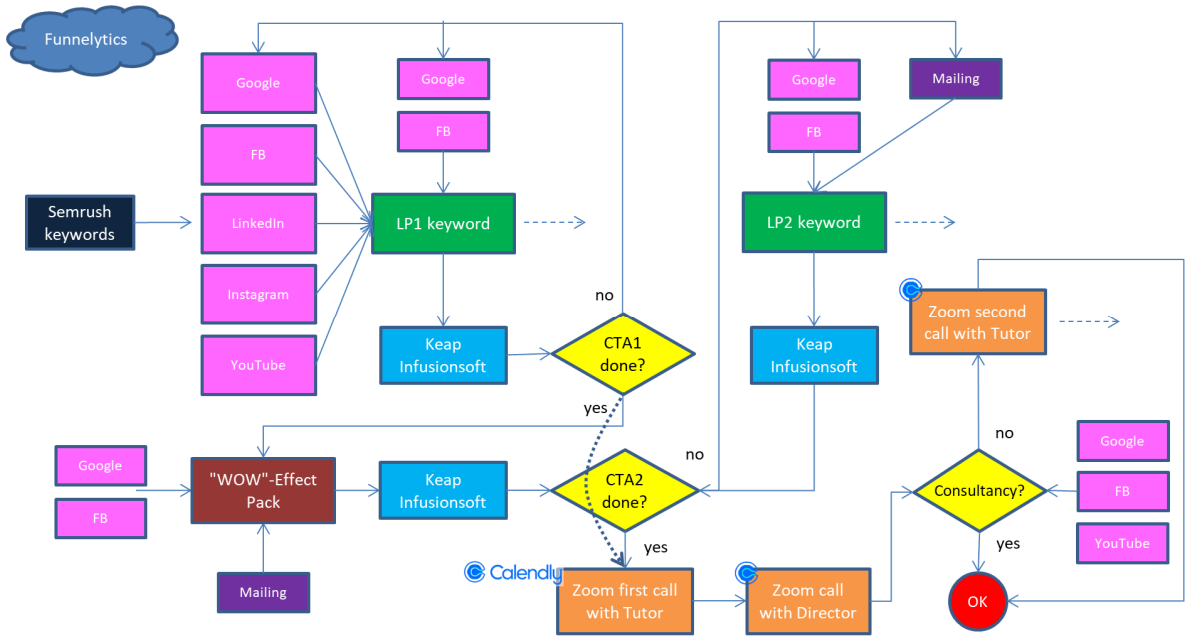


**Figure 165** Marketing strategy to attract potential interested persons towards energy efficiency. The colors represent: pink = social media, black = program for monitoring the conscious search on search engines, light blue = funnel creation program, green = landing page, brown = physical "wow" box, purple = mailing action, yellow = Call-To-Action (CTA), orange = videocall, blue = program for creating funnel schemes, red = target achieved. Dashed arrow = exit (not converted lead). Dotted arrow = short funnel.

