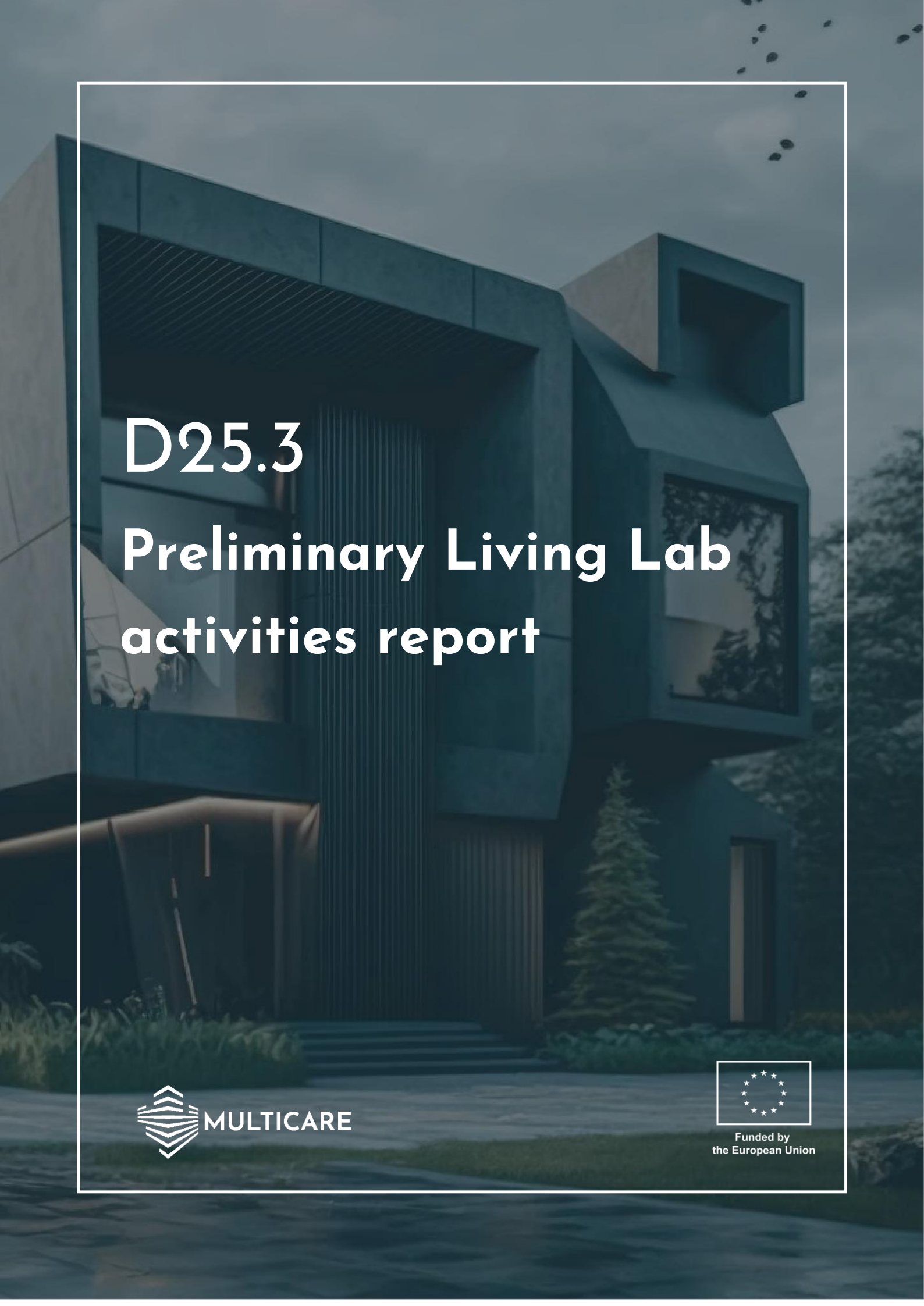


A photograph of a modern, multi-story building with a dark, textured facade. The building features large windows and a balcony. The image is used as a background for the report cover.

