BIO4EEB project

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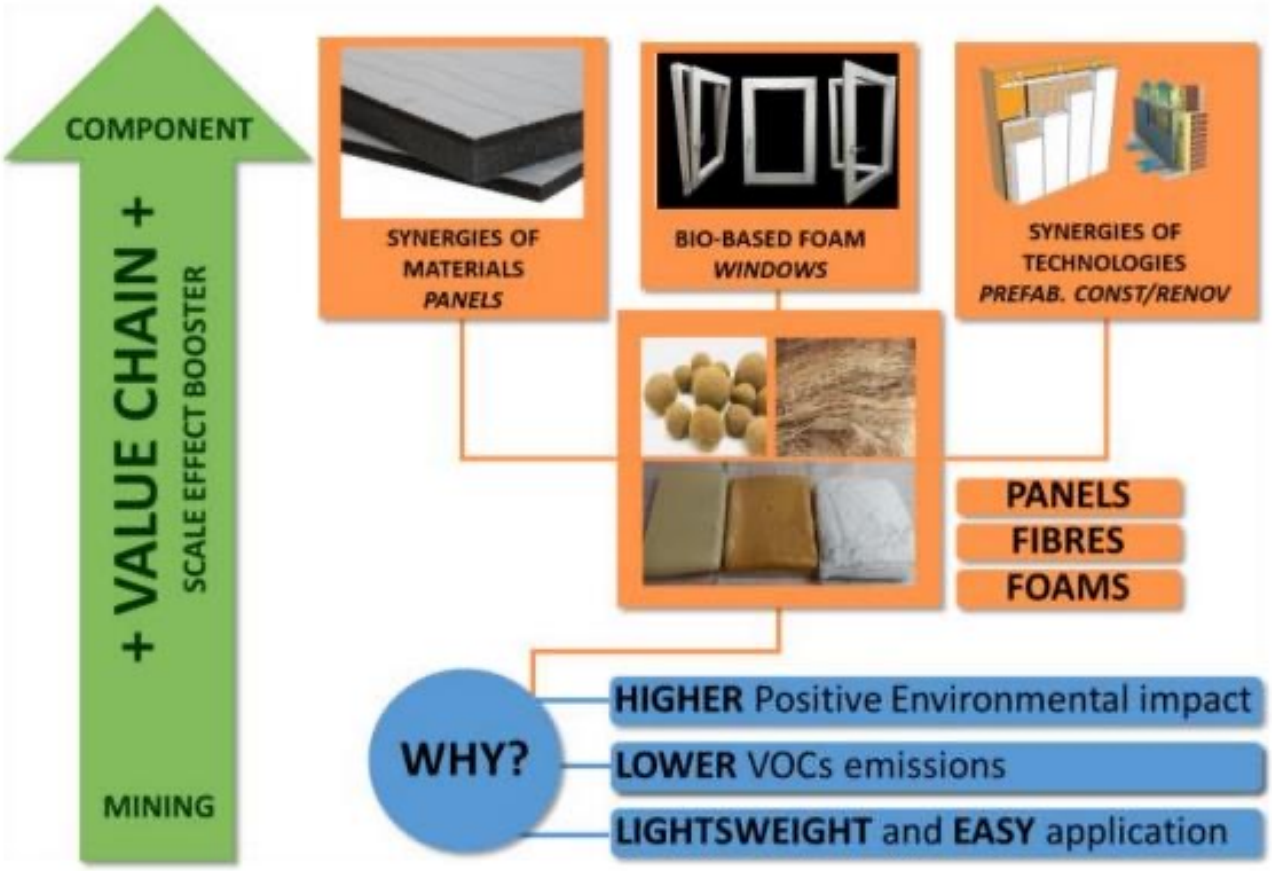
Project INTRO BIO4EEB in a nutshell



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Wrap up

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The BIO4EEB Mission – the bio-based game changer

The target is to support residential building´s construction performance extraordinary at all three hierarchical levels of construction parts simultaneously (building, component, material) by creating an amplified environmental impact and reducing additionally VOC emissions.

BIO4EEB will apply non-hazardous bio-based materials as e.g., Posidonia and various bio-based foams to develop and to proof the marketability of smart components for external and internal use as material application, pre-fab panels or windows.

