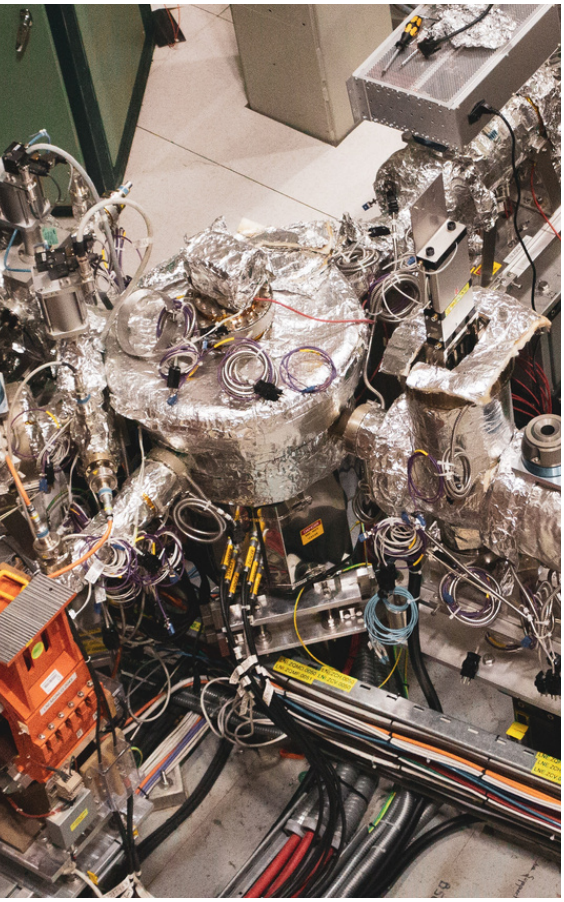
SEPTEMBER
2023

RESEARCH AND INNOVATION PROJECT INVENTORY

Cerame-Unie
The European Ceramic Industry Association



CERAME-UNIE INVENTORY OF EUROPEAN RESEARCH AND INNOVATION PROJECTS

This document brings together the information on research and innovation funded projects that are of high relevance to the ceramics industry. The document focusses on EU funded projects (Life+, SPIRE,...). Both ongoing projects and recently finalised projects are mentioned.

The following information was compiled with the help of CU members. It is to be considered as a living document and information on additional projects is always welcomed.

The main data provided in this document are:

- the acronym of the project and its full name;
- the project period;
- budget;
- funding programme;
- aim of the project;
- key ceramic partners and the countries involved;
- links to the project webpages.

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ONGOING PROJECTS

COMPLETED PROJECTS

ONGOING PROJECTS

SPIRE FUNDED PROJECTS

DESTINY: Development of an Efficient Microwave System for Material Transformation in energy INtensive processes for an improved Yield

AIM

The DESTINY project aims to realize a functional, green and energy saving, scalable and replicable solution, employing microwave energy for continuous material processing in energy intensive industries. The target is to develop and demonstrate a new concept of firing granular feedstock for materials transformation using full microwave heating as alternative and complement to the existing conventional production. The DESTINY system is conceived as cellular kilns in mobile modular plant, with significant advantages in terms of resource and energy efficiency, flexibility, replicability and scalability with reduced environmental footprint.

START YEAR

2018

END YEAR

2022

BUDGET

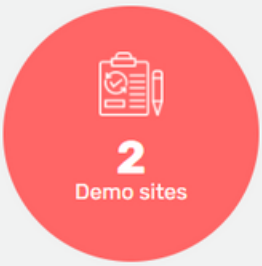
8 442 000 €

FUNDING

SPIRE

The DESTINY concept will be proved in two demo sites located in Spain and Germany, covering high energy demanding sectors of strategic interest as Ceramic (Pigments), Cement (Calcined clay) and Steel (Sinter, Iron Pellets/DRI, ZnO), to validate the critical parameters of the developed technology in relevant environment (TRL 6). It will be implemented 2 feeding modules per demo site and 1 mobile microwave kiln module and product treatment.

The industrialization and sustainability of DESTINY high temperature microwave technology will be assessed through the evaluation of relevant KPIs, with Life Cycle Methodologies. With the final aim of ensuring a large exploitation an market penetration for DESTINY, technology-based solutions business model, economic viability and replicability analysis will be conducted. For guaranteeing industrial transferability appropriate exploitation and dissemination activities have been defined during and even after the end of the project.



PARTNERS

14 partners from 8 countries, including:

- Innceinnmat Sl - Spain
- National Technical University Of Athens – Ntua - Greece
- Università Politecnica Delle Marche - Italy
- Universitat Politecnica De Valencia - Spain
- Chumillas Technology Sociedad Limitada - Spain

LINK

https://www.destinyh2020andbeyond.eu/

HORIZON 2020 FUNDED PROJECTS

LightCoce:
Building an Ecosystem for the up-scaling of lightweight multi-functional concrete and ceramic materials and structures

AIM

Easy to transport, handle and install, lightweight components are being increasingly used in construction and infrastructure sectors, as well as in the aerospace, automotive and defence industries. Concrete and ceramics are the focus of interest due to their wide range of applications and durability. But their lightweight attributes need to be coupled with enhanced properties and multifunctionalities. The EU-funded LightCoce project will build an ecosystem for the upscaling of these materials and structures. To do this, it will provide open access to SMEs or industry to a single entry point ecosystem that will cover a range of end applications from construction materials (bricks, ceramic tiles) and infrastructures (ready mix concrete and prefabricated components) to high-tech applications in the automotive and aerospace industries.

START YEAR
2019

END YEAR
2023

BUDGET
13 483 617,50 €

FUNDING
HORIZON 2020

The main objective of the LightCoce project is to cover the gap in the upscaling and testing of multifunctional lightweight concrete and ceramic materials by providing open access to SMEs or Industry to a single entry point ecosystem consisting of already developed Pilot Lines including three clusters of existing pilot lines; a. Concrete group, b. Conventional Ceramics group, and c. Advanced Ceramics group), process and materials modelling, Characterization, Standardisation, Regulatory, Safety & Environmental Assessment, Data Management and Innovation Management that will be accessible to the interested stakeholders at fair conditions and cost.

The ecosystem will support the upscaling activities of European SMEs and industry, covering a large range of end applications from constructions materials (bricks, ceramic tiles), infrastructures (ready mix concrete, prefabricated components), to high tech applications in automotive & aerospace industry.

PARTNERS

26 partners from 9 countries, including:

- NTUA - Greece
- Aercrete Technology AB - Sweden
- Advanced Material Simulation S.L. (AMS) - Spain
- ASHRAE - Greece
- Axia Innovation - Germany
- Unismart, University of Padova - Italy
- Sustainable Innovations Europe - Spain

LINK

https://www.lightcoce-oitb.eu/en/normal/home

LIGHTCOCE

DOC3D PRINTING

START YEAR
2018

END YEAR
2022

BUDGET
3 500 000 €

FUNDING
HORIZON 2020

AIM

High-value ceramics are widely utilised in high-end engineering disciplines due to their low density, Outstanding mechanical strength alongside with their excellent thermal, corrosion and wear resistance for aerospace, and medical applications.

However, conventional manufacturing techniques are time-consuming and show several limitations, such as geometrical variation induced by the shrinkage during sintering and low material yield, alongside with high tool wear during milling and machining. As of today, these drawbacks impede the industrial utilisation of these ceramic materials for a growing range of engineering and medical disciplines. To tackle this problem, DOC-3D-PRINTING will train a new generation of Early-Stage Researchers (ESR) to develop the whole value chain of ceramics 3D printing from elaborating feedstock to testing in products for commercialisation. DOC 3D Printing will cover the whole value chain of ceramics 3D printing, from laboratory research to product development.

Accordingly, the research objectives are:

- To develop feedstock customised for 3D-printing (AM) at reduced cost.
- To design and build next generation of 3D printers and strategies specifically dedicated to ceramics production (net-shape ceramics faster with desired properties & design at reduced cost).
- To correlate input to output produced ceramics and demonstrate it for applications.
- To define and establish standardization, regulatory issues, qualifications and risks analysis.
- To increase knowledge on modelling & characterizations and develop specific tools for that.

PARTNERS

9 partners from 6 countries, including:

- Eurocoating Spa - Italy
- Marion Technologies S.A. - France
- Gazi Universiti - Turkey
- Cerhum - Belgium
- University of Birmingham - UK

LINK

http://www.doc-3d-printing.eu/en/about-the-project/project-overview.html

FORGE:
Development of novel and cost-effective coatings for high-energy processing applications

AIM

The equipment used in energy-intensive industries is pushed to the limit, but improvement of current and future equipment is essential to increase production efficiency, component lifetime and reduce environmental impact. Innovation of the materials is the key. The EU-funded FORGE project will develop novel coatings of compositionally complex alloys and ceramics, combining machine learning models, thermodynamic calculations, and high-throughput experiments.

FORGE will demonstrate these coatings on processes such as CO2-capture, waste heat recovery, components undergoing wear and in kilns, defying the acting degradation forces, and assuring coating effectiveness with smart monitoring of their deterioration. FORGE aims to minimise the overall capital and operative expenses especially in steelmaking, aluminium, ceramic tiles and cement industries.

PARTNERS

13 partners from 8 countries:
Coordinators: MBN Nanomaterialia SPA - Italy

- TWI Limited - UK
- Tailorlux GMBH - Germany
- Asas Aluminyum Sanayi ve Ticaret Anonim Sirketi – Turkey

START YEAR
2020

END YEAR
2024

BUDGET
5 982 612,50 €

FUNDING
HORIZON 2020

- Asociacion de Investigacion de las Industrias Ceramicas AICE - Spain
- Max Planck Institut Fur Eisenforschung GMHB - Germany
- Eidgenossische Materialprufungs- Und Forschungsanstalt -Germany
- Technovative Solutions Ltd- UK
- Fraunhofer Gesellschaft Zur Foerderung der Angewandten Forschung E.V. - Germany
- Vniversity of Leicester – UK
- Onderzoekscentrum Voor Aanwending Van Staal NV - Belgium
- AEONX AI - France
- Cimsa Cimento Sanayi ve Ticaret Anonim Sirketi - Turkey
-

LINK

https://www.forge-project.eu/

iWAYS:
Innovative Water recovery solutions through recycling of heat, materials and water across multiple sectors

START YEAR
2020

END YEAR
2024

BUDGET
12 806 610,25 €

FUNDING
HORIZON 2020

AIM

Despite efforts for the transition towards an eco-friendlier society and industry, the annual global extraction of materials tripled over the last 50 years. The EU-funded iWAYS project aims to reverse this trend by introducing several technologies that are focused on environmental challenges while also assisting economic growth and productivity. The project will develop a set of technologies capable of recovering water and energy from exhaust gases in the industrial processes (ceramic, steel, and chemical industries). Among other impacts, the project is expected to reduce freshwater consumption by 30 % to 64 %.

Furthermore, the solutions provided by the project will recover additional materials from flue gas such as valuable acids or particulates, improving the raw material efficiency in production and reducing detrimental emissions to the environment.

PARTNERS

18 partners from 9 countries including:
Coordinator: Universita degli Studi di Modena e Reggio Emilia - Italy

- Asociacion De Investigacion De Las Industrias Ceramicas ITC-AICE - Spain
- Ceramiche Atlas Concorde Spa
- Brunel University London - UK
- Simam SpA - Italy
- Econotherm (Uk) Limited
- European Science Communication Institute (Esci) Ggmbh
- Water Europe - Belgium
- Innovacio Y Consulting Tecnologico De Barcelona Sl - Spain
- Alufluor AB- Sweden
- Fundacio Eurecat - Spain
- National And Kapodistrian University Of Athens - Greece
- Lietuvos Energetikos Institutas
- Fundacio Institut Catala De Recerca De L'aigua - Spain
- Tubacex Tubos Inoxidables Sa
- Krean S.Coop.
- Ethnicon Metsovion Polytechnion
- Iamas Technologies LDT
- Politechnika Wroclawska

LINK

https://www.iways.eu/

NEWSKIN

AIM

The NewSkin Project aims to create an Open Innovation Test Bed (OITB) to provide the Innovation Ecosystem (IE) with the necessary technologies, resources and services to uptake a set of game changing, efficient and cost-effective innovative processes to manufacture nano-enabled industrial and consumer products as well as the necessary testing capabilities to demonstrate nano-enhanced goods features.

The overall project is divided in 9 Work Packages. The first 4 Work Packages aim to create the OITB structure, upgrade the different facilities integrated within the NewSkin OITB, calibrate these upgraded facilities and create a Catalogue of Services and a Value Proposition. WP 5 and 6 aim to validate the OITB members coordinated services provision. WP7 will include the development of the on-line platform, after which the Consortium will start the Innovation Ecosystem Engagement activity to connect the OITB with the target markets and stakeholders. Wp8 will include the Dissemination and Exploitation activities to ensure the OITB sustainability after the Grant Execution including the preparation of events, Technology Roadmaps and the OITB Marketing and Business Plan that will role the OITB activity after the Grant Execution. WP9 will be devoted to the Project Management Activities.

