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

SUSTAINABLE PLACES 2022
6-9 Sep 2022

meta building labs

MEZeroE

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

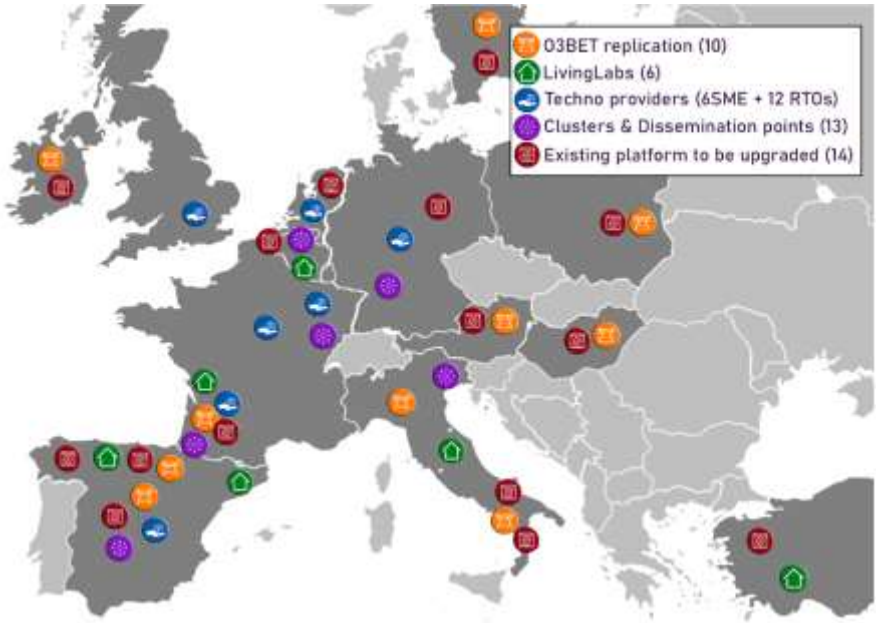
Coordinator : Nobatek INEF4 INSTITUT POUR LA TRANSITION ENERGETIQUE

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

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 · Groupe Polylogis · LogiStic

Living Labs

European Network of Living Labs · BAŞAKŞEHİR BELEDİYESİ

Universities

Università degli Studi di Reggio Calabria 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 ?

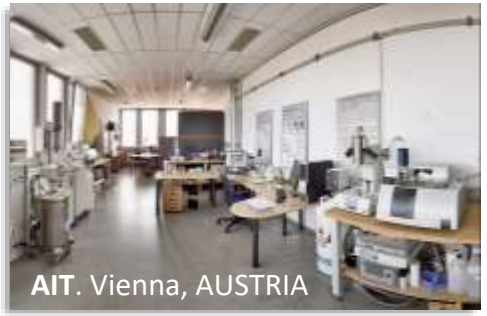
To improve competitiveness and boost market impact of the small- and medium-sized enterprises **(SMEs)**

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**.

metabuilding aisbl

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

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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"