The efficiency and effectiveness raises the market acceptance and establishes a unique selling proposition including a seven years RoI!

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The BIO4EEB Mission – the bio-based game changer

BIO4EEB closes the increasing gap of insulation material shortage caused by the regular growing demand and the mismatch caused by lacking production potential and the outcome of the current energy crisis by boosting the use of available bio-based qualified materials as alternative solutions.

The objective is to substitute using fossil resources for components and replace them at a comparable price value positioning.

New business models utilizing the complete economic value chain open the market for bio-based BIO4EEB solutions and products uplifting the generic bio-based material use and qualifying their application at a circular economy approach for creating a much greener EU building and construction industry real estate stock.

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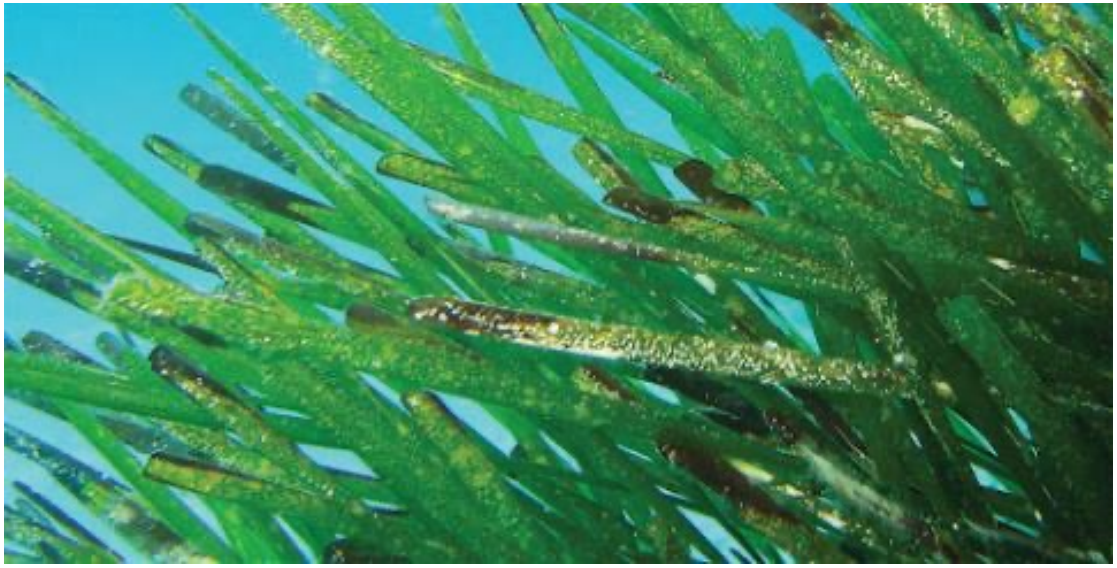
Waste to Wonder



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Challenges e.g. Posidonia

The material is natural and does not contain any additives. The thermal conductivity of the insulation material is 0.039 W/(m K). And this value is retained even if the fibers absorb more than three times their own weight in water vapor.

They can buffer the moisture and gradually release it again. With a specific heat storage capacity of over 2500 J/(kg K), the potential Posidonia solution achieves excellent summer thermal protection that is up to 300% higher than the values of all other insulation materials.

Thanks to its high silicate content, the material is non-flammable and therefore has fire behavior according to building material class B2. The absence of proteins ensures resistance to rotting and high mold resistance.

Thanks to its resource-saving processing, Posidonia thermal insulation has the lowest primary energy consumption of all insulation; 99.9% less than mineral insulation materials. Numerous awards speak for the high ecological quality.

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Challenges and prejudices e.g. Posidonia

- Higher Initial Costs
- Limited Availability and Supply Chain Issues
- Ownership of waste bias
- Performance and Durability Concerns
- Regulatory and Certification Hurdles
- Lack of Awareness and Education
- Cultural and Industry Resistance
- Technical Challenges
- Life Cycle Assessment (LCA) and Environmental Impact
- S-LCA and SRL analysis integration
- Market Demand and Consumer Perception of materials
- Investment and Innovation

BIO4EEB addresses these challenges simultaneously applying a multifaceted approach, including policy support, industry collaboration, fosed research and development, and efforts to raise awareness and educate stakeholders about the benefits and potential of bio-based building materials.

