



BuildUPspeed

Deliverable 5.3

General report on Market Activation Platform on the activities for establishing the Market Activation Platforms as Webplatforms

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Terminology

Term	Definition
Pop-up factory (PuF)	Pop-up factories are temporary manufacturing and/or assembling facilities that can be quickly set up and taken down to produce components for construction projects. It is a factory in the district itself for the time of the retrofitting program. The factory will develop and assemble industrialized prefab building components that will be installed in the retrofitting projects.
Local Advisory Boards (LAB)	Local Advisory Board (LAB) is a permanent advisory board, connected to a specific ecosystem which will provide assistance, support and advice based on the specific needs of the various stakeholder categories they represent.
Soundboard groups	To gather direct input and feedback from regional and national markets, national soundboardgroups will be formed. These groups, consisting of stakeholders, will discuss specific solutions, products, and services, providing feedback to fine-tune the project approach. Feedback can be collected through conferences or workshops. Soundboard groups are ad hoc, with temporary members providing feedback on project actions, outcomes, and results.



Executive summary

This deliverable presents an overarching report on the activation of local industrialized renovation markets within the five BuildUPspeed ecosystems: Austria, France, Italy, Spain and the Netherlands. The report documents how the project supported market activation through stakeholder engagement, Local Advisory Boards, soundboard activities, pilot projects, Pop-up Factory concepts, a European Market Activation Platform and benchmarking activities.

The BuildUPspeed project aimed to accelerate the uptake of industrialized, serial and circular renovation solutions by connecting technical innovation with practical market needs. Market activation was therefore understood not only as communication and dissemination, but as a process of creating awareness, building stakeholder networks, supporting knowledge exchange, testing solutions in real contexts and identifying conditions for replication and scaling.

An important role in this process was played by the Local Advisory Boards established in each ecosystem. These boards brought together relevant actors from the renovation value chain, including public authorities, housing providers, building owners, planners, contractors, manufacturers, financial actors, research organizations and innovation networks. They helped connect the project to local market realities, provided feedback on project results and supported the identification of barriers, opportunities and implementation pathways.

Across the five ecosystems, a wide range of activities was carried out to activate stakeholders and strengthen market uptake. These included conferences, workshops, trainings, site visits, expert meetings, working groups, exhibitions and online exchange formats. The activities helped disseminate the BuildUPspeed concepts, collect market feedback, raise awareness of industrialized renovation and circular construction, and connect demand and supply actors.

The market activation activities differed according to the specific context and maturity of each ecosystem. In **Austria**, the focus was on serial renovation with prefabricated façade modules, urban mining and re-use, the Re-Use Box as a Pop-up Factory concept, and the development of national market activation platforms. In **France**, the work concentrated on circular economy approaches, selective deconstruction, material reuse and a mobile on-site factory concept for sanitary equipment reconditioning. In **Italy**, the ecosystem focused on the Energiesprong approach, industrialized off-site retrofit, a satellite factory concept and the connection between demand, supply and financing in the social housing sector. In **Spain**, market activation was supported through pilot projects using industrialized timber construction, training activities, stakeholder events and the creation of a regional innovation cluster for industrialized construction in the Valencia Region. In **the Netherlands**, the work focused on post-war social housing renovation, circularity, education, pilot-related knowledge exchange and the testing of Pop-up Factory-related approaches in social housing contexts.

The pilot projects presented in the report show that industrialized renovation can be applied to a wide range of building types, including schools, student housing, multi-family residential buildings, social housing and public buildings. They also demonstrate that industrialized renovation is not only a technical approach, but requires coordination across planning, manufacturing, logistics, financing, regulation, resident communication and quality assurance.

The benchmarking exercise provides evidence on the benefits and remaining challenges of industrialized renovation and urban mining. A total of 11 completed benchmarking



templates were analyzed, including seven industrialized renovation cases and four urban mining cases. The results show that the clearest and most consistent benefit of industrialized renovation is the reduction of time on site. All industrialized renovation cases with available data performed better than their baseline in terms of delivery and productivity.

Energy and environmental performance also showed positive results in most industrialized renovation cases. Several pilots demonstrated substantial reductions in final energy demand, primary energy demand and greenhouse gas emissions. However, the benchmarking also showed that construction costs remain a major challenge. In all analyzed industrialized renovation cases, costs were higher than the selected reference values, reflecting the pilot character of many projects, differences in renovation scope, local market conditions and the still limited scale of implementation.

The results for materials, waste and circularity were more mixed, and data availability was lower. This indicates that more systematic data collection is needed to better demonstrate the circularity benefits of industrialized renovation. The quality, safety and people category could not yet be assessed quantitatively, as post-completion defect data were not available at the time of reporting.

The urban mining cases showed clear positive impacts in terms of material reuse, waste prevention, avoided disposal costs and job creation. The Austrian Re-Use Box cases and the French Palmer case demonstrate that structured recovery, documentation, redistribution and reuse of construction products can create environmental, economic and social value. These cases also show that Pop-up Factory logic can be applied not only to manufacturing or assembly, but also to logistics, sorting, checking, brokerage and reuse processes linked to deconstruction and renovation.

Overall, the report shows that BuildUPspeed has contributed to making industrialized, serial and circular renovation more visible, tangible and actionable for European market actors. The project has created stakeholder networks, strengthened local ecosystems, supported practical pilot implementation and generated evidence on the benefits and limitations of innovative renovation approaches.

The findings also highlight important conditions for future market uptake. These include stable pipelines of renovation projects, stronger business models, suitable procurement and financing mechanisms, technical standardization, quality assurance, digital support tools, continued stakeholder exchange and better performance data from implemented projects. By addressing these conditions, the results of BuildUPspeed can support the wider replication and scaling of high-quality, climate-neutral and resource-efficient renovation across Europe.

1 Introduction

This deliverable provides an overarching report on the activation of local industrialized renovation markets within the five BuildUPspeed ecosystems: Austria, France, Italy, Spain and the Netherlands. The report documents how the project engaged stakeholders, established Local Advisory Boards, activated soundboard groups, supported pilot activities and contributed to the development of market structures for industrialized, serial and circular renovation.

The BuildUPspeed project aimed to accelerate the uptake of industrialized renovation solutions by connecting technical innovation with local market needs, stakeholder networks and practical implementation pathways. Market activation is therefore understood not only as dissemination, but as a process of building awareness, creating exchange formats, involving relevant actors from demand and supply sides, testing solutions in real contexts and identifying conditions for replication and scaling.

An important role in this process was played by the Local Advisory Boards. These boards were established in each ecosystem to connect the project with local renovation markets and to provide feedback on the relevance, usability and market potential of the project results. In addition, broader soundboard activities, workshops, conferences, site visits, trainings and stakeholder meetings were organized to raise awareness, discuss barriers and opportunities, and support the uptake of industrialized renovation approaches.

Beyond stakeholder activation, the report also presents concrete market activation activities in the five ecosystems. These include realized and ongoing pilot projects, renovation with industrialized modules, circular construction and urban mining activities, implementation of Pop-up Factory concepts, development of local or national market activation platforms, and the establishment of regional or sectoral innovation structures. Together, these activities show how BuildUPspeed moved from conceptual development to practical engagement with local markets.

Finally, the report includes the results of the benchmarking performance of selected pilot cases. This benchmarking provides evidence on the benefits and limitations of industrialized renovation and urban mining approaches, focusing on aspects such as delivery time, cost, energy performance, circularity, material recovery and process-related impacts. The results help identify where industrialized and circular renovation already demonstrate clear advantages and where further development, standardization and data collection are still needed.

Structure of the Report

The report is structured into four main parts. Following this introduction, **Chapter 2** reports on the activation of the Local Advisory Boards in the five BuildUPspeed ecosystems. For each country, the chapter describes the formation of the LAB, the expertise represented and the activities carried out to engage LAB members and wider soundboard groups.

Chapter 3 presents the market activation activities in Austria, France, Italy, Spain and the Netherlands. It documents how each ecosystem addressed industrialized renovation, circular construction, pilot projects, Pop-up Factory concepts and market activation platforms according to its specific local context and market maturity.

Chapter 4 presents the results of the benchmarking performance of the pilot cases. It summarizes the methodological approach, gives an overview of the collected cases and discusses the results for industrialized renovation cases and urban mining cases.

Chapter 5 provides the overall conclusions of the report, summarizing the main findings from stakeholder activation, ecosystem activities and benchmarking, and reflecting on the contribution of BuildUPspeed to the wider market uptake of industrialized, serial and circular renovation in Europe.

2 Report on the Activation of Local Advisory Boards

In the first months of the BuildUPspeed project, Local Advisory Boards (LABs) were established for each of the five ecosystems, consisting of branch organizations, companies, SMEs, start-ups, and other interested parties. The purpose of these LABs is to provide advice on various aspects of the project, including the relevance and quality of the technical and scientific output, as well as the market and exploitation potential of the overall project. As ecosystem-based advisory structures, they play an important role in connecting the project to the realities of local renovation markets and in ensuring that the developed concepts respond to actual stakeholder needs.

The LABs serve as the core group linking stakeholders, owners and managers, and other relevant organizations and individuals directly involved in the pilot markets. They contribute to project meetings and working sessions, gain access to project results, and support the exchange of innovative ideas and discussions regarding the usability of the results and their further deployment and capitalization. In this way, the LABs do not only act as advisory bodies, but also as multipliers and interfaces between the project consortium and the market actors that are essential for future uptake and replication.

The composition of the LABs reflects the ambition of BuildUPspeed to involve relevant actors from across the renovation value chain and from different stakeholder categories. Important advisors from the relevant target groups, including branch organizations and sector representatives, help assess the relevance of project activities, the quality of the results, and the opportunities for implementation in their respective market environments. Their involvement strengthens the practical orientation of the project and increases its capacity to address ecosystem-specific barriers, opportunities, and priorities.

In addition to the Local Advisory Boards, national soundboard groups were used to gather direct input and feedback from regional and national markets. These groups were formed as more flexible and ad hoc stakeholder formats, discussing specific solutions, products, and services and providing feedback through conferences, workshops, and other exchange activities. The feedback collected through these soundboard activities helps fine-tune the project approach and supports alignment with regional and national market requirements. Together, the LABs and soundboard groups foster active engagement with relevant stakeholders, encourage collaboration and feedback, and help ensure that the project remains closely connected to the conditions and needs of the five ecosystems.

The following sections provide an overview of the Local Advisory Boards established in Austria, France, Italy, Spain, and the Netherlands, as well as a description of the activities carried out to activate them during the project. For each ecosystem, the chapter presents the formation of the LAB, the expertise represented, and the events, meetings, and exchange formats through which stakeholder involvement has been encouraged and structured over the course of the project.

2.1 Austrian Local Advisory Board

The Austrian Local Advisory Board plays a central role in connecting BuildUPspeed with the national renovation ecosystem and in responding to stakeholder needs in a targeted way. Bringing together actors from the public, demand, financial, supply, and design sides, the Austrian LAB supports the project with expertise on serial renovation, circular construction, and market development. The following section presents the formation of the Austrian LAB and the broad range of activities carried out to activate stakeholders and support the market uptake of the project concepts in Austria.



2.1.1 Formation of the Austrian Local Advisory Board

The Austrian local advisory board consists of the following members:

2.1.1.1 RENOWAVE.AT

Address: Mariahilfer Straße 89/22, 1060 Vienna, Austria

Contact Person: Ulla Unzeitig

Contact E-Mail: ulla.unzeitig@renowave.at

Category: public side

Expertise for the project:

RENOWAVE.AT is the innovation laboratory for climate-neutral building and neighborhood renovations throughout Austria since 1.1.2022. They are the independent point of contact for innovations in the renovation sector. Their goal is a livable & climate-neutral building sector and a renovation turbo for the construction and real estate industry.

2.1.1.2 I.IBW Institute for Real Estate

Address: Institut für Immobilien, Bauen und Wohnen GmbH, Postfach 2, A-1020 Vienna, Austria

Contact Person: Wolfgang Amann

Contact E-Mail: amann@iibw.at

Category: demand side

Expertise for the project:

Since its founding in 2000, the IIBW has dedicated an international network of experts to its research.

Thus, it builds a bridge between housing and real estate research, which is highly fragmented in the university or research sector, on the one hand, and politics and business on the other.

2.1.1.3 REENAG Holding AT

Address: Hagenmüllergasse 12/2, Vienna, Austria

Contact Person: Winfried Braumann

Contact E-Mail: W.Braumann@reenag.com

Category: financial side

Expertise for the project:

REENAG is a competence center for the development, financing, construction and operation of renewable energy power plants, as well as for the development and financing of energy efficiency measures. REENAG builds on the long term experience and expertise of its employees and partners. There are no geographical restrictions to the activities of REENAG. REENAG develops, implements and operates its own renewable energy power plants, and also offers its expertise to third parties via consulting services.

2.1.1.4 Towern 3000

Address: Vorberg 182, 8973 Schladming, Austria

Contact Person: Thomas Buchsteiner



Contact E-Mail: thomas.buchsteiner@towern3000.at

Category: supply side

Expertise for the project:

Having grown out of facade construction and still firmly anchored in the construction industry today, Towner 3000 has dedicated itself specifically to the increased marketing needs of this industry from the very beginning. Today, the threads of the network extend into all levels of the analog and digital communication world. The areas of expertise have crystallized over the decades from the most diverse tasks and job positions of the team members.

2.1.1.5 ROMM ZT

Address: Löwengasse 47a, 103 Wien

Contact Person: Thomas Romm

Contact E-Mail: thomas.romm@romm.at

Category: other – design side

Expertise for the project:

Arch. DI Thomas Romm dedicates himself to the topic of resources with a focus on the environmental effectiveness of planning and building. As an architect with expertise in circular economy he works on the eco-efficiency of mass flows. He teaches ecology for architects at the Academy of Fine Arts Vienna at the Institute for Art and Architecture.

2.1.2 Report on the Activation of Local Advisory Board in Austria

Table 1 provides an overview of the LAB and soundboard activities carried out in the Austrian ecosystem to engage relevant stakeholders and support the activation of the local renovation market. The listed activities illustrate the broad range of conferences, workshops, networking events, and exchange formats used to gather feedback, disseminate BuildUPspeed concepts, and strengthen collaboration with key actors in the Austrian construction and renovation sector.

Table 1: LAB and Soundboard Activities in Austria

No	Name of the Activity	Location	Date	Category	Attendees	Target Group	number of participants
1	Impact Days 2023	Graz, Austria (Seifenfabrik)	Oct 2023	Congress	LAB & SBG	construction companies, clients, research institutions, universities, government	300
2	Resource 2023	HOTEL IMLAUER & Bräu Salzburg, Rainerstraße	May 2023	Congress	SBG	economy, science, NGO, politics, legislative bodies	120

No	Name of the Activity	Location	Date	Category	Attendees	Target Group	number of participants
		e 12-14, Salzburg					
3	Mind:shift - Gebäude neu denken in Zeiten der Klimakrise	ÖAMTC Zentrale, Baumgasse 129, 1030 Wien	Mar 2023	Congress	SBG	companies	100
4	Drive 0 Symposium	European Comittee of the Regions, Rue Belliard 99/101, 1040 Brussels	Nov 2023	Congress	SBG	economy, science, city planners, EU policy stakeholders	50
5	Kreislaufmanger Bau	Innsbruck and Vienna	Mar 2023/ Apr 2023	Other	SBG	stakeholder construction (consultant, construcion companies)	3x30
6	Soundboard activity with Wood Construction	Graz	Nov 2023	Other	LAB/ SBG	Stakeholder wood Construction	18
7	ISEC Conference	Graz	Apr 2024	Congress	SBG	economy, science, ngo, politics, legislative bodies	400/10
8	Buying Social and Circular - Social Enterprises and Private Sector Partnerships Workshop	Brussels	Apr 2024	Workshop	SBG	Social businesses and companies	Ca. 50
9	Freitag-Akademie MODUL 1 0 3 Nachhaltig und zirkulär	Vienna	Apr 2024	Academy	SBG	non-profit housing developer	25



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No	Name of the Activity	Location	Date	Category	Attendees	Target Group	number of participants
10	Follow Up: Soundboard/Local Advisory Board activity with Wood Construction	Graz	Sep 2024	Workshop	SBG/LAB	Stakeholder Wood Construction	40
11	Mission Innovation Austria	Stegersbach/Austria	Oct 2024	Conference	SBG	Stakeholder	200/40
12	Impact Days 2024	Hallein/Austria	Oct 2024	Conference	SBG	Construction Companies, Housing Owners, Policy	300/60
13	1 st Exhibition serial Renovation	Hallein/Austria	Oct 2024	Exhibition/Conference	SBG	Construction Companies, Housing Owners, Policy	300
14	Kreislaufwirtschaft im Bauen, Weiterbauen und Rückbauen von Gebäuden	Vienna	Oct 2024	Workshop	LAB	Stakeholder and Municipality	30
15	Re_use Linz	Linz	Oct 2024	Conference	SBG	Stakeholder	150
16	Excursion of the Austrian Society for Sustainable Building	Vienna	Apr 2025	Excursion	LAB	Stakeholder	30
17	Impact Days 2025	St. Pölten	Nov 2025	Conference	SBG	All stakeholders	300
18	The Impact of Social Urban Mining on a	Online, Austria	Nov 2025	Webinar	LAB	Stakeholder	60

No	Name of the Activity	Location	Date	Category	Attendees	Target Group	number of participants
	Building Certification System						
19	Live Demo Grüne Gasse	Graz	Dec 2025	Workshop/Site-Visit	SBG	Stakeholder and Municipality	40
20	Live Demo Knittelfeld	Knittelfeld	Feb. 2025	Workshop/Site-Visit	SBG	Stakeholder and Municipality	40
21	Live Demo Arenberggasse	Vienna	Nov. 2025	Workshop/Site-Visit	SBG	Stakeholder and Municipality	40
22	Forum serielle Sanierung (4x)	Online	Oct.2025	Workshop	SBG	Stakeholder and Municipality	30-60
23	ISEC Conference 2026	Graz	April 2026	Conference	SBG	industry, science, ngo, politics, legislative bodies	550

2.1.2.1 Impact Days 2023

Date: 17th/18th October 2023

Location: Graz, Austria (Seifenfabrik)

Participants: 200 in total / 40 in the BuildupSpeed workshop

Goal: Knowledge exchange with different stakeholders, feedback on the BuildUpspeed concepts from LAB &SBG

Description:

On October 17 and 18, 2023, the Impact Days, the first renovation congress in Austria, took place. With over 300 participants on two days, all relevant stakeholders of the Austrian renovation branch were represented. A major focus of the event was the renovation with prefabricated modules. Thus, the Austrian Ecosystem used this opportunity and organized a BuildUPpeed Workshop as a first Soundboard group event. We also invited the Local Advisory Board to the Workshop. During the workshop the barriers and needs as well as critical risks and local challenges to deep renovation in Austria were asked and discussed. Subsequently, the project and the concepts were presented in order to get first feedback from the main stakeholders. The findings are very essential for the further approach of the

project and the Austrian market was informed and educated about the BuildUPspeed concepts.



Figure 1: BuildUPspeed Workshop at the Impact Days (© Christof Hütter)

The results of the Mentimeter surveys conducted during the workshop are summarized below:

1. What are the measures that contribute to increasing the renovation rate in Austria?

- Increase funding
- Legal framework conditions
- favorable financing
- Reduce construction costs
- Reduce bureaucracy
- Obligation to renovate
- Stricter/clearer regulatory measures
- Raise awareness
- Technology development
- Life cycle assessment
- Simplify funding applications
- Prohibit new construction
- Make refurbishment refinanceable through rent
- Unrenovated buildings lose value
- Amend MRG, WEG
- Structuring the funding opportunities
- Rising energy prices
- Further training
- Renovation certificate as an incentive system
- Training in schools
- Good studies

2. What makes refurbishment difficult in Austria?

- WEG, MRG
- Lack of framework conditions
- Construction costs
- Cost development
- Will and know-how of planners
- laws
- Approval procedures
- Insufficient experience
- Technical aspects take priority over social and building culture decisions
- Workforce
- Regulations too rigid
- Densification must be facilitated

3. Which Pop-Up Factory concept do you think is most realistic for Austria?

- District PuF (2x)



- On site Factory (5x)

4. Are there any examples of the PuF-concept being implemented in Austria?

- Seestadt Aspern
- Road Construction
- Prefabricated house production,
- On-site window renovation in parliament
- Tiny houses production
- 3D print models
- Wind farm production

5. What professional points of contact do I see with the PuF concepts?

- Certification
- Promotion
- Reuse of materials
- Construction site traffic
- Advice and knowledge transfer as a central point of contact or digitally supported

6. What do you want to find on the MAP?

- Concepts
- Kooperations
- Products
- Information about refurbishment processes
- Quick Check of potential of a building for prefabricated renovation
- Laws

2.1.2.2 Re-Source 2023

Date: 4th and 5th of May 2023

Location: Salzburg, Austria

Participants: 80-100

Goal: Transnational exchange of experience on topics related to the circular economy and resource conservation, knowledge exchange between DACH-countries (esp. legislative bodies)

Description:

The focus of the sixth expert conference "Resource Conservation - from Idea to Action" was on the transnational exchange of experience on topics related to the circular economy and resource conservation as well as the further development of waste management. In their presentations, expert speakers outlined approaches and strategies for sustainable resource management and showed options for implementation in practice.

Organized by the environmental ministries and federal offices of Germany, Switzerland and Austria the topics ranged from resource conservation in the construction industry and the strengthening of plastics recycling to circular textiles, the avoidance of food waste and sustainable consumption patterns. Participants from business, science, politics, NGOs and administration discussed trends and political directions for resource-saving business and life in Austria, Germany and Switzerland.

The conference was aimed at experts from business, science, politics, NGOs and administration in the fields of waste management, resource conservation, sustainable products and consumption.

More information here: <https://www.umweltbundesamt.at/news230505>



2.1.2.3 Mind:shift - Gebäude neu denken in Zeiten der Klimakrise

Date: 16th of March 2023

Location: Vienna

Participants: 180-200

Goal: Exchange options and challenges in the transformation of the building sector

Pics are available here: <https://www.yard-forum.at/termine/mindshift-gebaeude-neu-denken-in-zeiten-der-klimakrise/>

Description:

On 16 March, the event organized by FCP, M.O.O.CON and ClimatePartner took place at the ÖAMTC headquarters in Erdberg.

The aim was to give decision-makers from various corporate divisions an understanding of the possible levers for achieving the climate goals. The event focused on three main areas - the design, use, and operation of office and production sites.

FCP provided the participants with concentrated expertise on the topics of digitalization, energy efficiency, circular economy, and life cycle analysis. This took place within the framework of Deep-dive impulse lectures and discussion contributions in the morning and through the organization of the workshop discussion "Thinking about cycles and life cycles" together with Markus Meissner from BauKarussell.

2.1.2.4 Drive 0 Symposium

Date: 15th of November 2023

Location: Brussels, Belgium

Participants: 60 stakeholders from Brussels' diverse sectors: EU institutions working in the field of policy, construction, architecture, energy, manufacturing, social housing, property owners' associations

Goal: Transfer the research orientated knowledge into the operational sector

Description:

In December 2023, the Drive 0 project organised **the final symposium and clustering workshop on 15th November 2023 in Brussels**. This full-day titled: '*Fostering experiences from EU innovation projects to accelerate a sustainable built environment*' was organised in collaboration with Drive 0 sister projects: PLURAL, GigaRegioFactory, STEP-UP, INFINITE, BuildUPspeed. The aim was to reflect together with these other relevant EU projects on the profound impact of the developed innovative construction and renovation solutions drawing insights from experiences on the ground. The event explored emerging trends like prefabrication, circularity, off-site construction, modularization, digitalization, and industrialisation.

As one ***illuminating opportunity to unleash the solutions market potential*** BauKarussell highlighted the social urban mining approach and how it raises the visibility of waste and the linked economic values.

Source: https://www.drive0.eu/wp-content/uploads/2024/02/DRIVE-0_2023-Symposium-Report.pdf



2.1.2.5 Kreislaufmanager Bau

Date: Three lectures on 3rd of February, 24th of February and 27th of April 2023

Location: Innsbruck (twice) and Vienna

Participants: 77 employees from 43 SMEs

Goal: Transfer the research orientated knowledge into the operational sector

Description:

The main objective of the project was to provide employees from SMEs and JVs in the construction sector (building and civil engineering, construction planning, brick and concrete manufacturers, timber construction) with research-oriented knowledge, case studies and concrete recommendations for action for a circular future.

Waste from the construction sector is the largest waste stream in Austria. Within the framework of sustainable and resource-saving development, these waste quantities must be reduced, and the recycling rate increased. This is because the circular economy not only leads to a significant reduction in the burden on the environment, it also has clear economic advantages. To the extent that construction companies succeed in keeping valuable raw materials in the cycle, dependence on expensive raw materials is reduced and the dependence on expensive raw material imports decreases. Closing loops requires specific know-how. For this reason, information on the circular economy in construction is urgently needed in education and training.

More information: <https://www.uibk.ac.at/de/weiterbildung/projekte/kreislaufwirtschaft/>

2.1.2.6 Soundboard Activity with Wood Construction Companies

Date: 23rd of November 2023

Location: Graz, Austria

Participants: 18

Goal: Networking and educating the national timber construction industry in order to familiarize them with the business field of serial refurbishment.

Description:

As part of the workshop, which was organized in cooperation with our Local Advisory Board member RENOWAVE.AT and Holzcluster Steiermark, we invited all precast element manufacturers in Austria. The timber construction industry in Austria is experiencing a sharp decline in orders for new buildings. It is time to open up new business areas. Thanks to their many years of expertise in prefabricated construction, serial renovation is a potential business area for them. As part of the workshop, the AEE presented serial refurbishment, including all the incentives and obstacles. The large group then worked on a joint strategy for market entry.



Figure 2: Workshop with Wood Construction Stakeholders ©AEE INTEC



Figure 3: Workshop with Wood Construction Stakeholders ©AEE INTEC

2.1.2.7 ISEC conference 2024

Date: 10th of April 2024

Location: Graz Austria

Participants: 10 out of 400 conference participants

Goal: Knowledge exchange with relevant players that have energy efficiency as their first target, evaluation PuF-Concept

Description:

The 3rd International Sustainable Energy Conference 2024, on Renewable Heating and Cooling in Integrated Urban and Industrial Energy Systems took place in Graz, Austria. A total of 400 experts* from science, industry and politics from 35 countries attended the conference which offered a high-caliber audience from research, industry, commerce, the energy sector, public administration, and politics the opportunity to take an in-depth look at the pressing issue of energy sovereignty, which is being driven by climate change and political guidelines. In seven Key-note speeches, 77 oral presentations, 105 poster contributions, and intensive discussions, the experts explored how research findings can be translated into concrete measures for the energy transition.

One side session was organised by the BuildUPspeed Team (ABT, DEMO, AEE INTEC and AIE). After the input related to the PuF-Types and the interpretation of the Type "mobile on-site factory" for the AIE spin of "BauKarussell" the participants discussed challenges, options and chances within the circular transformation.



Figure 4: BuildUPspeed workshop at ISEC conference © Meissner



Figure 5: BuildUPspeed workshop at ISEC conference © Elagiry



2.1.2.8 Buying Social and Circular

Date: 18th of April 2024

Location: Brussels, Belgium

Participants: 50

Goal: Knowledge exchange with other social enterprises, their business partners and the EU commission, opportunities and challenges of scaling up partnerships between the private sector and social enterprises

Description:

The project Buying Social and Circular – Social Enterprises and Private Sector Partnerships (BuySocCirc)“ aims to incentivise, support, and accelerate social circular enterprises’ access to private procurement. With RREUSE (the umbrella organisation of social enterprises in Brussel) in the lead, the eight-member consortium examines current practices and deliver their practical, on-the-ground, expertise on setting partnerships with the private sector.

One activity of the project was an exchange workshop in Brussels to dive into the opportunities and challenges of scaling up partnerships between the private sector and social enterprises. Extending product lifetime through re-use has a significant positive social and environmental impact, as BauKarussell is well aware of. Re-use is a powerful catalyst to create local jobs and strengthen the local economy all the while preventing resource waste and pollution. When operated by social enterprises, these activities offer additional job and training opportunities for individuals of all skill levels and backgrounds, including the most vulnerable groups in our communities.

To help establish and scale partnerships between private companies and social enterprises, the BuySocCirc project workshop brought together representatives from the social economy and mainstream business (like BauKarussell) to discuss success factors, barriers and opportunities to scale up and develop new partnerships in the circular economy.

(see also <https://rreuse.org/events/buying-social-and-circular-social-enterprises-and-private-sector-partnerships-workshop/>)

2.1.2.9 Freitag-Akademie

Date: 26th of April 2024

Location: Vienna

Participants: 25

Goal: Awareness building for CEOs of non-profit housing developers and credit institutes, Education

Description:

In addition to education and advice, the Wohnen Plus Akademie offers the Freitag Academy format for managers and the practical check with industry insiders. Current topics of relevance to the sector and social policy are discussed in the focal points of the housing industry. Learning from and with each other is the focus of Netzwerk plus, a format that highlights the challenges of the various areas in a housing company.

BAuKarussell was one of four key inputs. The second phase of the workshop was used to exchange and collect challenges, options and potential that will arise with the transformation.



Figure 6: Freitag Akademie © Wohnenplus

2.1.2.10 Follow Up: Soundboard/Local Advisory Board activity with Wood Construction Companies

Date: 24th September 2024

Location: Graz, Austria

Participants: 40

Goal: Expanding the expertise of Austrian timber construction companies: How can building services be integrated into the timber façade?

Description:

In order to accelerate the renovation rate in Austria, the aim is to establish serial renovation on the market. To achieve this, the BuildUpspeed project is working intensively with Austrian timber construction companies to provide them with the necessary expertise to enter the market. Together with our LAB member RENOWAVE.AT, we organized this workshop to give companies an understanding of serial refurbishment.

AEE INTEC was in charge of organizing and moderating the workshop with the LAB member and providing input.



Figure 7: LAB activity with wood construction companies in Graz © AEE INTEC

2.1.2.11 Presentation at Mission Innovation Austria

Date: 10th October 2024

Location: Stegersbach, Austria

Participants: 200 total/ 40 Workshop

Goal: Knowledge exchange with the industry, presentation of the positive effect of serial refurbishment in relation to the heating transition in Austria

Description:

The heat transition in Austria was discussed at Mission Innovation Austria. The aim was to clearly demonstrate that serial refurbishment must be a key component here if we are to achieve our climate targets. AEE INTEC was able to present the special features of serial refurbishment



Figure 8: Cornelia Ninaus (AEE INTEC) presents at Mission Innovation Austria © AEE INTEC

2.1.2.12 RENOWAVE.AT Impact Days 2024

Date: 23/24th October 2024

Location: Hallein Austria

Participants: 300/60 Session

Goal: Knowledge exchange with all relevant players for serial refurbishment

Description:

Together with our LAB member RENOWAVE.AT, a focus was placed on serial refurbishment as part of the annual IMPACT DAYS (conference with over 300 participants). The aim was to disseminate this new approach as widely as possible to accelerate the renovation rate in Austria. AEE INTEC was allowed to give a presentation on the topic of building technology integration into the façade.



Figure 9: RENOWAVE.AT Impact Days © RENOWAVE.AT

2.1.2.13 1st Exhibition for Serial Renovation in Austria

Date: 23/24th October 2024

Location: Hallein Austria

Participants: 300

Goal: Knowledge exchange and Market activation in Austria

Description:

Together with our LAB member RENOWAVE.AT, we have launched the first Austrian exhibition on serial refurbishment. Over two days, clients and contractors had the opportunity to get to know each other. The exhibition offered a simple and uncomplicated way to get to know the innovative refurbishment approach, as well as the associated providers and the opportunity to ask questions. The exhibition was rounded off with a speed meeting at which all stakeholders were able to network.



Figure 10: Exhibition at RENOWAVE.AT Impact Days © RENOWAVE.AT

AEE INTEC was not to be missed as an exhibitor and also gave guided tours through the various exhibitors to make the approaches on the Austrian market easier to understand.

2.1.2.14 Kreislaufwirtschaft im Bauen, Weiterbauen und Rückbauen von Gebäuden

Date: 24th October 2024

Location: Vienna Austria

Participants: 30

Goal: Knowledge exchange and market activation in Austria

Description:

The Urban Living Lab Circular Building Vienna deals with the establishment of a circular economy in the construction industry, specifically with the transfer of theory into practice. Workshops and formats that build on each other are used to intensively examine how the principles of the circular economy can be applied in planning, new construction, renovation and use ("practice check"). The focus is on the specific requirements of circular construction and how these can be implemented in practice. From fall 2024, the Urban Living Lab will concentrate on the "practice check" in a total of four focus group workshops. The target group is primarily planning and construction practitioners as well as stakeholders from academia.



In the second workshop “Circularity in building, rebuilding and demolishing buildings”, our LAB representative Thomas Romm was able to present the potential and challenges of circular demolition.

2.1.2.15 re_use Linz – Kick Off Conference

Date: 24th October 2024

Location: Linz Austria

Participants: 150

Goal: Knowledge exchange and Market activation in Austria, Networking

Description:

Large construction companies, the city and Linz AG want to become a model region for a climate-friendly construction industry until 2040.

re_use Linz is an initiative of the City of Linz and LINZ AG, in which all relevant stakeholders in the greater Linz area (e.g. companies of the City of Linz, construction companies, private developers, NGOs, interest groups, research institutions) develop and coordinate the necessary measures to achieve this goal.

The initiative was officially launched on Thursday with a conference attended by over 150 participants from the construction industry - building contractors, energy suppliers, and civil engineers. “re_use Linz” is intended to be a platform on which public and private players can jointly define and exchange ideas on the parameters for the further development of the construction industry towards climate neutrality.

BauKarussell stood as one of ten best practice examples of the already possible uses.

(Source: <https://reuselinz.at/> and <https://kurier.at/chronik/oberoesterreich/klimaneutrale-bauwirtschaft-linz-recycling-projekt-re-use/402966848>)

2.1.2.16 Excursion of the Austrian Society for Sustainable Buildings

Date: April 17th 2025

Location: Vienna, Austria

Participants: app. 20

Goal: Informing participants about the challenges and potentials of Re-Use and the Re-Use Box within the organisation’s certification system

Description: Comprehensive building certification is a versatile tool in times of climate crisis. It defines quality standards, highlights the sustainability targets achieved and thus enables individual buildings to be compared with one another. Since its initial development in 2002, the certification system used by the ÖGNB has represented a comprehensive solution for Austrian building certification. The breadth of its content is comparable to other national and international systems and is compatible with international standards for promoting the sustainability of buildings. The ÖGNB criteria.

The field trip gave members a practical insight and provided an opportunity for discussion based on their observations of a real-life Re-Use Box operation. Particular emphasis was placed on the interfaces involved in reuse and the criteria for certification.



Figure 11: The participants of the excursion to an active Re-Use-Box © left: BauKarussell, right: Joanna Pianka

2.1.2.17 RENOWAVE AT Impact Days 2025

Date: 12th – 14th November, 2025

Location: St. Pölten, Austria

Participants: approx. 300

Goal: strengthen exchange between market actors and supported the further activation of the Austrian renovation market by making concrete solutions, cooperation opportunities and scalable approaches for climate-neutral renovation more visible.

Description:

The RENOWAVE.AT Impact Days 2025 took place from 12 to 14 November 2025 in St. Pölten and served as one of Austria's central events for sustainable, climate-neutral building renovation. The event brought together experts from research, industry, politics, public administration and civil society to discuss how renovation can become more efficient, affordable and climate-friendly.

The programme included keynotes, workshops, project presentations, best-practice examples and networking formats. Main topics included serial renovation, energy-efficient refurbishment, circular construction, financing, renovation strategies and practical solutions for increasing the renovation rate in Austria. The event was complemented by the Exhibition on Serial Renovation, which presented innovative products, processes and implementation examples.

AEE INTEC contributed to the RENOWAVE.AT Impact Days 2025 with a presentation by Cornelia Ninaus in the session "Trend Focus: Serial Renovation". The presentation introduced the SeRenoWood project and supported the exchange on practical approaches for serial renovation in Austria.

The RENOWAVE.AT Impact Days 2025 again included an exhibition on serial renovation, providing companies and solution providers with the opportunity to present practical products, systems and approaches for industrialized refurbishment. The exhibition complemented the conference programme and supported direct exchange between building owners, planners, construction companies and technology providers.



2.1.2.18 The Impact of Social Urban Mining on a Building Certification System

Date: 13th November 2025

Location: Online webinar

Participants: app. 60 members of the Association Austrian Society for Sustainable Building

Goal: The aim of the event was to explore the connections between social urban mining and building certification systems.

Description:

The webinar covered the activities and impacts of social urban mining, including the Re-Use Box, and highlighted its connection to the building certification system of the Austrian Society for Sustainable Building. Within the broad criteria catalog, Social Urban Mining is reflected in the criteria for integrated planning, waste management on the construction site, the use of recycled and reused building materials, and the demolition concept. Being applied it supports efforts toward quality and sustainability in demolition, new construction, and renovation in several areas.

The Austrian Sustainable Building Council (ÖGNB) was initiated and founded in Austria in January 2009, by a number of renowned and independent institutions in the field of sustainable building. Comprehensive building assessment defines quality standards, makes achieved sustainability goals visible, and thus allows individual buildings to be compared with one another. Its scope is comparable to other national and international assessment systems and is compatible with international standards for promoting the sustainability of buildings.

2.1.2.19 Live Demo Grüne Gasse Graz

Date: 5th December 2025

Location: Graz, Austria

Participants: more than 40 representatives from the real-estate and housing sector, construction industry, research organisations and public administration

Goal: demonstrate the practical implementation of serial renovation method on a real building, facilitate exchange among market actors, and discuss financing, scalability and market activation of serial renovation in Austria.

Description:

On 5 December 2025, a live demonstration event on serial renovation was organised in Graz, Austria, bringing together more than 35 representatives from the real-estate and housing sector, construction industry, research organisations and public administration. The event provided participants with the opportunity to experience an implemented serial renovation solution directly on site and to exchange views on the future market development of industrialised renovation approaches in Austria.

The demonstration showcased a highly efficient renovation concept based on modular prefabricated façade elements that integrate multiple technical functions, including ventilation, photovoltaic systems and heat-pump technology. The approach illustrates how industrialised renovation processes can reduce on-site construction time while improving building energy performance and occupant comfort.

The event included presentations and an expert discussion addressing key topics for the market uptake of serial renovation, including financing mechanisms, regulatory

frameworks, standardisation opportunities and digitalisation of planning and construction processes. Participants discussed the significant potential of serial renovation for large existing residential buildings due to its rapid implementation, high quality, low disruption for occupants and contribution to climate-neutral building renovation.

The demonstration building, a six-storey student residence in Graz, served as a practical example of the performance and implementation potential of serial renovation. Renovation measures included the integration of prefabricated façade modules, renewable energy technologies and building-system upgrades. Project results presented during the event showed substantial improvements in the building envelope and energy performance, including a significant reduction in heating demand and enhanced thermal comfort.

The event facilitated knowledge exchange among key market actors and provided a platform to discuss pathways for scaling up serial renovation in Austria. Particular attention was given to the financial and regulatory conditions required for wider market adoption, as well as the role of standardisation and industrialisation in reducing costs and accelerating renovation rates. Through the combination of a real-life demonstration and expert dialogue, the event contributed to increasing awareness, strengthening stakeholder networks and supporting the market uptake of serial renovation solutions.



Figure 12: Live Demo for interested stakeholders at Grüne Gasse © AEE INTEC

2.1.2.20 Live Demo Knittelfeld

Date: 25 Februar 2025

Location: Landesberufsschule Knittelfeld, Austria

Participants: more than 40 representatives from the real-estate and housing sector, construction industry and public administration

Goal: increase awareness and market acceptance of serial renovation solutions through a live demonstration, facilitate knowledge exchange among key stakeholders, and discuss pathways for scaling up industrialised renovation approaches in Austria.

Description:

On 25 February 2025, a live demonstration event on serial renovation was held at the campus of the vocational school Landesberufsschule Knittelfeld in Austria. The event brought together more than 40 representatives from the real-estate and housing sector, construction industry and public administration to experience industrialised renovation solutions in practice and discuss their potential contribution to accelerating the energy renovation of existing buildings.

The demonstration showcased the installation of prefabricated façade modules on a building undergoing renovation. Participants were able to observe the assembly process in real time, including the integration of building services and technical interfaces. Particular attention was given to the construction details, material solutions and the highly efficient installation process, which required only a small assembly team and generated virtually no construction waste on site.

In addition to the live installation, participants visited a recently renovated school building on the same campus. The visit provided practical insights into the architectural, technical and operational benefits of industrialised renovation approaches. Special interest was shown in the innovative ventilation concept, which combines decentralised ventilation units integrated into façade elements with central heat recovery solutions.

The event also included expert presentations covering technical, architectural and market-related aspects of serial renovation. These contributions provided a basis for discussions on implementation strategies, standardisation, life-cycle cost considerations and opportunities for broader market deployment.

The concluding discussion highlighted the growing recognition of serial renovation as an important solution for addressing upcoming renovation challenges in the building sector. Participants emphasised the need for additional implementation projects to generate economies of scale, further standardisation of planning and construction processes, and stronger collaboration across the value chain. The importance of life-cycle cost assessments and improved knowledge-sharing mechanisms was also identified as a key factor for supporting market uptake.

The event contributed to raising awareness of industrialised renovation solutions, strengthening networks among relevant stakeholders and encouraging further market activity. Several participants indicated ongoing preparations for future serial renovation projects within their own building portfolios, demonstrating increasing interest in the approach and its potential for large-scale deployment in Austria.



Figure 13: Participants of Live Demo for interested stakeholders in Knittelfeld © Klimafonds / Krobath



2.1.2.21 Live Demo Arenberggasse

Date: 14th November 2025

Location: Arenberggasse, Vienna, Austria

Participants: more than 40 representatives from the real-estate and housing sector, construction industry and public administration

Goal: showcase practical applications of serial renovation, promote knowledge exchange among market actors, and discuss the technical, regulatory and economic conditions required for large-scale deployment of industrialised renovation solutions.

Description:

On 14 November 2025, a live demonstration event on serial renovation was held in Arenberggasse in Vienna. The event brought together more than 40 representatives from the real-estate and housing sector, construction industry and public administration to experience innovative renovation solutions directly on site and discuss their potential contribution to accelerating the energy transition in the building sector.

The demonstration focused on the renovation of a six-storey residential building dating from 1977 and comprising 24 apartments. Participants observed the implementation of a serial renovation approach based on prefabricated, multifunctional façade modules. These modules integrate thermal insulation and building services technologies while enabling active heating and cooling through the building envelope. The installation process was completed within less than ten days, demonstrating the speed and efficiency achievable through industrialised renovation methods.

The event highlighted the substantial energy and climate benefits of the renovation concept. Presented results indicated a reduction in heating demand of approximately 80%, the replacement of fossil-fuel-based heating systems with heat pumps combined with photovoltaic generation, and a significant reduction in annual CO₂ emissions. The approach also demonstrated how deep renovation can be carried out with minimal disruption for residents through clean and highly organised construction processes.

Expert presentations provided insights into technical solutions, implementation experiences and lessons learned from practical application. These contributions formed the basis for a moderated discussion addressing key challenges and opportunities for wider market adoption of serial renovation.

Discussions focused on topics such as standardisation, process optimisation, funding mechanisms, resident engagement and regulatory requirements. Participants emphasised the importance of adapting legal and planning frameworks to better support prefabrication, industrialised construction methods and standardised renovation processes. The event also highlighted the critical role of early stakeholder and resident involvement in ensuring acceptance and successful implementation of renovation measures.

A further topic of discussion was the transferability of serial renovation solutions to other building segments. Participants identified educational buildings as a particularly promising application area, where energy-efficiency improvements can be combined with modern ventilation concepts through standardised and prefabricated solutions.

