YEARBOOK

European Projects

Version 2024

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PTEC
Plataforma Tecnológica Española de Construcción

GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

Comisión Europea

YEARBOOK

European Projects

Version 2024

ANUARIO

Proyectos Europeos

Edición 2024

INDEX

SUSTAINABLE AND HEALTHY CITIES AND MOBILITY

CartujaQanat

Recovering the street life in a climate changing world

Sustainable and Healthy Cities and Mobility

Project information

- URBAN INNOVATIVE ACTIONS
- 01/11/2018
- 31/10/2022
- 3.999.107,76 €
- EMASESA

Project description

The project can be defined as an urban regeneration operation, which consists of an integrated set of actions and elements that act as social stimulators to improve universal accessibility, ensure that the surface interventions on the existing urbanization manage to reconfigure the executed urbanism and develop a new model of public-private governance. This ecosystem will be based on 4 pillars:

- Refreshing facilities (bioclimatic qanat)
- Underground gallery
- Bioclimatic amphitheatre
- Bioclimatic island

Project results

- Governance model at the level of urban policy
- Guide: tool for the implementation of technologies / solutions
- Demonstrator of the various technological solutions

Impact on the construction sector

- Use water as a natural cooling element in a sustainable way.
- Construction of climate shelters. New thermal conditioning systems in outdoor spaces.
- New uses of construction

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

DURA DOURO

The Douro as an enduring resource of the border landscape and territory

Sustainable and Healthy Cities and Mobility

Project information

- Call: (European Union/FEDER/Interreg)
- Starting date. 01/11/2022
- End date.30/06/2023
- Global Budget of the Project. 196.108,94 €
- Project coordinator. Fundación Santa María la Real del Patrimonio Histórico
- Subcontracted entities and third parties. Azucena Nuño Nuño

Project description

The DuraDOURO project, within the Duero-Douro initiative, seeks to apply and project in wider geographical areas and among new agents, the work methodologies and results obtained in the two projects that are capitalized, Flumen Durius and Paisaje Ibérico, both focused on the knowledge and enhancement of the cultural and territorial resources of border areas to improve the quality of life of their inhabitants and generate a greater economic flow in them, as a basis for endogenous development.

DuraDOURO will contribute to the promotion and dissemination on a larger scale of both projects, adding their areas, and to generate new tools that will lead to the enhancement of their results and to deepen the positive impact on the territory as a whole.

Project results

- Improvement of management and planning strategies for the cultural and landscape heritage of the cross-border territory.
- Promotion of the cultural and landscape values identified in the territory, the sustainability of its resources and the attraction of quality tourism.
- Strengthening of cross-border networking.
- Tools for a better understanding of the socio-cultural, economic and environmental impacts of tourism

Impact on the construction sector

- The aim is to increase the impact of the dissemination of results, transfer the methodology applied throughout the border area, generate synergies between territories and support the sustainability of the tools generated and communication.

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

MOSAIC

Ultra-High-Performance Materials for smart hydraulic tiles: A new perspective in the art craft Innovation for urban environments

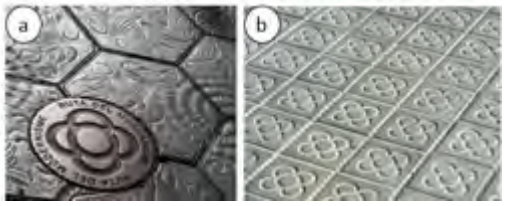
Funded by the European Union

Sustainable and Healthy Cities and Mobility

Project information

- Call: COSME-SMP-2021-CLUSTER. FRIEND CCI
- Starting date: 15 / 10 / 2023
- End date: 15 / 10 / 2024
- Global Budget of the Project: 50,000 EUR
- Project coordinator: TESELA
- Partners: MOSAICOS LAMARDELEJOS & NGI SYSTEMS

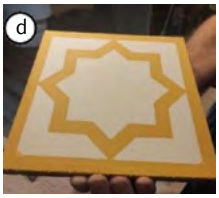
a. Hydraulic tiles designed by Gaudí and installed in "La Pedrera" (Barcelona, Spain).
b. Pannot hydraulic tiles installed in "Eixample" (Barcelona, Spain).
c. Craft process of creating hydraulic tiles.
d. Hydraulic tiles produced in MOSAIC project.



Project description

The MOSAIC project aims to research, develop and revolutionize the perspective of the use of hydraulic tiles in urban pavements.

To this end, new types of Ultra-High-Performance Materials (UHPM) will be developed and combined with craft manufacturing methods and IoT sensors to produce smart hydraulic tiles. The designs of the tiles will be based on representative and artistic elements of the city of Granada, considering the inclusion of disabled pedestrians. Finally, the generated tiles will be installed in different locations (e.g., streets and/or squares) inside Granada city. Serving as a new element of the decorative identity of the different neighbourhoods for future generations.



Project results

- Obtention of 2 new UHPM formulas.
- Generation of 3 different types of Smart hydraulic UHPM tiles with iconic symbols of Granada city.
- Technology validation in a real environment (Granada city).

Impact on the construction sector

- Increase the efficiency of the pavements.
- New smart pavement for measuring
- urban heat island effect inside cities.
- Promote the use of hydraulic tiles.
- Integration of innovation, culture, and craft in the urban environment.

Contact data

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- Eugenio Navarro ; TESELA ; eugenionavarro@teselainnova.com

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Comisión Europea

MYBUILDINGISGREEN

Application of Nature-Based Solutions for local adaptation of educational and social buildings to Climate Change

Sustainable and Healthy Cities and Mobility

Project information

- LIFE 2017 CLIMA.
- 01/09/2018.
- 29/02/2024.
- 2.854.102,00 €.
- Project leader: CSIC-Real Jardín Botánico.
- Partners: CSIC-IETcc, CARTIF, CIMAC, DIPBA, Municipio de Porto

Project description

https://life-mybuildingisgreen.eu/en/home/

LIFE-myBUILDINGisGREEN aims to increase the climate resilience of education buildings and social care services by implementing Nature-Based Solutions as prototypes of climate adaptation and improvement of the well-being of real estate.

Nature-Based Solutions (NBS), as climate change adaptation measures, are taking particular relevance. It is important to generate knowledge and evidence on the effectiveness maximizing environmental, social and economic co-benefits. Thus, the project will contribute to the definition of standards and/or criteria for designing them into real buildings.

Project results

- Improve knowledge of SbN
- Analyze the cost-benefit ratio of SbN as climate adaptation tools;
- Promote governance action
- Transfer and replicate the BNS

Impact on the construction sector

- Building Codes
- Climate adaptation
- Eduactional builings
- NBS enterprises
- Governance

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

OET DURIUS

Design of the Cross-border Ecological Observatory of the Duero-Douro Corridor to improve the connectivity and biodiversity of the territory

Sustainable and Healthy Cities and Mobility

Project information

- Call: (European Union/FEDER/Interreg POCTEP)
- Starting date. 01.01.2024
- End date. 31.12.2026
- Global Budget of the Project. 2.016.599,49 €
- Project coordinator. Fundación Santa María la Real
- Subcontracted entities and third parties. To be determined

Project description

The ultimate goal of this project is to protect and preserve the biodiversity of natural ecosystems and the environment of the selected territory (Duero-Douro corridor), also seeking to generate a shared strategy and innovative action plans for the transfer of governance solutions and for the management and connectivity of transboundary areas.

Project results

- Development of a joint, cross-border Green Infrastructure Strategy for the Durius priority ecological corridor.
- Increased percentage of population with access to new or improved green infrastructure in areas that are depopulated or susceptible to depopulation.

Impact on the construction sector

- Green infrastructure will be created in an urban area to promote connectivity and ecological coherence throughout the corridor.
- Urban areas reinforced with NBS that favor mitigation and adaptation to climate change.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

OMICRON
Intelligent Road Asset Management Platform

Towards a more automated and optimised maintenance, renewal and upgrade of roads by means of robotised technologies and intelligent decision support tools

Sustainable and Healthy Cities and Mobility

Project information

- Call: H2020-MG-2020-TwoStages
- Starting date: 01/05/2021
- End date: 30/06/2024
- Global Budget of the Project: 5M€
- Project coordinator: CEMOSA

Project description

The objective of OMICRON is the development of an Intelligent Asset Management Platform with a broad portfolio of area-specific innovative technologies to improve the construction, maintenance, renewal and upgrading of the European road network. This project will improve the entire asset management process by focusing on four pillars:

- The implementation of digital inspection technologies, including UAVs, ground vehicles and connection to C-ITS systems.
- The development of a Digital Road Twin.
- The constitution of a decision support tool for road infrastructures.
- The development of intelligent solutions for construction and ordinary and extraordinary maintenance activities in road infrastructures, making use of modular construction technologies, robotics, virtual reality or augmented reality.

Project results

- Development of inspection systems using drones.
- Development of a Digital Twin of the road.
- Development of a decision support system for maintenance.

Impact on the construction sector

- Improved safety.
- Reduction of maintenance costs.
- Reduction of maintenance impact on traffic.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Comisión Europea

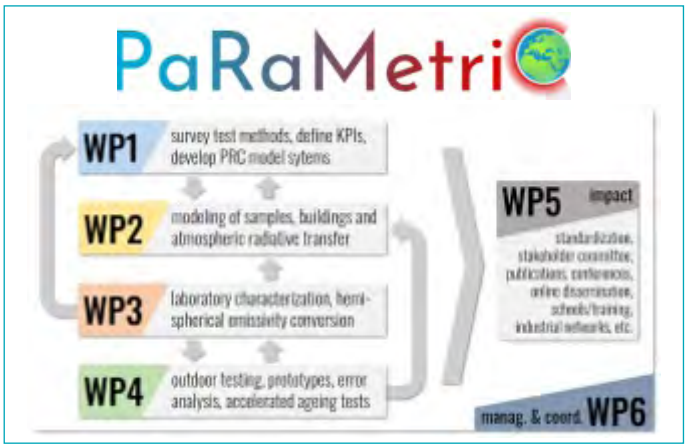
PaRaMetri

Metrological framework for passive radiative cooling technologies

Sustainable and Healthy Cities and Mobility

Project information

- EURAMET 2021 call - Metrology support for the Green Deal (GRD)
- 01/10/2022
- 30/09/2025
- 2.346.525,00 €
- Lorenzo Patelli (INRIM)



Project description

Passive Radiative Cooling (PRC) materials that can dissipate heat as infrared radiation can help improving the efficiency of cooling systems and addressing the global climate challenge. The overall goal of this project is to establish a metrological framework for comparable performance assessments of PRC technologies by: developing the conceptual framework for comparable performance assessments; developing and validating numerical models to correlate the cooling performance of PRC materials with the thermal and optical properties of their components; developing accurate approaches for determining the thermal properties of PRCs and for converting measured radiometric quantities into a usable form for heat balance calculations; developing setups and protocols for on-site testing of PRC materials; facilitating the take up of the technology and measurement infrastructure developed in the project.

Project results

- Protocols for reproducible measurement of adequate figures of merit
- Models for the performance of PRCs
- Accurate characterization of thermal and spectral properties
- Setups and protocols for on-site testing

Impact on the construction sector

- More focused development of new PRCs
- New market for PRC coatings; cooling energy savings; new job opportunities for renovating roofs
- Better thermal comfort, lower health impacts during heat waves.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Comisión Europea

Sustainability And Resilience for Infrastructure and Logistics networks

Sustainable and Healthy Cities and Mobility

Project information

- Call: HORIZON-CL5-2022-D6-02
- Starting date: 01/06/2023
- End date: 31/05/2024
- Global Budget of the Project: 3,98M€
- Project coordinator: Fraunhofer Gesellschaft

Project description

The SARIL Project aims to complement the classical definition of resilience (focused on hazard prevention, robustness and rapid system recovery) with environmental aspects. To this end, key indicators that quantify both the resilience of the system to disturbances and the environmental burden of freight transport are defined in close collaboration with a broad group of stakeholders.

Adopting three different scenarios at different geographical scales (regional, national and international/EU), different models are developed to capture the undisturbed operation of the system as well as the behavior in case of disturbance.

Project results

- Common framework for the assessment and management of resilience and sustainability of logistics networks.
- Recommendations for improving resilience and sustainability.

Impact on the construction sector

- Improved resilience of transport infrastructures
- Improved sustainability of transport infrastructure

Contact data

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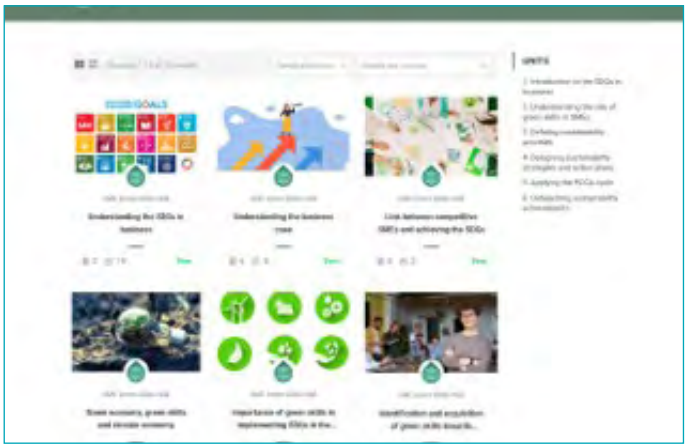
This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

SME Green Skills HUB

Support for the implementation of sustainable development goals in small and medium-sized businesses through vocational training

Sustainable and Healthy Cities and Mobility



Project information

- Call: ERASMUS+ programme
- Start date: September 2020
- End date: August 2023
- Budget: 399.245,00 EUR
- Coordinartor: INFODEF

Project description

SME Green Skills HUB is an Erasmus+ project aimed at assisting and guiding Small and Medium-Sized Enterprises in the implementation of the Sustainable Development Goals. For this purpose, it fosters green sectorial skills through innovative and new generation training methods using gamification and workplace learning pedagogies with the guidance of VET teachers, trainers, and mentors. SMEs experience sustainable change as a result, moving from transactional to transformational partnerships, exploring new methods and approaches to measuring impact or finding meaningful ways to collaborate with local communities.

