

Innovations Developed Through EU-Funded Projects

Showcasing cutting-edge solutions developed across European initiatives

About this document:

The STAR*track project has been engaging with a range of EU-funded projects to highlight and share the innovations that are emerging from their work. This document provides an overview of these innovations and the progress being made to support Europe's transition towards a sustainable, circular, and climate-neutral built environment.



Contents

DigiFab.....	4
Innovation: DigiFab_Digital process chain for energy renovations using pre-Fabrication.....	4
Drastic	6
Innovation: Circular Renovation with Prefabricated Panels (Estonian Demonstrator) .	6
Innovation: "Re:Textile", Circular Construction Facility with Reclaimed-Timber Structure (Norwegian Demonstrator)	8
DR RISE.....	10
Innovation: DR-RISE: Residential Demand Response Platform and Energy Helix Community	10
EBENTO	12
Innovation: EBENTO One-Stop-Shop Platform for Energy Performance Contracting and Renovation	12
FORTESIE	15
Innovation: FORTESIE Marketplace	15
HEART.....	17
Innovation: HEART – Holistic Energy and Architectural Retrofit Toolkit	17
Innovation: SOTTILE – Solar Technological Tile	19
Minority Report	21
Innovation: Renovation Road Mapping Decision Support System (DSS)	21
MULTICARE	23
Innovation: Flash-Flood Early Warning Protocol for Tecuci City.....	23
MULTICLIMACT	25
Innovation: MULTICLIMACT CREMA tool (Climate Resilience Maturity Assessment)	25
PROBONO.....	27
Innovation: Neighbourhood Level - Simulation and Optimization Model for Renewable Energy Communities	27
.....	28
RE-SKIN	29
Innovation: RE-SKIN – Renewable and Environmental-Sustainable Kit for Building Integration	29
WeForming.....	32

Innovation: WeForming Data Space connector 32

DigiFab

The DigiFab project revolutionizes building renovation through a digital process chain, offering detailed assessment, co-creation methodology, and adaptable prefabricated modules with passive and active technologies for near-zero energy building levels and reduced environmental impact.



This solution transforms the renovation process by digitizing it from design brief to finalization. It integrates BIM for automated assessment and monitoring, slashing installation time (2 days/200m²) and costs (30% less than conventional renovation). This approach minimises uncertainties by leveraging accurate data collection and a high-quality digital twin to optimise designs and enable "just in time" manufacturing of lightweight, recycled, and bio-based material modules with active envelope heating and energy management.

Installation is site-specific, monitored by laser scanning and worksite solutions managing demolition waste and noise. Energy performance documentation is also provided. Three demonstration sites in Spain, Austria, and Greece, with diverse building typologies, will showcase their stakeholder benefits.

[Learn more about the project here.](#)

Innovation: DigiFab_Digital process chain for energy renovations using pre-Fabrication

General description: DigiFab is a fully digital renovation chain that integrates BIM-based automated assessment, high-fidelity digital twins, and co-creation workflows. It introduces "just in time" manufacturing of different prefabricated modules with embedded passive and active envelope technologies. The process enables ultra-fast installation, precision, automated monitoring, and reliable documentation.

Features and benefits: This innovation translates into tangible benefits for multiple stakeholders. Occupants experience higher comfort and energy savings, while construction actors gain a faster, more predictable, and cost-effective process (up to 30% cheaper). The automation ensures replicability across diverse building typologies and EU contexts, reducing environmental impact and supporting scalable adoption throughout the European renovation ecosystem.

Innovation development status: under development (TRL6-7)

Innovation type: Process, System

Learn more: <https://www.digifab-project.eu/>

Contact details: info@digifab-project.eu



Drastic

Drastic stands for **D**emonstrating **R**eal and **A**ffordable **S**ustainable Building Solutions with **T**op-level whole life cycle performance and **I**mproved **C**ircularity.



Through five ‘Demonstrator’ pilot projects, Drastic aims to showcase varied and innovative solutions to reduce whole life carbon and the climate impact of construction across the entire construction value chain in Europe, whilst increasing and improving circularity within the built environment.

The Drastic Demonstrators will target different layers of buildings, to achieve reduction of operational and embodied carbon emissions and foster material reclamation and reuse. Drastic will show how these solutions, combined with improved business models, can lead the way towards a whole life cycle decarbonisation of the European Union (EU) building stock by 2050.

[Learn more about the project.](#)

Innovation: Circular Renovation with Prefabricated Panels (Estonian Demonstrator)

General description: Timbeco’s circular renovation solution upgrades apartment buildings using high-precision, prefabricated timber-frame façade elements designed for easy disassembly, reuse, and minimal environmental impact. By integrating circular-economy principles into both design and production, these elements significantly shorten on-site construction time, enhance energy performance, and reduce waste.

Developed in collaboration with TalTech University and supported by the DRIVE0 and DRASTIC innovation projects, Timbeco’s approach offers a future-proof renovation method that increases building value, minimizes operational disruptions, and extends the building’s lifecycle through smart, reusable components.

Features and benefits

- **Integrated building systems:** Ventilation ducts and electrical cabling can be seamlessly incorporated into the prefab façade elements during production. This reduces installation time on-site and ensures a higher level of quality and accuracy.
- **Factory-installed renewable energy solutions:** Solar panels can be fully integrated into the façade elements at the factory, including all necessary wiring. This provides an efficient, clean, and fast way to add renewable energy generation to existing buildings.