1. First of all, the ideal funnel path should be schematized on a suitable program such as Funnelytics.
2. Then, a discovery of the mostly searched keywords or keyphrases should be made on a platform able to monitor the conscious search when looking for nZEB's, Passivhaus, sustainability and energy efficiency. For this purpose, for example Semrush has proven to be very useful, as it provides information about conscious searched keywords, analytics, comparison between competitors and much more.
3. Once the keywords are known, a set of campaigns ("lead magnet") should be launched on several social media channels: the most common are Google, Facebook, LinkedIn, Instagram and YouTube, while selecting the potential public only among the people focused on sustainable topics.
4. All the campaigns target to specific Landing Pages (LP's) with contents written in copywriting, recalling and mentioning the keywords previously found for SEO purposes.
5. Meanwhile, the person landed on the LP is retargeted through Google and Facebook with some graphical content which leads again to the same LP.
6. According to the selected Call-To-Action (CTA), e.g. interest on training or consultancy, a special action monitoring program like Keap Infusionsoft, ActiveCampaign, HubSpot, Pipedrive or similar can keep track of the requests coming from the forms on the LP and automatically perform some further actions (e.g. sending alerts to Account Manager or CMO, sending emails to the lead etc.).
7. If the CTA is fulfilled (i.e. the lead asks for a consultancy or agrees on the free delivery of informational material), then the lead is directly contacted by a Tutor for Energy Efficiency (short version of the funnel) or he/she is sent some informational material with further CTA consisting in requesting a free call with the Tutor. Again, funnel programs like Infusionsoft keep track of such requests via online forms on specific LP's. Conversely, if the lead does not proceed with the CTA, retargeting and nurturing starts again until he/she finally acts as foreseen. In the case nothing happens after a certain period of time, the lead exits the funnel and is considered lost (dashed arrow in Figure 165).
8. In the meantime, some motivational mailing action begins.
9. After receiving the free "Wow"-effect box aiming at increasing the awareness of nZEB/Passivhaus, the lead may ask for a free consultancy (2$^{nd}$ CTA) exploring the possibility for retrofitting existing buildings, designing new constructions or providing professional training. If nothing happens, the lead is brought to a different branch of the funnel which leads to a new LP with CTA coincident to the previous one, i.e. request of a free consultancy. Again, if after a certain time nothing happens, the lead exits the funnel.
10. In the case the lead proceeds with the request of free consultancy with the Tutor, he/she directly selects the best suitable time for a videocall using a platform like Calendly. During the first videocall, a preliminary insight about nZEB and Passivhaus is given and the lead is offered to have a more technical videocall with increased authority in the person of the Director of ZEPHIR.
11. After the call with the Director, a series of retargeting actions including Google, Facebook and YouTube motivational contents begins, in order to make the conversion easier.
12. If the lead agrees on receiving consultancy (or training), then the target is achieved and the funnel is over. The Tutor inserts then this customer into a CRM software like ActiveCampaign which can follow-up the status of the deal. If not, the Tutor tries again to convince the lead who exits the funnel if no final decision is taken.

Finally, it can be noted that people got used to “meet” online during the pandemics, thus lowering the barriers for long distances and decreasing the costs for unnecessary travels. However, there is still a small fraction of people who prefer meeting in person either for consultancy or for attending courses and events. So, it can be confirmed that a hybrid approach for the Roadshows and for the events is always advisable, as agreed in the GA amendment.

## 5.05 ROMANIA

**Table 16** A Suggestion of the key steps in the process of organizing events in Romania

| **nZEB Roadshow Process** | | |
|---|---|---|
| **EVENT CONCEPT (CITY, TIME, SCALE)** | **team** | **Cost, accessibility, transportation, synergies with entities and projects.** |
| **SELECTING LOCAL PARTNERS** | **team** | **Organization and logistics capacity** |
| **CHOOSING A VENUE** | **Team & local partners (co-organisers)** | **Indoor vs Outdoor, Cost, Weather conditions, Back up options,** |
| **LOGISTICS AND COMMUNICATIONS EFFORTS** | **local partners (co-organisers) and Team** | **Communication efforts,<br>Event Agenda, logistics efforts regarding the exhibitors** |
| **TRANSPORT AND INSTALLATION** | **local partners (co-organisers) and Team** | **Reliable transport company, scheduling and installation for the exhibition** |
| **nZEB Roadshow EVENT** | **local partners (co-organisers) and Team<br>Exhibitors<br>volunteers** | **Media coverage, documenting and monitoring<br>Activities - workshops, conferences, hands on demonstrations, consultations, etc** |
| **DEINSTALLATION AND TRANSPORTATION** | **local partners (co-organisers) and Team** | |
| **BETWEEN THE EVENTS** | **team** | **Secured location, mobile container maintenance** |

**Best practice in selecting a venue (outdoor):**

- Large open outdoor area - urban plaza, or adjacent to one, situated in the city center roughly 40-50 sqm per exhibitor (including common areas and circulation),
- The main focus point should be the mobile unit set as a stage with enough free space for seating arrangements (a minimum of 120 sqm are required, 2 sqm per person),
- The organizers area should be situated in a highly visible space adjacent to the mobile container, 1-2 team members should always be available for answering visitor's questions,
- The organizers tent should be able accommodate several simultaneous consultation meetings or a small workshop (a 4x 12 m tent should be enough) as a backup for bad weather conditions,
- The mobile unit positioning, orientation and sunshade should be taken into consideration for organizing the outdoor conferences - north / north east with tree shade in the afternoon served as a good configuration,