D25.3

Preliminary Living Lab activities report



Funded by
the European Union

D25.3 Preliminary living lab activities report

Dissemination Level: PU

Lead Partner: ASM

Due date: 31.03.2026

Actual submission date: 07.04.2026

PUBLISHED IN THE FRAMEWORK OF

MULTICARE (Horizon Europe grant 101123467)

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REVISION AND HISTORY CHART

VERSION	DATE	EDITORS	COMMENT
Draft	25.03.2026	Łukasz Wilczyński, Agnieszka Kowalska (ASM)	Draft version
0.1	27.03.2026	Carmine Pascale, Marco Pepe, Francesco Iuliano (STRESS)	Review
0.2	03.04.2026	Magdalena Kosiorek (ASM)	Final version

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Executive Summary

This report is a summary of the main Living Lab activities performed in the MULTICARE project up to Month 30. It presents both the course and the results of the activities, outlining the engagement of users, stakeholders and participants in co-creation and testing processes. The report includes an analysis of initial findings, challenges encountered and early insights gained from the Living Lab activities.

In the first part of the report, the description of the webinar's organisational aspects is provided – date, format, hosts, and participants. Moreover, the recruitment process and recruitment tools (e.g. e-mail invitations and dissemination through project communication channels and external platforms) are mentioned.

The report recalls the main objective of the MULTICARE Living Lab activities – to raise awareness, engagement and acceptance of project solutions among relevant stakeholders and to support the co-creation framework established within the project. The document also lists the elements that were presented to the gathered audience: the overall MULTICARE objectives and methodology, structural systems for integrated seismic and energy-efficient rehabilitation, resilient façade solutions under future climate change conditions, and digital workflows supporting resilient design on multiple scales. Means used by the organisers to better illustrate the project scope are also mentioned in this report, e.g. the general project presentation and technical presentations delivered by project partners.

The core part of the report is the presentation of the webinar outcomes and feedback collected from participants during the Q&A sessions. In general, the Living Lab webinar was characterised by a high level of interaction and engagement, reflected in the number of participants and the extended discussion time.

The first Living Lab event took place on 13 February 2026 in an online format. Further Living Lab rounds are planned within the project lifetime to continue stakeholder engagement, validation and refinement of MULTICARE solutions.

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GLOSSARY

ACRONYM	FULL NAME
WP	Work Package
T	Task
D&C	Dissemination and Communication
M	Month
KPI	Key Performance Indicator

1. Deliverable introduction

This section introduces the scope and context of the document and presents relationships with other work packages and tasks of the MULTICARE project.

1.1 Scope and structure of the deliverable

This deliverable presents a summary of the first Living Lab activities implemented within the MULTICARE project. The document focuses on the first MULTICARE Living Lab webinar organised on 13 February 2026 and provides an overview of its objectives, organisation, implementation and main outcomes.

As part of the project's Living Lab framework, this report outlines the progress achieved in establishing stakeholder engagement and initiating the co-creation process foreseen within the project methodology. The deliverable documents the first step in activating the Living Lab community and engaging relevant stakeholders in the discussion and validation of MULTICARE solutions.

The report presents:

- The organisational aspects of the Living Lab webinar, including format, agenda and participant profile.
- The objectives and methodological approach of the Living Lab within MULTICARE.
- The main outcomes of the event, including stakeholder interaction and qualitative feedback collected during the Q&A sessions.

This deliverable supports the continuation of Living Lab rounds planned within the project lifetime and contributes to the progressive validation and refinement of MULTICARE solutions.

1.2 Relation to other Tasks and Deliverables

This deliverable has been developed within the framework of WP25 and specifically relates to the implementation of Living Lab activities foreseen under the project's stakeholder engagement and co-creation approach.

The Living Lab activities are designed to support the validation and refinement of MULTICARE solutions by actively involving relevant stakeholders in the discussion of structural systems, façade technologies and digital design tools. The preliminary Living Lab report documents the first implementation step of this framework, namely the organisation of the first MULTICARE Living Lab webinar in February 2026.