- **Faster, cleaner renovation process:** Industrial production allows most of the work to be completed off-site, minimizing disturbance to residents and ensuring faster assembly once panels arrive on location.
- **Designed for circularity:** Panels are engineered for disassembly and reuse, supporting a long-term sustainable strategy that reduces material waste and lowers total lifecycle costs.
- **Enhanced energy efficiency:** High-performance insulation and airtight construction dramatically reduce energy consumption and improve indoor comfort.

Innovation development status: On market

Innovation type: Other

Learn more: <https://timbeco.ee/en/products/circular-renovation/>

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Innovation: "Re:Textile", Circular Construction Facility with Reclaimed-Timber Structure (Norwegian Demonstrator)

General Description: The Re:Textile project focuses on creating a small industrial facility built entirely through sustainable, circular-economy construction methods. A key feature of the project is the extensive use of reclaimed timber for structural applications, demonstrating that high-quality reused wood can safely and effectively replace newly manufactured materials in load-bearing contexts.

The building is assembled using reclaimed and repurposed components, including structural timber, glulam beams, steel roof plates, and insulation panels, sourced from a decommissioned cryptomining warehouse

Features and benefits:

- **High material reuse rate:** Major structural and envelope elements are reclaimed, significantly reducing the need for new raw materials.
- **Substantial environmental impact reduction:** The Re:Textile project serves as a practical demonstration of how circular economy principles can dramatically lower the environmental footprint of construction. Life Cycle Assessment (LCA) results show reductions of 38% to 95% across key categories such as climate change, acidification, human toxicity, and resource use when compared to conventional building methods using virgin materials.
- **Biogenic carbon storage and avoided emissions:** Reclaimed timber contributes valuable biogenic carbon storage, while the reuse of steel and other components avoids emissions associated with their production. Overall, the project achieves an 8.6-ton reduction in CO₂eq emissions relative to standard construction practices.
- **Cost-efficient construction:** Repurposed materials decrease procurement costs while maintaining structural performance.
- **Scalable circular model:** The project provides a replicable blueprint for future circular industrial developments.
- **Improved resource circulation:** Collaborating with OMTRE AS enables local material recovery and revitalization of existing building components.

Innovation development status: In use

Innovation type (please select one of these): Material

Learn more: [Omtre - too wood to go](#), [Omtre: Posts | LinkedIn](#), [Norwegian Re:Textile: Posts | LinkedIn](#)

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DR RISE



Due to the current energy crisis, the EU is reaching a critical point in the energy transition with the Clean Energy Package. Residential demand response (DR) is a promising approach that can significantly contribute to such a transition, but its potential is yet untapped. DR is the adaptation of the final energy demand in reaction to signals from the energy markets in order to increase the stability of the energy system. In this framework, DR-RISE's main objective is to demonstrate the benefits of DR in the residential sector, not only for the end-consumers but for the overall energy system and the actors involved and promote it. Accordingly, DR-RISE will further develop a holistic set of tools and services with a twofold objective: increasing energy efficiency via optimal management and demonstrating DR schemes' benefits (not only economic).

[Learn more about the project here.](#)

Innovation: DR-RISE: Residential Demand Response Platform and Energy Helix Community

General description: DR-RISE (Demand Response – Residential Innovation for a Sustainable Energy system) is an EU-funded Horizon Europe research project developing an integrated set of tools, services, and community-driven methods to democratize residential demand response (DR). It aims to empower end-users to optimise their energy consumption, participate in DR schemes and contribute flexibility to the energy system, while demonstrating the systemic benefits of DR across the grid and supporting energy transition goals.

Features and benefits:

- Integrated digital demand response platform providing web- and mobile-based tools to support residential energy management and participation in demand response schemes.
- Explainable AI and forecasting tools for load, renewable generation, prices and flexibility availability, enabling informed and transparent decision-making.
- Secure and privacy-by-design data architecture, ensuring user trust and compliance with EU data protection requirements.
- [Energy Helix Community platform](#), fostering collaboration and knowledge exchange among stakeholders from research, industry, policy and society to support scaling and replication of demand response solutions.

Innovation development status: DR-RISE is actively building, deploying, and testing its platform and tools in real pilot environments across multiple EU countries. The project is progressing through development and initial deployment phases with multi-stage pilots and iterative enhancements based on user feedback.

Innovation type: Societal Process, Software, System

Learn more: <https://dr-rise.eu>

Contact details: info@dr-rise.eu

EBENTO



EBENTO is a Horizon Europe project addressing one of the key challenges of Europe's building sector: making energy-efficient renovations more accessible, transparent, and citizen-centred. The project has developed the EBENTO One-Stop-Shop Platform, a digital solution that streamlines the entire renovation process, from design and financing to contracting and performance monitoring.

The platform focuses on Energy Performance Contracting (EnPC), reducing complexity through innovative business models that integrate energy savings, comfort, and demand-response services. Its three core modules—performance contracts, monitoring, and Building Information Modelling -based simulation—support better decision-making for citizens, cooperatives, ESCOs, and public authorities.

Currently in its near-final version and open for testing, EBENTO aims to build trust, lower transaction costs, and foster holistic renovations, contributing to a more energy-efficient, digital, and climate-neutral European building stock.

[Learn more about the project here.](#)

Innovation: EBENTO One-Stop-Shop Platform for Energy Performance Contracting and Renovation

General description: The EBENTO One-Stop-Shop Platform is a digital solution designed to simplify, coordinate, and accelerate energy-efficient residential renovations, with a strong focus on Energy Performance Contracting (EnPC). It integrates technical, financial, and contractual dimensions into a single environment, supporting collaboration among citizens, cooperatives, ESCOs, financial entities, and public institutions. The platform addresses key market barriers such as fragmentation, lack of transparency, complex contracts, and limited consumer trust.