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Demo Cases

Real demo cases

Five real demo cases where selected representing 3 climate zones (Continental, Mediterranean and Oceanic) and 5 different building typologies: 1) Multifamily multistorey residential refurbishment in Lithuania; 2) Historical/protected single family residential refurbishment in Spain; 3) Single family residential refurbishment / new construction in Germany; 4) Rural single family residential refurbishment in Czech Republic and 5) Multifamily multistorey residential new construction in France. More details around each of these demo cases is provided in the following sections.

5 REAL DEMO CASES

Virtual demo cases

The virtual demo-cases will serve as a test-bed of assessing several different technological solutions and their potential environmental, economical and social impact. The selected virtual demo cases are representing parts of the European residential building stock with high replicability potential. Together with the real demo cases they cover the main residential building types (by size, historical protected status, age etc.) from the dominant climates (Middle European Continental, Oceanic, Mediterranean Climate). The demo cases were selected by relying on the TABULA-Episcope building typology.

3 VIRTUAL DEMO CASES

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The 5 Objective SCOPE

Objective 1: Development of affordable user centric envelope solutions aligned with market needs, and applicability to different building typology.

Objective 2: Development of new environment friendly, lightweight and cost-effective bio-based insulation materials and their adaptability for improving ventilated façades for building and renovation to go near nZEB standards.

Objective 3: Demonstration of the circularity, adaptability of the BIO4EEB solutions for an easy installation in real operational environment and their replicability using virtual demo cases.

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The 5 Objective SCOPE

Objective 4: Development of multicriteria and multi-stakeholder platform for improving the decision-making process for selecting the best energy efficient renovation strategy and promoting building stock renovation.

Objective 5: Facilitate the development of the BIO4EEB solutions through synergies with existing relevant Open Innovation Test Beds (OITBs) and to improve the project dissemination & communication through clustering with sister projects as well as to extent the BIO4EEB outcomes to Latin American construction market sectors.

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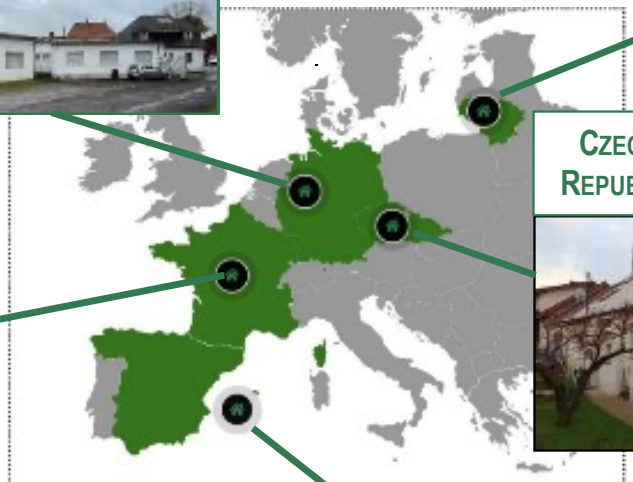
WP4 | T4.2 Demonstration in real demo-cases

