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PLACES 2022
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SUSTAINABLE PLACES 2022

6-9 Sep 2022

meta building labs

MEZEROE

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Open Innovation Test Beds (OITBs)

"EU Construction Open Innovation Test Beds as drivers for SME product development"

14:45-16:15 Wed. SEP 7TH, 2022 (Hybrid)

NICE, FRANCE + Online

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WELCOME

Thomas Messervey
Workshop Moderator

- **Alain Zarli (ECTP)** – OITBs as Inn. Accelerators in Construction
- ***Francesco Babich (EURAC)*** – *MeZEROE Project*
- ***Dimitris Fantanas (NTUA)*** – *iCLIMABUILT Project*
- ***Germain Adell (NOBATEK/INEF4)*** – *METABUILDING LABS Project*
- ***Q&A*** – *Physical and dropped into the chat*

What is an OITB?

Open Innovation Test Bed (OITB): Following the EC, is a set of entities, established in at least three Member States or Associated Countries, providing **common access to physical facilities, capabilities and services required for the development, testing and upscaling in industrial environments**. The objective of the Open Innovation Test Beds is to bring innovative products within the reach of companies and users in order to advance from validation in a laboratory (TRL 4) to prototypes in industrial environments and further (TRL 7+) . The EC recommends that "Open Innovation Test Beds provide common access through one **single entry point** acting as a legal entity."

Following Open Innovation 2.0 paradigm and recommendations by the Open Innovation Strategy & Policy Group (OISPG) & EC.

Why is the EU interested in OITBs?

- **EU SME Competitiveness**
- **Streamline product development processes**
- **Increase use of testing facilities / industry-academia-RTO collaborations**
- **EU construction sector competitiveness**

Following Open Innovation 2.0 paradigm and recommendations by the Open Innovation Strategy & Policy Group (OISPG) & EC.

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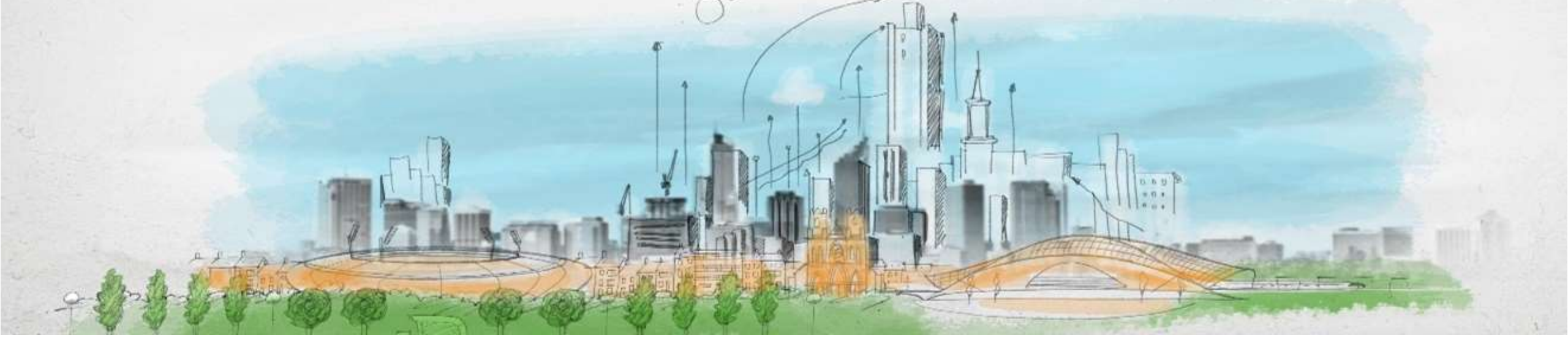
Alain ZARLI – ECTP Secretary General

Opportunity of OITBs



Opportunity for OITBs to increase innovation and competitiveness in the EU construction sector

Alain ZARLI – ECTP Secretary General

SP2022 – NICE – 7 September 2022

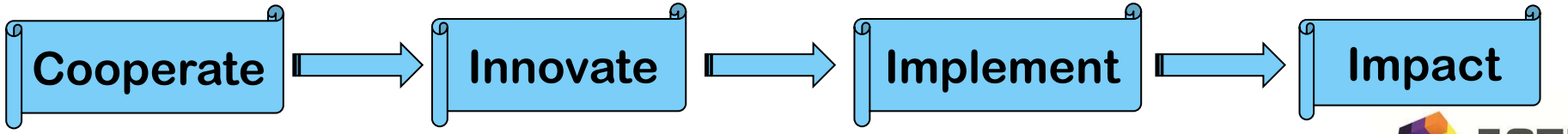
ECTP
INNOVATIVE BUILT ENVIRONMENT

ECTP in a nutshell

European Construction, built environment & energy-efficient buildings Technology Platform

Paramount challenges such as **energy, climate change, efficiency & more generally sustainability** prove to become of utmost importance for the **Built Environment (buildings, infastructures, utility networks…)** and **Construction sector** and need to be tackled within an **integrated approach**

- ECTP - an *AISBL* legal entity – based in Brussels
- It gathers **145+** member-organizations from the Construction sector and other sectors from the whole supply chain of the **Built Environment.**
- Its main mission is to develop new **R&D&I** strategies to improve **competitiveness**, meet **societal needs** & take up **environmental challenges**.



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INNOVATIVE BUILT ENVIRONMENT

Integrated innovation in Construction is an absolute necessity

Context, industrial & technological trends

- **The built environment and related industries** must evolve towards carbon neutrality (resource efficiency, circularity, sobriety in usage)
- **Buildings as proactive part of the city**: interactive, re-natured **districts, infrastructures** integration, valorisation of **cultural heritage**
- **Ageing infrastructures** must evolve & adapt to new uses and hazards → *Resilience*
- **Biobased and advanced materials** must be integrated to achieve more resilience, comfort, health, safety, resource efficiency, and carbon neutrality.
- The **industrial (r)evolution** is still to be implemented, by integrating mature technologies (AI, automation, etc) into all processes from design to manufacturing and construction
- **Digitalisation** is to be generalised in the construction processes and in the built environment

ECTP
INNOVATIVE BUILT ENVIRONMENT

OITB
Why?

Revisiting innovation ecosystem for Construction in Europe

*≈98% **SMEs** in the Construction industry → a key target!*

Still the Construction generate far more physical goods than software / apps (≈85% of deep tech SMEs developing physical items)

- Help SMEs to demonstrate their innovative technologies
- Trans-national knowledge and technology transfer
- SME-oriented new types of innovation services
- Knowledge of European/National/Regional programmes for business innovation
- Production & use of comprehensive, comparable data sets and a common data repository that may inform EU- & European countries-wide policies at all levels

ECTP
INNOVATIVE BUILT ENVIRONMENT

OITB
What for?

Generating an IMPACT enhancement…

- Need for revisited Construction innovation ecosystem:
  - Nurture 'deep tech' and innovation, and speed development and scale-up of innovation across Europe – leading to twin green and digital transitions
  - Unlock Construction innovation potential with deep tech innovation:
    - creating cutting-edge solutions across the continent
    - seeking solutions to the most pressing societal and economic challenges.
- Take-up of environmental technologies
- Eco-innovation **networks** and **clusters**
- New and integrated approaches i.e environmental management, environmental-friendly design off products, processes and services
- Co-investment / de-risking with focus on eco-innovation

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INNOVATIVE BUILT ENVIRONMENT

OITB
In which R&I framework?

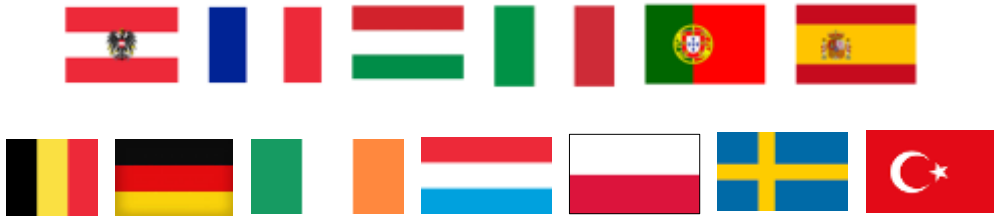
Sector-specific innovation: clustering is KEY!

- ECTP intends to capitalise on clustering to benefit its members and in particular SMEs
  - **Common collaborative environment** between clusters representing countries/regions and/or sectors
  - Rapid access to references/project outcomes of cluster members
  - Facilitate technology and market watch across countries and sectors
  - Share opportunities with other clusters (e.g. focused on IT, NBS, AM, etc.) → Cross-sectorial / multi-disciplinary approach

  → A unique environment for OITB deployment!

Cluster Management

Starting with 13 countries followed by all the others:



metabuilding

ECTP INNOVATIVE BUILT ENVIRONMENT

www.metabuilding.com linked to the European Construction Technology Platform: www.ectp.org

OITB
How?