Interrelation with Other Deliverables

This deliverable is closely linked to the following documents:

- D25.2 – MULTICARE Dissemination and Communication Activities Report: The implementation of Living Lab activities was introduced. The present document provides an extended description and detailed analysis of these activities.
- D26.6 – Final Living Lab Activities Report: Will consolidate the results of all Living Lab rounds planned throughout the project lifetime and provide a comprehensive evaluation of stakeholder engagement and validation activities.

Through this structured alignment, the present deliverable ensures continuity between the initial Living Lab planning phase and the subsequent rounds of implementation. It supports the progressive validation of MULTICARE solutions and contributes to the long-term refinement and scalability of project outcomes.

2. Living Labs framework

This chapter presents the MULTICARE Living Lab framework, which defines the structure, objectives, and implementation approach of Living Lab activities within the project. The framework establishes a consistent methodology for stakeholder engagement, co-creation, and validation of project solutions across different phases of the project lifecycle.

2.1 Objectives

The objectives of the MULTICARE Living Labs are:

- To engage end-users and relevant stakeholders throughout the project lifecycle, from the user requirements phase to the pilot evaluation phase.
- To ensure that MULTICARE solutions are aligned with real needs, expectations, and operational conditions of target users.
- To raise awareness of MULTICARE objectives, technologies, and expected impacts among defined stakeholder groups.
- To collect qualitative and quantitative feedback from stakeholders at different stages of the project to support continuous improvement of technologies and tools.
- To support the customization of MULTICARE solutions to real-life conditions, considering technical, social, economic, and operational factors.
- To present validation MULTICARE solutions in real or near real-life environments, ensuring usability, effectiveness, and relevance.
- To increase stakeholder acceptance and readiness for adoption of MULTICARE solutions.
- To facilitate knowledge exchange between research, industry, and end-users.
- To support exploitation and replication of project results through stakeholder involvement in evaluation and assessment activities.

2.2 Living Lab structure and implementation approach

The Living Lab framework is implemented through a series of structured activities combining online and on-site engagement formats. Three main Living Lab webinars are

planned during the project lifetime, complemented by additional workshops and targeted sessions organized by project partners.

The first Living Lab was designed as an introductory session, providing stakeholders with a comprehensive overview of the MULTICARE project, its objectives, and developed technologies. It also introduces key technical areas, including building rehabilitation, resilient façade solutions, and digital tools supporting resilient design.

The second Living Lab took place in Naples at University of Naples Federico II. This session focuses on practical engagement, discussion, and validation of technologies under operational conditions.

Subsequent Living Lab activities will be organized by project partners AMS and AMCCRS, in the form of dedicated workshops supporting stakeholder engagement, testing, and validation processes in different local contexts.

A dedicated webinar focused on financial aspects and new financial mechanisms will be organized by RoGBC, providing stakeholders with insights into economic feasibility, investment conditions, and financial implementation of MULTICARE solutions.

The Living Lab series will conclude with a final webinar summarizing project results, lessons learned, and validated solutions, supporting knowledge transfer, exploitation, and future uptake of the developed technologies.

2.3 Stakeholder engagement and outreach approach

The Living Lab framework is based on a stakeholder engagement and outreach approach involving end-users and stakeholders directly participating in or affected by the project, including consortium partners, as well as scientific, technological, and relevant business communities.

Stakeholder engagement is implemented through structured collaboration and interaction mechanisms, primarily in the form of targeted Living Lab workshops. These activities are designed to raise awareness, support stakeholder engagement and acceptance, and involve participants in the definition of requirements and evaluation of MULTICARE solutions.

The implementation of Living Lab activities is supported by dedicated communication and dissemination actions ensuring effective outreach to target groups. These include the distribution of invitations via email, promotion through project communication channels and partner networks, and publication of follow-up materials such as articles and updates summarizing Living Lab outcomes.

This approach ensures both effective stakeholder engagement and broad outreach, supporting continuous participation and awareness throughout the project.

3.1st round Living Lab Action Plan

This chapter presents the first round of Living Lab activities carried out within the MULTICARE project. It outlines the planning process and provides a structured overview of the different phases of the Living Lab implementation. The chapter describes the pre-event preparation phase, including stakeholder engagement and organisational activities, followed by the implementation phase held on 13 February 2026. Finally, it covers the post-event phase, focusing on the evaluation of the activities.