Features and benefits:

- One-stop-shop for design, financing, contracting, and monitoring of renovations.
- Dedicated Energy Performance Contracts and Guarantees module (digital logbook, smart contracts, traceability).
- Monitoring module for energy use, savings, comfort, and quality of life.
- BIM-based simulation module to compare technical and financial renovation scenarios

- Integration of demand-response and comfort-based guarantees into EnPC models.
- Improved transparency, reduced transaction costs, and enhanced citizen engagement

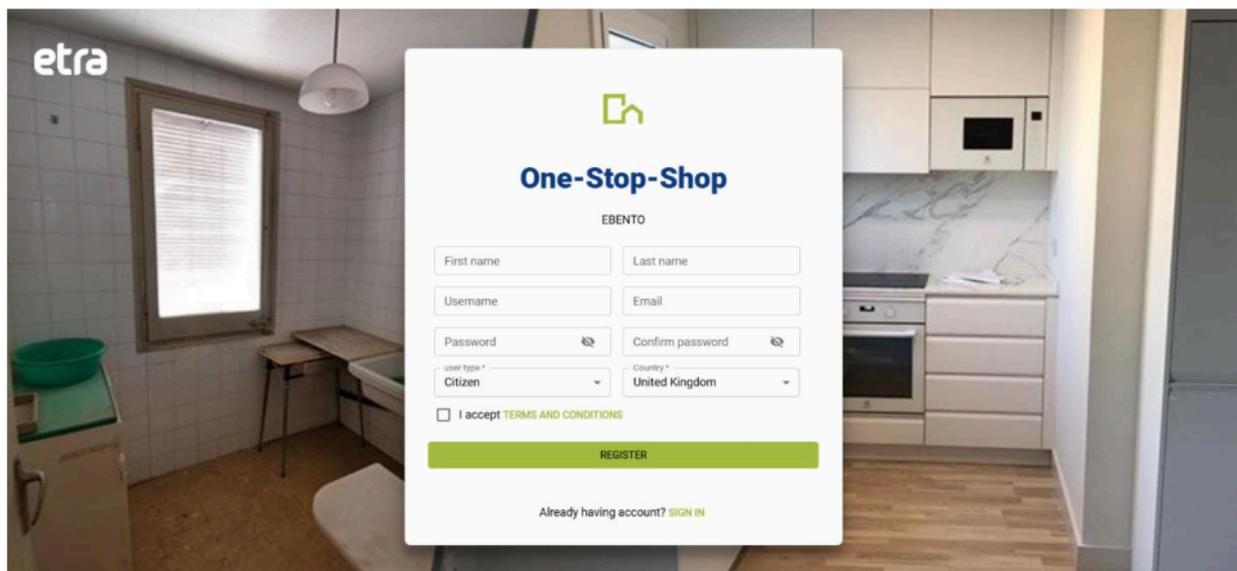
Innovation development: Under development – near-final version, currently in public testing. TRL: Approximately TRL 7–8 (system prototype demonstrated in operational environment)

Innovation type: Software / System

Learn more: <https://ebentoproject.eu/tools/>, **One-Stop-Shop EBENTO**

How to Use the EBENTO One Stop Shop Platform – Step-by-Step Guide

Contact details: Ana Isabel Martínez García amartinez.etraid@grupoetra.com



One-Stop-Shop v1.4.31 ESDO Valencia etra

Dwelling: TEST_HOUSE1 - 8669303YJ4186N0032TL

TEST_HOUSE1 - TEST_HOUSE1

- Carrer De L'arquitecte Segura De Lago 19, 46014 Valencia, Valencia, Spain
- Contract identifier: ANOTHER TEST
- Monitoring of: Electricity consumption
- Sensors: Sensor 1
- Devices: Control1

Energy Perf. Certificate

Indexes

CO₂ kg CO₂ emissions

Energy consumption

Electricity consumption (TEST_HOUSE1- electricity)

From: 16/07/2025 To: 30/07/2025

Information non available

Use of appliances

Information non available

EBENTO. This project has received funding under the R&D framework Horizon 2020 of the European Union - No. 101079888 grant agreement.

One-Stop-Shop v1.4.31 etra

BUILDING DATA

- Building ID: 120794647
- Address: Lasrambla 19 4b
- Building type: Building with many dwellings
- Construction year: 2018

ENERGY CERTIFICATE

- Energy label: C 126 kWh/m²
- Certificate type: KEK (measured)
- Issue date: 2021-10-31
- Expire date: 2031-10-30

FORTESIE



Building a Greener Future with FORTESIE

Across Europe, the FORTESIE EU project is driving the transformation of buildings into smarter, more energy-efficient spaces. By combining innovative technologies, financing models, and collaboration tools, FORTESIE helps make energy renovation more accessible and impactful.

At the heart of this mission lies the **FORTESIE Marketplace** — a dynamic online hub where companies, service providers, and building owners connect to bring renovation ideas to life. From discovering innovative products and renovation packages to finding trusted partners, the Marketplace simplifies every step of the energy renovation journey. Together, we're building a future where sustainable renovations are easier, faster, and within everyone's reach.

[Learn more about the project here.](#)

Innovation: FORTESIE Marketplace

General description: The FORTESIE Marketplace is an online collaborative platform designed to connect stakeholders involved in energy renovation projects, including construction companies, ESCOs, technology providers, and building owners or managers. It serves as a central hub for offering, discovering, and managing energy renovation solutions, services, and products.