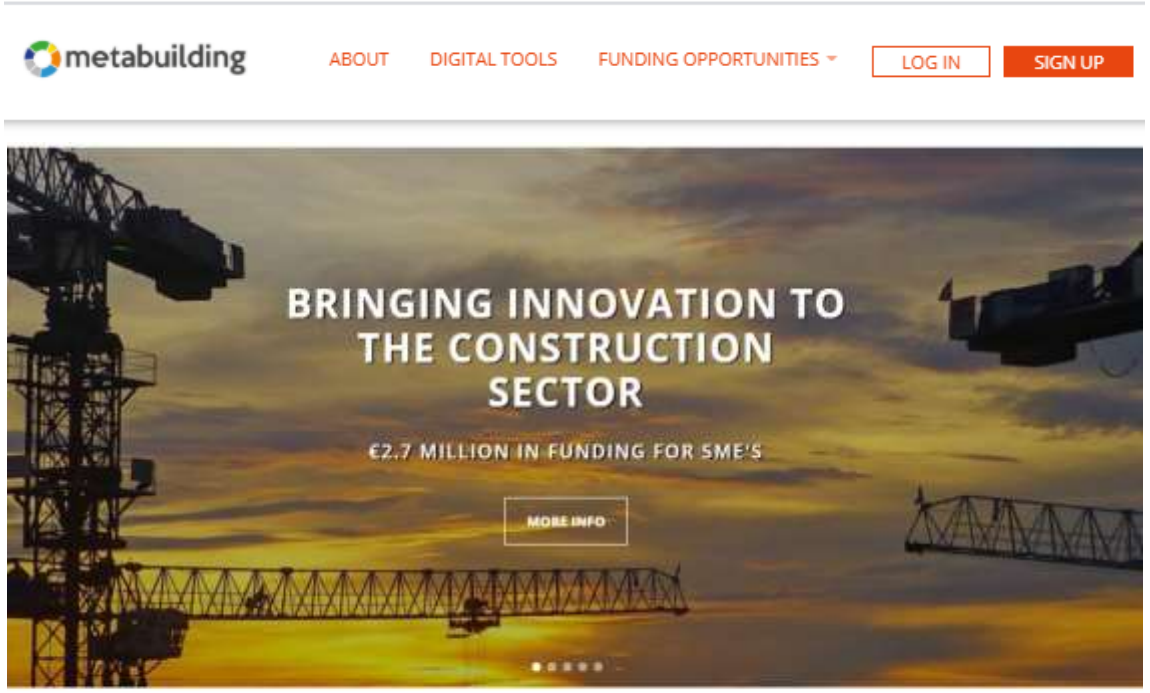
metabuilding.com

- **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.**

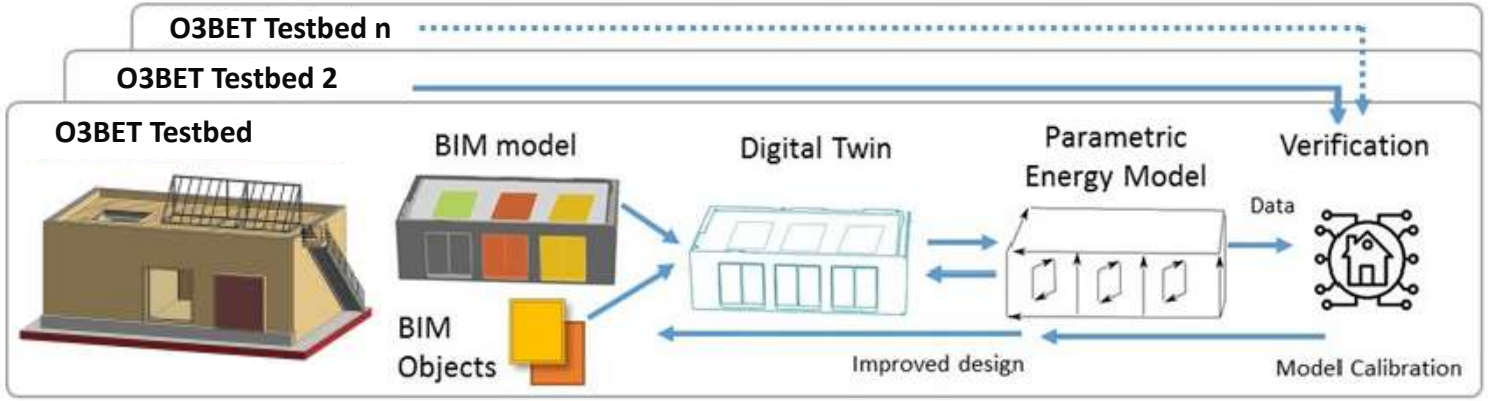
METABUILDING LABS

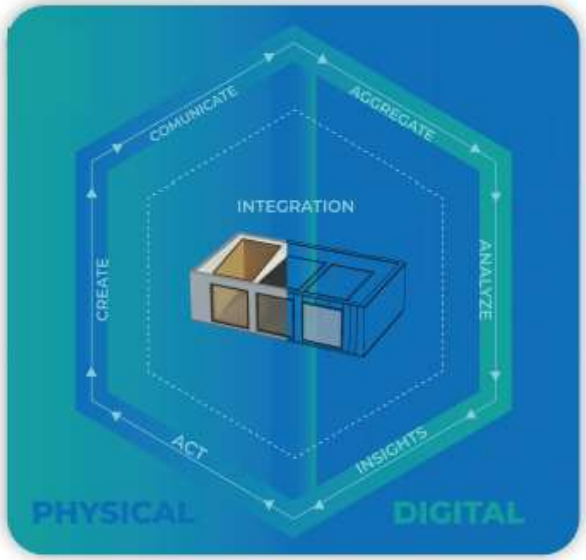
New generation envelope testbed: the O3BET