Project results

- European Competence Framework
- Virtual Campus, with innovative training modules and professional online courses available to all stakeholders.
- Mobile assessment application.
- Guidelines with key tips and lessons learned to promote transparency and recognition of competences.

Impact on the construction sector

- Increase in the number of companies aligning their business strategies and/or their commitment to the SDGs
- Training programs made available to companies and VET entities to both improve their skills in sustainability and become more competitive.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

DIGITALIZATION

av-AI-lable

Ultra-High-Performance Concrete (UHPC) Materials selection by Artificial Intelligence (AI) and Machine Learning (ML)

av-AI-lable | TESELA | STAIRWAI | Funded by the European Union

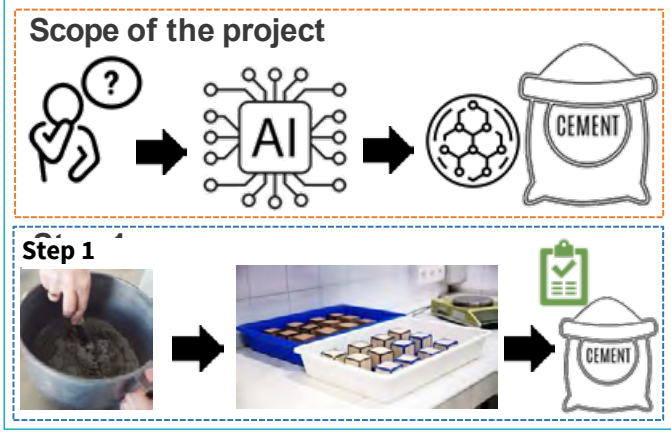
Digitalization

Project information

- Call: H2020-ICT-2020-2.
- STAIRWAI
- Starting date: 15.10.2023
- End date: 15.12.2023
- Global Budget: 10,000 EUR
- Project coordinator: TESELA

Project description

The av-AI-lable project aims to solve in 3 steps and just 1 click the precise design, characteristics, and performance of Ultra-High-Performance Concrete (UHPC) material mixtures using Artificial Intelligence (AI) and Machine Learning (ML). For that, different input variables (e.g., selection of raw materials, mixtures and/or particle size distribution) were used to determine mechanical properties (e.g., particle packing, compressive strength, and tensile strength), workability, durability, and rheological properties.



Project results

- Reduction of human skilled dependency and time-consuming experimental tests for creating new concrete materials.
- New tool which creates an easy choice of appropriate materials depending on their abundance and sustainable nature.

Impact on the construction sector

- Increase the digitalization of the building sector by the creation of data repositories.
- Improve the efficiency, sustainability and productivity of concrete companies during formulation tasks.

Contact data

- Gaspar Carrasco-Huertas, Ph.D. ; TESELA ; gasparcarrasco@teselainnova.com
- Eugenio Navarro ; TESELA ; eugenionavarro@teselainnova.com

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

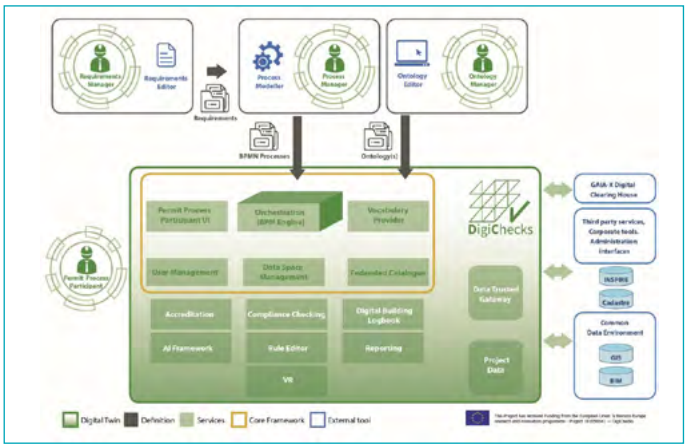
Comisión Europea

Digital environment for management of permits and compliance in building and construction

Digitalization

Project information

- Call: HORIZON-CL4-2021-TWIN-TRANSITION-01-10
- Starting date: 1st June 2022
- End date: 31st May 2025
- Global Budget of the Project: 6 532 900€
- Project coordinator: FCC Construcción
- Third parties: REALIA BUSINESS and i3B
- https://digichecks.eu/



Project description

The aim of DigiChecks is creating and demonstrating a new Digital Framework that allows interoperability and communication between platforms, based on technologies and international initiatives to facilitate the management of construction permits, including compliance checks.

DigiChecks proposes to build a digital framework that implements the following steps to overcome the challenges mentioned and pave the way to a more streamlined approach to manage and process permits:

Step 1: Standardized Permit Ontology

Step 2: Digitizing Permit Processes

Step 3: Building Permit Rules

Step 4: Integration of the previous steps into a Permit Service (API)

Project results

- Efficiency and productivity gains in design and construction process
- Fewer errors in planning
- Automated, faster, more accurate and more efficient permitting and compliance for construction works
- Contribution to relevant standards

Impact on the construction sector

- Increase of the efficiency of permits and compliance checks processes.
- Higher automatization of the processes. Mitigation of the time impact,
- Improvement in information quality

Contact data

- Project Coordinator: Elizabeth Rodríguez, erodriguezrod@fcc.es
- Technical Coordinator: Ignacio Rincón, Ignacio.rincon@fccco.com

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

DigiLab/BE

DigitalLab for the Built Environment: An Integrated Approach for Upgrading Digital Skills in Technical Education

Digitalization

Project information

- Call 2021-KA220-HED
- 01-01-2022
- 01-01-2025
- 399 590 €
- NTNU
- CTCON, UCN, UVA, SVHS, Ramboll

Project description

The Digilab/be project aims to create a user-friendly digital platform, accessible to both students and the public, where effective open educational resources can be found for acquiring the necessary competencies in the creation and use of digital twins.

This platform will teach people how to create, utilize, and benefit from digital twins in the building industry, a cutting-edge technology that's making waves in the 3D realm, scanning, and simulation fields from European and global industries.

Project results

- PR1: Handbook
- PR2: Building Digital Twin
- PR3: Virtual training with Digital Lab
- PR4: Updating Digital Twin
- PR5: Smartization of Digital Twin
- PR6: Debriefing Report

Impact on the construction sector

- Boosting new digital skills
- Implementing new technologies
- Creating new collaborative dinamics
- Improving digital integration
- Optimizing building performance

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

HABITABLE

Alliance of centres of excellence in vocational training for sustainable habitat

Digitalization

Project information

- Partnership for Excellence – Centres for Vocational Excellence ERASMUS EDU-2022-PEX-COVE
- 2023 JUNE
- 2027 MAY
- 4.998.387€
- AEICE Cluster of efficient habitat
- NO.

Project description

The Alliance of Centres of Excellence in Vocational Training for Sustainable Habitat project aims to respond to the skills shortage and mismatches caused by the digital and green transition in the Habitat sector. To this aim the project will develop innovative, learner-centred teaching methods, curricula on technical skills and key competences, and a system of certification for micro-credentials to up-and reskill adult learners and SME employees. A Platform of Centres of Vocational Excellence for Sustainable Habitat will be set-up building a skills ecosystem together with a wide range of local and regional partners, as well as centres of professional excellence in other countries.

Project results

- To lead the green and digital transition of the Habitat sector
- Implement a Habitat Skills Intelligence monitoring system.
- Provide labour market relevant skills.
- Design and apply digital tools and Extended Reality technologies to learn.

Impact on the construction sector

- Provide access to innovative curricula.
- Support the upskill and reskill of adult learners and SME employees.
- Implement a new system for the certification in the Habitat sector.
- Support career guidance.
- Create new spaces to facilitate international cooperation.
- Provide policy recommendations.

Contact data

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- https://habitable-cove.eu/

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Integrated Asset Management for Rail

Digitalization

Project information

- Call: HORIZON-ER-JU-2022-01
- Starting date: 01/12/2023
- End date: 30/11/2026
- Global Budget of the Project: 46M€
- Project coordinator: ADIF

Project description

The IAM4RAIL project focuses on seven different demonstrators for railway assets that are key pieces for research and innovation in the railway sector.

The integration of asset status information with the traffic management system (TMS), the analysis of available information with artificial intelligence (AI), and the development of Digital Twins are key topics for R&D&I in IAM4RAIL. Other topics, such as interventions with novel technologies like robotics or additive manufacturing, are considered relevant to improve asset management in the railway sector. IAM4RAIL seeks a cross-border, interoperable and holistic European approach to these (and other) topics in the framework of asset management, which will be transferred once developed to harmonize the European railway system.

Project results

- Development of degradation models for POT bearings in bridges.
- Development of an alarm system for earthworks.

Impact on the construction sector

- Improved bridge monitoring processes.
- Improvement of earthworks monitoring processes.
- Development of Digital Twins.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Digitalization

Project information

- Call (WP-call-topic): Research into optimised and future railway infrastructure
- Starting date: 01/01/2021
- End date: 31/12/2023
- Global Budget of the Project: 11M€
- Project coordinator: Trafikverket

Project description

The IN2TRACK3 project continues with the developments started during the IN2TRACK and IN2TRACK2 projects together with the demonstration of these developments in real environments and the creation of new complementary tools in the field of design, monitoring or renovation and rehabilitation of the railway system.

It aims to reduce life cycle costs, improve reliability and punctuality, increase capacity, enhance interoperability and improve customer experience. The structure of the work plan is designed around the development of a number of well-focused technological innovations in several areas (switches and crossings, superstructure and structures), each and every one of which will contribute to achieving the desired impact at the level of the entire rail system.

Project results

- Development of an aquatic inspection system for infrastructures using ROUVs.
- Development of a software for monitoring the structural health of bridges.

Impact on the construction sector

- Improved water inspection processes.
- Improved bridge monitoring processes.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Inherit

Next Generation Solutions for Sustainable, Inclusive, Resource-efficient and Resilient Cultural Heritage

Digitalization

Project information

- Call: HORIZON-CL5-2022-D4-02
- Starting date: 01/10/2023
- End date: 31/03/2027
- Global Budget of the Project: 5M€
- Project coordinator: Singular Logic

Project description

The overall vision of INHERIT is to create a systematic methodology, accompanied by cutting-edge information and communication technologies (ICT), such as Internet of Things (IoT), Artificial Intelligence (AI) and big data analytics, as well as associated social behavioral practices, towards sustainable, inclusive and resource-efficient cultural heritage solutions. INHERIT will enable socially innovative and economically viable interventions at both building, neighborhood and city levels, covering all relevant aspects of the heritage-built environment lifecycle.

Project results

- Social framework and knowledge for sustainable and inclusive heritage building.
- Methodology for the inspection and evaluation of heritage buildings.
- Catalog of solutions for the modernization of heritage buildings.
- Digital services for the design, renovation, monitoring, management and maintenance of heritage buildings.
- Data space for the “smartification” of heritage buildings.

Impact on the construction sector

- Facilitate and accelerate the renovation and conservation of heritage buildings.
- Encourage the efficiency, climate resilience and sustainability of heritage buildings.
- To promote “smartification”, accessibility and inclusiveness in heritage buildings.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

One step open DBL solution

Digitalization

Project information

- Call: HORIZON-CL4-2022-TWIN-TRANSITION-01
- Starting date: 01/01/2023
- End date: 31/12/2025
- Global Budget of the Project: 5,4M€
- Project coordinator: CETMA

Project description

OpenDBL seeks to develop an open solution for the digital building ledger on a single standardized platform through an open API as well as to create useful content to simplify the heavy workload of the AECO industry. The project has 3 specific objectives:

1) create a Digital Building Ledger with useful content and functionalities,

2) ensure that our Digital Building Book is usable and simple to reduce the time to load, search and use information and thus have a good adoption,

3) make it economically attractive through a value proposition and appropriate pricing.

Project results

- Open platform for the digital book of buildings
- Artificial intelligence-based tool for automating semantic interoperability
- Mobility application for intelligent quality control and data verification

Impact on the construction sector

- Encourage the digitalization of the construction sector.
- Encourage the interoperability of digital solutions in the construction sector.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Europe's Rail Flagship Project 4 - Sustainable and green rail systems

Digitalization

Project information

- Call: HORIZON-ER-JU-2022-01
- Starting date: 01/12/2022
- End date: 31/11/2026
- Global Budget of the Project: 38M€
- Project coordinator: ALSTOM

Project description

The Rail4Earth project aims to cover sustainable and environmentally friendly rail systems, including rolling stock, infrastructure, stations and all their related subsystems. The objectives are to significantly advance several families of Key Performance Indicators in different fields: technical, environmental, economic, standardization. Decarbonization of fuel trains, noise and vibration reduction, energy savings, circular economy, resource consumption, resilience to climate change and pandemic attacks, attractiveness of passenger trains constitute the core of the proposed project. The consortium carrying out the project is made up of partners of recognized prestige from the European field: operators, train and subsystem manufacturers, research and technology laboratories that will identify the precise needs of operators, implicitly including European public policies for sustainable transport, including Climate Neutral Europe by 2050.