- Public/ private parking space sufficient parking spaces in the vicinity of the event (for exhibitors as well as visitors),
- Large tents work better than individual tents in multiple ways - sunshade, rain cover, visual unity, indoor flexibility,
- Equipment or machinery for unloading and loading of models- best practice is to consult partners on dimensions and weights of models, displays etc. prior to the event. Loading and unloading should be scheduled and organized prior to the event - by zones, by size and type of exhibition, by equipment and manpower needed,
- The route from the nZEB Roadshow mobile unit site to the potential event venue should be checked for critical points, especially entrances and exits from cities (e.g., via Google Maps) and discussed with the selected driver,
- Accessibility on site should be checked by the team and co-organisers - elevated sidewalks, light posts, trees, other urban fixtures should be considered in designing the general layout,
- A general layout of the nZEB Roadshow event should be provided to the exhibitors and partners prior to the event

**Figure 166** nZEB Week Timisoara exhibition layout - small tents, and mobile containers on the perimeter, large tents in the middle, stage area (A) in the left bottom corner

**Best practice in selecting a venue (indoor):**

- A consecrated venue for fairs and exhibitions has the most potential in attracting large numbers of visitors while providing the necessary amenities (e.g., Cluj Napoca BT ARENA),
- Clear access and information points must be established, the organizers zone should be in a highly visible area, near the access point, 1-2 team members should always be available for answering visitor's questions,
- A stage area for conferences & workshops must be provided, a cul-de-sac arrangement works best, if not possible a corner of the exhibition is preferable,

- Depending on the events concept some other designed area may include: live demonstration area, Kids corner,
- A general layout for the exhibition part of the roadshow must be drafted and provided in advance for the exhibitors (including access points, positioning for the mobile container, individual exhibitors),
- A general layout of the nZEB Roadshow event should be provided to the exhibitors and partners prior to the event,
- It is more manageable to have a single location for the event in both outdoor and indoor format.

**Figure 167** Top right - access points, loading and unloading / Top left exhibition layout (divided by zones) / Down - glimpses from the stage area

**Transportation and installing the mobile container**

- A large part of the mobile container concept included ease of transportation features such as having the maximum weight (loaded) set at 3.5 tons and using a tiny house trailer chassis.
- The mobile container is designed for disassembly regarding the following aspects: the tiny house trailer chassis can be reused, the TEGO boards can be unscrewed and reused as building foundation casings, the structure made of pressed steel can be recycled as well as the steel roofing.
- For transportation the best practice was to find a trusted transport company and driver who knows and understands the demands of transporting the Mobile Container, and book him in advance. Technical checkups for the mobile container should be scheduled 2-3 weeks prior to the transport.

- The exhibition site and possible obstacles should be discussed with the driver well in advance. Having the nZEB Roadshow Weeks in large cities and central, very tourist known places helps because the driver is already aware of the site.
- The mobile nZEB Roadshow mobile container should arrive first onsite and be the last one to leave, providing enough room for maneuvering and positioning the container.
- Loading of the container can be made prior to the day of departure but weight calibration should be made with the driver present taking an estimate of 1-3 hours.

**Figure 168** The mobile container Lifecycle - assembly, transportation, installation, exhibition/ stage, reuse and eventually disassembly

**nZEB Roadshow Team**

- Clear roles and schedules should be provided for the team members and co-organizers for ensuring compliance with the complex event agenda,
- A 5 persons team is rather small given the scale of the events for nZEB Roadshow in Romania,
- A local partner entity (co-organizer) is essential for logistics and organization, while having on site information and providing contact with the local stakeholders,
- Volunteers are needed for loading / unloading and monitoring visitors. They can be recruited from students' associations or from the co-organisers entity,
- Highly qualified volunteers or members of the co-organisers entity can provide extra know how in the consultations sessions, and give the opportunity to run parallel consultation sessions widening the reach of information,
- Local architecture practices and local construction developers are instrumental in providing opportunities for site visits in the Roadshow area. These site visits can be organized within the Roadshow schedule but with a certain amount of autonomy regarding the appointed presenters and number of visitors. In Cluj Napoca we had 5 such site visits, independently organized in 2 allotted time slots, allowing many of the visitors to reach 2 of the site visits.