The event provided a valuable platform for exchange between building owners, housing providers, public authorities, planners and technology experts. By demonstrating a completed renovation project under real-life conditions and facilitating dialogue among key stakeholders, the event contributed to raising awareness, strengthening market confidence and supporting the broader uptake of serial renovation solutions in Austria.



Figure 14: Participants of Live Demo for interested stakeholders in Vienna © Klimafonds / Krobath

2.1.2.22 Forum Serial Renovation Austria

Start: 22nd October 2025

Format: online

Frequency: bimonthly

Initiated by: AEE INTEC together with RENOWAVE.AT (Local Advisory Board member)

Participants: approx. 30–60 representatives per session from research, industry, planning, housing sector and public administration

Goal: establish a continuous platform for structured knowledge exchange on serial renovation, support the transfer of project experience into scalable solutions, and foster dialogue between key actors along the renovation value chain.

Description

The Forum Serial Renovation Austria was established by AEE INTEC together with RENOWAVE.AT as a recurring platform for structured exchange on key questions related to industrialised and serial renovation. The forum takes place every two months in an online format and brings together stakeholders from research, industry, planning and implementation to discuss current developments, technologies, project experiences and open technical, economic, regulatory and organisational questions.

The aim of the forum is to consolidate dispersed knowledge from individual projects, make it visible and collectively develop it further. In particular, it supports the identification of recurring challenges and the derivation of solutions that can enable the broader application and scaling of serial renovation approaches in Austria and beyond.

Since its launch, four forum sessions have been held, each focusing on different aspects of serial renovation:

The first forum (22 October 2025, approx. 57 participants) focused on framing the conditions for scaling serial renovation in Austria. A central topic was the presentation of the MasSan study, which examines technical, economic, legal and organisational prerequisites for broader implementation. Key discussion points included suitable building typologies, financing and subsidy mechanisms, regulatory barriers and the development of market structures. The discussion addressed fundamental questions such as which

buildings are most suitable for serial renovation and how pilot experiences can be translated into large-scale deployment.

The second forum (17 December 2025, approx. 50 participants) focused on a concrete implementation example and enabling technologies. A recently completed renovation project in Vienna was presented alongside an innovative system solution for façade-integrated building energy systems. The discussion addressed practical implementation aspects, including regulatory constraints in dense urban areas, construction processes, façade installation techniques and system-based heating and cooling concepts. The exchange highlighted the importance of real-world projects for understanding technical feasibility and regulatory challenges.

The third forum (18 February 2026, approx. 33 participants) focused on lessons learned from completed demonstration buildings across Europe. The discussion centred on the transferability of industrialised renovation solutions, including prefabricated façade systems, digitalisation approaches and integrated building technologies. Participants emphasised the importance of practical experience, particularly regarding construction processes, involved stakeholders and real implementation conditions. The session provided valuable insights into what works under real-world conditions and which aspects need to be considered early in future projects.

The fourth forum (22 April 2026) presented the SeRenoWood project, focusing on ongoing developments such as building assessment tools, typology definition, reference module development, portfolio analysis and functional planning approaches. The session will provide a platform to discuss early results, exchange feedback and support the further development of scalable serial renovation solutions.

Overall, the Forum Serial Renovation Austria has established itself as a regular exchange format that strengthens collaboration between key stakeholders, supports knowledge transfer from pilot projects into broader application, and contributes to accelerating the market uptake of serial renovation approaches through continuous dialogue and shared learning.

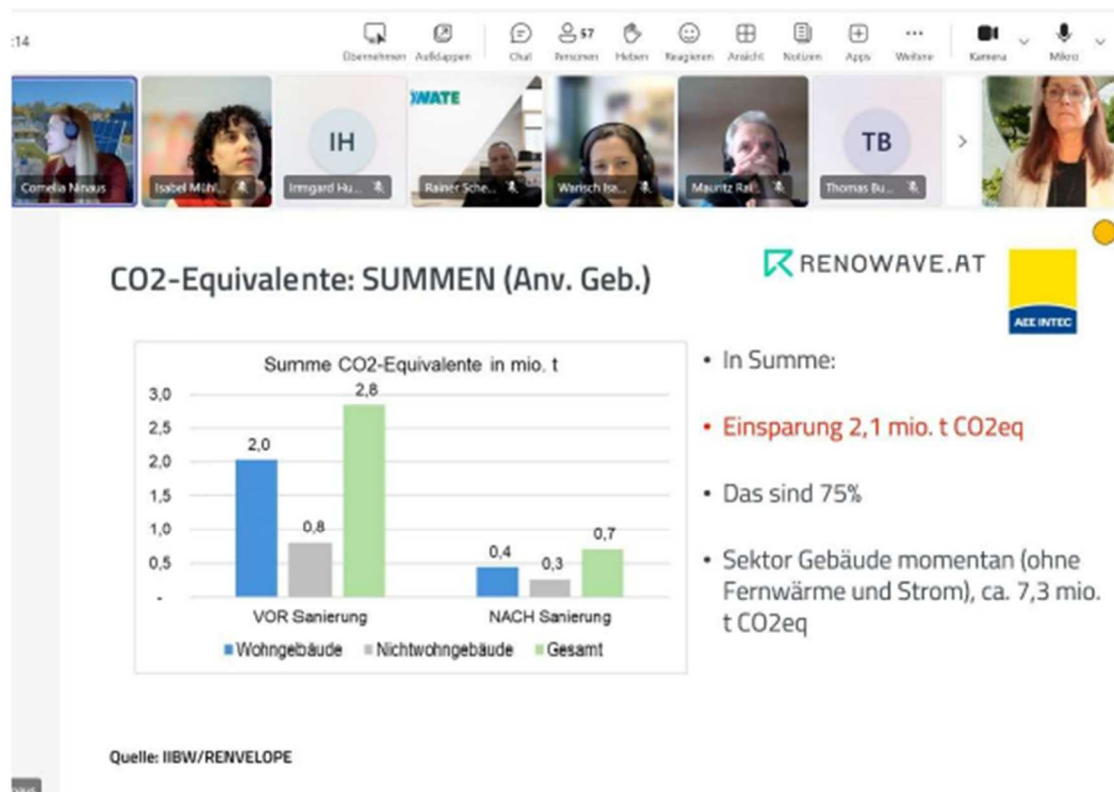


Figure 15: Screenshot Forum Serielle Sanierung © RENOWAVE.AT



2.1.2.23 ISEC 2026

Date: 14th – 16th April 2026

Location: Graz, Austria

Participants: 550

Goal: Dissemination of serial and circular renovation topics, exchange between research, industry and policymaking

Description:

ISEC 2026 in Graz was organized by AEE INTEC and provided an important platform for disseminating the topics of serial and circular renovation within the wider context of sustainable energy systems and the decarbonisation of the building stock. Through presentations, posters and discussions on industrialised renovation approaches, prefabricated façade systems, resource efficiency and innovative business models, the conference helped connect research findings with practical implementation needs. By bringing together experts from science, industry and policy, ISEC 2026 contributed to raising awareness of serial and circular renovation as key strategies for accelerating high-quality, scalable and climate-neutral building renovation in Europe.

2.2 French Local Advisory Board

2.2.1 Formation of the French Local Advisory Board

The French Local Advisory Board consists of the following members:

2.2.1.1 GIP GPV

Address: Résidence Beausite, Rue Marcel Paul Bâtiment B0, 33150 Cenon

Contact Person: Maxime DERRIEN

Contact E-Mail: maxime.derrien@surlarivedroite.fr

Category: Public side

Expertise for the project:

The GPV Rive Droite is a public territorial engineering agency that has been working for over 20 years alongside the cities of Bassens, Lormont, Cenon, and Floirac to enhance the quality of life, promote economic development, and foster ecological transition. This is done with a continuous commitment to social justice, involving numerous partners, funders, and stakeholders both within and outside the territory.

2.2.1.2 ODEYS

Address: 6 All. du Doyen Georges Brus, 33600 Pessac

Contact Person: Thomas Ranchou

Contact E-Mail: t.ranchou@odeys.fr

Category: other – Networking side

Expertise for the project:

Odeys is the construction cluster of Nouvelle-Aquitaine, a network bringing together numerous stakeholders in the construction and materials industry. Odeys supports industry players in their innovation initiatives and projects, fostering human and professional



synergies through its network. It plays a significant role in the development and support of sustainable construction, particularly focusing on the theme of circular economy.

2.2.1.3 EnergieSprong FR

Address: 7-11 boulevard Haussmann - 75009 Paris

Contact Person: Pierre-Antoine DUFFRENE

Contact E-Mail: paduffrene@greenflex.com

Category: Other – Market development side

Expertise for the project:

The European Energiesprong movement aims to develop new standards for energy renovation to democratize access to "zero-energy guarantee" renovations for a wider public. This involves industrializing the renovation of buildings. Energiesprong provides many resources for construction stakeholders, including solution providers, project owners, and facilitators.

2.2.1.4 Union Regionale HLM (Nouvelle Aquitaine)

Address: 3 rue Montyon – 87100 LIMOGES

Contact Person: Nicolas Blaison

Contact E-Mail: nicolas.blaison@union-habitat.org

Category: Demand side

Expertise for the project:

This stakeholder will represent the demand side

2.2.1.5 Bordeaux Metropole

Address: Esplanade Charles-de-Gaulle 33045 Bordeaux Cedex

Contact Person: CHAPPERT Laurence

Contact E-Mail: l.chappert@bordeaux-metropole.fr

Category: Financial side

Expertise for the project:

This stakeholder will represent the financial side

2.2.2 Reporting on the Activation of Local Advisory Boards in France



Table 2 provides an overview of the LAB and soundboard activities carried out in the French ecosystem to engage relevant stakeholders and support the activation of the market. The listed activities show the first steps taken to connect BuildUPspeed with the French renovation and circular construction context through conferences, networking formats, and targeted exchange with LAB members and sector representatives.

Table 2: LAB and Soundboard Activities in France

N o	Name of the Activity	Location	Date	Categor y	Attendees	target group	number of participan ts
1	Sustainabl e places 2023	Madrid, Spain	June 14-16, 2023	Congres s	LAB & SBG	Researcher s and innovation companies departmen ts	300
2	Saint-Gobain conference	Bordeau x, France	Novemb er 9, 2023	Congres s	Stakeholde rs of constructio n sector	Stakeholde rs of constructio n sector	100
3	Meeting with the LAB	Bordeau x, France	Novemb er 29, 2023	Lunch	LAB		8
4	Circolab event	Bordeau x, France	January 2024	congres s			
5	Signing of the charter in support of the circular economy	Bordeau x, France	August 2025	Signing charter	DomoFranc e, 7 project owners		
6	2 nd night of the Innovation	Bordeau x, France	Novemb er 2025	Congres s	Stakeholde rs of constructio n sector	Stakeholde rs of constructio n sector	100
7	Launch of projects on the maintenanc e with reuse	Bordeau x Metropol e, France	By the end of 2026	Projects	DomoFranc e,		
8	Work on integrating circular economy data (Digital Product Passport) into the BIM model.	Bordeau x Metropol e, France	By the end of 2026	worksh op	Domofranc e, Upcyclea, various partners, industrials,		10



2.2.2.1 Sustainable Places 2023: 50 Shades of Industrial Deep Energy Retrofit

Date: June 14th, 2023.

Location: Madrid, Sustainable Places Conference 2023

Participants: About 30 persons

Goal: Open discussion on industrialized deep energy retrofit.

Description: The workshop aimed to identify key challenges and factors that hinder the uptake of industrialization and establishment of deep-renovation factories and unravel examples of relatively successful deep-renovation factories. The 50 shades of industrialized deep energy retrofit workshop has been chaired by Peter Op 't Veld; Maria Sara Di Maggio & John van Oorschot. Other projects involved were [GigaRegioFactory](#) project, [StepUP project](#), [INFINITE project](#), [Drive 0 EU H2020](#), PLURAL, [Switch2Save](#), [ENSNARE](#).

2.2.2.2 Saint-Gobain Conference

Date: November 9th, 2023.

Location: Bordeaux, France

Participants: 100

Goal: Presentation of good practices, industrial processes, initiatives about circular economy. Create synergy between stakeholders of the construction sector

Description:

This half-day conference organised by Saint-Gobain brought together key players from the construction sector to address circular economy challenges: waste management, recycling and re-use, ecodesign, and deconstruction. Around fifteen speakers from major groups, institutions and local stakeholders shared case studies and on-the-ground initiatives, with a focus on the Nouvelle-Aquitaine region. The event fostered collaboration between industry actors in support of the ecological transition.

2.2.2.3 Meeting with the LAB

Date: November 29th, 2023.

Location: Bordeaux, France

Participants: 100

Goal: Presentation to the French LAB, of BuildUpspeed, goals and expectations, discussion about the Local pop-up factories, Market activation platform

Description:

As part of WP5 and WP6, the French ecosystem partners organised a meeting with LABS members, namely: Odeys, Union régionale HLM, and (Greenflex)/Ressorts. This first meeting aimed to share exchanges on the ambitions and objectives of BuildUpspeed, present the concept of Local Pop-up Factories, the Market Activation Platform, and the integration with the LABS. This exchange took place at M12 of the project, in the format of a working lunch.



2.2.2.4 CIRCOLAB event

Date: January 2024

Location: Bordeaux, France

Participants: GIPGPV, social landlords, open to the public in the construction industry

Goal: Introduction of the label and raising awareness among landlords about re-use challenges.

Description:

CIRCOLab is an association, a community of stakeholders of the construction sector engaged in the circular economy development, and specially on reused materials.

They have drawn up different tools for their members as methodology guides, sharing best practices, and presentation of innovative solutions. They have created a lot of Workshop about different items which are important for the Circular Economy:

- Taxation
- Legal and Insurances
- Exploitation
- Deconstruction and Traceability: traceability sheet
- Excess values on buildings
- Indicator of reused benefits
- Environnement and label: update of the CIRCOLAB evaluation tool considering feedback from users. They offer training to become certifiers of the label.

Label aims to promote the efforts made on circular economy and re-used materials and to set an assessment framework. The project is evaluated on the deconstruction, the resources transport etc and a numeric tool calculates automatically the score.

2.2.2.5 Signing of the Charter in Support of the Circular Economy

Date: 28th May 2025

Location: Bordeaux, France

Participants: Bordeaux Metropole, GIP GPV, La fab, DomoFrance, Bordeaux Metropole Aménagement, Aquitanis, EPA Bdx Euratlantique, Incité Bordeaux Metropole Territoire,

Goal: To formalize a collective commitment by key urban planning and construction stakeholders in the Bordeaux Metropole area toward circular economy principles and material reuse

Description: The signatories commit to integrating circular economy practices across all their construction and urban development operations — systematically conducting resource inventories before demolition, prioritizing reuse and recycling of materials, anticipating future dismantlability of new builds, and incorporating reused or recycled materials in public spaces. They also commit to cooperating through annual steering and technical committees, shared digital tools (resource inventories, eco-product catalogues, legal templates), and a common platform (REFAIR) to track and circulate available materials across the territory.



2.2.2.6 2nd night of the innovation

Date: 20th November 2025

Location: Bordeaux, France

Participants: DomoFrance, Actions Logement, Bordeaux Metropole, Trustymo, Biloba, FACILDATA, Rehab, KENO Architectes, Nobatek, open to the public in the construction industry

Goal:

"Innovating to build the territories of tomorrow" — demonstrating that innovation, at the heart of DomoFrance's strategy, makes it possible to implement concrete solutions deployed in the field, in service of the ecological, social and technical transition of French territories.

Description:

- STAC'OPTIM: AI & data to optimize energy performance and decarbonization—Dryas, Kocliko, EnerLab Sarl, Bordeaux Métropole.
- Social innovation in Les Aubiers: inclusion and community living—French Judo Federation, Cap d'Agir, Espace Textile.
- Circular economy: reuse, recycling, Zero Waste House, and reuse of excavated soil with KENO Architectes, GPV Rive Droite, and NOBATEK.
- Technical innovation: drones and AI for large-scale building inspections, and EV charging infrastructure with Logivolt WAAT
- Introduction of the Lab'DomoFrance. This working group notably launched a call for applications to start-ups covering several themes, including the circular economy. The 5 selected start-ups will be supported by DomoFrance.

2.2.2.7 Launch of projects on the maintenance with reuse

Date: 2026, to be continued after the end of BuildUPspeed

Location: Bordeaux, France

Participants: DomoFrance, Upcyclea

Goal: Launch of maintenance contract incorporating equipment reuse.

Description: Maintenance projects incorporate reuse, such as replacing waterproofing while reusing roof gravel. This year, our goal is to incorporate reuse into our maintenance contracts, including housing renovations. To achieve this, we are currently exploring the possibility of expanding the Upcycléa Net 0 platform with a mobile app that allows maintenance teams to view material inventories at DomoFrance's storage facilities and place orders with companies that will collect this equipment from the designated locations. Identifying each item of equipment with a QR code will allow us to track it from removal, through storage and reconditioning, to reinstallation, along with all identification information (brand, model, treatment, etc.) and environmental indicators related to its use.



2.2.2.8 Work on integrating circular economy data (Digital Product Passport) into the BIM model and scan out-of-stock items

Date: 1st half of 2026

Participants: Domofrance, Upcyclea, construction companies

Goal: As mentioned earlier, the concept of DPPs is already integrated into the platform. The goal is to encourage as many manufacturers as possible to integrate their data into it. The integration of DPPs into BIM models is currently under consideration but has not yet been tested.

Description: Domofrance actively engages its industrial and business partners in circular economy practices through a three-pronged approach with manufacturers (mainstreaming reuse, integrating products into the Upcyclea Net 0 platform, and listing end-of-stock items via NOAH), regular outreach with construction firms and tradespeople (individual meetings, ecosystem events, site visits), and hands-on support to help partners recondition and remarket salvaged products (sanitary ware, ventilation, electrical components, timber). This includes participation in the *"Tuesday of the (re)construction"* training cycle for craftspeople and membership in the Woodrise Vallée circular timber economy initiative led by Bordeaux Métropole.

2.3 Italian Local Advisory Board

The Italian Local Advisory Board connects BuildUPspeed with the social-housing renovation ecosystem of Milan and the Lombardy region, where the Italian pilot activities are concentrated. Its members were selected to cover, in a complementary way, the whole value chain of industrialized deep renovation: the demand side, represented by the owners and managers of the public and affordable housing stock; the supply side, represented by industrialized construction, precast and offsite design expertise; and the financial side, represented by the banking sector. This combination of profiles allows the LAB to support the project on all the dimensions that simultaneously determine the viability of an Energiesprong-style retrofit — technical feasibility, industrialized production and access to financing — and to advise on how these can be combined into a replicable model for the Italian social housing context. The following sections present the formation of the Italian LAB and the activities carried out to activate its members over the course of the project.

2.3.1 Formation of the Italian Local Advisory Board

The Italian Local Advisory Board brings together five organizations. Unlike the other ecosystems, a single contact person has not been indicated for each member organization. This reflects the way stakeholder engagement was actually organized: rather than relying on one fixed referent per organization, the activities were structured around specific topics and opportunities — such as the pop-up factory feasibility study, the selection of the pilot buildings, or the definition of the financing schemes — each of which involved the most relevant people within each organization at that moment. As a consequence, meetings were typically held with several representatives at once, and often jointly across more than one organization. The Italian Local Advisory Board consists of the following members:

2.3.1.1 MM Divisione Casa

Address: Via del Vecchio Politecnico, 8 - 20121 Milano

Category: Demand side

Expertise for the project:

MM S.p.A. is the in-house engineering and services company wholly owned by the Municipality of Milan; through its Divisione Casa it manages the public residential housing stock of the City of Milan, amounting to around 30,000 dwellings, contributing to address situations of housing fragility. As manager of stock it represents the demand side and is the main interlocutor for obtaining information and feedback on the renovation of the social housing buildings considered for the BuildUPspeed pilot. Its involvement is essential to test how industrialised deep-renovation approaches can be applied to publicly owned social housing.

2.3.1.2 Redo Sgr Spa Società benefit

Address: Viale Vittorio Veneto 2 - 20124 Milano

Category: Demand side

Expertise for the project:

Redo Sgr is a benefit company and certified B-Corp that manages real-estate funds dedicated to affordable and social housing and to urban regeneration in the Lombardy region, including the Fondo Immobiliare di Lombardia. It has been testing some off-site technologies for the construction of new affordable housing and is currently exploring new factory models for its interventions. Its viewpoint on pop-up factory concepts, covering both new construction and renovation, is therefore crucial, as it is a leading player in new affordable housing and regeneration projects in Lombardy.



2.3.1.3 Structurama Europe

Address: Via Italia, 197 - 20874 Busnago

Category: supply side

Expertise for the project:

Structurama is an international design and consultancy company, active since 1998, specialised in building design, structural engineering, prefabrication and the design of both fully automated and traditional plants. It has wide expertise in precast concrete building systems and in the layout of construction factories. It is the ideal member for advice on the proper design and feasibility studies of pop-up factories, and is also the company subcontracted within EDERA's budget for these activities.

2.3.1.4 Assimpredil ANCE

Address: Via San Maurilio, 21 – 20123 Milano

Category: supply side

Expertise for the project:

Assimpredil ANCE is the association of construction companies of the provinces of Milan, Lodi, Monza and Brianza, and the largest territorial branch of ANCE. It brings together small, medium and large enterprises active in urban regeneration and in residential, commercial and public construction. As the voice of the construction companies that need to adapt to new ways of conceiving on-site and off-site works, it represents the supply side of the value chain.

2.3.1.5 Intesa Sanpaolo

Address: Via Monte di Pietà, 8 – 20121 Milano

Category: Financial side

Expertise for the project:

Intesa Sanpaolo is the leading banking group in Italy, offering commercial banking, corporate and investment banking, asset management and insurance services, with a strong focus on sustainable finance and the circular economy. Within BuildUPspeed it represents the financial side, as it is the bank EDERA is engaging with to define specific financing schemes for Energiesprong-style deep retrofits. Its involvement covers both the financing of the satellite factory — mainly through equity — and of the industrialised renovation projects, through favourable debt for ESCOs or private homeowners.

2.3.2 Reporting on the Activation of Local Advisory Boards in Italy



Table 3 summarizes the LAB activities carried out in the Italian ecosystem to initiate stakeholder engagement and support the development of market activation actions. The activities listed reflect the first steps taken to connect BuildUPspeed with the Italian renovation market, disseminate project concepts, and involve relevant actors from the fields of social housing, industrialized renovation, and innovative financing.

Table 3: LAB Activities in Italy

No	Name of the Activity	Location	Date	Attendees	Content
1	Meeting with MM S.p.A.	Milan, Italy	November 2024	MM S.p.A.	Selection of the pilot building for the pop-up factory feasibility study: definition of the selection criteria and identification of a social housing building with a recurrent archetype and a renovation already planned by 2027, suitable to demonstrate the industrialised approach.
2	Meeting with MM S.p.A.	Milan, Italy	July 2025	MM S.p.A.	Refinement of the feasibility study assumptions, in terms of renovation programme and timing towards 2027 + presentation of first comparison offsite vs traditional retrofit.
3	Meeting with Structurama	Milan, Italy	July 2024	Structurama	Exploration of the satellite factory concept in Italy and initial scoping of the subcontracting tasks, focusing on the factory layout for both new construction and renovation.
4	Meeting with Structurama	Milan, Italy	January 2025	Structurama	First revision of the work related to the factory layout for both new construction and renovation, including the production capacity rates.
5	Meeting and factory visit with Redo Sgr and Structurama	Lombardy, Italy	January 2025	Redo Sgr, Structurama	Factory visit to observe the current production of precast concrete panels for new construction, in order to assess how an existing facility could integrate industrialised residential renovation.
6	Meeting with Intesa Sanpaolo	Milan, Italy	September 2025	Intesa Sanpaolo	Assessment of the financing options for both the satellite hybrid factory – mainly through equity – and the industrialised renovation projects, through favourable debt for ESCOs or private homeowners.
7	Meeting with Redo Sgr and Intesa Sanpaolo	Milan, Italy	November 2025	Redo Sgr, Intesa Sanpaolo	Joint discussion between the demand and financial sides on aligning Redo Sgr's affordable-housing investment pipeline with Intesa Sanpaolo's financing instruments, exploring a combined equity/debt structure to support industrialized renovation and new affordable housing.
8	Meeting with Assimpredil ANCE	Milan, Italy	September 2025	Assimpredil ANCE	Presentation of the BuildUPspeed industrialised renovation approach to the construction companies' association and

No	Name of the Activity	Location	Date	Attendees	Content
					discussion of supply-side readiness, barriers and the skills needed for member contractors to take up off-site renovation works.
9	Meeting with Assimpredil ANCE (follow-up)	Milan, Italy	October 2025	Assimpredil ANCE	Follow-up on how industrialized and off-site renovation could be reflected in public procurement practices and on engaging member construction companies in pilot tenders, to strengthen the local supply chain for deep renovation.

Beside the dedicated meetings with the LABs members, other events have been organized or attended to present BuildUPSpeed results related to the Italian ecosystem, both nationally and internationally, as presented below.

2.3.2.1 Energiesprong Italy Renovation Days

Date: 29 November 2023

Location: Cariplo Factory in Milan, Italy

Participants: About 200 participants

Goal: Show and work on the achievements of Energiesprong movement in Italy regarding industrialized and deep renovation.

Description:

During the event, among other activities, all the European projects (including BuildUPspeed) in which Edera is involved and that have synergies with the implementation of Energiesprong in Italy have been presented. It has been a way to disseminate their role to all the audience and show their connection to concrete actions, building renovations and market activation. Members of the future Italian LAB were present so it will be easy to further engage them in the near future.

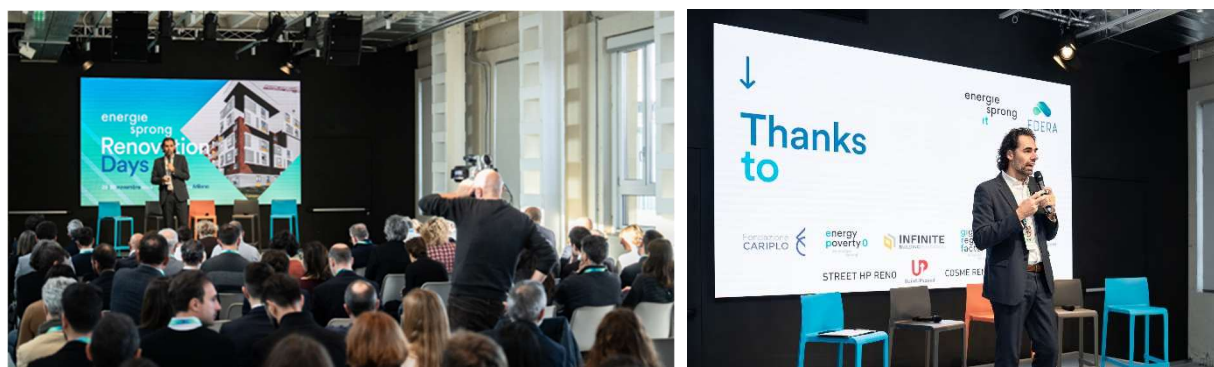


Figure 16: Energiesprong Italy Renovation days 2023 (@ EDERA)

2.3.2.2 Energiesprong Italy Renovation Days - 2nd edition

Date: 13–14 November 2024

Location: Cariplo Factory in Milan, Italy

Participants: Over 300 registered participants

Goal: To bring together the Italian community of innovative, industrialised building renovation, present the progress and scaling-up of the Energiesprong approach in Italy, and let participants see the most recent Energiesprong pilot interventions first-hand — including the BuildUPspeed pilot in Pieve Emanuele.

Description:

The first day, hosted at Cariplo Factory, was opened by the Mayor of Milan and centred on the launch of the three-year "Energiesprong Milano" programme — promoted by EDERA together with the Municipality of Milan and Fondazione Cariplo — which aims to develop solutions to accelerate and reduce the cost of the deep renovation of the city's public housing and school stock through innovative economic and procurement models. Within this framework, EDERA presented the European projects in which it is involved, including BuildUPspeed, showing their connection to concrete renovation actions and market-activation activities in Italy; The second day was dedicated to site visits to recent Energiesprong retrofits in the Milan area followed by a workshop on the frontiers of innovation in Energiesprong retrofit. Among the visited sites, the intervention in **Pieve Emanuele** was of particular relevance: it is the Italian BuildUPspeed pilot, an industrialised deep retrofit carried out with steel-framed modular panels.



Figure 17: Energiesprong Italy Renovation days 2024 and Pieve Emanuele site visit (@EDERA)

2.3.2.3 Workshop at ReBuild 2026

Date: 12 May 2026

Location: Riva Del Garda, Trento, Italy

Participants: About 60 participants

Goal: open a structured discussion on how off-site/industrialised construction can respond to environmental and social housing needs — and, in particular, how it can become a tool to implement the European Affordable Housing Plan and the Italian national "Piano Casa".

Description:

The workshop was organised by EDERA within ReBuild 2026 (Riva del Garda, 12–13 May 2026), the main Italian event on the future of the built environment. The introductory presentation set the discussion within the BuildUPspeed framework, drawing on project outputs such as the hybrid/pop-up factory concept (plants producing components for both new construction and retrofit) and the evidence on the 20–35% cost reduction enabled by scaling up industrialised renovation.

After three framing talks participants worked in four parallel tables, each addressing a different dimension of the value chain: public demand, private demand, supply chains and production capacity, and enabling factors (regulation, finance, culture and public policy).

The main conclusions shared across the four tables, of direct relevance to the BuildUPspeed market-activation work, can be summarised as follows:

- Market acceleration must rest on technical, quantitative communication: presenting real, measured project experiences (both retrofit and new construction) is essential to show that many off-site solutions exist, with different costs and performance, and that off-site should be adopted where it adds value compared with the traditional model - a need directly addressed by the BuildUPspeed Market Activation Platform.
- A shared system of standards and certifications is needed to guarantee performance quality and reduce the risk borne by designers and clients, ensuring that only qualified players offer industrialised solutions.
- Reaching the volumes needed to lower costs requires working on public procurement, in particular "cascading" framework agreements (general contractor – panel manufacturer – suppliers) supported by demand aggregation (collective purchasing or larger multi-building PPPs), moving beyond the single-intervention logic to reach an industrial scale.
- Decision-support tools that quantify the benefits of off-site (time, cost, quality, environmental impact) at the early design stage are essential to enable clients and designers to choose it — a feature highlighted as relevant for BuildUPspeed Market Activation Platform additional development.
- New financing and business models are needed, including mixed-use schemes and additions/extensions that cross-subsidise the renovation of social housing, and dedicated social funds to bring vacant public stock back into use — hybrid satellite factory could supply both renovation and extension panels being a valuable model to solve both the environmental and housing crisis.

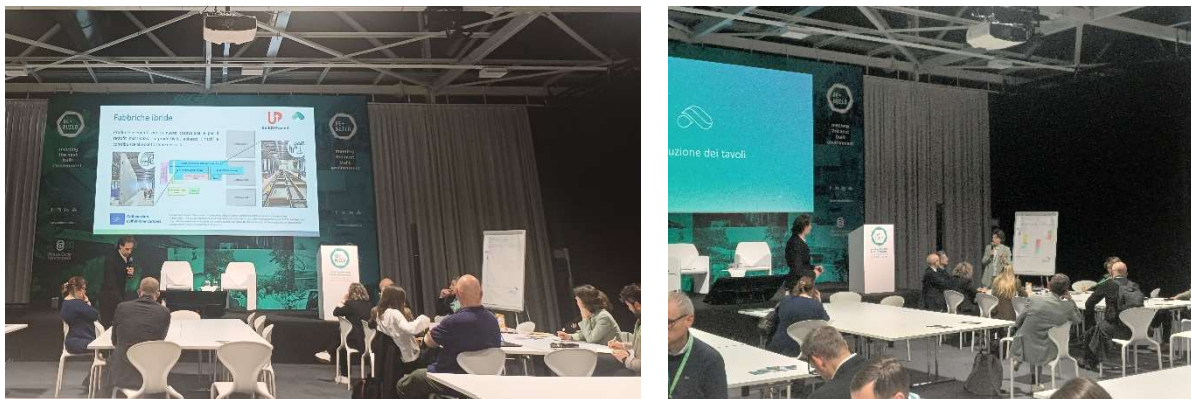


Figure 18: ReBuild 2026 workshop (@EDERA)

2.3.2.4 The Decarbonisation Summit 2025 – "Emission Cuts and Housing Affordability"

Date: 4 December 2025

Location: Brussels, Belgium

Participants: About 40 participants

Goal: Present, at EU level, different paths to decarbonising the housing stock while preserving affordability and liveable neighbourhoods and, showcase the Italian off-site retrofit experience, including the BuildUPspeed Pieve Emanuele pilot, within the European debate on prefabricated renovation.

Description:

The Decarbonisation Summit 2025, organised by Housing Europe, was held on 3–4 December 2025 in Brussels. Dedicated to "Emission Cuts and Housing Affordability", the summit explored different decarbonisation paths for the public, cooperative and social housing sector, from neighbourhood-scale renovation and prefabrication to bio-based materials, heat pumps and sustainable mobility.

EDERA was invited by Housing Europe to contribute to the session "Prefabricated construction and renovation". The presentation showed how prefabricated renovation and construction at scale can accelerate the decarbonisation of social housing cost-effectively. It framed the Italian challenge and positioned the Energiesprong/off-site approach and the BuildUPspeed Market Activation work (unlocking and showcasing proven off-site deep renovations, building local demand–supply ecosystems and developing Local Pop-up Factory concepts) as levers for scale-up. As concrete evidence it presented two recurrent Italian housing typologies: a public social-housing case in Milan (via Russoli) and, as the BuildUPspeed pilot, the private residential complex in Pieve Emanuele retrofitted with an industrialised steel-framed panel system and a dedicated new product developed by the manufacturer. The Pieve Emanuele results were used to demonstrate the value of the BuildUPspeed approach: a jump of four energy classes (from F to B), façade installation in about three months at a pace of 60 m²/day with a three-person team, carried out without scaffolding or cranes, using only scissor lifts and so minimizing disruption for residents.



Figure 19: The Decarbonisation Summit 2025 (@EDERA)

2.3.2.5 "Affordable Housing Initiative Days" Seminar at Energy Cities Annual Forum

Date: 28 April 2026

Location: Guimarães, Portugal

Participants: Around 100 participants

Goal: To bring ground-level practice and EU policy discussion together on two key levers of a just renovation of Europe's housing stock by presenting the Italian ecosystem's industrialized-renovation and innovative-procurement experience.

Description:

The "Affordable Housing Initiative Days" Seminar was organized by Housing Europe together with the Affordable Housing Initiative European Partnership (SHAPE) and Energy Cities, as a side-event of the Energy Cities Annual Forum. The seminar was structured around two levers of affordable and sustainable renovation — public procurement and partnerships and coalitions. EDERA gave the presentation "Industrialized construction towards affordability" on behalf of BuildUPspeed project and Offsite Hub Italia. The presentation framed the Italian housing challenge and positioned off-site/industrialized

construction as a way to compress costs while improving speed, quality, sustainability and social inclusion. The BuildUPspeed hybrid satellite concept (with plants producing both new-construction and retrofit elements, to lower risk, maximize productivity and reduce the final price) was presented as the supply-side lever to scale up.



Figure 20: Affordable Housing Initiative Days (@EDERA)

All the 5 events are summarized in the table below:

Table 4: Main market activation events

No	Name of the Activity	Location	Date	Category	Target group	Number of participants
1	Energiesprong Italy Renovation Days (1st edition)	Cariplo Factory, Milan, Italy	29 Nov 2023	Conference and workshops	Solution providers, general contractors, housing stock owners/managers, public administrations	≈200
2	Energiesprong Renovation Days (2nd edition)	Cariplo Factory, Milan, Italy (+ site visits, incl. Pieve Emanuele)	13–14 Nov 2024	Conference and site visits	Housing providers, companies, public administrations, universities, NGOs, policymakers	≈300
3	Workshop “Off-site for sustainable and inclusive housing” (ReBuild 2026)	ReBuild, Riva del Garda (TN), Italy – Sala Vela B	12 May 2026	Workshop	Cooperatives, developers, housing companies, private-social sector, supply chain (tbc)	≈60
4	The Decarbonisation Summit 2025 – “Emission Cuts and Housing Affordability”	BIP Meeting Center, Brussels, Belgium	3–4 Dec 2025	Summit / conference	Public, cooperative and social housing providers, cities, EU institutions, researchers, industry	≈40
5	“Affordable Housing Initiative Days” Seminar	Sociedade Martins Sarmento, Guimarães, Portugal	28 Apr 2026	Seminar (side-event of the Energy Cities Annual Forum)	City representatives, housing providers, researchers, industry partners	≈100



2.4 Spanish Local Advisory Board

2.4.1 Formation of the Spanish Local Advisory Board

The Spanish Local Advisory Board consist of the following members:

2.4.1.1 Colegio Oficial de Aparejadores y Arquitectos Técnicos de Madrid

Address: C. del Maestro Victoria, 3, 28013 Madrid

Contact Person: Juan Carlos Cabrero

Contact E-Mail: jccabrero@construccionavanzada.com

Category: Supply side

Expertise for the project:

Mr. Juan Carlos Cabrero is M. Sc. Building Engineer (Polytechnic University of Madrid-UPM), founder and Director of the Course in Industrialized Construction a postgraduate course in the Universidad Francisco de Vitoria. He has been working for 20 years in the construction industry as an industrialization specialist.

2.4.1.2 iCONS Cluster, for the Construction industrialization in Navarra

Address: iCONS – C. del Dr. Huarte de San Juan, 3, 31003 Pamplona, Navarra

VARquitectos - Calle Aizoáin, 10, 31013 Ansoáin, Navarra

Contact Person: Mr.Germán Velázquez

Contact E-Mail: germantxo@arquitectos.com

Category: Supply side

Expertise for the project:

Mr. Germán Velázquez is Architect (Escuela Técnica Superior de Arquitectura Universidad de Navarra, ETSAUN), Passivhaus designer and is a board member of the iCONS Cluster, for the Construction industrialization in Navarra. He is partner at VARquitectos architectural team, established in 1973, with experience in more than 11.500 housings, including 1.000 Passivhaus certified ones. Currently, developing several +Energy buildings, as the new University of Medicine in Pamplona, several social housings buildings, and health centers.

2.4.1.3 Neinor Homes

Address: Calle Henao, 20, 48009, Bilbao

Contact Person: Lucas Galán Lubascher

Contact E-Mail: lucas.galan@neinorhomes.com

Category: Supply side

Expertise for the project:

Lucas Galán is M.Arch (ETSAM), IE Executive MBA and M. Sc. in Real Estate Management with more than 15 years of international experience in Spain, Chile, Brazil and Japan with a global vision and knowledge in the real estate and construction industry. Extensive knowledge of sustainability, new technologies applied to the real estate and construction sector, as well as of the international ecosystem of clusters, companies and industrialized



building systems. Currently responsible for the strategy and innovation ecosystem at Neinor Homes, the leading residential developer in Spain, through Neinor Lab and Neinor Next.

2.4.1.4 Catedra Maderamen (Maderamen Chair)

Address: Universitat Politècnica de València (UPV), building 1B, campus door R, Camino de Vera s/n, 46022, València

Contact Person: Joan Romero Clausell

Contact E-Mail: jromero@five.es

Category: Public side

Expertise for the project:

The Maderamen Chair, created by the UPV and the IVE in March 2021 with the support of the Generalitat Valenciana (regional government), aims to promote and develop activities that make visible the need for and importance of recovering wood in the design and improvement of the built habitat, seeking its decarbonization, favoring circularity, creating equitable, healthy and resilient environments, through innovation, digitization and industrialization of the sector.

2.4.1.5 AVS - Asociación Española de Gestores Públicos de Vivienda y Suelo

Address: C/ Luis Vives, 2 - 1º entlo, 46003 Valencia

Contact Person: Enrique Bueso Guirao

Contact E-Mail: ebueso@gestorespublicos.org

Category: public side

Expertise for the project:

AVS, the Spanish Association of Public Housing and Land Managers, is a technical and professional non-profit organization that brings together public bodies responsible for housing, land, urban facilities and public services in Spain. Its participation in the Advisory Board ensures a strong “public side” perspective, bringing practical knowledge of public housing delivery, urban regeneration, social and affordable housing policies, and the challenges faced by local and regional authorities. AVS is therefore well placed to assess how industrialized and prefabricated renovation solutions can respond to public-sector needs, support scalable implementation, and generate value for public housing stock and citizens.

2.4.2 Reporting on the activation of Local Advisory Boards in Spain



Table 5 summarizes the LAB and soundboard activities carried out in the Spanish ecosystem to activate relevant stakeholders and support the uptake of industrialized renovation approaches. The listed activities reflect the efforts to connect BuildUPspeed with the Spanish market, promote knowledge exchange, and gather targeted feedback from professionals, companies, and institutional actors involved in the construction and renovation sector.

Table 5: LAB and Soundboard Activities in Spain

No	Name of the Activity	Location	Date	Category	Attendees	Target group	No of participants
1	Sustainable places 2023	Madrid	June 14-16, 2023	Congress	LAB & SBG	Researchers and innovation companies' departments	30
2	Industrialized wood construction (Maderaula & catedra Maderamen)	Valencia	June 22, 2023	Other (Technical seminar)	SBG	Architecture students, professionals and companies in the construction sector and in the wood industry.	150
3	LAB internal meeting	Online	November 13, 2023	Meeting	LAB	LAB	9
4	Conference on buildings decarbonization	Valencia	March 6 th , 2024	Conference	LAB & SBG	Professional audience including public authorities	250
5	Public policies to promote industrialized mass timber	Madrid	26 June, 2024	Conference	SBG	Key stakeholders from the public sector, construction industry, timber sector, and research community	n/a
6	Establishment of industrialization WG	Valencia	October 25 th , 2024	Meeting	SBG	Construction companies, industry stakeholders, sector representatives, and innovation actors from the	14

No	Name of the Activity	Location	Date	Category	Attendees	Target group	Nº of participants
						Valencia Region.	
7	Training on industrialized solutions	Online	February 26 th , 2025	Training	LAB & SBG	Technical professionals (from public & private sector)	287
8	Industrialization in timber construction	Alicante	March 7 th , 2025	Technical visit	LAB & SBG	Students, researchers, architects, engineers, timber construction professionals	55
9	Agile construction for social housing	Valencia	11-12 June, 2025	Conference	SBG	Professional audience, including public authorities	178
10	Cadwork training course	Valencia	2-4 July, 2025	Training	SBG	students, architects, engineers, and timber construction professionals.	12
11	Ceramics in industrialized construction	Castellón	October 8 th , 2025	Conference	SBG	Ceramic industry representatives, construction professionals, technical experts, and stakeholders in advanced ceramic technology	n/a

No	Name of the Activity	Location	Date	Category	Attendees	Target group	Nº of participants
						es and industrialised construction.	
12	Industrialized Construction Forum	Madrid	October 29 th , 2025	Conference	SBG	Professional audience including public authorities	n/a
13	IV Innovation Day in Times of Change (INGENNUS)	Zaragoza , Spain	14 th November, 2025	Conference	SBG	Professional audience	n/a
14	CTN-UNE 41/SC 14 Committee	Madrid, online	2 nd March, 2026	Working group	SBG	Professional audience	46
15	Rebuild 2026	Madrid	24-26 th March, 2026	Congress	SBG	Professional audience	n/a
16	FESCOMAD — Fundación Laboral de la Construcción	Madrid	10 th April, 2026	Conference	SBG	Professional audience	n/a
17	Employment and Entrepreneurship Fair	Navarra, Spain	23 rd April, 2026	Fair	SBG	Young professionals	n/a
18	Fearless Talks	Spain	4 th May, 2026	Talk	SBG	Professional audience	n/a
19	Congress INMATBYCIARE	Madrid, Spain	14 th May, 2026	Congress	SBG	Professional audience	n/a
20	PTEC Industrialized Construction Working Group (recurring)	Madrid / online	2024–2025	Working group	LAB & SBG	Construction companies , developers , manufacturers, technology centres, engineering firms,	160 active member entities

No	Name of the Activity	Location	Date	Category	Attendees	Target group	Nº of participants
						universities	
21	Robotics in Construction Workshop	Madrid (Ferrovial HQ)	9 April 2024	Workshop	SBG	Construction companies, robotics integrators, technology centres, universities, automation providers	30
22	PTEC institutional participation in REBUILD 2024	Madrid (IFEMA)	19–21 March 2024	Trade fair	SBG	Industry, construction, development, public administration, architecture, engineering	Several thousand visitors (full fair)
23	PTEC institutional participation in REBUILD 2025	Madrid (IFEMA)	March 2025	Trade fair	SBG	Industry, construction, development, public administration, architecture, engineering	Several thousand visitors (full fair)
24	Workshop "From the ground to the data: how industrialization transforms civil engineering works"	Burgos	11 June 2025	Workshop	SBG	Civil engineering firms, infrastructure contractors, public works managers, BIM/data	20

No	Name of the Activity	Location	Date	Category	Attendees	Target group	Nº of participants
						technology providers, technology centres, public administrations	
25	Workshop on 3D printing in construction	Madrid	2025	Workshop	SBG	3D printing companies, engineering firms, technology centres, architecture, universities	50
26	Industrialized Construction and Renovation Workshop	Valladolid	8 October 2025	Workshop	LAB & SBG	Construction and development companies, manufacturers of industrialised and renovation solutions, social housing managers, public administrations, technology centres, engineering and architecture	70
27	PTEC institutional participation in CONSTRUMAT 2025	Barcelona (Fira)	May 2025	Trade fair	SBG	International construction sector: industry, professionals,	Several thousand visitors

No	Name of the Activity	Location	Date	Category	Attendees	Target group	Nº of participants
						technology providers, public sector	(full fair)
28	Publication of the Glossary of Industrialized Construction Terms (online open-access tool)	Online (plataforma maptec.es)	2025	Publication	SBG	Professionals, companies, public administrations, university and vocational training (whole sector)	Open-access (no registration required)

2.4.2.1 Sustainable Places Conference 2023: 50 Shades of Industrial Deep Energy Retrofit

Date: June 14th, 2023.