The platform facilitates the entire renovation process, from showcasing innovative technologies and renovation packages to forming partnerships and finding collaborators for public and private building projects.

Features and benefits:

- Comprehensive offer space for energy renovation products, services and complete renovation packages.
- Matchmaking functionality connecting demand (building owners, managers, public authorities) with supply (companies, service providers, ESCOs).
- Collaboration network enabling stakeholders to interact and form consortia or partnerships.
- User-friendly interface to make energy renovation more accessible, even for nondigital-savvy users.
- Supports both public and private building renovations, contributing to EU energy efficiency goals and decarbonisation targets.
- Alternative financing opportunities, supporting users in identifying innovative funding and investment models for renovation projects.
- Promotes visibility for SMEs and innovative providers within the European renovation ecosystem.

Innovation Development Status: On market / In use

Innovation Type: Software / System

Learn more: <https://fortesie-marketplace.eurodyn.com/>

Contact details: info@fortesie.eu

MAKE PUBLIC BUILDINGS ENERGY EFFICIENT.

- ✓ Save money and energy
- ✓ Contribute to climate targets
- ✓ Bring value to the community

Find solutions on the FORTESIE MARKETPLACE



TAKE PART IN ENERGY RENOVATIONS!

- ✓ Grow your business.
- ✓ Find new customers.
- ✓ Promote sustainable practices

Join our One Stop Shop Marketplace



UPGRADE YOUR COMFORT. CUT YOUR ENERGY BILLS.

- Save energy.
- Increase property value.
- Breathe better air

Join our One Stop Shop Marketplace



RENOVATE BUILDINGS. BOOST YOUR BUSINESS.

- ✓ Drive new business opportunities.
- ✓ Meet modern energy efficiency standards.
- ✓ Provide sustainable solutions

Join the FORTESIE MARKETPLACE



[Learn more about the project here.](#)

Innovation: HEART – Holistic Energy and Architectural Retrofit Toolkit

General description: HEART is a holistic, multi-technology retrofit toolkit designed to enable deep energy renovation of existing residential buildings towards nearly Zero Energy Building (nZEB) standards. It integrates building envelope solutions, HVAC systems, renewable energy systems, energy storage, and advanced ICT into a single interoperable system, coordinated by a cloud-based Decision Support System (DSS) and Building Energy Management System (BEMS).

Key features:

- Cloud-based DSS + BEMS with predictive and adaptive control
- Integrated envelope technologies (prefabricated insulation, window retrofit)
- Building-integrated photovoltaics (BIPV) and renewable energy systems
- DC-powered HVAC (heat pumps, smart fan-coils)
- Multi-input/multi-output (MIMO) power controller
- Thermal and electrical energy storage
- Smart Grid interaction and user engagement interfaces

Main benefits:

- Up to 90% reduction in building energy consumption
- Increased self-consumption of renewable energy (up to ~60%)
- Improved indoor comfort (summer and winter)
- Reduced installation time (~30%) and operational costs
- Enhanced decision-making, transparency, and financing attractiveness
- Supports scalable, replicable deep renovation strategies

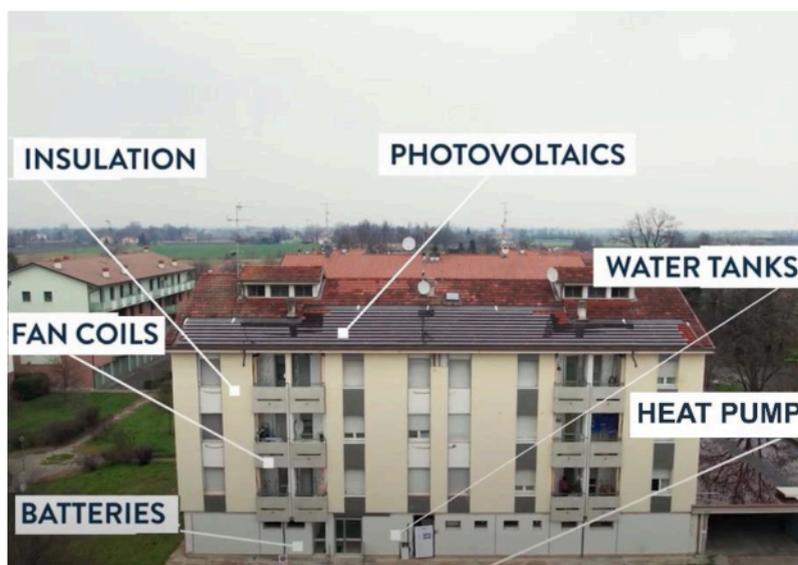
Innovation development status

Developed and tested in 2 pilots - TRL 7

Innovation type: System (integrated technological system combining material, software, and energy technologies)

Learn more: <https://heartproject.eu/>

Contact details: Coordinator: Politecnico di Milano (POLIMI), Italy
Contact: claudio.delpero@polimi.it



Innovation: SOTTILE – Solar Technological Tile

General description: SOTTILE is an architectural building-integrated photovoltaic (BIPV) roofing system designed to transform traditional pitched (tile) roofs into active solar energy generators while maintaining aesthetic, cultural, and architectural integrity. It consists of modular photovoltaic tiles and supports that integrate seamlessly with existing traditional roofing materials, making solar adoption viable even in heritage or visually sensitive contexts.

Although SOTTILE originated as part of the **HEART Horizon 2020 research project**, it has since been **commercialized via the SOTTILE Solar startup**, which offers the system and has realized installations (e.g., pilot projects at Politecnico di Milano).