Providing with a new vision for innovation development & roll-out

- At the centre of a complex innovation ecosystem:
  - scientists, engineers, entrepreneurs, academic institutions, venture capital and big enterprises
  - as well and customers, local authorities, etc.
- Importance of delivering an OITB common structured process through a <u>one-stop shop</u>:
  - for evaluation & assessment of innovations
  - and for all European innovation ecosystem players → clustering!
- Supporting deep tech innovation through:
  - Experimentation spaces and facilities that could be utilised in collaboration with all innovative Construction SMEs / deep tech SMEs
  - Regulatory sandboxes helping to keep up with the rapid evolution of technology / allowing deep tech breakthroughs to be evaluated and then marketed in the EU

ECTP
INNOVATIVE BUILT ENVIRONMENT

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Francesco Babich – EURAC

MEZeroE

MEZEROE

Measuring Envelope products and systems contributing to next generation of healthy nearly Zero Energy buildings

Project overview

Sustainable Places 2022, Nice (France)

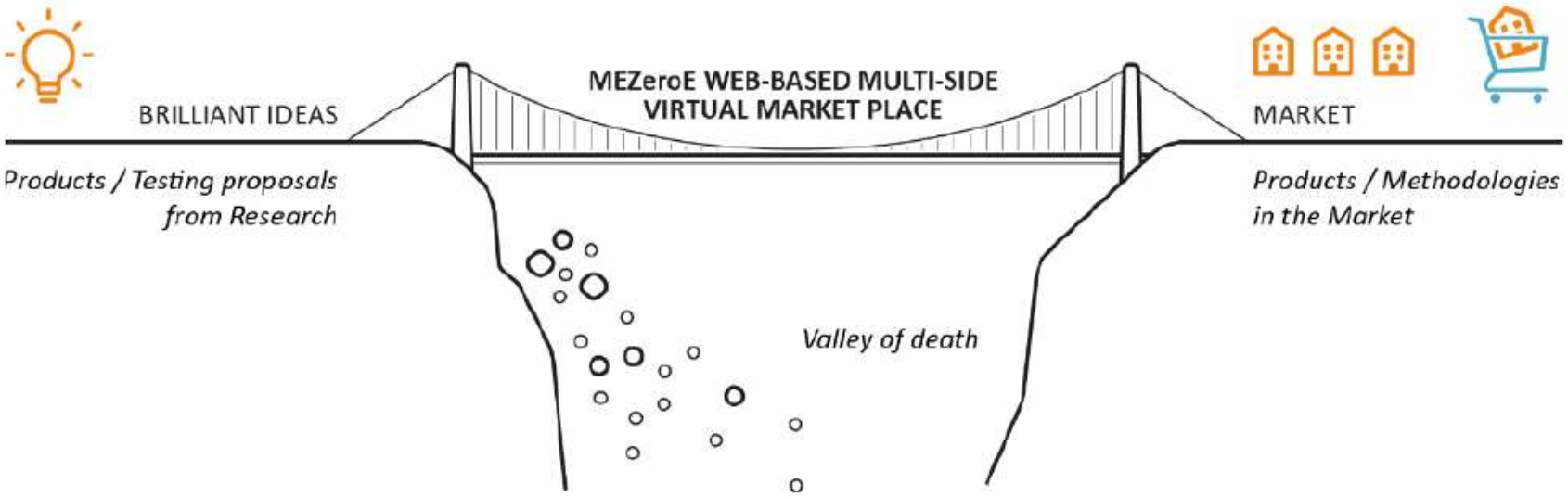
This project has received funding from the European Union's Horizon 2020 research and innovation programme under **grant agreement No 953157**

eurac research

Senior researcher at Eurac Research (Italy)

- Research area: indoor environmental quality (**IEQ**), health & comfort in the built environment
- Expertise in simulations (e.g. **CFD**) and experimental research
- Project coordinator: H2020 "**MEZeroE**", ERDF "New-Air", and "Breath“
- **Chair** of **IBPSA Publications** Committee
- Member of three **ASHRAE Technical Committees**: 2.1 "Physiology and Human Environment“, 2.3 "Gaseous Air Contaminants and Gas Contaminant Removal Equipment“, and 4.10 "Indoor Environmental Modeling"

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under **grant agreement No 953157**



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MEZeroE aims to create an EU distributed **open innovation ecosystem** for:

- developing nearly Zero Energy Building (nZEB) Enabler **Envelope Solutions**;
- transferring **knowledge**;
- **matching** testing **needs** with test **facilities**;
- providing **monitoring** in real **buildings** used as **living labs**;
- **standardizing** cutting-edge **solutions** coming from SMEs and larger industries.

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RTD PARTNERS
- EURAC
- POLIMI
- LEITAT
- UIBK
- ZAG
- CUT
- ITEC
- DTU
- TECNALIA

IND PARTNERS
- FOCCHI
- VELUX
- WINDOWMASTER
- FLEXBRICK
- HELIATEK
- TECNAN
- FLEX&ROBUST
- ROTHOBLAAS
- RIKO
- INDRESMAT

M&V PARTNERS
- AIRBNCO
- NUVAP
- GREETEG

BIZ PARTNERS
- INCURVO
- COMPAZ
- R2M

RTD partners: providing testing facilities, research and innovation capacities and knowledge of standardisation and certification processes

IND partners: bringing innovative products or products needing standardise assessment methodologies

MEZeroE eco-system

M&V partners: providing advanced and comprehensive monitoring systems and data analytics shared environment

BIZ partners: providing capacity and practical tools to support innovation process, results exploitation and knowledge transfer

External participants: providing buildings to be used as living labs (see letter of support)

External participants: market players and early adopters (see letter of support)

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Impact 1 - Realisation of **open and upgraded facilities** at the EU level for the design, development, testing, safety assessment, and upscaling of materials and components for **building envelopes**, easily accessible to users across different regions of Europe

Impact 2 - Facilitated **access** to building testing/monitoring **equipment** and to **finance** (in particular for SMEs) through a **single entry point**

Impact 3 - At least a **20% increase** in the number of new **SME users** for existing test beds

Impact 4 - At least **20% improved industrial process** parameters and **30% faster verification** of materials performance for highly promising applications and at least **30% reduction in energy** consumption across the entire **life cycle**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under **grant agreement No 953157**

Single entry point (SEP) web-based multi-side **virtual marketplace** which will include:

- 9 Pilot Measurement & Verification Lines (**PM&VL**)
- 3 Open Innovation Services (**OIS**)
- Access to real-buildings as living labs (**LL**)
- **Additional resources and support** including training, business model development, systematic IP and knowledge management, and more

MEzeroE will **fast-track prototypes to the market** as fully **characterized** and **exploited** (full potential unlocked) products

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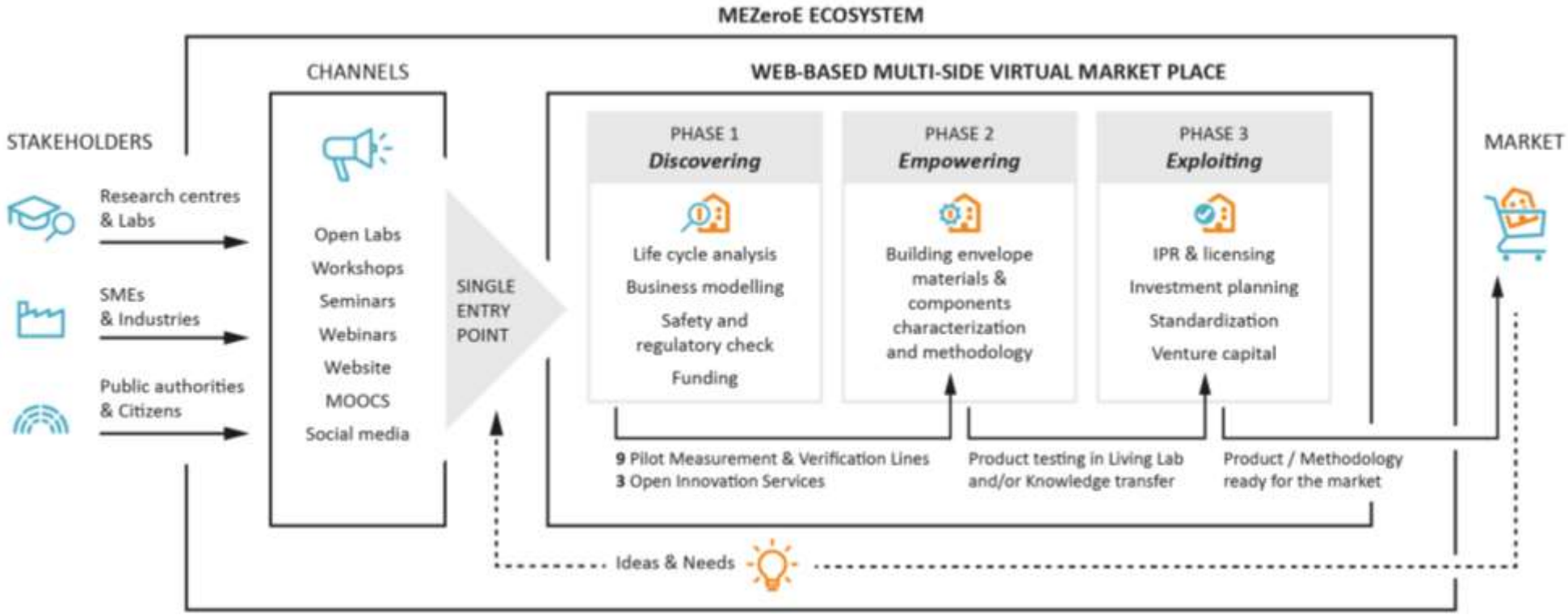

MEZeroE accompanies enterprises in adopting the open innovation approach, namely discovery (phase 1) → empowering (phase 2) → exploiting (phase 3)