Location: Madrid, Sustainable Places Conference 2023

Participants: About 30

Goal: Open discussion on industrialized deep energy retrofit.

Description:

The workshop aims to identify key challenges and factors that hinder the uptake of industrialization and establishment of deep-renovation factories and unravel examples of relatively successful deep-renovation factories. The 50 shades of industrialized deep energy retrofit workshop has been chaired by our project coordinator Peter Op 't Veld. Other projects involved were [GigaRegioFactory](#) project, [StepUP project](#), [INFINITE project](#), [Drive 0 EU H2020](#), PLURAL, [Switch2Save](#), [ENSNARE](#).

2.4.2.2 Technical seminar: Industrialized wood construction

Date: June 22nd, 2023

Location: Universitat Politècnica de València (UPV), Valencia.

Webinar co-organized by Cesefor, Catedra Maderamen, IVE and UPV.

Participants: About 150

Goal: Promote the knowledge and application of industrialized wood construction, highlighting its advantages and opportunities in the business and professional sphere,

Description:

The day included 10 presentations, which addressed different advantages of the use of technical wood, and a practical experience of assembling a prototype of a lightweight timber frame, highlighting the trend towards industrializing housing construction with this material, facilitating total control of the product (material optimization, cost control, waste

reduction, etc.) and rapid execution through elements previously designed and manufactured for subsequent assembly.



Figure 21: Technical seminar: Industrialized wood construction (© IVE)

2.4.2.3 Spanish LAB internal meeting

Date: November 13th, 2023

Location: Online.

Participants: 9 people, LAB & BUPS partners

Goal: Formalize the launch of the Spanish LAB.

Description:

The online meeting formalized the launch of the local advisory board for the BUPS project, allowing the members of the board and all project partners to get to know each other. The BuildUPspeed project was then presented, as well as the main concepts, ideas and activities to be conducted in the project. Afterwards, the role of the LAB members was explained, their expected involvement, as well as the activities in which they are expected to participate and collaborate, continuing with the review of the activities planned for the coming months, and finally concluding with a round of questions and answers.



Figure 22: LAB s members meeting

2.4.2.4 Conference on decarbonisation of housing stock

Date: March 6th, 2024

Location: Salón de Actos Jardín Botánico. Calle Quart 80. 46008 Valencia

Participants: 374 people registered for the event; attendance not recorded (estimate based on the room's seating capacity, 250 people). LAB & SBG. Professional audience including public authorities, architects, construction companies, technical experts, innovation actors and stakeholders involved in housing renovation and decarbonization.

Goal: To disseminate strategies, tools and practical examples supporting the decarbonization of residential buildings, including industrialization, circularity, natural materials, energy communities and environmental assessment tools.

Description: The event was organized by IVE to promote knowledge transfer on low-carbon and sustainable approaches for residential buildings. The program addressed key strategies and tools for energy renovation and decarbonization, including residential energy communities, industrialization, natural materials, renaturalization, circular construction, quality recognition and environmental information tools such as TURIA. ACR, partner of the BuildUPspeed project, contributed with a presentation on industrialization. The activity supported WP5/T5.3 by engaging Spanish market stakeholders, disseminating industrialized and sustainable renovation approaches, and reinforcing the role of the Spanish ecosystem in accelerating the uptake of scalable decarbonization solutions.

Figure 23: Presentation by Jesús Alonso, ACR, at the conference.

2.4.2.5 Conference on the promotion of industrialized mass timber in building, participation in the roundtable “Public policies to promote industrialized mass timber”

Date: 25-26th June, 2024

Location: La Casa de la Arquitectura, Madrid, Spain. The event was also streamed online through the MIVAU YouTube channel.

Participants: Exact number not available. Professional audience including public authorities, policy makers, architects, construction companies, timber industry representatives, researchers and building-sector stakeholders.

Goal: To support market activation for industrialized and low-carbon building solutions in Spain by contributing to a national policy dialogue on the role of industrialized mass timber in construction and renovation.

Description: The event, organized by the Spanish Ministry of Housing and Urban Agenda in collaboration with MASS Madera and Built by Nature, addressed the opportunities and

barriers for industrialized mass timber in Spain. IVE participated in the roundtable “Public policies to promote industrialized mass timber”, contributing the perspective of the Spanish BuildUPspeed ecosystem. The activity supported WP5/T5.3 objectives by fostering stakeholder engagement, regulatory discussion, knowledge transfer and favorable conditions for the uptake of industrialized construction and renovation solutions.



Figure 24: Speakers at the panel discussion 'Public policies to promote industrialized mass timber'. Image taken from the video "Conference on the promotion of industrialized mass timber in building 26/06/2024", published on YouTube on 26 June 2024 (screenshot taken at 02:08:21).

2.4.2.6 Meeting for the establishment of a Working Group on Industrialized Construction in the Valencia Region

Date: 12:00-14:00h, October 25th, 2024

Location: IVE premises, UPV, Valencia, Spain & Online (hybrid event)

Participants: 9 people in the room, and 5 people online. Around 14 participants attended the meeting. A total of 16 companies and organizations were registered. Participants included construction companies, industrialized construction stakeholders, sectoral representatives and innovation actors from the Valencia Region.

Goal: To assess the interest and feasibility of creating a regional working group on industrialized construction, as a first step towards a more structured network or cluster of companies working on industrialization and prefabrication in the Valencia Region.

Description: The meeting was promoted by IVE and FEVEC, the Valencia Federation of Construction Entrepreneurs, to identify common needs, barriers and opportunities for companies working in industrialized construction and prefabrication. The discussion addressed challenges such as access to industrialization support schemes, financing difficulties, high capital immobilization during construction works, limited visibility of regional companies and the need to improve mutual knowledge among stakeholders.

The agenda included the presentation of the working group initiative, a discussion on its potential structure and operation, an open debate on participants' interests and expectations, and a presentation of the BuildUPspeed web platform as a tool to support market activation. The activity contributed to the Spanish ecosystem by bringing together regional companies and stakeholders, mapping existing industrialized construction capacities, identifying shared barriers and exploring how collaborative tools and platforms could help stimulate the market for industrialized construction and renovation.



Figure 25: Meeting for the establishment of a Working Group on Industrialized Construction in the Valencia Region

2.4.2.7 Training course on industrialised building construction

Date: Launched February 26th, 2025

Location: Online, through the IVE Virtual Classroom.

Participants: 287 people, LAB & SBG. The course targets architects, engineers, construction companies, developers, public bodies, technical professionals and other stakeholders interested in industrialized construction and renovation.

Goal: To provide national-level training on the design, integration and implementation of industrialized building solutions, supporting the development of professional skills and market readiness for industrialized construction and renovation in Spain.

Description: This 45-hour online course, organized by IVE, provides an introduction to industrialized building construction, covering system classifications, design and on-site assembly of industrialized components, business models, occupational risk prevention, sustainability, EU Taxonomy and innovation. The course includes a specific unit on the BuildUPspeed project, presenting the Spanish ecosystem pilots, the Market Activation Platform and the Pop-up Factory concept. The teaching team includes IVE professionals, contributing expertise on industrialized construction, sustainability and market activation, as well as ACR, partner of the BuildUPspeed project. The activity supports WP5/T5.3 by strengthening market activation through capacity building and stakeholder engagement and also contributes to WP7 as the national training activity in Spain.

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Formación

Construcción Industrializada de Edificios

Duración: 45 horas online

Objetivos:

El objetivo de este curso es dotar al alumnado del conocimiento necesario con el que iniciarse en el área del diseño y construcción de los edificios mediante componentes industrializados, el participante conocerá las diferentes clasificaciones de sistemas constructivos, vocabulario, historia y contexto actual, nuevos modelos de negocio, proyectar y montar in situ diferentes tipos de componentes, así como la prevención de riesgos laborales específicos al montaje de componentes.

Formación relacionada	+
Programa	+
Profesorado	+
Información práctica	+
Tarifa	+

Figure 26: Information and registration details for the Industrialized Construction Course are available on the IVE website (<https://productos.five.es/producto/construccion-industrializada-de-edificios>)

2.4.2.8 Technical visit: Industrialization in timber construction

Date: March 7th, 2025

Location: Technical visit from Universitat Politècnica de València (UPV) to WESpanel facilities in Monforte industrial area and modular timber construction sites in Elche, Alicante, Spain.

Participants: 55 people. The visit was addressed to students, researchers, architects, engineers, timber construction professionals and other technical stakeholders interested in industrialized timber construction.

Goal: To provide direct exposure to industrialized timber construction processes, including robotic manufacturing, modular production and real building applications.

Description: The technical visit was organised in the framework of Cátedra Maderamen, a member of the Spanish Local Advisory Board. The program included a presentation at the WESpanel showroom, a visit to a robotic production line, a visit to a modular timber plant in Elche, and a visit to an inclusive sports pavilion as a real application case. The activity contributed to knowledge transfer and capacity building by connecting participants with practical examples of digital manufacturing, prefabrication, modular construction and timber-based industrialized solutions, supporting their potential uptake in both new construction and building renovation.



Figure 27: Attendees at the WESpanel premises (@Catedra Maderamen)

2.4.2.9 Conference on “Agile construction of affordable housing through industrialized methods”

Date: June 11-12th, 2025

Location: Auditorio Joan Plaza - Jardí Botànic de la Universitat de Valencia C/ de Quart, 80, Valencia.

Participants: 178 people, LAB (AVS) & SBG. Professional audience including public authorities, social and public housing providers, architects, construction companies, industrialized housing manufacturers, technical experts and stakeholders involved in affordable housing delivery.

Goal: To promote industrialized approaches as a practical pathway to accelerate the delivery of affordable housing, addressing regulatory, technical, financial, procurement-related and market barriers

Description: The event was organized by AVS, AVS Comunitat Valenciana, the First Vice-Presidency and the Regional Ministry of Social Services, Equality and Housing of the Valencian Regional Government, the Valencian Housing and Land Agency (EVHA), and the Valencian Institute of Building (IVE), in collaboration with the AVS Technical Working Group, and focused on the role of industrialized approaches in increasing the speed, quality, scalability and affordability of housing interventions. Although the program was strongly connected to affordable housing delivery, the topics addressed — public procurement, administrative procedures, technical quality requirements, financing and insurance, production capacity, and successful implementation experiences — are also relevant for the industrialized renovation and transformation of the existing housing stock. By bringing together public administrations, housing providers and market actors, the event addressed the need to activate demand, connect stakeholders, remove barriers and disseminate practical knowledge to support the wider uptake of industrialized solutions in Spain.



Figure 28: Image from the event “Agile delivery of affordable housing through industrialized methods”, held in Valencia and organized by AVs in collaboration with IVE. The image is available on the AVS website.

2.4.2.10 Cadwork training course: design, manufacturing and assembly of timber structures

Date: 2–4 July 2025

Location: In-person training course, IVE premises, UPV, Valencia, Spain.

Participants: 12 people. The course was addressed to students, architects, engineers, timber construction professionals, designers, manufacturers and other technical stakeholders interested in the digital design, fabrication and assembly of timber structures

Goal: To strengthen technical skills related to the use of digital tools for the design, manufacturing and assembly of timber structures, supporting the uptake of industrialized timber construction and renovation solutions.

Description: The course was promoted by Cátedra Maderamen, a member of the Spanish Local Advisory Board, and focused on the use of Cadwork for timber construction, covering the digital workflow from design to fabrication and assembly of timber structures. By promoting practical skills in digital modelling, manufacturing preparation and construction planning, the activity contributed to capacity building for industrialized timber-based solutions. It also supported the wider activation of the Spanish ecosystem by training professionals and future professionals in methods that can improve precision, productivity, prefabrication potential and scalability in both new construction and building renovation.



Figure 29: Cadwork practical training session (@Catedra Maderamen)



2.4.2.11 Event: High-quality ceramics. Industrialized construction. Ceramic solutions that meet new market demands.

Date: October 8th, 2025

Location: Salón de actos del Instituto de Tecnología Cerámica (ITC-AICE) en Castellón / Online (hybrid format).

Participants: Exact number not available. SBGs: Professional audience including ceramic sector representatives, construction companies, architects, engineers, technical experts, industrialized solution providers and stakeholders interested in advanced ceramic technologies for industrialized construction.

Goal: To showcase the potential of ceramic solutions in industrialized construction, presenting innovative technologies, advanced processes and market-oriented solutions that can improve quality, productivity and scalability.

Description: The event was organized by ATC (Spanish Association of Ceramic Technicians) and focused on the role of ceramics in industrialized construction, including large-format ceramic solutions, industrialized façades, prefabricated bathrooms, progressive industrialization processes and component-to-assembly strategies. IVE participated with a presentation on "Strategies and tools to boost industrialization in building", contributing the perspective of the Spanish BuildUPspeed ecosystem. The activity addressed the need to connect material manufacturers, construction stakeholders and innovation actors, disseminate practical solutions, and foster the uptake of industrialized approaches applicable to both new construction and building renovation.

2.4.2.12 Industrialized Construction Forum 2025 – roundtable on quality, industrial processes, certification and sustainability

Date: October 29th, 2025

Location: Colegio Oficial de Arquitectos de Madrid (COAM), Madrid, Spain.

Participants: Number of people not available, SBG. Professional audience including public authorities, architects, construction companies, industrialized solution providers, certification bodies, technical institutes, clusters, professional associations and other stakeholders involved in industrialized construction and renovation.

Goal: To promote dialogue on the quality, certification, sustainability and industrial processes needed to scale up industrialized construction and renovation solutions in Spain.

Description: The forum, organized by the Spanish Association for Industrialized Construction (AECI), brought together key stakeholders from the construction sector through parallel roundtables, practical case-study workshops, international presentations, networking spaces and an exhibition area. IVE participated in Session 7, "Quality in industrialized construction. Industrial processes, certification and sustainability", contributing its expertise on quality frameworks, technical assessment and sustainability in the built environment. The activity supported the Spanish ecosystem by connecting public and private stakeholders, addressing barriers related to quality assurance and certification, and promoting trust in industrialized solutions applicable to both new construction and building renovation.



Figure 30: Roundtable on quality, industrial processes, certification and sustainability (@AECI)

2.4.2.13 Industrialization, sustainability and collaboration - IV Innovation Day in Times of Change (INGENNUS)

Date: 14 November 2025

Location: Zaragoza, Spain

Participants: 190 participants. Professional audience including construction, engineering and architecture stakeholders, innovation actors and companies interested in sustainable transformation and collaborative approaches.

Goal: To the intersection of industrialization, sustainability, and collaboration as key drivers of innovation in the construction sector, in a context of rapid change.

Description: ACR participated in the fourth edition of INGENNUS's Innovation Day, dedicated to analyzing how industrialized construction can serve as a catalyst for sustainable transformation. The event gathered professionals from construction, engineering, and architecture fields to exchange knowledge and foster collaborative approaches aligned with the European renovation wave objectives promoted by BuildUPspeed.

2.4.2.14 Participation in the CTN-UNE 41/SC 14 Committee on "Industrialized Construction" for the review and validation of the UNE standard: "Industrialized construction of buildings: Definitions, classification and industrialization index"

Date: March 2nd, 2026.

Location: UNE headquarters, Madrid, Spain, and online via Teams. Hybrid format.

Participants: 46 people. The meeting brought together representatives from public administrations, standardization bodies, research centers, construction companies, manufacturers, professional associations and technical organizations involved in industrialized construction. IVE attended the meeting as a member of the subcommittee.

Goal: To contribute to the collective national standardization work on industrialized construction, particularly in relation to common definitions and methods for assessing the degree of industrialization in building works

Description: IVE participated in the meeting of CTN-UNE 41/SC14 "Industrialized construction", where the draft standard on definitions and the industrialization index was



discussed by the subcommittee members. The standardization work is being developed collectively by multiple organizations from the construction sector, public administration, research, and industry.

Within this context, IVE presented a complementary module developed internally to support the assessment of the level of industrialization of building works. The tool was shared as an additional contribution to the ongoing discussion and was proposed for further analysis and possible consideration in a future revision of the standard.

The activity contributed to the Spanish ecosystem by connecting BuildUPspeed-related work with national standardization processes, supporting the development of a shared language and assessment framework for industrialized construction and renovation, and helping to build trust and comparability around the degree of industrialization of different building interventions.

2.4.2.15 REBUILD 2026

Date: March 24-26th, 2026

Location: Madrid, Spain

Participants: Not available.

Goal: Showcase the latest innovations in sustainable and industrialized construction, connecting the entire value chain: developers, architects, manufacturers, and technology companies.

Description: ACR participated in REBUILD 2026, one of the leading international congresses for architecture and construction innovation in Spain. The event brought together key stakeholders from across the built environment sector. ACR's presence at REBUILD provided an important dissemination opportunity for the BuildUPspeed project, showcasing the Market Activation Platform and the potential of industrialized renovation solutions to accelerate the EU renovation wave.

2.4.2.16 FESCOMAD — Fundación Laboral de la Construcción

Date: April 10th, 2026

Location: Spain

Participants: Not available.

Goal: Promote the use of wood and timber-based industrialized solutions in construction, fostering connections between professionals, manufacturers, and training entities.

Description: ACR participated in FESCOMAD, an event organized in collaboration with the Fundación Laboral de la Construcción. The activity focused on the use of wood as a key material in industrialized construction and renovation, addressing training, professional skills, and market development. ACR contributed by presenting experiences and results from the BuildUPspeed project related to timber-based renovation solutions

2.4.2.17 Navarrese Employment and Entrepreneurship Fair - employment opportunities in the construction sector and the generational renewal challenge

Date: April 23rd, 2026

Location: Navarra, Spain

Participants: Exact number not available. The activity targeted young professionals, employment and entrepreneurship stakeholders, construction companies, training actors and other participants interested in career opportunities in the construction sector.



Goal: Highlight employment opportunities in the construction sector, focusing on the generational renewal challenge and the role of industrialized construction in attracting new talent.

Description: ACR participated in the Navarrese Employment and Entrepreneurship Fair, presenting the opportunities available in the construction sector for young professionals. The session addressed the generational succession challenge in the industry and how industrialized construction methodologies open new pathways for innovation and skilled employment.

2.4.2.18 Fearless Talks - "La industrialización a debate"

Date: 4 May 2026

Location: Spain

Participants: Exact number not available. Professional audience including construction-sector stakeholders, innovation actors, companies and experts interested in the barriers, opportunities and future trends of industrialization.

Goal: To facilitate an open and critical debate on industrialization in the construction sector, exploring current barriers, opportunities and future development trends.

Description: ACR was invited to participate as speaker/panelist in the Fearless Talks session "Debate on industrialization". The debate-format event brought together leading voices from the construction sector to discuss the current state and future of industrialized building. ACR used the session as an opportunity to disseminate the BuildUPspeed approach and highlight the relevance of deep renovation through industrialized solutions.

2.4.2.19 III Congress on Industrialized Construction - INMATBYCIARE

Date: 14 May 2026

Location: Madrid, Spain

Participants: Exact number not available. Professional audience including manufacturers, developers, architects, engineers, construction companies and stakeholders involved in off-site and prefabricated construction.

Goal: To promote the advancement and dissemination of industrialized construction techniques, tools and good practices among industry professionals and market stakeholders.

Description: ACR participated in the third edition of this national congress dedicated to industrialized construction, which brought together relevant actors from the construction value chain to share experiences and innovations in off-site and prefabricated construction. ACR contributed as participant/presenter on behalf of ACR and BuildUPspeed, supporting the dissemination of project outcomes, the BuildUPspeed Market Activation Platform and the potential of industrialized renovation solutions.

2.4.2.20 PTEC Industrialized Construction Working Group

Date: Recurring activity throughout 2024 and 2025 (periodic meetings over both years).

Location: PTEC headquarters (Madrid) and member entities. Combination of online and in-person sessions.

Participants: 160 active member entities. Construction and development companies, manufacturers of industrialized systems, technology centers, engineering firms, architecture practices and universities of the sector.

Goal: To articulate a stable space for coordination, knowledge exchange and shared agenda among the main agents of the Spanish industrialized construction ecosystem,



identify R&D opportunities, drive technology transfer to the market and produce reference technical documentation for the sector.

Description:

The Industrialized Construction Working Group is one of PTEC's most active groups and one of the structural pillars of the Spanish ecosystem of industrialized construction. During 2024–2025 it has met periodically, combining working sessions, thematic workshops and technical committees. The group has produced concrete outputs (such as the Glossary of Industrialized Construction Terms, published online) and has co-organized the specific sector workshops listed in this section. Its work has reinforced the connection between the technological supply side and the demand side of the Spanish market, in direct alignment with the objectives of BuildUPspeed.

2.4.2.21 Robotics in Construction Workshop

Date: 9 April 2024.

Location: Ferrovial Headquarters, Madrid. In-person format.

Participants: 30 attendees. Construction companies, robotics integrators, technology centers, universities and providers of automation solutions for the construction sector.

Goal: To present and disseminate the latest advances in robotics and automation applied to the construction sector, as a key enabler of advanced industrialization, and to foster connection between robotics technology providers and large Spanish contractors.

Description:

The workshop addressed the applications of robotics and automation in construction processes (rebar automation, façade manipulation, robotized on-site processes), which constitute one of the central enablers of industrialized construction. The session connected the technological offer of robotics providers with the demand of large Spanish contractors and showcased pilot applications already operating in the sector. The activity contributed to the activation of the Spanish market for industrialized construction by reinforcing one of its key technological dimensions.

2.4.2.22 PTEC institutional participation in REBUILD 2024

Date: 19, 20 and 21 March 2024.

Location: IFEMA Madrid. In-person format (leading national sectoral trade fair).

Participants: Several thousand professional attendees from the sector (industry, construction, development, public administration, distribution, architecture and engineering). PTEC participated as a representative entity of the Spanish ecosystem, with presence in round tables, presentations and coordinated activities with member companies.

Goal: To reinforce the visibility of the Spanish industrialized construction ecosystem at the largest national trade fair of the sector, articulate new collaborations and connect PTEC members with the market demand and supply.

Description:

REBUILD is the leading national trade fair dedicated to innovation in building, industrialized construction, energy efficiency and deep renovation. PTEC participated institutionally in the 2024 edition, contributing to the visibility of the project and of the industrialized solutions developed within the Spanish ecosystem. The presence of the platform allowed connection with industrial members, technology centers and end-customers from the housing and infrastructure sectors.

2.4.2.23 PTEC institutional participation in REBUILD 2025

Date: 23,24 and 25 April 2025

Location: IFEMA Madrid. In-person format (leading national sectoral trade fair).



BuildUPspeed

Participants: Several thousand professional attendees from the sector. PTEC participated as a representative entity of the Spanish ecosystem, with presence in different formats (round tables, presentations, coordinated activities with industrial members and technology centers).

Goal: To reinforce the visibility of the Spanish industrialized construction ecosystem at the largest national trade fair of the sector, articulate new collaborations and connect PTEC members with the market demand and supply, while disseminating the results of the working groups and European projects in which the platform participates.

Description:

In the 2025 edition of REBUILD, PTEC strengthened the dissemination effort initiated in 2024, contributing to position industrialized construction and renovation as central themes of the sector's agenda. The participation contributed directly to increasing the visibility of industrialized solutions and to connecting supply and demand actors in the Spanish ecosystem, in line with the objectives of the BuildUPspeed project.

2.4.2.24 Workshop "From the ground to the data: how industrialization transforms civil engineering works"

Date: 11 June 2025.

Location: Burgos, Spain. In-person format.

Participants: 20 attendees. Civil engineering firms, infrastructure construction companies, public works managers, technology providers (BIM, sensorization, data capture), technology centers and public administrations.

Goal: To show how the combination of industrialization and digitalization (on-site data capture, BIM, digital twins, automation) is transforming construction processes in the field of civil engineering works, and to foster the transfer of these approaches to the Spanish sectoral ecosystem.

Description:

Technical workshop organized by PTEC that addressed the intersection between industrialized construction and digitalization of on-site processes. Practical cases were discussed on the prefabrication of infrastructure elements, automation of production processes and the use of digital tools (BIM, data models, sensorization) to link industrialized design with execution and subsequent operation. The workshop connected technological supply and sectoral demand in line with the objectives of BuildUPspeed.

2.4.2.25 Workshop on 3D printing in construction

Date: 21 October 2025

Location: Madrid

Participants: 50 attendees. Companies offering 3D printing solutions for construction, engineering firms, technology centers, architecture practices and universities.

Goal: To present and disseminate the state of the art of additive manufacturing (3D printing) applied to construction, one of the most disruptive industrialization routes for the sector, and to foster the connection between 3D printing technology providers and Spanish construction stakeholders.

Description:

Workshop dedicated to additive manufacturing (3D printing) applied to construction, addressing both the structural use of printed elements and the production of components for industrialized building systems. The session presented real cases and disseminated the potential of this technology to accelerate the production of construction elements, reduce material consumption and unlock new architectural typologies aligned with industrialized approaches.



2.4.2.26 Industrialized Construction and Renovation Workshop

Date: 8 October 2025.

Location: Valladolid, Spain. In-person format.

Participants: 70 attendees. Construction and development companies, manufacturers of industrialized and renovation solutions, social housing managers, technical staff from public administrations, technology centers, engineering firms and architecture practices.

Goal: To promote the knowledge and uptake of industrialized construction and renovation techniques among the agents of the Spanish sectoral ecosystem, connecting technological supply with real demand and favoring replicable use cases, in direct alignment with the objectives of BuildUPspeed.

Description:

Technical-sectoral workshop organized by PTEC within the framework of the activities of the Industrialized Construction Working Group. The session addressed the latest advances in industrialized construction solutions (prefabrication, modularity, panels, 2D and 3D systems) and, specifically, their application to deep renovation processes of the existing building stock. Practical case studies from member companies were presented and the barriers and enablers to scale up these solutions at national level were discussed. The activity contributed directly to the activation of the Spanish market and to the dissemination of industrialized renovation solutions.

2.4.2.27 PTEC institutional participation in CONSTRUMAT 2025

Date: 20,21 and 22 May 2025

Location: Fira Barcelona, Spain. In-person format.

Participants: International trade fair with several thousand professional visitors. Audience: international construction sector (industry, professionals, technology providers, public sector).

Goal: To reinforce the visibility of the Spanish industrialized construction ecosystem in one of the main international construction trade fairs held in Spain, and to articulate connections with international actors interested in industrialized renovation and construction solutions.

Description:

Construmat is one of the main international meetings of the construction sector held in Spain, with a specific focus on innovation, sustainability and industrialization. The presence of PTEC in its 2025 edition reinforced the visibility of the Spanish ecosystem of industrialized construction in an international context, complementing the action carried out at national level through REBUILD.

2.4.2.28 Publication of the Glossary of Industrialized Construction Terms

Date: Published in 2025 (continuous update and availability online).

Location: Digital publication. Open online tool available on the PTEC website (plataformaptec.es).

Participants: Developed by the PTEC Industrialized Construction Working Group, with contributions from more than 20 entities. Addressed to the sector as a whole: professionals, companies, public administrations, university and vocational training.

Goal: To establish a common, agreed terminological framework among the agents of the Spanish industrialized construction sector, removing ambiguities, facilitating technical and



commercial dialogue, and fostering the incorporation of these concepts into tender specifications, regulations, training and official documentation.

Description:

Reference document developed by PTEC's Industrialized Construction Working Group and published as an open-access online tool on the platform's website. The Glossary compiles and defines the main technical, commercial and regulatory terms associated with industrialized construction (modularity, 2D and 3D systems, prefabrication, DfMA, etc.). It responds to a recurring demand from the sector and constitutes a structural contribution to the Spanish ecosystem fully aligned with the objectives of BuildUPspeed.

2.5 Dutch Local Advisory Board

2.5.1 Formation of the Dutch Local Advisory Board

The Dutch Local Advisory Board consists of the following members:

2.5.1.1 Bouwhulpgroep

Address: Beukenlaan 133, Eindhoven, The Netherlands

Contact Person: Haico van Nunen

Contact E-Mail: h.v.nunen@bouwhulp.nl

Category: supply side

Expertise for the project: Expert/professor in the field of deep-renovation and local pop-up factories

2.5.1.2 Vervoort Architecten

Address: Torenallee 45 (Glasgebouw SWA 1.003), Eindhoven, The Netherlands

Contact Person: Anneke Vervoort

Contact E-Mail: anneke@vervoortarchitecten.nl

Category: Supply side

Expertise for the project: Expert/architect and design specialist

2.5.1.3 Smart Urban Redesign Research Centre

Address: Nieuw Eyckholt 300, Heerlen, The Netherlands

Contact Person: Prof. Dr. Nurhan Abujidi

Contact E-Mail: nurhan.abujidi@zuyd.nl

Category: other – Design side

Expertise for the project: Expert/professor in urban transformation and running Urban Living Labs and ecosystems

2.5.1.4 Sustainable International Business (SIB)

Address: Brusselseweg 150, 6217 HB Maastricht

Contact Person: Prof. Dr. Nikos Kalogeras



Contact E-Mail: nikos.kalogeras@zuyd.nl

Category: other – Design side

Expertise for the project: International Business School Maastricht; Expert/professor in business challenges regarding sustainable cooperation in contemporary product/service markets

2.5.1.5 Woonpunt

Address: Leidenlaan 18-20, 6229 EZ Maastricht

Contact Person: Pieter Diederan

Contact E-Mail: p.diederan@woonpunt.nl

Category: demand side

Expertise for the project: Housing Association

2.5.1.6 Van Wijnen Groningen

Address: Kieler Bocht 19 , 9723 JA Groningen

Contact Person: Nadia Mild

Contact E-Mail: <https://www.vanwijnen.nl/locaties/groningen>

Category: supply side

Expertise for the project: Building contractor expert in industrialized solution and multi-site coordination

2.5.1.7 WEBO

Address: Spoelerstraat 15, 7461 TX Rijssen, NL

Contact Person: Bart Voortman

Contact E-Mail: bvoortman@webo.nl

Category: supply side

Expertise for the project: Expert in production of prefabricated facade solutions

2.5.1.8 Smeets Bouw

Address: Kotterweg 20, 6222 NR, Maastricht

Contact Person: Roger Lardenojie

Contact E-Mail: <https://smeetsbouw.nl/>

Category: supply side

Expertise for the project: Contractors, building company expert in multi-site coordination with industrialized solutions

2.5.2 Reporting on the Activation of Local Advisory Boards in Netherlands

Table 6 provides an overview of the LAB and soundboard activities carried out in the Dutch ecosystem to gather feedback, engage relevant stakeholders, and support the development of ecosystem-specific actions. The listed activities reflect the first steps taken to identify barriers and opportunities and to translate key BuildUPspeed concepts, such as industrialized renovation, pop-up factories, and market activation planning, into the Dutch context.

Table 6: LAB and Soundboard Activities in The Netherlands

N o	Name of the Activity	Location	Date	Category	Attendees	Target group	Number of participants
1	Sustainable places 2023	Madrid	June 14-16, 2023	Conference	LAB & SBG	Researchers, policy makers, managers	300
2	Defining an action plan for ecosystems	Online	Oct 5, 2023	Workshop	Ecosystem leaders	Input from all stakeholders in the ecosystem	15
3	Minor UT-A	Heerlen, NL	Ac. Y. 2023/24	Project-based education minor course	Students, Researchers	Minor students of Built Environment	~30
4	Minor CIRC	Heerlen, NL	Ac. Y. 2023/24	Project-based education minor course	Students, Researchers	Minor students of Built Environment	~30
5	Graduation Assignment	Heerlen, NL	Ac. Y. 2023/24	Graduation thesis	Students, Researchers	Graduating students of Built Environment	2
6	Sustainable places 2024	Luxembourg	23-25 September 2024	Conference	Researchers	Researchers, policy makers, managers	400
7	Thematic session SURD Atelier	Heerlen, Netherlands	21 November 2025	Event and panel discussion	students, researchers, stakeholders, politicians	students, researchers, stakeholders, politicians	60
8	Minor "Applied Sustainability"	SIB, Maastricht, NL	March-June 2025	Project-based education minor course	Students, Researchers	Minor students of the School of International Business	36

N o	Name of the Activity	Location	Date	Category	Attendees	Target group	Number of participants
9	Meetings for discussing the pilot projects	Maastricht	Sep 2025 – June 2026	Meetings, site visits	Researchers, Housing Association, contractors	Researchers	3
10	Meetings for discussing the pilot projects	Hoensbroek, Heerlen	Jan 2024 – January 2026	Meetings, site visits	Researchers, Housing Association, contractors	Researchers	3
11	Meetings for discussing the pilot projects	online	Jan 2025 – June 2026	Meetings, round tables	Researchers, Contractors, suppliers	Researchers	6
12	Development of the Training session	online	May-June 2026	Explanatory videos about development of BUPs	ZUYD and DEMO Researchers	Researchers, practitioners	tbd
13	4th International Sustainable Energy Conference (ISEC 2026)	Graz	April 2026	Contribution to a collective paper for Conference presentation	Researcher, practitioners	Researcher, practitioners	N/A
14	7th Symposium on Circular Economy and Sustainability	Maastricht	24-26 June 2026	Conference	Researcher, practitioners	Researcher, practitioners, politicians	150
15	7th Symposium on Circular Economy and Sustainability	Maastricht	24-26 June 2026	Abstract	Researcher, practitioners	Researcher, practitioners	N/A

2.5.2.1 Sustainable Places Conference 2023: 50 Shades of Industrial Deep Energy Retrofit

Date: June 14th, 2023.

Location: Madrid, Sustainable Places Conference 2023

Participants: About 30 persons

Goal: Open discussion on industrialized deep energy retrofit.

Description:

The workshop aims to identify key challenges and factors that hinder the uptake of industrialization and establishment of deep-renovation factories and unravel examples of

relatively successful deep-renovation factories. The 50 shades of industrialized deep energy retrofit workshop has been chaired by Peter Op 't Veld; Maria Sara Di Maggio & John van Oorschot. Other projects involved were [GigaRegioFactory](#) project, [StepUP project](#), [INFINITE project](#), [Drive 0 EU H2020](#), PLURAL, [Switch2Save](#), [ENSNARE](#).

Type of barriers | preconditions

1. Construction proces	2. Cost / value	3. Expertise, skills & knowledge	4. Logistics & site operations
5. Regulatory / Building Code	6. Industry & market culture (client's desire, negative stigma's, unfamiliarity, lowest cost orientation)	7. Supply & procurement, also including liability, quality and certification issues	8. Other

Figure 31: Barriers and preconditions

2.5.2.2 Workshop: Defining an action plan for ecosystems

Date: October 5th, 2023

Location: Online - [BuiltUPSpeed Workshop, Visual Workspace for Innovation \(miro.com\)](#)

Participants: About 15 persons with input from all stakeholders active in the ecosystem

Goal: Identifying barriers and solutions as a baseline of the action plan putting the key BuildUPspeed concepts (MAP, pop-up factory) into action in the ecosystems.

Description:

A Miro board has been developed to collect specific input from the 5 ecosystems; the results of the Miro board provide input for an action plan for the ecosystem. The Miro is seen as a 'living canvas' which can be adjusted during the duration of the project.

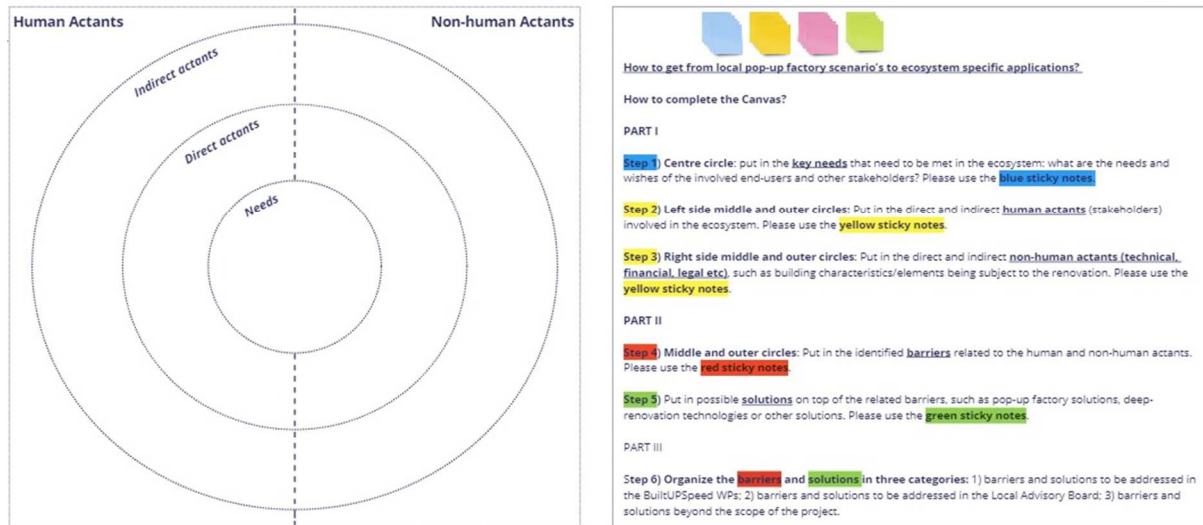


Figure 32: Canvas applied (MIRO) during the workshop to provide input for the industrial renovation actions plans in the 5 eco-systems.

2.5.2.3 Minor UT-A

Date: Academic year 2023-2024

Location: Heerlen, ZUYD Hogeschool, Built Environment Departement

Participants: About 30 students

Goal: Project-based education minor course

Description:

The Minor *Urban Transformation – Analysis (UT-A)* has been developed for students of the Built Environment Department of ZUYD Hogeschool according to a project-based learning approach. The minor is embedded within the Urban Living Labs (ULL) and Demo Labs (DL) of the Smart Urban Redesign (SURD) research group, where a specific urban area is defined as a shared project environment. Working in interdisciplinary teams that reflect the main Built Environment profiles (BKO, CT, RO), students carry out an integrated spatial, social, technical and environmental analysis of a real urban case in Hoensbroek (Heerlen). The aim is to build a solid analytical foundation for future urban transformations, while enabling students to develop their own professional profile within an interdisciplinary, practice-oriented setting supported by researchers and practitioners.

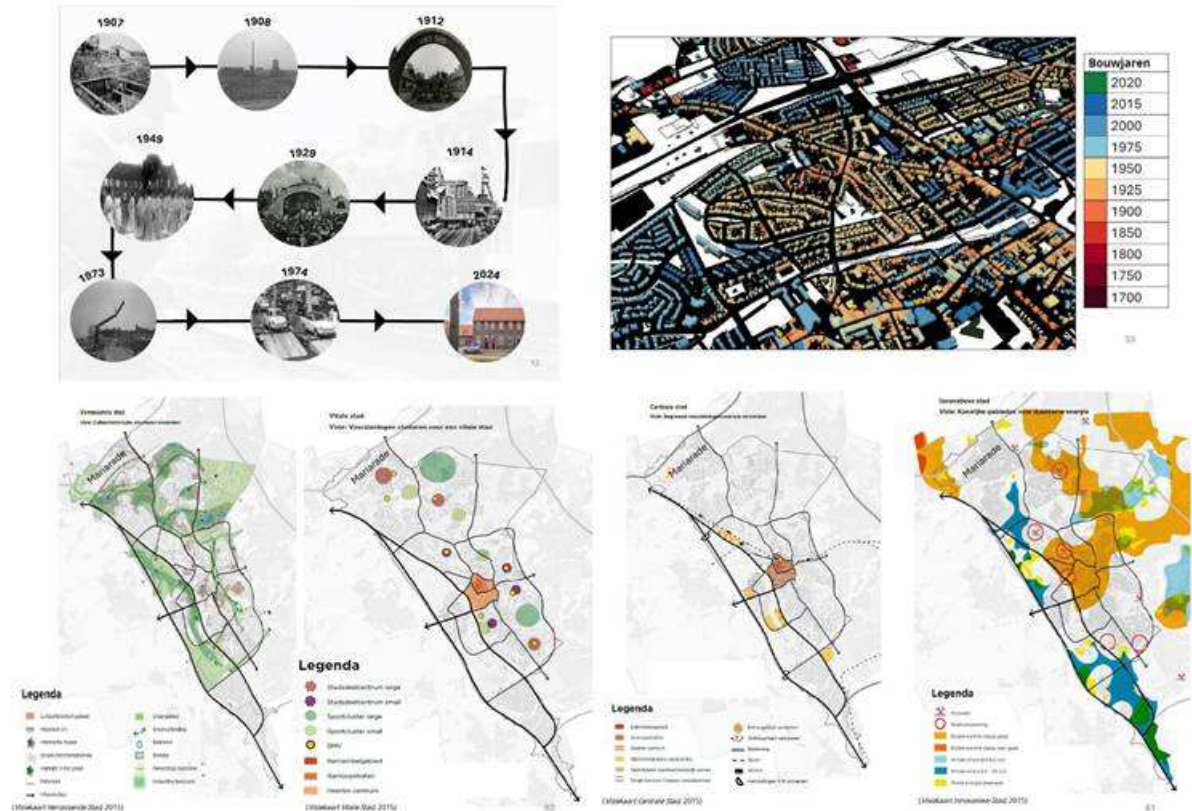


Figure 33: ZUYD Minor UT-A students work overview (Group: Ruud de TheijE, Nadine Huids, Bram de Groot, Henk van Kuijk).

2.5.2.4 Minor CIRC

Date: Academic year 2023-2024

Location: Heerlen, ZUYD Hogeschool, Built Environment Departement

Participants: About 30 students

Goal: Project-based education minor course on deep energy retrofit.