GERMANY

LITHUANIA



CZECH REPUBLIC

FRANCE

SPAIN

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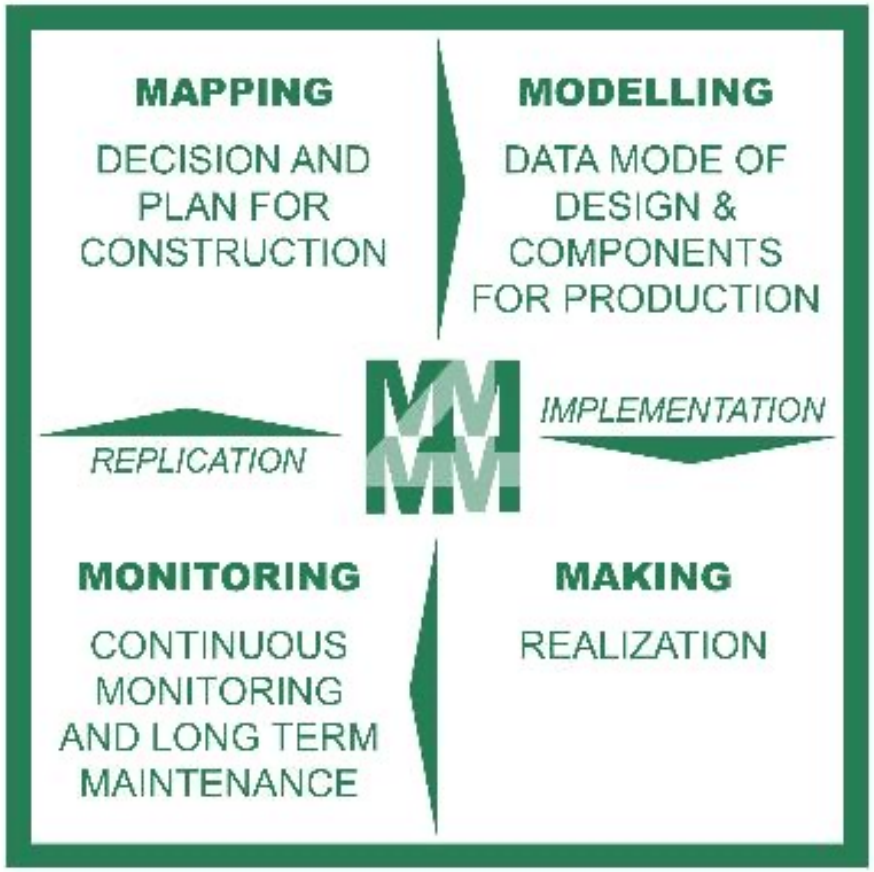
WP4 | 4M approach



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WP4 | T4.2 Demonstration in real demo-cases