METABUILDING LABS O3BET

Provide at least 9 New Innovative Test Benches

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





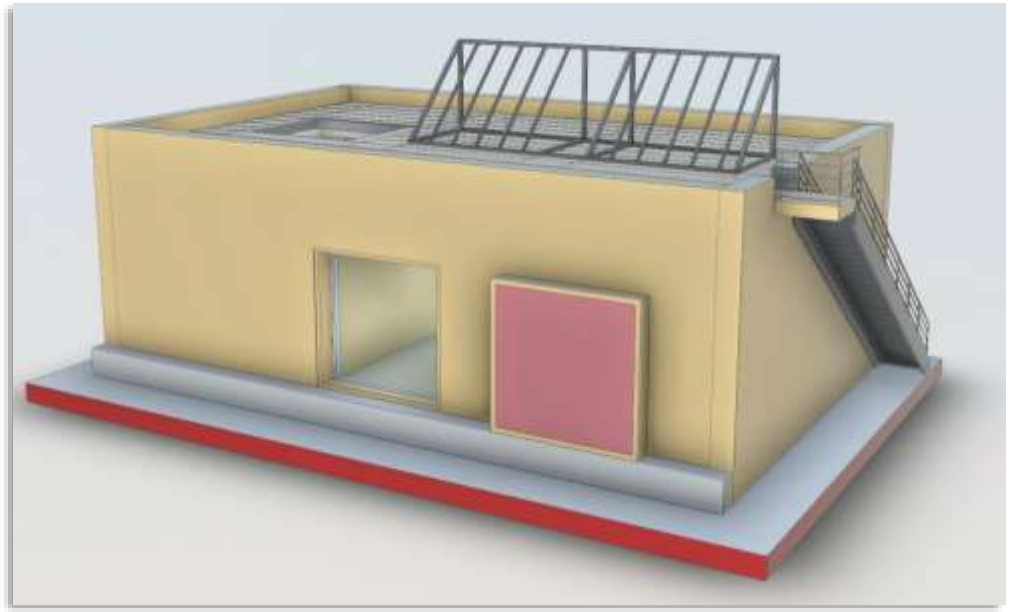
O3BET Creation / Purpose

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.