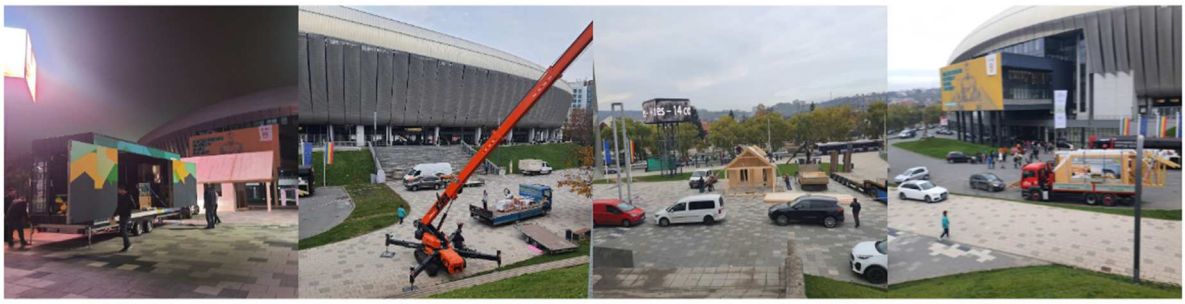

**Figure 169** Some of the logistics efforts preparing the Cluj Napoca nZEB Week involved several cranes, a manitou and about 20 people from the co-organising team

**nZEB Roadshow Activities**

- 4 days seems to be the right amount of time for conducting a successful nZEB Week, while providing the whole range of designed activities. From Wednesday to Saturday seems to work best for the public and partners, with different activities aimed at different stakeholders depending on day of the week and time of day (further detailed in the events description).
- For the gamification work package which requires considerable time and people resources the best practice would be reaching out to NGO's , Children's / Technical/ science Exhibitions and Museum and providing a common activity.
- The consultation meetings are a great way to provide know-how for ongoing nZEB projects. Best practice would be targeting developers and architects (as opposed to residential clients which were most of the consulted parties) thus scaling up the reach of the provided information.
- Workshops should be prepared well in advance taking into account synergies with local stakeholders and ongoing projects. Due to the workshops format, a limited number of participants can be accommodated (differs depending on the venue and audience). Email invitations to local stakeholders should be issued well in advance, with reminders and required confirmation. Workshops should have their own micro agenda.
- The Romanian team encouraged partners to be proactive in developing onsite demonstrations and in showcasing their products and systems. Some examples are blower door tests on the mobile container, airtightness demonstrations, VR demonstrations, on stage presentations from an nZEB implementation standpoint.
- After the nZEB Week in Brasov the exhibitors started showing interest in realizing their own 1:1 mock-ups with their products and systems integrated. Time and effort on the team's behalf should be made in discussing and verifying the presented solutions so that only the best practices in nZEB implementation are showcased in the event.

**Figure 170** Some of the 1:1 mock-ups created by the exhibitors for the nZEB Weeks

**Best practice communication**

- The preparation of nZEB Roadshows can be an ongoing effort, from the perspective of raising awareness and disseminating knowledge regarding nZEB and networking with potential partners for future events,
- The best practice is to announce the city date for the next nZEB Week at the end of the current one,
- Having the local City Hall, local University, local Chamber of Architects (or other similar organizations) as well as a co-organiser works towards a successful event,
- We collected informal feedback from the partners, visitors and exhibitors, a google forms questionnaire should be implemented,
- Best practice for online registration is providing confirmation and reminders before the event,
- The public announcement for the event should be made 2 months prior to the date,
- Focus on local media for at least 2 weeks prior to the event, this is the same usual period when exhibitors and partners saturate social media with posts about the nZEB Roadshow Week,
- Efforts should be made into providing a content package for the exhibitors (acting as influencers and reaching a wider audience) - information regarding the planned event, videos, photos available for editing and media distribution.

**Figure 171** Raising awareness - the visitors could post a photo on social media with the hashtag "nZEB Activist", having a chance at winning an electric scooter.

**Between the events:**

- The mobile unit is stationed near Building Knowledge Hub in Bucharest, situated on the premises of INCD URBAN INCERC Bucharest. It has the advantages of being a secured location, it can be showcased to visitors at BKH and is easily accessible to project team members or external collaborators.
- Maintenance efforts for the Mobile Unit should be made between the events.

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