3.1 Planning phase

The organisation of the first MULTICARE Living Lab webinar was foreseen in the project implementation plan, which includes the preparation of three webinar-based Living Lab sessions during the project lifetime.

At the end of September 2025, internal discussions were initiated within the consortium regarding the structure, objectives and scope of the first Living Lab session. The format, thematic focus and expected contributions from technical partners were progressively defined during consortium consultations.

At the beginning of January 2026, the organisational framework was finalised. ASM confirmed the organisation of the first MULTICARE Living Lab session, planned 13 February 2026, and formally invited selected partners to contribute.

The agreed structure included:

- A general overview of the MULTICARE project and Living Lab framework.
- A technical presentation on structural systems for building rehabilitation.
- A presentation dedicated to resilient façade solutions.
- A session introducing digital tools and software workflows developed within the project.

The session was initially planned to last approximately 1.5–2 hours, allowing around 20 minutes per presentation, followed by a joint Q&A session.

The agenda and scope were consulted with all involved partners before final confirmation.

All planned activities and organisational steps were structured and summarised in the Action Plan presented in the table below.

Table 1 Living Lab Action Plan

Phase	Action	Timeline	Responsible Partner(s)	Output
Planning	Internal discussions on structure and scope	End September 2025	ASM + Consortium	Draft LL 1st webinar concept
Planning	Agenda consultation and confirmation	October–December 2025	ASM + All contributing partners	Final agenda
Planning	Formal confirmation of webinar format and partner contributions	Early January 2026	ASM	Confirmed speakers and structure
Preparation	Development of promotional banners	January 2026	ASM	Event banner + agenda banner
Preparation	Opening of registration	~3 weeks before event	ASM	Registration form + participant list
Preparation	Dissemination via BUILD UP and ECTP	January 2026	ASM	External portal publications
Preparation	Social media and partner promotion	January–February 2026	ASM + Partners	Online visibility
Implementation		13 February 2026	TU Delft	Moderated session

	Moderation of webinar			
Implementation	Structural systems presentation	13 February 2026	Sapienza (UNIROMA1)	Technical presentation
Implementation	Façade solutions presentation	13 February 2026	Priedemann + Hölscher	Technical presentation
Implementation	Digital workflows presentation	13 February 2026	OMRT	Technical presentation
Implementation	Q&A sessions and discussion	13 February 2026	All speakers	Stakeholder interaction
Post-event	Publication of recording	After webinar	ASM	Website upload
Post-event	News article publication	After webinar	ASM	Website article
Post-event	Social media summary	After webinar	ASM	SM posts
Post-event	Announcement of next LL (Naples – ACER)	After webinar	ASM	Continuity communication

3.2 Pre-event preparation phase

The registration for the webinar opened approximately three weeks before the event date. Participation required completion of a registration form, after which registered participants received a direct webinar access link.

Dissemination of the event included:

- Publication on the BUILD UP portal.
- Publication through ECTP channels.

- Announcement on the MULTICARE project website.
- Promotion via project social media channels.
- Distribution through partners' communication networks.

Two dedicated visual materials were developed:

- An event announcement banner.
- An agenda banner presenting speakers and thematic focus.

Partners responsible for technical sessions prepared their presentations in coordination with ASM. TU Delft, as project coordinator, confirmed the moderation of the session.



Figure 1 Living Lab banner

3.3 Implementation phase – 13 February 2026

The session was moderated by TU Delft (Project Coordinator). The agenda included the following presentations and speakers:

- **MULTICARE Project Overview (10:00–10:15)**
Mauro Overend (TU Delft) and Simona Bianchi (TU Delft)
- **Seismic and Energy-Efficient Building Rehabilitation (10:15–10:50)**
Prof. Stefano Pampanin (Sapienza University of Rome),
Prof. Marco Di Ludovico (University of Naples Federico II),
ACER – Tecnica Gamma Prof. Ing. Roberto Castelluccio
- **Resilient Facade Solutions (10:55–11:15)**
Natchai Suwannapruk (Priedemann) and Abhinay Kumar (Hoelscher)
- **Digital Tools for Resilient Design (11:20–11:40)**
Ondrej Vesely (OMRT) and Evdokia Stavridou (OMRT)

Each presentation was followed by a dedicated Q&A session, and an additional joint discussion took place at the end of the webinar. Although the session was initially planned for two hours, the high level of engagement and number of questions extended the total meeting duration to approximately 2 hours and 42 minutes. The webinar was recorded for further dissemination purposes. A total of 79 participants attended the session (66 concurrent participants at peak).