Key Features:

- Modular photovoltaic tiles designed for pitched roofs that match the geometry/size of traditional tiles.
- Solar Technological Tile (BIPV) – meaning the product simultaneously serves as roof covering and electricity generator.
- Support structure made from recycled plastic, which enhances sustainability, reduces embodied carbon and enables easy assembly/disassembly.
- Customizable aesthetics, including tile and support colors for improved architectural integration.
- Compatible with most traditional clay tile roofs, installing only where active solar generation is desired.

Benefits:

- Architectural integration: SOTTILE preserves roof appearance and is suitable for historic or design-sensitive buildings.
- Easy installation & maintenance: Modular design supports rapid assembly and future removal/replacement.
- Sustainability focus: Use of recycled materials and alignment with circular economy principles.
- Enhanced solar adoption: By reducing iconic visual impact and integration barriers for solar on pitched roofs.

Innovation development status: Commercial deployment TRL 9

Innovation type: System / Material + Technological Product

Project / Company: SOTTILE SOLAR S.R.L.

Address: Via Bergamo 19/21, 20045 Lainate (MI), Italy

Contact email: info@sottile.solar

Phone: +39 340 1494759

Website: <https://www.sottile.solar/>



Minority Report



The Minority Report project is focused on advancing sustainable urban renovation by developing digital solutions for building upgrades. Central to this is the Renovation Road Mapping Decision Support System (DSS), a software process designed to empower local stakeholders, planners, architects, engineers, and building professionals. The DSS provides advanced planning support for building renovations, with a strong emphasis on enhancing climate resilience and energy efficiency at the district scale. Moreover, the process supports collaboration across disciplines and levels of expertise by focusing on user friendly user interface and intuitive user experience. Currently, the process is under development at Technology Readiness Level 6, the DSS aims to streamline renovation planning, support sustainability goals, and facilitate effective stakeholder engagement, making it an asset for urban transformation projects.

[Learn more about the project here.](#)

Innovation: Renovation Road Mapping Decision Support System (DSS)

General description: The Renovation Road Mapping Decision Support System (DSS) is an advanced digital process designed to help stakeholders (local stakeholders, planners, architects, engineers, and building professionals) plan and optimize building renovations for improved climate resilience and energy efficiency at district scale.

Features and benefits:

- **Advanced Planning Support:** Enables planners, architects, engineers, and building professionals to plan and optimize building renovations effectively.
- **Climate Resilience & Energy Efficiency:** Focuses on improving climate resilience and energy efficiency at the district scale, supporting sustainability goals
- **Stakeholder Collaboration:** Designed for use by multiple stakeholders, fostering collaboration across disciplines and levels of expertise
- **Digital Decision Support:** Provides a digital platform for informed decision-making throughout the renovation process.

Innovation development status: Under development. TRL 6

Innovation type: Software

Learn more: [Minority Report project meets in Dublin](#)

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MULTICARE



MULTICARE, a Horizon Europe project, is developing innovative, low-carbon and resilient technologies for the built environment facing multiple hazards. One of its key advances is the Flash-Flood Early Warning Protocol for Tecuci City (Romania), created by Transilvania University of Braşov, National Institute for Earth Physics, and the Municipality of Tecuci. The protocol integrates real-time hydrological data, AI-based forecasting and a smart alert system to improve local readiness for flash floods. It helps authorities react faster, reduce damages, and protect citizens. Currently validated under real conditions, this innovation demonstrates strong potential for replication in other European cities exposed to flood and climate risks.

[Learn more about the project here.](#)

Innovation: Flash-Flood Early Warning Protocol for Tecuci City

General Description: Within the Horizon Europe project MULTICARE – Multi-hazard low-carbon resilient technologies and multi-scale digital services for a sustainable built environment, Transilvania University of Braşov, together with the National Institute for Earth Physics (INFP) and the Municipality of Tecuci, has developed a Flash-Flood Early Warning Protocol.

This innovation introduces a digital, data-driven system designed to enhance preparedness and minimize the impact of flash floods. By combining real-time hydrological monitoring, AI-assisted simulations, and automated alert mechanisms, the protocol strengthens Tecuci’s resilience and supports informed, timely responses by local authorities.

Features and benefits:

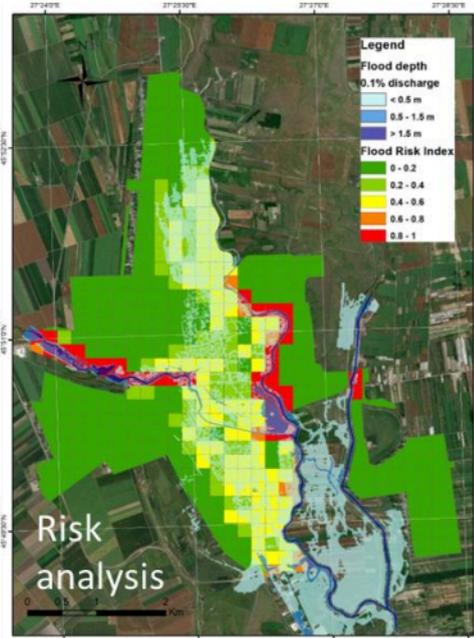
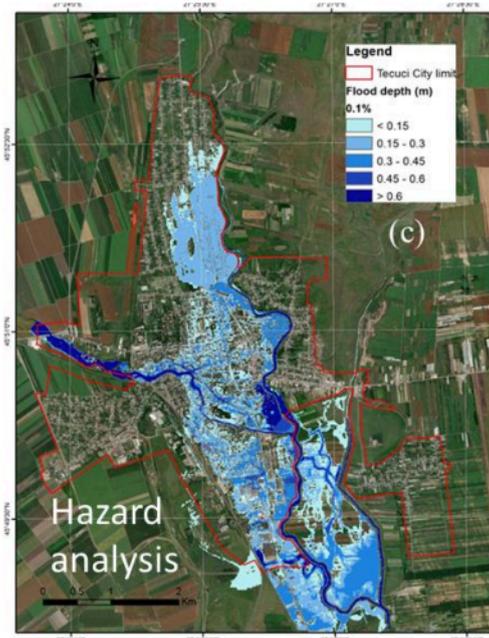
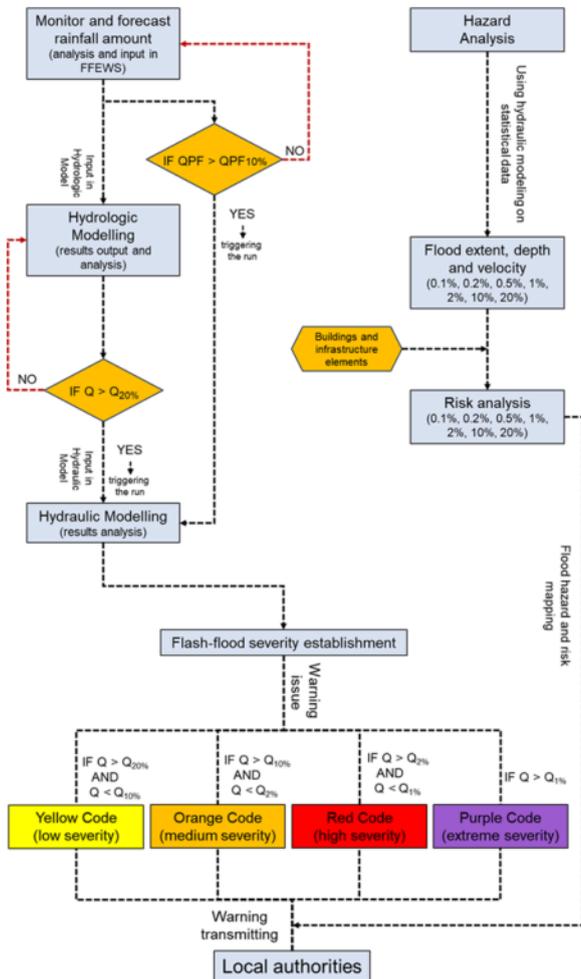
- **Real-time Monitoring:** Integration of river and rainfall sensors with European weather models (GFS, ECMWF).
- **Predictive Modelling:** AI-based hydrological and hydraulic forecasting of flood scenarios.
- **Rapid Communication:** Automatic alerts and visual dashboards for first responders and city operators.
- **Replicability:** The system’s modular structure enables easy adaptation in other European cities exposed to flood and climate hazards.

Innovation Development Status: Under development – TRL 6–7, validated in a relevant environment at the Tecuci pilot site (Romania).

Innovation Type: System / Technology

Learn more: <https://multicare-project.eu/flash-flood-early-warning-protocol-for-tecuci-city/>

Contact details (Communications partner): ASM Research Solutions Strategy, Poland m.kosiorek@asmresearch.pl



MULTICLIMACT



multiclimact

The MULTICLIMACT project (MULTI-faceted CLIMate adaptation ACTions to improve resilience, preparedness and responsiveness of the built environment against multiple hazards at multiple scales, GA number 101123538) addresses the urgent need to adapt the built environment to changing climatic conditions and increasing extreme events. It develops a mainstreamed framework and toolkit supporting public stakeholders and citizens in assessing and enhancing the resilience of buildings (including cultural heritage), urban areas, infrastructures, and territories against locally relevant hazards. The approach integrates socio-economic, life, engineering, and climate disciplines, promoting resilience-enabling ACTions through reliable, easy-to-implement, and cost-effective Design Practices, Materials, and Digital Solutions. Demonstrations across four diverse case studies in Europe ensure applicability across scales and contexts, fostering a climate- and future-proof built environment.

The CREMA (Climate Resilience Maturity Assessment) tool supports decision-makers in evaluating and implementing resilience-enhancing interventions. By quantifying resilience scores and translating damage into monetary loss, CREMA enables users to identify vulnerabilities, prioritize interventions, and understand cost-benefit ratios, fostering informed, science-based adaptation and resilience planning.

[Learn more about the project here.](#)

Innovation: MULTICLIMACT CREMA tool (Climate Resilience Maturity Assessment)

General description: The MULTICLIMACT CREMA (Climate Resilience Maturity Assessment) tool is designed to assist both public and private decision-makers in implementing resilient solutions for the built environment, specifically targeting climate-related hazards such as heatwaves and floods, as well as natural threats like earthquakes. The tool conducts comprehensive risk and resilience assessments across various scales, including buildings, urban areas, and entire territories.

The primary objective of the CREMA tool is to provide a comprehensive framework that enables policymakers to assess the resilience of various assets, including cultural heritage structures, urban sectors, and regional amenities. By quantifying the resilience score of these assets, the tool helps to identify vulnerabilities and prioritize interventions that can mitigate the impacts of climate-related and natural hazards. The CREMA framework is characterized by a collaborative and human-centered approach, ensuring that the tool is both scientifically robust and practically applicable.