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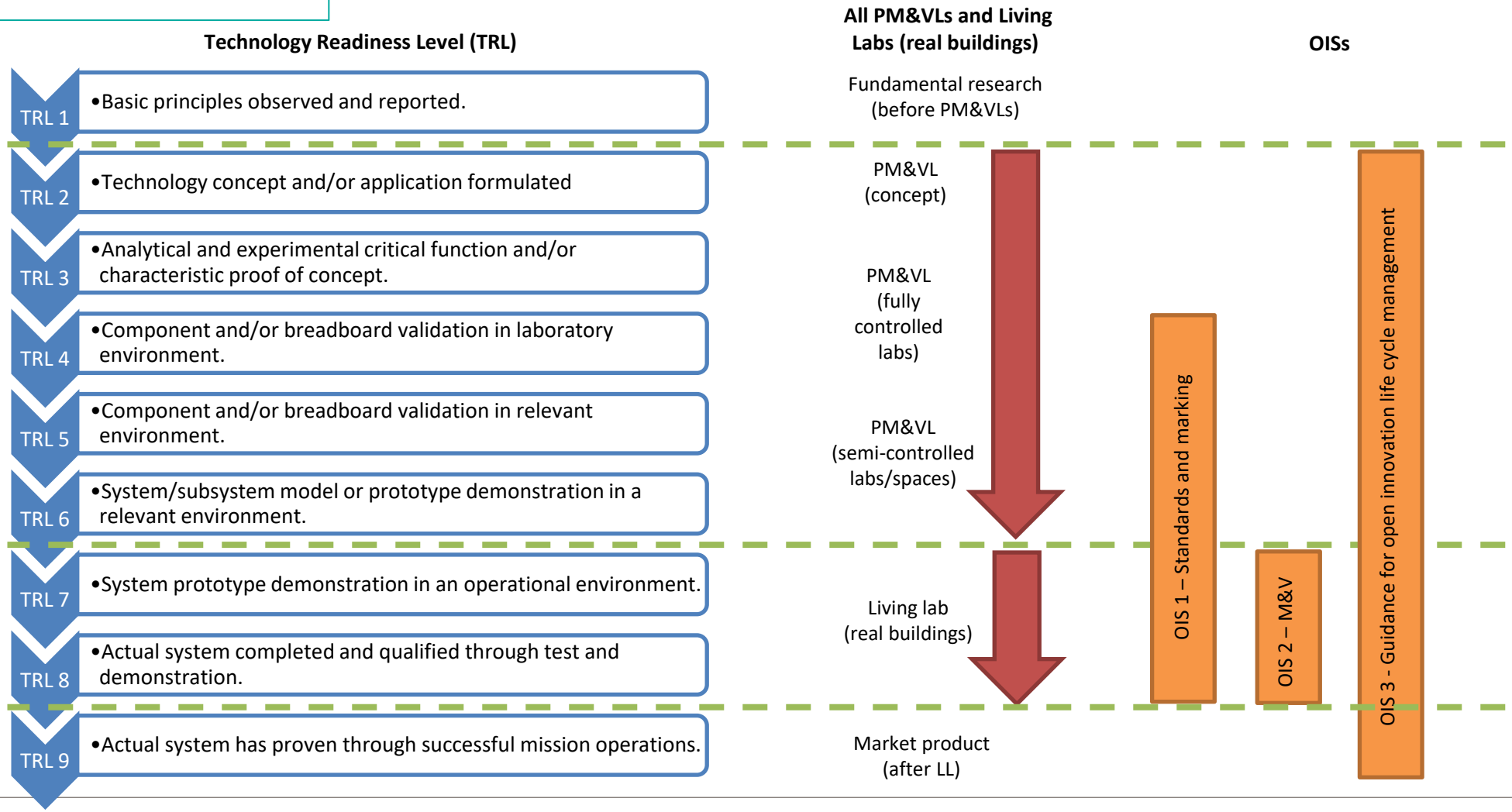

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PM&VLs	Title	Leader
PM&VL1	Advanced BIPV and hybrid PV/T systems characterisation	Tecnalia
PM&VL2	Building envelope/IEQ interaction	Eurac
PM&VL3	Active energy component characterization	Leitat
PM&VL4	Visual and thermal performance analysis of dynamic glass systems	Leitat
PM&VL5	Building/user interaction characterization	DTU
PM&VL6	Multi-layers dry nEES characterization	PoliMI
PM&VL7	Mechanical resistance and stability characterization of connections/joints btw component materials and supporting structures	CUT
PM&VL8	Solar gain control in semi-transparent envelope component	UiBK
PM&VL9	Wooden prefab components assessment line	ZAG

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PM&VL	Technical requirements	Requirements categories under EU Regulation 305/11	Requirements implementation
1, 7, 9	Safety	Mechanical resistance and stability	Statics, durability, Seismic resistance
		Safety in case of fire	Reaction to fire, fire resistance, propagation
		Safety and accessibility in use	Building as a safe to use system
2, 6, 8	Health	Hygiene, health, environment	High IEQ, water tightness, vapour permeability
		Protection against noise	Airborne sound insulation, soundscape, vibration
3, 4, 5	Efficiency	Energy economy, heat retention	nZEB, SRI, air permeability
		Sustainable use of nat. sources	GPP, envelope circular economics

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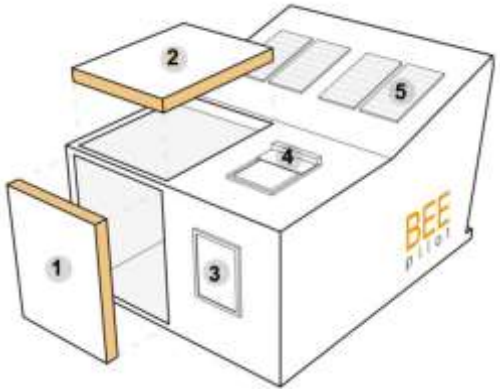
BEE pilot (PoliMIi)



Calorimeter (Eurac)

MultiLab (Eurac)

Thermal manikin (DTU)

High capacity fan (Tecnalia)

Acoustic manikin (Eurac)

Kubik (Tecnalia)

PASSYS outdoor test cells (UIBK)

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OISs	Title	Leader	Other partners
OIS1	Standard framework procedures for certification and marking	ZAG	ITEC, Eurac, Tecnalia
OIS2	Cost-effective M&V smart kit for living labs	Eurac	Arbnco, greenTEG, Nuvap, DTU, PoliMi
OIS3	Guidance for open innovation life cycle management	Incurvo	Eurac, R2M, PoliMi, Tecnalia

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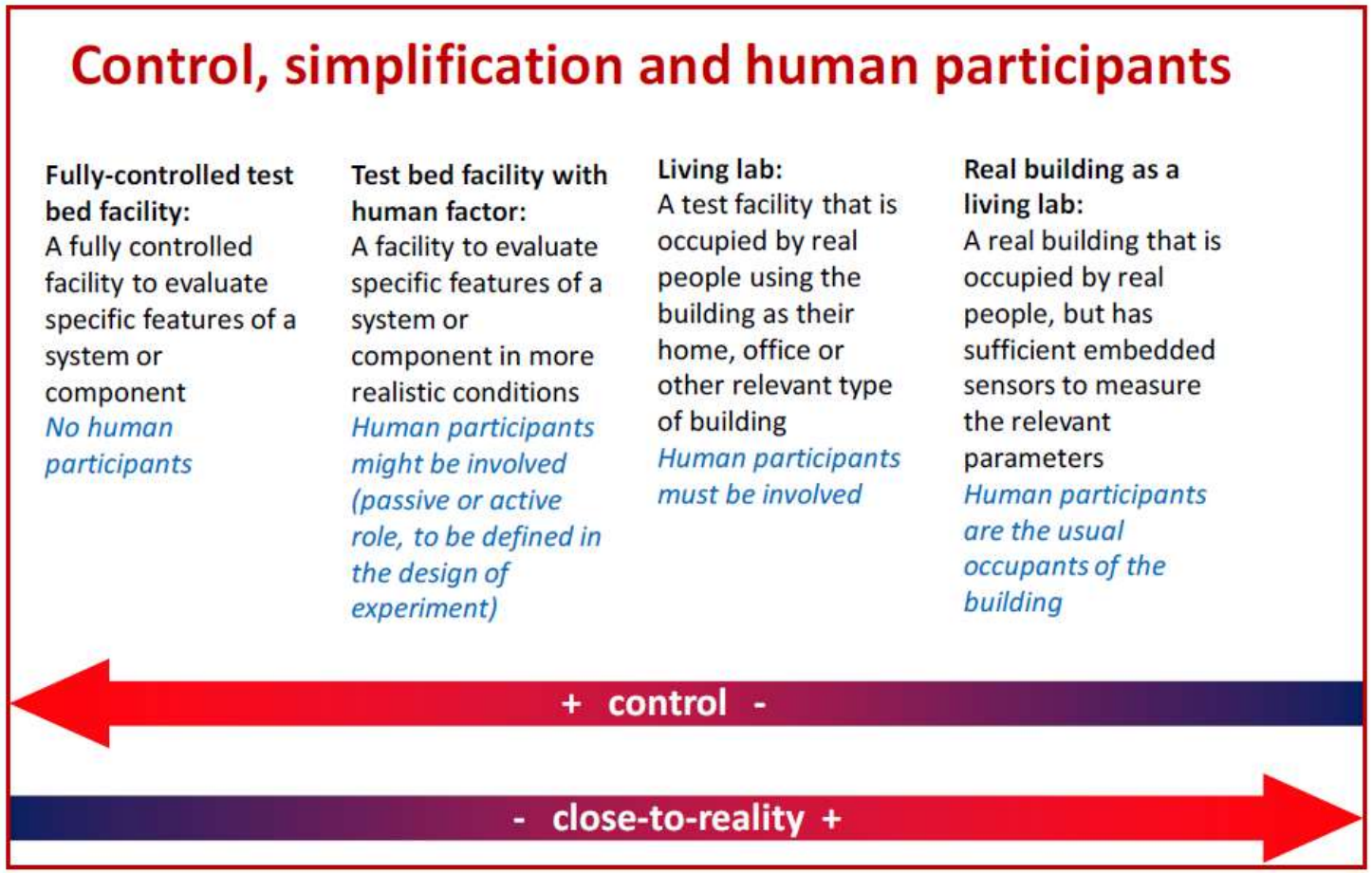