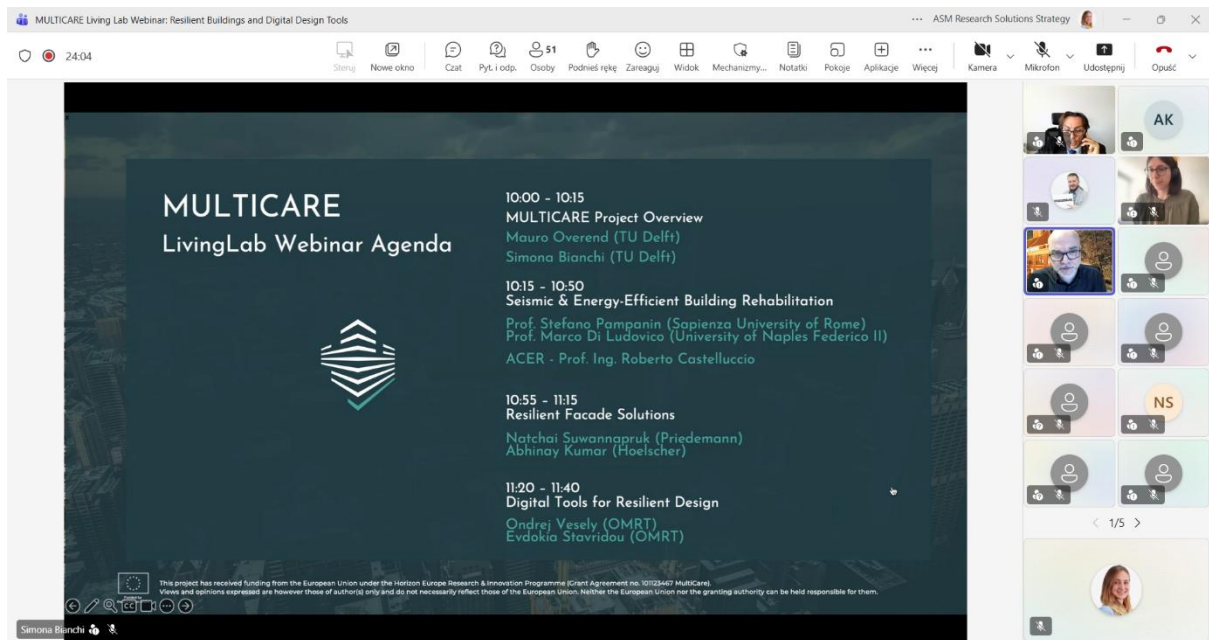


Figure 2 Living Lab webinar

3.4 Post-event activities

Following the webinar:

- The recording was published on the project website.
- A dedicated news article summarising the event was published.
- Social media posts were released presenting key highlights.
- Communication included the announcement of the next Living Lab session planned in Naples (Pilot Acerra).

These actions ensured continuity of engagement and supported the progressive development of the Living Lab community.

4. Target Groups

The first MULTICARE Living Lab webinar was addressed to stakeholders involved in resilient building design, rehabilitation and digitalisation processes. The selection of target groups was aligned with the Living Lab framework defined in the project methodology and aimed at engaging potential users, implementers and beneficiaries of MULTICARE solutions.

The Living Lab session was promoted towards the following target groups:

- Structural and civil engineers involved in seismic retrofitting and building rehabilitation.
- Architects and façade engineers working on climate-adaptive building envelope solutions.
- Sustainability specialists and building performance experts engaged in low-carbon and energy-efficient design strategies.
- Digital design professionals and BIM experts involved in multi-scale modelling and resilient design workflows.
- Urban planners and technical consultants working on resilience at building and district levels.
- Representatives of public authorities and pilot site stakeholders connected to rehabilitation and resilience initiatives.
- Researchers and academic experts in the fields of seismic engineering, façade systems and digital tools for resilience.