START YEAR
2020

END YEAR
2024

BUDGET
15 618 250,89 €

FUNDING
HORIZON 2020

PARTNERS

34 partners from 12 countries, including:

- Convention Europeenne de la Construction Metallique ASBL- Belgium
- Fraunhofer Gesellschaft zur Foerderung der Angewandten Forschung E.V. - Germany
- Uppsala Universitet - Sweden
- Fundacion para el Desarollo y la Innovacion Tecnologica - Spain
- Confindustria Emilia Area Centro - Italy

LINK

https://www.newskin-oitb.eu/the-project/

ASTRABAT

AIM

It aims to develop optimal Lithium-ion battery solutions for the increasing demands of the electric vehicle market in particular.

The goal is to fulfil Europe's need for a safe, high-energy, sustainable and marketable battery for green mobility that could be manufactured in Europe on a massive scale. To do so, the new ASTRABAT cells will enable:

ASTRABAT is part of a broader drive by the European Union to make electric mobility become the next transport mode and contribute to the EU overall goal to reduce greenhouse gas (GHG) emissions by 80-95% by 2050 (currently, the transport sector is responsible for around one quarter of Europe's GHG emissions). It is expected that e-mobility will represent 70% of the total rechargeable Li-ion battery cell market's value in 2022 and that 70% of the EU electricity should be produced by renewable energies. Hence, the electric battery storage is vital in this transition to clean mobility and clean energy systems.

START YEAR

2020

END YEAR

2023

BUDGET

€8M

FUNDING

HORIZON 2020

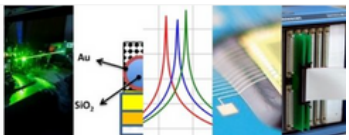
CONSORTIUM

- CEA – France
- Fraunhofer IKTS – Germany
- Fraunhofer ISC - Germany
- Politechnika Warszawska – Poland
- Umicore - Belgium
- Nanomakers - France
- Daikin Chemical Europe GmbH - Germany
- Université de Limoges - France
- LEITAT - Spain
- Laclanché GmbH- France
- Yunasko - Ukraine
- Elaphe - Slovenia
- Lomartov - Spain
- Fondazione Icons - Italy
- Stellantis - Netherlands

LINK

https://astrabat.eu/

NEWILUMIS:
New Versatile Platform for Illumination and Sensing



AIM

NewILUMIS project aims at developing a novel functional material based on a layered ceramic, associated to a surface plasmon resonance (SPR) structure and a mesoporous topcoat as an innovative photonic component for lighting/sensing. The target areas will be environmental protection and security, medical diagnostics, biosensing and chemical compound detection.

The core of the lightning structure will be a rare earth doped (RE3+) ceramic (YAG). Its layered construction will allow tailoring the spectral and spatial characteristics of the light source under LED excitation. The ceramic composition (active dopants, scattering phase material, etc.) will be modified to obtain the desired colour rendering index and a high efficiency of the resulting source. This light source will be used for sensing when combined to SPR and functionalized mesoporous coatings. Packaging issues will also be considered to produce a demonstrator whose performance will be tested in relevant industrial applications.

START YEAR

2020

END YEAR

2023

FUNDING

HORIZON 2020

CONSORTIUM

- Łukasiewicz Research Network, Institute of Microelectronics and Photonics – Poland
- Institute of Research for Ceramics – France
- Warsaw University of Technology – Poland
- Fraunhofer Institute for Ceramic Technologies and Systems IKTS, – Germany
- Teknosystem Sp. z o.o – Poland

LINKS

https://www.era-learn.eu/network-information/networks/m-era-net-2/m-era-net-call-2019/new-versatile-platform-for-illumination-and-sensing

METABUILDING

AIM

The METABUILDING innovation ecosystem brings together stakeholders from construction and 4 emerging industrial sectors; recycling & circularity, additive manufacturing, nature-based solutions and digital industry. The METABUILDING Platform aims to facilitate collaboration between new partners and experienced experts to further innovation.

The METABUILDING platform is the digital backbone. The METABUILDING platform consists of several digital tools and services that help SME's and other stakeholders engage in successful innovation. In this platform you will find services and information that will assist you in finding existing innovative technologies ready to deployed or project partners seeking collaboration on new exciting projects.

CONSORTIUM

- Nobatek/ INEF4 – France
- European Construction Technology Platform – Belgium
- European Aluminium (EFB) – Belgium
- European Networking of Living Labs – Belgium
- Plataforma Tecnológica Española de Construcción - Spain

START YEAR

2020

END YEAR

2023

BUDGET

€5 126 625

FUNDING

HORIZON 2020 - Research and Innovation Programme

- Platforma Technológica Portuguesa da Construçao– Portugal
- Fonds de Dotation Cercle Promodul INEF4 - France
- Federazione Delle Costruzioni - Italy
- Pannon Business Network Nonprofit KFT - Hungary
- Indra soluciones Technologias de la información S.L - Spain
- Grunstattgrau Forschungsund Innovations GmbH - Austria
- Ecowise Ekodenge Limited - UK
- Steinbeis Innovation GGmbh - Germany
- Octopussy & Co - France
- EURIC - Belgium

LINK

https://www.metabuilding.com/about/

ERA-MIN PROJECT: PROPER

New sustainability metrics to improve recycling PROcess PERformances regarding resource use, environmental impacts and economic benefits

AIM

The exploitation of natural resources generates economic development but compromises the associated natural capital and produces environmental impacts. The European Commission considers the decoupling between economic growth and resource use as the central core of strategies on eco-efficiency of resources. List of resource efficiency indicators measuring this decoupling exists but suffers from some criticisms. The goal of PROPER is to develop resource efficiency indicators to be applied in the private sector to take better decisions, for both investment and commercialization, in the context of primary and secondary production. This development relies on life cycle approaches to address the overall loop closing evaluation in a circular economy perspective.

Furthermore, such indicators are tools to measure the sustainability performances of materials production. To reach this objective, PROPER aims at developing indicators and testing their applicability in a process perspective by studying three substances (silicon carbide, chromium oxide and graphite) and their primary and secondary productions The project firstly develops a methodology to operationalize the quantification of resource dissipation. Then dissipation is integrated to the LCA of the three substances and the two production routes to quantify the associated potential.

START YEAR

2020

END YEAR

2023

BUDGET

€442,844

FUNDING

HORIZON 2020 - Research and Innovation Programme

PARTNERS

- BRGM – France
- RDC Environment - France
- Extracthive Ceramics Recycling - France

LINK

https://www.era-learn.eu/network-information/networks/era-min-2/era-min-joint-call-2019/new-sustainability-metrics-to-improve-recycling-process-performances-regarding-resource-use-environmental-impacts-and-economic-benefits

Exceed

AIM

EXCEED's multi-metal/mineral, zero-waste mining-and-refining approach adopts a mineral-centric, integrated methodology via the application of a first-of-its-kind predictive and forensic geometallurgy, supported by enhanced in-line characterisation tools and the development of digital twins. Using four premier European pegmatite and RMG case studies, EXCEED develops, upscales & demonstrates cost-effective, sustainable, and responsible extraction routes for recovering the CRMs and industrial minerals as by-products from Li-bearing hard-rock ores. A suite of CRMs will be extracted and refined, while diverse industrial minerals will be refined and valorised in low-carbon building materials.

LINK

https://exceed-horizon.eu/

START YEAR

2023

END YEAR

2026

BUDGET

€ 11 178 103

FUNDING

HORIZON 2020

PARTNERS

- Teknologian Tutkimuskeskus VTT Oy
- Imerys SA
- Caspeo Sarl
- Sustainable Innovation Institute (IDD-SII)
- Keliber Technology OY
- Betolar Oy
- Savannah Lithium Limitada
- Dynamic and Security Computations SL (DSC)
- Wienerberger NV
- Universite de Lorraine (UL)
- Katholieke Universiteit Leuven (KUL)
- Geologian Tutkimuskeskus (GTK)
- Oulun Yliopisto (UOULU)
- Polytechneio Kritis (TUC)
- Meab Chemie Technik GMBH (MEAB)

Ecocerâmica e Cristalaria de Portugal

AIM

Increase the competitiveness of national ceramics and domestic glassware, based on factors of innovation, differentiation and a strong collaborative dynamic and investment in innovation throughout the years various segments of the sector's value chain, supported by improving the qualification of its assets.
The ECP-Pact participant and activities structure, configures a complete consortium, as it brings together industrial productive and R&D capabilities, that will cover all productive advances, and technical-scientific developments foreseen in the ECP-Pact project.

START YEAR
2022

END YEAR
2025

BUDGET
€ 100.739.593,11

FUNDING
PRR

LINK

www.agendaecp.pt

PARTNERS

- Vista Alegre Atlantis
- AIP
- Apicer
- Bordalo Pinheiro
- CCG
- Cerutil
- Crisal
- CTCV
- Fnway
- Induzir
- Inegi
- INOV
- LPL
- SLQ
- LST
- Matcerâmica
- MCS
- Metalcértima
- Microprocessador
- Primus Vitória
- PRF
- Revigrés
- Ria Stone
- Sanindusa
- TICE
- UA
- Viatel
- Visabeira

LIFE FUNDED PROJECTS

LIFE HYPOBRICK EUROPEAN PROJECT

AIM

The manufacture of ceramic materials is energy intensive, consumes large amounts of primary raw materials, and produces considerable amounts of greenhouse gases (GHG). Bricks and roof-tiles are the ceramic products with the highest GHG emissions.

The LIFE HYPOBRICK project aims to demonstrate the feasibility of manufacturing waste-based building products using an extremely low CO2 emission process, called the alkaline-activation process (AAP). The project will focus on manufacturing bricks made from the new waste-based material in southern and northern European countries (Spain and Germany), in which the wastes available and the constructive requirements are quite different and cover the trends existing in a significant number of European countries.

To achieve its aim, the project will:

- ·Formulate waste-based mixtures and produce new materials for manufacturing bricks using the AAP that meet all the technical and environmental requirements for international standards and for the market;
- Define the operating variables of all the process stages involved in the AAP;
- Modify the industrial facilities to allow the manufacturing of the new building material;
- Solve the potential production problems that may arise during the pilot and industrial trials in order to obtain building products free of defects and with the required properties;
- Obtain a cost-effective and economically-viable building material with an innovative process that favours its commercialisation; and
- Make an agreement with another manufacturing company (outside of the project consortium) to replicate and transfer the results before the end of the project.

START YEAR

2019

END YEAR

2022

BUDGET

1 578 722 €

FUNDING

LIFE18 CCM/ES/001114

PROJECT'S IMPLEMENTORS

Coordinating Beneficiary:

- Asociación de Investigación de las Industrias Cerámicas (AICE)

Associated Beneficiary(ies):

- Ladrillos Mora, S.L.
- Recycling, Consulting & Services, S.L.
- Schlagmann Poroton GmbH & Co. KG
- Technische Hochschule Nuernberg Georg Simon Ohm

LINK

https://lifehypobrick.eu/

Current Brick Manufacturing Process

Current System

Alkaline Activation Process (AAP)

LIFE Hypobrick

LIFE EGGSHELLENCE:
A potential raw material for ceramic wall tiles

AIM

The project LIFE EGGSHELLENCE involves two very different production sectors: egg production and processing and ceramic production. Both sectors have established an industrial symbiosis in accordance with the principles of the Circular Economy, in this case, reusing the waste of thousands of tons of eggshells produced each year to process them as raw material in the ceramic tiles manufacturing.

The need to protect virgin and non-renewable raw materials, together with the previous experience of the members of this project in the field of ceramic processing and waste recovery, has encouraged the consortium to try to demonstrate the technical feasibility of using eggshells as a secondary raw material in the production of ceramic tiles.

This project will result in economic benefits, both for the egg processing industry and for the ceramic industry, but also in environmental benefits, since it will contribute to the implementation of the Waste Framework Directive (Directive 2008/98/EC) following the objectives and targets of the Roadmap for a Resource Efficient Europe.

LINK

https://www.lifeeggshellence.eu/

START YEAR

2020

END YEAR

2024

BUDGET

145 077,90 €

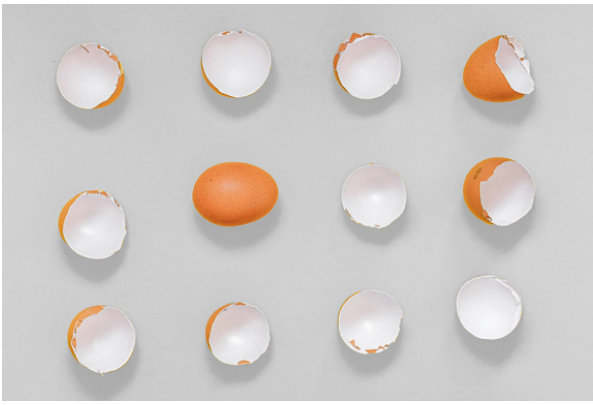
FUNDING

LIFE +

PARTNERS

Coordinator: Asociacion de Investigacion de las Industrias Ceramicas AICE

- EUROATOMIZADO, S.A
- Maincer
- University of Aveiro
- Agotzaina, S.L
- Adelino Duarte da Mota



LIFE SUPERHERO:
Energy-efficient roofs for sustainable low-cost climate adaptation

AIM

Ventilated and permeable roofs (VPRs) made from clay tiles can provide a sustainable climate adaptation and mitigation technology, which considerably reduces the energy required to cool buildings. The LIFE SUPERHERO project team, coordinated by Centro Ceramico, will demonstrate the benefits of the technology by renovating two buildings in Reggio Emilia. They aim to increase the use of VPRs by producing a standardised roof air permeability test method, and updating regulations, standards and green rating systems to include VPRs. The team will also release a decision-support tool for building design, and upgrade a roof tile production line in Italy to produce the new VPR tiles.