Description:

The Minor "Circular low carbon built environments" has been developed and tested for the students of the Built Environment Department of ZUYD Hogeschool, according to a project-based approach to education. The minor is embedded in the Urban Living Labs (ULL) and Demo Labs (DL) of the Smart Urban Redesign (SURD) research group. The course focuses on assignments from the broad field of the built environment: spatial development, architecture, and civil engineering, requiring the students to formulate their own assignments to work on, within the given context of the ULL, in consultation with the group and supervisors. In small groups, the students are asked to work on the case of Pastoor Schleidenstraat in Hoensbroek (Herlen), with the scope of developing a revitalization vision towards a circular, energy-neutral, and vibrant built environment. The Minor is also enriched by the participation of lecturers and researchers who focus on deep renovation and circular transformation through time.

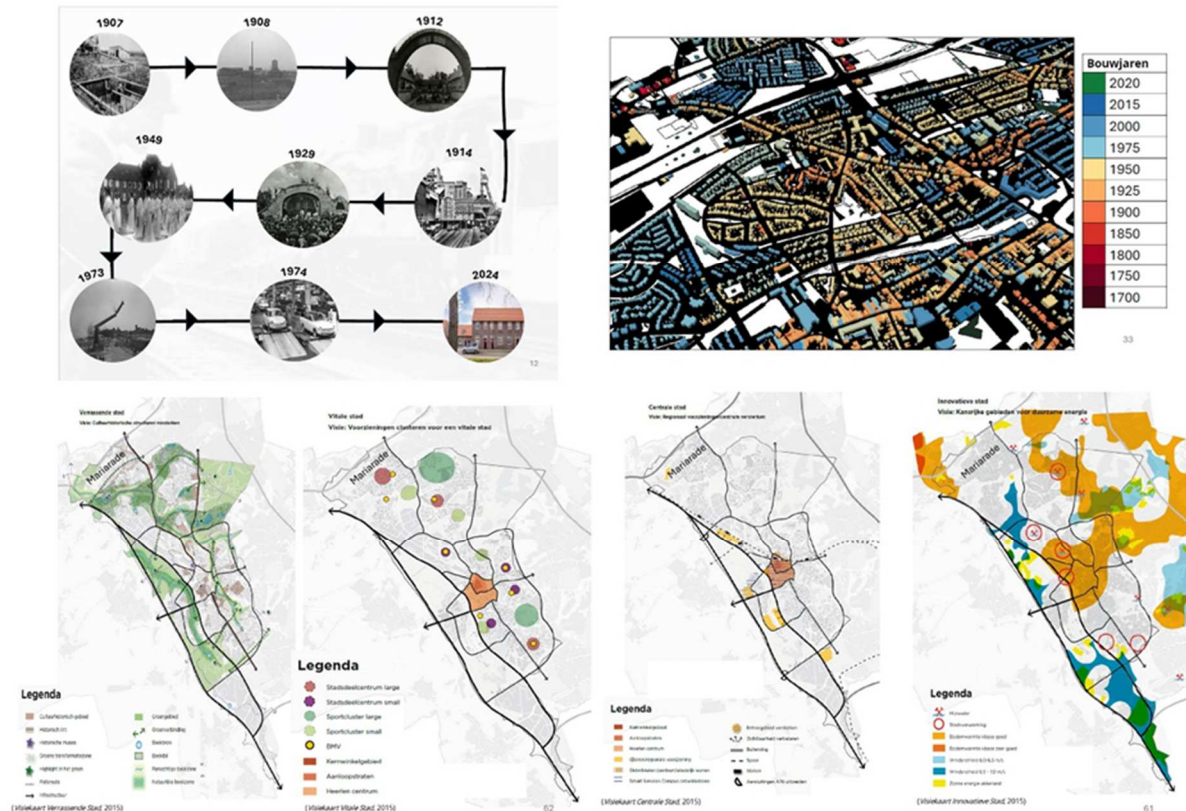


Figure 34: Overview of ZUYD Minor CIRC student works process and results (Group 6: Dean Cuijpers (CT), Jur Hofmann (RO), Delano Kanders (BK), Thijs Offermans (BK), Finn Dreessen (BK))

2.5.2.5 Graduation Assignment

Date: Academic year 2023/24

Location: Heerlen, ZUYD Hogeschool, Built Environment Departement

Participants: 2 students

Goal: Graduation research project on circular construction and renovation

Description:

The graduation projects offer for the academic year 2024/2025 for the students of the Built Environment Department of ZUYD Hogeschool include some opportunities to be involved within the themes developed and investigated by BUPS. The developed offer includes the (1) Development and design of local pop-up factory for renovation, (2) the development and design of a prefabricated modular renovation concept for porch-floor flats in Hoensbroek, or (3) the development and design of a circular renovation concept for porch-floor flats. The thesis "Snel, sneller, snelst. Tijd besparen, kwaliteit behouden: prefab appartementenrenovatie [Fast, faster, fastest. Save time, maintain quality: prefab apartment renovation]" explores walk-up apartment buildings more sustainable through a circular prefabricated renovation method. The thesisis "Circular Renoveren. Een onderzoek gericht op circulaire renovatiemethoden voor portieketageflats [Circular Renovation. A study focused on circular renovation methods for multi-storey flats]" explores the different aspects of circular renovation in the built environment, aiming at developing a circular renovation design, centered on value retention and environmental impact.

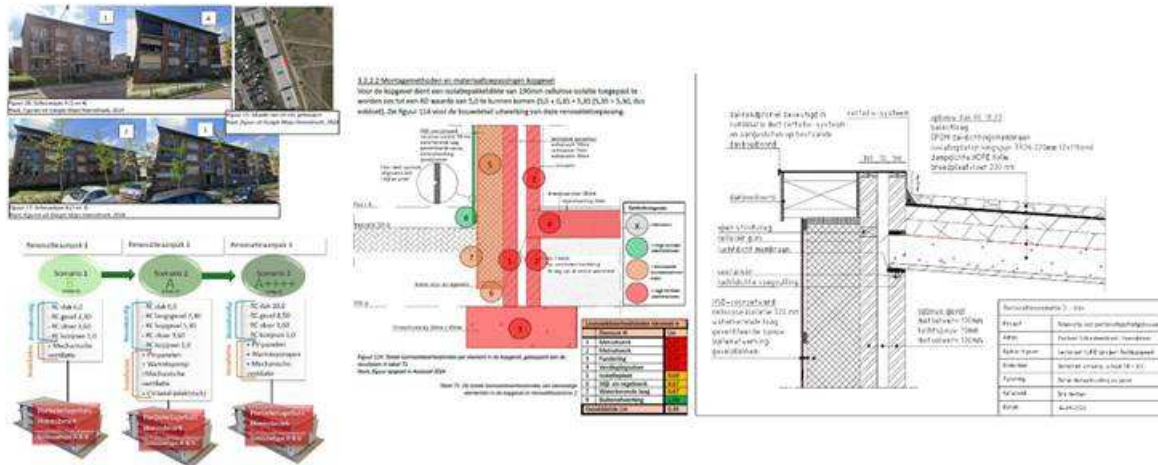


Figure 35: Pictures extracted by "Circular Renoveren"(Graduation thesis by D. Herben).

2.5.2.6 Sustainable Places 2024

Date: 25th September 2024

Location: Luxembourg, Sustainable Places Conference 2024

Participants: About 30 persons

Goal: Open discussion on "Navigating the Shades of Industrialized Deep Energy Retrofit"

Description:

The work of BuildUpSpeed (BUPS) was presented at the Conference "Sustainable Places 2024" by John van Oorschot in the panel "Speeding up industrialised Building renovation by introducing the Local Pop-up Factory concept" (session "Navigating the Shades of Industrialized Deep Energy Retrofit: Strategies for a Sustainable EU Building Stock") on the 25th September 2024. The contribution framed BUPS within the EU ambition to retrofit 100 million dwellings by 2050 through industrialized, modular, and digitally enabled renovation approaches. The session explored how prefabricated envelope systems, regional factory models, and integrated digital-physical workflows can accelerate decarbonisation, while addressing regional diversity, market activation, and policy frameworks necessary to scale up deep energy retrofits across Europe.

<https://www.sustainableplaces.eu/previous/sp2024/navigating-the-shades-of-industrialized-deep-energy-retrofit-strategies-for-a-sustainable-eu-building-stock/>

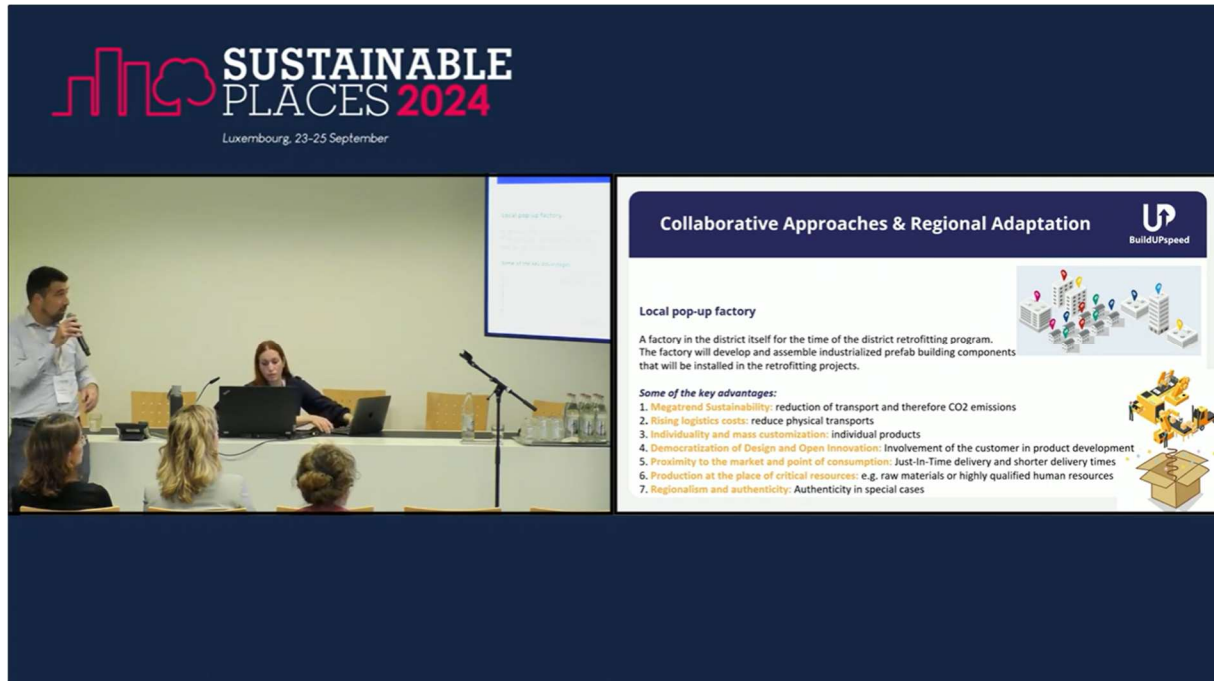


Figure 36: Screenshot of the intervention at the "Sustainable Places 2024", as published on the Conference website (Source: <https://www.youtube.com/watch?v=uPi2jBscEMk>)

2.5.2.7 Thematic session SURD Atelier

Date: 21ST November 2025

Location: Former DSM Building, Heerlen

Participants: 60 (students, researchers, stakeholders, politicians)

Goal: Informing and discussing on circularity in the Construction and Renovation sector

Description:

With the occasion of the closing ceremony of the 10th edition of SURD Atelier, a design workshop organized by the Smart Urban Redesign (SURD), in Heerlen, a panel discussion has been developed on the crucial role of Circularity within the Built Environment. The panel, initiated by Nurhan Abujidi was supported by a conversation with Olga Ioannou (Delft University of Technology), Chris Leinders (ECCBT), and Roger Feller (MeerWaarde). To the event, stakeholders and local politicians were present, together with fellow researchers, professors and students involved in the Built Environment field.



Figure 37: Panel discussion with Olga Ioannou (Delft University of Technology), Chris Leinders (ECCBT), and Roger Feller (MeerWaarde) (© ZUYD, SURD).

2.5.2.8 Minor “Applied Sustainability”

Date: March-June 2025

Location: SIB, Maastricht (NL)

Participants: 36 students; 2 researchers

Goal: develop and evaluate an innovative deep-retrofit solution for residential buildings by investigating homeowners’ willingness to pay for energy-efficiency improvements and the factors influencing their investment decisions

Description:

This business challenge focuses on the role of deep energy retrofits in achieving national and European climate goals. Students are asked to explore how the energy performance of existing dwellings can be improved through measures such as insulation, airtightness, renewable energy systems, and other strategies derived from the Trias Energetica framework. Building on this technical understanding, the assignment requires students to develop an innovative product, service, or business concept that could support the adoption of retrofit measures at the household or neighborhood scale. Particular attention should be given to the economic feasibility of the proposal and to homeowners’ willingness to pay for energy-efficiency improvements, identifying the factors that influence investment decisions and the potential value proposition of the proposed solution.



Figure 38: Assignment panels of students from Group 1 (SIB, Maastricht).

2.5.2.9 Meeting for discussing pilot project

Date: September 2025 – June 2026

Location: Maastricht, NL

Participants: 3 (Researchers, Housing Association, contractors)

Goal: collect first-hand knowledge on the implementation of PuF concepts through the Maastricht pilot

Description:

Throughout the implementation of the pilot project Quirinaalhof in Maastricht, researchers from Zuyd University maintained close collaboration with the contractors and the housing association involved in the renovation process. Periodical meetings were organized to discuss technical, organizational, and operational aspects of the intervention and the concept of PuF, while site visits allowed the research team to observe the building and understand the extent of the works.



Figure 39: The Quirinaalhof building, Maastricht (© B. Andaloro)

2.5.2.10 Meetings for discussing pilot project

Date: January 2024 – January 2026

Location: Hoensbroek, Heerlen, NL

Participants: 4 (Researchers, Housing Association, contractors)

Goal: collect first-hand knowledge on the implementation of PuF concepts through the Hoensbroek pilot

Description:

Throughout the implementation of the pilot project Pastoorschleidenstraat in Hoensbroek (Heerlen), researchers from Zuyd University maintained close collaboration with the contractors and the housing association involved in the renovation process. Online and in person meetings were organized to discuss technical, organizational, and operational aspects of the intervention and the concept of PuF, while site visits allowed the research team to observe the building and understand the extent of the works.



Figure 40: The Pastoorschleidenstraat building, Hoensbroek (Heerlen) (© B. Andaloro).

2.5.2.11 Meeting for discussing pilot project

Date: Jan – June 2026

Location: online

Participants: 6 (researcher, main contractor, facade supplier)

Goal: collect first-hand knowledge on the implementation of PuF concepts through the Gronngen pilot

Description:

Throughout the implementation of the InCube pilot project in Groningen, researchers from Zuyd University maintained close collaboration with the main contractor and the facade supplier involved in the renovation process. Online meetings were organized to discuss technical, organizational, and operational aspects of the intervention and the concept of PuF.

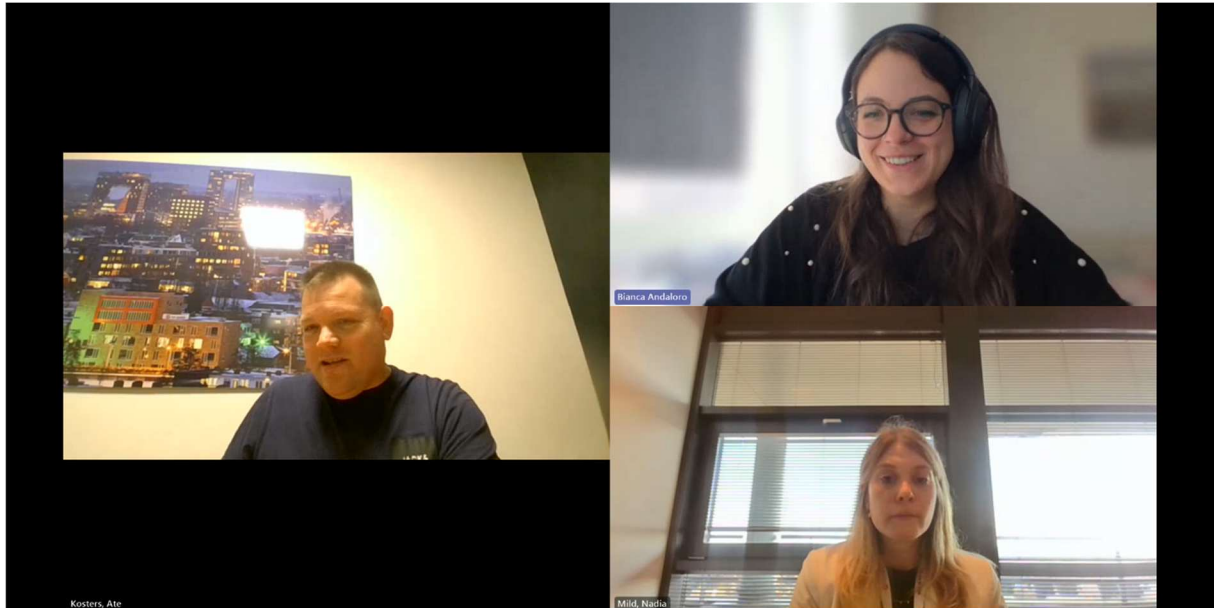


Figure 41: Online meeting with van Wijnen company about the Groningen pilot (© B. Andaloro).

2.5.2.12 Development of the Training Sessions

Date: May-June 2026

Location: online

Participants: researchers from ZUYD, DEMO, and PTEC

Goal: Development of contents and visual for the recording of Training sessions

Description:

The activity focused on the development of both the content structure and supporting visual materials for the recording of the European Training Course on Industrialized Construction and Renovation within the BuiltUPSpeed project. This included defining the thematic scope and learning objectives of the training sessions, coordinating contributions from project partners and invited speakers, and preparing presentation materials, graphics, and case-study documentation. particular attention was dedicated to Session 4, focused on Plug-and-Use Façades (PuFs), which explored their technical characteristics, implementation processes, and potential contribution to accelerating deep-retrofit practices. In parallel, Session 5, "Case Studies and Application to Local Context", was developed to present pilot projects and practical use cases, illustrating how industrialized renovation solutions can be adapted to different local conditions and stakeholder contexts. The activity also involved aligning the educational content with the overall course program, ensuring consistency across sessions, and preparing materials suitable for online delivery and future dissemination through recorded training modules.

2.5.2.13 4th International Sustainable Energy Conference (ISEC 2026)

Date: 14-16 April 2026

Location: Graz, Austria

Participants: N/A

Goal: disseminate and critically discuss the potential of Pop-Up Factories and Market Activation Platform

Description: ZUYD contributed to the collective paper submitted as a result of the participation to the 4th International Sustainable Energy Conference in Graz. The paper discusses how industrialised renovation can be accelerated across Europe by combining innovative production models, such as Pop-Up Factories (PuFs), with integrated financing mechanisms based on Energy Service Companies (ESCOs) and crowdfunding. Drawing on the LIFE BuildUPspeed project, it analyses the implementation of different PuF scenarios in five European countries and evaluates their technical, economic, and ecosystem readiness. The paper argues that aligning industrialised construction solutions with tailored business and financing models can help overcome market barriers and support the large-scale uptake of deep renovation.



Figure 42: 4th International Sustainable Energy Conference, website.

2.5.2.14 7th Symposium on Circular Economy and Sustainability (conference)

Date: 24-26 June 2026

Location: Maastricht, the Netherlands

Participants: 150 people

Goal: disseminate and critically discuss the potential of Pop-Up Factories as scalable and circular solutions.

Description:

Researchers from Zuyd University will participate in the 7th Symposium on Circular Economy and Sustainability (CESUST 2026), held in Maastricht, the Netherlands, contributing to the scientific discussion on circular and industrialized renovation strategies. The contribution, entitled "*Pop-Up Factories for Circular Deep Renovation: Pathways towards a European Circular Transformation*", explores the role of Pop-Up Factories (PuFs) as innovative mechanisms for accelerating deep renovation processes across Europe. The conference targets researcher, academic, practitioners and members of (local) governments to inspire them and collectively reflect upon circular and sustainable renovations.

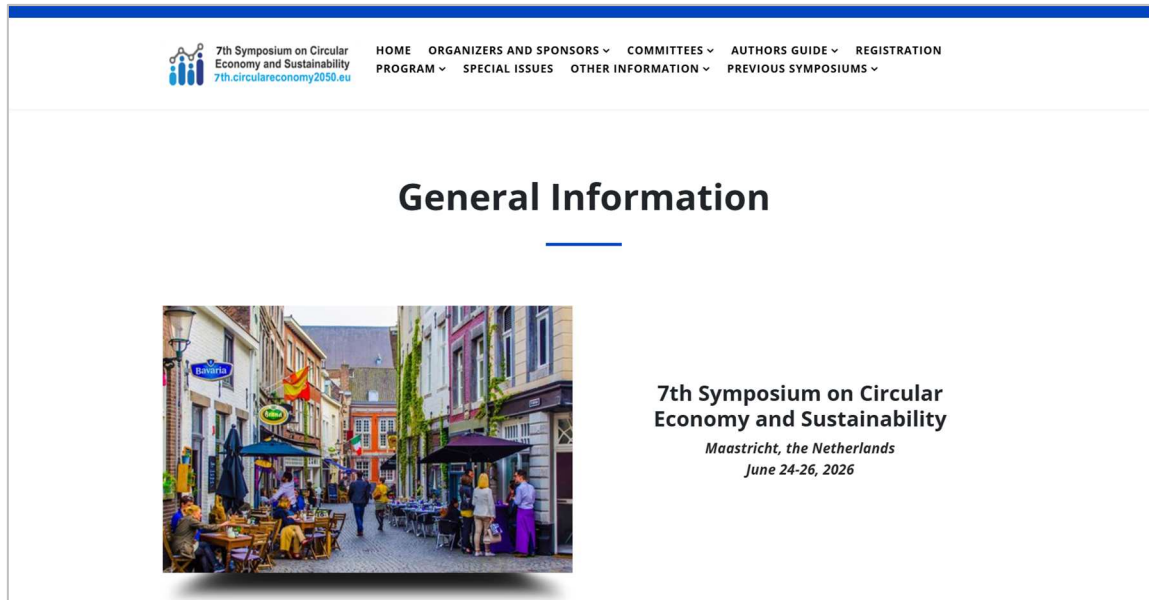


Figure 43: 7th Symposium on Circular Economy and Sustainability, website.



Figure 44: 7th Symposium on Circular Economy and Sustainability, panel discussion (© B. Andaloro).



2.5.2.15 7th Symposium on Circular Economy and Sustainability (abstract)

Date: 24-26 June 2026

Location: Maastricht, the Netherlands

Participants: 150 people

Goal: disseminate and critically discuss the potential of Pop-Up Factories as scalable and circular solutions for accelerating deep renovation processes across diverse European renovation ecosystems, in a scientific publication.

Description:

Researchers from Zuyd University will participate in the 7th Symposium on Circular Economy and Sustainability (CESUST 2026), held in Maastricht, the Netherlands, contributing to the scientific discussion on circular and industrialized renovation strategies. The contribution, entitled "*Pop-Up Factories for Circular Deep Renovation: Pathways towards a European Circular Transformation*", explores the role of Pop-Up Factories (PuFs) as innovative mechanisms for accelerating deep renovation processes across Europe. Drawing on experiences developed within the LIFE BuildUPSpeed project, the presentation examines five PuF typologies and their application within different European renovation ecosystems, highlighting their potential to support localized production, circular resource flows, stakeholder collaboration, and the scaling-up of industrialized renovation approaches. The contribution also reflected on the opportunities and challenges associated with adapting PuF models to diverse national and regional contexts, emphasizing their relevance for achieving Europe's climate-neutral and circular transition goals.

3 Reporting on Market Activation

This chapter presents the market activation activities carried out within the five BuildUPspeed ecosystems and shows how the project has moved from stakeholder mobilization to concrete implementation. Building on the work of the Local Advisory Boards and soundboard activities described in Chapter 2, the focus here is on the practical steps taken to stimulate the uptake of industrialized renovation solutions, circular construction approaches, and ecosystem-specific collaboration models.

The chapter highlights how market activation has been translated into pilot projects, pop-up factory related concepts, urban mining and re-use activities, and the development of national or local market activation platforms. As the starting conditions, stakeholder structures, and market maturity differ across Austria, France, Italy, Spain, and the Netherlands, the activities presented also vary in scope and focus. Together, however, they illustrate the different pathways through which BuildUPspeed supports the emergence of local industrialized renovation markets and creates the conditions for replication beyond the project duration.

3.1 Reporting on Market Activation, Austria

In Austria, market activation has been done mainly by triggering of a whole series of pilot projects that were focused on the following topics:

- Renovation with industrialized modules
- Urban Mining & Reuse
- Urban quality enhancing

The concept of PopUpFactories was addressed mainly in the topic of re-use. The concept of the re-use box was analyzed in detail as an assembly factory as documented in the deliverables of WP4.

In addition, two national market activation platforms for serial renovation have been implemented in Austria during the lifetime of the BuildUPspeed projects. They will be linked to the main BuildUPspeed Market Activation Platform.

The topic of serial renovation has been discussed intensively in Austria in numerous events for stakeholders and resulting in national projects including a large part of the timber construction branch in Austria as well as further national and international research projects with demonstration buildings.

3.1.1 Renovation with Industrialized Modules

One goal of the Austrian ecosystem is to trigger the implementation of new renovation concepts. For this reason, we want to push renovation with prefabricated roof and facade elements.

In the following, renovation projects that are triggered by the Austrian Ecosystem are presented.

Arenberggasse, Vienna

The building is situated in Arenberggasse in Vienna and is owned by Sozialbau AG.



Figure 45: Pilotproject Arenberggasse © Klimafond/Krobath

The building of Sozialbau AG was in a thermally insufficient. The project involved the renovation of a residential building using prefabricated façade modules, which include integrated, electrically controlled external shading systems. In addition, French balconies are newly constructed, requiring specific cut-outs in the façade modules. The existing gas heating system is replaced by a combination of brine-water and air-water heat pumps. A key component of the new heating system is the use of building component activation. Summer cooling is provided via free cooling from deep boreholes, and a rooftop photovoltaic system, integrated into the overall concept, contributes to the building's energy supply.

Vocational School, Knittelfeld

The second project is a school building from LIG situated in Knittelfeld, Styria.

The renovation of the Vocational School Knittelfeld is a demonstration project for serial, prefabricated and circular renovation approaches. The project focused on the deep renovation of an educational building during ongoing school operations. A central element of the renovation was the use of highly prefabricated timber façade modules, which were manufactured off-site and installed on the existing building envelope. These multifunctional façade elements combine several renovation measures in one system, including thermal insulation, high-performance windows, external shading, ventilation components and photovoltaic elements.



Figure 46: Pilot project Knittelfeld before renovation© AEE INTEC

The project demonstrates how prefabricated façade systems can reduce the complexity and duration of renovation works on site. By shifting a significant part of the production and assembly process to controlled factory conditions, construction quality can be improved and weather-related delays can be reduced. At the same time, the installation of large-scale façade modules helps minimize disturbance for building users. This is particularly relevant for schools and other public buildings, where long interruptions of normal operation are difficult to manage.

From an energy perspective, the renovation aimed to significantly reduce heating demand and improve the overall performance of the building envelope. The integration of ventilation components also supports better indoor air quality, which is especially important in educational buildings. In combination with photovoltaic elements, the renovation concept contributes not only to energy efficiency, but also to the increased use of renewable energy on site.

The Vocational School Knittelfeld therefore serves as a practical example of how industrialized renovation can be applied to public building stock. It shows that serial renovation is not limited to residential buildings but can also offer strong potential for schools and similar building types. The project provides valuable experience regarding planning, prefabrication, logistics, installation and user-oriented renovation processes. As such, it represents a relevant reference case for the further development and replication of high-quality, scalable renovation solutions in Austria and beyond.



Figure 47: Construction Site Pilot Knittelfeld © Klimafond/Krobath



Figure 48: Prefabricated façade modules delivered on site © Klimafond/Krobath



Figure 49: Ventilation System Knittelfeld © AEE INTEC

Grüne Gasse, Graz

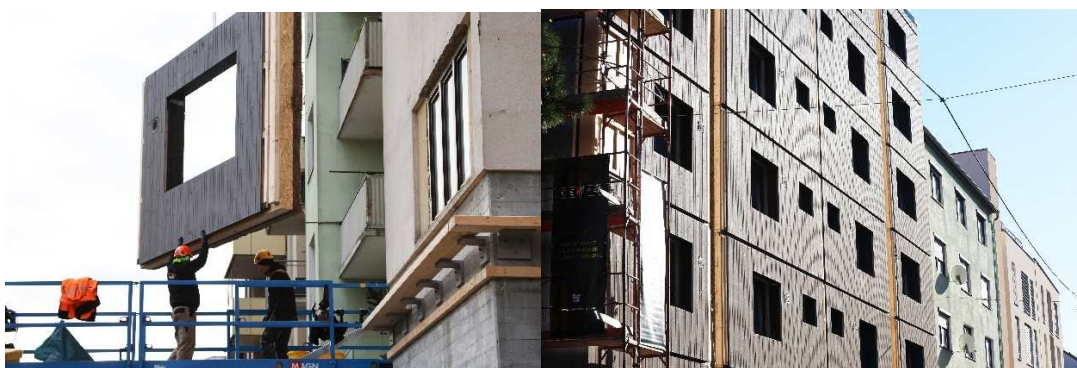


Figure 50: Pilot Grüne Gasse © Klimafond/Krobath

The renovation of Grüne Gasse in Graz is a demonstration project for serial, prefabricated renovation. The six-storey residential building from 1972, used as a student residence, is being modernized with highly prefabricated façade modules while remaining occupied. The renovation concept combines improved thermal insulation with façade-integrated building services, including the CEPA® energy façade for low-temperature heating and cooling,

decentralized ventilation with heat recovery, photovoltaic elements, air-to-water heat pumps, sun protection and roof greening.

The project demonstrates how deep renovation of multi-storey residential buildings can be carried out with reduced on-site construction time, improved quality control and limited disruption for residents. As the building represents a common post-war residential typology, Grüne Gasse provides valuable experience for the replication of industrialized renovation solutions in dense urban contexts in Austria and beyond.

Linzer Straße, Vienna

The renovation project Linzer Straße in Vienna is a demonstration case which focuses on the transition away from fossil gas in multi-storey residential buildings. The project addresses a group of seven structurally identical residential buildings owned by Sozialbau, providing an opportunity to test and compare different renovation and heat pump system solutions under comparable conditions. The overall aim is to combine a high-quality thermal renovation with the replacement of gas-based heating and domestic hot water systems by innovative heat pump solutions, supported by photovoltaic systems and, where applicable, ventilation systems with heat recovery.

A central feature of the project is its focus on minimal-invasive renovation. The renovation concept investigates how prefabricated façade elements, improved building envelope performance and modular heat pump technologies can be combined to reduce heating demand and enable efficient low-temperature operation. Different system variants, including central, semi-central and decentralized heat pump solutions, are tested across the buildings. This makes the project especially relevant for the wider Austrian and European residential building stock, where many existing apartment buildings face similar challenges regarding fossil heating systems, limited space for technical installations and the need to reduce disruption for residents.

The Linzer Straße project therefore demonstrates how serial renovation approaches can support the decarbonization of existing residential buildings. By combining prefabrication, heat pump technologies, renewable electricity generation and practical testing under real building conditions, the project provides valuable insights into technical feasibility, user acceptance, system efficiency and replicability. The project is an important reference case for future “phase-out gas” strategies and for scaling climate-neutral renovation solutions in urban housing contexts.



Figure 51: Pilot project Linzer Straße (© AEE INTEC)

Südsan

The Südsan renovation project in Bludenz, Vorarlberg is a demonstration project for socially compatible, climate-target-oriented renovation of existing multi-family housing. The project focuses on two representative buildings in the Südtiroler-Siedlung Bludenz, a residential estate built between 1943 and 1962 with almost 400 housing units. These buildings represent a common stock of small and medium-sized multi-family houses in non-metropolitan Austrian regions, many of which still have poor thermal performance and outdated individual heating systems.

The project investigates how comprehensive renovation can be implemented in an energy-efficient, economically viable and socially acceptable way. A key objective is to compare renovation with demolition and new construction in terms of energy demand, greenhouse gas emissions, investment costs and life-cycle costs. The renovation approach includes improvements to the building envelope, modernization of the energy supply and the use of innovative façade-based solutions such as the CEPA® energy façade. Special attention is given to maintaining affordable rents and reducing disruption for residents during the renovation process.

Südsan therefore provides valuable evidence for the renovation of existing residential buildings that are technically outdated but socially and urbanistically worth preserving. By combining energy-economic optimization, climate-compatible renovation strategies and social affordability, the project serves as an important reference for scaling deep renovation in similar housing estates in Austria and beyond.



Figure 52: Renovation Project Südsan © AEE INTEC

3.1.2 Urban Mining & Re-Use

Since the AIE is one of the founding cooperatives of the now legally registered cooperative **BauKarussell e.Gen.** it is engaged in introducing the concept of Social Urban Mining to support the transformation towards more circularity. BauKarussell e.Gen. is working with its cooperative members (in particular AIE) to further develop its reuse brokerage service. As an essential component of the Social Urban Mining concept, this service follows the basic principles of BauKarussell: added value for building owners, the social economy and the environment; acting within a defined time frame; activities directly on site. The placement is primarily aimed at the B2B target group. An approach is pursued in which the acceptance of potentially reusable components/elements/materials is started immediately after commissioning by the building owner. In principle, it is agreed in the contract that all items available on site will be procured exclusively by BauKarussell. Precisely agreed exceptions can be discussed with the building owner. The collection of possible reuseable products, the so-called Re-Use Bauteilkatalog, is the basis for the initial brokerage activities. On-site inspections are possible in individual cases.

This is reflected in the following activities:

1. AIE and BauKarussell are engaged in several R&D calls at national level and new projects:

- a. BauKarussell has set up a new curriculum for a seminar to strengthen the position of the team leaders of social enterprises that oversee the practical work. Together with a social enterprise we also run the first seminar with 10 attendants from five organizations. This curriculum contains five modules theory and one module practical training. Another shorter Format is strictly dedicated to the start meeting at a building site. The cooperative also engages in Development project that review existing curricula for vocational training and higher vocational schools.
 - b. The national R&D project ReAssuRe checks existing test standards that are used for new building products. The aim is to set up a methodology for 5 to 8 specific reused products. The project will highlight the problems of applying existing standards to re-used products. The consortium includes a test center and a construction company.
 - c. The projects BauKrecord and ReUseMarketboost aim to set up and develop a digital tool to identify and document potentially reuseable building elements. To reduce the financial risks, a tool is needed that can be used by employees from our cooperative members. The projects sets up procedures and specifications of duties.
 - d. The project RessourceRevival deals with a former industry production area. The consortium wants to work out resource potentials for grey/rainwater, excavated soil, energy production on site and the reuse of construction waste. The building owner is part of the consortium, and the instrument of an R&D project secures the efforts to think on a more strategic level about "resources on site".
 - e. The national R&D project ReUse:Holzhaus assembles three of the major producer companies for prefabricated wooden houses to analyze potential for deconstruction.
2. BauKarussell also engages in real developing projects (**pilots**).
- a. The first Re-Use Box in the frame of the project took place in spring 2024 in a **former army barrack in Carinthia**. This site, with several building complexes, will be redeveloped in the coming years. Tours with potential clients were conducted over two days with interested B2B parties. Several customers organized direct dismantling and collection. Further arrangements were made for the period up to handover to the demolition contractor. The feedback from the discussions was consistently positive - especially from the building owner Österreichisches Bundesheer (Austrian Armed Forces).



Figure 53: Entrance and information banner © BauKarussell



Figure 54: The welcome desk © BauKarussell



Figure 55: Safety precautions for Nogo areas for site visitors © BauKarussell

- b. TGA A **former training center in Vienna** (app. 11.000m²) has been identified to host the first Social Urban Miner for team leaders". The planning process continues, and we discuss with the building owner the option to install a Re-Use Box.

In early 2025, BauKarussell was engaged at a former training center in Vienna (app. 11.000m²) to keep as many resources as possible in circulation and to prepare the building for demolition. As part of the Re-Use Box event from 2–6 June, the building opened its doors for one last time. During the week-long pop-up store, the public could visit a sales exhibition in the foyer, designed and implemented by a social enterprise. Another social enterprise handled the sales and provided a dismantling and transport service. For anyone wishing to deepen their knowledge of upcycling and reuse, workshops had been offered by again another social enterprise.



Figure 56: The former training center in Vienna © BauKarussell



Figure 57: Visitor browsing and examining the potential for reuse © JoannaPianka



Figure 58: The exhibition desk at the Re-Use Box © JoannaPianka



Figure 59: Visitors checking the catalogue and the potential for reuse of tiles © JoannaPianka



Figure 60: the welcome and cash desk at the re-Use Box © JoannaPianka

- c. The **Otto-Möbes-Akademie in Graz** is a versatile conference and events center covering an area of approximately 4,500 m². The oldest part of the building dates back to the 1920s, although the property has been modernized and extended on several occasions. To meet the future requirements of an education and events venue, it has been undergoing comprehensive renovation and modernization since January 2026. To keep as many of the high-quality and well-maintained building components and fittings in circulation as possible, to facilitate skills development and employment during the demolition work, and to ensure transparency throughout the entire project, BauKarussell was commissioned to carry out social urban mining.

In the summer of 2025, ahead of the start of construction, the potential for social urban mining was assessed, identifying a particularly high potential for reuse. To enable operational work to begin swiftly once the AK Steiermark had vacated the premises, over 500 available building components were catalogued and assessed whilst the building was still in use. The project also marked the launch of fully digital reuse recording and brokerage at BauKarussell. The inventory was also used to organize the distribution of available movable assets to other AK Steiermark sites.

Over a period of 11 weeks, interested parties were able to view the building to assess the available reusable building components and products, and have them dismantled by qualified third parties. At the same time, a social enterprise removed floor coverings, suspended ceilings, lighting fixtures and door leaves, and sorted the materials into separate waste streams for disposal.

Thanks to the extended allocation window, detailed recording and efficient processing via BauKarussell's central database, the potential for reuse was fully realized.

The complete parquet flooring in the dining hall, the commercial kitchen equipment, aluminum-wood windows, door frames, external railings, canopies, wooden decking, sports equipment and even a sauna were successfully placed for reuse. Upon completion of the project, an interface plan was handed over as a basis for subsequent trades.



Figure 61: The conference venue Otto-Möbes-Akademie in Graz © BauKarussell



Figure 62: Construction meeting in the former dining room, which was also used as a temporary storage area © BauKarussell



Figure 63: Dismantled door frame components ready for pick up © Baukarussell



Figure 64: Collection of designer chairs © BauKarussell



Figure 65: Glas elements prepared for transport to the new location © BauKarussell



Figure 66: Deconstruction of a glass canopy © BauKarussell

3.1.3 Urban quality enhancing

SMART BALKON

More and more people are seeking housing with open spaces. However, a large portion of the existing building stock lacks balconies or terraces. Modern, attractive balconies have become an essential component of sustainable renovation projects. SMART BALKON has set itself the goal of providing an intelligent, efficient, and above all, sustainable solution for retrofitting a wide range of existing buildings.

In Vienna, "Smart Balkon" refers to an initiative by Rhomberg Bau GmbH aimed at retrofitting existing buildings with modern balconies. This service is particularly beneficial for buildings that were originally constructed without balconies, offering improvements that enhance both the property value and residents' quality of life.

Key features of the initiative include:

- **Modular Design:** Using the FRAME system, these steel-constructed balconies are prefabricated, allowing for rapid installation – often within two days.
- **Sustainability:** Options for integrated photovoltaic panels allow for on-site electricity generation, promoting energy efficiency and contributing to the building's sustainability.
- **Urban Greening:** The incorporation of greenery helps support urban biodiversity, contributing to a healthier city environment.
- **Customization:** A user-friendly online configurator allows clients to design balconies tailored to their specific needs and preferences.

This initiative not only revitalizes older buildings but also supports Vienna's objectives for sustainable urban development.

Two notable projects constructed by SMART BALKON are the ESSBAR project and the Wattmannngasse project. Both projects were executed using the FRAME balcony system, although they differ in their design.

ESSBAR: Located at Karmarschgasse 59 in 1100 Vienna, this project significantly contributes to enhancing urban quality. A distinctive feature of this project is the synergy between the steel structure and the integration of vertical greenery into the railing, which further elevates the aesthetic and environmental value of the building as mentioned in the previous chapter.

Wattmannngasse: Situated at Wattmannngasse 24 in 1130 Vienna, this project stands out for its unique feature: the client's request for a glass floor to maximize natural light entering the apartments. This design ensures that the building maximizes its connection to the surrounding environment while providing residents with a brighter living space.

Both projects were executed using a "Pop-Up Factory" method. All steel parts and connections were pre-manufactured in transportable pieces, which were then assembled on-site in the storage area and lifted into place using a crane. This approach not only speeds up construction but also minimizes disruption to the existing building.



Figure 67: Single Construction Close-up Site Wattmannngasse 24, 1130 Vienna, © Rhomberg



Figure 68: Completed Construction Site Wattmannngasse 24, 1130 Vienna, © Rhomberg

Over the past two years, SMART BALKON has completed 103 balconies across 17 projects, between 2023 and 2024, showcasing the growing demand and successful execution of this innovative and sustainable solution.

Project: ESSBAR

In Vienna's 10th district, a pioneering retrofit project has been realized that exemplifies how sustainable urban renewal can enhance both quality of life and environmental responsibility. As part of this initiative, 32 balconies were added to an existing residential complex, creating approximately 200 square meters of new outdoor space. A defining feature of the project is the integration of 64 vertical gardens using state-of-the-art greening technology. These vertical planting systems are irrigated with reused rainwater and greywater collected from the building's roofs, while an integrated photovoltaic system provides renewable energy to power the setup. The result is a closed-loop, resource-efficient ecosystem that brings greenery and functionality directly to residents' homes.

This innovative approach not only improves the building's ecological footprint but also significantly enhances urban living. The vertical gardens create a more pleasant microclimate, reduce local heat stress, and provide residents with the opportunity to grow herbs, vegetables, and berries—turning balconies into small urban oases. Importantly, this transformation was achieved with minimal structural intervention, making it a practical solution for upgrading existing buildings.

The project forms part of the broader research initiative "ESSBAR," a collaboration involving nine partners, including the Danube University Krems and the University of Natural Resources and Life Sciences, Vienna. The goal of the initiative is to develop scalable, real-world solutions for sustainable retrofitting of older housing stock, with a special focus on improving urban microclimates through vertical greening. The edible balcony retrofit stands as a forward-thinking model for how innovation and sustainability can merge in densely built urban areas, offering inspiration for cities aiming to modernize without compromising ecological values.



Figure 69: Work in Progress: Construction Site ESSBAR demo object, Karmarschgasse 59, 1100 Vienna, © Rhomberg



Figure 70: Completed Construction Site ESSBAR demo object, Karmarschgasse 59, 1100 Vienna, © Rhomberg



Figure 71: Plants and irrigation connection at ESSBAR demo object, Karmarschgasse 59, 1100 Vienna, © Rhomberg

3.1.4 Implementation of the PuF Concept

Re-Use Box as PuF

In the frame of operative activities in Social Urban Mining BauKarussell organizes selling, collection and deconstruction into one or more days. These days run under the **"BauKarussell Re-Use-Box"** brand. By arrangement, the customers or their contracted professionals or social enterprises dismantle the purchased reuse components. At the same time, tours of the property are offered to take a closer look at the available reuse components and, if necessary, to take them with them.

The Re-Use Box is also used for publicity activities. BauKarussell and/or the building owner organize visits from politicians, local residents and trainees to provide information about social urban mining and the upcoming construction project itself.