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Real buildings as living labs - main steps:

1. **Definition** of real **buildings** to be used
2. **Appointing** of a **quantitative surveyor** to follow the different demonstration activities and manage the available budget
3. Definition of **Bill of Materials** (BoM) and detailed **Gantt** chart each building LL
4. **Implementation** of renovation package
5. **Engagement** action to involve the **building users** in the experimental campaigns with the aim to collect their feedbacks
6. Installation and commissioning of **M&V system in each building** LL and establishment of data flow and connection with common data base
7. **Data post- processing** and reporting

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VMKP-KER	Web-based multi-side virtual marketplace	R2M
PM&VL-KER-1	Advanced BIPV and hybrid PV/T systems characterisation facing Efficiency and Safety requirements	TECNALIA
PM&VL-KER-2	Energy demand and indoor occupants' comfort performance characterisation	EURAC
PM&VL-KER-3	Active energy component characterization facing Efficiency requirement	LEITAT
PM&VL-KER-4	Dynamic glass systems facing Efficiency requirement	LEITAT
PM&VL-KER-5	Mutual behavioural control and interaction through IoT and AI solutions based on building envelope and users' needs and corrections	DTU
PM&VL-KER-6	Thermal, air, acoustic, structural and fire resistance characterization of the multi-layers dry nEES	POLIMI
PM&VL-KER-7	Durability characterisation of block-walls	CUT
PM&VL-KER-8	Thermal-optical characterisation of advanced façade system	UIBK
PM&VL-KER-9	Fire safety, hygro-thermal, and acoustic characterisation of wooden-based prefab façade systems	ZAG
P-KER-1	Multifunctional Facade system	FOCCHI
P-KER-2	Comprehensive comfort and IEQ-based skylights	VELUX
P-KER-3	Building integrated natural ventilation solutions	WINDOW MASTER
P-KER-4	Super-insulation materials	INDRESMAT
P-KER-5	Integration of PV in an interwoven steel wire mesh, enclosed in a mosaic of brick to control sunlight for energy production and lighting	FLEXBRICK
P-KER-6	Lightweight, easy-to-install Organic BAPV film for existing roofs functionalization	HELIATEK
P-KER-7	Glass integrated Organic BIPV elements for façade integration	HELIATEK
P-KER-8	Durable Advanced Functional Coatings	TECNAN
P-KER-9	Advanced Nanomaterials for Energy Efficient Glazing Systems	TECNAN
P-KER-10	Flexible structural connectors	FLEX&ROBUST
P-KER-11	Tailored roof/facade membranes	ROTHOBLAAS
P-KER-12	Sustainable prefab wooden envelope components	RIKO HISE
OIS-KER-1	Legislative and standard framework services for CE mark	ITEC, ZAG, EURAC, TECNALIA
OIS-KER-2	Data collection in living labs	ARBNCO, GTEG, NUVAP, EURAC, DTU, POLIMI
OIS-KER-3	Innovation Management; (Business plan services, Investor capital services and IPR and licensing services)	INCURVO, EURAC, R2M, POLIMI, TECNALIA

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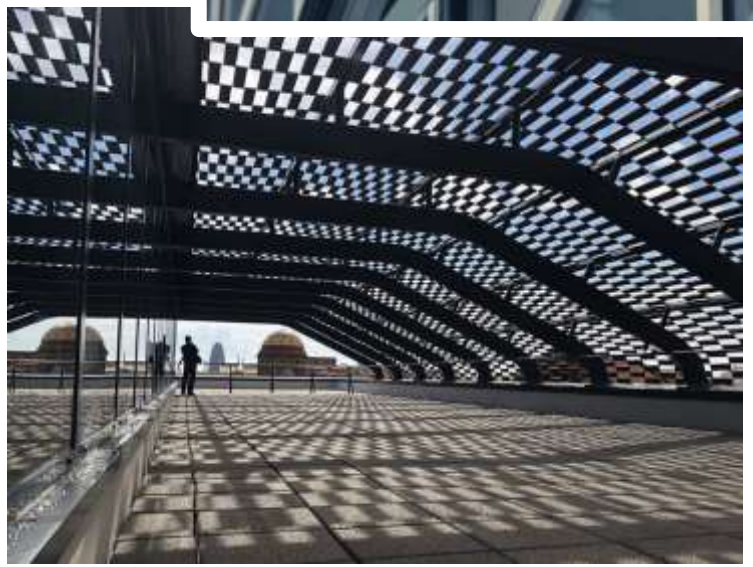
Smart control strategies for skylight windows (VELUX website)

Multifunctional Façade Module by Focchi (RenoZEB Project)

Flexible Organic PV (Heliatek website)

Smart actuators for windows (WINDOW MASTER website)



Flexbrick application (Flexbrick website)

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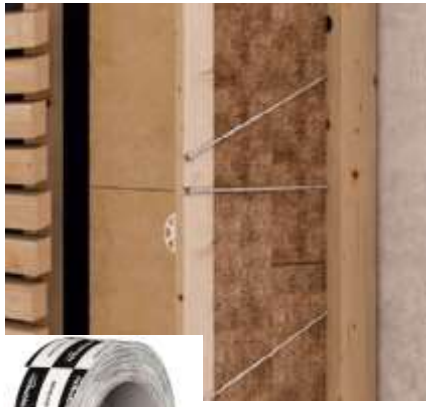
Hydrophobic coating on porous material (TECNAN website)

Nanotechnology treatment for glass surface (TECNAN website)

Vapor control membrane (Rothoblaas website)

Sealing tape (Rothoblaas website)

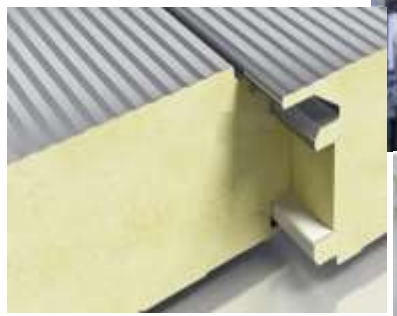


DGZ screws (Rothoblaas website)

Prefabricated façade on new building (RIKO HISE website)

Wood external cladding (RIKO HISE website)

Use of flexible polymer to repair a crack between masonry and concrete (Flex&Robust website)



Insulation foam (INDRESMAT website)

Foamed frame (INDRESMAT website)

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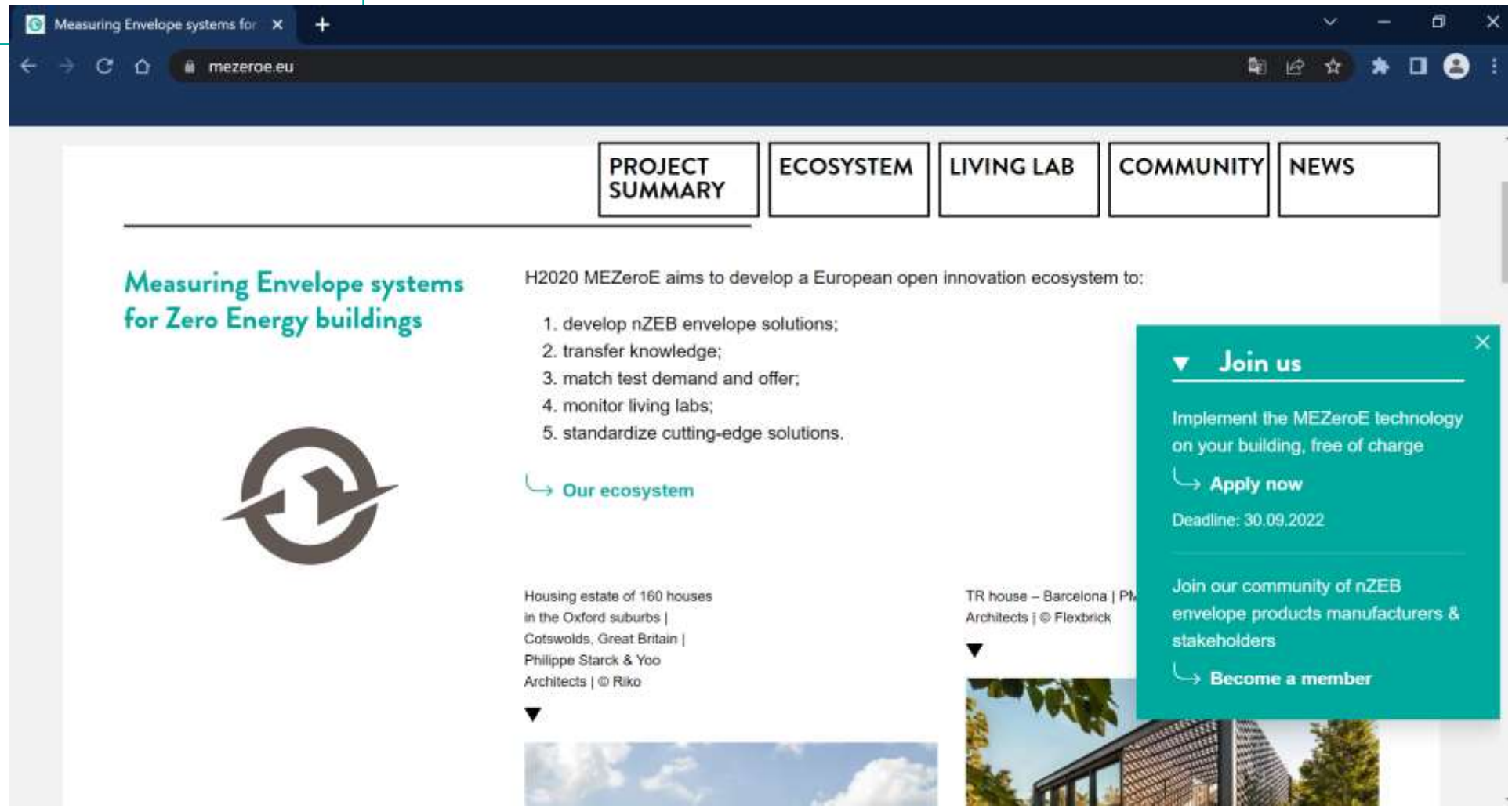