START YEAR

2020

END YEAR

2025

BUDGET

3 032 924 €

FUNDING

LIFE19 CCA/IT/001194

PARTNERS

10 partners, including:

- Confindustria Ceramica - Italy
- HISPALYT - Spain
- Industrie Cotto Possagno - Italy
- Terreal - France
- Edilians - Belgium
- CENTRO CERAMICO - Italy
- Università Politecnica delle Marche - Italy
- Centre Technique de Matériaux Naturels de Construction - France
- ACER - Italy
- Comune di Reggio Emilia - Italy

LINK

www.lifesuperhero.eu

LIFE REPLAY:
Unveiling a recycling-source of heavy metal-based solids component and organic effluent for use in the ceramic industry

AIM

LIFE REPLAY proposes a novel circular value chain for inkjet ink wastes by introducing a new concept to reuse waste from the ceramic industry. indeed, the project aims to demonstrate the technical and economic feasibility of using ceramic inkjet ink wastes as a new raw material for the ceramic industry. For this purpose, wastes will first be processed by a prototype and separated into a heavy metal inorganic pigment, and an organic solvent. These components will then be reintroduced into the production process of pigments, ceramic inkjet inks, cleaners and ceramic tiles.

The project will contribute to the implementation of the Waste Framework Directive, the Roadmap to a resource-efficient Europe and the Circular Economy Action Plan through the promotion of resource efficiency and new business models aligned with the waste management hierarchy. It is also in line with the Raw Materials Initiative, aiming to boost resource efficiency and the supply of secondary raw materials through recycling.

LINK

https://lifereplay.eu/

LIFE REPLAY

START YEAR

2021

END YEAR

2025

BUDGET

1,290,675 €

FUNDING

LIFE20 ENV/ES/000115

COORDINATOR

- Asociación de Investigación de las Industrias Cerámicas - Spain

PARTCIPANTS

- CTR(Centro De Tratamiento De Residuos Del Mediterraneo Sl), Spain
- AKCOAT(Akcoat Recubrimientos Quimicos Especializados S.L.U), Spain
- NEPTURY(NEPTURY TECHNOLOGIES, S.L.), Spain
- KEROS(KEROS CERÁMICA S.L.), Spain

LIFE : Reducing nanoparticle exposures in industrial workplaces

AIM

The assessment of the exposure to nanomaterials in industrial workplaces is a widespread challenge due to the high diversity of nanoparticle sources. These form two main categories: manufactured nanomaterials (MNM) and process-generated nanoparticles (PGNP). MNM are intentionally designed and manufactured for specific purposes, and for this reason they have been widely studied. However, PGNP are unintentionally released to workplace environments during different industrial activities, and therefore they remain unknown.

PGNP are generated in high-energy processes such as burning fuels, plasma cutting, welding, metal grinding and ceramic tile firing. These industrial processes are considered as permanent releasers of PGNP (up to several million nanoparticles/cm3), which may lead to chronic exposures and diseases if these sources are not recognised as such and if control measures are omitted or not adequately designed.

The main objective of the LIFE NANOHEALTH project is to reduce occupational exposure to PGNP from permanently releasing industrial processes by optimising the performance of Risk Management Measures in indoor exposure scenarios. The aim is to clearly define the levels of concentration and risks posed by PGNP generated in industrial processes, as well as develop models for simulating the dispersion of PGNP in indoor air and draw up engineering measures for minimising PGNP in industrial environments.

The project will contribute to meeting EU legislation on health and safety of workers regarding the risk of nanomaterials at work in a cost-effective way, providing policy makers, authorities, professionals and workers with a set of tools and technologies that will offer adequate solutions for addressing these risks.

START YEAR

2022

END YEAR

2024

BUDGET

1 533 563 €

FUNDING

LIFE Programme

PARTNERS

Coordinator: Asociacion De Investigacion De Las Industrias Ceramicas ITC-AICE

- Ceramica Saloni, S.A
- Urban Air Purifier
- Talleres Mecánicos Comas, SLU
- Agencia Estatal Consejo Superior de Investigaciones Científicas
- Unimat Prevención, SL
- Universitat Politècnica De Catalunya

LINK

https://webgate.ec.europa.eu/life/publicWebsite/project/details/5727

2B Adapt

AIM

2B Adapt: climate adaptation through biodiversity at business parks - ecosystem-based solutions for climate adaptation at business parks.

2B Adapt provides nature-based solutions for climate adaptation on business parks. The overall objective is to help companies and managers of the business parks to deal with climate-related problems such as flooding and heavy rainfall on the one hand and severe drought and heat (islands) on the other hand by adapting through nature-based measures (ecosystem services).

START YEAR

2023

END YEAR

2026

BUDGET

10 680 000 €

FUNDING

5 340 000 €

PARTNERS

- Gemeente Bladel
- Gemeente Land van Cuijk
- Gemeente Son en Breugel
- Blenders VZW vereniging Zeeuwse Milieufederatie
- Huis van de Brabantse Kempen,
- Natuurinvest Ondernemingsvereniging Majoppeveld
- Stad Lommel
- Vlaamse Overheid
- POM Antwerpen
- POM West-Vlaanderen
- POM Oost-Vlaanderen
- POM Vlaams-Brabant
- Provincie Oost-Vlaanderen
- Provincie Zeeland
- SCR-Sibelco NV
- Stad Beringen
- Wienerberger NV
- Vlaamse Milieumaatsschappij
- Universiteit Antwerpen

ERASMUS+ PROGRAMME

SPIRE-SAIS: Skills Alliance for Industrial Symbiosis – (SAIS) A Cross-sectoral Blueprint for a Sustainable Process Industry (SPIRE)

AIM

The main objective of the project is to develop a blueprint "European Energy Intensive Industry Skills Agenda and Strategy (SPIRE-SAIS)" for an ongoing and short-termed implementation of new skills demands concerning cross-sectoral industrial symbiosis (IS) and energy efficiency.

This project will deliver a consolidated approach for addressing industry sectors overarching skills demands and challenges, focusing particularly on the people and skills necessary for industrial symbiosis and energy efficiency. Build on the already existing SPIRE coordination, projects and activities, a cross-sectoral industrial symbiosis approach covering all the eight SPIRE sectors will be developed.

COORDINATOR

Technische Universität Dortmund - Germany

LINK

https://www.spire2030.eu/sais

START YEAR

2020

END YEAR

2023

BUDGET

-

FUNDING

Erasmus+ Programme

RESEARCH FUND FOR COAL AND STEEL

HYDROPIC ANALYSIS AND CONTROL OF HYDROGEN CONTENT DURING STEELMAKING

AIM

The objective of the research project is to enhance the control of the hydrogen content during the different steps of liquid steelmaking, to reliably achieve low target hydrogen contents in the final product under reduced energy and resource consumption. To this purpose, detailed investigations on hydrogen pick-up and removal throughout the key processes of liquid steelmaking, i.e. secondary metallurgy and continuous casting, will be performed. They will be accompanied by dedicated measurement campaigns of the hydrogen content dissolved in liquid steel and the transfer into the as cast material based on novel in-situ measurement technologies.

The results of these investigations will be used to derive correlations of hydrogen content evolution with the process conditions during the different treatment steps with focus on ladle treatment as well as casting via the tundish. On this basis dynamic process models for the relevant mechanisms and metallurgical reactions of hydrogen pick-up and removal will be set up. The models will be used in combination with optimized in situ measurements to monitor and predict the evolution of the hydrogen content dissolved in liquid steel throughout the complete process chain. A combination of model-based advisory system, in-situ measurement strategies and dynamic control of process parameters will be developed to apply optimal operational practices for the quality-dependent demands, for a reliable achievement of the target hydrogen content in the final product under minimum energy and resource consumption. The complete system will be tested and validated under industrial conditions in plant trials and established for operational practice for the production of different steel grade groups.

START YEAR
2019

END YEAR
2022

BUDGET
1 500 000 €

FUNDING
RFCS 847256

PARTNERS

- VDEh-Betriebsforschungsinstitut gGmbh (BFI)
- RHIMagnesita (RHIM)
- Sidenor I+D S. A. - Spain
- Aktiengesellschaft der Dillinger Hüttenwerke
- Minkon

HORIZON EUROPE

RECONMATIC:
Automated solutions for sustainable and circular construction and demolition waste management

Reconmatic

START YEAR
2022

END YEAR
2026

BUDGET
6 091 958 €

FUNDING
Horizon Europe

AIM

A suite of innovative tools, solutions and techniques to build bridges through "bottom-up" construction and demolition waste (CDW) prevention and handling to reach "top-down" European waste reduction goals is proposed. The project's agenda reflects the HORIZON-CL4-2021-TWINTRANSITION- 01-11 call objectives, with a focus on integrated decision making that would allow considering all aspects of CDW generation and involving all stakeholders within the construction industry. Current practices in CDW management, from prevention and minimization of waste to its reuse, will be evaluated and markets to support the supply chains and circular economies will be identified. Consequently, a digital information management system for stakeholders' collaboration and waste traceability will be developed, tested and demonstrated. It is envisaged that the CDW minimization will be achieved by empowering BIM and integrating waste management relevant data into the information models. Processes of converting different formats of construction information to the digital twins will be automated, as well as the decision-making system for repurposing, deconstruction and demolition. Automation will be employed for AI-assisted CDW classification and robotic segregation off-site. The methodology for CDW logistics in regard to the automatic and more efficient CDW sorting and distribution will be proposed, along with methodologies to provide new added-value uses to CDW. The consortium involves 7 research institutions, 10 small to medium enterprises, 5 large companies and 1 association, representing 5 EU countries, UK and China. The feasibility and efficiency of the developed solutions

will be evaluated using 6 demonstrators. This consortium composition will enable us to tackle the whole life-cycle CDW management, propose beyond the state-of-the-art technologies, and contribute to reaching the zero-waste construction industry in Europe in the near future.

PARTNERS

Coordinator: Technical university of Praga

- Asociacion de Investigacion de las Industrias Ceramicas ITC-AICE
- The University of Salford
- Fundacion Tecnalia Research & Innovation
- Nanjing Eurosmart Intelligent Technology Research Institute Co, Ltd
- Future Needs Management Consulting Ltd
- The University of Manchester
- Envisan-gem, a.s.
- Panepistimio Thessalias
- Anakem SA EL
- Strabag a.s. CZ
- Aristotelio Panepistimio Thessalonikis
- I-Catalist SL
- Italferr Spa It
- Cluster De Habitat Eficiente
- Ergodomi Avete
- Skyrodema Verias SA
- JAIP - Jihoceska Sgentura pro Podporu Inovaciops
- Lecycle Ltd
- Reciclados Sostenibles, S.L. (RECSO)
- Bimbox Associates Ltd UK
- Morgan Sindall Construction & Infrastructure Ltd
- China Association of Circular Economy

LINK

https://cordis.europa.eu/project/id/101058580

CARBON4MINERALS:
Transforming CO2 into added—value construction products

AIM

The European Green Deal sets ambitious targets for GHG emission reductions for the process industry that can only partly be reached by the transition to renewable energy. Residual, hard-to-abate CO2 emissions from industrial processes, such as steel and cement production, will need to be captured, and wherever possible, processed and recycled into new products.

The Carbon**4**Minerals project addresses the simultaneous use of CO2 from industrial flue gases with current and future waste streams to unlock a vast stack of resources for innovative law-carbon binders and construction materials (80-135% lower CO2-emissions).

A total of 8 industrial pilots will be built and operated across the process value chain from CO2, capture to cement production and low-carbon construction products. Technical, environmental, and economic feasibility will be validated by an integrated assessment and the development of a service life test package tailored to these new products. Co-learning modules are developed to support industrial implementation and market introduction. A consortium of technology providers, producers and research partners will develop, test, and demonstrate the processes.

The research consortium made of 14 partners from 7 different European countries has met for a kick-off meeting held from the 1st to the 2nd of February 2023 in Berchem, Belgium also attended by the Project Officer Marko Cacanoski from the European Commission. The partners will work an the concept until the end of the project, which is set for the 31st of December in 2026.