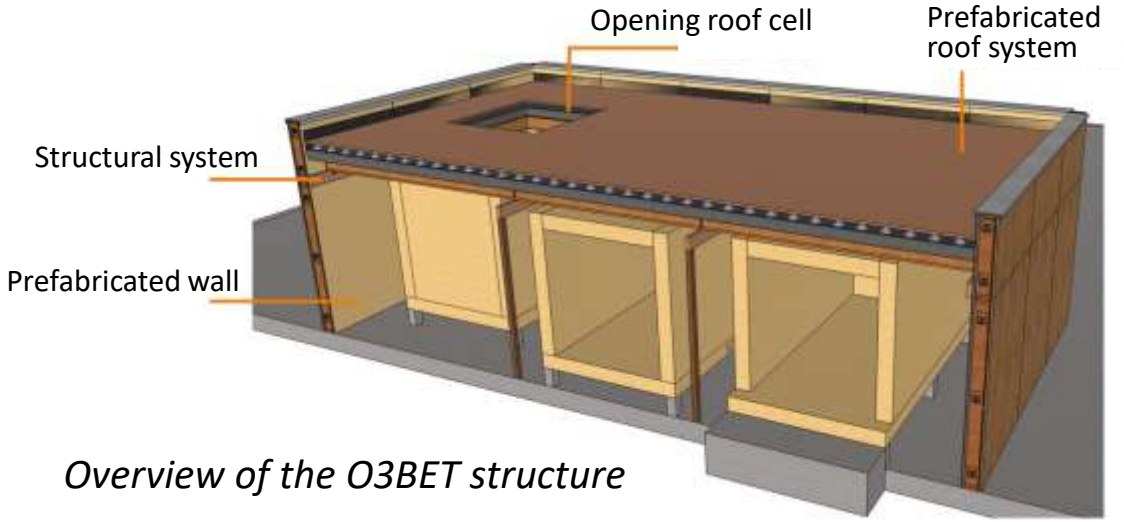
O3BET Benefits

- 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

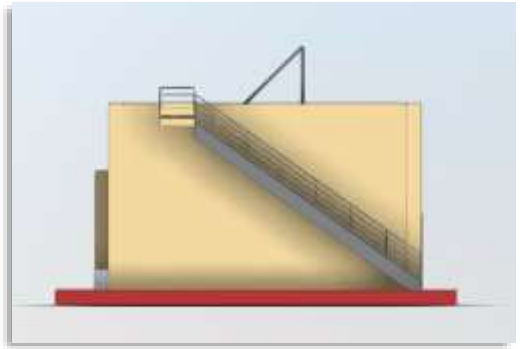
Design of the O3BET dismountable and movable Module

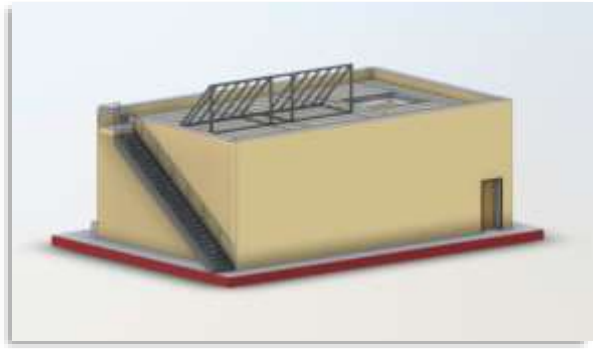


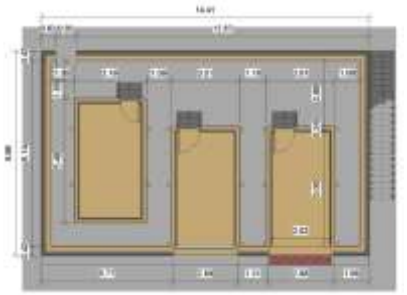
Alternative with two façade cells and one roof cell



Overview of the O3BET structure







METABUILDING LABS

Technology Development & Demonstrations

TECHNOLOGY DEMONSTRATIONS

URBAN CANOPEE · France

Technology name:

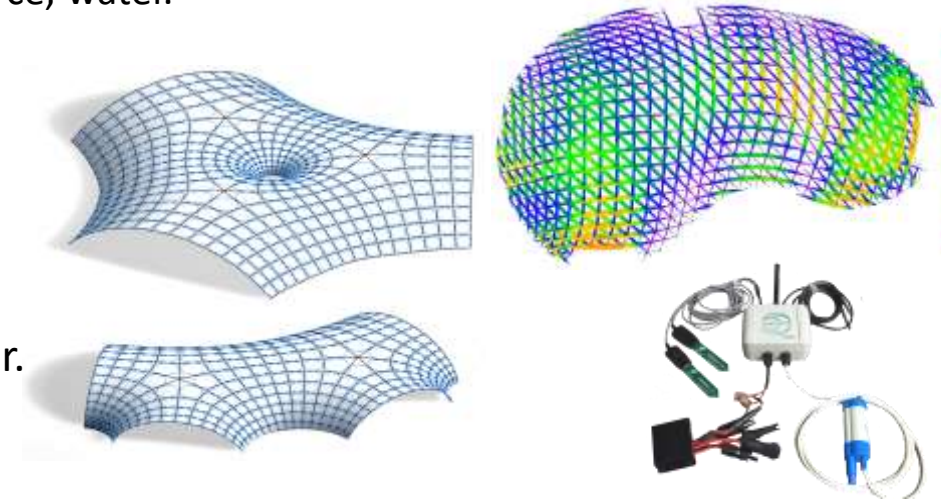
“Greening Solution for Prefabricated Facades”

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:

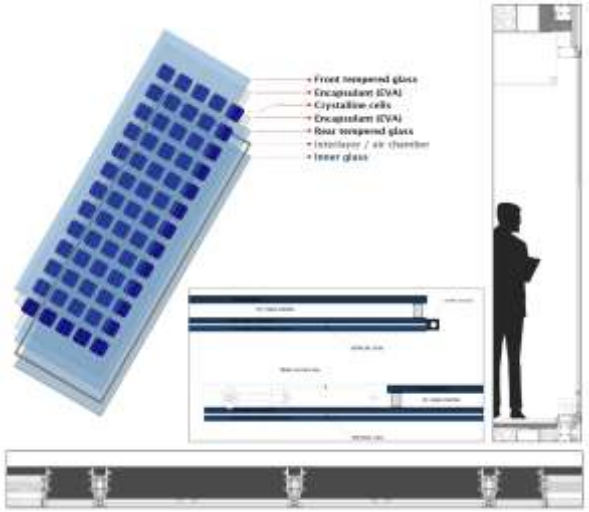
“BIPV Insulating Glazing Unit Modules with Bifacial Cells and Argon Chambers”