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MEZeroE

Measuring Envelope products and systems contributing to next generation of healthy nearly Zero Energy buildings

THANK YOU

francesco.babich@eurac.edu

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Germain Adell – NOBATEK/INEF4

METABUILDING LABS

metabuilding labs

EU wide Network of Testing Facilities & Innovation Services
for new Building Envelope Technologies & Products

METABUILDING LABS Project @ Sustainable Places 2022

· Nice, France ·

SUSTAINABLE PLACES 2022

Venue I · Sep. 6, 7 : **Centre Universitaire Méditerranéen**
Venue II · Sep. 8, 9 : **Université Côte d'Azur (IAE)**

METABUILDING LABS Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 953193. The sole responsibility for the content of this document lies entirely with the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

EU Construction Open Innovation Test Beds (OITB) as Drivers for SME Product Development

Wednesday, September 7th, 2022 | 14:45h - 16:15h | Workshop | Hybrid

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iCLIMA BUILT

METABUILDING LABS

The Project

THE PROJECT

METABUILDING LABS, a global network of testing facilities

METAclustered, SME oriented European Open Innovation Test Bed for the BUILDING envelope materials industrial sector using a harmonised and upgraded technical framework and living LABS

Topic ID :

DT-NMBP-05-2020 : Open Innovation Test Beds for materials for building envelopes

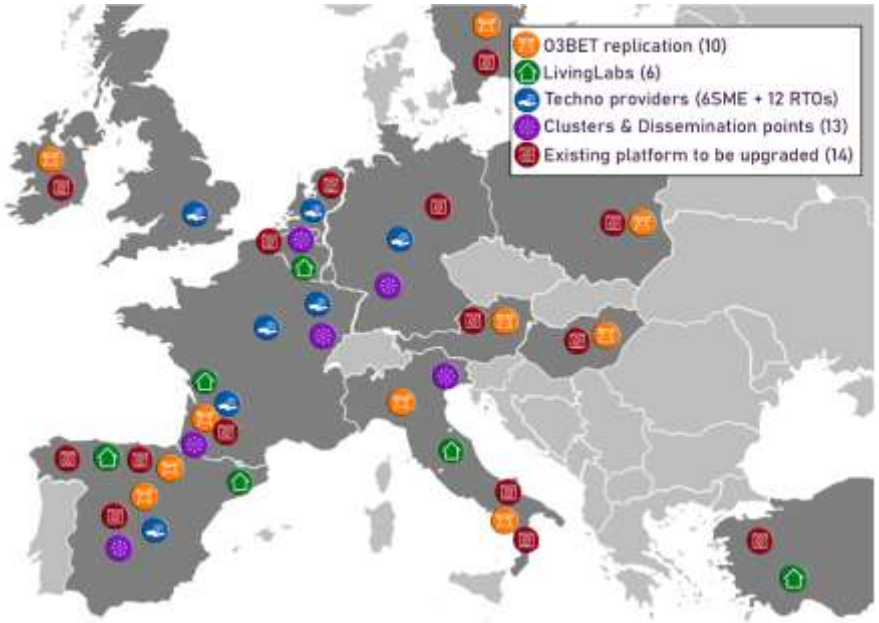
Coordinator : Nobatek INEF4 INSTITUT POUR LA TRANSITION ENERGETIQUE

Consortium : **40** partners from **13** European countries

ECTP INNOVATIVE BUILT ENVIRONMENT **+ 20 ECTP** members involved

Period : **5**-years project (2021 - 2026)

Budget : **17**M€ (funded **15.6**M€)



THE PROJECT

Project Objectives

"METABUILDING LABS, SMEs easy access to high value testing facilities for next-generation buildings"

Build a future-proof, upgradable, competitive, sustainable, and inclusive European Construction Sector Innovation Ecosystem and OITB network.

Stimulate investments in building-envelope innovative technologies by providing test beds evidence on material and system performance.

Contribute to the enhancement of technical and environmental quality of building products, by providing benchmarking testing facilities and innovation support to technology developers.

Unlock the innovation potential of European SMEs by providing access to prototyping, testing and certification services and infrastructures.

Test user acceptance and environmental requirements of products and **co-develop** solutions in living labs.

"METABUILDING OITB will help to accelerate SMEs' innovation, allowing them to become more competitive"

PROJECT CONSORTIUM

Composition of the METABUILDING LABS Consortium

metabuilding labs

Project Coordinator (RTO)

Nobatek INEF4 — INSTITUT POUR LA TRANSITION ENERGETIQUE

Building Envelope Technology Developers

HORMIPRESA LIVING · onyx · COVERIS · URBAN CANOPEE · EDILIANS

Clusters / Industrial Associations

ECTP INNOVATIVE BUILT ENVIRONMENT · PTEC Plataforma Tecnológica Española de Construcción · FEDERCOSTRUZIONI · EUROPEAN ALUMINIUM · MATERALIA pôle de compétitivité

ICT & Construction Industry

minsait An Indra company · ecowise · ekodenge · ArcelorMittal

RTOs / Test Bed Providers

CEMI TECHNOLOGY CENTRE · CARTIF · stress · RISE · BAM · cstc.be · LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY · LIST · IDONIAL · Tekniker MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE · AIT AUSTRIAN INSTITUTE OF TECHNOLOGY · ITB Instytut Techniki Budowlanej

Residential Building Owners

vipasa · CASA SPA · HOUSING EUROPE · Polylogis · LogiStic

Living Labs

European Network of Living Labs · BAŞAKŞEHİR BELEDİYESİ

Universities

Mediterranea · I2M BORDEAUX · OÉ Gaillimh NUI Galway · UPV · EHU

Exploitation / Communication

IMPULSE PARTNERS Strategy | Innovation | Performance · R2M RESEARCH TO MARKET SOLUTION · Steinbeis Europa Zentrum · beCommons

METABUILDING LABS OITB

METABUILDING LABS Open Innovation Test Bed - Main Intention

WHAT ?

Support to develop and test **innovative systems and solutions for next generation buildings**

WHY ?

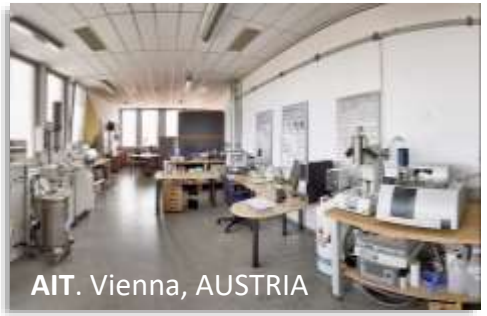
To improve competitiveness and boost market impact of the small- and medium-sized enterprises **(SMEs)**

HOW ?

By providing an easy access to a wide network of high-value **testing facilities**


ITB. Warsaw, POLAND


NOBATEK/INEF4. Anglet, FRANCE


AIT. Vienna, AUSTRIA


RISE. Borås, SWEDEN

METABUILDING LABS OITB

+ 100 Testing Facilities for Building Envelopes across 12 European Countries

The **METABUILDING LABS** network of +100 testing facilities include:

- **Laboratories**
- **Test benches**
- **Pilot buildings ontology**
- **Living labs**

WHERE ?

Across the following countries:

AUSTRIA · BELGIUM · FRANCE
GERMANY · HUNGARY · IRELAND
ITALY · LUXEMBOURG · POLAND
SPAIN · SWEDEN · TURKEY

METABUILDING LABS OITB

METABUILDING Association OITB Brokerage Business Model

- Access to the **METABUILDING Platform** and basic services are **free of charge**.
- Testing and innovation services contracted / implemented by the OITB will be subject to a **brokerage fee**.

The Single-Entry Point to manage the OITB

WHAT DOES IT OFFER ?

Flexibility, facilitated service design, transparency and trust. SMEs receive a guided experience through the testing / innovation service process facilitated by a digital platform.

WHY IS IT USEFUL ?

- For testing facilities, incoming requests are pre-curated and quicker through the planning process.
- For SMEs seeking services, they can self-educate first and work with an innovation coach to get to the correct requests and potentially facilitated by programs they didn't know about.