In addition, within the broader MULTICARE Living Lab framework, final users and building-related stakeholders are considered important target groups. These include building owners, facility managers, school representatives and occupants of residential buildings. While the February 2026 webinar had a predominantly technical focus, these groups remain key beneficiaries of the solutions developed within the project and are expected to be progressively engaged in subsequent Living Lab rounds, particularly those linked to pilot site implementation.

As the webinar registration process did not require a detailed professional classification, the exact distribution of participant profiles cannot be determined. However, the thematic

scope and dissemination channels used indicate that the session was primarily directed towards professional and expert stakeholders relevant to the technical content presented.

5. Results of 1st round Living Lab

This chapter presents the main outcomes of the first MULTICARE Living Lab webinar, including both the technical insights shared during the presentations and the key points raised during the discussion with participants.

The results reflect the current stage of development of MULTICARE solutions, as well as stakeholder interests and feedback collected during the session.

5.1 Technical insights and presented solutions

The Living Lab webinar provided a comprehensive overview of the MULTICARE approach, combining physical technologies and digital tools to improve the resilience of buildings under multiple hazards.

A key topic discussed was the multi-hazard and multi-scale approach, addressing the increasing exposure of buildings to combined risks such as earthquakes, extreme weather events, and climate-related impacts. The importance of integrating decisions across different scales, from materials and components to building and city level, was highlighted as a fundamental principle of the project.

A significant part of the discussion focused on innovative structural rehabilitation solutions, particularly the concept of external exoskeleton systems. These solutions aim to improve both seismic performance and energy efficiency while minimizing invasiveness for building occupants. The proposed approach enables retrofitting of existing buildings without requiring relocation of residents, which was identified as a major advantage compared to traditional renovation methods.

Experimental validation results presented during the session confirmed that:

- timber-based exoskeleton systems significantly improve the seismic performance of reinforced concrete structures;
- the solutions increase energy dissipation capacity and overall structural resilience;
- the concept is technically feasible and applicable to real building conditions.

At the same time, the experimental programme highlighted important implementation challenges, including:

- the need to optimise detailing, such as gaps between structural elements,
- the importance of addressing beam-column joint vulnerabilities,
- the necessity to combine solutions with additional reinforcement techniques in some cases.

Another important area of discussion concerned facade systems as part of resilient building design. The façade was presented as a complex system contributing not only to energy performance but also to protection against environmental and climate-related hazards.

The presented façade solutions focused on:

- modular and plug-and-play systems enabling flexibility and adaptability,
- integration with exoskeleton structures;
- use of low-carbon and energy-efficient materials;
- development of component databases and design catalogues supporting decision-making.

In addition, the concept of predictive maintenance supported by monitoring systems was introduced. The integration of sensors into façade systems allows for real-time data collection and early detection of performance issues, contributing to long-term resilience and reduced maintenance costs.

The webinar also demonstrated the development of digital tools supporting resilient design, including:

- parametric modelling and simulation of building performance;
- multi-criteria analysis combining energy, environmental, and comfort indicators;
- decision-support tools enabling comparison of multiple design variants;
- digital dashboards integrating building-scale and component-scale data.

These tools allow stakeholders to evaluate different design scenarios and optimise solutions based on specific conditions and priorities.

5.2 Stakeholder discussion and feedback

The discussion session and participant questions provided valuable insights into stakeholder interests, concerns, and expectations.

Participants showed strong interest in the practical applicability of the proposed solutions, particularly in the context of existing buildings.

Questions focused on:

- the feasibility of applying exoskeleton-based retrofitting in real conditions;
- the level of invasiveness and implementation complexity;
- cost-effectiveness and return on investment.

Economic aspects were a key topic of discussion. Participants raised questions regarding payback time and cost-benefit analysis, highlighting the importance of demonstrating financial viability.