In the background, BauKarussell implements legal requirements during the mediation. Any reusability is compared with the results of the pre demolition audit according to the Austrian Recycled Building Materials Ordinance. Hazardous products or building areas are excluded from any reuse activities. Air conditioning and refrigeration units are tested in accordance with the EU regulation for fluorinated greenhouse gases. Electrical appliances are tested for safety following the Austrian electrical engineering act.

In the classification of Pop-up Factories, the BauKarussell Re-Use-Box is an "Assembly Factory". The tasks include reception, checking legal restrictions, mediation and, above all, logistics. Key points in the implementation are, for example

- Agree upon an adequate timeline with the building owner.
- Definition of the "story" that is transported with the Re-Use Box.
- Defining the exact target group.
- Planning concept for the process on the site of the property (welcome desk, parking spaces, tour design).
- Safety concept (cordons, first aid, emergency numbers, visitor regulations)
- PR documents (photos, which activities/what should be documented)
- Follow-up (evaluate impact indicators, initiate PR/public relations)

A core element of the PuF concept is the development and continuous refinement of a screenbook, which functions as a structured planning and checklist tool to guide reuse activities before, during, and after deconstruction. The screenbook supports early coordination with real estate developers, clarifies negotiation points, identifies technical and logistical constraints (such as lack of electricity or reliance on elevators), and enables post-activity documentation and evaluation. This planning framework is applied iteratively across all pilots and is considered a key outcome of the ecosystem's work.

Operationally, the Austrian PuF scenario is implemented through a portfolio of pilots including completed and ongoing projects such as community shops, hotels, large industrial parks, and a former training center in Vienna where a new reuse box is being established (see Chapter 3.1.2). These pilots demonstrate different levels of engagement, from conceptual urban mining studies to active dismantling and reuse operations, often in cooperation with social economic enterprises. While not all projects result in on-site reuse boxes, linkages to operational dismantling and reuse pathways are systematically explored.

First Experiences with PuF at Taggerwerke in Graz

The first experiences with Pop-Up Factories (PuF) and on-site mounting of renovation components at the Taggerwerke site in Graz demonstrate the strong potential of the "Assembly Factory Concept" for industrialized and multifunctional building renovation. The project, implemented within the EU project EXCESS, focused on transforming a former

industrial feed production building into a modern office and mixed-use building while integrating positive energy solutions and circular construction principles.

A central aspect of the project was the use of prefabricated façade elements with integrated building technology. Instead of delivering fully finished modules, individual façade components were transported to the construction site and assembled locally by technicians before being mounted onto the building. This Assembly Factory concept enables flexible adaptation to the specific conditions of the existing structure and allows adjustments to be made directly on site. The experiences showed that this approach can significantly simplify logistics for large and complex façade systems while also reducing transport volumes and improving handling flexibility during installation.



Figure 72: First façade elements are already on the wall © AEE INTEC

The project also highlighted the importance of close coordination between planning, prefabrication, logistics, and on-site assembly teams. Existing buildings often present unexpected structural and regulatory challenges that require adaptable installation processes. At Taggerwerke, strict Austrian fire protection regulations for the 10-storey high-rise building required the use of a steel substructure for the façade elements instead of lighter conventional systems. To address these requirements, specially designed suspension brackets and steel components had to be welded together directly on site by construction workers. These experiences demonstrated that Assembly Factories can provide the flexibility needed to respond to project-specific conditions while still maintaining many advantages of prefabrication and industrialized renovation.

Another important lesson learned concerns the integration of multifunctional energy systems into prefabricated renovation components. The façade elements include solutions such as façade-integrated photovoltaics and component activation systems that use the building structure itself as thermal storage for heating and cooling. The project demonstrated how industrialized renovation can contribute to positive energy buildings and flexible future energy systems. In addition to the façade systems, the long-term energy concept for the site includes multiple heat pumps, extensive photovoltaic use, and plans for a small hydropower plant to move toward an energy self-sufficient district.

The project further emphasized the compatibility of Pop-Up Factory concepts with circular construction approaches. A strong focus was placed on reuse and resource efficiency throughout the revitalization process. Existing materials and reused components sourced from across Europe were integrated wherever possible into the redevelopment of the site. This approach not only reduced material consumption and waste generation but also demonstrated how industrialized renovation and circular economy principles can be combined successfully.

Overall, the experiences gained at Taggerwerke show that on-site assembly factories are a promising solution for complex renovation projects, especially when working with existing buildings that require customized technical solutions. The Assembly Factory concept enables high levels of prefabrication while maintaining the flexibility needed for challenging renovation contexts. The project provides valuable practical insights into logistics, installation procedures, circular material use, and the integration of innovative energy technologies, contributing important knowledge for future scalable and climate-neutral renovation strategies.

3.1.5 Market Activation Platform(s) in Austria

Austria has developed several complementary platforms to support high-quality, future-oriented and circular building renovation. While serielle-sanierung.at focuses on market activation for serial renovation with prefabricated elements and industrialized processes, qp-sanierung.at supports quality assurance by connecting building owners with qualified renovation experts and showcasing high-quality refurbishment projects.

In addition, platforms such as the re:store by [materialnomaden](https://materialnomaden.com) and the [Bauteilkatalog](https://bauteilkatalog.at) operated by [BauKarussell](https://baukarussell.at) strengthen circular construction and re-use practices. They support the collection, documentation, redistribution and reuse of building materials and components from demolition and renovation projects, helping to extend material life cycles and reduce construction waste. These initiatives also promote collaboration between planners, construction companies, cultural institutions, social enterprises and reuse networks.

Together, the platforms improve access to renovation knowledge, services, reusable materials and qualified providers. By connecting stakeholders, providing practical tools and promoting innovation, they contribute to the wider uptake of energy-efficient, resource-conscious and scalable renovation solutions in Austria.

The four platforms have been linked to the BuildUpSpeed Market Activation Platform.

3.1.5.1 **Serielle Sanierung.at**

serielle-sanierung.at is an Austrian B2B platform for serial building renovation. Its purpose is to support market activation by making serial renovation more visible, understandable and accessible for building owners, housing providers, planners, technology suppliers, construction companies and other stakeholders. This aligns with the BuildUPspeed market activation work in Austria, where national platforms for serial renovation are being developed and linked to the wider BuildUPspeed Market Activation Platform.

The website explains the concept of serial renovation: the use of prefabricated façade, roof or balcony elements that are produced off-site and mounted quickly on-site, often with integrated building technology such as photovoltaics, ventilation or heat pumps. It presents the main benefits, including shorter construction times, higher prefabrication quality, reduced disruption for residents, lower energy demand and CO₂ reductions.

In terms of content, the platform offers a renovation quick check, an eligibility assessment for buildings, an overview of providers, best-practice projects, FAQs, and information on funding opportunities. It also includes the "Forum Serielle Sanierung", a recurring online format for exchange, pitches, project examples and networking among companies, building owners, municipalities, researchers and other professionals.

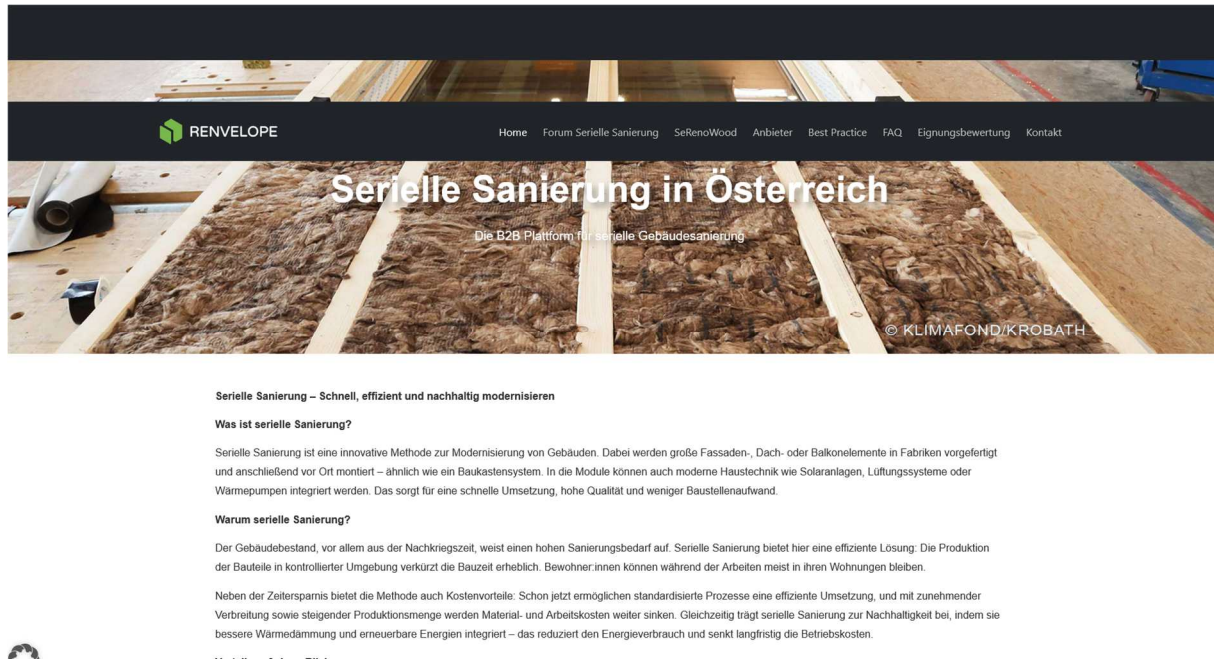


Figure 73: Screenshot of the homepage *serielle-sanierung.at*

3.1.5.2 Qualitätsplattform Sanierung

qp-sanierung.at is the website of the Qualitätsplattform Sanierung, an Austrian quality network for sustainable and high-quality building renovation. The platform is organised as an association called Qualitätsplattform Sanierung, founded in 2021, and is operated by RENOWAVE.AT. It complements the advisory services of the Austrian federal states by making qualified renovation providers visible and easier to contact.

A key feature of the platform is its quality-checked membership model. Companies cannot simply list themselves: they must meet defined quality criteria, commit to the platform's Charta, and demonstrate experience with high-quality, sustainable and energy-conscious renovation projects. Admission to the association is decided by a jury currently composed of board members of the Qualitätsplattform and representatives of public advisory bodies.

Companies that want to become members can contact the platform by email to receive information about the admission process. The criteria differ depending on the company's sector and services, but general requirements include commitment to the Charta, participation in quality-oriented renovation projects and recommendations. Members pay an annual fee based on company size.

Through this association-based structure, qp-sanierung.at functions not only as a searchable directory of renovation providers, but also as a quality assurance instrument for the Austrian renovation market. It strengthens trust, transparency and cooperation between building owners, planners, construction companies and other renovation experts.

WILLKOMMEN BEI DER QUALITÄTSPLATTFORM SANIERUNG

Wer ein Gebäude zukunftssicher sanieren möchte, braucht kompetente Partner. Die Qualitätsplattform Sanierung ist ein Netzwerk von Unternehmen, die sich auf hochwertige Sanierung und Renovierung spezialisiert haben. Gegründet 2021 als Verein, fördert und sichert die Plattform Qualitätsstandards und ergänzt damit das Angebot der Beratungsstellen der österreichischen Bundesländer.

UNSER ANGEBOT

Die Plattform versteht sich als Qualitätsnetzwerk – Mitglieder müssen strenge Qualitätskriterien erfüllen und sich zur Einhaltung unserer Charta verpflichten.

Im Gegensatz zu vielen anderen Sanierungsportalen erfordert diese Plattform keine Eingabe von Projektdaten. Sie können sich ganz einfach anhand der bereitgestellten Informationen über die anbietenden Unternehmen ein eigenes Bild machen und die passenden Firmen direkt kontaktieren. Für die Erstellung eines maßgeschneiderten Angebots ist in der Regel eine Vorbesprechung oder Besichtigung vor Ort erforderlich.



Helmut Schöberl, Vereinsobmann, Ulla
Unzeitig, RENOWAVE.AT

Figure 74: Screenshot of the homepage qp-sanierung.at

3.1.5.3 Re:store operated by materialnomaden

The re:store by materialnomaden is a collaborative platform dedicated to extending the life cycle of materials, objects, and creative resources. It serves as a space where surplus materials from exhibitions, workshops, cultural institutions, and local industries are collected, sorted, and redistributed instead of being discarded as waste. The main goal of the re:store is to promote circular economy principles, reduce unnecessary consumption, and encourage sustainable production methods in art, design, education, and community projects. By making reusable materials accessible, the re:store supports experimentation, creative reuse, repair, and responsible resource management. It also functions as a social meeting point where artists, students, makers, and organizations can exchange knowledge, develop collaborations, and strengthen local networks. Through practical action and shared responsibility, materialnomaden inspire ecological awareness and contributes to a more sustainable and resource-conscious future.

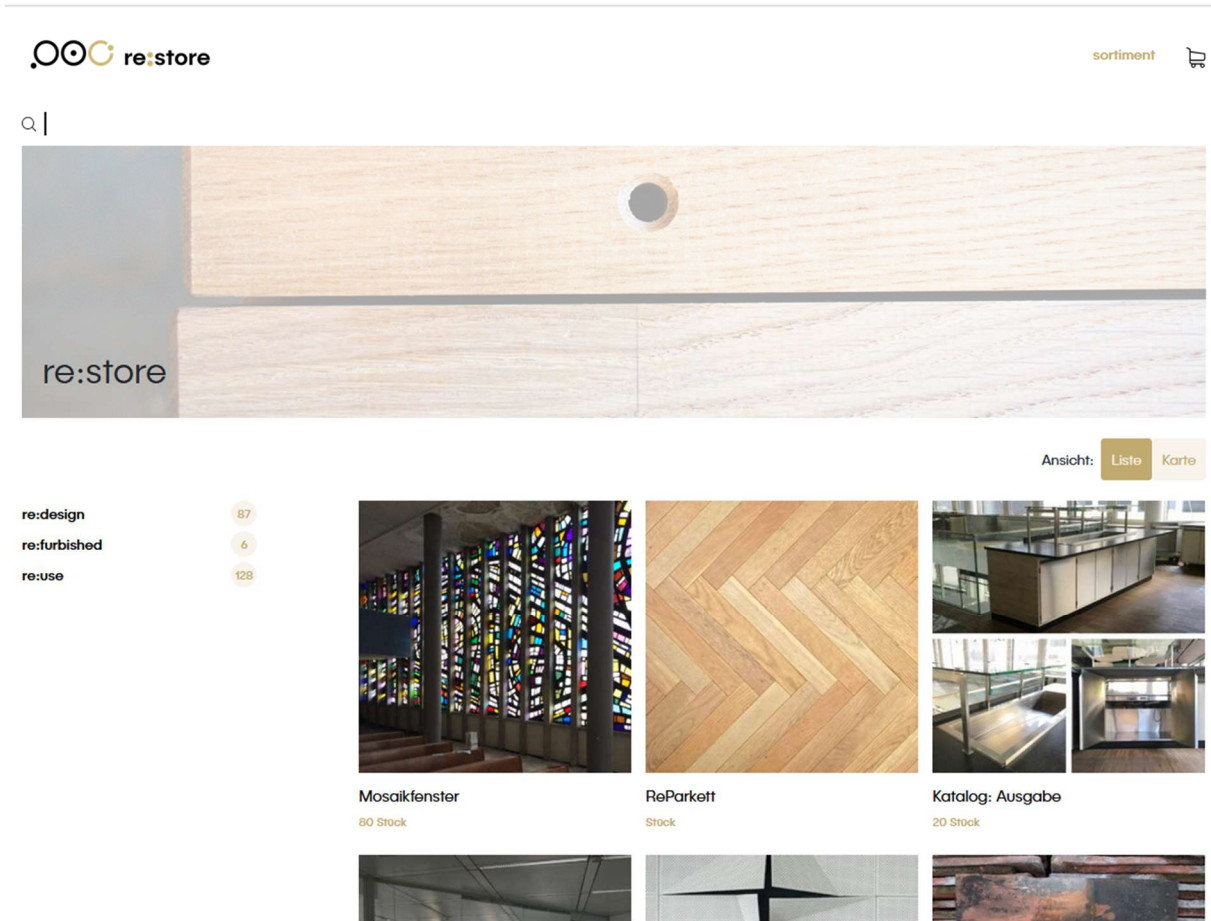


Figure 75: Screenshot of the re:store (www.restore.or.at) operated by materialnomaden

3.1.5.4 Bauteilkatalog operated by BauKarussell

The component catalog of BauKarussell is designed to support the circular use of building materials and reusable construction elements. Its main objective is to document, classify, and make visible valuable components from existing buildings before demolition, deconstruction or renovation takes place. The catalog enables architects, planners, construction companies, and reuse initiatives to identify materials and building parts that can be carefully dismantled and reintegrated into new projects. By providing detailed information about dimensions, material quality, condition, and potential applications, the catalog promotes resource efficiency and reduces construction waste. It also contributes to lowering GHG-emissions by extending the life cycle of existing materials and decreasing the demand for newly produced resources. In addition, the catalog strengthens awareness for circular construction practices and encourages collaboration between the building sector, cultural institutions, and environmental initiatives.

Kategorien

[Alle Produkte](#)
[Außenbereich/Garten](#)
[Baustoffe](#)
[Böden/Wandbeläge](#)
[Dach/Fassade](#)
[Elektrogeräte](#)
[Fenster/Glas](#)
[Haustechnik](#)
[Innenausbau](#)
[Küche/Gastro](#)
[Lampen/Leuchten](#)
[Möbel/Einrichtungen](#)
[Pflanzen](#)
[Raritäten](#)
[Sanitär/Bad](#)
[Türen/Tore](#)
[Ziegel/Naturstein](#)

Projekt

- ☐ Büro- & Werkstättenareal Loosdorf
- ☐ BauKarussell e. Gen.
- ☐ Hallenbad Hietzing
- ☐ GESA - Gemeinnützige Sanierungs- und BeschäftigungsgmbH

Marke

- ☐ Laufen

Suchen ...



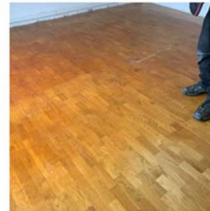
Sortieren nach: Name (A-Z)



3er Spind, Garderobe - Schließsystem "Ojmar"
60,00 € / Stück
42 Stück vorhanden



3-er Spind doppel, Schwimmbad, Schließsystem "Ojmar" - RESERVIERT
70,00 € / Stück
4 Stück vorhanden



Eichenparkett 6x36x2,1 bereits demontiert
35,00 € / m²
17 m² vorhanden



Hänge WC Laufen - RESERVIERT
15,00 € / Stück
2 Stück vorhanden



LOOS Sessel Rolf Benz, blau
80,00 € / Einheit(en)
2 Einheit(en) vorhanden



Mobile Tankstelle, Marke: Denios, 330l
450,00 € / Stück
1 Stück vorhanden



Nostalgie Badeschilder
8,00 € / Stück
13 Stück vorhanden



Parkett Buche, bereits demontiert
35,00 € / m²
80 m² vorhanden

Figure 76: Screenshot of Bauteilkatalog (<https://katalog.baukarussell.at/shop>) operated by BauKarussell

3.2 Reporting on Market Activation, France

3.2.1 Pilot Projects in France

First Pilot: 2 Buildings PALMER P

Project type: deconstruction, rehabilitation

Location: residence Palmer, Cenon (33150 FR)

The main pilot project concerns two selected buildings of the Palmer residence, social housing, that are being extensively renovated and complemented by a new extension. The project places a strong emphasis on circular economy principles, particularly on the reuse of materials and the valorization of existing resources.



Figure 77: Maps of the Palmer residence and the building concerned by the first step of renovation specially the pilot project : Palm P ; @DomoFrance



Figure 78: View of the Palm P, the French pilot project, before renovation ; @DomoFrance

After obtaining amendments with ANRU and signing agreements among different stakeholders of the project, “design/construction” studies were concurrently carried out. Following these actions, the first stage of deconstruction was completed by the end of 2023, and the second will start in 2024. The specifications require the demolition company to achieve a significant rate of recovery for materials and equipment. These resources are then stored on the ground floor for the rehabilitation of the building and its surroundings. Reusable equipment includes items such as toilets, windows, guardrails, electric equipment, etc. All these resources are tracked on a digital traceability platform, Upcyclea.

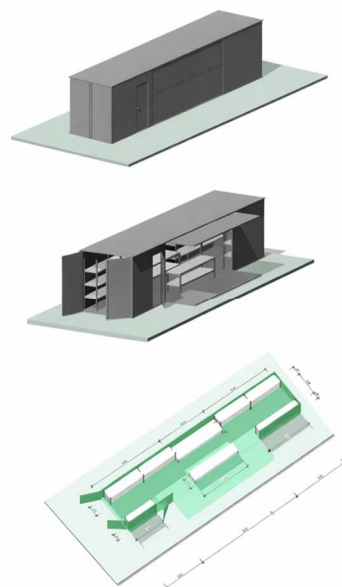


Figure 79: Storage after careful removal on the pilot site @DomoFrance

<https://www.youtube.com/watch?v=ncv9VOqMNe8>



Figure 80: video showing the process of careful removal, selective deconstruction and recycling of the pilot site; @DomoFrance / production: studio Blue Lemon



2

Figure 81 : example of the design of the mobile on site factory; @Favre



Figure 82 : testing the cleaning process for the reemployment of the sanitary equipment; @Favre

Second Pilot: Sols Contraintes, bien communs

Project type: research for revaluated polluted soil

Location: Lormont (33310)

Description:

A large part of the soil in the French ecosystem, on the right bank integrated in the GPV are polluted. This unprecedented collaboration at the metropolitan level involving public and private stakeholders has the goal to find a possibility and solutions to reuse this wasted land into resources for rehabilitation and construction.

Different innovative solutions will be considered as fabrication of clay brick, wall, etc.

The notable progress of recent months is the obtaining of funding to continue research on potential reuse solutions.

BuildUPspeed has an important role for feeding good solutions and process, especially on the integration of local pop-up factories as mobile on-site.

DomoFrance will provide 31 social buildings for the experimentation technologies developed within the project.

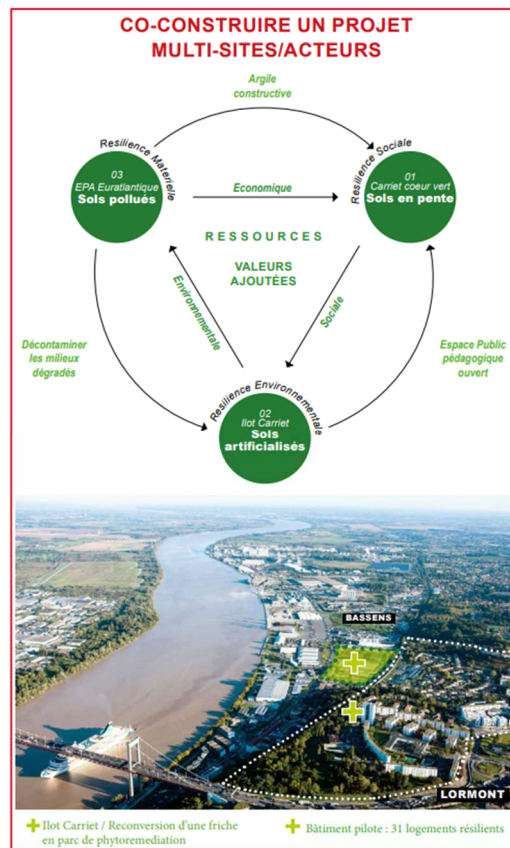


Figure 83: Sols Contraintes, bien communs ; @GIPGPV

Part of the project: Main local stakeholders are part of this project: Keno architects, Euratlantique, (public institution), Domofrance (social landlords), Odeys (cluster), Materrup (start-up), Nobatek/INEF4, GPV, LAFAB, CNRS ChimEco,

3.2.2 Implementation of the PuF concept (mobile unit for sanitary equipment reconditioning)

The concept of the mobile on-site factory has been deployed on a first pilot project at Palmer in the first half of 2026. While the design and process are still being refined — and the setup does not yet take the form of a fully structured mobile factory such as a container unit — it has already enabled the supply of reused sanitary equipment for 20 apartments. A second pilot, involving the renovation of a social housing building in Talence in the second half of 2026, will further refine the process and increase the reuse rate.

3.3 Reporting on Market Activation, Italy

The Italian ecosystem mainly focused on the implementation of the Energiesprong model in the province of Milan through different activities, described in the paragraphs below.

3.3.1 Implementation of the PuF Concept

Within the BuildUPspeed local pop-up factory (PuF) framework, the Italian ecosystem developed a **satellite-factory** scenario, conceived to support the large-scale industrialized

renovation of residential buildings, with a particular focus on the public social-housing sector. Given the significant industrial investment that such a facility requires, the concept was explored through a structured pre-feasibility study rather than through direct deployment within the project's lifetime.

The feasibility analysis was grounded on a real-world reference pilot: **six public social-housing buildings of the 1960s–70s in Milan** (Viale Omero area) that the Municipality expressed its willingness to retrofit. The pilot illustrates an industrialized façade-renovation approach based on offsite concrete panels, combined with new roofing and the replacement of the heat-generation systems, able to improve both energy and seismic performance (an envisaged jump from energy class G to A2) while keeping residents in place and installing the envelope without scaffolding. On this basis the study compared the off-site renovation scenario with demolition-and-reconstruction alternatives (both prefabricated and traditional) and assessed the added value of dedicating an off-site satellite factory to this and future interventions. The satellite factory was designed as a **hybrid production model**, able to manufacture components for both renovation and new construction to maximize capacity and reduce the risk linked to fluctuations in demand. The configuration combines a main offsite hybrid factory (producing the structural roof and façade panels and the precast elements for new construction or reconstruction), a set of smaller close-to-site satellite units (integrating the more delicate components — windows, photovoltaics, green finishes, heat pumps and mechanical ventilation, electrical and hydraulic connections, seismic dampers), and on-site activities (panel assembly, provisional works and services to tenants), coordinated through lean, just-in-time logistics.

Finally, to test the replicability of the concept in a different territorial context, a feasibility study was carried out for a **remote location**: a public social-housing building owned by IACP Catania, in Sicily. A hybrid arrangement was explored by pairing the main production facility located on the mainland, with local Sicilian SMEs and concluding with a structured GO assessment, beside complicated maritime logistics and need to local workforce training. For the full design, implementation plans and feasibility findings, reference is made to the dedicated WP4 deliverable (D4.1).

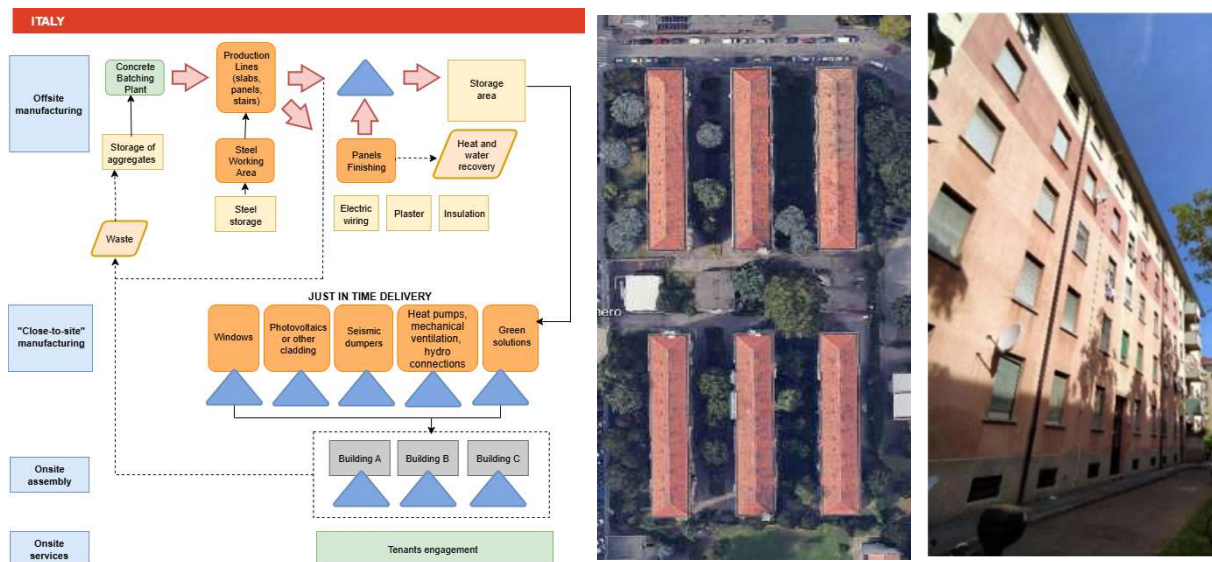


Figure 84: Satellite factory schemes and testing pilot in Milan @EDERA, MM spa and Google Maps

3.3.2 Renovation with Industrialized Modules

Beside the feasibility study, a central market-activation activity of the Italian ecosystem was the grounding of real off-site retrofits, in order to demonstrate that a market for industrialized renovation solutions already exists and to encourage public administrations to consider these solutions in their procurement bids.

Within this effort, **one BuildUPspeed pilot was successfully completed in Pieve Emanuele**, in the metropolitan area of Milan (Lombardy). The pilot consists of five privately-owned residential buildings dating from 1970 — five floors, 238 apartments, around 12,000 m² of façade and originally served by individual boilers — retrofitted with an industrialized, steel-framed modular panel system. The intervention is a deep energy retrofit carried out almost entirely off-site: the façade was installed in about three months, at a pace of roughly 60 m²/day with a three-person team and without scaffolding or cranes — using only scissor lifts — thereby minimizing disruption for residents. The works achieved a jump of four energy classes (from F to B) and relied on a new panel product developed and implemented specifically for this project by the manufacturer (Isopan), together with the design and installation partners of the Italian ecosystem. This result was achieved through BuildUPspeed and the EnergieSprong movement that supported the realization of the intervention by creating the enabling market conditions (bringing demand and supply together and accompanying the building owners and the manufacturer towards an industrialized solution) and by facilitating the creation of the local supply chain needed to deliver it.

Thanks to the short on-site duration, the performance achieved and the competitive cost, the Pieve Emanuele pilot was selected as the reference case for the monitoring and benchmarking activities of BuildUPspeed with respect to traditional practices. Indeed, the positive outcome of the project was also decisive for the continuation of the program: thanks to the successful completion and the demonstrated performance of the first five buildings, the same industrialized approach will be extended to a second phase of the same district — a concrete confirmation of the replicability of the solution and of its uptake on the local demand side.



Figure 85: Industrialized renovation completed in Pieve Emanuele, Italy @EDERA and Isopan

3.3.3 Market Activation Platform in Italy

As for the other ecosystems, the reference tool is the central BuildUPspeed Market Activation Platform (MAP), a webtool developed within the project to unlock and showcase proven offsite and industrialized renovation solutions, connecting demand and supply through a catalogue and map of solutions, experts and success stories. The Italian ecosystem was not directly involved in the technical development of the MAP, nor did develop a dedicated national platform but links are created with both the [EnergieSpong website](#) and the [Industrialised Deep Retrofit Hub](#) developed within H2020 Infinite project. Its contribution focused instead on requirements, validation and content. Local stakeholders were interviewed to understand their needs and to identify the main features and content the platform should offer; the Italian partners then took part in testing the prototype and providing feedback on its functionalities. Going forward, the ecosystem will



continue to feed the platform with best practices and solutions, drawing on the ongoing mapping of the Italian industrialized-renovation market and on the developments carried out through the EnergieSprong movement and Offsite Hub Italia, together with the testing and piloting activities of Eurac Research.

3.4 Reporting on Market Activation, Spain

Spanish ecosystem relays in 3 pillars:

- **policy side**, represented by Valencia Region (Ministry of housing)
- **market side**, represented by ACR (construction company), with the experience, innovation and resources needed to lead the transformation of construction industry
- **clustering side**, represented by PTEC, with more than 153 direct partners, and an informative outreach of more than 2000 entities, covering homogeneously the innovation ecosystem in the Spanish construction sector.

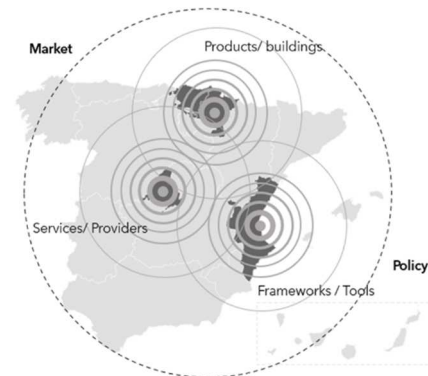


Figure 86: Spanish Market

All sides complement and are needed for the set up and/or improvement of renovation strategies based on industrialization.

Being the market penetration of industrialized solutions very light now, **learning, testing, evaluating and disseminating** will be the focus of the pilot experiences.

The activities of Spanish ecosystem are:

- to facilitate the **local knowledge** regarding industrialized processes for renovation
- to ease the **regulatory framework** and facilitate/ promote the **implementation** of applicable industrialized solutions **at local level**
- which can be aligned with the **pop-up service factories concept**
- to learn by applying, analyzing, testing and evaluating more advanced industrialized experiences and concepts, and designing the business strategies and/or dissemination and training actions necessary to **penetrate market and fasten and growth the renovation** (and business) **rates**.

3.4.1 Pilot projects in Spain

Pilot Market Overview:

In line with the activities of the Spanish ecosystem, the main objectives in relation to the pilot market are:

- Based on the pilots' performance, analyze and evaluate how much the Spanish market is aligned with the BUPS principles.
- From these results, define a roadmap for an effective implementation in the medium term.

The approach followed for the selection of the Spanish pilots and the way to proceed is summarized in the following image:

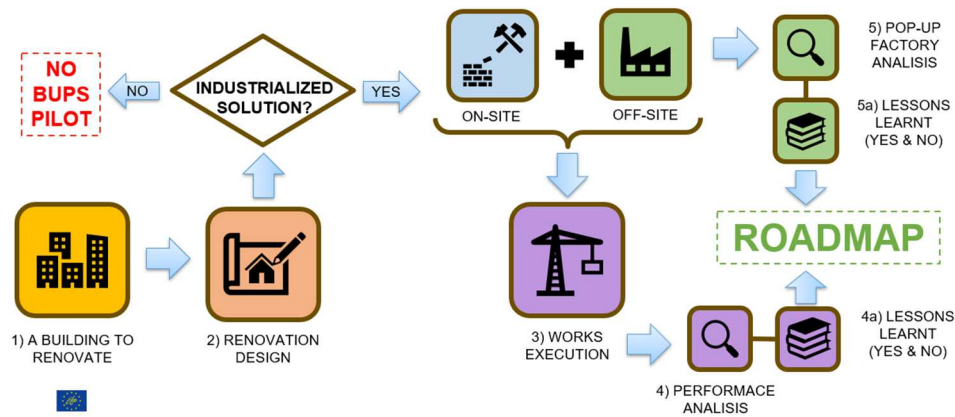


Figure 87: Spanish Pilot Approach (@ACR)

Following this approach, the pilots identified and selected so far are:



Figure 88: Spanish Pilot (@ACR)

PILOT 1: Student housing in Zaragoza

Complete renovation and **building extension** of Pontoneros' military former headquarters in Zaragoza (Spain) to convert it into 337 rooms new student housing.

Type of building: Student housing

Area: 13,347 m²

Renovation time: 17 months

Client: Xior Student Housing

Location: Zaragoza

Why has this building been selected as pilot for the Spanish ecosystem?

The project has been selected as the pilot of the Spanish ecosystem, first of all, because it is a renovation project in which industrialized construction systems will be used (very unusual in Spain).

Secondly, in the same project, two parallel renovation actions will be carried out, one of them using industrialized systems and the other with conventional construction solutions.

It is, therefore, a unique project that will allow us to compare in real time the advantages and possible drawbacks of industrialized systems against conventional ones, being able to analyze deadlines, costs, auxiliary resources of both solutions.



Figure 89: Spanish Pilot 2 © ACR

Key aspects of the project:

- It is a **renovation intervention**.
- It is a **listed building**, too. The renovation must preserve certain elements of the original building. Therefore, the construction system selected must be able to adapt to these specific elements.
- There are two parallel actions:
On the one hand, the **renovation of the former military headquarters (1)**. In addition to the complete renovation of the building, two more floors will be added, and a small new building will be integrated into it. All this using CLT (a **wooden industrialized construction system**).

On the other hand, the **renovation of the militaries housing (2)**. Apart from the renovation of the building, two other small buildings will be added, using a **conventional solution**.



Figure 90: Spanish Pilot Overview © ACR

PILOT 2: Public body headquarters in Pamplona (Municipal Association of the Region of Pamplona)

The project consists of the **renovation works of a historical building**, as well as specific structural and conservation works.



Type of building: Public body headquarters (administrative building)

Area: 2,968 m²

Renovation time: 24 months

Location: Pamplona

Why has this building been selected as the pilot for the Spanish ecosystem?

- It was decided to include this second pilot due to the need to expand the data already collected, particularly for the analysis of the "pop-up" factory concept.
- It is also a renovation project (again, quite unusual in Spain) with the same industrialized (wood) system (cross laminated timber, CLT), in this case in an office building (a former monastery building).
- As it is located in Pamplona, we can explore deeper into the concept of "pop-up" factory as ACR has strong bonds with small local suppliers.

Current Status:

In relation to the envisaged approach, the current situation is that data is being collected on both projects and analyzed not only in the sense of the performance achieved but also in relation to the potential integration of the new ideas and concepts introduced by BUPs.

All data collected from both pilots will be analyzed and compared. It is expected the two pilot sites complement each other, obtaining excellent feedback to define a BUP roadmap for the Spanish Ecosystem.

3.4.2 Implementation of the PuF Concept

Within the Spanish BuildUPspeed ecosystem, the Pop-up Factory (PuF) concept has been explored through the Salesas pilot in Pamplona, Navarra. The project involves the transformation of a former monastery into a public body headquarters, combining heritage conservation, adaptive reuse, and industrialized timber construction. Although the pilot was not originally designed as a formal PuF implementation, its construction process provides a relevant basis for assessing an Assembly PuF logic in a real renovation context.

The Spanish PuF is not conceived as an independent production facility or separate business entity. Instead, it is embedded within the construction site organization and supports the local adaptation, preparation, and assembly of CLT-based components close to their final installation point. The process also includes the selective recovery and potential reuse of timber elements from the existing building, adding a circular dimension to the pilot.

Its main value is operational rather than economic. In a protected heritage building, industrialized components must be adapted to irregular geometries, existing structural conditions, and preservation requirements. The Assembly PuF supports this adaptation by improving coordination between design, logistics, subcontractors, and installation activities. It also helps increase execution precision, quality control and responsiveness to unforeseen site conditions.

The workflow combines two main streams. First, newly supplied industrialized timber components are received, stored, checked, adapted, and prepared for installation, supported by BIM-based documentation. Second, recovered timber beams from selective deconstruction are inspected, classified, cleaned, and assessed for possible reintegration into the building. This demonstrates how close-to-site assembly can be combined with circular material practices.

From a logistics and delivery perspective, the PuF logic reduces unnecessary handling and supports better sequencing of works. Dedicated areas for storage, assembly and related



construction activities allow the PuF to function as part of the broader site organization. The model also benefits from ACR's established relationships with local SMEs, subcontractors, installers and suppliers in Navarra, reinforcing the role of the local construction ecosystem.

The feasibility assessment suggests that the Spanish Assembly PuF is technically and operationally workable, and generally compatible with the regulatory context, if heritage constraints, noise limits, working hours, crane restrictions and public-space issues are properly managed. However, its financial and market feasibility remain limited. The PuF has no separate revenue model, dedicated cost structure, or confirmed demand pipeline beyond the pilot. Its costs are integrated into the overall construction process.

For this reason, the Spanish case should be understood as an operational implementation model, not as a mature commercial business model. Its contribution is to show how close-to-site assembly, BIM-supported precision work, local supply-chain coordination and selective material reuse can support complex industrialized renovation projects.

Future replication would require early integration of the PuF logic in design and planning, clearer allocation of responsibilities, systematic monitoring of time, quality, waste, reuse and cost indicators, and a stable pipeline of similar projects. With sufficient repetition and demand aggregation, the model could evolve from a project-specific support mechanism into a more structured approach for industrialised and circular renovation in Spain.

3.4.3 Creation of the Regional Innovation Cluster for Industrialized Construction (CINCO) in the Valencia Region

The creation of the *Clúster de Innovación en la Construcción de la Comunitat Valenciana* (CINCO) is a relevant milestone connected with the activation of the Spanish BuildUPspeed ecosystem. The initiative is promoted in the regional context by the Regional Government (Generalitat Valenciana) and IVE, and aims to structure and coordinate the industrialized construction ecosystem in the Valencia Region. Within BuildUPspeed, IVE has acted as the public-policy-side partner of the Spanish ecosystem, contributing to market activation, stakeholder engagement, knowledge transfer and the identification of barriers and opportunities for the uptake of industrialized solutions in construction and renovation.

The cluster should also be understood in relation to the specific regional context in which BuildUPspeed was implemented. During the project, IVE was already promoting market activation initiatives and exploring the creation of a working group with companies specializing in industrialized construction. In parallel, the DANA weather event created an urgent regional need to repair damaged buildings and, in some cases, to demolish and rebuild them within shorter timeframes. This situation increased the relevance of industrialized approaches and led to initial pilot experiences, while also revealing practical barriers related to procurement, contracting, financing, technical requirements and the adaptation of administrative procedures. These issues were addressed through stakeholder activities and sectoral events, such as the conference on "Agile delivery of affordable housing through industrialized methods", which helped to share experiences, discuss public-sector challenges and learn from other administrations.

This regional context coincided with a broader policy and market framework that reinforced the need to structure the industrialized construction ecosystem. At European level, the need to accelerate energy renovation and decarbonization increased interest in off-site manufacturing, higher quality control and more efficient use of resources. At national and regional level, the PERTE for housing industrialization, the future State Housing Plan 2026–2030, the Plan Endavant initiative, regional housing needs after the DANA event, and the IVACE support framework for strategic clusters created favorable conditions for moving from isolated initiatives towards a more coordinated regional structure.

On this basis, an initial cluster approach was developed to assess the feasibility of creating a regional structure able to connect the different actors involved in industrialized

construction. This first approach focused on the need to coordinate companies, manufacturers, public authorities, technical bodies, universities, professional organizations and other stakeholders, while also taking into account the specific productive strengths of the Valencia Region, such as ceramics, metal, technical timber, logistics and advanced manufacturing. At this stage, 45 agents expressed their support through letters of support to the Strategic Plan, providing an initial critical mass for the future cluster.

After this initial mobilisation, the work moved towards the preparation of the *Plan Estratégico de Constitución* (PEC) of the Industrialized Construction Cluster of the Valencia Region. A working group was launched to support the drafting of the PEC, with the aim of moving from the initial cluster concept to a structured strategic and organizational framework. The first activities included documentary review, data collection, literature screening and the compilation of relevant European, national and regional policy and regulatory references. In parallel, a survey was carried out to characterize the industrialized construction ecosystem in the Valencia Region, receiving 56 responses.



Figure 91: Launch meeting of the working group for the preparation of the Strategic Plan for the Constitution of CINCO, the Regional Innovation Cluster for Industrialized Construction in the Valencia Region (more info: <https://www.five.es/cluster-industrializacion/>). (@IVE)

The first phase of the PEC, focused on analysis and diagnosis, has now been completed. The main outputs developed in this phase are the contextualization and strategic framework report, the ecosystem mapping and value chain characterization report, the competitive diagnosis, including a SWOT analysis and preliminary action lines, and the feasibility report and critical mass validation. These documents provide the evidence base for the next stage of work and support the definition of the cluster's mission, governance model, strategic priorities and initial action plan.

The roadmap for the cluster is structured in three phases: analysis and diagnosis, strategic formulation, and deployment and formalization. With Phase 1 completed, the process is now moving towards Phase 2, which will focus on defining the mission and vision of the cluster, identifying strategic challenges and action lines, and designing the governance model. The subsequent phase will address the action plan, stakeholder commitments, formal launch and monitoring mechanisms. This phased process shows that the cluster is already at an advanced preparatory stage and is expected to move towards formalization and operational deployment in the short term.