HOW DOES IT WORK ?

One registers within the platform, accesses available information, and if testing or a service is required, contact is made via the platform to a national innovation coach to start the process.

METABUILDING & METABUILDING LABS

One Ecosystem,
One Platform,
One Open Innovation Test Bed

METABUILDING ECOSYSTEM

Two Projects, One Ecosystem - Synergies for SME Outreach

metabuilding labs

2 independent but complementary H2020 projects

metabuilding

INNOSUP 2019

+

metabuilding labs

DT-NMBP-05-2020

metabuilding aisbl

The Single-Entry Point to manage the OITB

ECTP INNOVATIVE BUILT ENVIRONMENT

metabuilding.com

The Digital Open Innovation Platform

- Created in METABUILDING
- Handled to METABUILDING LABS
- The Virtual SEP to the OITB

metabuilding OITB

The testing facilities, living labs, early adopter buildings and innovation service providers

METABUILDING Ecosystem will be consolidated and enlarged in **METABUILDING LABS,** as both projects share the same objective:

"Push and help SMEs to deliver new and Innovative Solutions for the Construction Market"

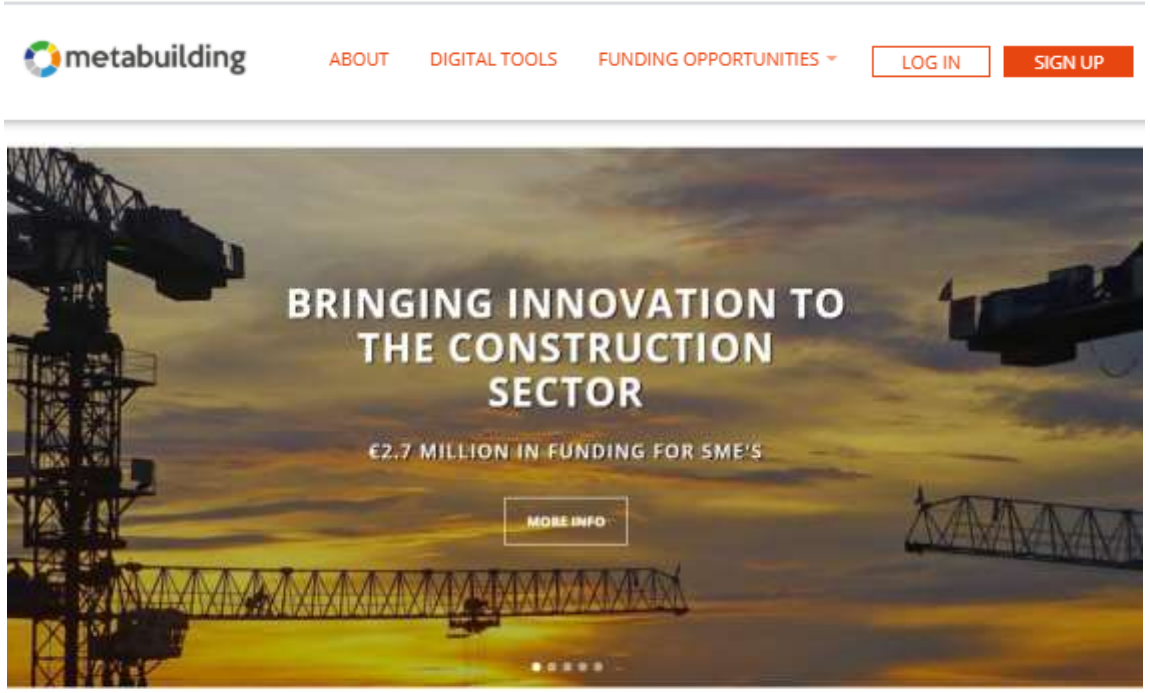
metabuilding.com

- **Created** in METABUILDING
- **Enhanced** in METABUILDING LABS
- **Serving** as a virtual Single-Entry Point to channel the OITB offer
- **Giving** easy access to a powerful innovation ecosystem
- **Enabling** stakeholders to develop and test innovative systems and solutions

"Open Innovation Digital Platform, helping all stakeholders of the enlarged Built Environment Sector"

METABUILDING PLATFORM

The Backbone of an EU Scale Innovation Ecosystem



METABUILDING Innovation Ecosystem

I BE DIFFERENT

Perform through innovation.

- Access Innovation Funding
- Find Innovative Technologies
- Find a Partner
- Get Innovation Support
- Test Your Innovation

"METABUILDING Platform aims to facilitate collaboration between new partners and experienced experts for further innovation"

METABUILDING PLATFORM

Service Offer:

Development and Testing from idea to market

Facilitated **access to testing** and certification thanks to the **Virtual Single Entry Point** metabuilding.com

Innovation support **from idea to the market**.

Structured **access** for innovators **to pilot / demonstration sites**.

Due diligence on innovative solutions **for investors**.

Easy access / low-cost development testbench - Open access, Open data, Open source (O3BET).

Added Value:

Direct access to the Innovation Ecosystem and end users

METABUILDING **Open Innovation Platform** linked to Built4People Partnership

Integration in EU wide innovation ecosystem providing access to clients and financial sustainability for the OITB.

Involvement of end users / inhabitants in development process.

Access to **investors / financing.**

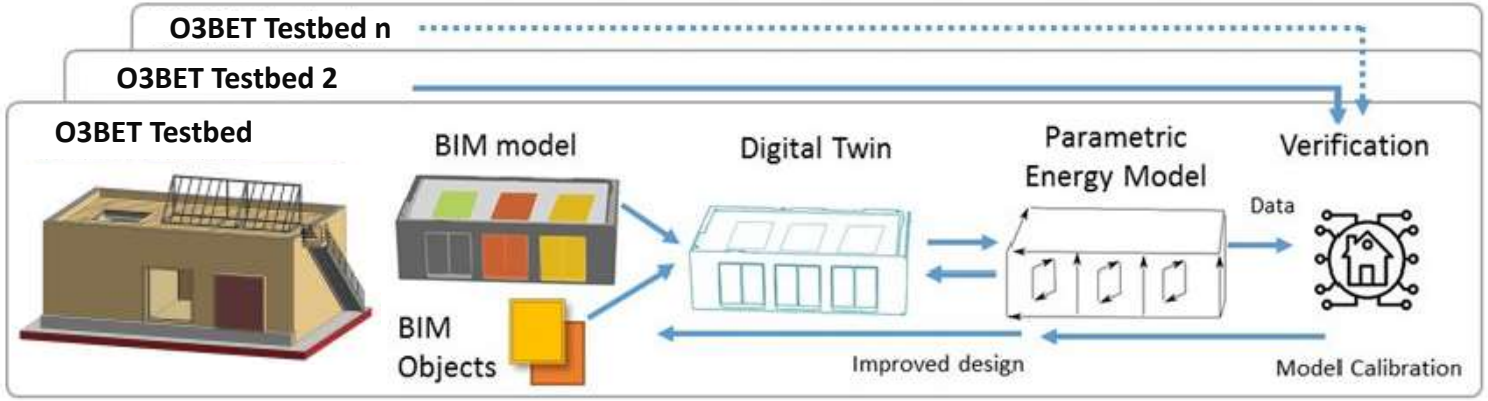
METABUILDING LABS

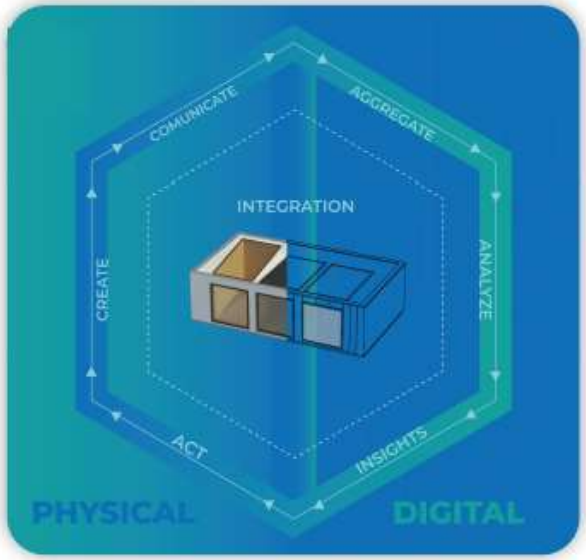
New generation envelope testbed: the O3BET

METABUILDING LABS O3BET

Provide at least 9 New Innovative Test Benches

O3BET | Open Source
Open Data
Open Access | **Building Envelope Testbench**





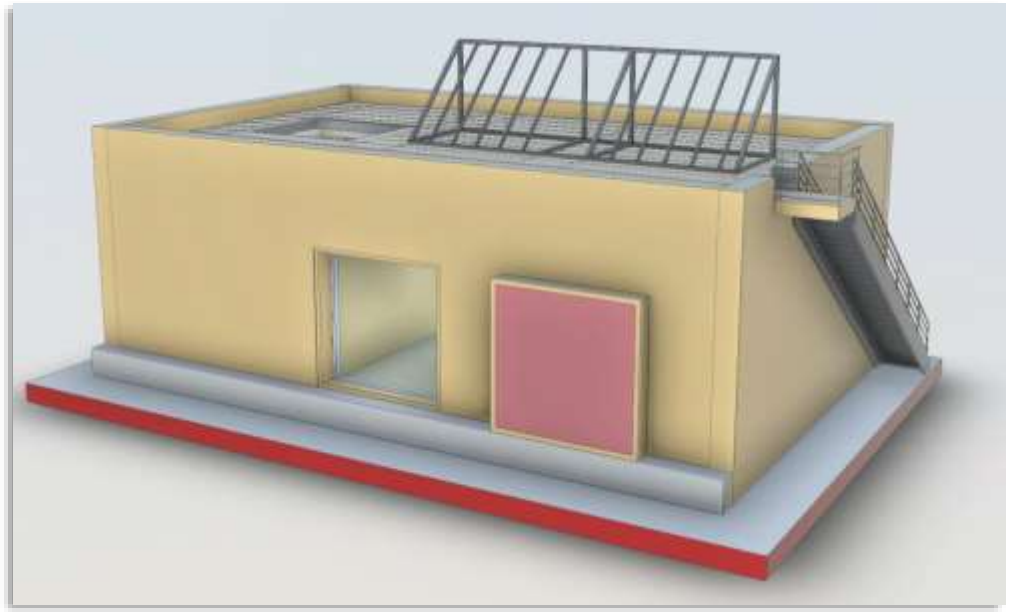
O3BET Creation / Purpose

Under the need for real conditions testing of envelope technologies during the product development process, as part of its Open Innovation Test Bed (OITB) services, and complementary to the existing test beds at partners facilities, the project works to **design, develop and provide** 9 innovative O3BET installations.