Project results

- Solutions to turn stations and railroads into energy hubs
- Solutions for promoting eco-design
- Tools for smart green railway stations as digital twins for energy optimization.

Impact on the construction sector

- Improving the sustainability of railroads
- Create more attractive and resilient transport infrastructures.
- Contribute to green rail systems
- Improve the energy flexibility and resilience of smart grids
- Improved station energy management
- Increased consumption of renewable energies

Contact data

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- Noemi Jiménez Redondo, noemi.jimenez@cemosa.es

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

SEAMLESS-PV 1

Development of advanced manufacturing equipment and processes aimed at the seamless integration of multifunctional PV solutions, enabling the deployment of IPV sectors

Digitalization

Project information

- Call: H2020-LC-SC3-2018-RES-SingleStage
- Starting date: 24/09/2018
- End date: 24/03/23
- Global budget:11.3M € (UE:8,8M €)
- Projetc coordinator: TECNALIA
- Consotium: Mondragón Assembly, ONYX, COMSA, EU partners

Project description

SEAMLESS-PV drives the implementation of new integrated photovoltaic (IPV) solutions in different market sectors. The objective is to develop advanced manufacturing equipment, processes and digitalisation strategies focusing on glass-glass lamination as well as lightweight composite and polymer-based technologies.

Facing at real industrial environments and different market demands and opportunities, Seamless-PV sets up six pilot line levels and 11 different IPV demo cases across Europe, divided between integration in noise barriers (PVNB), buildings (BIPV), electric vehicles (VIPV), and agriculture (AGRI-PV).

Project results

- 6 pilot line levels and 11 different IPV demo
- advanced flexible automated PV equipment manufacturing based on high efficiency c-Si technologies,
- upscale of new manufacturing processes
- a set of IPV products (cost-competitiveness and market requirements and expectations).

Impact on the construction sector

- Flexible tabber-stringers to manufactures flexible BIPV module cells, with different PV technologies (HJT, Zebra,…)
- An equipment allowing the automatic bussing of customized BIPV modules and a new prelamination approach for customized IPV modules, among others

Contact data

- Daniel Valencia, daniel.valencia@tecnalia.com
- Eduardo Roman, eduardo.roman@tecnalia.com

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

SEAMLESS-PV 2

Development of advanced manufacturing equipment and processes aimed at the seamless integration of multifunctional PV solutions, enabling the deployment of IPV sectors

Digitalization

Project information

- Call: H2020-LC-SC3-2018-RES-SingleStage
- Starting date: 01/01/2023
- End date: 31/12/2026
- Global budget:16,9M € (UE:12,58M €)
- Projetc coordinator: TECNALIA
- Consotium: Mondragón Assembly, ONYX, BRANKA, EU partners

Project description

SEAMLESS-PV drives the implementation of new integrated photovoltaic (IPV) solutions in different market sectors. The objective is to develop advanced manufacturing equipment, processes and digitalisation strategies focusing on glass-glass lamination as well as lightweight composite and polymer-based technologies.

Facing at real industrial environments and different market demands and opportunities, Seamless-PV sets up six pilot line levels and 11 different IPV demo cases across Europe, divided between integration in noise barriers (PVNB), buildings (BIPV), electric vehicles (VIPV), and agriculture (AGRI-PV).

Project results

- 6 pilot line levels and 11 different IPV demo
- advanced flexible automated PV equipment manufacturing based on high efficiency c-Si technologies,
- upscale of new manufacturing processes
- a set of IPV products (cost-competitiveness and market requirements and expectations).

Impact on the construction sector

- Flexible tabber-stringers to manufactures flexible BIPV module cells, with different PV technologies (HJT, Zebra,…)
- An equipment allowing the automatic bussing of customized BIPV modules and a new prelamination approach for customized IPV modules, among others

Contact data

- Daniel Valencia, daniel.valencia@tecnalia.com
- Eduardo Roman, eduardo.roman@tecnalia.com

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

SHELTER

Sustainable Historic Environments hoListic reconstruction through Technological Enhancement and community based Resilience

Partners: tecnalia, TOWER, UnSMART, Red, gis, XUNTA DE GALICIA, LINKS, IHE DELFT, Nobatek INEF4, EURONET, AlphaConsult, LIÈGE, ekodenge

Digitalization

Project information

- Call: H2020 LC-CLA-04-2018
- Starting date: 1 Jun 2019
- End date: 31 May 2023
- Global Budget: 5.999.448,75€
- Project coordinator: TECNALIA
- Partners: UPV/EHU, Estudios GIS, Xunta de Galicia, U. Bologna, U. POLITO, U. Liege, U. Masarykova, UNESCO…

Project description

SHELTER project will develop a data-driven knowledge framework based on data used by scientists and heritage managers. The project will attempt to understand the direct and indirect impact as well as the risks of climate change on historic sites. It will also associate concepts used in risk management and climate change adaptations to cultural heritage efforts. Regional characteristics and different types of risks as well as social and economic conditions will be considered to incorporate climate resilience in cultural heritage management efforts with validation in five open-labs (3 Urban Open Labs –Italy, Turkey and Netherlands- and 2 Cross-border Open Labs – Sava River and Baixa Limia-Serra Do Xurés), representative of main climatic and environmental challenges in Europe and different heritage's typologies.

Project results

- Information models and databes
- Decision Support System about vulnerability and resilience
- Digital tool for citizens consultation
- Portfolio to improve Cultural Heritage buildings and sites' resilience

Impact on the construction sector

- Better and safer reconstruction in historic areas
- Enhanced resilience and reduced vulnerability of historic areas
- Digitalization of the historic areas life cycle.

Contact data

- Project Coordinator: Aitziber Egusquiza, aitziber.egusquiza@tecnalia.com
- Project Website: https://shelter-project.com/

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme
Comisión Europea

SOCIAL IMPACT OF CONSTRUCTION

Build Up Skills. The construction sector towards 2030

Social Impact of Construction

Project information

- Life Clean Energy Transition
- 01/11/2022
- 01/05/2024
- 1,193,904.67 €
- Fundación Laboral de la Construcción – FLC

Project description

The *overall objective* is to address the skills needed in construction for the energy transition, the creation of zero-energy buildings and awareness of resource efficiency. All this with the new situation offered by the sector in the midst of technological change, digital support, efficient resources, renewable energies adaptation to new technologies, less use of fossil resources and the lack of professionals (inclusion of women and young people).

Two additional specific objectives have been established:

- Relaunching of the Construction Platform meeting point for all the related agents of the Sector
- Updating of the Status Quo and Development of the Roadmap

Project results

- Construction Platform meeting point
- Status Quo Analysis
- Roadmap of training

Impact on the construction sector

- Reference space on training topics for the construction sector
- Training needs evaluation of the construction sector to achieve energy performance of buildings to the 2030 European objectives

Contact data

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- Esther Rodríguez, esrodriguez@fundacionlaboral.org

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

SUSTAINABUILD

Interdisciplinary Digital Skills for Sustainable Construction

UNIVERSITY COLLEGE OF NORTHERN DENMARK · HOGESCHOOL PXL · samk · ctcon Centro Tecnológico de la Construcción · Erasmus+

Social Impact of Construction

Project information

- Erasmus+ Call 2024 Round 1 KA2
- 10/01/2022
- 09/01/2025
- 275,982 €
- University College of Northern Denmark (UCN)
- Other partners: PXL, SAMK & CTCON

Project description

SUSTAINABUILD has the aim of increasing the awareness and disseminating knowledge regarding the sustainable development goals (SDGs) and European Union (EU) taxonomy in the construction industry. This will be done via the free distribution of an analytical framework, a University course and a manual for practitioners. The target audience of the project is mainly classified into companies, academia, public bodies and citizens. The SDGs were approved by the General assembly of the United Nations in 2015 and became implemented as a part of Agenda 2030. Since then, nations worldwide have applied the goals in their policies. Specifically, the EU has launched many policies approaching the different parts of SDGs, as other frameworks as the EU taxonomy and the Green Deal.

Project results

- Analytical Framework about the SDGs in the construction industry
- University Course
- Manual for practitioners
- Dissemination events

Impact on the construction sector

- Higher knowledge about different worldwide and European sustainability frameworks.
- Better implementation of sustainability practices by the industry, academia and public bodies.

Contact data

- UCN: Aysar Dawod Selman adse@ucn.dk
- CTCON: Roberto Rodríguez Álvaro rrodriguez@ctcon-rm.com

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Comisión Europea

INDUSTRIALIZATION

AEGIR

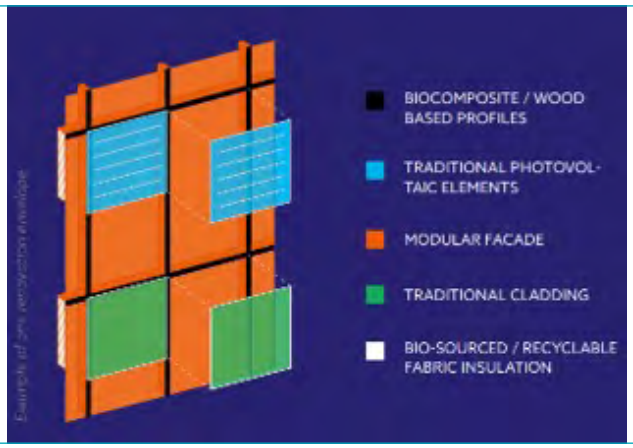
DigitAl and physical incrEmental renovation packaGes/systems enhancing envIronmental and energetic behaviour and use of Resources

Materials | Components | Systems | Digital | Design | Construction | Demos | Associations Dissemination | RTOS

Industrialization

Project information

- Call: HORIZON-CL5-2021-D4-02-02
- Starting date: 1 Oct 2022
- End date: 30 Sep 2026
- Global Budget: 13.790.078 €
- Project coordinator: TECNALIA
- Partners: UXAMA, BEEPLANET, COMSA, IDP, Env. Arq. ENAR, Ing. Cruz Marqués, Ayt. Malgrat de Mar…



Project description

AEGIR main objective is to demonstrate a physical and digital sustainable framework that boosts the take up of deep retrofitting achieving nearly zero energy buildings. This approach is supported by (i) innovative, industrialized, high performance and non-intrusive multifunctional plug-and-play envelope solutions to increase the use of locally deployed renewable technologies. (ii) A digital ecosystem of services to improve the whole construction workflow (from design, manufacturing, construction, and operation) reducing costs with a sustainable approach. And (iii) a socio-economic model providing financial schemes and business models at building scale. The project will be demonstrated in four different climates: Spain, France, Denmark, and Romania).

Project results

- Industrialised deep renovation solution, which integrates:
  - Thermal and acoustic insulation
  - Ventilation
  - Renewable energy sources
- Ecosystem of digital services

Impact on the construction sector

- Reduced energy and resources consumption and carbon footprint
- Reduced execution time and inconvenience to users
- Improved quality of interventions
- More cost-effective interventions

Contact data

- Julen Astudillo, julen.astudillo@tecnalia.com
- Project website: https://aegirproject.eu

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Comisión Europea

BEEYONDERS

Breakthrough European tEchnologies Yielding cOnstruction sovereigNty, Diversity & Efficiency of ResourceS

Industrialization

Project information

- Call: HORIZON-CL4-2021-TWIN-TRANSITION-01-12
- 21 partners from 9 countries
- Project budget: € 8 million
- Cooperation between Europe and Japan
- 6 demonstrators in 4 countries

Project description

Demographic trends in Europe are posing a challenge to the construction sector, which is facing labour shortage, and an aging existing workforce. This can be addressed through the integrated adoption of breakthrough technologies, e.g. autonomous vehicles, collaborative robotics, additive manufacturing, smart wearables, digital twin, and artificial intelligence, which can help to get construction tasks done with more efficacy, while at the same time making the sector more attractive to young people, and improving the safety, productivity, quality and environmental impact of construction projects. BEEYONDERS will take a leap forward in the design, development, and integration of these breakthrough technologies in real construction scenarios, bringing together the capabilities of European stakeholders, thus also demonstrating how the dependency on technology import from outside Europe can be reduced. Solutions will be developed for supporting the integration of autonomous and tele-operated, ground and aerial robotic platforms and heavy equipment in harsh environments. Innovative additive manufacturing solutions will be developed for resource optimization and for protection of biodiversity in maritime works. Safety, wellbeing, and training of workers will be improved through the development of exoskeletons, advanced wearables, and learning resources supported by XR technologies. A Digital Twin enriched with AI-based layers for decision-making will support seamless integration and management of all Project technologies. These will be tested and validated in 6 demonstration case studies covering different project typologies: tunnels, earthworks for road construction, buildings, maritime infrastructures, and road maintenance. BEEYONDERS impact will be evaluated both from the point of view of users? acceptance (e.g. benefits for aging workforce, attraction of young workers, contribution to gender balance in construction) and environment(e.g. LCA & LCC applied to all project).