From the perspective of BuildUPspeed, the cluster can be reported as a relevant result of the Spanish ecosystem activation process. It translates several needs addressed during the project into a more stable regional framework: coordination between stakeholders, visibility of industrialized construction capacities, identification of barriers, support to training and skills development, connection with public policy, and promotion of industrialized solutions for both new construction and renovation. In this sense, CINCO provides a concrete example of how project-based ecosystem activities can contribute to longer-term market stimulation mechanisms at regional level.

3.4.4 Local Market Activation Platform(s) in Spain

Within the Spanish ecosystem, a local platform is being developed to support the identification and visibility of good practice cases, companies and technical solutions related to prefabricated and industrialized building construction and renovation. The platform responds to the need to organize and make accessible the information available in the Spanish market, helping stakeholders to identify relevant examples, solution providers and companies with expertise in prefabricated systems, modular construction, industrialized processes and renovation-oriented solutions.

The platform is conceived as a local market activation tool. It collects and structures information on good practice cases, technical solutions, companies and actors that can contribute to the renovation of buildings through prefabricated and industrialized approaches. By doing so, it helps connect knowledge, practical examples and market capacity, supporting building owners, public authorities, designers, construction companies, manufacturers and other stakeholders involved in the renovation value chain.

This initiative is aligned with the BuildUPspeed Market Activation Platform approach, as it contributes to improving access to renovation knowledge, increasing the visibility of local providers and supporting the wider uptake of scalable industrialized renovation solutions. It also provides a basis for future dissemination, replication and stakeholder engagement activities within the Spanish ecosystem.

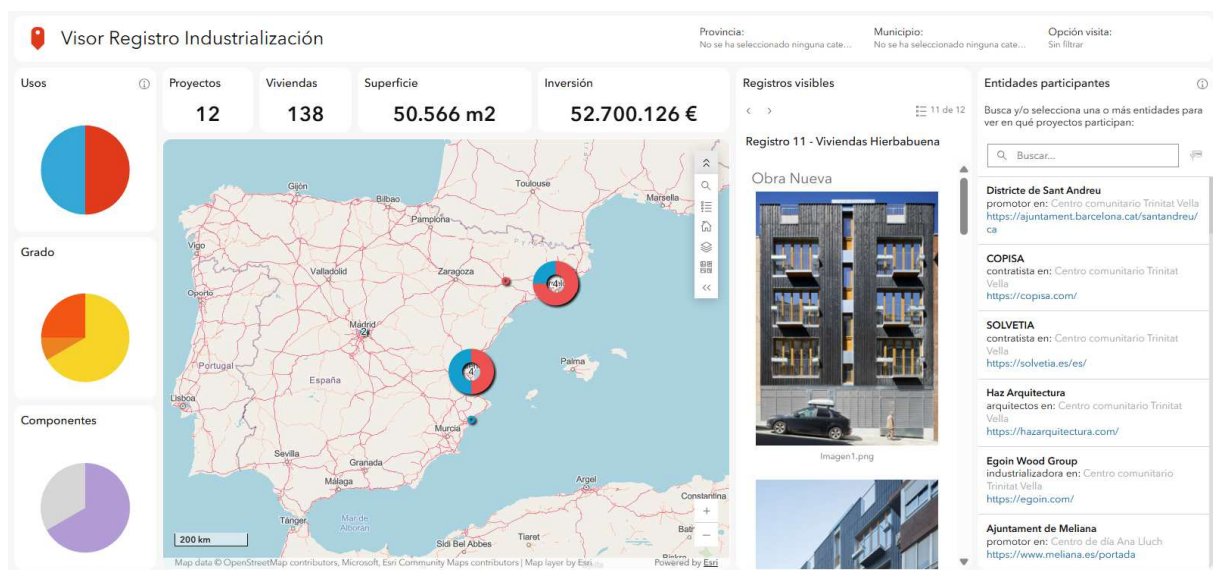


Figure 92: Spanish Local Market Activation Platform.

(<https://www.arcgis.com/apps/dashboards/5c5f41c8441f4179a9ad6dba04c631c8>).

3.5 Reporting on Market Activation, Netherlands

The selected Dutch pilot cases explore different approaches to the sustainable renovation of post-war social housing in the province of Limburg, in the south of the Netherlands. Although differing in scale, building typology, and technical complexity, both pilots address common challenges faced by the Dutch housing sector, as for example ageing building stock, poor energy performance, increasing maintenance requirements, and the need to transition towards fossil-free and climate-neutral housing. Beyond improving energy efficiency, the projects seek to enhance residential comfort, affordability, accessibility, and environmental quality while extending the service life of existing buildings and reducing the environmental impacts associated with demolition and reconstruction.

The two pilot projects have been selected as demonstrators for testing the District and Assembly Factory model of Pop-up Factory (PuFs), which emerged as the most suitable implementation model for the Dutch ecosystem. Both cases demonstrate a significant level of maturity in the adoption of industrialized and circular renovation processes, while also highlighting the remaining challenges associated with the large-scale implementation of PuF principles. Their development is strongly supported by favorable market conditions, particularly the increasing demand for deep renovation interventions driven by Dutch housing associations, which collectively own and manage a substantial share of the national housing stock. This creates a unique opportunity to align industrialized renovation strategies with long-term housing, energy, and climate objectives.

The analysis of the two pilot cases, which are currently at different stages of the renovation process, provides valuable insights into the practical implementation of the PuF model and the organizational structures required to support it. In particular, the projects show the variety of actors, competencies, partnerships, and governance mechanisms involved in industrialized renovation scenarios, ranging from housing associations and contractors to manufacturers, technical suppliers, ecological consultants, and resident-support professionals. Together, the pilots offer a comprehensive understanding of the technical and socio-organizational dimensions necessary for the successful deployment of PuF-based renovation approaches¹.

3.5.1 Pilot case: Pastoorschleidenstraat in Hoensbroek, Heerlen

The Pastoor Schleidenstraat pilot is located in Hoensbroek, a district of the municipality of Heerlen in the southern Netherlands. The project focuses on the renovation of four post-war portico apartment blocks constructed in 1957 and owned by the social housing association Woonpunt. Together, the buildings accommodate 36 social housing apartments and represent a typical example of the Dutch post-war housing stock currently facing challenges related to energy performance, accessibility, technical deterioration, and residential quality. The intervention forms part of broader efforts to extend the lifespan of existing housing while contributing to national sustainability and climate objectives.

The Hoensbroek Area

The apartment blocks are situated in the Mariarade neighborhood, between Hoensbroek-Centrum and De Dem, an area characterized by a relatively ageing population, lower-than-average income levels, and a high proportion of single-person households. While the

¹ More detailed information regarding the pilot cases, the Dutch ecosystem, and the implementation of the PuF model can be found in Deliverable D4.1 and its accompanying annexes.

neighborhood benefits from good accessibility and the presence of public green spaces, several social and environmental challenges persist. Livability assessments highlight concerns related to safety, social cohesion, and the poor quality of public spaces. Environmental analyses further identify issues of heat stress, excessive paved surfaces, limited biodiversity, and vulnerability to flooding during heavy rainfall events. The condition of the housing stock reflects these broader challenges, with the existing buildings displaying poor maintenance, low energy performance, and inadequate accessibility for elderly and mobility-impaired residents.



Figure 93: Aerial view of the Pastoorschleidenstraat pilot (© Google Earth).

Type of Renovation

The renovation consists of a comprehensive deep-retrofit intervention aimed at extending the service life of the buildings by approximately 30 years while improving their energy performance from the current average labels E–G to energy label A. The works include asbestos removal, façade repair and cleaning, replacement of windows, frames and doors, installation of high-performance insulation systems, and complete renewal of roofing components. Internally, the project involves the replacement of kitchens, sanitary facilities, flooring, finishes, and technical installations, including new ventilation systems with CO₂ control, upgraded electrical and drainage networks, fire safety measures, and energy-efficient heating and hot water systems. The intervention also incorporates biodiversity-enhancing measures, such as nesting facilities for swifts and bats, together with landscaping improvements around the buildings. Through this integrated approach, the project seeks to improve energy efficiency, comfort, accessibility, environmental performance, and overall quality of life for residents while demonstrating the potential of circular and sustainable renovation strategies for post-war social housing.

See Annex VIII of D4.1 for more details on this pilot.

3.5.2 Pilot case: Quirinaalhof in Maastricht

The Quirinaalhof pilot is located in Maastricht and concerns the renovation of a large high-rise residential complex owned by the social housing association Woonpunt. Constructed between 1970 and 1971, the building comprises 144 apartments and has reached a stage where major intervention is required to ensure its long-term viability. The project represents a strategic transition from conventional maintenance practices towards an industrialized and highly coordinated renovation approach. Building upon the experience gained through the nearby Palatijnhof pilot, the renovation seeks to demonstrate how industrialized construction methods can accelerate renovation processes, reduce waste, improve sustainability performance, and lower overall costs while extending the building's functional lifespan by several decades.

The Maastricht Area

The Quirinaalhof complex is situated within a dense urban area of Maastricht and occupies a prominent position within a larger residential neighborhood. The surrounding context is characterized by a combination of residential buildings, public spaces, green areas, and parking facilities. As with many post-war housing estates, the area faces challenges related to the ageing building stock, energy performance, and long-term sustainability. The project is therefore positioned not only as a building renovation but also as part of a broader effort to improve housing quality, affordability, and environmental performance for residents. A strong social dimension accompanies the intervention, with Woonpunt implementing an extensive participation process involving tenants throughout the planning stages. This participatory approach is particularly important because Dutch legislation requires the approval of at least 70% of residents before renovation works can proceed. Dedicated tenant coaches facilitate communication between residents, the housing association, and contractors, ensuring that social concerns are addressed alongside technical requirements.

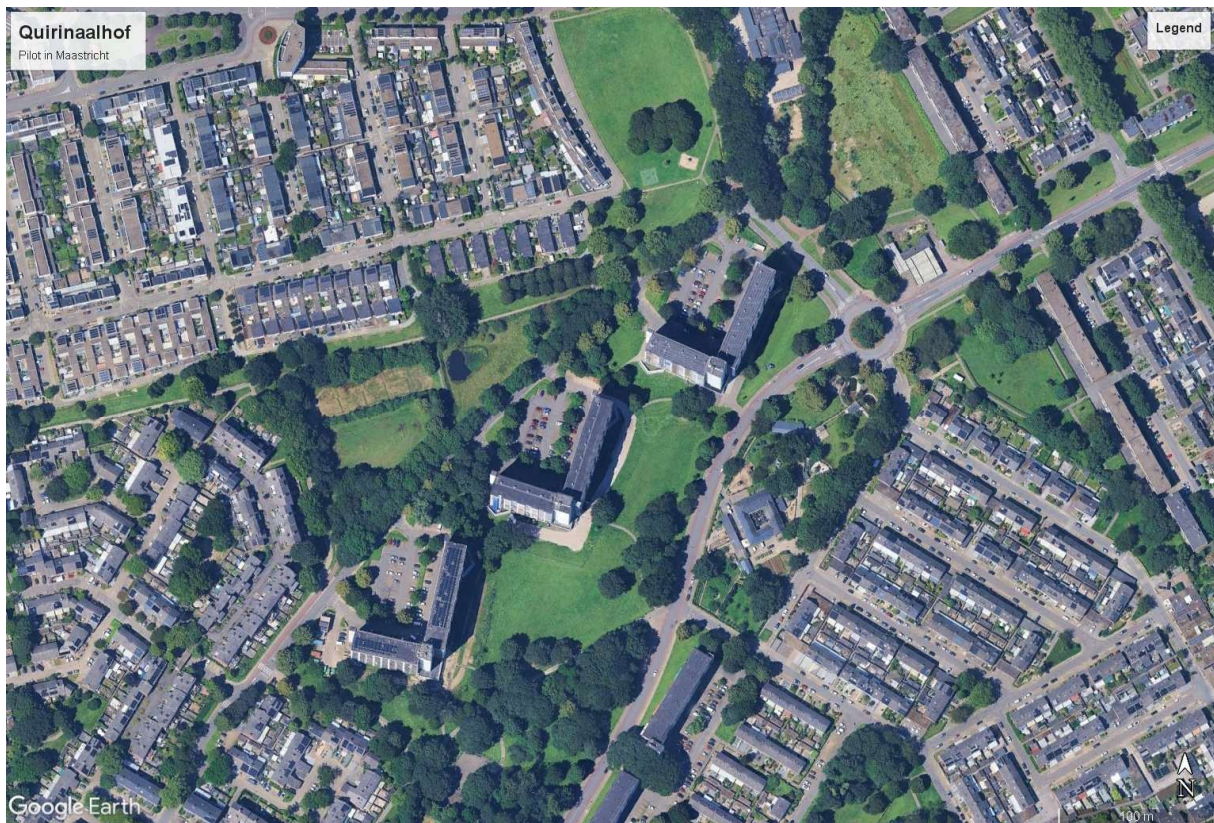


Figure 94: Aerial view of the Faalhof area with the Quirinaalhof building in Maastricht (© Google Earth).



Type of Renovation

The Quirinaalhof project consists of a deep, industrialized renovation aimed at extending the building's service life by approximately 30 years while upgrading the apartments to energy label A or A+. Central to the intervention is the replacement of the existing collective heating system with individual heat pumps for all 144 dwellings, supported by roof-mounted PVT (photovoltaic-thermal) panels that simultaneously generate electricity and recover thermal energy. The renovation includes the complete refurbishment of kitchens, bathrooms, and sanitary facilities; replacement of vertical water and waste pipes; roof insulation upgrades from approximately 5–10 cm to 30 cm; installation of new wooden window systems; façade improvements; ventilation upgrades; and ecological measures for protected species such as bats and house sparrows. Particular emphasis is placed on industrialized construction methods, including the use of prefabricated components and a "just-in-time" logistics strategy designed to minimize disruption for residents. Innovative solutions, such as installing new window frames in front of existing asbestos-containing frames and applying prefabricated ceramic panels directly over existing wall finishes, reduce waste generation, shorten construction time, and support circular renovation principles.

The renovation is expected to be delivered over a construction period of approximately 1.5 years and constitutes a demonstrator for large-scale sustainable renovation of post-war social housing in the Netherlands.

See Annex VIII of D4.1 for more details on this pilot.

4 Results of the benchmarking performance of the pilot cases

4.1 Introduction and scope

This section presents the results obtained from the benchmarking templates developed under Task 5.4 to assess the benefits of renovation cases within BuildUPspeed.

The detailed monitoring approach, template structure and instructions for completion are described in the T5.4 monitoring report included as an Annex I. Therefore, this section focuses on the information collected through the completed templates and on the main findings derived from their analysis.

The analysis covers the pilot cases reported by the BuildUPspeed ecosystems. Two types of cases are considered: renovation projects using industrialized or prefabricated solutions, and urban mining cases focused on material recovery, reuse and high-quality recycling.

industrialized renovation cases are available in four ecosystems (Austria, Italy, Netherlands and Spain), while urban mining cases are available in two ecosystems (France and Austria). The French pilot focuses exclusively on urban mining, whereas the Austrian ecosystem includes both industrialized renovation cases and urban mining cases.

4.2 Methodological approach

The analysis follows the benchmarking approach defined in Task 5.4. Each case is assessed by comparing a baseline value with a pilot value. The baseline represents the reference situation, such as a conventional renovation approach, previous practice or standard process. The pilot value represents the performance of the BuildUPspeed case.

For industrialized renovation solutions, indicators are organized into categories covering delivery and productivity, cost and business case, energy and environmental impact, materials, waste and circularity, quality, safety and people, and pop-up factory processes when applicable. The template distinguishes between a basic benchmarking level, based on core indicators, and an extended benchmarking level, including additional indicators when more detailed data are available.

For urban mining cases, the benchmarking is more focused. The assessment is based on individual indicators related mainly to material recovery, reuse, avoided waste, cost savings and related impacts. Energy-related indicators are only considered when the urban mining case is linked to an energy renovation of the building. Pop-up factory indicators are optional and only apply when such a scenario is relevant.

The results should be interpreted considering the different maturity, scope and data availability of the pilot cases. In some cases, values are based on measured or project data, while in others they are based on calculations, literature values, professional judgement or justified estimations.

4.3 Overview of collected cases

The benchmarking templates collected cover both industrialized renovation cases and urban mining cases. The industrialized renovation cases are distributed across Austria, Spain, Italy and the Netherlands, while the urban mining cases are reported by Austria and France.

The table below summarizes the cases collected and analyzed.



Table 7: Summary of all analyzed cases

Pilot project	Country	Municipality	Case type	Building use	Subtype	Gross floor area (m ²)	Renov. scope	Project status
Grüne Gasse 48	Austria	Graz	industrialized renovation	Residential	Multifamily	1.265	Total	Operation & Monitoring
LBS Knittelfeld	Austria	Knittelfeld	industrialized renovation	Tertiary	Educational	4.074	Total	Operation & Monitoring
Re-Use Box Hensel	Austria	Villach	Urban mining	Other	Other	9.800		Completed
Re-Use Box OMAK	Austria	Graz	Urban mining	Tertiary	Educational	4.400		Completed
Re-Use Box TGA	Austria	Vienna	Urban mining	Tertiary	Educational	11.200		
Résidence Palmer	France	CENON	Urban mining	Residential	Multifamily	6.783	Total	Commissioning & Handover
Pastoor Schleidenstraat	Netherlands	Hoensbroek, Heerlen	industrialized renovation	Residential	Multifamily	4.848	Partial	Construction
Quirinaalhof	Netherlands	Maastricht	industrialized renovation	Residential	Multifamily	18.370	Partial	Permitting & Procurement
Van Heemskerckflat	Netherlands	Groningen	industrialized renovation	Residential	Public residential	9.600	Total	Construction
Pontoneros student housing	Spain	Zaragoza	industrialized renovation	Residential	Public residential	4.915	Total	Operation & Monitoring
Las Salesas Offices	Spain	Pamplona	industrialized renovation	Tertiary	Administrative	2.968	Total	Operation & Monitoring
Pieve Emanuele Lot 1	Italy	Pieve Emanuele	industrialized renovation	Residential	Multifamily	22.300	Total	Operation & Monitoring

The diversity of cases reflects the different focus of the BuildUPspeed ecosystems. Some pilots address building renovation through prefabricated or industrialized solutions, while others focus on material recovery and reuse. Austria is the only ecosystem with completed templates for both types of approaches.

A total of 11 completed templates has been analyzed:

- 8 cases correspond to industrialized renovation solutions.
- 4 cases correspond to urban mining strategies.

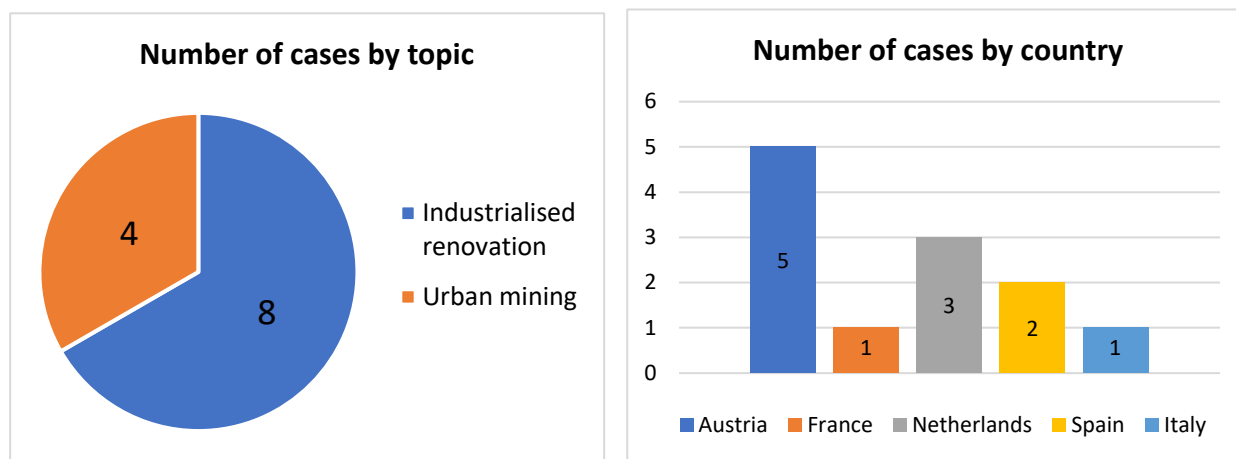


Figure 95: Statistics of analyzed cases

Results from industrialized renovation cases

This section presents the benchmarking results for the industrialized renovation cases reported through the T5.4 templates. The analysis is organized by benchmarking category. For each category, the core KPI is identified, together with the number of cases providing scored data and the use of additional indicators for extended benchmarking.

Scores are normalized, where 100 represents the baseline. Values above 100 indicate better performance than the baseline, while values below 100 indicate worse performance. Absolute values are shown as reported in the templates.

4.3.1 Overview of indicator coverage

Table 8: Indicator coverage

Category	Core KPI(s)	Cases with scored data	Additional indicators included
Cost & Business Case	Construction cost	8/8	2 case (Salesas-Pamplona: design cost + unit cost of ind. elements; Pieve Emanuele: Cost certainty + Unit cost of ind. elements)

Delivery & Productivity	Time on-site	8/8	2 case (Salesas-Pamplona: time certainty; Pieve Emanuele: time certainty + total programme time)
Energy & Environmental Impact	Final energy savings		
	Primary energy savings		
	GHG emissions reduction		
	Renewable energy generation	8/8	No
Materials, Waste & Circularity	Waste generated	6/8	1 case (Salesas-Pamplona: Use of reused/recycled materials in situ, ex situ)
Quality, Safety & People	Emergent defects	0/8	No
PuF – Processes		2/4	
	Savings in material transportation costs due to PuF proximity to site	(4/8 apply PuF scenario)	No

4.3.2 Cost & Business Case

The core KPI for this category is *Construction cost*, expressed in €/m². This indicator was scored in all eight industrialized renovation cases. One case, public body headquarters in Pamplona, also included two additional indicators in the extended benchmarking: *Design cost* and *Unit cost of industrialized elements*. While the Italian case included: *Cost certainty* and *Unit cost of industrialized elements*.

Table 9: Scores for construction costs for industrialized renovation cases

Case	Construction cost – pilot value (€/m ²)	Core score
Grüne Gasse 48	1 980	25.0
LBS Knittelfeld	1 160	25.0
Pastoor Schleidenstraat	350	60.0
Quirinaalhof	800	40.0
Van Heemskerckflat	1 276	25.0
Pontoneros student housing	123.3	25.0
Las Salesas Offices	124.6	25.0
Pieve Emanuele Lot 1	1 500	116.7

All cases, beside the Italian one, score below the baseline in this category. This means that the reported pilot construction costs are higher than the reference values used in the templates. These results should be interpreted with caution, as cost values depend strongly on renovation scope, local market conditions, baseline assumptions and the pilot nature of the solutions applied. The Italian pilot was able to save costs using industrialized solutions thanks to the combination of seismic and energy efficiency improvements that makes offsite solutions already more convenient. Indeed, traditional seismic renovations cost around 1800 €/m² due to the time-consuming reinforcement activities.

4.3.3 Delivery & Productivity

The core KPI for this category is *Time on-site*, expressed in weeks. This indicator was scored in all seven cases. One case, Public body headquarters in Pamplona, also included *Program Certainty* as an additional indicator in the extended benchmarking. While the Italian case included: *Program certainty* and *Total program time*.

Table 10: Scores for delivery and productivity for industrialized renovation cases

Case	Time on-site – pilot value (weeks)	Core score
Grüne Gasse 48	10.0	180.8
LBS Knittelfeld	12.0	170.0
Pastoor Schleidenstraat	15.0	140.0
Quirinaalhof	58.5	135.7
Van Heemskerckflat	71.5	124.7
Pontoneros student housing	17.0	115.0
Las Salesas Offices	42.0	108.7
Pieve Emanuele Lot 1	12.0	153.8

All cases perform above the baseline in this category. This confirms that time-related benefits are the clearest and most consistent result of the industrialized renovation cases. The inclusion of program certainty in the Pamplona case increases its extended score from 108.7 to 154.3. In Italy, the extended score remains high (143.2) thanks to both promising program certainty and total works' duration.

4.3.4 Energy & Environmental Impact

All indicators in this category are defined as CORE KPIs: *Final Energy Savings*, *Primary Energy Savings*, *GHG Emissions Reduction* and *Renewable Energy Generation*. No additional indicators are defined for an optional extended benchmarking.

Table 11: Energy and environmental impact for industrialized renovation cases

Case	Final energy savings (GWh/y)	Primary energy savings (GWh/y)	GHG emissions reduction (t/y)	Renewable energy generation (GWh/y)	Category score
Grüne Gasse 48	0.034	0.083	11	0.040	143.5
LBS Knittelfeld	0.323	0.652	130	0.004	200
Pastoor Schleidenstraat	0.43	0.503	65	0.05	140.2
Quirinaalhof	1.9	0.61	171	0.11	118.6
Van Heemskerckflat	0.24	0.5	63.6	0.09	72.3
Pontoneros student housing	0.23	0.248	0.89	0	105.9
Las Salesas Offices	0.118	0.118	0.93	0	108.3
Pieve Emanuele Lot 1	2.01	2.11	402	0	111.2

Most cases perform above the baseline in this category. LBS Knittelfeld obtains the highest score, followed by Grüne Gasse 48 and Pastoor Schleidenstraat. Van Heemskerckflat is the only case below the baseline, mainly due to lower reported energy and emission savings compared with the reference scenario. In any case, it should be noted that, with regard to the Dutch cases, the figures reported are estimates based on the calculations set out in the comparison file. Accordingly, they should be regarded as provisional and may be subject to change once the renovation project has been completed and formally handed over.

These results should be interpreted together with the baseline assumptions and units used in each template, as the cases differ in building type, renovation scope and data source. Overall, it's worth noticing that cases which haven't installed renewable energy sources have a slightly lower score.

4.3.5 Materials, Waste & Circularity

The core KPI for this category is *Waste generated*, expressed in t/1,000 m². This indicator was scored in six of the eight cases. The two Austrian industrialized renovation cases did not provide scored data for this category. One case, Las Salesas Offices (Public body headquarters in Pamplona), also included the additional indicator use of reused/recycled materials.

Table 12: Scores for materials, waste & circularity for industrialized renovation cases

Case	Waste generated – pilot value (t/1,000 m ²)	Reused/recycled materials – pilot value (kg/m ²)	Category score
Pastoor Schleidenstraat	120	n/a	25
Quirinaalhof	53	n/a	110.2
Van Heemskerckflat	108	n/a	25
Pontoneros student housing	0.6	n/a	80
Las Salesas Offices	0.5	0.18	100
Pieve Emanuele Lot 1	5	n/a	144

The results are mixed. Quirinaalhof and Pieve Emanuele performs above the baseline (according to estimations), while Las Salesas Offices is comparable to the baseline. The other scored cases perform below the baseline. In Pamplona, the inclusion of reused/recycled materials increases the extended score from 100.0 to 150.0.

This category has lower data availability than time, cost and energy indicators. Waste and circularity data should therefore be interpreted as case-specific evidence rather than as a fully comparable cross-case result. The analysis shows that this aspect is still under-evaluated and monitored and more protocols should be introduced.

4.3.6 Quality, Safety & People

The core KPI for this category is emergent defects, measured as the number of defects recorded after completion of the works during the Defects Liability Period per €100,000 of construction cost. No case provided scored data for this indicator. In the Dutch cases, this is mainly because the required information is expected to become available only after handover and during the post-completion period. In the Austrian, Spanish and Italian cases, the limitation is related to data accessibility, as this information was either not

available or could not be obtained from the project documentation or stakeholders at the time of reporting. As a result, the Quality, Safety & People category could not be quantitatively assessed at this stage.

4.3.7 PuF – Processes

The core KPI for this optional category is savings in material transportation costs due to PuF proximity to site. This category only applies when a pop-up factory or similar local production, assembly or logistics scenario is relevant to the case.

Table 13: PuF – Scores for processes for industrialized renovation cases

Case	Savings in transportation Pilot value (€)	Category score
Pastoor Schleidenstraat	13	200
Quirinaalhof	17.5	n/a
Van Heemskerckflat	20	25

Only two cases obtained a scored result. Pastoor Schleidenstraat shows a strong improvement compared with the baseline, while Van Heemskerckflat scores below the baseline. Quirinaalhof reports a pilot value, but no score was calculated because no comparable baseline was provided.

The PuF category is therefore useful for specific cases, but it is not applicable to all industrialized renovation pilots.

4.3.8 Main findings

The industrialized renovation benchmarking shows that the most consistent benefit is related to delivery and productivity. All cases with available data show reduced time on-site compared with the baseline.

The energy and environmental impact category also shows positive results in most cases, although the magnitude of improvement depends strongly on the baseline and renovation scope.

The cost category remains challenging, with all cases scoring below the baseline, beside for the combined seismic and energy efficiency prefabricated solutions of the Italian case study. This reflects higher reported pilot costs compared with the reference scenarios used.

The materials, waste and circularity category presents mixed results and lower data availability. The quality, safety and people category could not be assessed due to the lack of post-completion defect data.

Overall, the benchmarking provides useful evidence of time-related and energy-related benefits from industrialized renovation, while also identifying areas where more consistent data collection is needed in future applications.

4.4 Results from urban mining cases

This section presents the benchmarking results for the urban mining cases reported through the T5.4 templates. Unlike the industrialized renovation template, the urban mining template is based on individual indicators rather than on benchmarking categories. The analysis therefore focuses on material recovery, waste prevention, cost savings, job creation and PuF-related indicators where applicable.

Scores are normalized, where 100 represents the baseline. Values above 100 indicate better performance than the baseline. However, in several urban mining indicators the baseline is “no reuse” or “no recovery”, represented by a value of 0. For this reason, many indicators reach the maximum score of 200. In these cases, the absolute pilot values are particularly relevant for interpreting the results.

4.4.1 Indicator coverage

Table below summarizes the main indicators covered by the urban mining templates.

Table 14: Indicator coverage for urban mining cases

Indicator	Type	Cases with scored data
Pieces and/or units of construction products reused	CORE KPI	4/4
Amount of waste prevented / sent to high-quality recycling	CORE KPI	4/4
Cost savings due to reuse / avoided landfilling	CORE KPI	4/4
Creation of new jobs	CORE KPI	3/4
Savings in material transportation costs due to PuF proximity to site	CORE KPI, PuF	3/4
Reduction in waste generated during PuF operations	Additional PuF indicator	4/4

The most complete information was provided for material recovery, waste prevention and cost savings. Job creation was reported in the Austrian cases but not scored for the French case. PuF-related indicators were mainly relevant for the Austrian Re-Use-Box cases, while the French case provided only selected PuF-related information.

4.4.2 Reused construction products

The core KPI for material reuse is the *Number of pieces or units of construction products reused*. All four urban mining cases provided values for this indicator.

Table 15: Scores for reused products

Case	Pilot value	Score
Re-Use Box Hensel	1 088 units	200
Re-Use Box OMAK	2 314 units	200
Re-Use Box TGA	2 196 units	200
Résidence Palmer	100 units	200

All cases score above the baseline. The Austrian Re-Use-Box cases report the highest number of reused construction products, while the French PALMER case reports a smaller number of reused units. The results show that urban mining enabled reuse that would not have occurred under the reference scenario.

4.4.3 Waste prevention and high-quality recycling

The core KPI for waste prevention is the *Amount of waste prevented or sent to high-quality recycling*. All four cases provided scored data.

Table 16: Scores for prevented waste

Case	Amount of waste prevented / sent to high-quality recycling (t)	Score
Re-Use Box Hensel	109	200
Re-Use Box OMAK	40.6	200
Re-Use Box TGA	14.5	200
Résidence Palmer	5,543	200

All cases show improvement compared with the baseline. The PALMER case reports a much larger value than the Austrian Re-Use-Box cases, reflecting the different scale and nature of the case. For this reason, the values should be interpreted as case-specific evidence rather than as directly comparable results.

4.4.4 Cost savings and job creation

The core KPI for economic benefit is *Cost savings due to reuse or avoided landfilling*. All four cases provided scored data for this indicator.

Table 17: Scores for cost savings for urban mining cases

Case	Cost savings	Score
Re-Use Box Hensel	€ 16 300	200
Re-Use Box OMAK	€ 6 100	200
Re-Use Box TGA	€ 2 171	200
Résidence Palmer	€ 2 400	200

The Austrian cases report cost savings mainly linked to the sale of recovered products and avoided landfilling. The French case also reports positive cost savings, although at a lower absolute value than the largest Austrian case.

Job creation was reported in three cases.

Table 18: Scores for job creation for urban mining cases

Case	Job creation (FTE)	Score
Re-Use Box Hensel	0.25 FTE	200
Re-Use Box OMAK	1 FTE	200
Re-Use Box TGA	3 FTE	200
Résidence Palmer	Not scored	n/a

The highest reported employment effect corresponds to Re-use Box TGA (Technisch Gewerbliche Abendschule). The PALMER case did not provide a scored result for this indicator.

4.4.5 PuF-related indicators

The urban mining template includes optional indicators for PuF-related processes. The core PuF indicator is savings in material transportation costs due to proximity to site. This indicator was scored in the three Austrian Re-Use-Box cases.

Table 19: Scores for transport cost savings for urban mining cases

Case	Transport cost savings (€)	Core PuF score
Re-Use Box Hensel	€ 60.000,00	200
Re-Use Box OMAK	€ 21.600,00	200
Re-Use Box TGA	€ 8.100,00	200
Résidence Palmer	Not scored	n/a

The highest transport-related saving is reported for Re-Use Box Hensel (Hensel Kaserne Villach). This suggests that local recovery and redistribution can generate relevant logistical benefits when the PuF or Re-Use-Box scenario is clearly defined.

An additional PuF indicator was also reported: reduction in waste generated during PuF operations.

Table 20: Scores for waste reduction for urban mining cases

Case	Reduction in waste generated during PuF operations (%)	Extended PuF result
Re-Use Box Hensel	61%	200
Re-Use Box OMAK	46%	200
Re-Use Box TGA	20%	112,5
Résidence Palmer	25%	200

The Austrian Re-Use-Box cases show reductions between 20% and 61%. The PALMER case reports a 25% reduction related to sanitary equipment.

4.4.6 Energy-related information

Energy-related indicators are included in the urban mining template only when the urban mining action is linked to an energy renovation of the building. These indicators are not intended to assess urban mining itself, but to collect the basic energy-related data needed for the later monitoring of project impacts.

Therefore, they are not expected to be completed for cases focused only on material recovery, reuse or recycling. In the submitted templates, the Austrian Re-Use-Box cases mainly address material recovery and reuse, while the PALMER case is linked to a broader renovation process and provides energy-related impact data.



For this reason, energy indicators are not used for cross-comparison between urban mining cases. They should only be interpreted where the urban mining strategy is part of a wider energy renovation project.

4.4.7 Main findings and conclusions

The urban mining cases show clear benefits in terms of material reuse, waste prevention and avoided disposal costs. All cases with available data perform above the baseline for the main material recovery indicators.

The most relevant results are the absolute values reported for reused units, waste prevented and cost savings. The normalized scores are useful to show improvement against the baseline, but they are less informative for comparing the magnitude of benefits because several baselines are equal to zero.

The Austrian Re-Use-Box cases provide the most complete information across the urban mining and PuF indicators. The French PALMER case reports strong waste prevention and reuse figures, but less information is available for job creation and PuF transport savings.

Overall, the urban mining benchmarking confirms that the template is useful for documenting material recovery and reuse benefits. However, comparison between cases should be made carefully, as the cases differ significantly in scale, type of recovered elements, baseline assumptions and whether the recovered materials are reused in the same project or in another destination.

4.5 Overall conclusions from the benchmarking exercise

Overall, the benchmarking exercise has shown that the T5.4 templates are useful to collect and organise evidence from different types of renovation cases. Their main value is not only the calculation of scores, but the creation of a common structure to describe cases, compare them with a baseline and identify which benefits can be demonstrated with available data.

The exercise also shows that comparability depends strongly on data availability and baseline definition. For this reason, the benchmarking results should be interpreted together with the absolute values, data sources and assumptions reported in each template.

The results provide a first evidence base for reporting and communication, while also identifying improvements for future applications: earlier planning of data collection, clearer definition of baselines, better access to post-completion data and a selective use of the information to feed the Market Activation Platform and future Best Practice Cases.

5 Conclusions

This deliverable shows how BuildUPspeed has contributed to the activation of local markets for industrialized, serial and circular renovation across the five project ecosystems: Austria, France, Italy, Spain and the Netherlands. Through Local Advisory Boards, soundboard groups, workshops, conferences, trainings, site visits and pilot-related activities, the project created structured opportunities for exchange between building owners, housing providers, public authorities, planners, contractors, manufacturers, researchers and other relevant market actors.

A key outcome of the work is that market activation was not limited to dissemination, but developed into a practical process of stakeholder mobilization, knowledge transfer and implementation support. The Local Advisory Boards helped connect the project to the specific conditions of each national and regional renovation market. They provided feedback on project results, supported the identification of barriers and opportunities, and acted as multipliers for the wider uptake of BuildUPspeed concepts.

The ecosystem activities demonstrate that industrialized renovation can be supported through different but complementary pathways. In Austria, the focus was strongly placed on serial renovation with prefabricated façade modules, urban mining, reuse, and the development of national market activation platforms. In France, circular economy approaches, selective deconstruction, material reuse and the first steps towards a mobile on-site factory for sanitary equipment reconditioning were central. In Italy, the work focused on the Energiesprong approach, off-site retrofit solutions, a satellite factory concept and the activation of demand and finance for social housing renovation. In Spain, activities concentrated on industrialized timber construction, pilot projects, training, standardization and the creation of a regional innovation cluster for industrialized construction. In the Netherlands, the work focused on social housing renovation, education, circularity, and practical learning from pilot projects applying industrialized and Pop-up Factory-related approaches.

The pilot projects and market activation activities confirm that industrialized renovation is relevant for a wide range of building types and contexts, including schools, student housing, multi-family residential buildings, social housing, administrative buildings and heritage-related renovation cases. They also show that serial renovation and circular approaches are not single technical solutions, but require coordinated action across the full value chain, including planning, manufacturing, logistics, financing, regulation, resident communication and quality assurance.

The benchmarking of pilot cases provides important evidence on the benefits and remaining challenges of industrialized renovation and urban mining. For industrialized renovation, the clearest and most consistent benefit is the reduction of time on site. All cases with available data performed better than the baseline in terms of delivery and productivity. Energy and environmental performance also showed positive results in most cases, confirming the potential of deep renovation with prefabricated and integrated solutions to reduce energy demand and greenhouse gas emissions.

At the same time, the benchmarking results show that cost remains a critical challenge. In the analyzed cases, construction costs were generally higher than the selected reference values, reflecting the pilot character of many projects, differences in renovation scope, local market conditions and the still limited scale of implementation. Materials, waste and circularity results were mixed, and data availability was uneven. The quality, safety and people category could not yet be assessed quantitatively due to the lack of post-completion data. These findings underline the need for more systematic and comparable data collection in future projects.



The urban mining cases show clear benefits in terms of reuse, waste prevention, avoided disposal costs and, in several cases, job creation. The Austrian Re-Use Box cases and the French Palmer case demonstrate that structured material recovery and reuse can create environmental, economic and social value. They also show that Pop-up Factory logic can be applied not only to manufacturing and assembly, but also to logistics, sorting, checking, redistribution and reuse activities linked to deconstruction and renovation.

Overall, BuildUPspeed has demonstrated that successful market activation depends on the combination of practical pilots, stakeholder networks, visible examples, digital platforms, training formats and policy-relevant exchange. The project has helped to make industrialized and circular renovation more tangible for market actors and has created reference cases that can support replication beyond the project duration.

Future work should build on these results by further strengthening business models, procurement approaches, financing mechanisms, technical standardization and quality assurance for industrialized renovation. It will also be important to maintain and update market activation platforms, continue stakeholder exchange formats, and collect more robust performance data from completed renovation projects. By doing so, the results of BuildUPspeed can contribute to scaling up high-quality, climate-neutral and resource-efficient renovation across Europe.



Annex I

BuildUPspeed Ecosystems Performance Monitoring



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Executive summary

Task 5.4, BuildUPspeed Ecosystems Performance Monitoring, defines a common approach to monitor the impacts and benefits generated by the BuildUPspeed project. The task supports the overall project objective of accelerating building renovation through industrialised solutions, ecosystem activation, pop-up factory concepts and the involvement of the renovation value chain.

Although the original task description included the monitoring of indoor environmental quality, comfort, well-being and user behaviour, the scope was adapted during the project. Given the practical limitations of implementing extensive monitoring campaigns across all ecosystems, Task 5.4 focused on two dimensions more directly aligned with the BuildUPspeed objectives: monitoring the acceleration of renovation rates and documenting the benefits of industrialised renovation solutions, urban mining strategies and pop-up factory approaches.

The monitoring of renovation rate acceleration builds on the impact framework included in the project proposal and Grant Agreement. It distinguishes between three layers of impact: impacts achieved during the project through pilot renovations, impacts expected within five years after the project through ecosystem replication, and wider European-level replication impacts. To estimate these effects, the methodology combines real data from pilot projects with an action × success rate approach for activities such as training, dissemination, workshops, Market Activation Platform use and letters of commitment.

The monitoring of renovation benefits is addressed through two benchmarking templates: one for industrialised renovation solutions and one for urban mining cases. These templates were developed through an iterative process with project partners, including workshops, surveys and feedback from pilot representatives. They collect comparable information on technical, environmental, economic, process-related and circularity benefits, while keeping the required data collection feasible for different pilot contexts.

As a result, Task 5.4 produced three practical templates: the Impact Monitoring Template, the Benchmarking Template for industrialised renovation solutions, and the Benchmarking Template for urban mining solutions. Together, these tools provide a structured and traceable framework to report project impacts, compare renovation cases, identify benefits and support future best practice cases that may feed the Market Activation Platform.

The results collected through the templates will support project reporting, including LIFE KPI reporting and Deliverable D5.3. They will also help communicate the added value of BuildUPspeed solutions and provide evidence for future replication by ecosystems, building owners, housing providers, public authorities and other stakeholders involved in the renovation market.

Introduction

Task 5.4, BuildUPspeed Ecosystems Performance Monitoring, aims to define a common approach for monitoring the performance and impact of the BuildUPspeed ecosystems. The task is linked to the overall ambition of the project: accelerating the volume and depth of building renovation through the uptake of industrialised renovation solutions, the activation of local ecosystems, the implementation of pop-up factory concepts and the involvement of the renovation value chain.

According to the original task description, the monitoring activities were expected to cover three main dimensions. The first one (a) referred to the monitoring of actual building performance, including indoor environmental quality, comfort, well-being, health and user behaviour. The second one (b) focused on the monitoring of the acceleration of the renovation rate, based on the activities carried out in each ecosystem. The third one (c) addressed the monitoring of the benefits of renovation, with the objective of supporting market uptake by collecting and communicating evidence on the added value of renovation processes, systems, methodologies and business models.

During the development of the task, the monitoring scope was adapted to better reflect the specific focus of BuildUPspeed and the practical capacities of the participating ecosystems. As BuildUPspeed is mainly centred on industrialised renovation processes, market activation and the scaling-up of renovation solutions, the development of extensive indoor environmental quality or occupant monitoring campaigns was not prioritised. Such campaigns would have required specific monitoring equipment, long-term measurement protocols and technical resources that were not available in all ecosystems. In addition, they were not considered the most direct way to assess the contribution of the project to its core objectives.

For this reason, **Task 5.4** concentrated on **two monitoring dimensions** that are more closely aligned with the BuildUPspeed objectives. The first one is the assessment of how project activities can contribute to **accelerating renovation rates** in the participating ecosystems. The second one is the structured collection of information on the **benefits of renovation**, with a particular focus on industrialised renovation solutions, prefabricated systems, circular strategies, urban mining practices and pop-up factory scenarios.