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

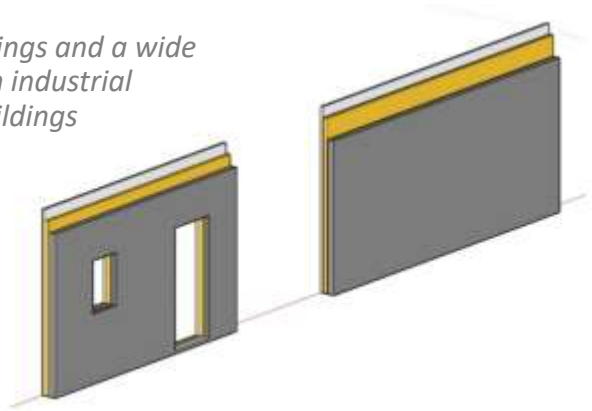
Technology name:

“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



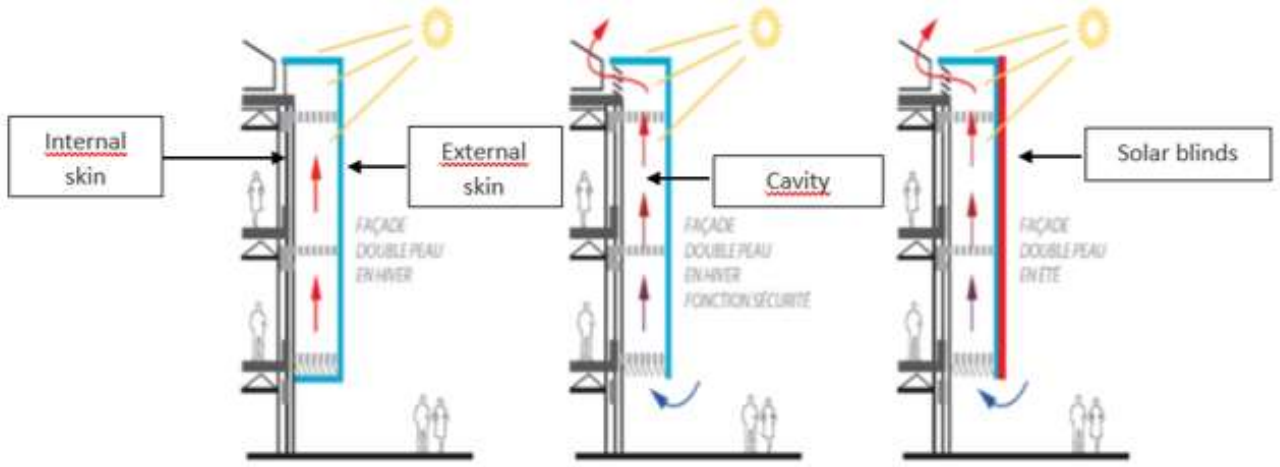
COVERIS · France

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

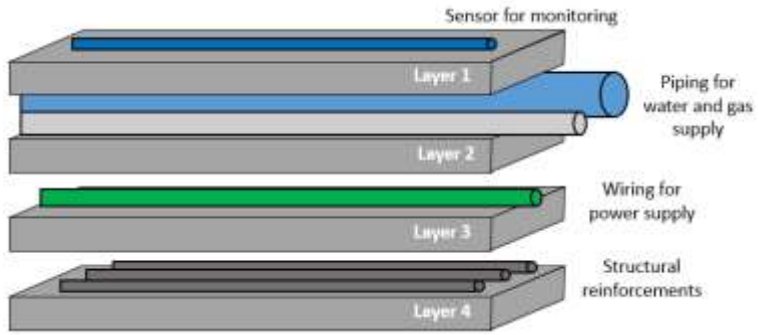
Technology name:

“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

EDILIANS

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.