Project results

- Integration in construction of pioneering technologies: autonomous vehicles, human robot collaboration, additive manufacturing, wearables, exoskeletons and autonomous maintenance.
- Demonstration of the impact of the use of these new pioneering technologies on the efficiency of resources (raw materials, water, etc.), the reduction of waste and embedded CO_2 emissions.
- Demonstration of the safety of the new technologies in a construction environment, in cooperation with workers.
- Reduced dependence on imported technologies related to additive manufacturing, human robot collaboration or autonomous vehicles.
- Increase in the wellbeing of the construction workforce involved.

Impact on the construction sector

- 11 % Less C02 emissions by the construction sector
- 14 % Improvement of efficiency in production
- 20 % Increase in workers' endurance
- 50 % Reduction in sick leave due to lower back injuries

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

BIPVBOOST

Bringing down costs of BIPV multifunctional solutions and processes along the value chain, enabling widespread nZEBs implementation

Industrialization

Project information

- Call: H2020-LC-SC3-2018-RES-SingleStage
- Starting date: 24/09/2018
- End date: 24/03/23
- Global budget:11.3M € (UE:8,8M €)
- Projetc coordinator: TECNALIA
- Consotium: Mondragón Assembly, ONYX, COMSA, EU partners

Project description

Integrating photovoltaics into parts of the building envelope such as the roof and facade could transform a city's carbon footprint, significantly reducing its reliance on grid electricity generated by burning fossil fuels. Despite the potential of building-integrated photovoltaics, their market uptake is limited because the photovoltaics industry has failed to provide holistic solutions that could **meet the energy target set by the EU.** The EU-funded **BIPVBOOST** project plans to develop technical solutions to foster the application of building-integrated photovoltaics. The project will seek to achieve significant cost reduction of the technology, while maintaining flexibility of design, high performance, long-term reliability, design aesthetics, standardisation and compliance with legal regulations.

Project results

- 17 new BIPV cost-competitive solutions
- Demostration of solutions in 4 buildings
- Padvanced BIPV manufacturing
- Digitalisation along the BIPV value chain
- Standarization/ Qualification of BIPV systems

Impact on the construction sector

- New multifunctional BIPV construction solutions that are amortizable and at competitive prices.
- Standardization of these new elements.
- Digital processes: design, manufacturing and installation based on BIM, BEMS,…
- Reduction of carbon footprint and energy independence of buildings and cities.

Contact data

- Daniel Valencia, daniel.valencia@tecnalia.com
- Eduardo Roman, eduardo.roman@tecnalia.com

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

CALSILAM

Additive Manufacturing of Calcium Silicate Hydrate monoliths for sound and thermal insulation pannels

CALSILAM TESELA metabuilding Funded by the European Union

Industrialization

Project information

- Call: H2020 INNOSUP-01-2018-2020
- METABUILDING.
- Starting date: 01/09/2022
- End date: 01/04/2023
- Global Budget of the Project: 60,000 EUR
- Project coordinator: TESELA
- Partners: PRINT4D & CETIM

CALSILAM
Laboratory 3D printer

CALSILAM
Industrial 3D printer

Project description

The current wall construction methods rely on a multi-layering system, where the different materials are stacked together (either bonded together or not bonded) to achieve a specific requirement in terms of structure, sound insulation, thermal bridges or resistance.

CALSILAM project aims to solve this problem using an innovative material developed that have good thermal and sound insulation properties (all-in-one). For achieve that, silicate-based materials and different 3D printing systems (small and large scale) are used to study the industrial manufacturing of insulation pannels.

Laboratory 3D printed sample

Industrial 3D printed sample

Project results

- 3D printable formulation.
- Formulation with good properties in terms of shrinkage, density & strength at different days.
- Effective solution in terms of sound absorption & thermal conductivity.

Impact on the construction sector

- Expand the potential of sound and thermal insulating composite materials.
- Decrease by 50% the multi-layer wall thickness by a unique single layer.
- New approach to the 3D printing process for construction projects.

Contact data

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- Eugenio Navarro ; TESELA ; eugenionavarro@teselainnova.com

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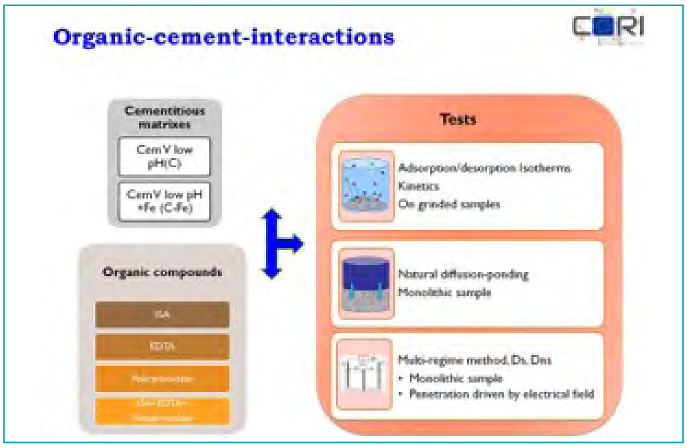
EURAD

European Joint Programme on Radioactive Waste Management

Industrialization



Project information

- NFRP-2018-6
- 01/06/2019
- 31/05/2024
- 59.922.246,61 €
- IETcc-CSIC - third parties

Project description

Implement a joint Strategic Programme of research and knowledge management activities at the European level, bringing together and complementing EU Member State programmes in order to ensure cutting-edge knowledge creation and preservation in view of delivering safe, sustainable and publicly acceptable solutions for the management of radioactive waste. The main activities of EURAD will consist of RD&D activities aiming at developing and consolidating S/T knowledge of the EURAD Strategic research Agenda and Roadmap. IETcc-CSIC participate in the RD&D: “Improved understanding of the role off organics (either naturally occurring or as introduced in the wastes and their influence on radionuclide migration in cement based environments)”

Project results

- Understanding organics degradation and retention processes in the binary organics-cement and ternary radionuclide-organics-cement systems.

Impact on the construction sector

- Organic materials are present in some nuclear waste and as admixtures in cement-based materials and can potentially influence the performance of a geological disposal system, especially in the context of low and intermediate level waste disposal.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

MASS-IPV

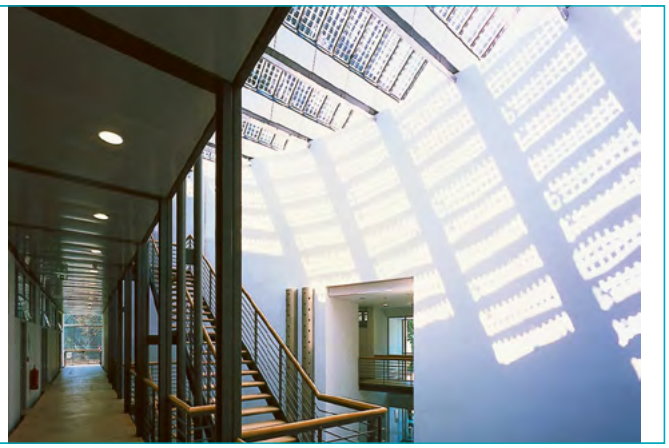
Enabling Massive Integration of PV into Buildings and Infrastructure

Fraunhofer tecnalia cidetec Alucoil EnerBIM silla OverEasy IB Cross Cultural Consulting Sagl
BuGG IZPITEK BRANKA sunthalpy iwin NTNU Stratagem
BIPV PROJECTS BV SUPSI agenzia per l'energia e lo sviluppo sostenibile TULIPPS madaster BIPV.world

Industrialization

Project information

- Call: Horizon-CL5-2023-D3-01
- Starting date: 27/09/2023
- End date: 31/10/2027
- Global budget: 8,67M € (UE:7,19M €)
- Projetc coordinator: Fraunhofer
- Consotium: TECNALIA, CIDETEC, Izpitek, Alucoil, Branka, Sunthalpy, EU Partners



Project description

Breaking barriers to mass integration of photovoltaics into buildings and infrastructure.

Meeting European climate targets demands a dramatic surge in renewable energy adoption. While photovoltaic (PV) costs have dropped, integrated PV (IPV) remains a niche market due to persistent barriers. In this context, the EU-funded MASS-IPV project brings together key players to demonstrate how innovative tools and technologies can pave the way for the mass integration of cost-effective IPV systems into buildings and infrastructure. Specifically, the project will showcase the potential of multifunctional and cost-effective IPV systems through five different construction projects. The initiative represents a crucial step towards achieving a dramatic rise in renewable energy implementation, bringing us closer to our climate protection goals.

Project results

- 15 new BIPV cost-competitive solutions
- Demostration of solutions in 5 buildings
- Advanced BIPV manufacturing
- Digitalisation along the BIPV value chain
- Standarization/ Qualification of BIPV systems
- Collaborations between PV and construction sectors

Impact on the construction sector

- Solarization of building envelope products
- Easy-installation and easy-maintenance solutions
- Digitalization (digital tools, BIM, IPV planing, IPV monitoring & diagnosis)
- Enhance the sustainability of IPV value chains (European Green Deal)

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme
Comisión Europea

SUSTAINABLE MATERIALS AND CIRCULAR ECONOMY

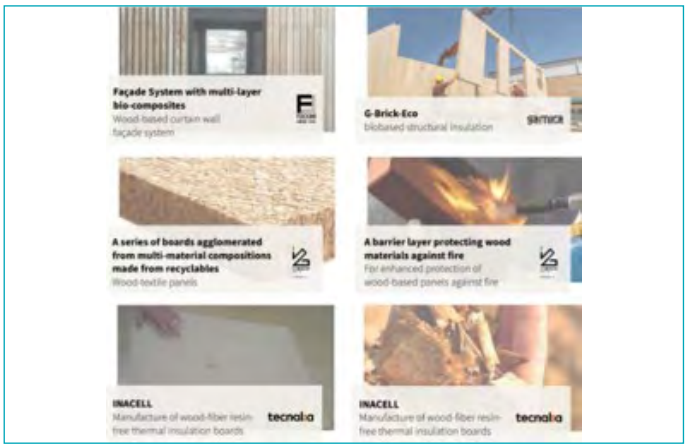
BASAJAUN

Building A SustainAble Joint between rurAl and UrbaN Areas Through Circular And Innovative Wood Construction Value Chains

Sustainable Materials and Circular Economy

Project information

- Call: H2020 LC-RUR-11-2019-2020
- Starting date: 1 Oct 2019
- End date: 31 Mar 2024
- Global Budget: 12.287.506,91€
- Project coordinator: TECNALIA
- Partners; IRURENA, GARNICA, Env. Arq. ENAR, AIMPLAS, BASKEGUR…



Project description

The EU-funded BASAJAUN project will bring together wood transformation companies, research organisations, associations and public bodies to maximise forest value through its use in wood construction. Stakeholders in urban areas will also be integrated via a thematic platform.

Overall, the project will focus on optimal utilisation of wood forest resources for the construction of a four-storey apartment building. The project will also undertake the digitalisation of the construction value chain, from forest to buildings. For this purpose, innovative wood-based construction materials (thermal insulation, composites, varnishes, SIPs) and systems (structure, facades, floors, walls, roof and fixings) will be developed and upscaled,

Project results

- G-Brick-Eco, structural insulation panel (plywood and eco-insulation material)
- Wood-based curtain wall façade system
- Thermoplastic composite sheet
- Wood Pulp Panels

Impact on the construction sector

- Increased resource and/or energy efficiency
- Industrialization of the construction sector
- Digitalization of ‘forest to building’ value chain
- Mitigation of anthropogenic GHG emissions
- Reduction of the carbon footprint of buildings
- Enhanced connectivity of rural-urban areas

Contact data

- Project Coordinator: Javier García Jaca, javier.garciajaca@tecnalia.com
- Project Website: https://basajaun-horizon.eu/

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

An Innovative Circular Economy Training based on BIM and LCA technologies applied to the Construction Industry

ctcon Centro Tecnológico de la Construcción · Universidad Politécnica de Cartagena · Universitatea Tehnică din Cluj-Napoca · evozon · Østfold University College

Sustainable Materials and Circular Economy

Project information

- Erasmus+
- 01/09/2022
- 31/08/2024
- 250.000,00 €
- Ostfold University College
- CTCON, UPCT, Universitatea Tehnica Cluj-Napoca and Evozon

Project description

The general aim of this project is to build skills for future construction actors, higher education students now, so that they may become drivers of change for the construction sector towards a sustainable construction model that uses natural and recycled materials, reducing the environmental impact and thus meeting the objectives of EU directives and member countries' plans. The main project objective goes totally in line with the horizontal priority "Environment and fight against climate change".