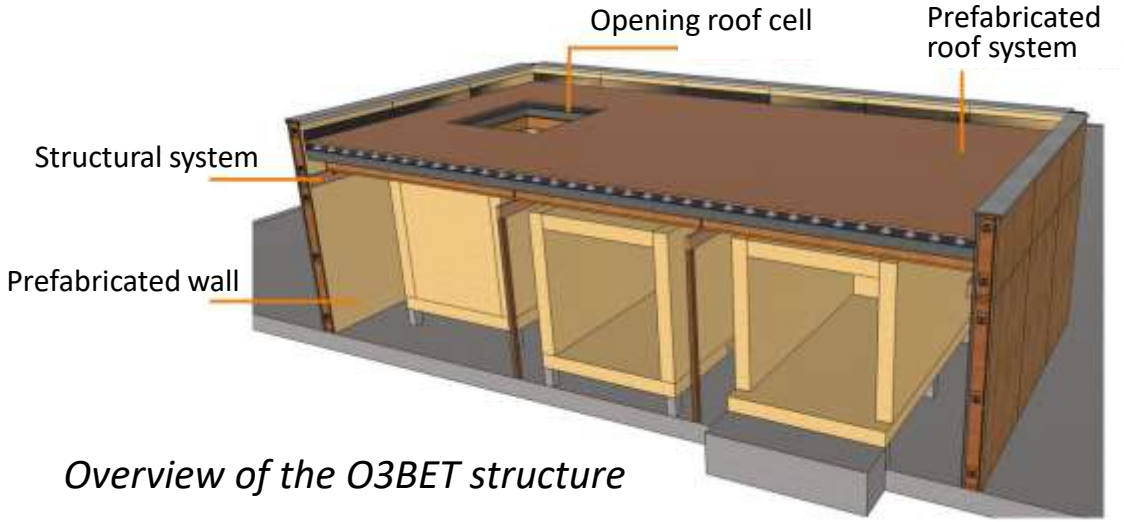
O3BET Benefits

- A 1:1 scale
- Standardised and fully replicable
- Cost-effective
- Timber based and industrialised
- Mountable/dismountable low environmental impact kit
- Digital twin enabled
- Including all necessary sensors/hardware for virtual testing

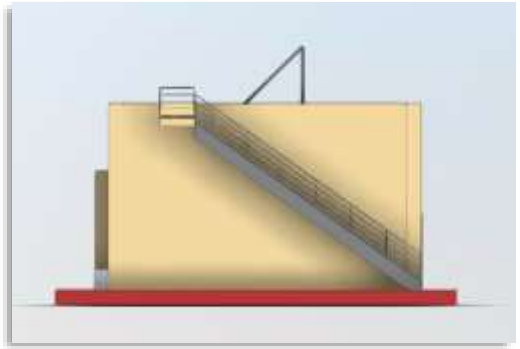
Design of the O3BET dismountable and movable Module

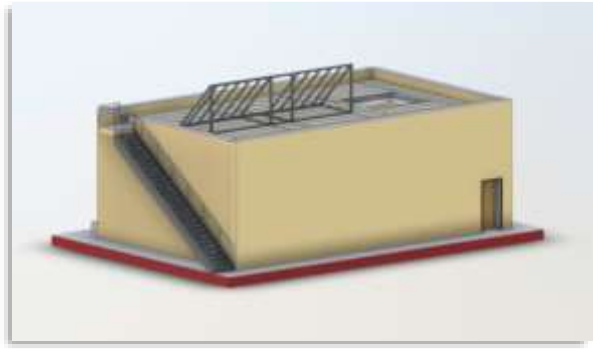


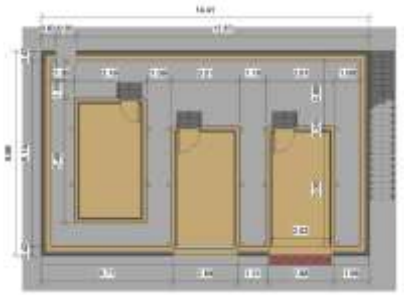
Alternative with two façade cells and one roof cell



Overview of the O3BET structure







METABUILDING LABS

Technology Development & Demonstrations

URBAN CANOPEE · France

Technology name:

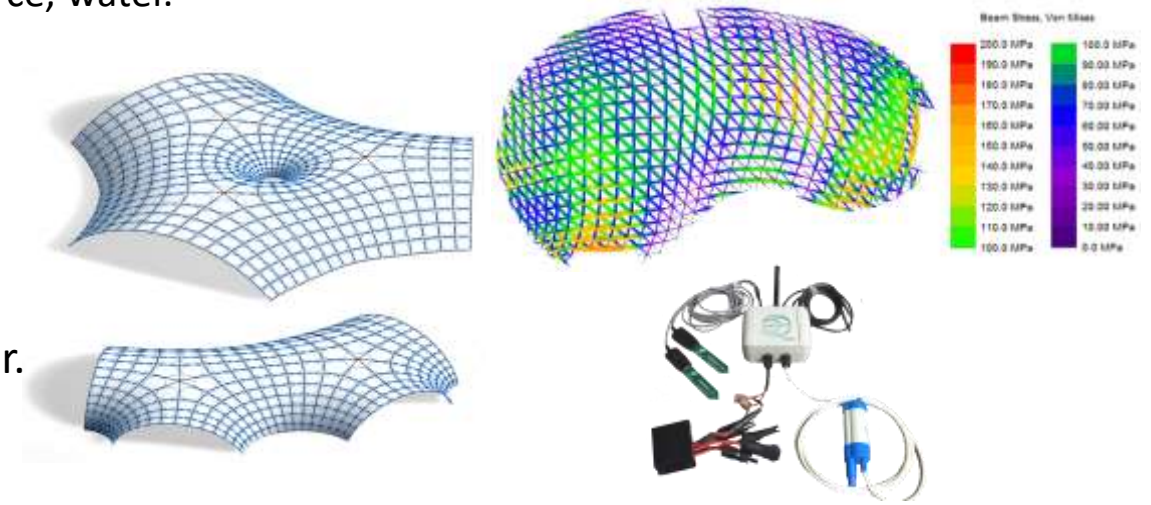
“Greening Solution for Prefabricated Facades”

Description: Vegetation, rain protection and thermal insulation are combined in a “plug and play” module for the greening of façades. This concept is derived from the Urban Canopee commercialised “Corolla” product:

- **Self-supporting, modular and lightweight structures** where the plants are delivered already grown.
- **Autonomous smart irrigation system** to manage the watering of climbing plants, helping to preserve an increasingly scarce resource, water.

Our green structures help to:

- Combat the heat build-up in our cities.
- Reduce harmful air pollution.
- Restore biodiversity.
- Make communities greener, healthier and happier.



ONYX SOLAR · Spain

Technology name:

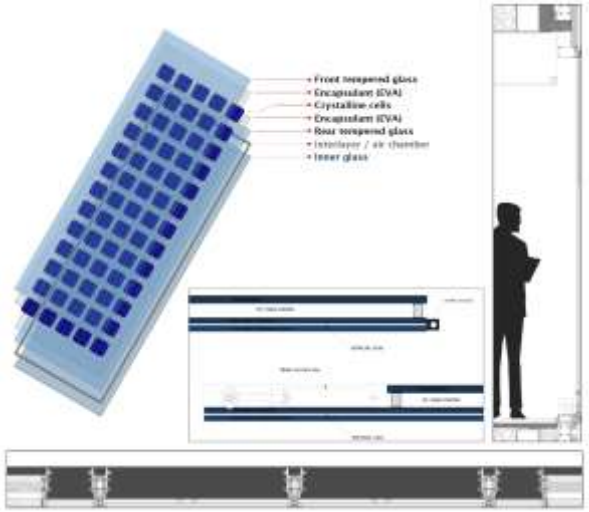
“BIPV Insulating Glazing Unit Modules with Bifacial Cells and Argon Chambers”

Description: BIPV units to be integrated on curtain wall systems based on crystalline bifacial solar cells, defined with different argon chambers thickness and module configurations.