START YEAR
2023

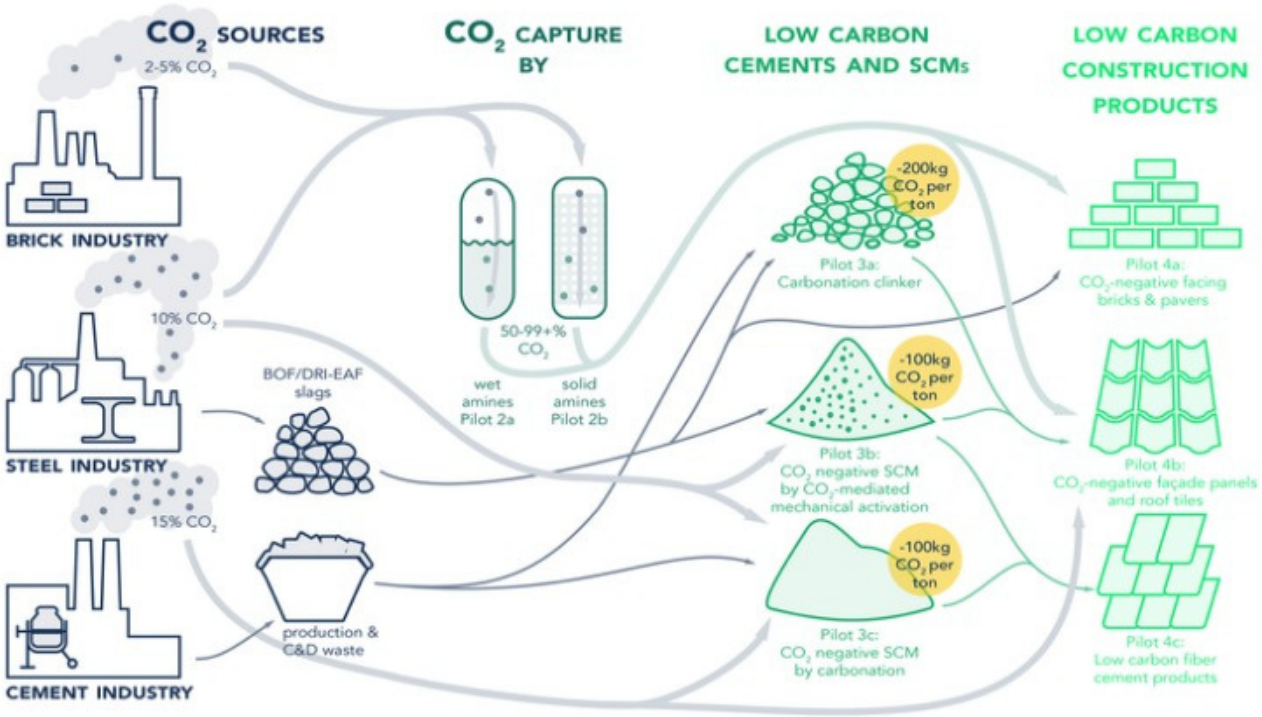
END YEAR
2026

BUDGET
20 000 000 €

FUNDING
101091870

PARTNERS

- Heidelberg Materials
- Arcelor Mittal
- Etex Group
- Vandersanden
- Fenix.TNT
- KON Chemical Solutions
- RWTH Aachen University
- NTNU
- SINTEF
- Carbonoro
- TCKI
- Carbon Upcycling
- ETH Zürich



OTHER FUNDED PROJECTS

TORETECH:
Energy Efficiency in Brick Production

START YEAR

2019

END YEAR

-

BUDGET

-

FUNDING

-

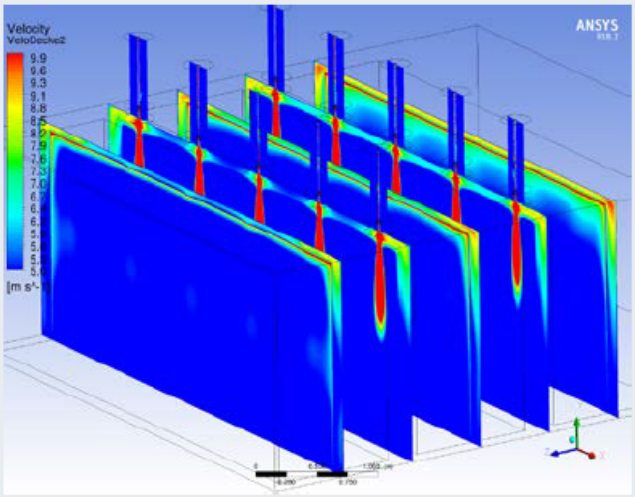
With TOREtech, a jet pump pure gas burner concept is being developed that functions without an external supply of combustion air. Pure gas burners only work with the hot furnace atmosphere already contained in the combustion chamber of the tunnel furnace and avoid the insertion of air, thus reducing the energy requirement. However, the pure gas burners currently available on the market do not have the required flame jet speed to achieve a homogeneous temperature distribution in the furnace, which means that burners with externally supplied combustion air have been used for tunnel furnaces up until now. This innovative concept combines the pure gas burner with a jet pump using natural gas. This approach has not yet appeared on the market and should increase the energy efficiency of the process.

PARTNERS

- Wienerberger
- TU Wien (Vienna University of Technology)
- Current Calculation and Simulation e.U.

LINK

https://www.energy-innovation-austria.at/article/toretech-2/?lang=en



CFD simulations (Computational Fluid Dynamics)

> Detailed analysis of the burner and nozzle geometries (including the combustion calculation, analysing the mixing behaviour and the flame structure)
> Optimisation of the burner geometry
> Combustion calculation regarding potential pollutant emissions
> Analysing the ignition characteristics for various conditions

Source: DrS[3]

ANDACAST:
Substitute Materials for Andalusite in Refractory Castables

AIM

The aim is to prepare the refractory industry for the decreasing availability of primary andalusite raw materials. Adequate substitution materials will therefore be required to further guarantee the performance of thermal processes that rely on the superior properties of andalusite-based refractories. R&D to develop substitute materials for andalusite as a raw material is therefore of strategic interest for the refractory sector and the main objective of the project.

Basic knowledge will be created about how andalusite-based refractories achieve their beneficial properties, including improved methods to describe the thermal evolution of refractories in terms of structural and mineralogical changes. This will allow the development of substitute materials for andalusite (which can be translated into economic results by SMEs by producing castables from them).

START YEAR
2021

END YEAR
2022

BUDGET
807 786 €

FUNDING
CORNET
(national funding)

PARTNERS

- Forschungsgemeinschaft Feuerfest e. V. – Germany
- Hochschule Koblenz – Germany
- Institut Interuniversitaire des Silicates, Sols et Matériaux – Belgium

REFRAPREDICT:
Predicting the Long-Term Refractoriness of Refractory Monolithics made from Secondary Raw Materials

AIM

The research objective is to increase the knowledge about the influence of small amounts of impurities from secondary raw materials onto the processing behaviour (workability, setting, hardening) and the high-temperature behaviour/performance of refractory monolithics.

The research also aims at improving the definition of "refractoriness". What is understood as a limiting temperature for the use of a refractory product is indeed a temperature range, in which melt phases are being formed and refractories undergo a transition from brittle to ductile behaviour. These effects are actually able to drastically improve the high-temperature behaviour of refractories.

The new knowledge shall enable SMEs from the refractory sector to use more secondary raw materials, while guaranteeing the performance of the refractory materials they produce.

START YEAR
2021

END YEAR
2022

BUDGET
769 025 €

FUNDING
CORNET
(national funding)

PARTNERS

- Forschungsgemeinschaft Feuerfest e. V. – Germany
- Hochschule Koblenz – Germany
- Łukasiewicz - Instytut Ceramiki i Materiałów Budowlanych – Poland
- Stowarzyszenie Producentów Materiałów Ogniotrwałych – Poland

COLCAST:
Improving the High Temperature Performance of Colloidal Bonded Refractory Castables

AIM

The research aims at alternative and innovative colloidal based bonding systems for refractory monolithics based on alumina, silica/alumina (mullite) or magnesia/alumina (spinel) as an alternative to colloidal silica. This shall enhance the high temperature performance of colloidal bonded monolithics.

The research shall also deepen the knowledge about the high temperature thermomechanical and thermochemical behaviour of colloidal bonded refractory monolithics. Producers of refractories will be able to rely on sound insights into their high temperature behaviour and on new investigation methods to improve and develop refractory solutions with increased lifetime.

START YEAR

2021

END YEAR

2023

BUDGET

855 000 €

FUNDING

CORNET
(national funding)

PARTNERS

- Forschungsgemeinschaft Feuerfest e. V. – Germany
- Hochschule Koblenz – Germany
- Institut Interuniversitaire des Silicates, Sols et Matériaux – Belgium

CAMBRIDGE CARBON CAPTURE:

OVERVIEW

CO2LOC technology offers a realistic solution to climate change by enabling industry to profitably sequester CO2 through a two-stage mineralization process. The mineralization process permanently locks the sequestered CO2 in rock form and due to its flexibility, can be utilized across a range of industries. CO2LOC is unique in that it approaches the planet's dependency on fossil fuels by introducing a profit motive to industry to invest in emission-reduction. Our advanced mineralisation processes combine low cost inputs to de-carbonise the emissions, whilst simultaneously producing valuable by-products.

CO2LOC technology combines two distinct stages: the production of low-cost consumables, and the CO2 capture itself:

1. The first stage involves the low energy digestion of silicate minerals with NaOH to produce low-cost MgOH2 for the carbon-capture stage. By-products from this initial process include silicon dioxide, and a number of trace metals.
2. The second stage is where CO2 capture occurs: the exhaust gas is bubbled through a reaction column, in which the MgOH2 reacts with the CO2 to produce MgCO3. The MgCO3 is then filtered out, forming a rock-like substance, permanently storing the sequestered carbon in solid-form.

Cambridge Carbon Capture

START YEAR

2022

BUDGET

Pilot: £3m

FUNDING

UK Government

PARTNERS

- Innovate UK
- YLEM
- WRK Design & Services
- Wales & West Utilities
- Energy Innovation Centre
- TATA Steel
- AMEC Foster Wheeler
- Shell
- University of Cambridge
- The University of Sheffield
- Northern Gas Networks

LINKS

Information on Pilot Stage
www.cacaca.co.uk/

COMPLETED PROJECTS

SPIRE FUNDED PROJECTS

DRYFICIENCY:
Waste Heat Recovery in Industrial Drying Processes

AIM

The overall objective of the DRYficiency project is to lead energy-intensive sectors of the European manufacturing industry to high energy efficiency and a reduction of fossil carbon emissions by means of waste heat recovery to foster competitiveness, improve security of energy supply and guarantee sustainable production in Europe. The project addresses three sectors, namely brick, pet care/feed and food industry.

The results are however of major relevance for a number of other energy-intensive industries such as e.g. pulp and paper industry. The key elements of the solution are two high temperature vapour compression heat pumps: a closed loop heat pump for air drying processes and an open loop heat pump for steam drying processes. The DRYficiency solution will be demonstrated under real production conditions. in operational industrial drying processes in three leading European manufacturing companies from the pet food, food and brick industries.

START YEAR

2016

END YEAR

2021

BUDGET

7 084 849,26 €

FUNDING

SPIRE

PARTNERS

14 partners from 5 countries, including:

- Wienerberger AG - Austria
- European Heat Pump Association - Belgium

LINK

http://dry-f.eu/

ETEKINA:
Thermal energy recovery

ETEKINA
Thermal energy recovery

AIM

ETEKINA is an EU funded research project aiming to recover 57-70% of the waste heat stream in energy intensive industries. ETEKINA stands for "heat pipe technologies for industrial applications."

Ten companies and institutes from across Europe have joined forces to improve the energy performance of energy intensive processes. Their solution is based on heat exchanger technology (HPHE) using heat pipes for thermal recovery.

As part of the project, three HPHE prototypes will be built and tested for three different production plants in the aluminium, steel and ceramics sectors. The different industrial environments produce different exhaust streams with different waste heat quantity and quality (chemical composition, different particles coming out along with the gases, temperature and pressure of the flue gases), and provide different processes where the recovered heat might be utilized.

The challenge: the recovery solution should be adapted increasing the overall efficiency and being cost-effective.

START YEAR

2017

END YEAR

2021

BUDGET

5 539 612,25 €

FUNDING

SPIRE

PARTNERS

10 partners from 5 countries, inclunding:

- Ikerlan - Spain
- Econotherm - UK
- SIJ Metal Ravne - Slovénie
- Ceramiche Atlas Concorde - Italy
- European Science Communication Institute - Germany

LINK

https://www.etekina.eu/

HARMONI:
Industrial Cooperation on Regulation and Standardisation

AIM

The HARMONI project, approved by the European Commission, started in October 2017 and concluded in 2019. HARMONI was a CSA project with the aim of proposing solutions to regulatory bottlenecks and standardisation. The consortium consisted of various industrial partners, associations and institutes representing the cement, ceramics, chemical, minerals, metal, steel and water sectors.

In order to achieve HARMONI's overarching goal, the consortium developed and applied a methodology for ensuring an effective collaboration of the 8 sectors to elaborate the solutions to the common challenges they faced due to non-technological barriers, such as regulatory issues or the lack of European Standards when trying to improve their resource efficiency.