Project results

- A web app based on construction material circularity, LCA and BIM
- An educational program on sustainable building and C&D waste management

Impact on the construction sector

- More sustainable construction industry
- Producing less waste
- Consuming less energy
- Reusing and recycling materials

Contact data

Marina Sánchez Rubio – Sustainable Construction and Climate Change Area
msanchez@ctcon-rm.com – +34 968 35 52 70

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme
Comisión Europea

CARDIMED

Climate Adaption and Resilience Demonstrated in the MEDiterranean region

Sustainable Materials and Circular Economy

Project information

- HORIZON-MISS-2022-CLIMA-01-06
- 01/09/2023
- 01/03/2028
- 19.971.411,25 €
- National Technical University of Athens (NTUA)

CARDIMED
CLIMATE ADAPTATION AND RESILIENCE DEMONSTRATED IN THE MEDITERRANEAN REGION

Funded by the European Union

Project description

The CARDIMED project aims to instigate systemic transformations for climate resilience in the Mediterranean region, unifying and integrating all initiatives addressing climate adaptation and mitigation through Natural Based Solutions (NBS) and other engineering infrastructures. To achieve this goal, it will provide both the underlying structural framework and the network of 9 Demonstrator (DEMO) clusters that will form a critical mass for replication, transferability, and scaling up. The project will implement, test, and demonstrate circular and nature-based solutions that foster digital, social, and systemic transformation. CARDIMED aims to connect over 28 MED regions and more than 70 communities through demonstration and replication strategies, effectively integrating NBS into systemic resilience building.

Project results

- CARDIMED demonstrates various innovative NBS for digital and socio-ecological transformation
- It provides digital tools in multiple languages to promote adoption of impactful NBS measures with quantified impacts
- CARDIMED showcases the sustainability of intensified Constructed Wetlands (CWs) for water treatment and reuse
- WEFE nexus model will provide a comprehensive tool to evaluate NBS and engineering solutions.

Impact on the construction sector

- Climate Resilience: Assist 150+ European regions by 2030 in becoming climate resilient
- Demonstrations: Conduct 75 large-scale projects integrating technical methods and nature-based solutions
- Climate Risk Management: Aid European regions in understanding, preparing, and managing climate risks.

Contact data

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- Fernando Fernández, ffernandez@ctcon-rm.com

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Comisión Europea

Exploit4InnoMat (E4IM)

An open Innovation Ecosystem for exploitation of materials for building envelopes towards zero energy buildings

Instituto de Ciencias de la Construcción EDUARDO TORROJA

Sustainable Materials and Circular Economy

Project information

- Call: HORIZON-CL4-2022-RESILIENCE-01.A DIGITISED, RESOURCE-EFFICIENT AND RESILIENT INDUSTRY 2022
- Starting date: 01/01/2023
- End date: 31/12/2026
- Global Budget of the Project. 11,340,890.38
- Project coordinator: UNI SYSTEMS SYSTIMATA PLIROFORIKIS MONOPROSOPI ANONYMI EMPORIKI ETAIRIA (UNIS),
- Subcontracted entities and third parties: IETcc-CSIC, ICV.

Project description

Building sector is responsible for 40% of energy consumption and 36% of CO_2 emissions in the EU. As nZEB becomes the new standard, the role of building materials and smart envelope systems is becoming more and more important. Exploit4InnoMat (E4IM) OITB will make available a high-end Open Innovation Testbed network for building envelopes including roofs and facades, enabling the replication of prototypes in different buildings taking into consideration the trade-offs between the three sustainability pillars, the life cycle stages as well as their impacts. End-User Market Needs for low-cost, flexible, on demand material-based solutions, which will be assessed through an extensive partnership knowledge on materials characterization and modelling, monitoring and process control, environmental and assessment, regulatory and standardization, social acceptance and innovation management, realizing for nZEB solutions. In order to achieve this target a wide range of expertise has been brought to the OITB covering fields such as Open Innovation Testbeds for nano enabled cement, non cement premixes and ceramics, advanced coatings and glazing solutions loaded with aerogel, fibers, PCMs and other nanomaterials providing multifunctional properties; pilot lines for nanodispersion, 3D printing and roboting spraying; as well as a network of four real scale living laboratories for nZEB technologies evaluation, will facilitate a realization tool for developing close to market technological solutions. Additionally, a semi-automated tool combining BIM analysis, fast track modelling and simulation will make enable a digital tool for utilizing building blocks (structural, solar thermal and BIPV) in order to create a harmonized and aesthetically pleasing urban environment. The consortium of E4IM are constituted by 27 partners. CSIC is leader of pilot line (PL) 6, “Advanced Ceramics”. This PL will be able to produce new formulations of ceramic materials for building envelopes by incorporation of different types of industrial waste: ash, slag, paper, urban waste, construction and demolition waste and nanoparticles as a coating in order to improve the thermal properties of new material.

Project results

- Density: < 800 kg/m3
- Flexural Strength: > 0.8 MPa
- Compressive Strength: > 4.9 MPa
- Thermal Conductivity: < 0.2 W/mk
- Water absorption: < 2 kg/m^2

Impact on the construction sector

- Reduce CO_2 and carbon footprint
- Improve termal insulation properties
- Reduce energy consumption and costs of raw material
- Increase the porosity of bricks by adding wastes

Contact data

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- Moisés Frías, mfrias@ietcc.csic.es
- Silvia Gómez, silvia.gomez@csic.es

Plataforma Tecnológica Española de Construcción

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

FREEDOM

Solving treatment of wastewater sewage sludge with new HTL technology to produce hydrocarbons, asphalts and fertilizers

Sustainable Materials and Circular Economy

Project information

- LIFE 2019 ENVIRONMENT
- 01/10/2020
- 30/09/2024
- 4.397.563 €
- Fabio Cella (AGRO).
- CSIC, CAP, Caffù, MONDO, SYNGEN, UNIPV.

Project description

The project proposes an ecological alternative to the disposal and management of sewage sludge produced by wastewater treatment. The general objective of the LIFE FREEDOM project is to apply at demonstration level hydrothermal liquefaction as innovative and reliable technology for the treatment of sewage sludge and the production of useful materials of widespread industrial use by installing a HTL plant at an urban WWTP. The starting level of readiness of the project is TRL 6 and, at the end of the project, it is expected to reach TRL 9 (ready for marketing), ie a very close to market project. However, two aspects can be considered at a lower TRL (TRL5) and concern the production of phosphorus and use of the mineral fraction in the Construcción industry .

Project results

- To upcycle the mineral fraction from sludge into advance inorganic materials with diverse applications, in particular cementitious materials that reduce ecological impacts associated with Portland cement manufacture.

Impact on the construction sector

- A full-scale HTL reaction sludge transformation pilot plant has been built and connected to a medium-sized municipal treatment plant.
- The inorganic mineral fraction is used for the production of cement is mixed with substitution levels of up to 10%.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

hermETICS

Lightweight Autohealing Mortars for External Thermal Insulation Building Systems

Funded by the European Union

Sustainable Materials and Circular Economy

Project information

- Call: H2020-INNOSUP-1. AMULET
- Starting date: 20/07/2022
- End date: 31.10.2024
- Global Budget of the Project: 120.000 EUR
- Project coordinator: TESELA
- Partners: GATIM & CHEMICAL BUILDING PROJECT

Project description

The hermETICS project consists of the development and upscaling of auto-healing base mortars for External Thermal Insulation Building Systems (ETICS). For this challenge, End Life Tyres (ELT) residues are used to ensure lightweight characteristics in combination with auto-healing materials which provides by autogenous healing mechanism the fixing of early-cracks in the mortar used in the ETICS.

Project results

- Reduce Stone aggregates (40 %) by incorporating recycled tyre waste.
- Obtain auto healing mortar with low cost and high sustainability.
- Reduce the density of actual mortars (33%) & increase the insulating power.

Impact on the construction sector

- Increase the durability and sustainability of ETICS mortars.
- Reduce carbon footprint of the mortar material up to 51 %.
- Incorporation of by-products in the value chain of building sector.

Contact data

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- Eugenio Navarro ; TESELA ; eugenionavarro@teselainnova.com

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Increasing circularity in process industries by upcycling secondary resources

Sustainable Materials and Circular Economy

Project information

- Call: HORIZON-CL4-2023-TWIN-TRANSITION-01-42
- 18 partners of 7 countries
- Project budget: over 9,5 Million €
- 3 demonstrators:
  - Upcycling of Lithium Aluminosilicate Residue (LAR), from the extraction of Lithium
  - Upcycling of SRMs from urban waste cellulose
  - Upcycling of steelmaking slags into alternative raw materials for the construction sector

Project description

The ICARUS innovation project, coordinated by ACCIONA's Construction business, framed within the Horizon Europe program of the European Union, is based on the recycling of waste materials from various processing industries. The objective is to introduce waste materials into the construction sector, promoting the circular economy and sustainable development. Furthermore, the project represents a significant advance in the research and demonstration of technologies aimed at improving secondary raw materials, guaranteeing a quality similar to that of the original raw materials. To validate these new technologies, three cases of application of this waste in construction will be carried out: recycling of mineral waste from lithium extraction and refining; recycling of steel slag through carbon capture and storage; valorization of cellulosic waste from wastewater treatment plants and superabsorbent waste, where ACCIONA's Water business will actively participate. The ICARUS project will provide technological support to energy-intensive industries, also high consumers of raw materials and generators of waste, since they are key to promoting the transition towards greener and digital processes. The project seeks standardization to promote a resilient, ecological and digital single market, where sustainability in resource management is key. The circular economy in the construction sector is still in an early phase, with an estimated circularity rate of 12.4% in 2021 in the European Union. Addressing the problem of resource availability for the infrastructure sector, and as responsible for 50% of the total extraction of materials and more than 35% of waste flows in the European Union, the ICARUS project is positioned as a step decisive towards sustainable transformation, determinedly facing these current challenges and leading the way towards a greener future. ACCIONA's participation in this project reaffirms its commitment to sustainable innovation, leading the implementation of solutions for a circular economy in constant evolution.

Project results

- New technologies and processes to recycle raw materials in three demonstration cases, developing digitalization, facilitating data interoperability processes and optimizing cost-effective technologies and their gaps towards a green and digital transition.
- Demonstration of the technical and economic feasibility of the use of secondary industrial resources that lead to construction products with properties and performances identical to those produced using primary resources.
- Digital tools for monitoring and process optimization.

Impact on the construction sector

- Recycling (upcycling and downcycling) of secondary raw materials for construction applications contributing to circular and sustainable economy supported by digital tools.
- Increase the use of secondary resources in the process industry leading to significant increase in resource efficiency across the value chain and subsequent reduction of CO_2 emissions.
- Reduction of waste sent to landfills and an overall positive environmental impact.
- Increase the level of circularity within the construction and process industries, which will have economic and environmental benefits.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

IMIP

Innovative eco-construction system based on interlocking modular insulation wood & cork-based panels

Sustainable Materials and Circular Economy

Project information

- Interreg Sudoe program 2020-2027. SOE3/P3/E0963
- Start date: 01/05/2020
- End date: 30/04/2023
- Total budget: 1.326.162,88 €, FEDER funding 994.622,63 €
- Project leader: Universidad Politécnica de Valencia

Project description

IMIP aims to support the shift towards a low-carbon economy through smart, sustainable and inclusive growth with a special focus on the construction sector. The project contributes to climate change mitigation by increasing the use of wood and cork products in the construction and renovation of public buildings thanks to their high energy efficiency and carbon storage capacity. IMIP promotes the circular bio-economy through the design of a new construction system based on prefabricated modular pieces characterised by their easy, quick and economical assembly and disassembly for reuse. The source of raw material is low-quality wood available in Mediterranean pine forests and cork. In addition, it has developed a plug-in for modelling carbon stocks and the substitution effect of wood products using BIM methodology.

Project results

- Design of innovates wood-cork Panels.
- Construction of 4 pilot action using IMIP panels.
- Representative solutions simulation using Virtual Reality
- Develop of plug-in for BIM incorporating life-cycle benefits such as carbon stock.

Impact on the construction sector

- Good practice guidelines to improve energy efficiency in buildings through local bio-resources.
- New Wood panels solutions.
- Virtual simulation of solutions for product decision making.
- Carbon stock in interlocking panels for BIM.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

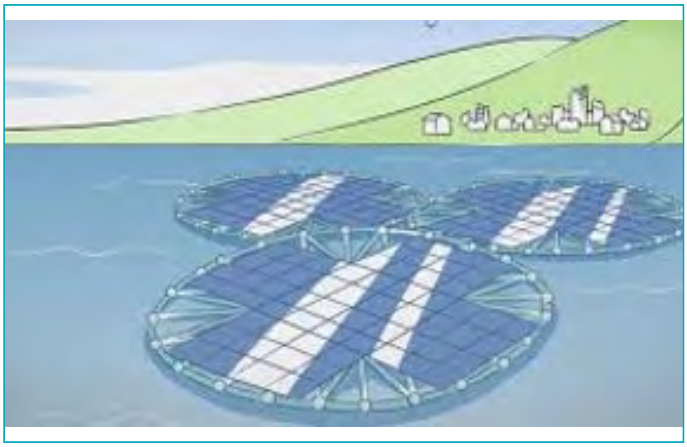
NATURSEA-PV

Novel eco-cementitious materials and components for durable, competitive, and bio-inspired offshore floating PV substructures

Sustainable Materials and Circular Economy

Project information

- Call: HORIZON-CL5-2021-D3-03
- Starting date: 1 Nov 2022
- End date: 31 Oct 2026
- Global Budget: 3.621.694,10€
- Project coordinator: TECNALIA
- Partners: UPV/EHU, CSIC, Prefabricados FORMEX, MARIN, U. Bordeaux, U.C. Cork, TU Darmstadt, Warran Hub and IST-ID.