Features and benefits: The CREMA tool employs a robust methodology that integrates both probabilistic and deterministic risk assessment methods. It involves several critical steps,

including the Identification of Potential Threats, Asset Characterization, Vulnerability Assessment, and Impact Quantification.

The assessment process begins by selecting the scale of analysis, followed by the characterisation of relevant hazards, evaluation of vulnerabilities, and identification of potential impacts. These impacts are classified as direct (affecting the physical system), indirect (influencing service continuity), and personal (concerning injuries or fatalities). The tool generates a resilience score, supplemented by calculations of Expected Annual Loss both before and after the implementation of resilience measures. This quantitative approach provides decision-makers with valuable metrics to inform and guide their choices.

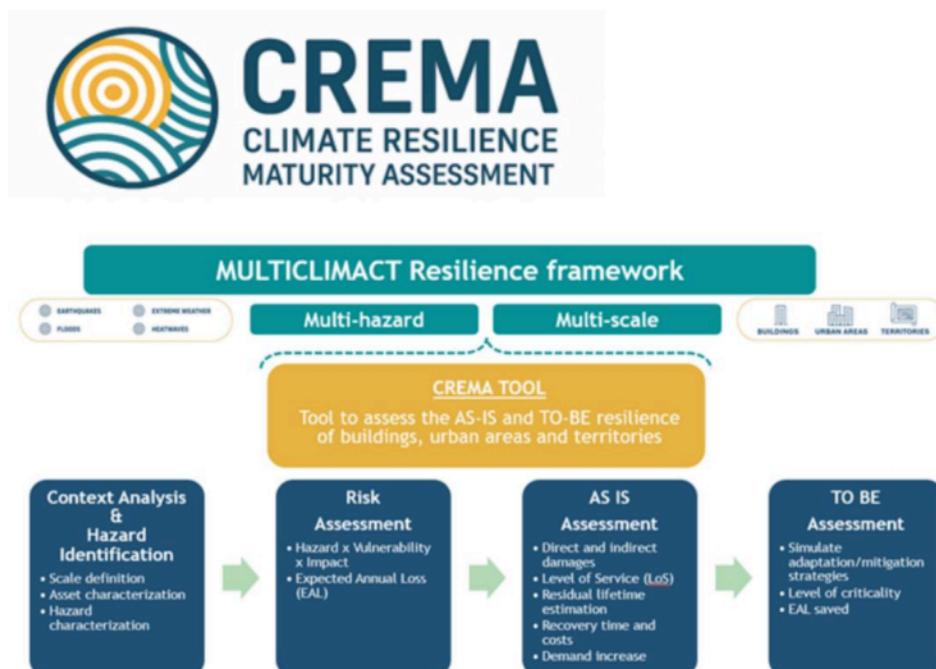
A significant feature of the tool is its ability to translate damage into monetary loss, thus helping decision-makers understand the cost-benefit ratios of different resilience-enhancing interventions. Overall, the CREMA tool represents a significant advancement in climate adaptation and resilience planning, empowering decision-makers to make informed choices that protect communities and assets from the adverse effects of climate change and other natural hazards.

Innovation development status: Under development, TRL6-7

Innovation type: Software, System, Technology

Learn more: D1.3 CREMA Tool Planning and Design: https://multiclimact.eu/wp-content/uploads/MULTICLIMACT_D1.3_FINAL.pdf

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PROBONO

As society becomes increasingly urban and ever dependent on technological innovations, it is vital to ensure that people and planet are put at the very heart of this development in a way that is sensitive to and encourages the protection, expansion or re-introduction of sustainable space amongst the urban sprawl. This is the aim of the PROBONO project. PROBONO has an initial focus on renovating existing urban buildings and locations in a resource and energy efficient way. Applying technology, business and socio-economic innovations to stimulate a transition to net-zero and energy positive buildings, leading to a better understanding of how these sustainable renovations can be a catalyst to create a wider, more sustainable Green Building Neighbourhood and thus, thriving and sustainable community.

[Learn more about the project here.](#)

Innovation: Neighbourhood Level - Simulation and Optimization Model for Renewable Energy Communities

General description: The Neighbourhood Level is a scalable and replicable simulation and optimization decision support model designed to support the development of Renewable Energy Communities (RECs) across diverse European contexts. Developed within the [H2020 PROBONO](#) project, it enables detailed techno-economic assessment of REC configurations, helping decision-makers transition from building-level to community-wide energy management.

Features and benefits:

- **Agent-Based and Discrete-Event Simulation:** Models the behavior of each POD based on hourly electricity demand and PV generation.
- **Metaheuristic Optimization Engine:** Uses nonlinear programming and genetic algorithms to maximize Net Present Value (NPV), considering capital and operational expenditures, inflation, and revenues.
- **Dynamic, Country-Specific Strategies:** Adapts simulations to reflect national regulatory frameworks and incentives.
- **Scalability:** Validated in Italy, applied in Brussels, Porto, and Belgium, and being extended to Madrid and Dublin.
- **Integration-Ready:** The Neighbourhood Level model is currently undergoing integration into the Digital Twin developed within the PROBONO project.
- **High Flexibility:** Easily configurable input parameters (e.g., energy prices, PV sizes) for scenario testing and investment analysis.