START YEAR

2017

END YEAR

2019

BUDGET

70 000 €

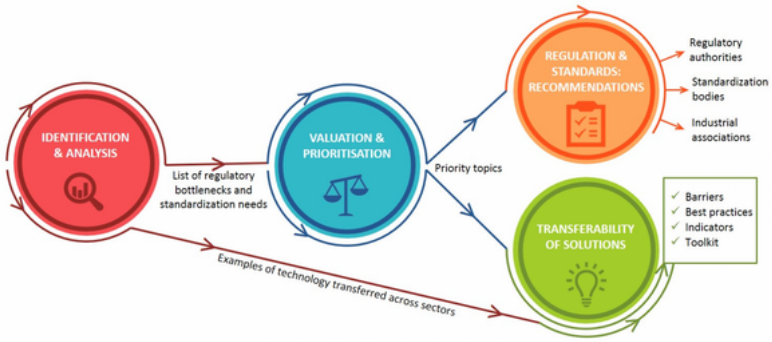
FUNDING

SPIRE

PARTNERS

7 partners from 4 countries, including:

- CIRCE - Spain
- A.SPIRE - Belgium
- DIN - Germany
- European Centre for Refractories gGmbH - Germany
- FEhS Institute for Construction Materials Research - Germany



LINK

https://www.spire2030.eu/harmoni

DREAM:
Design for Resource and Energy Efficiency in Ceramic Kilns

AIM

The DREAM project aimed to design, develop and demonstrate a radically improved architecture for ceramic industrial furnaces, characterised by optimised energy consumption, reduced emissions, and lower operating costs compared to currently available technological solutions. This will be obtained by substantially enhancing specific furnace parts (control system, refractories, emissions abatement system) and by adding new modules and sub-systems (CHP unit, heat pipes) to the current furnace architecture.

DREAM specific objectives include:

- to design innovative hardware furnace components improving energy efficiency,
- to introduce substantial improvements on current hardware-software kiln parts,
- to demonstrate the DREAM solutions in a variety of industrial settings,
- to pave the way for a full seizure of DREAM related market opportunities.

DREAM strongly contributes to both the sustainability and competitiveness of the European ceramics and process industries. Indeed, the DREAM coordinator and industrial partners are technology and market leaders in the ceramics equipment field, and this will streamline the translation of the DREAM research results into successful products and services.

START YEAR

2016

END YEAR

2019

BUDGET

5 076 105 €

FUNDING

SPIRE

PARTNERS

10 partners from 4 countries, including:
Coordinator: SACMI – Italy

- RATH GmbH- Germany
- Forschungsgemeinschaft Feuerfest e.V. - Germany
- Mirage Granito Ceramico SPA - Italy
- Keraben Grupo SA – Spain

LINK

https://www.spire2030.eu/dream

SHAREBOX:
Secure Management Platform for Shared Process Resources

AIM

Resource efficiency offers a major economic opportunity for the European Process Industry, both in terms of cost savings as well as opportunities to offer greener products and services. Industrial Symbiosis (IS) is the use by one company or sector of by-products, including energy, water, logistics and materials, from another. The approach that underpins SHAREBOX centres on logical work flow that covers from the identification of new symbiotic synergies right through optimised connections among companies and organisations in established symbiotic relationships. SHAREBOX will provide plant operations and production managers with the robust and reliable information that they need in real-time in order to effectively and confidently share resources (plant, energy, water, residues and recycled materials) with other companies in an optimum symbiotic ecosystem.

START YEAR

2015

END YEAR

2019

BUDGET

6 000 000 €

FUNDING

SPIRE

PARTNERS

15 partners from 6 countries, including:

- Ceramic Industry Research Association - Spain
- Keros Cerámica S.L. - Spain
- International Synergies Ltd. - UK
- The University of Twente - Netherlands
- Chemie-Cluster Bayern - Germany

LINKS

http://sharebox-project.eu/

IBD: INTENSIFIED BY DESIGN®
for the intensification of processes involving solids handling

AIM

IbD® will create a holistic platform for facilitating process intensification in processes in which solids are an intrinsic part, the cornerstone of which will be an intensified-by-design® (IbD). The IbD approach is hinged on the use of robust data about a process to 'redesign', modify, adapt and alter that process in a continuous, intensified system, and will be the new paradigm in the intensification of processes based on statistical, analytical and risk management methodologies in the design, development and processing of high quality safe and tailored chemicals, pharmaceuticals, minerals, ceramics, etc. under intensified processes.

START YEAR

2015

END YEAR

2018

BUDGET

11 000 000 €

FUNDING

SPIRE

The IbD Project will deliver the EU process industry with an affordable and comprehensive devices-and-processes design-platform endeavoured to facilitate process intensification (PI), which specially targets -but is not limited to- solid materials processing. Five PI industry case studies will be implemented in mining, ceramics, pharmaceutical, non-ferrous metals and chemical processes using the IbD approach and to validate the IbD methodologies, tools, PI modules, control and fouling remediation strategies and the ICT Platform itself for the industrial implementation of PI in processes involving solids. The Platform includes design modules for the commonest intensified reactors-Rotating fluidized beds, micro-structured reactor and spinning disk, among others, as well as a generic Module Builder -equipped with a set of both proprietary and third-parties design tools- for designs carried out on the basis of radically novel ideas. The IbD Platform output is basically a data set that comprises the intensified reactor design -ready to be built or assembled-, an optimised whole process design including the upstream/downstream intensified unit operations and their solids handling capability, as well as cleaning methods, etc. and the expected economic and environmental quantitative impacts.

36
MONTHS

11
MILLION BUDGET

22
PARTNERS

8
COUNTRIES

PARTNERS

22 partners from 8 countries, including:

- Euroatomizado, S.A. (EUROATOM) -Spain
- Ceramic Industry Research Association - Spain
- MBN Nanomaterialia S.p.A. - Italy
- Outotec Oyj - Finland

LINK

http://ibd-project.eu/

HORIZON 2020 FUNDED PROJECTS

ATHOR: Advanced THermomechanical multiscale mOdelling of Refractory linings

AIM

The ATHOR network was firstly dedicated to train researchers in multi engineering required fields for a better understanding of thermomechanical behaviour of refractory linings used in I&S applications. The project aimed to cover all the main features of thermomechanical analysis of refractory linings including material characterization, impact of corrosion on thermomechanical properties, thermal shock resistance, modelling of non-linear thermomechanical behaviours, instrumentation of industrial devices and measurement in operation conditions. New testing methods and models were developed to address the Scientific/Technological (S/T) challenges for these applications and help to design better performing refractory materials and linings.

The main scientific objective of the ATHOR network was to adapt and develop the most advanced modelling strategies and experimental technologies to the field of refractory to be able to perform reliable computations and measurement in the temperature range of the applications of these materials. ATHOR targets the development of high-end engineering technologies in the fields of material's science and numerical simulations to give a substantial contribution through the design of more robust and reliable refractory linings.

START YEAR

2017

END YEAR

2019

BUDGET

1 100 750 €

FUNDING

HORIZON 2020

PARTNERS

14 partners from 8 countries, including:

- University of Limoges - France
- University of Minho - Portugal
- RHI-Magnesita - Austria
- Pyrotek Scandinavia AB – Ed - Sweden

LINK

http://www.etn-athor.eu/

AMITIE:
Additive Manufacturing Initiative for Transnational Innovation in Europe

Additive Manufacturing Initiative for Transnational Inovation in Europe

This project received funding from EU H2020 Research & Innovation Programme under the Marie Skłodowska Curie Grant Agreement 734342

AIM

Additive manufacturing (AM) technologies and overall numerical fabrication methods have been recognized by stakeholders as the next industrial revolution bringing customers' needs and suppliers' offers closer. It cannot be dissociated to the present trends in increased virtualization, cloud approaches and collaborative developments (i.e. sharing of resources). AM is likely to be one good option paving the way to Europe re-industrialization and increased competitiveness. AMITIE will reinforce European capacities in the AM field applied to ceramic-based products.

Through its extensive programme of transnational and intersectoral secondments, AMITIE will promote fast technology transfer and enable as well training of AM experts from upstream research down to more technical issues. This will provide Europe with specialists of generic skills having a great potential of knowledge-based careers considering present growing needs for AM industry development. To do that, AMITIE brings together leading academic and industrial European players in the fields of materials science/processes, materials characterizations, AM technologies and associated numerical simulations, applied to the fabrication of functional and/or structural ceramic-based materials for energy/transport, and ICTs applications, as well as biomaterials. Those players will develop a new concept of smart factory for the future based on 3D AM technologies (i.e. powder bed methods, robocasting, inkjet printing, stereolithography, etc.) and their possible hybridization together or with subtractive technologies (e.g. laser machining). It will allow for the production of parts whose dimensions, shapes, functionality and assembly strategies may be tailored to address today's key technological issues of the fabrication of high added value object following a fully-combinatorial route. This is expected to lead to a new paradigm for production of multiscale, multimaterial and multifunctional components and systems.

START YEAR

2017

END YEAR

2021

BUDGET

877 500 €

FUNDING

HORIZON 2020

PARTNERS

20 partners from 8 countries, including:

- Universite Polytechnique Hauts-De-France - France
- Friedrich-Alexander-Universitaet Erlangen Nuernberg - Germany
- Bundesanstalt Fuer Materialforschung Und Pruefung - Germany
- Universita Degli Studi Di Padova - Italy
- Politecnico Di Torino - Italy

LINK

http://www.rise-amitie.eu/

CLEANTECHBLOCK2

AIM

The CLEANTECHBLOCK2 project was a project led by Gråsten Brickworks in Denmark to pursue an innovative building component to create a systemic change with the construction market and recycling market in Europe. The project followed on from where the project CleanTechblock left off, aimed to finalise the technical development started under CleanTechBlock. The intention was to commercialise this product, a patented multifunctional sandwich-block based on the combination of two clay brick shells and foamed recycled glass. The goal for this newbuilding product was to met the market preferences for more environmentally friendly products, as well as make a positive contribution to the energy efficiency of buildings, while reducing the demand for raw materials.

The CleanTechBlock has demonstrated value for money and reduced labour time in the construction phase, on top of reduced transportation costs. As well as this, the sandwich-blocks offer an overall increase in the living areas of 3-5%, while also demonstrating compelling insulation properties. CLEANTECHBLOCK2 was expected to result in an expected sales turnover of €67M and profits of €15M, 6 years after commercialization. The product ought to be sold for both residential and non-residential construction, the primary target markets were in Denmark, Sweden and Germany. The CLEANTECHBLOCK2 project aimed to help the EU to achieve its energy and environmental policy objectives.

START YEAR

2017

END YEAR

2019

BUDGET

1 572 500 €

FUNDING

HORIZON 2020

COORDINATOR

Graaten Teglvaerk - Denmark

LINK

http://cordis.europa.eu/project/rcn/210634_en.html

http://www.cleantechblock.com/

CELL3DITOR

AIM

A Solid Oxide Fuel Cell (SOFC) is a ceramic-based multilayer device that involves expensive and time-consuming multi-step manufacturing processes including tape casting, screen printing, firing, shaping and several high-temperature thermal treatments.

The main goal of the Cell3Ditor project was the development of a 3D printing technology for the industrial production of SOFC stacks by covering research and innovation in all the stages of the industrial value chain. All-ceramic joint-free SOFC stacks with embedded fluidics and current collection were fabricated in a two-step process (single-step printing and sintering) to reduce in energy, materials and assembly costs while simplifying the design for manufacturing and time to market.

Compared to traditional ceramic processing, the Cell3Ditor manufacturing process presents a significantly shorter time to market (from years to months) and a cost reduction estimated in 63% with an initial investment below one third of an equivalent conventional manufacturing plant (production of 1000 units per year).

START YEAR

2016

END YEAR

2019

BUDGET

2 191 233 €

FUNDING

HORIZON 2020
Fuel Cells and Hydrogen Joint Undertaking

PARTNERS

8 partners from 6 countries, including:

- 3DCeram - France
- Fundació Institut de Recerca de l'Energia de Catalunya - Spain
- SAAN Energi AB - Sweden
- Francisco Albero, S.A. - Spain
- Promethean Particles LTD - UK

LINK

http://www.cell3ditor.eu/about/

SMARTREC:
Developing a standard modularised solution for flexible and adaptive integration of heat recovery and thermal storage capable of recovery and management of waste heat

START YEAR

2016

END YEAR

2020

BUDGET

4 567 886,63 €

FUNDING

HORIZON 2020

AIM

Waste heat is a problem common to high temperature processing industries as a significantly underused resource, often due to challenges in economic heat valorisation. Secondary aluminium recycling and ceramic processing were identified as key examples with economically recoverable waste heat.

Several challenges are inherent; these processes are batch-based rather than continuous with corrosive particulate-laden flue gas over a wide temperature range. The Smartrec system meets these challenges by development of a standard, modular solution for integration of heat recovery with thermal storage that valorises medium to high grade waste heat, adaptable to different temperatures and industries. Following end-user analysis and characterisation of exhaust streams and waste products, full life cycle costing and assessment will be carried out with candidate molten salts selected for thermal storage and heat transfer fluid, validated by corrosion testing. A custom heat pipe heat exchanger will be modelled and designed around the requirements of heat transport capacity wick structure and capable of heat exchange with a molten salt pumping loop. This loop will include dual media thermocline thermal storage system with cost/system modelling, validation and instrumentation incorporated. A pilot Smartrec system will be constructed and deployed in a secondary aluminium recycler and/or ceramic processor valorising high grade heat for continuous energy-intensive salt-cake recycling. Smartrec will be validated by integration with existing systems with >6 months operation including a fully developed instrumentation framework.

A knowledge-based tool will be developed containing all relevant Smartrec parameters and information to model the system fully and allow users to determine their requirements, potential benefits and integrate Smartrec into their own systems via an open access workshop hosted by the consortium.