Project description

NATURSEA-PV project will develop innovative structural designs capable of handling marine conditions, ensuring durability and minimising (un)installation costs. NATURSEA-PV will improve the overall lifetime, reliability and maintainability of marine substructures for offshore floating PVs and reduce LCOE by using newly developed, environmentally friendly, low-carbon ultra-high-performance concrete. The project will also create a specific predictive simulation toolkit to evaluate mechanical and chemical durability of the new materials. Finally, project partners will collaborate with associations, public bodies and regulators to assess the implementation barriers and potential socio-economic and environmental impact, propose corrective measurements and ensure social acceptance.

Project results

- Innovative structural designs
- Environmentally friendly low carbon ultra high performance concrete, coated with new biobased antifouling and anticorrosive coatings.
- Predictive simulation toolkit

Impact on the construction sector

- Floating PV in offshore environments
- Improvement of the overall lifetime, reliability, and maintainability of marine substructures for offshore floating PVs
- Reducing its LCOE (Levelized Cost of Energy)

Contact data

- Project Coordinator: Edurne Erkizia, edurne.erkizia@tecnalia.com
- Project Website: https://www.natursea-pv.eu/

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

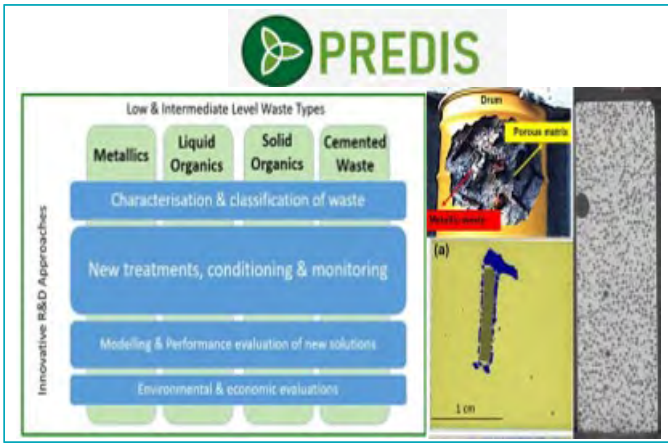
The Predisposal management of radioactive waste

47Partners from 17 EU countries

Sustainable Materials and Circular Economy

Project information

- H2020-NFRP-10-2019-2020
- Sep. 2020
- August. 2024.
- 23.1M€, EU contribution 14M€.
- VTT (Finland)
- https://predis-h2020.eu/.



Project description

For radioactive waste to be safely disposed of, certain requirements need to be met for its management prior to disposal. With this in mind, the EU-funded PREDIS project has been developing and carrying out activities for the pre-disposal treatment of low and intermediate radioactive waste. The PREDIS project develops and increases the Technological Readiness Level of treatment and conditioning methodologies for wastes for which no adequate or industrially mature solutions are currently available, including metallic materials, liquid organic waste and solid organic waste. PREDIS project has developed innovative cement matrices for encapsulation/immobilization in cemented waste forms for handling and pre-disposal storage by testing and evaluating.

Project results

- Portland & one-part geopolymer cement matrices to immobilise spent ion exchange resins & molten salts. Leaching risk in simulated cementitious waters, deionised waters and site disposal waters (Cabril).
- Immobilisation of metals in magnesium phosphate cements.

Impact on the construction sector

- Design of Smart cementitious matrices for immobilisation of wastes
- Validation of long-term durability performance in aggressive environments

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

RECONMATIC

Automated solutions for sustainable and circular construction and demolition waste management

Sustainable Materials and Circular Economy

Project information

- Call: HORIZON-CL4-2021-TWIN-TRANSITION-01-11
- Starting date July 2022
- End date June 2026
- Budget: 9.549.591,00 EUR
- Coordinator: Czech Technical University

Project description

The main goal of RECONMATIC is to develop automated tools and digitalised processes in order to mitigate and reduce Construction & Demolition waste, and to foster higher added value reuse of C&D waste materials. Innovative solutions and tools for C&D waste management within the whole life-cycle of buildings and infrastructure will be tested, validated and integrated in order to address the challenge for a zero waste construction industry in Europe and a low energy consuming sector.

Project results

- Digital tools for material and/or component tracing and C&D waste management.
- Automated solutions for de-construction and waste separation processes
- Contributions to relevant standards, policies & best practices.

Impact on the construction sector

- Solutions to help stakeholders involved in the processes of Construction & Demolition Waste Management to reach the EU target of high CDW recovery and the status of zero CDW by 2050.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

RECONSTRUCT

A Territorial Construction System for a Circular Low-Carbon Built Environment

Sustainable Materials and Circular Economy

Project information

- Call: HORIZON-CL6-2022-CIRCBIO-02-two-stage
- Starting date: 1 June 2023
- End date: 31 May 2027
- Global Budget: 6.694.967,50 €
- Project coordinator: ITeC
- Affiliated entities: Brunel & Teesside universities (UK)

Project description

The RECONSTRUCT project aims to develop eco-friendly alternatives to Ordinary Portland Cement, integrating them with recycled and bio-based materials for in-situ and prefabricated components. These structures will be designed to be removable, repairable, and reusable, with the entire construction materials lifecycle digitized for tracking and sharing material information, deploying digital tools such as Digital Product passport (DPP) continuously updated across the lifecycle of the material/product. An interoperability layer will allow data exchange with the building´s material passport (BMP), which will be integrated into a dynamic 6D-BIM, effectively acting as a Digital Twin. Finally, AI-based solutions will establish stable regional supply chains of waste materials, demonstrated through real-scale projects and regional clusters in Barcelona and Brussels, promoting sustainable construction practices.

Project results

- Digital systems for automatically determining local CDW availability.
- Novel Alkali-Activated Cements (AACs).
- Precast AACC panels, precast AACC pavement blocks & modular TRRC sándwich.
- DPP & BMP integrated into a dynamic 6D-BIM for design optimization.

Impact on the construction sector

- Reduce embodied CO_2 and increase recycled content in buildings, less construction waste and more closed-loop CDW recycling.
- Support the design, construction and deconstruction of fully circular buildings.
- Promote circular practices with the established of two circular construction clusters together with circular business models and policy roadmaps.

Contact data

- Website: https://reconstruct-project.eu/
- Contact email: coordinator@reconstruct.eu / info@reconstruct-project.eu

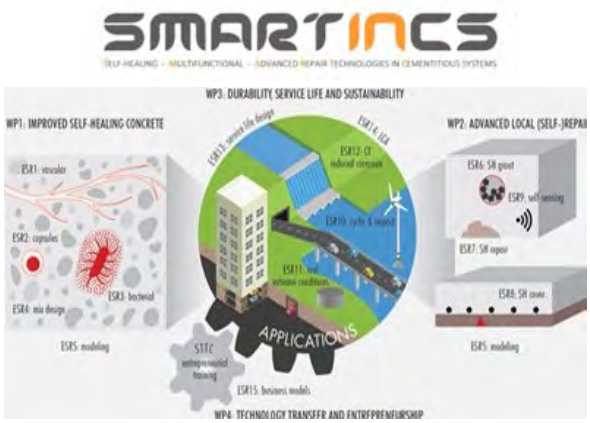
This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Self-healing concrete, repair mortars and grouts as key enabling technologies

Sustainable Materials and Circular Economy

Project information

- H2020-MSCA-ITN-2019
- December 2020.
- May 2024
- 4M€
- Univ. of Ghent (Belgium) https://smartincs.ugent.be/



Project description

SMARTINCS aims are the implementation of new life-cycle thinking & durability-based approaches to the concept & design of concrete structures, with self-healing concrete, repair mortars & grouts as key enabling technologies. Create a breakthrough in the current practice of the construction industry, characterized by huge economic costs related to inspection, maintenance, repair and eventually demolition.

SMARTINCS has training a new generation of creative and entrepreneurial early-stage researchers in prevention of deterioration of (i) new concrete infrastructure by innovative, multifunctional self-healing strategies and (ii) existing concrete infrastructure by advanced repair technologies.

Project results

- Developing & modeling innovative self-healing (SH) strategies.
- Integration of SH into service-life structural design approaches considering the effects on durability.
- Prove the eco-efficiency of smart concretes

Impact on the construction sector

- To quantify & prove the eco-efficiency of newly developed smart concrete with self-healing technology for cracking state & improve life cycle assessment & modeling
- Transfer of the SH technology to the market

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Innovative methodology based in circular economy and artificial intelligence to foster the transition to sustainable and very high energy performance buildings at a cost optimal level

Sustainable Materials and Circular Economy

Project information

- Call: HORIZON-CL5-2022-D4-02-05 — More sustainable buildings with reduced embodied energy / carbon, high life-cycle performance and reduced life-cycle costs (Built4People)
- Starting date: 11/01/2023
- End date: 04/30/2027
- Global Budget of the Project: 5.519.275,75
- Project coordinator: AIDIMME
- Partners: CTCON, LURTIS, BECSA, U. STUTTGART, CHIMAR, AGITEC, CRH, F6S, CRES, BRIMATECH, KEEY, ASI, ØSTFOLD UNIV. COL., KASTAMONU, TAKKENKAMP

SNUG

Co-funded by the European Union

UK Research and Innovation, Horizon Europe Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

UK Research and Innovation, Horizon Europe Guarantee.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

Swiss Confederation

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Project description

Buildings are responsible for over 40% of the energy consumption and CO_2 emissions in EU. Accordingly, the CE has stablished ambitious building standards aiming to transform all existing buildings into ZEBs by 2050 to reach a fully decarbonized building stock.

SNUG aims to demonstrate on three real buildings with different characteristics, uses and climatology, the application of an innovative methodology to support planners of new buildings or retrofitting works in selecting the most appropriate set of insulation materials, their combination and placement to maximize the energy efficiency and minimize GHG emissions of the building throughout its life cycle to make its ZEB rating more easily achievable, considering specific building characteristics and its environment, at an optimal cost level. This methodology will be supported by:

- A Digital Tool Assistant based on AI and virtual simulation
- Innovative sustainable by design thermal insulation materials
- An insulation materials database, including LCA information
- A Digital Building Logbook

Project results

- R1. Novel insulation materials/solutions sustainable by design (SSbD)
- ER1. Aerated eco-concrete blocks and Innovative circular cements
- ER2. Sustainable self-levelling mortars with PCM for radiant floors
- ER3. Renders & Plasters with DCW aerogel
- ER4. Blow-in aerogel based on wastes
- ER5. Biobased panels and biobased sandwich-panels
- R2. Insulation materials Database including technical and LCA information.
- R3. Digital Building Logbook improving traceable information about buildings during the whole life.
- R4. Digital Tool Assistant
- R5. Three demonstrators with different features, uses and climatology
- R6. A novel methodology based in the use of breakthrough technologies

Impact on the construction sector

- Planners of new buildings or retrofitting works are supported by the Digital Tool Assistant to maximise the energy efficiency and minimise GHG emissions of the building throughout its entire life cycle as shown in LCA.
- Techno-economic evaluations and life cycle cost analysis support comparisons of material sourcing, processing and use scenarios. Methods will be shared, and standardization is supported.
- Digital Building Logbook will facilitate informed decision making and information sharing within the construction sector, among building owners and occupants, financial institutions and public authorities.
- All the biobased or waste-based materials/solutions selected for scale-up and industrialization during the project not only help reduce energy consumption but show reduced embodied energy (-30%), reduce CO_2 emissions during production, are designed for circularity.

Contact data

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PTEC Plataforma Tecnológica Española de Construcción

Gobierno de España · Ministerio de Ciencia, Innovación y Universidades

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Comisión Europea

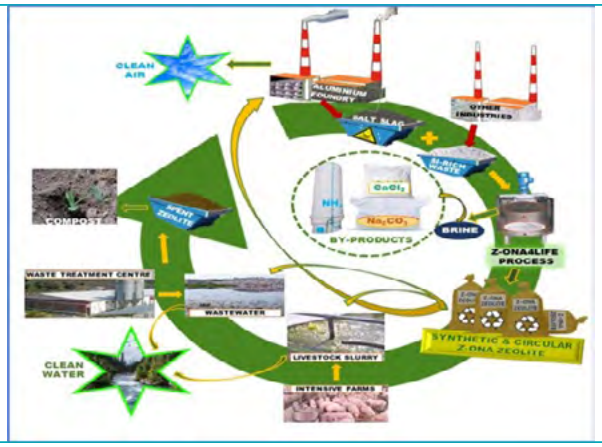
Z-ONA4LIFE

Aluminium Foundries Circularity via Holistic Zeolite Production for Effluents Depuration

Sustainable Materials and Circular Economy

Project information

- LIFE-2022-SAP-ENV.
- 01/07/2023.
- 30/06/2027.
- 3.597.591 €.
- Aurora López Delgado. CSIC.
- FERROSADIM S.L., ALUSIGMA S.A., INDEREN, COGERSA, TRUS-IT SRL, COMMPla Srl.



Project description

The project focuses on a new circular zeolite production technology and its exploitation. In this way, the environment is improved in two ways: hazardous waste recovery and effluent treatment. Z-ONA4LIFE considers salt slag as a secondary raw material and creates an opportunity to recover waste from other industries. Z-ONA4LIFE aims to close the loop between the generation of waste, its treatment, the development of valuable materials and its future market.

The synthetic Z-ONA zeolite from industrial waste could be used in many industrial applications, among which the Construction sector stands out, due to the growing demand of zeolites for the manufacture of construction and building materials.