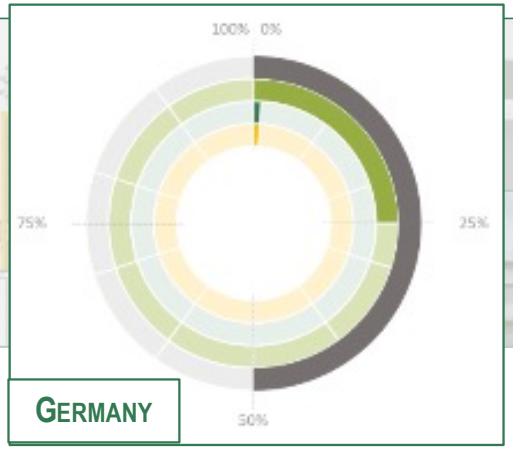
DEMO PROGRESSION

DATA COLLECTION, KPI SELECTION, MONITORING PLAN

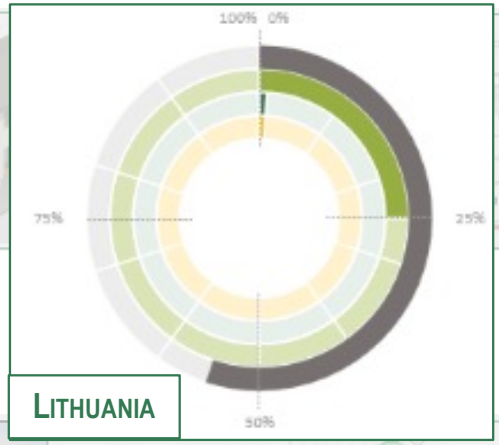
PRE-MONITORING, DESIGN VALIDATION

CONSTRUCTION PROCESS

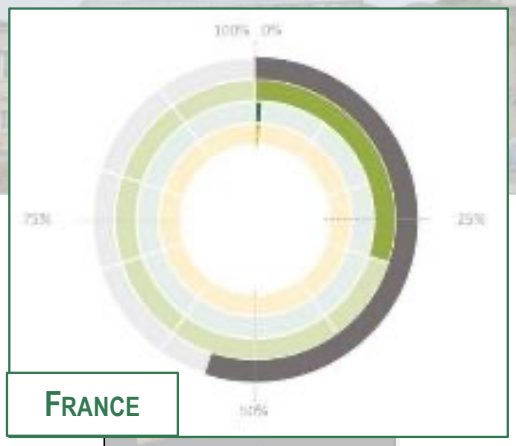
MONITORING AND CONCLUSIONS



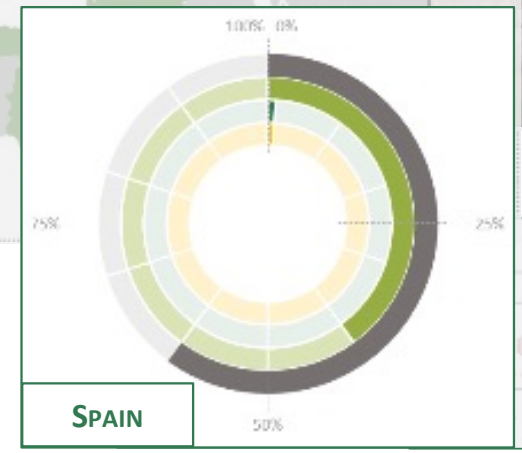
GERMANY



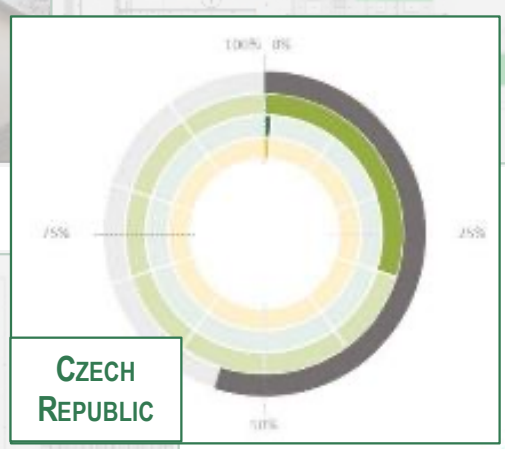
LITHUANIA



FRANCE



SPAIN



CZECH REPUBLIC

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WP4 | T4.2 Demonstration in real demo-cases

Schedule of demo-case in Lithuania (sample)

Work Package		Resp	Year 2 (2024)												Year 3 (2025)												Year 4 (2026)											
			01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12
			M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47	M48
WP3	**Development of new bio-based insulation materials and material combin**	**AIMPLAS**																																				
Task 3.1	Development of the Posidonia bio-based core	SOPHIA												D3.1																								
Task 3.2	Development of Polyelectrolyte complex (PECs) coatings	AIMPLAS																																				
Task 3.3	Development of the PLA foams	AIMPLAS																																				
Task 3.4	Development of the BIO Polyurethane foams for sprayable insulation foam and windows	INDRE																																				
Task 3.5	Characterisation of the new insulation materials and components	AIMPLAS																		D3.3																			
Task 3.6	Design, prototype and test of prefabricated building envelope integrating new materials for enha	FOCC																		D3.2																			
Task 3.7	Development of the BIO4EEB platform	R2M																		D3.4																			
WP4	**Demonstration and cost-effectiveness of the solutions**	**FOCC**																																				
Task 4.1	Design and preparation of real demo-cases: monitoring & evaluation plan, context analysis an	3L												D4.3												D4.4						D4.5						
Task 4.2	Demonstration in real demo-cases	FOCCHI																																				
4.2.1	demo case in Lithuania	PROTECH						D4.6												D4.7												D4.8						

Pre-Intervention Monitoring (Heating season)

Installation BIO4EEB solution

Post-Intervention Monitoring (Heating season)

Analysis

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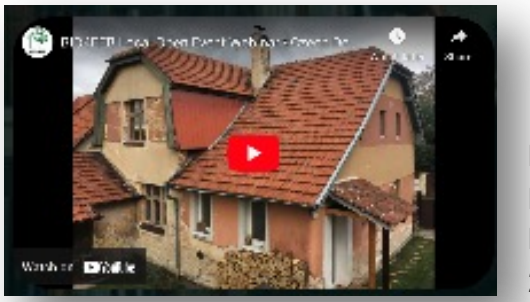
WP6 | T6.2 Local open events

Event title: Seminar for the Chairmen and Administrators of Communities of Residents of Multifamily Buildings
Date: 20th November 2023
Location: Meeting hall of the Vilnius City Municipality Council
40 attendees

Link here!

Physical event:
Inauguration CYNEO
Date: 28th November 2023
Vitual Event title:
Expérimentation biosourcée aux Halles des Ardoines
Date: 6th December 2023



Link here!