The responses emphasized that:

- economic performance depends on building location, risk exposure, and intervention scope;
- integrated solutions combining energy and seismic improvements can significantly reduce long-term costs;
- evaluation should consider the full lifecycle of the building rather than initial investment only.

Another area of interest concerned the adaptability of solutions to different building typologies, including reinforced concrete and masonry structures.

The discussion highlighted that:

- the general approach remains consistent across building types;

- however, technical details such as stiffness, connections, and structural behaviour must be adapted accordingly.

Participants also engaged actively in the discussion on façade design and resilience strategies, raising questions about:

- fire safety considerations;
- selection and weighting of parameters in multi-criteria assessment;
- integration of sustainability, cost, and performance aspects.

In the digital domain, stakeholders expressed interest in:

- the possibility of adapting tools to different locations and regulations;
- integration of future climate scenarios and long-term predictions;
- interoperability and integration of multiple hazard datasets;
- connection between simulation models and real-time monitoring data.

The discussion confirmed the relevance of digital tools for supporting decision-making but also highlighted the need for further development, particularly in terms of flexibility, scalability, and integration with real-world data.

Finally, the interaction with participants demonstrated a diverse and international audience profile, including geoscientists from Romania, architects and planners from Tyrol, architects and sustainability specialists from Spain, building engineers and architects from Switzerland, energy engineers from Colombia, civil engineers from Romania and Canada, researchers in structural and earthquake engineering from India, as well as academic experts in building physics and sustainability from Germany. This diversity confirmed the broad relevance of the MULTICARE approach and the need to provide accessible and adaptable solutions for different stakeholder groups.

6. Conclusions

The first MULTICARE Living Lab webinar marked the formal activation of the Living Lab framework and a key milestone in stakeholder engagement under WP25.

Organised online on 13 February 2026, the event gathered 79 registered participants, with 66 attending simultaneously at peak. Due to strong engagement and numerous questions, the session extended from the planned two hours to approximately 2 hours and 42 minutes.

The webinar achieved its main objectives: raising awareness of the MULTICARE approach to multi-hazard resilient rehabilitation, presenting structural systems, façade solutions and digital tools, and initiating interaction between project partners and external stakeholders. It also established the first step of the Living Lab stakeholder engagement process foreseen in the Description of Work.

The interactive format enabled valuable feedback, highlighting strong interest in practical implementation, cost-effectiveness and adaptation of solutions to different building types and local conditions. Stakeholders also showed particular interest in digital tools and decision-support systems.

Key lessons learnt include the need for stricter time management and moderation, as well as a stronger focus on real-life use cases, economic aspects and pilot-level validation. The session also confirmed the importance of presenting technical content in a clear and accessible way for diverse stakeholder groups.

The webinar proved that online formats are effective for early-stage engagement and awareness raising, while indicating the need to progressively introduce more interactive and site-based activities for validation under real-life conditions.

Further Living Lab activities will build on these insights, focusing on pilot implementation, stakeholder feedback and solution validation. The next session, planned in cooperation with the Acerra pilot site, will place greater emphasis on practical application and local conditions.

Overall, the first Living Lab provided a solid foundation for continued stakeholder engagement, validation and refinement of MULTICARE solutions throughout the project.

The next planned Living Lab activities are outlined in the table below.

Table 2 Next Living Lab activities

Living Lab (LL) Round	Format	Location	Timeline	Lead/ Responsible	Target Groups
LL1	Online webinar	Online	13 February 2026	TU Delft + ASM	Technical stakeholders (engineers, architects, researchers, digital experts, public authorities)
LL2	On-site workshop	Naples	25 March 2026	ACER + ASM	Local stakeholders, pilot site representatives, engineers, building owners, public authorities
LL3	On-site / hybrid workshop	Amsterdam	2026	AMS + ASM	Urban planners, engineers, sustainability experts, local stakeholders
LL4	On-site / hybrid workshop	Bucharest	2026	AMCCRS + ASM	Public authorities, engineers, building managers, local stakeholders
LL5	Online webinar	Online	2027	RoGBC + ASM	Investors, financial stakeholders, policy makers, technical experts

LL6	Online webinar	Online	2027	Consortium + ASM	All stakeholder groups
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