Project results

- Turning waste into raw materials
- Efficient manufacturing processes
- High quality zeolite production
- Improving environmental impact
- Technology and knowledge transfer

Impact on the construction sector

- Lightweight concrete manufacturing
- Enhancing building materials properties
- Improving indoor air quality
- Recycling of CDW for zeolite production

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

ENERGY TRANSITION

Energy balancing and resilience solutions to unlock the flexibility and increase market optionsfor distribution grid

Energy Transition

Project information

- Call: H2020-LC-SC3-2019-ES-SCC
- Starting date: 01/02/2020
- End date: 31/01/2024
- Global Budget of the Project: 9.4M€
- Project coordinator: CEMOSA

Project description

The ebalance-plus project aims to increase the energy flexibility of electricity distribution grids through a management platform that integrates building installations (air conditioning, household appliances, etc.), distributed generation facilities (photovoltaic power plants), energy storage, bidirectional electric vehicle charging points (V2G) and interoperates with energy management systems to estimate the energy flexibility of users and make it available to grid operators, retailers, distributors or energy aggregators. Through this technology, buildings will be able to integrate into future smart grids and their markets to reduce energy costs and carbon footprint.Translated with DeepL.com (free version)

Project results

- Energy flexibility management platform (hardware and services).
- Energy flexibility aggregation and activation services.
- Middleware for the integration of building control systems.

Impact on the construction sector

- Energy optimization of buildings: air conditioning, photovoltaic, batteries, electric vehicle charging to reduce energy costs and carbon footprint.
- Integration of buildings into the electricity market.

Contact data

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- Noemi Jiménez Redondo noemi.Jimenez@cemosa.es

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Energy efficiency Building Enhancement through performance guarantee Tools

Energy Transition

Project information

- Call: HORIZON-CL5-2021-D4-02
- Starting date: 01/10/2022
- End date: 30/09/2025
- Global Budget of the Project: 5,6M€
- Project coordinator: ETRA I+D

Project description

EBENTO's goal is to develop a comprehensive platform for all actors involved in the building construction and renovation sector to provide a single solution to better coordinate and manage energy performance contracts:

EBENTO will explore the best financing and collaboration schemes to establish energy services.

EBENTO will study how to improve current energy performance contracts (EPCs) for Demand Side Management services and what kind of investment options (grants, loans...) can be implemented to increase the number and impact of energy efficiency projects in the city/region.

Using digital tools, EBENTO will collect data on RECs, financial schemes and energy savings to give citizens the confidence to invest in new solutions, and companies the relevant information to reduce costs and easily replicate the work developed.

Project results

- One-stop-shop platform for renovation processes
- Innovative contracts with performance guarantees (EPC)
- Monitoring module
- Simulation module
- Data management tool

Impact on the construction sector

- Encourage guarantees and EPC contracts in the residential sector.
- Promoting technology for energy service companies.
- Reducing the costs of major renovations.
- Reducing CO_2 emissions linked to buildings,

Contact data

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- Noemi Jiménez Redondo, noemi.jimenez@cemosa.es

This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

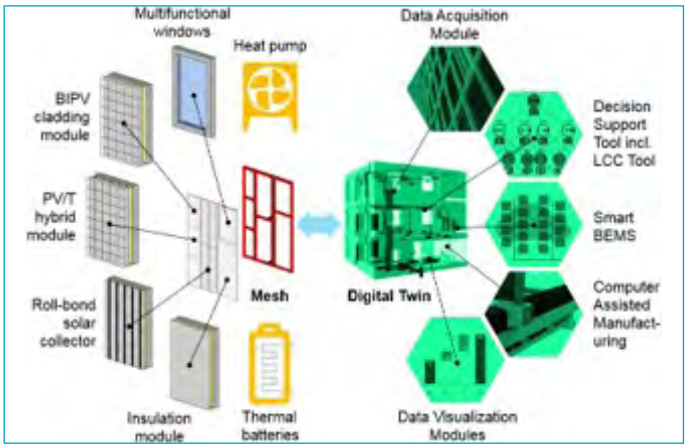
ENSNARE

Envelope mesh and digital framework for building renovation

Energy Transition

Project information

- Call: LC-EEB-04-2020 (IA)
- Starting date: January 2021
- End date: January 2025
- Global Budget: € 9 995 245
- Project coordinator: TECNALIA
- DOI: 10.3030/958445



Project description

In order to support implementation of low-carbon, energy-efficient building renovations, the project develops two key structures for interoperability of building components and tools: (1) an envelope mesh and (2) a digital platform. The envelope mesh is fully modular yet flexible, facilitating the mechanical assembly and interconnection of industrialized components with or without energy harvesting capabilities. The digital platform provides a toolbox of modular solutions supporting all stages of the renovation process, from data acquisition and early decision making up to the manufacturing, installation and operation phases. These tools are linked to a digital model of the building of increasing complexity and capabilities, ultimately leading to a Digital Twin that allows real-time simulation and operation of all components.

Project results

- Modular envelope mesh
- Innovative solar thermal, photovoltaic and PVT panels, active windows
- Digital platform for building renovation
- Automated data acquisition tool, early decision support toolkit, smart BEMS

Impact on the construction sector

- Reduction of renovation cost and time
- Plug & build solutions for retrofit incorporating renewables
- Digitalization of renovation process
- Increase in competitiveness of European construction companies

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

EURAD 2

European partnership on radioactive waste management

eurad
European Joint Programme on Radioactive Waste Management

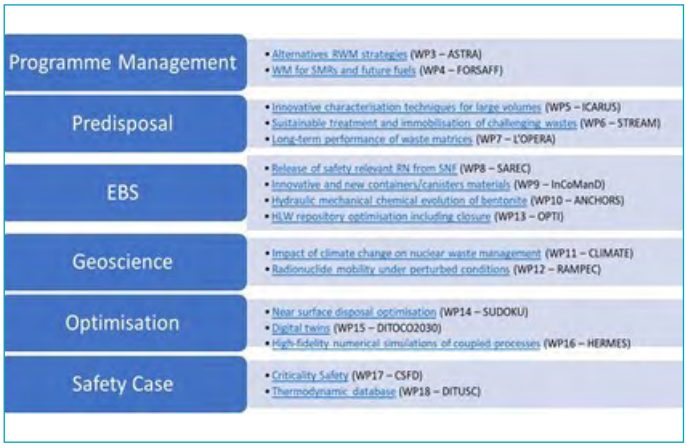
148 Partners from EU
(IETcc-CSIC)

CSIC
Consejo Superior de Investigaciones Científicas

Energy Transition

Project information

- EURATOM 2023 Radioactive waste-IBA
- Oct 2024
- Oct 2029
- 40M€ (20M€ EU founding)
- ANDRA (France)



Project description

EURAD 2 will support the implementation of the Waste Directive in EU Member States, taking into account the various stages of advancement of national programs for radioactive waste storage, considering the various stages of advancement of national programs, the differences in capabilities and inventories: 1) To support Members States in developing and implementing their national programs for the safe long-term management of full range of different types of radioactive waste. 2) To develop and consolidate existing knowledge for the safe start and operation of the first geological disposal facilities for the spent fuel high level waste in supporting optimisation and implementation of geological facilities. 3) Building of the achievements of previous EURAD 1 and PREDIS. IETcc-CSIC contribution to WP 6, 7 and 14.

Project results

- WP 6: STREAM: sustainable cement matrix design & upscaling conditioned waste
- WP 7: LOPERA: long-term performance of waste cement matrices
- WP 14: SUDOKU: understanding of covers & concrete barrier performance in near surface disposal facilities

Impact on the construction sector

- From WP6:design geopolymer, MKPC
- From WP7: geopolymer and Mg phosphate cements durability & leaching
- From WP 14: Cementitious materials ageing & degradation. Corrosion of reinforcement & cracking consequences

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

Comisión Europea

FEDECOM

FEDErated - system of systems- approach for flexible and interoperable energy COMmunities

Energy Transition

Project information

- HORIZON-CL5-2021-D3-02-05 - Energy Sector Integration: Integrating and combining energy systems to a cost-optimised and flexible energy system of systems
- Starting date: 01/10/2022
- End date: 30/09/2026
- Global Budget of the Project: 9.474.375€
- Project coordinator: GIROA-Veolia

Project description

FEDECOM's objective is to enable integrated local energy systems through the integration of cross-energy sectors and vectors, increasing the penetration of distributed renewable energies through optimal use of energy generation, storage and transformation. FEDECOM's concept is that electricity becomes the main energy vector, with electrical networks as the backbone for the decarbonization of all energy sectors and aggregators as the cornerstone of their potential exploitation. FEDECOM maximizes the potential synergies of two complementary deployment strategies: (i) direct electrification (for example, through demand-side electrification), and (ii) indirect electrification (with power-to-X technology).

Project results

- Scalable and adaptable cloud-based platform composed of analytical modeling and optimization services for the planning, supervision and control of integrated local energy systems.
- Demonstration of optimized operation of integrated systems.
- Holistic cooperative strategy for active demand management in energy communities.

Impact on the construction sector

- Planning improvement for the integration of electricity, heat and gas with renewable energy production.
- Greater flexibility and resilience of buildings.
- Improve citizen satisfaction by enabling them to benefit from data-driven energy services.

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

INCREASE

Effective advancements towards uptake of PV integrated in buildings & infrastructure

Energy Transition

Project information

- Call: HORIZON-CL5-2023-D3-01
- Starting date: 1 October 2023
- End date: 31 March 2028
- Global Budget of the Project: 9.6M € (EU: 8M €)
- Project coordinator: Th!nk E
- Consortium: Tecnalia, Becsa, Onyx, ETS Euskal Trenbide Sarea and others.

Project description

INCREASE aims to contribute to a wider uptake of integrated photovoltaics (IPV) by delivering innovations at module and system level. New encapsulants and coatings will be developed contributing to improved aesthetics, reduced glare, lower environmental footprint, improved behavior during fire, and improved antifoiling and antisoiling behavior. At system level, innovations will focus on integrated facade and roof concepts, as well as noise barriers.

The developed products and systems will be implemented in 9 buildings and infrastructures in 6 European countries. In these demonstrators, workshops will be organised beforehand to integrate co-creation processes, so that the joint collaboration of all stakeholders will be sought to generate results of greater impact and acceptance in the market.

Project results

- Deliver integrated solutions that reduce complexity of integrating PV in buildings
- Deliver solutions to address sizing of IPV
- Develop BIPV solutions that overcome the fire propagation risks through novel designs
- Contribute to new test protocols for fire safety of integrated PV

Impact on the construction sector

- Increase acceptance and bring confidence in integrated photovoltaics deployment
- Development of PV prefabricated solutions that require lower installation time compared to conventional construction solutions.
- Active engagement in and effective contributions to standardization activities

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

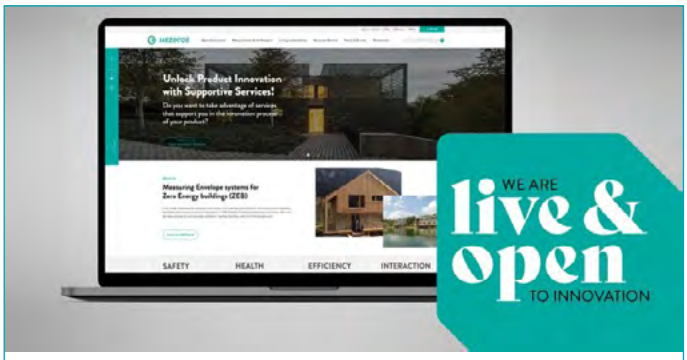
MEZeroE

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

Energy Transition

Project information

- Call: H2020-NMBP-TO-IND-2018-2020
- Starting date: 1 January 2021
- End date: 31 January 2026
- Global Budget of the Project: 17.1M € (EU: 14.7M €)
- Project coordinator: Eurac Research
- Consortium: Tecnalia, ITeC, Tecnan, Leitat, Flexbrick and others.



MEZeroE Digital Innovation Platform is one of the outputs of the Project, were you will find a collaborative ecosystem for stakeholders related to building envelopes.

Project description

The achievement of net zero energy buildings (NZEB) and high indoor environmental quality targets requires a profound transformation of the built environment. One of the promoted measurements is the inclusion of new technologies, materials and designs in the buildings. Nevertheless, innovation in Construction Sector is slow.

MEZeroE Project aims to create an EU distributed open innovation ecosystem for developing NZEB enable envelope solutions through a single-entry point web-based multi-side virtual marketplace. This will include 9 pilot measurement and verification lines, 3 open innovation services and 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 products.

Project results

- A single-entry point virtual marketplace as a web-based platform: MEZeroE platform.
- 9 pilot measurement and verification lines.
- 3 open innovation services.
- Wide ecosystem of stakeholders searching and offering support such as facilities, knowledge, coaching and funding.

Impact on the construction sector

- Foster innovation in the construction sector, contributing to EU building stock transformation in line with EU Green Deal.
- Improve open innovation approach in construction industry.
- Facilitate access to building testing/monitoring equipment and to finance through a single-entry point.