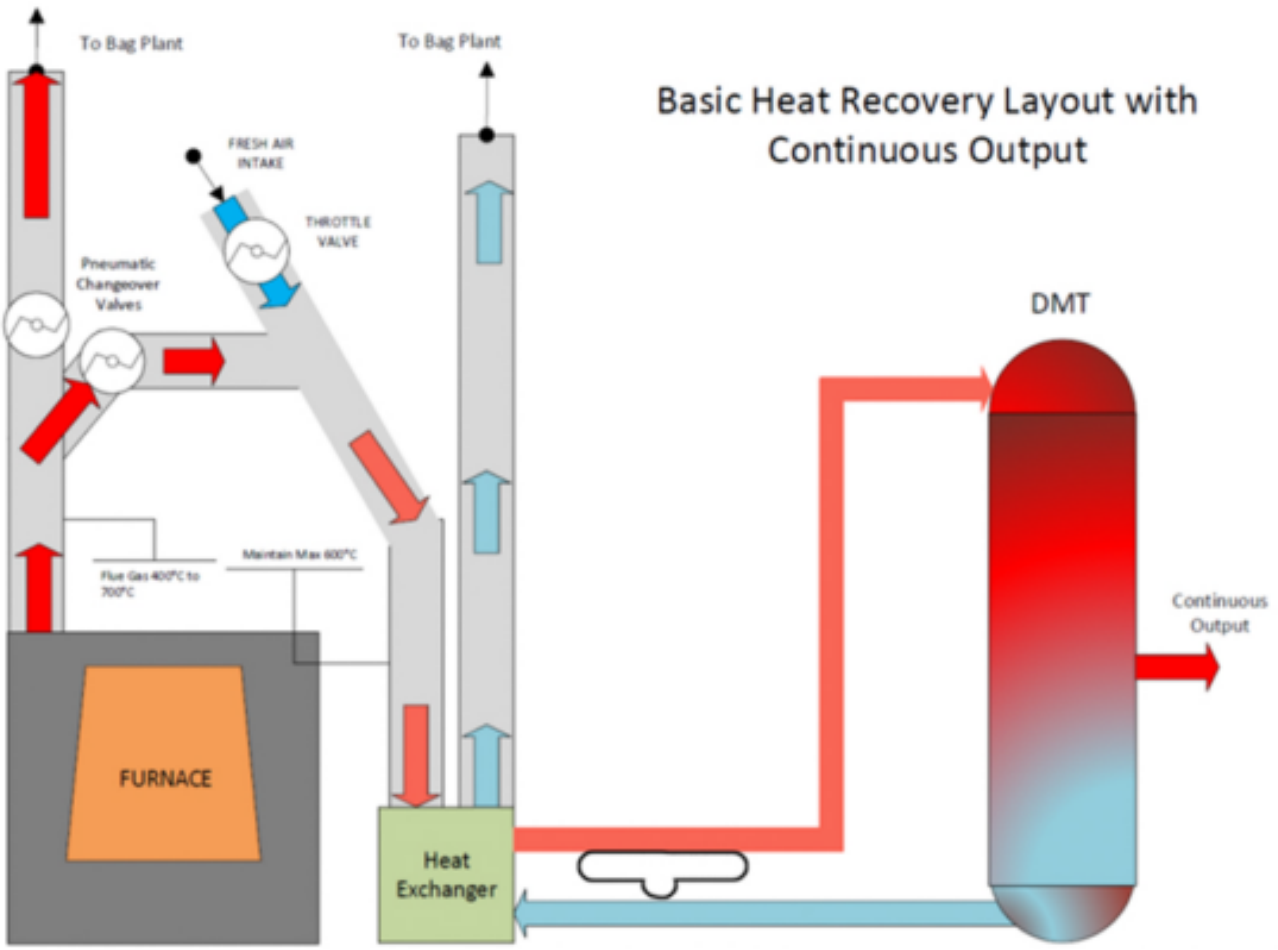
PARTNERS

9 partners from 6 countries, including:

- Econotherm Limited - UK
- Ceramic Industry Research Association - Spain
- Spike Renewables Srl - Italy
- Flowphys AS - Norway

LINK

http://smartrec.eu/



REMEB (Recycled Membrane Bioreactor):
Eco-friendly ceramic membrane bioreactor (MBR) based on recycled agricultural and industrial wastes for wastewater reuse

AIM

The main objective of the REMEB project was the implementation and validation of a low cost recycled ceramic membrane bioreactor (MBR) for water reuse in municipal and industrial wastewater treatment plants.

Currently available MBRs using inorganic membranes tend to have high running and maintenance costs. The REMEB project proposed to develop a new type of MBR which will significantly decrease the cost of MBR technology. REMEB used by-products from agro-industrial wastes (e.g. olive stones, hazelnut shells) and ceramic waste (chamotte) to develop the MBRs.

The REMEB project has partners in three countries: Spain, Italy and Turkey. The first stage of the project took place in Spain using chamotte, olive stones and waste from marble shaping and polishing. The membrane was then be replicated in Turkey and Italy using recycled materials and wastes that were available locally.

Validation of the technology took place at a wastewater treatment plant in Aledo in the Murcia region of Spain, with the aim of using the water for irrigation purposes in this water scarce area.

START YEAR

2015

END YEAR

2018

BUDGET

2 361 622,50 €

FUNDING

HORIZON 2020

PARTNERS

12 partners from 7 countries, including:

- Sociedad de Fomento Agricola Castellonense SA - Spain
- Seramik Arastirma Merkezi AS - Turkey
- Biowater Technology AS - Norway
- IMECA Process - France
- Universidad Antonio Narino - Colombia
- Investigacion y Proyectos Medio Ambiente SL - Spain

LINK

http://www.imecafrance.fr/images/Innovations/VW_poster_REMEB_841X1189mm_en.pdf

LIFE FUNDED PROJECTS

CERSUDS:
CERAMIC SUSTAINABLE URBAN DRAINAGE SYSTEM

LIFE CER SUDS

AIM

Combined sewers are those that, in addition to industrial and domestic wastewater, also collect surface runoff. Widely used throughout Europe, they pose the risk of combined sewer overflow spills, incidents that challenge the capacity of Member States to meet the water quality goals of EU legislation, including the Urban Waste Water Treatment Directive and the Water Framework Directive.

Surface water drainage in dry areas of Spain has traditionally been overlooked and considered a secondary component of combined sewers, rarely relevant except during periods of torrential rainfall. This attitude, along with rain patterns which differ greatly from those in countries where the principles of sustainable drainage have been widely implemented, might partially explain the relative lack of sustainable urban drainage systems (SUDS) in Spain.

SUDS involve a range of structural components (ponds, basins, swales, infiltration systems) and non-structural responses (cleaning programmes, amended regulations) designed to ameliorate the otherwise degrading effects of older, conventional drainage systems. The main objective of LIFE CERSUDS is to improve the resilience of cities to climate change and promote the use of green infrastructure in their urban planning as a means of managing surface water flooding. It aims to achieve this through the development and implementation of a demonstration low-carbon SUDS. The system will consist of an innovative permeable surface with a very low environmental impact, based on the use of tiles with low commercial value.

START YEAR

2016

END YEAR

2019

BUDGET

1 817 972 €

FUNDING

LIFE

RESULTS

The LIFE CERSUDS project successfully designed and produced a ceramic tiled pavement in the Spanish city of Benicssim, highlighting numerous environmental benefits throughout the application and use of this innovative low carbon permeable surface that manages surface water flooding. During the project, the system received more than 1 000 m3 of rainfall, from which 86% was managed by the system, either through collection for future use (7.8%), infiltration in the ground or evaporation into the atmosphere (78.2%).

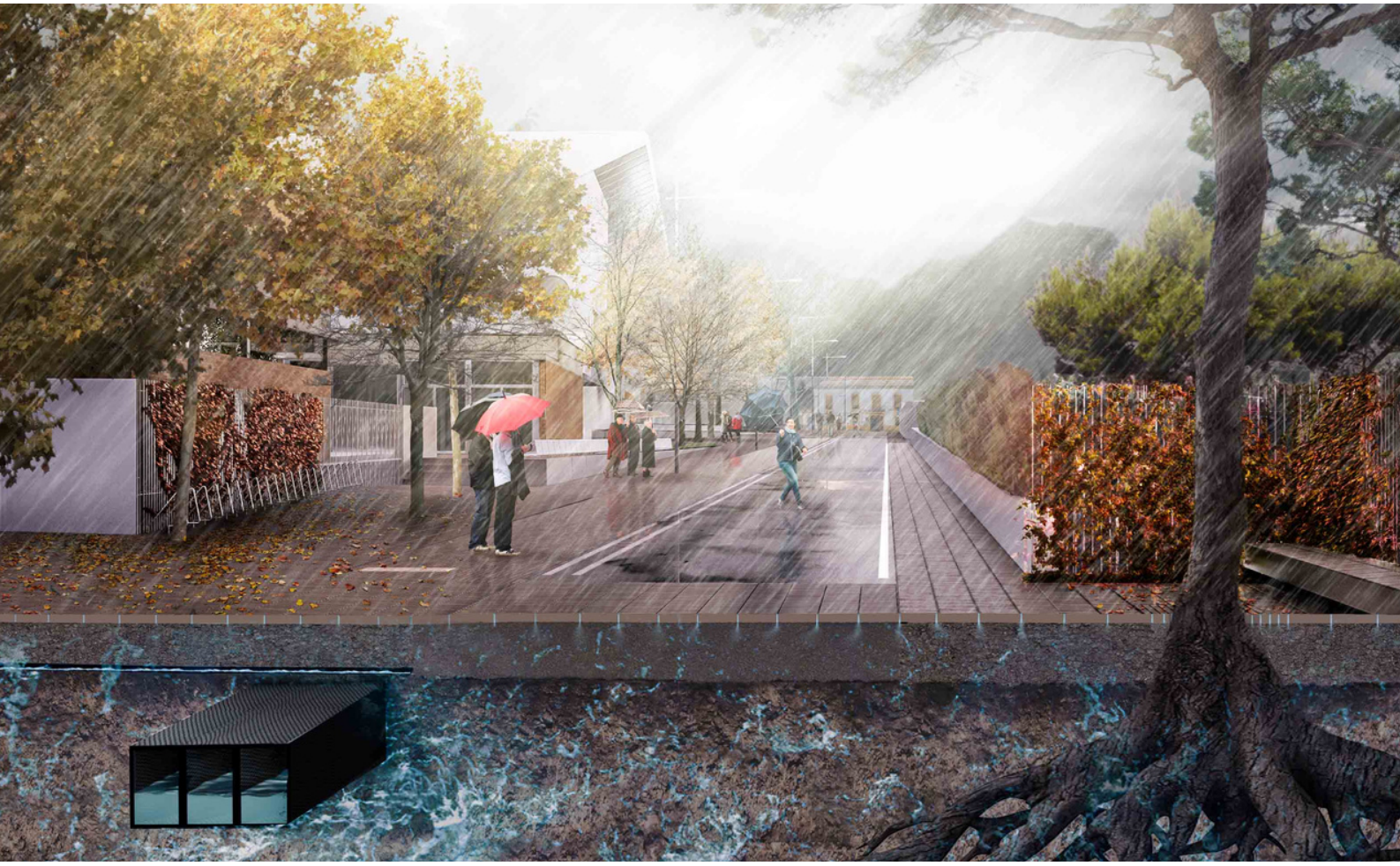
PARTNERS

6 partners from 3 countries, including:

- Trencadis de Sempre S.L - Spain
- CHM Obras e Infraestructuras S.A. - Spain
- Centro Tecnológico da Cerâmica e do Vidro - Portugal

LINK

http://www.lifecersuds.eu/



FORTURE:
Force of the Future

AIM

The aim of the project was to integrate the three pillars of sustainability (environment, economy and society) into the company's business model. Thanks to the digital technologies of Industry 4.0, the tools of environmental (LCA: Life Cycle Assessment), economic (LCC: Life Cycle Costing) and social (S-LCA: Life Cycle Assessment) impact assessments have been transformed from static (based on the analysis of time series) to dynamic (based on data collected in real time). The dynamic model is therefore suitable both to monitor the impacts at the same time in which they are produced, and to implement the approach of eco-design in the evaluation of alternative solutions of processes and products, minimizing the environmental, social and economic impact.

START YEAR

2017

END YEAR

2021

BUDGET

5,036,069.00 €

FUNDING

LIFE16 ENV/IT/000307

PARTNERS

3 partners, including:

- Gruppo Ceramiche Gresmalt S.p.A - Italy
- Università di Modena e Reggio Emilia - Italy
- Universidad Rey Juan Carlos - Spain

SPECIFIC OBJECTIVES

LIFE Forture has developed and successfully tested a tool for the assessment of environmental and socio-economic impact in real time, along the entire life cycle of the ceramic product. This tool, called DYCTA (Dynamic Sustainability Assessment), has also allowed to eco-design a new collection of tiles with lower environmental impact than the current production that has been launched to the market with the new brand G3NIUS (Eco-friendly Tiles: Smarter. Greener. Better).

LINK

https://www.forture-life.eu/

ECONOMICK

AIM

The ECONOMICK project consisted in helping the European ceramic sector to reduce its environmental impact and improve its competitiveness by developing an innovative intermittent kiln that consumes about 45% less energy compared to those that are currently available. The innovative shuttle kiln that has been developed have applications in the firing of sanitary ware, tableware and refractories.