The work carried out under Task 5.4 has resulted in the development of **three practical templates**. These templates are intended to support the collection of comparable information on the impact generated by BuildUPspeed activities and on the benefits demonstrated by selected renovation cases. The **first template** focuses on the **monitoring of renovation rate acceleration and project impact**, covering not only actions implemented within the ecosystems and pilots, but also transfer, dissemination and replication activities aimed at fostering the creation of new ecosystems and extending the BuildUPspeed approach beyond the initial demonstration contexts. **The other two templates** focus on the **benchmarking of renovation benefits**: one for **industrialised renovation solutions** and one for **urban mining** and circularity-related cases. The definition of these templates was supported by a collaborative process with project partners, including dedicated



workshops aimed at identifying the indicators that could best represent the benefits of renovation while remaining feasible to collect across different pilot contexts.

This report presents the rationale behind the monitoring approach and provides guidance on how the templates should be used. It is conceived as a practical document for the partners and stakeholders responsible for completing the templates, helping them understand the purpose of each tool, the type of data required, the expected level of detail and the possible data sources to be used.

1 BUPS monitoring philosophy

The monitoring philosophy of Task 5.4 is directly based on the approach defined in the BuildUPspeed project description. This approach is structured around two complementary dimensions: the monitoring of renovation rate acceleration and the monitoring of the benefits of renovation.

The first dimension focuses on assessing how BuildUPspeed activities can contribute to accelerating renovation processes. This includes the actions implemented within the ecosystems and pilots, but also wider project activities such as stakeholder engagement, training, dissemination, transfer and replication actions aimed at supporting market activation and the creation of new ecosystems. Therefore, the monitoring of renovation rate acceleration is not limited to completed renovation works, but also considers the enabling actions that may trigger future renovations or support the uptake of industrialised renovation solutions.

The second dimension focuses on documenting the benefits of renovation as an incentive for market uptake. In the context of BuildUPspeed, this means collecting structured information on the added value of industrialised renovation solutions, prefabricated systems, circular strategies, urban mining practices and pop-up factory scenarios. These benefits may be technical, environmental, economic, process-related or social, depending on the characteristics of each pilot or case.

The monitoring approach is conceived as practical and flexible. It does not aim to establish an extensive measurement campaign, but to provide a common framework for collecting comparable information across different ecosystems, pilot buildings and renovation contexts. For this reason, the templates developed under Task 5.4 combine harmonised indicators with a realistic consideration of data availability.

Overall, the BuildUPspeed monitoring philosophy aims to support project reporting, demonstrate the value of the solutions and actions promoted by the project, and generate useful evidence for future replication in other regions and markets.

1.1 Monitoring acceleration of renovation rate

When referring to the acceleration of the renovation rate, BuildUPspeed builds on the impact forecast already defined in the project impact section and included in the signed Grant Agreement. These expected impacts, shown in the table below, describe the contribution anticipated from the project in terms of industrialised renovation uptake, including renovated buildings, renovated floor area, energy

savings, renewable energy generation, greenhouse gas emission reductions and investment triggered.

The purpose of this section is therefore to explain how Task 5.4 will monitor the extent to which those initial impact targets are achieved or credibly triggered through the activities carried out during the project and, where relevant, beyond its duration.

1 st layer: Buildings, directly addressed and renovated during the project in the five pilot markets								
Ecosystem	Number of units	Total net floor area (m ²)	Energy use in existing situation (kWh/m ² ·y)	Energy saving (%)	Renewable energy production (GWh/y)	Primary saving (GWh/y)	CO ₂ emissions saving (t/y)	Investments triggered M€
Spain								
Residential	56	5.152	106	56	0,010	0,308	49	0,84
Total	56	5.152	106	56	0,010	0,308	49	0,84
The Netherlands								
Soc. housing 1	85	8075	180	35	0,202	0,51	288	2,4
Soc. housing 2	48	4560	180	85	0,114	0,70	395	1,4
Non-resid.	1	1000			0	0,09	51	0,3
Total	86	13635		50	0,316	2,02	1145	4,1
Italy								
Soc. Housing (6 buildings)	298	18900	160	68	0,96	2,04	140	6
Total	298	189000	160	68	0,96	2,04	140	6
France								
2 social housing blocks (80 flats)	2	5200	203	75	0	0,971	170	6,24
public office building	1	5000	168	70	0,12	1,274	60	6
Total	81	10200			0,12	2,245	230	12,24
Austria								
Residential	5	9.000	150	80	0,61	1,08	292	14
Non-resid.	5	12.000	170	70	0,82	1,42	386	16
Total	10	21000			1,43	2,5	678	30
Total 1st layer	531	68887			2,836	9,113	2242	53,18
2 nd layer: Buildings, be renovated as follow up, within 5 years after the project duration								
Ecosystem	Number of units	Total net floor area (m ²)	Energy use in existing situation (kWh/m ² ·y)	Energy saving (%)	Renewable energy production (GWh/y)	Primary saving (GWh/y)	CO ₂ emissions saving (t/y)	Investments triggered M€
Spain								
Residential	3720	342236	106	56	0,64	20,44	3225,80	55,80
Total	3720	342236	106	56	0,64	20,44	3225,80	55,80
The Netherlands								
Residential	364	36400	180	85	0,910	5,57	3152	10,9
Non-resid.	10	5600	180	50	0	0,50	285	1,68
Total	374	42000			0,910	6,07	3437	12,6
Italy								
Soc. Housing (around 36 buildings)	1800	113400	960	68	5,76	12,24	840	36
Total	1800	113400	960	68	5,76	12,24	840	36
France								
social housing (2000 flats)	50	130000	203	75	0,12	24,277	4264	156
public office buildings	10	50000	168	70	1,2	12,740	600	60
Total	60	180.000	168		1,22	37,02	4.864,00	216,00
Austria								
Residential	90	162000	150	80	10,98	19,44	5256	252
Non-resid.	85	204000	170	70	13,94	24,14	6562	272
Total	175	366000			24,92	43,58	11818	524
Total 2nd layer	6129	1043636			33,45	119,35	24184,8	844,4
3 rd layer: Potential by replicating through UIPI and HE members by the end of the project, triggered by the Renovation Hubs roadshows and replication in other interested seven new hubs								
Partner	Expected potential				Additional RES (GWh/y)	Additional energy saving (GWh/y)	Investm. triggered M€	
UIPI and HE	10 property owners use the Renovation hub to renovate in Europe, average floor area/project = 1000m ² making label step from D to B (= 35% saving) 40 social housing companies, motivated by the national housing federations (= 0,1% of all involved housing companies) doing a deep renovation, using the BuildUPspeed market activation platform. Average floor area/project = 1000m ² , making label step from D to A (= 45% saving)				1,26	6,19	20,5	
New eco-systems	5 new ecosystems/year after 2026, triggering each 300 residential units/year over 5 years, making label step from D to A (= 45% saving). Average energy use 180 kWh/m ² y; average floor area per unit residential 85 m ² ; 10 PV panels/unit (based on the averages of the baselines of current ecosystems)				15,94	51,64	190,9	

Figure 1 Project impacts

The impact forecast is structured into three layers. Layer 1 refers to the impacts triggered within the project duration, including the pilot buildings renovated during the project. For these cases, monitoring will rely on real data collected from the pilot buildings. Part of this information is already gathered through the templates for

monitoring the benefits of industrialised renovation, and the key impact data will be transferred to the BUPS Impact Monitoring Template.

Layer 2 refers to the impact foreseen within five years after the project duration. It includes renovations expected to be triggered as a continuation or replication of the activities developed in the five national ecosystems, taking into account their specific market conditions, scale, renovation approaches and types of buildings.

Layer 3 refers to wider replication impacts. This includes the expected impact generated by members of UIPI and Housing Europe as a result of the BuildUPspeed roadshows, as well as the impact expected from spin-offs of the five ecosystems, including new ecosystems created after the project.

Across the three layers, the renovation units may include different building uses, such as residential buildings, offices or other non-residential buildings. For this reason, the number of renovated units should be interpreted together with the renovated floor area. Floor area provides a common unit for comparing impacts across different building types and uses, and can be used to translate renovation activity into related indicators such as energy savings, greenhouse gas emission reductions and investment triggered.

This layered structure makes it possible to distinguish between impacts directly achieved during the project, impacts expected from the continuation of ecosystem activities after the project, and wider replication impacts at European level.

BuildUPspeed builds on previous experience from related projects, in particular Triple-A-reno, re-MODULEES and Save the Homes, which already addressed how to monitor renovation impacts in terms of renovated buildings, energy savings, greenhouse gas emission reductions and investment triggered.

The approach follows the action × points logic used in re-MODULEES, inspired by previous DOWEL-related work on monitoring European innovation networks. In practical terms, relevant project activities are counted and converted into estimated renovation impacts by applying a success rate according to their expected influence on the decision to renovate or on the adoption of industrialised renovation solutions. This allows BuildUPspeed to monitor not only renovations completed during the project, but also renovations credibly triggered by project activities such as dissemination, training, platform use, technical support or stakeholder commitments.

A general condition for an impact to be registered as a “BuildUPspeed impact” is that the renovation works use industrialised or prefabricated products, systems or processes promoted by the project, or that there is evidence of a clear influence of the BuildUPspeed approach through the platform, ecosystem activities, training, technical support, roadshows or pilot demonstrations.

For impact monitoring, the following types of activities can be counted:

- **Pilot implementation activities:** pilot projects directly renovated or implemented during the project, including cases used to analyse and validate industrialised renovation solutions, pop-up factory scenarios, Key Exploitable Results and related business models.

- **Ecosystem engagement activities:** meetings, workshops, conferences, technical sessions or stakeholder events organised within the national ecosystems, involving Local Advisory Board members, Soundboard Groups and other relevant stakeholders.
- **Training and capacity-building activities:** national or international training sessions, professional workshops and other learning activities aimed at increasing knowledge and skills related to industrialised, prefabricated or modular renovation solutions.
- **Demonstration and site-visit activities:** pilot visits, technical visits, demo days or practical demonstrations showing BuildUPspeed solutions, project results or renovation approaches.
- **European dissemination and replication activities:** roadshows, international workshops, dissemination events and communication actions, including those promoted by UIPI and Housing Europe, aimed at reaching wider stakeholder networks and supporting the creation of new ecosystems.
- **Market Activation Platform use:** where data are available, platform-related activity may also be counted, such as registered users, projects created, searches performed, tools used or contacts generated through the platform.
- **Commitments and follow-up actions:** letters of intent, expressions of interest, strategic plans or other documented commitments from stakeholders, especially when they represent building owners, housing providers, public authorities or other actors able to influence a wider building stock.

The key methodological question is how to demonstrate that the activities counted actually contribute to renovation impacts, and to what extent those impacts can be attributed to BuildUPspeed. The approach assumes that a project activity may trigger, or contribute to triggering, a renovation project using industrialised or prefabricated solutions.

To estimate this impact, an action × success rate system is applied. Each relevant activity is counted and multiplied by a success rate, understood as the estimated degree of influence of that activity on the decision to renovate using an industrialised solution or on the adoption of the BuildUPspeed approach. The result is interpreted as an estimated number of renovation projects triggered.

These triggered renovation projects are then converted into renovated floor area by applying a reference floor area per building, dwelling or renovation unit:

Estimated triggered renovated floor area =
 $\Sigma (\text{project activity count} \times \text{success rate} \times \text{reference floor area})$

The reference floor area may correspond to the average floor area originally considered in the project impact table. Alternatively, a different average value may be used when this better reflects the specific conditions of an ecosystem, the type of buildings addressed, or the average size of the building stock managed by the stakeholders involved. In such cases, the value used should be clearly justified.

This approach allows BuildUPspeed to translate different types of project activities into a common impact unit: renovated floor area. This is particularly relevant because the project addresses both residential and non-residential buildings, and the use of

floor area makes it possible to compare impacts across different building types and ecosystem contexts.

In order to simplify the count, we propose a classification of the project's action types, so that we can assign a success rate to each of these categories:

type of action	Success rate	Definition
<i>BUPS Pilot project</i>	100 %	Pilot sites receiving BuildUPspeed support during design, permitting and construction phases count at 100%.
Training (general technical professionals)	4 %	Share of trained technical participants expected to apply the knowledge to a future renovation-related opportunity, specification, feasibility study, design decision or implementation pathway.
Training (technicians with building portfolios)	8 %	Share of trained portfolio-related participants, users or organisations expected to activate, prepare or influence at least one renovation opportunity in their own building stock.
Communication/dissemination — Professional communication / dissemination event	1 %	Share of qualified attendees expected to apply the knowledge to a future renovation-related project or opportunity.
Communication/dissemination — Targeted technical / sector event	2 %	Share of qualified attendees expected to contribute to a future renovation opportunity, feasibility study, design decision, procurement process or project pipeline.
Communication/dissemination — Interactive workshop / working group / demonstration / site visit	4 %	Share of attendees with direct technical, managerial or decision-making capacity expected to apply the concepts in at least one renovation-related project.
<i>Digital platform — engaged MAP users</i>	1 %	Share of users reaching relevant MAP sections, catalogues, solution pages or project galleries who may later apply the concepts.
<i>Digital platform — completed wizard/action plan</i>	2 %	Share of users who complete a decision-support task and receive actionable recommendations or download an output.
<i>Digital platform — qualified real-case users</i>	4 %	Share of professionals or portfolio actors using the tool with a real building case who may apply the result to a renovation opportunity.
<i>Letter of commitment</i>	100 %	Building owners committed to replicate BUPS process or building stock representatives committed to replicate BUPS process in x% of their stock (x m ²).

Table 1 Success rates according to the type of action reported

1.1.1 Justification of conversion ratios for actions carried out in BUPS

The success rates used in the impact monitoring template were revised to better reflect the professional nature, intensity and implementation potential of the activities carried out in BuildUPspeed. The previous values were intentionally conservative. However, most BuildUPspeed activities are not addressed to the general public, but to professional stakeholders involved in the renovation value chain, including architects, engineers, contractors, manufacturers, public authorities, housing providers, renovation advisors, building owners, portfolio managers and other market actors. For

this reason, the revised values are still conservative, but they better represent the capacity of these audiences to influence future renovation-related opportunities.

The success rates do not represent guaranteed renovations. They estimate the share of qualified participants, users or organisations expected to apply BuildUPspeed concepts to a future renovation-related opportunity, such as a feasibility study, design decision, technical specification, procurement process, project pipeline, digital action plan or renovation project. The rates remain clearly below the higher conversion levels reported for intensive advisory services or one-stop-shop models, where support is more personalised and closer to implementation.

To avoid overestimation, each action should be classified under the most specific applicable category. When an action could fit several categories, the category reflecting the highest level of engagement and implementation capacity should be selected. For example, a workshop addressed to municipalities or housing providers should be classified according to its portfolio-oriented character rather than as a generic dissemination event. Double counting of the same action, participant, user or commitment must be avoided.

a) Training for general technical professionals

Recommended value: 4%

This ratio applies to training activities targeting professionals who can prescribe, design, advise, implement or influence renovation solutions, but who do not directly control a building portfolio. This includes, for example, architects, engineers, energy consultants, contractors, installers, manufacturers' technical staff and other professionals involved in the renovation value chain.

A conversion rate of 4% is applied. This value is derived from training-transfer evidence showing that 34% of employees still apply training material on the job one year after training. Since applying knowledge in professional practice does not necessarily lead to a renovation project, only a small attribution factor is considered. Applying a 10-12% renovation-relevance factor to the one-year training-transfer benchmark results in an estimated conversion of 3.4-4.1%, rounded to 4%.

Step	Assumption	Value
Training transfer after one year	Saks and Belcourt benchmark reported in ERIC review	34%
Share of applied learning connected to a renovation opportunity	Conservative attribution factor for general technicians	10-12%
Implied conversion	$34\% \times 5\%$	3.4-4.1% $\approx$ 4%

Table 2 Assumptions used for professionals training activities

b) Training for technicians with public/private building portfolios

Recommended value: 8%

This ratio applies to training activities targeting professionals who work for organisations owning, managing or operating buildings. This includes, for example, municipal technical officers, public housing teams, facility managers, asset managers, property managers, energy managers and technical staff involved in portfolio-level renovation planning or procurement.

A conversion rate of 8% is applied. This value is higher than the ratio for general technical professionals because these participants are closer to implementation. They can identify candidate buildings, prepare feasibility studies, influence investment planning, support procurement and integrate industrialised renovation concepts into portfolio-level strategies.

The value is derived by applying a 20–25% renovation-relevance factor to the one-year training-transfer benchmark of 34%, resulting in a range of 6.8-8.5%. A central value of 8% is retained as a reasonable assumption for portfolio-related training and capacity-building activities.

c) Communication and dissemination events

Recommended values: 1-4%, depending on the type and intensity of the action.

The rationale for these values is based on the expected influence of professional knowledge-transfer activities on future renovation-related practice. Evidence from professional knowledge-transfer literature shows that structured educational meetings and workshops can lead to measurable changes in professional practice. In BuildUPspeed, this is relevant because dissemination and communication activities are not addressed to a general public audience, but mainly to qualified professional stakeholders involved in the renovation value chain.

However, building renovation is a complex, capital-intensive and multi-actor process, depending on ownership, technical feasibility, finance, procurement, regulatory conditions and market availability. Therefore, the BuildUPspeed success rates are set at conservative low single-digit values. The 1% value is used for broad professional dissemination, the 2% value for targeted technical or sector events, and the 4% value for interactive or demonstration-based activities with higher engagement and practical applicability.

These values are interpreted as the share of qualified attendees expected to apply the knowledge gained to a future renovation-related opportunity, feasibility study, design decision, specification, procurement process, project pipeline or implementation pathway. They do not represent direct or guaranteed completed renovation works.

Evidence point	Observed value	Interpretation for BuildUPspeed
Professional educational meetings and workshops (Flottorp, 2008; Forsetlund et al., 2009)	Median 6% improvement in compliance with desired practice (IQR 1.8–15.9%)	Upper reference for professional-practice change. BuildUPspeed values remain below this benchmark and are not interpreted as guaranteed renovations.
Energy advice programme (DESNZ, 2026)	44% checked eligibility, 30% applied to a scheme, 15% installed a measure and 10% had measures in progress or planned after phonenumber advice	Upper benchmark for personalised advice contexts. BuildUPspeed event rates remain much lower because events do not provide full advisory support.
One-stop-shop advisory services (BUILD UP, 2025)	Around 16% conversion from initial advice to completed renovations; over 95,000 people advised and more than 14,000 homes renovated in 2023	Upper benchmark for structured renovation support. It is not applied to standard BuildUPspeed dissemination events.
Event type	Recommended success ratio	Reasonable interpretation
Professional communication / dissemination event	1%	Professional audience, broad but sector-relevant event.
Targeted technical / sector event	2%	Qualified audience and content directly linked to renovation,

		industrialisation, public buildings, housing or market uptake.
Interactive workshop / working group / demonstration / site visit	4%	Higher engagement, technical exchange, demonstration, co-creation or direct discussion of implementation and replication.

Table 3 Assumptions used for communication & dissemination activities

d) Market Activation Platform use

Recommended value: variable by funnel stage: 1–4%

This ratio applies to the use of the BuildUPspeed Market Activation Platform. Platform activity should not be treated as a single indicator, because a user who only accesses general content does not have the same relevance as a user who completes a wizard, receives recommendations or applies the tool to a real building case.

A funnel-based approach is therefore applied. Higher values are assigned when users complete more meaningful digital actions that may support a renovation decision. This includes accessing solution information, using a questionnaire or wizard, receiving recommendations, downloading an action plan or applying the tool to a real building case.

The revised values are 1% for engaged MAP users, 2% for users completing a wizard or action plan, and 4% for qualified real-case users. These values remain clearly below assisted-advice and one-stop-shop benchmarks. The DESNZ evaluation of the Consumer Advice and Information Programme reported that, after phoneline advice, 44% of surveyed users checked eligibility for a government scheme, 30% applied to one, 15% had installed a measure and a further 10% had measures in progress or planned (DESNZ, 2026). EU Peers evidence on one-stop-shops also reports an average 16% conversion from initial advice to completed renovations (BUILD UP, 2025). These benchmarks are treated as upper references because they involve more intensive support than a standalone digital platform.

Evidence point	Observed value	Interpretation for BuildUPspeed
MAP staged engagement / funnel logic	Platform actions differ in depth: accessing content, completing a wizard/action plan, or using the tool with a real building case	Supports differentiated MAP rates. Passive or generic visits should not be treated as equivalent to qualified renovation leads.
Meaningful decision-support action	Completion of a wizard, questionnaire, action plan or downloadable output represents a deeper interaction than browsing	Supports a 2% value for completed wizard/action-plan users, while avoiding overestimation for light engagement.
Assisted energy advice programme (DESNZ, 2026)	44% checked eligibility, 30% applied to a scheme, 15% installed a measure and 10% had measures in progress or planned after phoneline advice	Upper benchmark for personalised support. BuildUPspeed MAP values remain below this because the MAP does not necessarily provide full advisory or implementation support.
One-stop-shop advisory services (BUILD UP, 2025)	Around 16% conversion from initial advice to completed renovations	Upper benchmark for structured renovation support. It supports keeping MAP real-case use at 4%, clearly below OSS conversion levels.
MAP funnel stage	Recommended success ratio	Reasonable interpretation
Engaged MAP users	1%	Users reaching relevant MAP sections, catalogues, solution pages or project galleries.
Completed wizard or downloaded action plan	2%	Users completing a decision-support task and receiving actionable recommendations or an output.

Qualified real-case MAP users	4%	Professionals or portfolio actors using the tool with a real building case.
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Table 4 Assumptions used according to MAP use

To avoid double counting, users should be assigned to the deepest relevant funnel stage reached. For example, a user who accesses platform content and then completes a wizard should only be counted under the “completed wizard or downloaded action plan” category.

e) Letters of commitment

Recommended value: 100% of the committed renovation scope

This ratio applies to written commitments provided by building owners, building stock representatives or other organisations with direct capacity to promote or implement renovation projects. These commitments may result from participation in project activities, technical support received within an ecosystem, involvement in pilot-related actions, or engagement with concepts developed by the project.

A 100% success rate is applied only to the renovation scope explicitly covered by the letter of commitment. This means that if a building owner commits to renovate one building using industrialised, prefabricated or modular solutions, that specific building can be counted. If an organisation managing a building stock commits to replicate the BuildUPspeed approach in a defined percentage of its portfolio, only that declared share of the stock should be considered.

This category is treated differently from dissemination, training or platform use because the stakeholder has moved beyond general interest and has provided a documented commitment to renovate or to implement one or more concepts developed within the project. Therefore, the attribution to the project is stronger, provided that the commitment clearly refers to the use, replication or adaptation of the BuildUPspeed approach.

Commitment type	Recommended success ratio	How to apply it
Building owner commits to renovate a specific building	100%	Count the floor area of the committed building
Building stock representative commits to replicate the BUPS approach in a defined share of its stock	100% of the committed share	Count only the declared percentage or number of buildings/dwellings
Organisation provides a general letter of support without a defined renovation scope	Not counted, or counted under a lower engagement category	Use only as qualitative evidence unless a renovation scope is specified

Table 5 Assumptions used in the case of letters of commitment

To avoid overestimation, the committed renovation scope should be clearly documented. When the letter refers to a portfolio, the number of buildings, dwellings or floor area considered should be stated or estimated using a justified reference value.

f) Post-project cascade effect

Recommended value: 1.5 multiplier over five years, where applied.

In addition to the direct action × success rate calculation, a post-project cascade effect may be applied to estimate continued replication of BuildUPspeed concepts within the five years after the end of the project.

A cascade multiplier of 1.5 means that, for every 10 renovation-related applications initially triggered by BuildUPspeed activities, 5 additional applications are assumed to take place during the five-year post-project period. This reflects the possibility that organisations or professionals applying the BuildUPspeed approach once may continue using similar knowledge, tools or industrialised renovation concepts in subsequent projects. The assumption is consistent with energy-efficiency evaluation practice, where participant spillover, non-participant spillover and market effects are recognised as additional impacts induced by programme influence beyond directly supported actions.

The cascade effect should be treated as a post-project replication assumption. It should be clearly identified in the results and should not be used to double count the same actions, participants or buildings. If an ecosystem lacks sufficient evidence of continued activity, the cascade effect may be reported as a scenario or sensitivity result rather than as the only reported value.

1.2 Monitoring benefits of industrialised renovation

The templates for monitoring renovation benefits have been developed through an iterative process with BuildUPspeed partners. A first workshop was held during the 5th consortium meeting in Madrid to discuss potential indicators for assessing the benefits of renovation.

Name of pilot/demonstrator:		Country:			
Are there tenants/users in the buildings during the renovation? (Yes/No)					
Is this Pilot a Pop-up Factory? (Yes/No)					
Type of data to be monitored	Most appropriate indicators Propose the most appropriate indicators for each category according to the type of demonstrator/pilot.	Data sources Indicate possible/potential data sources available from which to document the indicators (e.g. bills, EPC, etc.).	Nature/accuracy of the data Real/estimation/genetic/etc.	Data granularity Level of accuracy/detail of data (e.g. annual, monthly, daily, hourly, etc.).	Comments Add any additional comments here
Energy					
IEQ					
Well-being & health of occupants					
Identify Energy human's behaviours					
Insight in the material flows (in a circular system)					

Figure 2 Excel template for collecting feedback from partners during CM 5-Madrid

In the following online consortium meeting (6th), a first proposal of indicators and template structure was presented, together with the idea of using the templates as a benchmarking tool. A [questionnaire](#) was then prepared to collect partner feedback on the relevance of the proposed indicators and on the feasibility of collecting the corresponding data from the pilot buildings. Between one and two pilot buildings per ecosystem were invited to complete the survey, in order to gather their views on the feasibility and ease of collecting the data listed.

The questionnaire addressed three main types of cases: industrialised renovation solutions, actual or potential pop-up factory scenarios, and urban mining or circularity strategies. The results were presented during the 7th consortium meeting and were used to refine the indicators and prepare a first draft of the templates.

Task 5.4: BuildUPspeed Ecosystems Performance Monitoring



➤ **Selection of more relevant and feasible KPIs:**

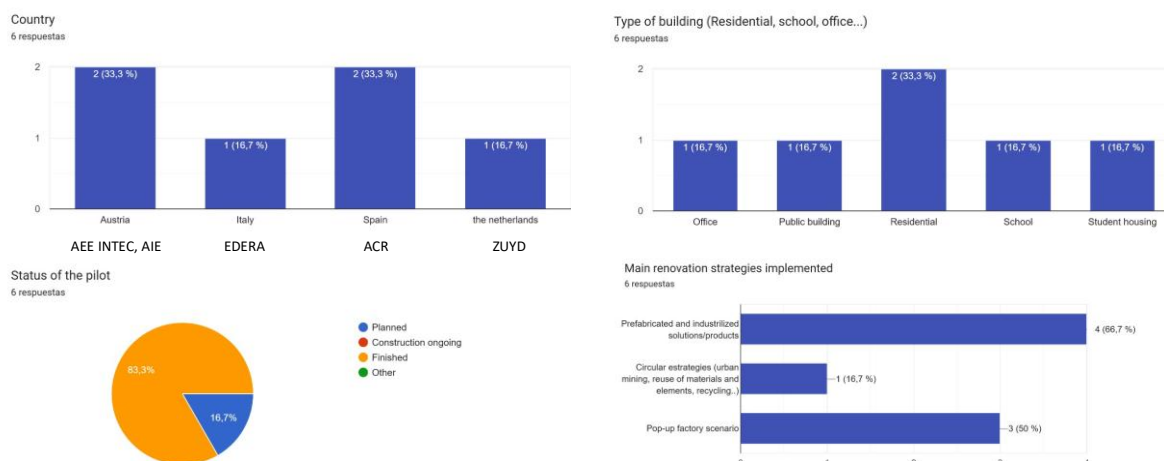


Figure 3 Some of the results presented from the indicators questionnaire

Task 5.4: BuildUPspeed Ecosystems Performance Monitoring



➤ **Selection of more relevant and feasible KPIs:**

- prefabricated and/or industrialised solutions / products / processes



	Relevance	Feasibility
[Total works duration]	4	4
[Duration from design to handover]	3	4
[Time saved compared to conventional renovation methods]	3	3
[Reduction in on-site construction time]	4	4
[Installation time of prefabricated solutions (façade, balcony, ...)]	4	4
[Overall project cost]	4	4
[Labor cost savings]	4	2
[Material waste reduction]	3	1
[Energy cost savings during and after renovation]	2	0
[Defect rates]	3	1
[Building lifespan projections]	2	1
[Energy performance over time]	2	2
[Energy savings]	2	1
[Energy needs reduction]	2	2
[Carbon footprint reduction]	3	2
[Increase in renewable energy generation]	2	2
[Use of recycled or sustainable materials]	3	3
[Number of on-site accidents or incidents]	3	3
[Reduction in safety risks]	3	0
[Compliance with safety standards]	2	2
[Ease of future modifications]	2	2
[Potential for component reuse or relocation]	2	0
[Customization options within prefabricated systems]	2	2
[Reduction in disruption to occupants]	2	2
[Improvement in indoor environmental quality]	2	1
[Occupant satisfaction surveys pre- and post-renovation]	2	1
[Maintenance cost reduction]	2	0
[Sustainable materials used (Ej. Biobased, EU Label, Blue Angel, ...)]	3	2
[Total investment costs]	4	4
[Cost per squared meter floor area]	4	4
[Cost per squared meter façade area]	3	3
[Potential accessible grants]	2	2
[Increase in property value]	2	1
[ROI (breakeven of total cost of ownership)]	2	0

Figure 4 Some of the results presented from the indicators questionnaire

During the last consortium meeting in Vienna (8th), an almost final version of the templates was presented. The main structure was validated, while some adaptations were identified to better address urban mining cases, which have specific characteristics. Additional meetings were organised to address this issue.

As a result, the templates were designed as practical benchmarking tools. The final structure incorporated partner feedback and inputs from additional references, including the methodology proposed by Van Vuuren, Middleton and R.P. (2020) for

quantifying the benefits of offsite construction. This helped to refine the indicators and to organise them into thematic categories.

The indicators were structured to support two levels of benchmarking. A basic benchmarking level was proposed to collect a reduced set of key indicators that could be completed by most pilots and would allow comparison between different cases. In parallel, an extended benchmarking level was defined to collect more detailed information when available, enabling a deeper analysis of specific cases and benefits.

This approach allows the templates to remain practical and feasible, while still supporting more comprehensive assessments where data availability permits. They can therefore be used both for reporting the BUPS pilot cases and for supporting future calls for best practice cases, which may feed the Market Activation Platform and contribute to the wider dissemination and uptake of industrialised renovation solutions.

2 Description of the templates

2.1 Template 1: Impact monitoring and renovation rate acceleration

The “BUPS_WP5_T54-ImpactMonitoring_Template” is used to monitor the contribution of BuildUPspeed activities to renovation rate acceleration. It translates project activities into estimated renovation impacts, mainly expressed as renovated floor area and, where possible, as related energy, environmental and investment indicators.

The template combines two types of information. First, it collects real impact data from pilot projects implemented during the project. Second, it estimates the potential impacts triggered by ecosystem and European-level activities, such as training, dissemination, workshops, Market Activation Platform use or letters of commitment.

The template is organised into three sheets:

- **Reporting**
- **Results**
- **Variables**

The **Reporting** sheet is the main working sheet. It is used to introduce the actions carried out, assign them to the corresponding ecosystem and impact layer, and provide the data needed to calculate their contribution to the project impact targets. For pilot projects, it also collects the key real data required to report Layer 1 impacts.

The **Results** sheet is an output sheet. It summarises the information reported in the template and aggregates the results by impact layer. It allows users to check the overall contribution of the reported actions against the project impact framework.

The **Variables** sheet contains the default values used in the calculations. These include success rates by action type, impact objectives by layer, average floor areas and reference factors for estimating energy savings, renewable energy generation, CO₂ emission reductions and investment triggered. The default values are based on the project proposal and Grant Agreement, but may be adjusted when a different value is better justified for a specific ecosystem or target building stock.

The template therefore provides a common and traceable framework to report BuildUPspeed impacts across ecosystems and activity types. It links pilot evidence with estimated impacts from replication and market activation activities, while keeping the assumptions used in the calculations transparent.

The “BUPS_WP5_T54-ImpactMonitoring_Template” is used to monitor the contribution of BuildUPspeed activities to renovation rate acceleration. It translates project activities into estimated renovation impacts, mainly expressed as renovated floor area and, where possible, as related energy, environmental and investment indicators

The template is organised into three sheets:

- **Reporting**
- **Results**
- **Variables**
-

[illegible]

Figure 5 Reporting sheet

The **Reporting** sheet is the main input sheet. The first step is to select the relevant ecosystem in cell B1, using the drop-down menu. In general, blue cells require the selection of an option from a drop-down menu, white cells are input cells to be completed by the user, and grey cells are automatically calculated or automatically populated from other inputs.

The recommended order for completing the Reporting sheet is the following:

1. Select the ecosystem in cell B1.

2. Report the actions carried out:

- Column A: date of the action.
- Column B: type of action, selected from the drop-down menu.
- Column D: short description of the action.
- Column E: number of participants, users, projects or equivalent count.
- Columns F and G: complete only when these cells appear in white. This mainly applies to letters of commitment, where the committed stock or percentage of stock must be reported.
- Columns H and I: automatically calculated or populated.
- Column J: impact layer related to the action. Layer 1 refers to pilot projects, Layer 2 to actions or activities linked to the national ecosystem, and Layer 3 to European-level activities.

For pilot projects, columns K to Q become white and must be completed with real project data. This information should be consistent with the data collected through the benchmarking templates for monitoring the benefits of industrialised renovation. These columns include the key impact data needed to report Layer 1 results.

Rows 27 to 35 show aggregated results by layer and compare them with the objectives defined in the project proposal and Grant Agreement impact section.

pilot/action	Total net floor area for renovation (m ²)	Energy use in existing situation (kWh/m ² y)	Energy saving (%)	Renewable energy production (GWh/y)	Amount of primary saving (GWh/y)	Amount of CO2 emissions saving (t/y)	Investments triggered M€	
Select from:	(from Selections)	(from Selections)	(from Selections)	(from Selections)	(from Selections)	(from Selections)	(from Selections)	
ES	1.000	90	45	0,02	0,25	22,00	0,80	layer 1
	2.284	106	56	0,00	0,14	21,72	0,37	layer 2
	0	106	56	0,00	0,00	0,00	0,00	layer 3

Figure 6 Results sheet

The **Results** sheet is an output sheet. It summarises the reported information and shows the aggregated impact results by layer. This sheet is automatically populated from the Reporting sheet and should not be modified.

layer	type of action	Success rate	Success definition	pilot/action	objectives (m ²) (layer 1)	objectives (m ²) (layer 2)	objectives (m ²) (layer 3)	Total net floor area for renovation (m ²)	energy use in existing situation (kWh/m ² y)	Energy saving (%) Average	renewable energy production (GWh/y) per m ²	Amount of primary saving (GWh/y) per m ²	Amount of CO2 emissions saving (t/y) per m ²	Investments triggered M€ per m ²	average size of residential buildings targeted for renovation	average size of tertiary buildings targeted for renovation	Average size of building targeted for renovation
1	EUPS Pilot project	100%	Pilot sites receiving BuildUPspeed support during 100% design, permitting and construction phases count at 100%.	AT	21.000,00	366.000,00		21.000,00	80,00	75,00	0,000069	0,000195	0,032286	0,001429	1.800,00	2.400,00	2100
2	Pushing (Governmental professional)	4	Share of trained technical participants expected to apply the knowledge to a future renovation-related opportunity, specification, feasibility study, design decision or implementation pathway.	ES	5.152,00	342.236,00		5.152,00	106,00	56,00	0,000002	0,000069	0,009511	0,000163	766,20		766,20
3	Pushing (Academician with building portfolio)	6	Share of trained portfolio-related participants, users or organisations expected to activate, prepare or influence at least one renovation opportunity in their own building stock.	IT	18.900,00	113.400,00		18.900,00	80,00	69,00	0,000051	0,000100	0,007407	0,000317	3.150,00		3150
	Democratising (Governmental professional)	1	Share of qualified attendees expected to apply the knowledge to a future renovation-related project or opportunity.	BE	13.635,00	42.000,00		13.635,00	80,00	50,00	0,000023	0,000148	0,003375	0,000301	6.317,50	1.000,00	4000
	Democratising (Governmental professional)	2	Share of qualified attendees expected to contribute to a future renovation opportunity, feasibility study, design decision, procurement process or project pipeline.	FR	10.200,00	98.000,00		10.200,00	85,50	72,50	14,30000	0,000245	0,066471	0,002341	2.600,00	5.000,00	3100
	Democratising (Governmental professional)	4	Share of attendees with direct technical, managerial or decision-making capacity expected to apply the concepts in at least one renovation-related project.	IT			687.500,00	687.500,00			0,000025	0,000084		0,000307			3000
	Display platform – concept of R&D action		Share of users reaching relevant MAP sections, 1 catalogues, solution pages or project galleries who may later apply the concepts.		69.897,00	1.043.636,00	687.500,00										
	Display platform – capacity to activate effective action		Share of users who complete a decision-support task and receive actionable recommendations or download an output.			1.898.923,00											
	Display platform – quality of results per sector		Share of professionals or portfolio actors using the 4 tool with a real building case who may apply the result to a renovation opportunity.														
	Letter of commitment		Building owners committed to replicate EUPS process 100% or building stock representatives committed to replicate EUPS process in 5% of their stock.														

Figure 7 Variables sheet

The **Variables** sheet contains the default values used by the Reporting sheet. It provides transparency on the assumptions and reference data used in the calculations.

In this sheet:

- Columns F to H show the aggregated floor area to be renovated for each impact layer: Layer 1, Layer 2 and Layer 3. These values correspond to the impact forecast included in the project proposal and Grant Agreement, organised by ecosystem or EU-level category.
- Columns I to O show the detailed impact indicators committed for the project implementation phase, corresponding to Layer 1. These values are later used to extrapolate impacts for the floor area triggered by project actions in Layers 2 and 3.
- Columns P and Q show the estimated average size of residential and/or non-residential buildings.
- Column R shows the average renovated building floor area used in the calculations.

By default, the values in the Variables sheet are based on the figures included in the project proposal. However, they may be modified when a different value is more representative of the specific ecosystem, target building stock or stakeholders involved. Any change should be clearly justified and documented.

3.2 Template 2: Benchmarking of industrialised renovation solutions

The template “BUPS_T5.4_Template_benchmarking_industrilised_solutions” was developed to collect comparable information on pilot buildings and best practice cases using prefabricated and industrialised renovation solutions. Its main purpose is to document renovation benefits and support benchmarking between cases.

The template can be used for BuildUPspeed pilots and, later, for best practice cases feeding the Market Activation Platform. It collects information on the building, the renovation intervention, the industrialised solution applied, the available performance data and the resulting benchmarking assessment.

The template is organised into five main sections:

- General information
- Renovation information
- Performance data
- Benchmarking
- Benchmarking logic

The first three sections are completed by the partner or case owner. The benchmarking sheet provides the output, while the benchmarking logic sheet explains the calculation approach and should normally not be modified.

A colour code guides users when completing the file. Yellow cells indicate mandatory fields, white cells optional fields, grey cells fixed headers or labels, and blue cells guidance notes.

GENERAL INFORMATION		Additional info	Guidance for completion
Location	Country		Select one option from the drop-down menu
	Region		Insert text
	Municipality / City		Insert text
	Address (Coordinates)		Insert text. Street address, address details, postal code, coordinates (latitude, longitude)
	Cadastral reference		
Building information	Building name		Text. 100 characters max.
	Building description		Text. 1500 characters max. General configuration of the building, construction characteristics and systems (façade, windows, roof, systems: heating & cooling, DHW, ventilation, lighting, etc.).
	Year of construction		Number (Format - AAAA)
	Type of building (use)		Options: Residential / Tertiary/Other
	Subtype		Options: For residential: single family / multifamily building... For tertiary: educational, administrative, healthcare, cultural, public residential, sports center, industrial... Other
	Number of dwellings		Only for residential buildings. Number format.
	Gross floor area (m2)		Number format
	Useful floor area (m2)		Number format. Total usable floor area within a building that is inside the thermal envelope of the building.
	Number of floors		Number format.
	Ownership		Select one option from the drop-down menu. Options: Public/private/mixed ownership/other
	Heritage building		Select one option from the drop-down menu: Yes/No
	Climate zone		According to national legislation
Applicable regulation		Building regulations related to energy efficiency in force at the year of construction.	
Additional information	Useful links		
	Main image		
Contact information	Name		Person responsible for the upload of pilot / best practice case
	Organization		Entity responsible for the pilot / best practice case
	Country		Select one option from the drop-down menu.
	Website		
	Email		

Figure 8 General information sheet. Colour code and editable fields

The “General information” sheet collects the basic description of the case: location, building name, building type, year of construction, number of dwellings, floor area, ownership, heritage status, climate zone, applicable regulation and contact details.

The “Renovation information” sheet describes the intervention: renovation dates, project status, type of intervention, energy efficiency measures, prefabricated or industrialised solutions applied, building elements addressed and possible circular strategies.

RENOVATION INFORMATION		Additional info	Guidance for completion
Scope			Select one option from the drop-down menu: Total/Partial
Renovation start date			Depending on the status(see row 27) this data could be estimated, or real...please indicate.
Renovation end date			Depending on the status (see row 27) this data could be estimated, or real...please indicate.
Type of renovation intervention:			Multiple selection (select all those apply from the check list below)
1 Energy efficiency (reduced demand/consumption, decarbonisation)		☐	
2 Universal accessibility (lifts, ramps, step-free routes, PRM, signage)		☐	
3 Safety and regulatory compliance (fire safety, evacuation, code compliance)		☐	
4 Health and comfort (IAQ / thermal comfort / acoustics) (ventilation, CO ₂ , humidity, acoustics, daylight)		☐	
5 Conservation and durability (pathologies/defects, damp, watertightness, corrosion, maintenance)		☐	
6 Structural upgrade / strengthening (load capacity, stability)		☐	
7 Functionality and reconfiguration (new circulation, layout changes, use optimisation)		☐	
8 Finishes and aesthetics (architectural appearance, finishes renewal)		☐	
9 Water efficiency (saving, reuse, rainwater, drainage)		☐	
10 Resilience and climate adaptation (shading, green solutions, heat island, flooding)		☐	
11 Digitalisation and monitoring (sensors, BMS, smart meters, digital twin)		☐	
12 Other objectives		☐	
Subtype of energy efficiency improvement measures (EEMs)			If applicable, please specify in cell C17
1 Thermal envelope & airtightness		☐	Multiple selection (select all those apply from the check list below)
2 Windows/doors & solar shading		☐	
3 Ventilation & heat recovery		☐	
4 Efficient HVAC & DHW generation		☐	
5 Controls & energy monitoring (BMS/submetering)		☐	
6 On-site renewables & self-consumption (storage optional)		☐	
7 Efficient lighting & other electric loads		☐	
Description (EEMs)			Text. 1000 characters max. Explain the initial situation (existing deficiencies in the building) and the improvements needed (what type of renovation is being carried out/foreseen).
Status			Select one option from the drop-down menu: Intake / Onboarding: Feasibility & Evaluation; Design: Permitting & Procurement; Construction; Commissioning & Handover; Operation & Monitoring.
Does the renovation involve any prefabricated solution (product/system/process...)?			Select one option from the drop-down menu: Yes/No
Element/s addressed by the prefabricated solution:			Multiple selection (select all those apply from the check list below)
1. Façade and envelope systems		☐	
2. Roofs and roof upgrades		☐	
3. Structural reinforcement or replacement		☐	
4. Floor slabs and flooring systems		☐	
5. Prefabricated bathrooms, kitchens and wet areas		☐	
6. Integrated building services and renewable energy systems		☐	
7. Interior partitions and linings		☐	
8. Building extensions using prefabricated or industrialised systems		☐	
Description of prefab solutions implemented			Free text.1000 characters max. Explain the prefabricated/industrialised solutions (products, components, systems, processes...) applied during the renovation
Does the renovation involve any circular strategy?			Select one option from the drop-down menu: Yes/No

Figure 9 Renovation information sheet – partial capture

The “Performance data” sheet is the main input section for benchmarking. It includes indicators grouped into thematic categories such as time and productivity, cost, energy and environmental impact, materials and circularity, quality, safety, user disruption and pop-up factory processes when applicable.