Event title: Demonstrační project Březany II
Date: 28th November 2023
24 attendees

Link here!

Event title: Deutsches Demonstrationsvorhaben
Date: 14th December 2023
23 attendees

Link here!

Event title: BIO4EEB EN ESPAÑA
Date: 29th January 2024
Over 50 attendees

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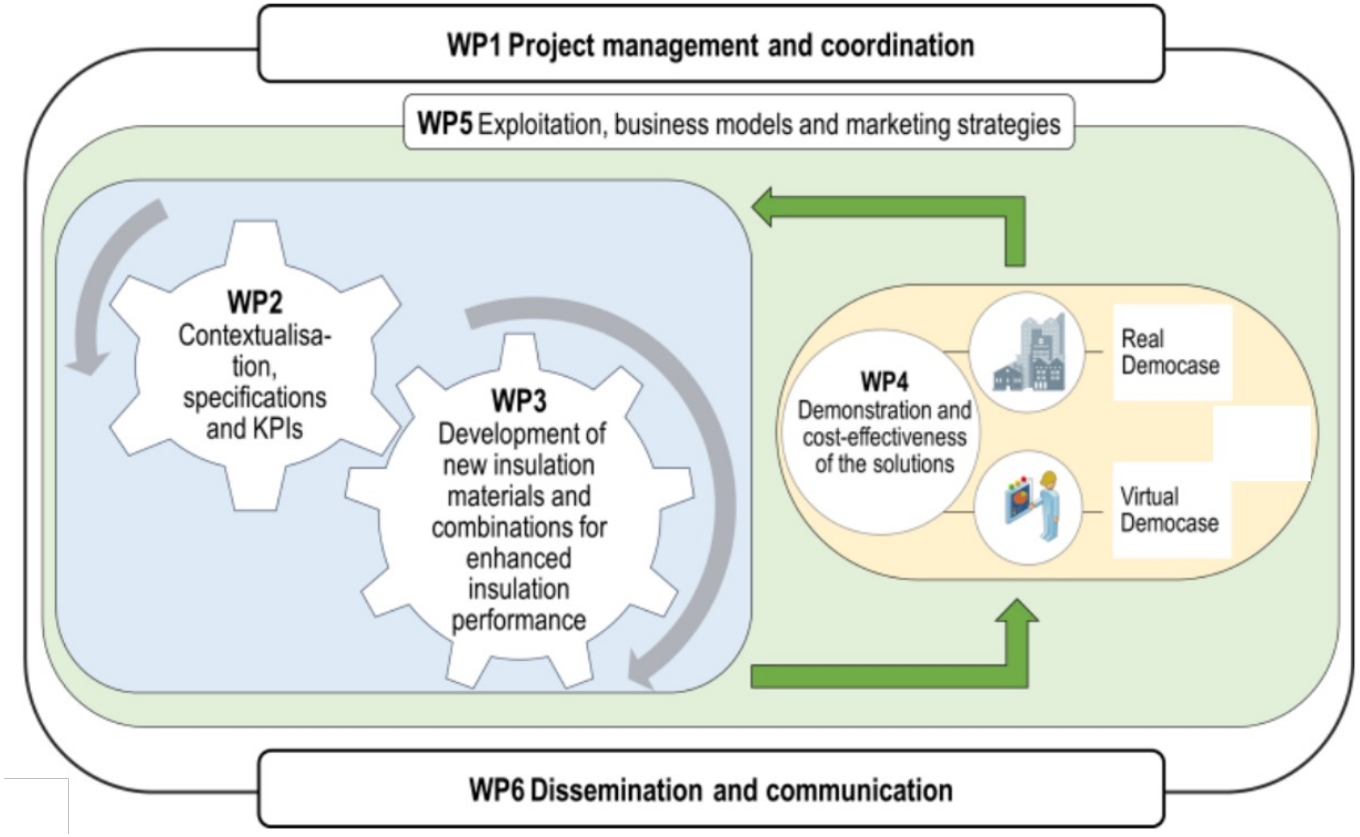
WP overview



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BIO4EEB consortium

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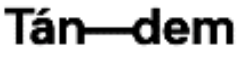









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