START YEAR

2016

END YEAR

2019

BUDGET

1 500 000 €

FUNDING

LIFE

RESULTS

ECONOMIK kilns allows to decrease operating costs in sanitary ware firing, re-firing and tableware firing, and improve production flexibility. As well as energy savings, ECONOMIK reduced -44% CO2 and -53% NOx emissions. The Social Life Cycle benefits of ECONOMIK are the reduction of workers' exposure to high temperatures during the working time, thanks to a lower external temperature of kiln walls, as well as the opportunity of avoiding night shift, thanks to shorter
firing cycles.

LINKS

http://www.economick.eu

https://www.economick.eu/wp-content/uploads/2019/06/eng_brochure_feb2019_v03.pdf

PARTNERS

The three company partners are:

- SETEC Group - France
- Life Cycle Engineering - Belgium
- Kerasan - Italy

ECONOMICK

WITH THE CONTRIBUTION OF THE LIFE FINANCIAL INSTRUMENT OF THE EUROPEAN COMMUNITY LIFE15 CCM/IT/000104

HEROTILE

AIM

In order to help the EU construction sector (refurbishment and new constructions) to achieve its energy efficiency targets, related CO2 emissions, and to facilitate the global market uptake of an eco-innovative EU product able to help reaching these objectives. LIFE HEROTILE Project aimed to develop:

- Two new types of roof tiles (Marseillaise and Portuguese tiles) with a shape characterized by a higher air permeability through the overlap of the tiles, and then a better energy performance by passive disposal of the solar radiation through under-tile ventilation;
- A practical and simplified free-license software for architects and technicians – SENSAPIRO Software Energy Savings Pitched Roofs- that, as developed on the basis of experimental data, will be able to predict the energy performance of the same building in changing only the roof configuration.

RESULTS

LIFE HEROTILE successfully developed innovative roof tiles that can passively remove heat, so reducing energy consumption for the cooling of buildings by up to 50%. The tiles were introduced into the market soon after the project ended.The project beneficiaries developed two new clay roof tile designs and demonstrated their improved performances in terms of energy consumption for summer cooling and greenhouse gas (GHG) emissions. Performance was evaluated under controlled conditions, and in real-world conditions by refurbishing the roofs of two demonstrative buildings in Cadelbosco (Italy) and Zaragosa (Spain).

LINK

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=5240

START YEAR

2015

END YEAR

2019

BUDGET

2 476 158 €

FUNDING

LIFE

PARTNERS

6 partners from 3 countries, including:

- Italian National Association of Clay Bricks and Roofing Tiles Producers – Italy
- Braas Monier Building Group – Germany
- Terreal – France

SILIFE:
Production of Quartz Powders with Reduced Crystalline Silica Toxicity

AIM

Quartz is one of the most widely used raw materials in European industry, irreplaceable in many applications due to its unique properties and low price. Total European usage of crystalline silica (i.e. quartz and cristobalite) is measured in thousands of millions of tonnes per annum. It is used in many manufacturing industries such as the cement, ceramics, foundry, glass, mineral wool, aggregates, mortar and concrete sectors. However, prolongedinhalation of respirable crystalline silica particles can cause lung inflammation and the lung disease known as silicosis. Hence, a vast number of European workers, around four million (European Trade Union Confederation, 2007), are potentially exposed to Respirable Crystalline Silica (RCS). Although it is not possible to substitute crystalline silica in many sectors, it is possible to nullify its toxicity by treating it with certain substances.

START YEAR

2015

END YEAR

2019

BUDGET

1 666 059 €

FUNDING

LIFE

RESULTS

The SILIFE project designed and developed a pilot quartz treatment for reducing the risks associated with Respirable Crystalline Silica (RCS) in the workplace. This represents a major step towards producing commercial quartz powders that show very little or no RCS toxicity, which can be used in many industrial processes.

PARTNERS

10 partners from 3 countries, including:

- Centro Ceramico (CCB) – Italy
- MAPEI S.P.A. – Italy
- ELASTOMERS – Italy
- Innovaciones Técnicas Aplicadas a Cerámicas Avanzadas, S.A.U. – Spain
- FUMBARRI – Spain
- ESMALGLASS – Spain
- Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e. V. – Germany

LINK

http://www.silife-project.eu/

FERTILIFE:
AGRICULTURAL CARBONIC FERTILIZATION WITH CERAMIC INDUSTRY GEI EMISSIONS

AIM

LIFE14 CCM/ES/000311 is a project co-funded by European Union within LIFE Program Climate Change Mitigation. In the FERTILIFE project, waste gases from the ceramic industry would be used in agriculture as an acidifier in irrigation water. The project aimed to develop a prototype in which CO2 emissions from a ceramics factory would be captured and used to carbonate water used to irrigate crops. The project aimed to:

1. Demonstrate the feasibility of "carbonic fertigation" – the injection of carbon into an irrigation system – for citrus crops, and analyse the impact of the continued use of CO2 in the soil and plant irrigation network.

2. Design and implement techniques for proper CO2 dissolution in a drip irrigation system, and monitor the implementation of the system and its deployment on different plots.

3. Assess the impact of carbonic fertigation on root respiration, and thus on total soil organic matter content.

4. Quantify the impact of carbonic fertigation on the use of chelates and other fertilisers. The use of chelates (chemical compounds) in agriculture is necessary to help plants absorb trace elements such as iron from soils with high pH, as in the Mediterranean basin.

START YEAR

2015

END YEAR

2018

BUDGET

1 047 073 €

FUNDING

LIFE

PARTNERS

4 partners from Spain, including:

- Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos (ASCER)
- Ceramic Industry Research Association (ITC-AICE)
- La Unió de Llauradors i Ramaders del País Vanlencià

LINKS

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=5257

FOUNDRYTILE:
VALORIZATION OF IRON FOUNDRY SANDS AND DUST IN THE CERAMIC TILE PRODUCTION PROCESS

FOUNDRYTILE

AIM

The LIFE FOUNDRYTILE project aimed to demonstrate the valorization of iron foundry sands and dust wastes in the ceramic tile production process, thus contributing to the implementation of Waste Framework Directive (2008/98/EC) and the goals of the Roadmap for a Resource-Efficient Europe. The new applications would have three main benefits: the preservation of natural resources, the increase in foundry waste valorization and environmental footprint reduction.

The innovation character is provided by the utilization of green and chemically bonded foundry dust and sand in tile production replacing natural products, clay (for red clay ceramic products) and sands (for white clay ceramic products). The demonstration character is provided by the pilot and industrial scale tests, to validate the environmental, technical and economic feasibility of foundry by products valorization in ceramic tiles production. The project results would be used to revise Best Available Techniques Reference. Documents (BREFs) for both foundry and ceramic sectors (BREF codes SF and CER).

START YEAR

2015

END YEAR

2018

BUDGET

1 205 363 €

FUNDING

LIFE

PARTNERS

5 partners from Spain, including:

- Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos (ASCER)
- Ceramic Industry Research Association (ITC-AICE)
- EUTOMI

LINKS

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=5281

HEART:
Improved HEAt Recovery in clay roof Tiles and bricks production

AIM

This project aimed to demonstrate that it is possible to significantly reduce the natural gas consumption and the CO2 emissions of existing state-of-the-art clay roof tiles or bricks production unit. TERREAL proposed to improve the current state of the art by applying energy recovery systems from other industries to the clay manufacturing process, and by integrating them in order to operate in a stable and reliable way 24 hours / day and 7 days / week. TERREAL concluded from preliminary studies that the existing state of the art could be improved by transferring technologies from other industries, and by integrating them into the clay manufacturing process: static exchanger and direct contact exchanger.

RESULTS

Due to corrosion problems that destroyed the HEART equipment, the project could not achieve the foreseen objectives and did not lead to sustainable direct benefits. Still, it has innovation value and could lead to environmental and socio-economic benefits in the future.

START YEAR

2013

END YEAR

2017

BUDGET

2 982 466 €

FUNDING

LIFE

PARTNERS

- TERREAL - France

LINKS

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4708&docType=pdf

SANITSER:
Sanitaryware production: use of waste glass for saving energy and resources

SANITSER

AIM

The objective of this project was to revise the production process in the ceramic sanitaryware sector by introducing glass cullet waste from urban waste disposal in ceramic blends for producing sanitaryware. The project focuses process innovations designed to a) provide a sustainable management, in terms of recovery of large amounts of glass cullet waste (soda lime glass: SLG), b) improve environmental performances of the ceramic sector by reducing CO2 emissions, c) enhance sustainability by energy saving and natural resources preservation.

START YEAR

2013

END YEAR

2017

BUDGET

2 298 282 €

FUNDING

LIFE

RESULTS

SANITSER industrial, environmental, social and economic achievements:

- final slip formulation contains more than 40% of recycled materials and has no quartz, while glaze formulation contains nearly 20% of recycled glass;
- reduction of firing energy consumption, decrease in transport activities, total reduction of CO2 emission within atmosphere, recycled material content within sanitary ware;
- high reduction of risk from silica exposure;
- significant savings of costs related to raw materials and energy consumption.

PARTNERS

4 partners from Italy, including:

- Minerali Industriali Srl
- Gemica Srl
- Setec Srl
- Life Cycle Engineering Srl

LINK

http://www.sanitser.eu/en

LIFECERAM:
ZERO WASTE IN CERAMIC TILE MANUFACTURE

AIM

LIFE CERAM project has reached its main objective, which was to achieve Zero-waste in ceramic tile manufacture through the fabrication of a new ceramic tile from waste and the design of a sustainable process based on dry milling and granulation technologies.

Indeed, LIFECERAM consortium has developed an innovative ceramic product in which both the body and the glaze have been exclusively obtained from ceramic waste generated by the process itself. This new product is designed to be used in outdoor applications.

Among the activities carried out by the LIFECERAM project during its 3 years, it should be pointed out that it has successfully developed 2 new ceramic compositions (one for the tile body and the other for the glaze) which have enabled the fabrication of LIFECERAM waste-based ceramic tile. The innovative composition takes into account the relative proportion of each type of ceramic waste. Moreover, this new ceramic product has satisfactory final properties (regarding porosity, mechanical resistance and environmental aspects, among others) and is suitable for current industrial processes, without any necessity to make changes in the fabrication plants.

START YEAR

2013

END YEAR

2016

BUDGET

799 502 €

FUNDING

LIFE

PARTNERS

5 partners from Spain, including:

- Ceramic Industry Research Association (ITC)
- Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos (ASCER)
- Keros Cerámica, S. A.
- Chumillas & Tarongi, S.L.
- Vernís, S.A.

LINK

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=4675

LIFE CLAYGLASS:
Adaptation to climate change by the structural ceramics industry through the use of recycled glass as pastry

AIM

The LIFE CLAYGLASS project aimed to reduce the environmental impact of the ceramics sector by demonstrating the technical and economic feasibility of producing ceramic tiles using any type of recycled glass as a flux material. In doing so, the project hoped to reduce CO2 emissions from the firing process and provide a commercial use for waste glass streams that are otherwise difficult to recycle.

Specifically, the project:

- Analysed and characterized types of glass and clay;
- Introduced a glass collection and transportation system - with storage and logistics arrangements adapted to the demand of the ceramics industries;
- Defined optimal treatment of glass and clay as raw materials in the manufacture of stoneware products;
- Established a pilot installation for glass treatment - milling - for the ceramics industry.

The addition of the recycled glass to the mix would reduce the demand for new raw materials from natural resources. It aimed also to reduce the required firing temperature from around 1250°C to around 1100°C, reduction in energy consumption and CO2 emissions.

LINK

https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=4689

START YEAR
2013

END YEAR
2016

BUDGET
1 977 222 €

FUNDING
LIFE

PARTNERS

5 partners from 2 countries, including:

- Asociación para la Investigación y Desarrollo Industrial de los Recursos Naturales – Spain
- Aristotle University Thessaloniki – Special Account for Research funds – Greece
- Ladrillos Mora SL – Spain
- Asociación Reinicia – Spain

ENVIP:
New environmentally friendly forming technique of ceramic sanitaryware by isostatic pressing

AIM

The main goal of the LIFE ENVIP project was to construct on a pre-industrial scale a prototype facility or forming sanitary wares by isostatic pressing of granulated body. This innovative technology is a promising alternative to the granulated body. This innovative technology is a promising alternative to the traditional method.

The main specific objectives of the project were to:

- eliminate the water consumption associated with the traditional forming process by pressure slip casting;
- reduce the volume of wastewater generated in the process;
- reduce energy consumption and CO2 emissions;
- identify the optimal conditions for the industrial forming process of sanitary wares with different geometries and dimensions;
- validate the compositions for different ceramic pastes used in the isostatic pressing process;
- disseminate the environmental improvements achieved with the new forming technology across the EU;
- identify, validate and communicate the application of this innovative technology, which can be potentially considered as a Best Available Technique to update the BREF in the sanitary wares' industry.

START YEAR
2013

END YEAR
2015

BUDGET
1 791 078 €

FUNDING
LIFE

PARTNERS

- Roca Sanitario, SA – Spain

LINK

http://ec.europa.eu/environment/life/project/Projects/index.cfmfuseaction=search.dspPage&n_proj_id=4630&docType=pdf

AIRUSE:
Testing and development of air quality mitigation measures in Southern Europe LIFE Environment and resource efficiency

AIM

The overall goal of the 'AIRUSE' project was to develop, demonstrate and adapt cost-effective and appropriate measures to ensure better air quality in urban areas. It aimed to identify the most effective mitigation measures to reduce PM levels to within acceptable limits and thus to contribute to meeting current and future EU targets around air quality.