For each indicator, the template allows the user to report baseline values and pilot values, indicate data sources, specify whether the value is measured or estimated, and add comments or assumptions. This makes it possible to compare the pilot case with a baseline, such as a conventional renovation approach or another reference case.

Performance data Category	Indicator	Unit	Included in benchmarking?	Guidance note	Baseline value	Baseline source	Baseline value type	Baseline data note	Pilot value	Pilot value type	Data note / estimation basis	Comments
Delivery & Productivity (Time)	Time on-site	weeks	CORE KPI	No universal default baseline is recommended. Use a comparable conventional renovation project with similar building type, use, occupancy conditions and scope of works. If unavailable, use a literature-based or expert estimated comparison and state assumptions clearly. Baseline should be based on a comparable conventional renovation project using the same definition of data, material or circularity deviation. If no project specific data exist, use organisational or external reference values and document the method used.	8	Literature-based			2	Real	E.g. Measured on site by contractor records	Weeks from start on site to practical completion. Start on site is the
	Programme certainty	%	Yes		50				100			Expressed as percentage deviation from predicted time on site. Actual
	Pre-construction period	weeks	No	Use a conventional renovation comparison with similar design complexity, procurement route, permitting, requirements and construction considerations. No generic default value is recommended. Compare against a conventional solution with equivalent technical scope and performance target. Include the same design stages and data, whether approximate and comparative data are included.								Weeks from appointment of main contractor to start on site
	Design time	weeks	No	Baseline should refer to the full duration of a comparable conventional renovation, from design/construction to completion, using the same start and end definitions as the pilot.								Weeks from project commencement (concept design) to practical co
	Total programme time	weeks	No									
Cost & Business Case (Cost)	Construction cost	€/m2	CORE KPI	Baseline should be based on a conventional renovation equivalent delivering the same functional scope and target performance. Adjust for floor area, specification level, local market conditions and price year. Clearly whether fit-out, pre-emptive and post-occupancy works are included.	150				350			Construction cost of building works. Costs associated with the build
	Cost certainty	%	No	Use the same definition for final cost variance or forecast accuracy in both pilot and baseline. If no project specific comparison exists, use organisational specific or literature-based reference values and document the assumptions.	65				99			Expressed as percentage deviation from predicted cost. Final contra
	Design cost	€/m2	No	Compare against a conventional renovation with the same scope, procurement route and design deliverables. Clearly whether consultant fees, coordination and digital design tools are included.								Design team fees from concept to completion of detail design stage.
	Unit cost of industrialized elements	€/PU (Functional unit: m2 / lin / unit, ...)	No	Use a conventional equivalent with the same technical function and performance level. State clearly the unit basis used and whether installation, transport and delivery times are included.								Functional unit (FU): m2 / lin / unit, depending on the element (Pha
Energy & Environmental Impact	Primary energy savings	GWh/y	CORE KPI	Baseline should use the same system boundary, floor area, weather data, occupancy assumptions and baseline method as the pilot. Compare against a conventional renovation scenario delivering the same intended performance level.	30				50			Primary energy consumption pre/post renovation
	Final energy savings	GWh/y	CORE KPI	Use the same design system, calculation period, and data and operating assumptions for pilot and baseline. If measured data are unavailable, use modelled estimates and document assumptions clearly. Baseline should represent the conventional renovation alternative with equivalent boundary conditions. Clearly whether the indicator refers to installed capacity, annual generation or self-consumed renewable energy.	85				92			Final energy consumption pre/post renovation
	Renewable energy generation	GWh/y	CORE KPI	Use the same emissions factors, calculation boundary and methodology for pilot and baseline. State whether the comparison covers operational emissions only or also embodied emissions.	100				100			
	GHG emissions reduction	t/y	CORE KPI		30				30			
Materials, Waste & Circularity	Waste generated	t/1000m2	CORE KPI	No generic default value is recommended. Baseline should refer to a conventional renovation solution with equivalent scope and technical function. Use waste management plans, bills of materials, records or literature-based estimates where available.	100				80			Include both on-site and off-site waste (where possible to obtain dat
	Use of reused/recycled materials (in situ, ex situ)	kg/m2	No	Compare against a conventional renovation baseline with the same scope and product categories. Use product declarations, supplier information or bill of quantities where possible, and state the basis of calculation.								
	Use of sustainable materials (E, Robovent, EU Label, Blue Angel, Nordic Swan, FSC, ...)	kg/m2	No	Baseline should refer to a conventional renovation solution with equivalent technical performance. Define clearly what supplies as sustainable material and use the same definition for pilot and baseline.								
Quality, Safety & People	Emergent defects	n/100,000€	CORE KPI	Baseline should use the same definition of defect, defect period and reporting boundary as the pilot. Use comparative project records, and occupancy records or organisational benchmarks where available. Use the same assessing boundary and defect/leakage definition for pilot and baseline. If project specific data are not available, expert estimate may be used, but assumptions should be recorded.	0				0			Number of defects recorded after completion of the works during the
	Cost of rework	%	No	Compare only where the same safety matrix and reporting method are used in both pilot and baseline. If national references are used, ensure they are consistent across different floors, times and reporting boundary.								Cost of modification and rectification works undertaken up to practi
	Accident Frequency Rate	Number of accidents per 100 000 person-hours	No									
Does PuF apply to the evaluation?												
PuF - Processes	Savings in material transportation costs due to PuF proximity to site	€	CORE KPI	Compare against the conventional logistics chain most likely to be used in the absence of PuF. Use the same cost boundary, transport assumptions and price basis for both pilot and baseline.	0				1			
	Reduction in waste generated during PuF operations	%	No	Baseline should compare PuF operations against the equivalent conventional production and installation process. Use the same material categories and waste boundary in both cases.								
	Number of local businesses employed	no	No	Baseline should compare the pilot against the most likely conventional supply chain alternative using the same procurement boundary. Define clearly what counts as "local" and apply the same rule to both cases.								

Figure 10 Performance Data sheet

The template distinguishes between a basic and an extended benchmarking level. The basic benchmarking uses a reduced set of core indicators that should be completed whenever possible and allow comparison between most cases. The extended benchmarking includes additional indicators that can be used when more detailed information is available. The user of the template can decide which additional indicators to include in the extended benchmarking from the existing set.

The “Benchmarking” sheet automatically summarises the results. It compares baseline and pilot values and shows the difference, relative improvement and normalised score by indicator and category. In this score, 100 represents the baseline; values above 100 indicate better performance, and values below 100 indicate worse performance.

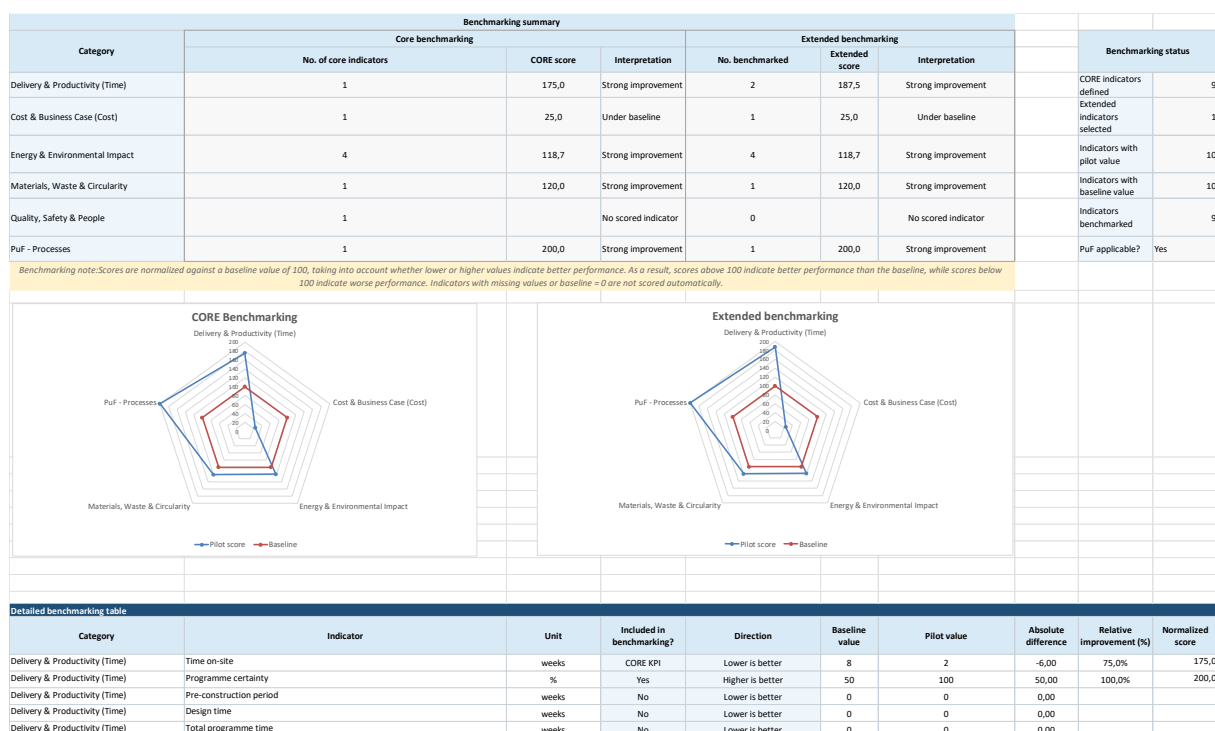


Figure 11 Benchmarking output - partial capture

The “Benchmarking logic” sheet explains the calculation method and defines whether higher or lower values represent better performance for each indicator. It is included for transparency and should only be modified if the benchmarking methodology is revised.

Overall, the template provides a practical structure to describe industrialised renovation cases, collect key data, compare them with a baseline and communicate the benefits of the solutions applied.

3.3 Template 3: Benchmarking of urban mining solutions

The template “BUPS_T5.4_Template_benchmarking_urban_mining” was developed to collect comparable information on pilot cases and best practice cases involving urban mining strategies, material recovery, reuse and high-quality recycling.

The philosophy of the template is aligned with the benchmarking approach used for industrialised renovation solutions, but it has been adapted to the specific nature of urban mining cases. In some pilots, urban mining is directly linked to the energy renovation of the same building. In other cases, recovered products, components or materials may be reused in another project, which may not yet be fully defined at the time of data collection. For this reason, the template focuses mainly on the recovery and reuse of materials rather than on the full assessment of a building renovation process.

The template is organised into the same main sections as the industrialised solutions template:

- General information

- Renovation information
- Performance data
- Benchmarking
- Benchmarking logic

The first three sections are completed by the partner or case owner. The benchmarking sheet provides the output, while the benchmarking logic sheet explains the calculation approach and should normally not be modified.

The “General information” sheet collects the basic description of the case, including location, building name, building type, year of construction, floor area, ownership, heritage status, climate zone, applicable regulation and contact details.

The “Renovation information” sheet describes the intervention and the urban mining strategy. It includes information on the renovation or deconstruction context, project status, type of intervention, recovered elements, reuse strategy and possible links with energy renovation.

DETAILED INFORMATION		Additional info	Guidance for completion
Does the pilot project (or best-practice example) involve the energy renovation of the building?	No		Select one option from the drop-down menu: Yes/No
Scope of the renovation			Select one option from the drop-down menu: Total/Partial
Renovation start date			Depending on the status(see row 27) this data could be estimated, or real...please indicate.
Renovation end date			Depending on the status (see row 27) this data could be estimated, or real...please indicate.
Type of renovation intervention:			Multiple selection (select all those apply from the check list below)
1 Energy efficiency (reduced demand/consumption, decarbonisation)		☐	
2 Universal accessibility (lifts, ramps, step-free routes, PRM, signage)		☐	
3 Safety and regulatory compliance (fire safety, evacuation, code compliance)		☐	
4 Health and comfort (IAQ/ thermal comfort / acoustics) (ventilation, CO ₂ , humidity, acoustics, daylight)		☐	
5 Conservation and durability (pathologies/defects, damp, watertightness, corrosion, maintenance)		☐	
6 Structural upgrade / strengthening (load capacity, stability)		☐	
7 Functionality and reconfiguration (new circulation, layout changes, use optimisation)		☐	
8 Finishes and aesthetics (architectural appearance, finishes renewal)		☐	
9 Water efficiency (saving, reuse, rainwater, drainage)		☐	
10 Resilience and climate adaptation (shading, green solutions, heat island, flooding)		☐	
11 Digitalisation and monitoring (sensors, BMS, smart meters, digital twin)		☐	
12 Other objectives		☐	
Subtype of energy efficiency improvement measures (EEMs)			If applicable, please specify in cell C17
1 Thermal envelope & airtightness		☐	Multiple selection (select all those apply from the check list below)
2 Windows/doors & solar shading		☐	
3 Ventilation & heat recovery		☐	
4 Efficient HVAC & DHW generation		☐	
5 Controls & energy monitoring (BMS/submetering)		☐	
6 On-site renewables & self consumption (storage optional)		☐	
7 Efficient lighting & other electric loads		☐	
Description (EEMs)			Text: 1000 characters max. Explain the initial situation (existing deficiencies in the building) and the improvements needed (what type of renovation is being carried out/foreseen).
Status			Select one option from the drop-down menu: Intake / Onboarding; Feasibility & Evaluation; Design; Permitting & Procurement; Construction; Commissioning & Handover; Operation & Monitoring.
Does the pilot project (or best case example) involve any prefabricated solution (product/system/process...)?			Select one option from the drop-down menu: Yes/No
Element/s addressed by the prefabricated solution:			Multiple selection (select all those apply from the check list below)
1. Façade and envelope systems		☐	
2. Roofs and roof upgrades		☐	
3. Structural reinforcement or replacement		☐	
4. Floor slabs and flooring systems		☐	
5. Prefabricated bathrooms, kitchens and wet areas		☐	
6. Integrated building services and renewable energy systems		☐	
7. Interior partitions and linings		☐	
8. Building extensions using prefabricated or industrialised systems		☐	
Description of prefab solutions implemented			Free text:1000 characters max. Explain the prefabricated/industrialised solutions (products, components, systems, processes...) applied during the renovation
Does the pilot project (or best case example) involve any circular strategy?			Select one option from the drop-down menu: Yes/No
Circular strategy addressed:			Multiple selection (select all those apply from the check list below)
1. Reuse of components and materials (reuse, repair or upcycling in the same or another project)		☐	
2. Material recovery from demolition/deconstruction (extraction, sorting and storage of materials for reuse)		☐	
3. Adaptability and flexible use (capacity for future layout changes, extensions or new uses)		☐	
4. Design for disassembly (reversible, removable and separable building systems)		☐	
5. Reduction of new material input (less virgin material through optimisation and reuse)		☐	
6. Circular and low-impact materials (recycled, recyclable, renewable, durable or low-carbon materials)		☐	
7. Waste prevention and recovery (audits, selective demolition, sorting, recycling and recovery)		☐	
8. Documentation and traceability (inventories, material passports and data for future reuse)		☐	
9. Other (specify)		☐	
Description of the circular approach applied			Free text:1000 characters max. Explain the circular approach applied during the renovation
Process photos			Pre During Post

Figure 12 Renovation information sheet

The “Performance data” sheet is the main input section. Compared with the industrialised solutions template, the number of indicators is reduced, as the assessment focuses on material recovery and reuse. The core indicators include, for example, pieces or units of construction products reused, cost savings due to reuse or avoided landfilling, amount of waste prevented or sent to high-quality recycling, and creation of new jobs.

PERFORMANCE DATA FOR THE BENCHMARKING								
Category	Indicator	Unit	Included in benchmarking?	Guidance note	Baseline value	Baseline source	Baseline value type	Baseline data note
Urban Mining	Pieces and or units of construction products reused	u	CORE KPI	The baseline is a comparable conventional renovation/demolition project without a specific urban mining strategy. Some ad hoc reuse may still occur in the baseline if this is normal practice in the country or market. Set the value using typical reuse levels for a similar building type, scale, age, and scope. Document the assumptions and data sources used.	8	Literature-based		
	Cost savings due to reuse/landfilling	€	CORE KPI	The baseline is a comparable conventional project that does not apply an urban mining approach and uses standard market practices for waste management and occasional recycling. The value should be estimated as the typical net cost difference versus standard procurement/disposal in the same country, using the same cost boundary, price year and scope. Clearly state whether the estimate includes avoided purchase costs, avoided landfill fees, and revenues from recovered materials.	10			
	Amount of waste prevented / sent to high-quality recycling	t	CORE KPI	The baseline is a comparable conventional project without systematic urban mining. Only include the level of waste prevention or high-quality recycling that would normally occur under standard local practices and regulations. Use the same material categories, waste boundary and reporting method as the project case and document any country-specific assumptions regarding usual recycling performance.	1			
	Creation of new jobs	FTE jobs	CORE KPI	The baseline should reflect the number of jobs normally generated in a standard comparable project to support the usual reuse of materials, products or systems under local market practices, without the application of a dedicated urban mining approach. The project value should report the extra jobs created specifically due to the urban mining approach. The objective is to capture the new employment generated by urban mining, not the total employment associated with the project	0			
Does PuF apply to the evaluation?		Yes						
PuF - Processes	Savings in material transportation costs due to PuF proximity to site	€	CORE KPI	Compare against the conventional logistics chain most likely to be used in the absence of PuF. Use the same cost boundary, transport assumptions and price basis for both pilot and baseline.	0			
	Reduction in waste generated during PuF operations	%	Yes	Baseline should compare PuF operations against the equivalent conventional production and installation process. Use the same material categories and waste boundary in both cases.	1			
	Number of local businesses involved	n ⁹	No	Baseline should compare the pilot against the most likely conventional supply chain alternative using the same procurement boundary. Define clearly what counts as "local" and apply the same rule to both cases.				
TO BE COMPLETED IF THE URBAN MINING PILOT PROJECT INVOLVES AN ENERGY RENOVATION OF THE BUILDING								
ADDITIONAL PERFORMANCE DATA FOR THE IMPACT MONITORING	Construction cost	€/m ²	FOR IMPACT	Baseline should be based on a conventional renovation equivalent delivering the same functional scope and target performance. Adjust for floor area, specification level, local market conditions and price year. Clarify whether VAT, preliminaries and external works are included.	3			
	Primary energy savings	GWh/y	FOR IMPACT	Baseline should use the same system boundary, floor area, weather data, occupancy assumptions and calculation method as the pilot. Compare against a conventional renovation scenario delivering the same intended performance level.				
	Final energy savings	GWh/y	FOR IMPACT	Use the same energy carriers, calculation period, end uses and operating assumptions for pilot and baseline. If measured data are unavailable, use modelled estimates and document assumptions clearly.				
	Renewable energy generation	GWh/y	FOR IMPACT	Baseline should represent the conventional renovation alternative with equivalent boundary conditions. Clarify whether the indicator refers to installed capacity, annual generation or self-consumed renewable energy.				
	GHG emissions reduction	tCO ₂ eq/year	FOR IMPACT	Use the same emissions factors, calculation boundary and methodology for pilot and baseline. State whether the comparison covers operational emissions only or also embodied emissions.	235			

Figure 13 Performance data sheet – partial capture

Unlike the industrialised solutions template, the benchmarking output is not organised by multiple thematic categories. Due to the more specific scope of urban mining cases, the benchmarking is based directly on individual indicators. This makes the template simpler and better adapted to cases where the main objective is to assess the recovery, reuse or recycling of materials.

The template also includes optional indicators for pop-up factory scenarios. These indicators should only be completed when a pop-up factory approach applies to the case. In this situation, a basic benchmarking can be carried out using the core PuF indicator, while an extended assessment can include up to two additional PuF-related indicators.

Additional energy-related indicators are included for cases where the urban mining pilot is also linked to an energy renovation of the building. These indicators allow the template to capture energy performance impacts when relevant, but they are not mandatory for urban mining cases focused only on material recovery.

The “Benchmarking” sheet automatically summarises the results. It compares baseline and pilot values and shows the difference, relative improvement and normalised score for each selected indicator. As in the industrialised solutions template, 100 represents the baseline; values above 100 indicate better performance, and values below 100 indicate worse performance.

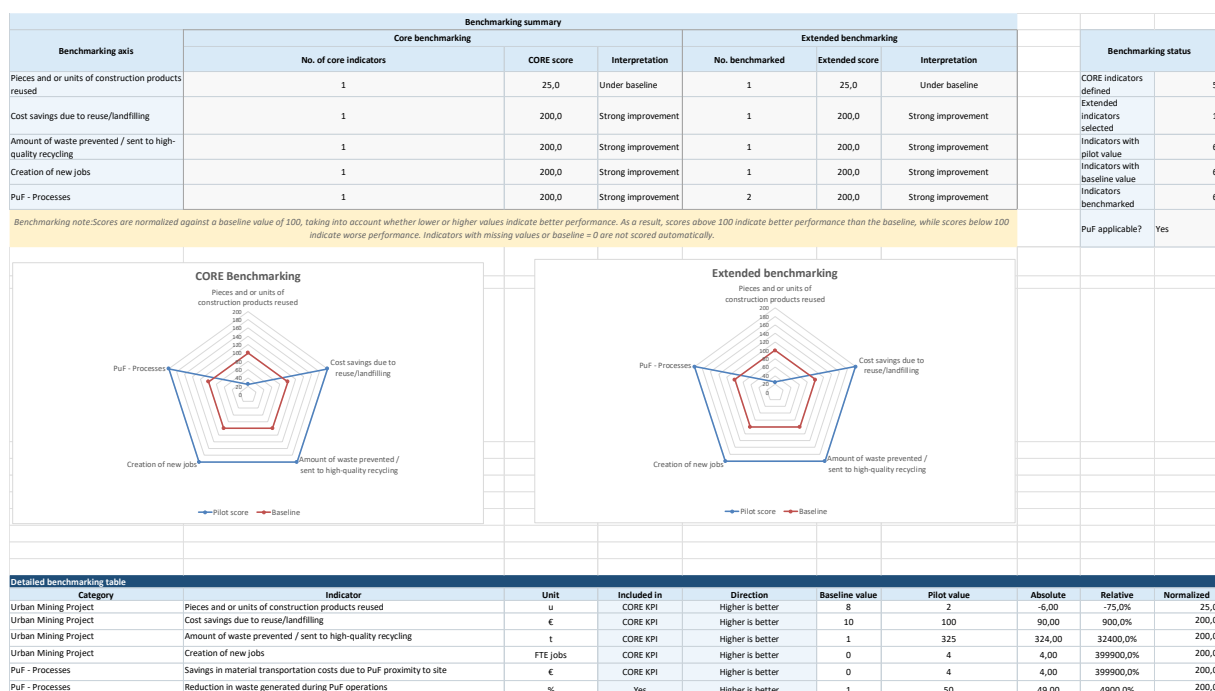


Figure 14 Benchmarking output - partial capture

Overall, the urban mining template provides a simplified benchmarking structure adapted to material recovery cases. It allows partners to report comparable information on reuse, waste prevention, cost savings and related impacts, while keeping optional sections for pop-up factory scenarios and energy renovation cases when they apply.

3 Instructions for completing the templates

The three templates developed under Task 5.4 have different purposes but share a common objective: to collect structured and traceable information on the impacts and benefits generated by BuildUPspeed activities and cases.

The templates should be completed by the partner responsible for the corresponding activity, ecosystem, pilot building or best practice case. The information should be reported using the best data available at the time of completion. Depending on the template, this information may come from project documentation, pilot documentation, construction planning, monitoring data, technical reports, communication records, training records, interviews or other reliable sources.

When exact data are not available, justified estimations may be used if they are relevant for the assessment. In such cases, the assumptions or calculation basis should be clearly described. If a field is not applicable, this should be indicated as “Not applicable”. If the information is relevant but not available, this should be indicated as “Not available”.

The Impact Monitoring Template is used to report project actions and estimate their contribution to renovation rate acceleration. The two Benchmarking Templates are

used to describe pilot or best practice cases and assess the benefits of industrialised renovation or urban mining strategies. Specific instructions for each type of template are provided in the following sections.

3.1 Instructions for the Impact Monitoring template

The Impact Monitoring Template should be completed to report the contribution of BuildUPspeed activities to renovation rate acceleration. The template combines real data from pilot projects with estimated impacts from ecosystem and European-level activities.

The template includes three sheets: **Reporting**, **Results** and **Variables**. Only the **Reporting** sheet should normally be completed by the user. The **Results** sheet is automatically generated, and the **Variables** sheet contains the default assumptions and reference values used in the calculations.

a) Completing the Reporting sheet

The first step is to select the relevant ecosystem in cell B1, using the drop-down menu. The colour code used in the sheet is the following:

Cell colour	Meaning
Blue cells	Select an option from a drop-down menu
White cells	Introduce input data manually
Grey cells	Automatically calculated or automatically populated

Table 6 Cell colour legend used in the template

The recommended order for completing the sheet is:

Step	Field	Instruction
1	Cell B1	Select the ecosystem to which the reported actions refer
2	Column A	Enter the date of the action
3	Column B	Select the type of action from the drop-down menu
4	Column D	Provide a short description of the action
5	Column E	Enter the number of participants, users, projects or equivalent units
6	Columns F and G	Complete only when the cells appear in white, mainly for letters of commitment
7	Column J	Select the impact layer related to the action
8	Columns K to Q	Complete only for pilot projects, when these cells appear in white

Table 7 Recommended steps to complete the template

Columns H and I are automatically populated or calculated according to the information introduced in the previous columns.

b) Selecting the impact layer

Each action must be assigned to one impact layer:

Layer	Use
Layer 1	Pilot projects implemented during the project

Layer 2	Actions or activities linked to a national ecosystem
Layer 3	European-level activities, including wider dissemination, replication or roadshow-related actions

Table 8 Layers to be assigned to the reported actions

Layer 1 should be used for pilot projects for which real monitoring or project data are available. Layers 2 and 3 are used to estimate the potential renovation impact triggered by BuildUPspeed activities.

c) Reporting pilot projects

For pilot projects, columns K to Q become white and must be completed with real project data. These data should be taken, where possible, from the benchmarking templates used to monitor the benefits of industrialised renovation.

The information may include renovated floor area, energy performance, energy savings, renewable energy generation, CO₂ emission reductions and investment triggered. These data are used to report Layer 1 impacts and to support the extrapolation of impacts for Layers 2 and 3.

d) Reporting ecosystem and European-level activities

For ecosystem and European-level activities, the template estimates the potential renovated floor area triggered by the action. The calculation is based on:

- the type of action selected;
- the number of participants, users, projects or equivalent units reported;
- the success rate associated with the action type;
- the reference floor area defined for the ecosystem or action.

The action types may include training activities, dissemination events, workshops, Market Activation Platform use, technical support actions, pilot-related engagement activities or letters of commitment.

e) Reporting letters of commitment

Letters of commitment should only be counted when they include a clear renovation or replication scope. This may refer to one or more specific buildings, or to a defined percentage or number of buildings within a portfolio.

For this type of action, columns F and G should be completed when they appear in white. These fields are used to report the committed stock or the percentage of stock to which the commitment applies.

A 100% success rate is applied only to the renovation scope explicitly covered by the letter of commitment. General letters of support without a defined renovation scope should not be used as quantitative impact evidence, although they may be reported qualitatively.

f) Checking the aggregated results

Rows 27 to 35 of the Reporting sheet show aggregated results by impact layer. These results are compared with the objectives defined in the project proposal and Grant Agreement impact section.

The Results sheet provides a summary of the same information, aggregated by layer. This sheet is an output sheet and should not be modified.

g) Use of the Variables sheet

The Variables sheet contains the default values used by the template. These include the success rates, impact objectives, average floor areas and reference factors used to estimate energy savings, renewable energy generation, CO₂ emission reductions and investment triggered.

By default, these values are based on the project proposal and Grant Agreement. They may be modified only when an alternative value is more representative of the ecosystem, target building stock or stakeholders involved. Any change should be clearly justified and documented.

In particular, the average renovated building floor area used for the calculations may be adapted when the default value does not reflect the building stock addressed by a specific ecosystem. The revised value should be supported by a clear explanation or data source.

h) Avoiding double counting

The same action, participant, building or commitment should not be counted more than once. When an action may fit more than one category, it should be reported under the most specific or most advanced category.

For Market Activation Platform use, users should be assigned to the deepest relevant funnel stage reached. For example, a user who accesses platform content and later completes a wizard should only be counted as a completed wizard user.

For letters of commitment, only the committed renovation scope should be counted. If the same building is already reported as a pilot project, it should not be counted again as a committed future renovation.

4.2 Common instructions for the benchmarking templates

The benchmarking templates are case-based tools designed to collect comparable information on the benefits of renovation approaches addressed in BuildUPspeed. They should be used for pilot buildings and, where relevant, for future best practice cases that may feed the Market Activation Platform.

The templates should be completed by the partner responsible for the pilot or case, with support from building owners, designers, contractors, manufacturers or other stakeholders when needed. The information should be completed using the best available data at the time of reporting.

Both benchmarking templates follow a similar structure. They include sheets for general information, renovation information, performance data, benchmarking results and benchmarking logic. The first sheets are used to describe the case and enter data. The benchmarking sheet automatically summarises the results. The benchmarking logic sheet explains the calculation approach and should (normally) not be modified.

The templates use a colour code to guide users. Mandatory fields must always be completed. Optional fields should be completed when the information is relevant and available. Guidance notes included in the templates should be consulted before entering data.

The benchmarking is based on the comparison between a baseline value and a pilot value. The baseline represents the reference situation, such as a conventional renovation approach, a previous practice, an initial situation or another justified reference. The pilot value represents the performance of the case assessed in the template.

For each value entered, users should indicate the source of information and the type of value. Data may be measured, calculated, estimated or based on expert judgement. When estimations are used, the assumptions or calculation basis should be clearly explained in the comments or notes fields.

If a field does not apply to the case, it should be marked as “Not applicable”. If the information would be relevant but is not available, it should be marked as “Not available”. This distinction is important for later interpretation of the results.

The templates support two levels of assessment. The basic benchmarking is the standard level and uses a reduced set of core indicators, providing the minimum common basis for comparison between cases.

The extended benchmarking is used when more detailed information is available or when a richer assessment is needed. The user can select one, several or all additional indicators from a predefined list organised by categories.

The benchmarking output compares the baseline and pilot values and provides a normalised score. In general, 100 represents the baseline. Values above 100 indicate better performance than the baseline, while values below 100 indicate worse performance. The output should be reviewed by the partner to check that the results are consistent with the data entered.

4.3 Specific instructions for the Industrialised renovation solutions template

This template should be used for cases involving prefabricated or industrialised renovation solutions, products, components or processes.
Users should complete the sheets in the following order:

1. General information

Identify the case and provide the main building data: location, contact person, building type, floor area, year of construction, ownership, heritage status, climate zone and applicable regulation.

Users should follow the “Guidance for completion” column included in the sheet. This column provides short instructions or clarifications for each field and should be checked before entering the information.

2. Renovation information

Describe the renovation intervention: project status, renovation dates, type of intervention, renovation measures, industrialised solution applied, building elements affected, and possible circularity or pop-up factory aspects.

Several fields in this sheet use predefined answer options. These options should be used whenever possible, as they are intended to work as filters and to facilitate

comparison between similar pilot cases or best practice cases.

3. Performance data

The “Performance data” sheet is the main input sheet for the benchmarking. It includes the indicators used to assess the benefits of the industrialised renovation solution.

The indicators are organised into six categories:

- Delivery & Productivity
- Cost & Business Case
- Energy & Environmental Impact
- Materials, Waste & Circularity
- Quality, Safety & People
- PuF – Processes

The first five categories are generally applicable to industrialised renovation cases.

The sixth category, “PuF – Processes”, only applies when the renovation case includes an actual or potential pop-up factory scenario.

Each category includes several indicators. At least one indicator per category has been defined as a CORE KPI. CORE KPIs form the basic benchmarking and provide the minimum common basis for comparison between cases.

Additional indicators are also provided within each category. These can be added to the extended benchmarking by selecting “Yes” in column E, “Included in benchmarking?”. If “Yes” is selected, the indicator will be included in the extended benchmarking results.

In the “Energy & Environmental Impact” category, all indicators have been defined as CORE KPIs, as this information is considered essential to assess the project impact, especially for the BuildUPspeed pilot buildings.

The “PuF – Processes” category should only be considered when a pop-up factory scenario applies. To include this category in the evaluation, users must answer “Yes” in cell D22, in response to the question: “Does PuF apply to the evaluation?”. As in the other categories, one PuF indicator has been defined as CORE, while additional PuF indicators can be selected for the extended benchmarking when data are available.

Since the pop-up factory concept is innovative and not yet widely used as a standard term in the construction sector, users who are not sure whether their case applies to a PuF scenario should consult Deliverable 4.1: Report on the Activities for the Design and Implementation of the Local Pop-up Factory Concept, Section 1, “The pop-up factory concept”. This reference should help them decide whether the “PuF – Processes” category is applicable to their case.

For each selected indicator, users should complete columns G to N:

- Column G – Baseline value: reference value used for comparison.
- Column H – Baseline source: data source used to define the baseline.
- Column I – Baseline value type: select one of the predefined options from the drop-down menu: measured, calculated, estimated or expert judgement.
- Column J – Baseline note: additional information or clarification regarding the baseline.
- Column K – Pilot value: value corresponding to the case assessed.
- Column L – Pilot value type: select one of the predefined options from the drop-down menu: measured, calculated, estimated or expert judgement.
- Column M – Data note / estimation basis: short explanation of assumptions, calculations or estimation method.

- Column N – Comments: additional clarification, limitations or contextual information. The baseline should represent the reference situation against which the industrialised solution is compared. It may refer to a conventional renovation process, usual practice, previous project data, initial situation or another justified reference. The pilot value should represent the performance of the industrialised renovation case assessed.

If exact data are not available, justified estimations may be used. In that case, the estimation basis should be clearly explained in column M. If an indicator is not applicable or not available, this should be stated.

4. Benchmarking

The “Benchmarking” sheet automatically displays the results. It compares baseline and pilot values and provides the benchmarking output for the selected indicators and categories.

All information in this sheet is referenced from other sheets. Users should not modify the calculated cells. The only element that may be added by the user is an image representing the renovated building or case, where indicated.

Users should review the benchmarking results after completing the “Performance data” sheet and check that the output is consistent with the values entered.

5. Benchmarking logic

The “Benchmarking logic” sheet explains the evaluation method used in the template, including the direction of improvement for each indicator and the scoring logic.

This sheet is included for transparency and to allow the methodology to be understood or adjusted if needed. However, it should not normally be modified by users.

4.4 Specific instructions for the Urban Mining template

The template follows the same general logic as the industrialised renovation solutions template, but it has been adapted to the specific nature of urban mining cases. In some cases, recovered materials, products or components are reused in the same building renovation. In other cases, they may be reused in another project, which may not yet be fully defined at the time of completing the template.

Users should complete the sheets in the following order:

1. General information

Identify the case and provide the main data of the building from which the materials, products or components are extracted. This includes location, contact person, building type, floor area, year of construction, ownership, heritage status, climate zone and applicable regulation, if relevant.

Users should follow the “Guidance for completion” column included in the sheet. This column provides short instructions or clarifications for each field and should be checked before entering the information.

2. Detailed information

This sheet has been adapted to urban mining cases. It collects more detailed information on the intervention, including whether the case also involves an energy renovation, a pop-up factory scenario or a circularity strategy.

The circularity question has been kept to maintain consistency with the structure of the industrialised renovation solutions template, although this template is specifically focused on urban mining and circularity cases.

The user should describe the intervention, the recovered elements, the recovery process, the reuse or recycling strategy, and whether the recovered elements are reused in the same project or in another project.

Several fields in this sheet use predefined answer options. These options should be used whenever possible, as they are intended to work as filters and to facilitate comparison between similar pilot cases or best practice cases.

If the final destination of recovered products, components or materials is not yet known, this should be clearly indicated in the comments or notes fields.

3. Performance data

The “Performance data” sheet is the main input sheet for the benchmarking. In this template, the assessment focuses mainly on material recovery, reuse, avoided waste, cost savings and related impacts.

Compared with the industrialised renovation solutions template, the number of indicators is reduced. This is because the objective is not to assess the full performance of a renovation process, but to evaluate the specific benefits of urban mining practices.

The benchmarking is based on individual indicators rather than on categories.

Therefore, the results are not grouped by thematic category in the benchmarking output.

The core indicators form the basic benchmarking and provide the minimum common basis for comparison between urban mining cases.

For each selected indicator, users should complete columns G to N:

- Column G – Baseline value: reference value used for comparison.
- Column H – Baseline source: source used to define the baseline.
- Column I – Baseline value type: select one of the predefined options from the drop-down menu: measured, calculated, estimated or expert judgement.
- Column J – Baseline note: additional information or clarification regarding the baseline.
- Column K – Pilot value: value corresponding to the case assessed.
- Column L – Pilot value type: select one of the predefined options from the drop-down menu: measured, calculated, estimated or expert judgement.
- Column M – Data note / estimation basis: short explanation of assumptions, calculations or estimation method.
- Column N – Comments: additional clarification, limitations or contextual information.

The baseline should represent the reference situation against which the urban mining strategy is compared. It may refer to conventional demolition, landfilling, use of virgin materials, standard waste management practice or another justified reference.

The pilot value should represent the performance of the urban mining case assessed.

If exact data are not available, justified estimations may be used. In that case, the estimation basis should be clearly explained in column M. If an indicator is not applicable, this should be stated.

The template also includes energy-related indicators. These should only be completed when the urban mining case is linked to an energy renovation of the building. If no energy renovation is involved, these indicators should be marked as “Not applicable”.

The template includes an optional “PuF – Processes” section. This section should only be considered when the urban mining case involves an actual or potential pop-up factory scenario.

To include the PuF indicators in the evaluation, users must answer “Yes” in cell D7, in response to the question: “Does PuF apply to the evaluation?”.

As the pop-up factory concept is innovative and not yet a widely established term in the construction sector, users should consult Deliverable 4.1, Section 1, “The pop-up factory concept”, if they are unsure whether their case applies to a PuF scenario.

In the urban mining template, extended benchmarking is only available when the PuF scenario applies. If this is the case, the core PuF indicator should be completed, and up to two additional PuF indicators can be selected for the extended benchmarking when data are available.

4. Benchmarking

The “Benchmarking” sheet automatically displays the results. It compares baseline and pilot values and provides the benchmarking output for the selected indicators. All information in this sheet is referenced from other sheets. Users should not modify the calculated cells. The only element that may be added by the user is an image representing the building, recovered elements or urban mining case, where indicated. Users should review the benchmarking results after completing the “Performance data” sheet and check that the output is consistent with the values entered.

5. Benchmarking logic

The “Benchmarking logic” sheet explains the evaluation method used in the template, including the direction of improvement for each indicator and the scoring logic.

This sheet is included for transparency and to allow the methodology to be understood or adjusted if needed. However, it should not normally be modified by users.

4 Submission, file naming and use of the results

4.1 File naming

To facilitate the collection and management of completed templates, partners should follow a common file naming structure.

The proposed naming format is BUPs_T54_[TemplateType]_[Country or Ecosystem]_[PilotName]_[Partner]_[YYYYMMDD].xlsx.

Where:

- [TemplateType] should be:
 - ImpactMonitoring
 - IndustrialisedSolutions
 - UrbanMining
- [Country] should indicate the ecosystem or the country of the pilot or case.
- [PilotName] should indicate the name of pilot building or best practice case, when it is the case.
- [Partner] should indicate the organisation responsible for completing the template.
- [YYYYMMDD] should indicate the date of the submitted version.

Examples:

BUPS_T54_ImpactMonitoring_ES_SpanishEcosystem_IVE_20260615.xlsx

BUPS_T54_IndustrialisedSolutions_AT_KnittelfeldSchool_AEEINTEC_20260615.xlsx

BUPS_T54_UrbanMining_FR_Palmer_NBK_20260615.xlsx

4.2 Responsibilities for submitting the filled-in forms

The Impact Monitoring Template should be completed by:

- The leaders of each ecosystem (AT, ES, FR, IT, NL), in collaboration with the relevant ecosystem partners and stakeholders.
- For actions implemented at European level, connected with layer 3, the template should be completed by the partners responsible for those actions. This includes activities mainly linked to WP6, such as T6.5 Roadshows, and international communication and training activities under WP7 (T7.5 Training). In these cases, the responsible partners, such as UIPI, HE, ACR, PTEC or other partners involved, should provide the information on the actions carried out and the available impact data.

The benchmarking templates for industrialised renovation solutions and urban mining cases should be completed by the partners responsible for each pilot or case. They should do so in collaboration with the relevant pilot stakeholders, such as building owners, designers, contractors, manufacturers or solution providers, and with the support of the corresponding ecosystem leader when needed.

For project pilots, information should be collected on the pilot cases implemented in each ecosystem, in order to support the later reporting of project impacts and renovation benefits. As a general principle, all pilot cases should be covered. However, where an ecosystem includes more than four pilot buildings, the collection of the full set of CORE indicators may focus on a representative sample of at least four pilot cases. Nevertheless, the CORE KPIs under “Energy & Environmental Impact” and “Cost & Business Case (Cost)” should be collected for all pilot cases within the ecosystem, regardless of the total number of pilots. This will ensure that the overall project impacts can be calculated and reported consistently.

For Best Practice Cases, ecosystem leaders will be responsible for designing and launching the call, as well as for coordinating the collection of the related information in their respective ecosystems, with the support of the other ecosystem partners. The information to be requested and published should follow the conditions defined in the call, including data availability, confidentiality restrictions and consent from the case owner.

All completed templates and related information should be submitted before the end of the project, M44, corresponding to 30 June 2026. In the case of Best Practice Cases, the agreed information should also be uploaded to the Market Activation Platform, where feasible, before the same deadline.



4.3 Use of the results

The information collected through the Impact Monitoring Template will be used to report project impacts and KPIs. These results will contribute to Deliverable D1.6, “Updated extract of the project data from the LIFE KPI webtool”, within Task 1.4, “Monitoring: KPI’s and Calculation of the energy indicators and their monitoring”.

The information collected through the benchmarking templates for the BuildUPspeed pilot cases will be used to report the benefits of the solutions implemented in the project. These pilot results will be included in Deliverable D5.3, “Final general report on Market Activation Platform on the activities for establishing the Market Activation Platforms as Webplatforms”.

Regarding Best Practice Cases, the benchmarking templates may be used as the common framework foreseen in Task 5.4 for collecting information from external renovation cases. The templates can be offered to stakeholders as a self-comparison and comparison-to-others tool, supporting the documentation of benefits achieved through industrialised renovation solutions, urban mining strategies or pop-up factory approaches.

Ecosystem leaders will be responsible for designing and launching the call for Best Practice Cases in their respective ecosystems, with the support of the other ecosystem partners. This process should be adapted to the local market characteristics and should define the minimum information to be requested from participants, taking into account data availability, confidentiality restrictions, the type of case and the consent of the case owner.

Where feasible, the information collected through the templates should be uploaded to the Market Activation Platform by the ecosystem leaders, with support from the corresponding ecosystem partners. The process should therefore be organised to facilitate the later integration of selected case information into the MAP, although the final level of detail displayed may depend on technical feasibility, platform functionalities and publication permissions.