Innovation development status: Under Development. TRL 5

Innovation type: Software, System

Learn more: <https://www.probonoh2020.eu/>

Contact details: Stefano Sanfilippo – Senior Project Engineer at STAM S.r.l.
s.sanfilippo@stamtech.com

The aim of the model is to simulate Renewable Energy Community (REC) operations. Different consumer, producers and prosumers are modelled to visualize and quantify the energy exchanges within the REC. This enables an user-friendly and interactive time-based simulation whose computations, starting from the hourly energy profiles, result in different economical KPIs strictly related to the modelled REC incentivisation scheme. The detail on the individual actor of the REC is also provided.



Living Lab

- Italy
- Spain - Madrid
- Portugal - Porto
- Belgium - Bruxelles
- Czech Republic - Prague
- Ireland - Dublin

Nominal Power PV1

kW

Nominal Power PV2

kW

CAPEX PV

€/kW

OPEX PV

%

Discount Rate

-

REC Lifetime

years

[Go to Simulation](#)



REC detail



Electricity graphs [kW]

Timestep [Hour]
8,760

Demand Production

Sharing

Overconsumption Overproduction

[Go to Report](#)

[Go to Building](#)




	REC	NO REC
Yearly Buying [€]	71,248.898	88,943.499
Yearly Incentive [€]	-3,805.829	0
Yearly Selling [€]	-5,974.226	0
Total Costs [€]	726,160.919	775,741.623
REC Benefit [€]	49,580.704	

[Go to REC](#) [Go to Building](#)



RE-SKIN



[Learn more about the project here.](#)

Innovation: RE-SKIN – Renewable and Environmental-Sustainable Kit for Building Integration

General description: RE-SKIN is a next-generation, circular-economy-based renovation system for existing residential, public, and tertiary buildings. It is a fully integrated, life-cycle-optimised renovation package that combines prefabricated envelope systems, hybrid renewable energy technologies, smart HVAC, energy storage, EV charging, and a cloud-based life-cycle DSS/BEMS. RE-SKIN explicitly addresses embodied energy, recyclability, reuse, climate resilience, and architectural quality.

Key features:

- Prefabricated multifunctional façade with biosourced and recycled materials
- Hybrid BIPVT roof (photovoltaic + thermal) with refurbished PV modules
- Solar-assisted DC heat pump with low-GWP refrigerant
- Repurposed EV battery storage
- Smart DC fan-coils replacing radiators
- Integrated EV smart charging and Smart Grid interaction
- Cloud-based life-cycle DSS + BEMS + Sustainability Dynamic Rating (SDR)
- Design-for-disassembly and circular economy compliance

Main benefits:

- Up to 90% reduction in operational energy demand
- 40–90% reduction in life-cycle CO₂ emissions
- Up to 60–70% circular/reused/recycled materials in renovation
- Reduced retrofit time (≥40%) and payback <15 years
- Improved resilience to climate extremes (heatwaves, floods, grid outages)
- Enhanced architectural quality, user comfort, and building value

Innovation development status: Under development / Large-scale demonstration - **Target TRL 7** by project end

Innovation type: System (integrated circular renovation system combining materials, technologies, software, and processes)

URL for more information: <https://reskinproject.eu/>

Contact details: claudio.delpero@polimi.it



Burgas Demo site



Milan Demo site: external



Milan Demo site: BIPV Roof

WeForming project is an EU-funded initiative working to transform buildings into active participants in managing the energy grid. Buildings currently account for 40% of the continent's energy use and 36% of its greenhouse gas emissions.

The project is developing Intelligent Grid-Forming Buildings (iGFBs) that can actively participate to Europe's decarbonisation goals. A key innovation is the **WeForming Data Space connector**, a user-friendly tool that enables buildings to easily share and access data with other systems. The technology empowers building occupants and managers to optimise their energy consumption. By simplifying data exchange, it makes it easier to create a network of buildings that can work together to manage energy use effectively, without the need for complex installations. This advanced technology is being tested in 6 demos across Europe.

[Learn more about the project here.](#)

Innovation: WeForming Data Space connector

General description: It is in active development providing the containerisation of the connector with a local storage database, a data service handler and a local connector GUI tailored to the Intelligent Grid-Forming Buildings (iGFBs) needs. This functionality is part of the second technology release of WeForming's integrated platform (MVP 2.0) and it streamlines the process of exchanging available datasets provided through a connector (provider) to other instances of the component (consumers) within the same ecosystem.

Features:

- The connector is packaged in a modular unit, which makes it easy to deploy and manage. It includes a local storage database to hold data and a data service handler to manage the flow of information.
- A user-friendly graphical interface specifically designed for users to interact with the system.
- A streamlined, secure and sovereign data exchange simplifies the process of exchanging datasets with interested stakeholders.
- The connector aligns with broader European Union initiatives like the Common Energy Data Spaces, ensuring it can operate effectively within a wider data ecosystem.

Benefits:

- The connector enables different systems within the iGFB to share but also discover data and energy applications in a seamless and interoperable manner; which is a core function of the project's intelligent Building Reference Architecture (W-IBRA). This is crucial for creating buildings that can actively manage their energy use.

- By simplifying data exchange and its interface, the connector empowers building occupants and managers to make informed decisions about their energy consumption, placing them at the centre of the energy optimisation process.
- Its modular nature allows for efficient deployment and management. The system is designed to scale, enabling multiple buildings to connect and exchange data, which is essential for creating a network of active grid participants.
- Connector-as-a-Service (CaaS) is a novel development that allows typical building to easily connect to the WeForming data space without the need of hefty hardware & software installations.

Innovation development status: Under development. TRL 6

Innovation type: Software

Learn more: <https://weforming.eu/weforming-mid-project-milestones-revolutionising-energy-management-with-intelligent-grid-forming-buildings-igfb/>

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