Contact data

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- Gloria Diez – ITEC gdiez@itec.cat

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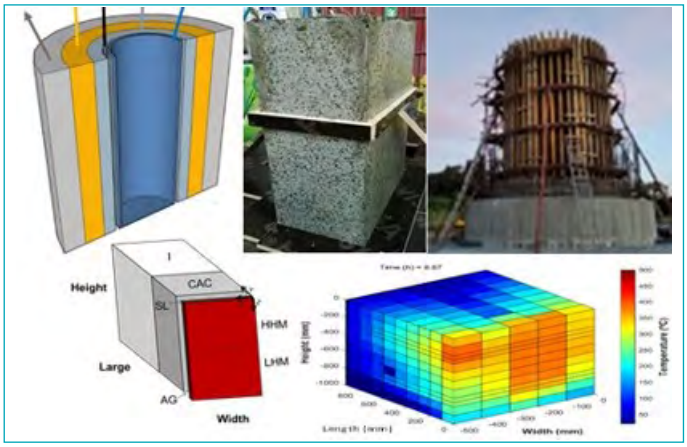
Comisión Europea

New StOrage Latent and sensible concept for high efficient CSP Plants

Energy Transition

Project information

- H2020-NMBP-2016-two stage
- January 2017
- July 2021
- 4.98M€
- Univ. of Evora (Portugal) http://www.newsol.uevora.pt/



Project description

NEWSOL addressed the challenge of increasing the efficiency of solar energy harvesting by means of advanced materials and architectures in line with those specified in SET-plan. Its main objective is to develop advanced materials for innovative storage media concepts for Concentrated Solar Power (CSP) up to the validation of their performance from lab scale to demonstrator prototypes. The project aimed at delivering innovative concretes for thermal energy storage design. The material developments envisaged in the project included: 1) two different new high thermal performance concretes. 2) a new ternary Molten Salt mixture. 3) a Filler Material selected after a recycling/reuse concept. The combination of the most suitable materials into two different storage concepts: a thermocline tank and a module.

Project results

- Design of a concrete of high-thermal stability: CAC + selected thermal aggregates. for use in thermocline tanks
- Thermal validation: thermal fatigue cycling 290-550ºC
- Up scaling from: TRL 5 to TRL 7

Impact on the construction sector

- Thermocline construction & commissioning
- Development & implementation of construction procedures.
- Development & implementation of commissioning procedures

Contact data

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This Project has received Funding from the European Union´s Horizon Europe research and innovation programme

RESHEALIENCE
Ultra High Durability Concrete

Rethinking coastal defence and Green-Energy Service infrastructures through enHancEd-durAbiLIty high-performance fiber reinforced cement-based materials

Energy Transition

Project information

- H2020-NMBP-06-2017
- January 2018
- March 2022
- 5.56M€.
- Politecnico de Milan (Italy). https://uhdc.eu/

Project description

ReSHEALience aim was to develop Ultra High Durability Concrete (UHDC) and Durability Assessment-based Design (DAD) methodology for structures, to improve durability and predict their long-term performance under Extremely Aggressive Exposures (XS-chloride induced corrosion, XA-chemical attack). The improvement was by supported upgrading Ultra High Performance Fiber Reinforced Concrete with new functionalities. Focused on marine structures (wind-offshore, mussel rafts) and for geothermal/biomass energy plants.

CSIC coordinated durability work activities, designed the monitoring plan of the pilots. Carried out theoretical & experimental studies towards risk analysis, durability environmental interaction & prediction that affect the materials & structures during the structure service life

Project results

- ReSHEALience has created and shared recipes for smart concrete mixes, that literally build resilience.
- Concrete crack: damage & deterioration in marine & geothermal waters

Impact on the construction sector

- Coastal infrastructure, such as flood defenses and offshore wind turbines, that withstand the forces of nature, including high winds and chemical attacks.

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OTHER INTERNATIONAL PROJECTS

BIO-TORFM

Development of top-of-rail friction modifiers based on vegetable oils and nanoadditives

Sustainable Materials and Circular Economy

Project information

- I-COOP 2021.
- 01/01/2022.
- 31/12/2023.
- 24.000 €.
- Román Nevshupa. CSIC.
- National University of Columbia.

Project description

Bio-degradable and environmentally friendly friction modifier for rail way transportation systems is been developing using avocado oil as base stock. Non-toxic and natural additives are used to control viscosity, oxidation resistance, antiwear and friction properties of the lubricant.

Project results

- A New Top-of-Rail Friction Modifier suitable for usage in urban and sensitive natural environments is been developing.

Impact on the construction sector

- Increase durability of railway infrastructure
- Reduction of noise, wear, maintenance cost
- Low environmental impact

Contact data

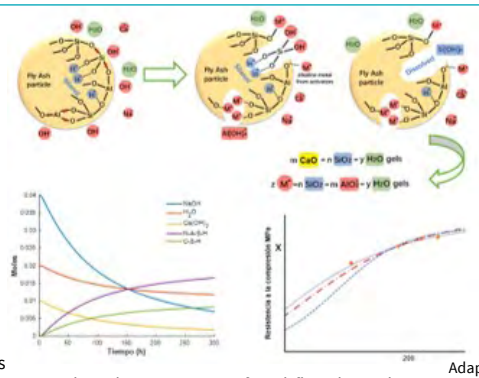
- Román Nevshupa, r.nevshupa@csic.es
- Ph. no. +34 911035746

Evolution of reaction products and compressive strength of alkali-activated cements using computational modelling techniques

Sustainable Materials and Circular Economy

Project information

- i-COOP project. Modality A (COOPA23007)
- 01/01/2024
- 31/12/2025
- 24000€
- María Criado Sanz
- CSIC and Universidad Nacional de Colombia. Sede Medellín



Adapted from [1]

References
[1] Z. Li, G. Xu, and X. Shi, "Reactivity of coal fly ash used in cementitious binder systems: A state-of-the-art overview," Fuel, vol. 301, no. November 2020, 2021, doi: 10.1016/j.fuel.2021.121031.

Project description

One of the challenges for academia and industry is to design strategies to control and optimise the manufacturing processes of Alkali-Activated Cements (AACs). The modelling of the processes is presented as a valuable tool to represent, control, and predict the properties of the cementitious material. It is proposed to develop a dynamic model of the kinetics of alkaline activation to predict the time evolution of the main reaction products formed and also to determine the compressive strength of the system.

Project results

- Analyse and build the phenomenologically based dynamic model of the kinetics of the AA process.
- Validate the model with experimental data and values reported in the literature.
- Relate the kinetics of the AA process over time to the products formed and their contribution to the compressive strength.

Impact on the construction sector

- This model will improve the existing knowledge on the alkaline activation process, providing improvements in the manufacturing process of low carbon footprint cements to solve problems related to their mechanical performance and promote their application.

Contact data

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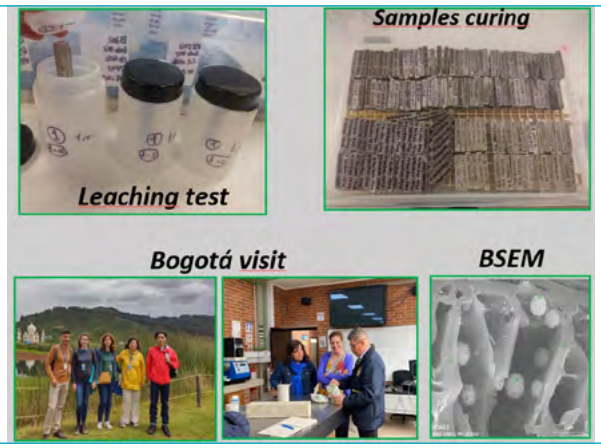
Ary Alain Hoyos Montilla. Universidad Nacional de Colombia. Sede Medellín, aahoyosm@unal.edu.co
Juan Sebastián Rudas Flórez. Institución Educativa Pascual Bravo, ju.rudas@pascualbravo.edu.co

New construction with lower carbon footprint from industrial waste in Latin America

Sustainable Materials and Circular Economy

Project information

- LINCGLOBAL22. Ref: INCGL20024
- 01/07/2022.
- 31/12/2024.
- 23.000 €.
- Alicia Pachón Montaño/María Criado Sanz. CSIC.
- Universidad Militar Nueva Granada (Bogotá) Colombia.



Project description

The CRII project is being developed between the Universidad Militar Nueva Granada de Colombia (Bogotá) and Eduardo Torroja Institute of Construction Sciences (IETCC-CSIC) (Madrid). The project focuses on the development of sustainable cementitious materials that encapsulate, without risk to the environment, waste from hydrocarbon extractions, where industrial by-products are used as raw materials to produce alkaline cement.

The alkaline cements developed are composed of rice husk ash, which originates as waste from cocoa drying, and blast furnace slag. Their durability under extreme climatic conditions and in contact with animal purines is evaluated for use as possible construction materials for animal enclosures.

Project results

- Development of a low carbon footprint cement that safely encapsulates a waste from oil extraction.
- Development of a cementitious material resistant to extreme climatic conditions and animal purines.

Impact on the construction sector

- Knowledge of a cementitious material developed exclusively from affordable industrial waste.
- Exchanges of knowledge, existing and new needs, as well as current and future contacts between Spain and Colombia.

Contact data

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- https://crii.ietcc.csic.es/

VEnUS

Energy Vulnerability in Iberoamerican homes, in the context of Climate Change. Detection, capacity building, and alleviation among university students.

Energy Transition | *Social Impact of Construction*

Project information

- I-COOP 2022
- 01/01/2024
- 31/12/2025
- 23.997,19 €
- Teresa Cuerdo Vilches (IETcc-CSIC).
- FCT-NOVA (PT); UNAM (MEX); IPN (MEX); U. Anáhuac (MEX) UPB (BOL); UTFSM (Chile);UCSP (PE); UCLV (CUBA); UNITEC (NZ)

Project description

The main aim is to delve into energy vulnerability and poverty, implications and determinants, as well as propose its alleviation, promoting good practices and measures for public decision-makers, public policies and strategies and technical, social and environmental interventions that alleviate vulnerability, on the residential park. For this, the study population is the university community and its environments. Awareness and training measures (workshops, master classes, etc.) and capacity building measures are included to train educators who influence future generations, and prepare future designers, architects, urban planners, and legislators, in matters of domestic energy. . The specific objectives are: 1) identify habitats of the university communities; 2) detect the energy vulnerability of these communities; 3) assess the impacts of energy vulnerability and poverty perceived by community and region; 4) generate proposals to mitigate impacts, in the context of Climate Change, and by region; 5) Dissemination of results (transverse to the project).

Project results

- International short stays in for latin-american junior researchers,PhD students and for CSIC group
- International Events and meetings: Seminars, Workshops, Conferences, etc
- Scientific papers and books
- Synergies among consortia members: Research projects, academic agreements, PhD programs…
- Work aligned to SDGs: 7, 10, 11, 3, 13 and 17

Impact on the construction sector

- Knowledge generation and exchange among regions in energy vulnerability among youngs
- Transdisciplinary approaches and multidimensional KPIs to assess and face energy poverty at homes
- Capacity Building to Academia, Institutions, students and potential professionals in Building & Construction
- Detection of opportunity niches for industry, technicians and practitioners in Fair and Just Energy Access and Transition, and Decarbonisation.

Contact data

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VIbRA-IS

Iberoamerican housing in the face of post-COVID challenges and adaptation to Global Change, from habitability: architectural and technical proposals for equitable and healthy habitats

Sustainable and Healthy Cities and Mobility

Project information

- LINCGLOBAL22
- 01/07/2022
- 31/12/2024
- 29.809,15
- Teresa Cuerdo Vilches (IETcc-CSIC).
- ISCIII (España); FCT-NOVA (Portugal); UNAM (México); UAM (México); UPB (Bolivia); UMSA (Bolivia); UTFSM (Chile)

Project description

The aim is to exchange experience in the diagnosis and proposal of habitability improvements, through sustainable and affordable architectural and technical solutions, which allow adaptation to Climate Change of housing and other extreme scenarios, such as health emergencies or disasters, to be faced with resilience, that involved confinement. Taking into account the socioeconomic and health impacts of habitability in housing, given these compared scenarios, the specific objectives are: 1) exchange the state of the art of the consortium regions; 2) detect deficiencies and pathologies associated with the lack of habitability by region, and implement them in the models for multiscale analysis; 3) promote design, constructive and technical solutions, with sustainable and healthy criteria, in each model; 4) evaluation of the feasibility of the proposals and quantification of improvements; 5) Dissemination of results. The areas of study are Mexico, Bolivia and Chile, regions with multiple microclimates, and hit hardly by catastrophes, such as COVID and Climate Change, and Southern Europe (Spain and Portugal), threaten by extreme weather events, above all.

Project results

- International short stays in for latin-american junior researchers,PhD students and for CSIC group
- International Events and meetings: Seminars, Workshops, Conferences, etc
- Scientific papers and books
- Synergies among consortia members: Research projects, academic agreements, PhD programs…
- Work aligned to SDGs: 7, 10, 11, 3, 13 y 17

Impact on the construction sector

- Knowledge exchange among regions in constructive/ technical solutions
- Transdisciplinary approaches and multidimensional KPIs to assess housing, habitability and energy impacts
- Capacity Building to current and potential professionals on Buildings and Construction
- Detection of opportunity niches for industry, technicians and practitioners

Contact data

- Teresa Cuerdo Vilches, teresacuerdo@ietcc.csic.es
- https://vibrais.ietcc.csic.es/

2024

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