Objectives:

- Use the solar radiation collected on both front and rear face of bifacial cells to **produce energy**.
- Avoid the problems related with the elevated glass surface buildings, by **controlling radiation and heat gains/losses** through the glazing (using selective layers on the glass composition) and reducing the air conditioning demands.
- Compare the behavior of bifacial solar cells prototypes with c-Si reference cells using the same design and configuration.

Small prototype with bifacial c-Si cells developed by H2020 BIPVBOOST project (4+4, 360 x 360 mm)



HORMIPRESA · Spain

HORMIPRESA LIVING

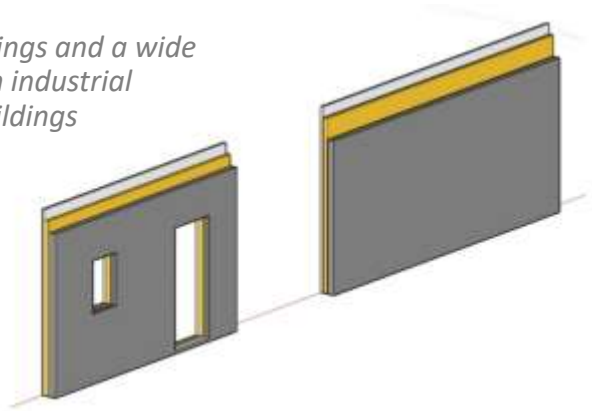
Technology name:

“Precast Insulated Concrete Panels for Residential and Industrial Buildings Envelope”

Description: It is a new precast sandwich panel (*“Hybrid Wall”*) comprising three different layers:

1. **Outer architectural layer** made of white concrete, contributing to aesthetic, robustness, durability, fire protection and sound insulation.
2. **Intermediate layer** of insulating material, either Polyisocyanurate (PIR) or mineral wool.
3. **Inner structural layer** made of timber (CLT or LVL), which replaces the original structural concrete layer, and helps to significantly reduce weight and CO_2 footprint.

Possibility of different openings and a wide range of sizes, for both industrial and residential buildings



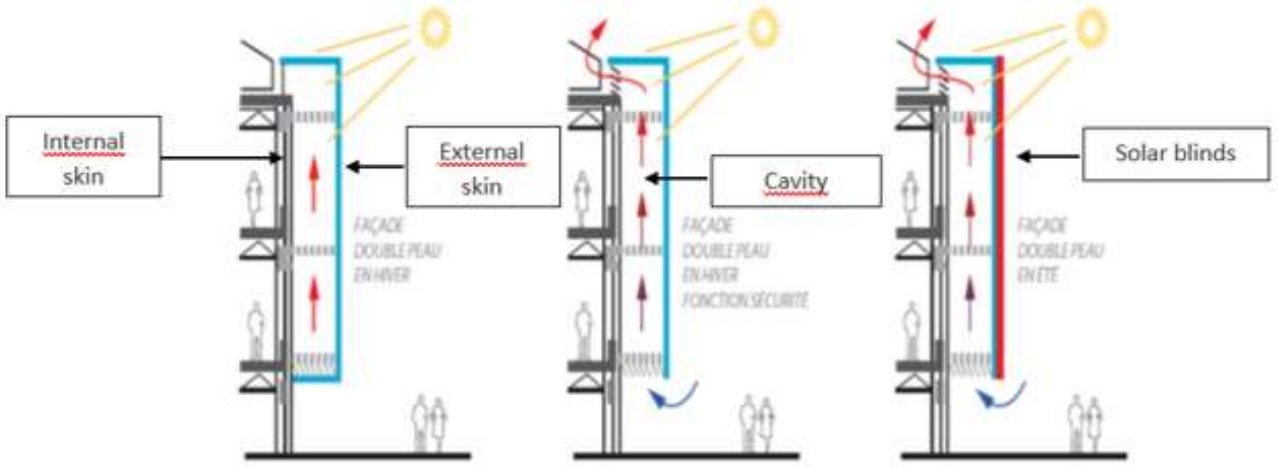
COVERIS · France

Technology name:

“Renovation Oriented Active Double Skin Glass Façade”

Description: The façade is a technology in which an air cavity between two skins is created:

- This cavity is generally closed in winter and open in summer.
- It enables to reduce heat losses through walls during the cold season and minimize solar gains in summer.



IDONIAL · Spain

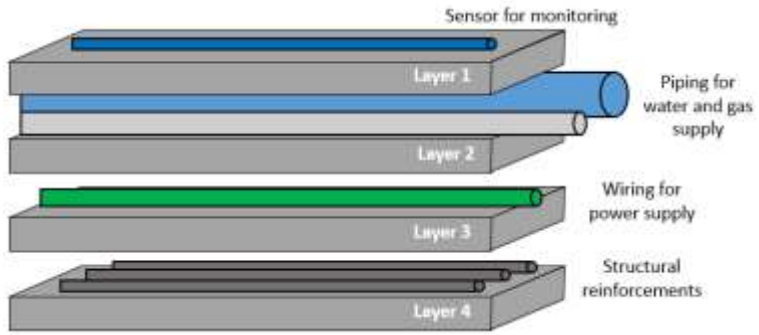
Technology name:

“Advanced Smart Building Envelope Component Manufactured by Large-scale 3D Printing”

Description: The technological development consists of **precast advanced construction components** (beams, columns, walls) made by **3D printing** (additive manufacturing), based on mortar/concrete materials, with advanced designs and embedded components for enhanced applicability and functionality.

Added value comes from:

- Various implemented auxiliary systems (pick&place, manipulation, placing of external additive, reinforcement structures, sensors, among others).
- Process control setup for operative parameters monitoring.



EDILIANS · France

Technology name:

“Aesthetic Photovoltaic Sun Shading System (APS3)”

Description: The system aims to control heat gains due to solar radiation through windows. This enhances the building’s thermal comfort, minimising cooling needs.

- The system includes a **photovoltaic module** to produce energy to be self-consumed by the building.
- It will **comply with wind, rain, hail, seismic and fire requirements** on building construction.

Objectives:

- **Assess/measure** the heat flow through windows in order to achieve a reduction of heat flow;
- **Test** in real size and real conditions;
- **Receive help** on fulfilling requirements on building construction (wind, rain, fire, etc.) in Europe;
- **Establish contacts** with building renovation companies or building owners to optimize the system and its performances.

METABUILDING LABS

Demonstrators & Living Labs

THE LIVING LABS

Streamlined access to Living Labs & pilot matchmaking

The Living Lab Methodology

Adapted from the Living Lab Integrative Process we are developing a methodology to promote active user involvement during the testing and scaling up of technologies in METABUILDING LABS. This methodology will also provide tools to emphasise with stakeholders and define their requirements, work with stakeholders in co-designing solutions and implementing the solutions in the long term.

Key points on Living Labs (LLs)

- LLs are **not always** building owners.
- LLs **can work with** building owners, offering the service-user-center approach.
- LLs **will always promote** "Active user involvement" ensuring feedback is captured and implemented throughout the whole lifecycle of the innovation.

DEMONSTRATION

Pilots for testing in real-life conditions

Pilot Site: FRANCE

Pilot Owner: Polylogis | PolyOuvrages

POLY-OUVRAGES , a social housing developer specialized in the construction, renovation and management of social dwellings for low-income families, students, young workers, elderly people and the physically impaired.

Typology: Multi-family housing.

Tested Technologies: Improve the actual envelope conditions by testing external thermal insulation, windows solutions, BIPV installation, LED deployment, etc.).




DEMONSTRATION

Pilots for testing in real-life conditions

Pilot Site: ITALY

Pilot Owner:

Casa S.p.A. designs, launches the call of tender, **supervises** the works and **manages** the **Public Residential Buildings** legacy in the Florence area.

Typology: Multi-family housing

Tested Technology: Test thermal solutions for the building envelope insulation.

DEMONSTRATION

Pilots for testing in real-life conditions

Pilot Site: SPAIN

Pilot Owner: vipasa

VIPASA, public provider of social and affordable housing in the Principality of Asturias, depends on the General Directorate of Housing- Regional Ministry of Social Affairs.

Typology: Multi-family housing

Tested Technologies: Improve the actual envelope conditions by testing external thermal insulation, test innovative windows solutions, implementation of collective air renewal systems.

DEMONSTRATION

Pilots for testing in real-life conditions

Pilot Site: TURKEY

Pilot Owner: BAŞAKŞEHİR BELEDİYESİ

Başakşehir Municipality is one of the largest districts of İstanbul Metropolitan City. It hosts a structured Living Lab and includes a large Organized Industry District with nearly 30.000 SME's.

Typology: R&D and technology building

Tested Technologies: Test Aramis Solar Collector Cladding for façades, Onyx roof solutions and transparent elements, Edilians Thin PV overhangs as shading solution, etc.

DEMONSTRATION

Pilots for testing in real-life conditions

Pilot Site: SPAIN

Pilot Owner: ArcelorMittal

ROOM2030, a Living Laboratory testbed integrating the latest technology and located in the ArcelorMittal R&D Centre in Asturias.

Typology: Hotel Room, equivalent to single family housing, representing the intelligent home of the future containing the most innovative and advanced technologies.

Tested Technology: Test IDONIAL panels realized by additive manufacturing.

Thank you for your kind attention

Project :
www.metabuilding-labs.eu

Platform :
www.metabuilding.com

METABUILDING LABS Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 953193. The sole responsibility for the content of this document lies entirely with the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

Thank You

SUSTAINABLE PLACES 2022

Sep. 6 - Sep. 9, 2022 | Nice, France