Specific actions to achieve this overall goal included:

- Harmonising methods for identifying the sources of PM in the air;
- Determining the relative contribution of different emission sources of PM;
- Identifying those sources that are responsible for exceeding PM limits in specific areas;
- Evaluating the effect of current air quality mitigation measures;
- Developing targeted mitigation measures for the most important and relevant PM sources in Southern European urban areas;
- Assessing how different mitigation measures impact on PM sources and overall air quality;
- Further adapting and optimising targeted mitigation measures.

The AIRUSE project achieved its main objectives, generating knowledge of the sources of PM and their relative impact. It employed advanced factor analysis modelling to quantify the contribution of a range of anthropogenic and natural sources to the PM concentration levels in five southern European cities – Athens, Barcelona, Florence, Milan and Porto.

START YEAR
2012

END YEAR
2016

BUDGET
2 368 719 €

FUNDING
LIFE

PARTNERS

- Agencia Estatal Consejo Superior de Investigaciones Científicas - Spain
- University of Aveiro - Portugal
- University of Florence - Italy

LINK

https://airuse.eu/

LASERFIRING:
Climate Change Adaptation of the Structural Ceramics Industry by Decreasing the Firing Temperature Using Laser Technology

AIM

The LASERFIRING project aimed to develop a new method for manufacturing structural ceramics using laser technology in the firing phase, allowing firing at lower temperatures. In the particular case of refractory bricks, the new process would reduce the firing temperature from 1 300 °C to 900 °C, without compromising the aesthetic or structural properties. The laser technology would replace part of the firing step. Laser surface treatment allows the conservation of the technological properties of the ceramics, even at a lower firing temperature. The new procedure requires a new drying system and a new furnace in which the laser tool will be integrated. This new approach would allow the firing temperature to be reduced by between 100 and 500°C, resulting in a considerable reduction in GHG emissions in the structural ceramics industry.

RESULTS

The LASERFIRING project achieved all its targets: the beneficiaries set up and validated a prototype for the development of a new line of ceramic products for the building industry, which reduces CO2 emissions.

START YEAR

2010

END YEAR

2013

BUDGET

2 468 358 €

FUNDING

LIFE

PARTNERS

4 partners from Spain, including:

- Instituto de Ciencia de Materiales de Aragón
- Asociación para la Investigación y Desarrollo Industrial de los Recursos Naturales (AITEMIN)
- Easylasser
- Physicgm

LINK

https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3659

5REFRACT

AIM

The overall purpose of the LIFE 5RefrACT project is to extend the "4R" approach to a "5R" paradigm (reduce-reuse-remanufacture-recycle-re-educate) and apply it to the steel sector and refractories market, thus achieving an integral valorisation of refractory materials (the aim is to increase the recovery of refractories up to 80% of the recoverable fraction). The LIFE 5RefrACT project will constitute the first industrial and systematic demonstration experience dealing with refractory waste in the steel sector.

Its specific objectives are the following:

- Development of new high added-value refractory materials that will be up to 70% reprocessed material from spent refractories.
- Reduction of soil occupation and pollution by avoiding the landfilling of up to 3,600 tonnes of refractory waste.
- Reduction of CO2 emissions (3,340 tonnes CO2/year) and energy consumption (approx. 6,100,000 kWh/year) by recycling refractories, as it is not necessary to produce magnesite and alumina from the source mineral.
- Establishment of guidelines for the European steel sector to adopt these strategies, disseminating the good practices defined in the sector.
- Contribution to the state of the art in refractory waste management so as to enrich and complete the BREF document on steel with specific methodologies and applications.
- Analysis of synergies between the steel industry and other energy-intensive industries in order to define new circular economy models based on the sharing and use of resources.

START YEAR

2018

END YEAR

2020

BUDGET

1 675 395 €

FUNDING

LIFE

PARTNERS

6 partners from 2 counties, including:

- REFRALIA, S.L. - Spain
- Universidad de Málaga - Spain
- SIDENOR INVESTIGACIÓN Y DESARROLLO S. A. - Spain
- Magnesitas Navarras, S.A. - Spain
- 2.-0 LCA consultants - Denmark

LINK

https://www.life5refract.eu/en/

2B CONNECT:
Bedrijven & Biodiversiteit

AIM

The objective of 2B Connect is to increase biodiversity in the border region BE-NL through close cooperation with companies. We focus on two tracks: on the one hand the greening of companies and sites and on the other hand the internalisation of the theme of biodiversity in environmental management.

PARTNERS

- Provincie Antwerpen
- Blenders VZW
- EV INBO
- vereniging Zeeuwse Milieufederatie
- Stad Aarschot, Gemeente Maastricht
- Huis van de Brabantse Kempen
- Natuurinvest, regionaal Landscvhap Noord-Hageland
- Stichting Landschapsbeheer Zeeland
- Stad Lommel
- Vlaamse Overheid
- Gemeente Helmond
- POM Vlaams-Brabant
- Provincie Noord-Brabant
- SCR-Sibelco NV
- Nolimpark, Verenigde Autobusmaatschappijen NV
- Regionaal Landschap Lage Kempen
- Wienerberger NV
- Roompot Recreatie BV
- Metallo Belgium NV
- Campine NV
- Gemeente Craenendonck
- Brabantia S&L Belgium NV
- Profel NV

START YEAR

2016

END YEAR

2020

BUDGET

6 025 000 €

FUNDING

3 012 000 €

LINK

https://www.2b-connect.be/

FP6 FUNDED PROJECTS

NOVACOAT: Replacement of conventional glaze on tiles and other high temperature processed materials with novel hybrid coating

AIM

The NOVACOAT project investigated hybrid inorganic-organic low temperature coating technology for wall tile manufacturing.

The NOVACOAT consortium developed a nanocomposite coating as an alternative to the glaze layer in wall tile manufacturing. Various hybrid compositions were developed during the project and were tested for commercial suitability for use in bathrooms and kitchens. Durability was identified as a problem of the hybrid coatings as they did not achieve the desirable high chemical (alkali, acid) and abrasion resistance required.

In spite of not achieving these durability criteria, the project offered valuable opportunities to explore the design possibilities of hybrid coatings. A range of novel visual effects were demonstrated which cannot be obtained via high temperature firing, such as holograms, fluorescents, and a broader colour palette more generally.

START YEAR
2005

END YEAR
2007

BUDGET
850 550 €

FUNDING
FP6

PARTNERS

10 partners from 6 countries, including:

- British Ceramic Tiles LTD - UK
- Engineered Nanoproducts Germany GMBH - Germany
- Ingegneria Ceramica SRL - Italy
- Keramika Biela Hora SRO - Slovakia
- Koninklijke Mosa BV - Netherlands
- Taideteollinen Korkeakoulu - Finland

LINK

https://cordis.europa.eu/project/id/5799/reporting

SILICERAM:
Studies aiming at assisting legislation and encouraging continual improvement strategies in the field of respirable crystalline silica

AIM

The overall aim of this project was to provide legislators with useful data for defining RCS in air limits. Setting a single low limit to encourage continual improvement, but allowing concessions based on proven reduced risks associated with certain RCS forms is seen as a possible way forward.

The project was focused on different industries of the ceramic sector: tiles, tableware, sanitary ware, refractory, bricks and roofing tiles. The project team showed that the probability of crystalline silica penetrating into the lung depends on the size of the particle. Large particles are exhaled anyway. Mathematical modelling revealed that only a fraction of the particle size distribution at a certain exposure level of RCS actually reaches the inner lung.

The results would enable a revision of the exposures experienced by workers. Together with the toxicity data developed for different forms of RCS, concessions can then be proposed according to the types of material used and the manufacturing conditions.

START YEAR
2004

END YEAR
2007

BUDGET
2 216 306 €

FUNDING
FP6

PARTNERS

39 partners from 7 countries, including:

- British Ceramic Confederation - UK
- Confederation des Industries Ceramique de France - France
- Associacao Portuguesa da Industria de Ceramica – Portugal
- Refractarios Alfran S.A. – Spain

LINK

http://cordis.europa.eu/project/rcn/107609_en.html

FP7 FUNDED PROJECTS

RESTAR:
Review and improvement of testing Standards for Refractory products

ReStaR
Review and improvement of testing Standards for Refractory products

START YEAR
2013

END YEAR
2017

BUDGET
2 298 282 €

FUNDING
FP7

AIM

The central objective of this project was to increase the competitiveness of the European SME refractory producers. This was going to be archived by generating up-to-date EN testing standards as a save guidance for the producers. An extensive investigation of the current EN testing methods, designs of experiments and inter-laboratory tests, more specifically collaborative tests, involving the major European refractory testing laboratories was be the key approach to attain this objective.

For a successful review of the EN testing standards and an effective dissemination of the results, a strong and broad-based cooperation between transnational partners was planned. For this purpose, the European SME-AG for the refractory industry was involved and brought together the most active European testing laboratories and SMEs to conduct a large scale and in-depth study of EN testing standards. On the basis of the expertise and results gained during the experimental investigations of the ReStaR project, drafts for revised testing standards and recommendations for the investigated EN testing standards were worked out.

PARTNERS

12 partners from 7 countries, including:

- Forschungsgemeinschaft Feuerfest e.V. – Germany
- Cerame-Unie – Belgium
- Fundacion ITMA - Spain
- Icar techniques and research materials refractory SA – France

LINK

https://www.restar.eu/

INSYSME:
INnovative SYStems for earthquake resistant Masonry Enclosures in R.C. buildings

AIM

The project aimed at developing innovative systems for masonry enclosures, to be used for façades, envelopes and internal partitions of reinforced concrete framed buildings, to derive sound concepts for their analysis and to develop reliable, simple and efficient methods for their design in the everyday engineering practice. The final result and the impact of the project would be the effective integration of the new materials, techniques and methodologies in the construction practice, for increasing safety and quality of life.

At the same time, the development of new masonry enclosure systems would increase, in a period of great crisis, the competitiveness of SMEs and Industry involved in the construction and clay masonry unit-manufacturing sector. The prenormative research issues that will be tackled through the definition of performance requirements and design methods will increase the impact of Associations in the code evolution process, and will favour development of skills for designers and service providers.

PARTNERS

16 partners from 7 countries, including:

- Tiles and bricks Europe AISBL – Belgiuim
- Associacao portuguesa da industria de ceramica – Portugal
- Centro tecnologico da ceramica e do vidro - Portugal
- Arbeitsgemeinschaft Mauerziegel im Bundesverband der Deutschen Ziegelindustrie- Germany
- Associazione nazionale degli industriali dei laterizi - Italy

START YEAR

2013

END YEAR

2016

BUDGET

2 697 131€

FUNDING

FP7

LINK

https://cordis.europa.eu/project/id/606229

SILICOAT:
Industrial implementation of processes to render RCS safer in manufacturing processes

AIM

The main objective of the project was the industrial implementation of these treatments in the ceramic manufacturing processes, thus transforming the quartz-containing raw materials into intrinsically safe products. The characteristics of the ceramic companies and their manufacturing processes made them especially suitable candidates. Furthermore, the experience gained in these industries will help in developing general-purpose treatments.

SILICOAT project has contributed a technically and economically feasible treatment to render the quartz used in the traditional ceramic industries intrinsically safe. In contrast with traditional measures of corrective nature, the SILICOAT treatment enables the RCS exposure risk to be addressed from its origin: the substance itself.

LINK

http://cordis.europa.eu/project/rcn/100961_en.html

START YEAR

2011

END YEAR

2014

BUDGET

1 552 203,40 €

FUNDING

FP7

PARTNERS

11 partners from 4 countries, including:

- Ceramic Industry Research Association (ITC-AICE) - Spain
- Associacao Portuguesa da Industria de Ceramica - Portugal
- Ceramica Flaminia Spa - Spain

ERASMUS+ PROGRAMME

KATCH-E: Knowledge Alliance on Product-Service Development towards Circular Economy and Sustainability in Higher Education

AIM

The project aims to develop training materials, which focus on the competences necessary to generate product-service-systems based on the model of a Circular Economy (CE). The application of life-time extending potentials such as cascade use, re-use or refurbishment is at the center of concern. The project focuses on the sectors construction and furniture, and brings together universities, research centers and companies from four different EU countries to cooperate in the following efforts:

- Analysing the training needs, trends and policies regarding "design for CE"
- Setting up a stakeholder network to support the transfer of knowledge
- Developing and testing a problem-based and multidisciplinary course,
- Creation of a MOOC ("Massive Open Online Course")
- Implementing the above in academic and company contexts by creating show cases

START YEAR

2017

END YEAR

2020

BUDGET

-

FUNDING

Erasmus+ Programme

COORDINATOR

LNEG - Portugal

LINKS

https://circulareconomy.europa.eu/platform/en/knowledge/katche-knowledge-alliance-product-service-development-towards-circular-economy-and-sustainability-higher-education

https://www.katche.eu/

CIRCULAR START:
Circular Start into Business

AIM

The idea of CircularStart is grounded on the recognition that there is a lack of know-how and training of start-ups and entrepreneurs in the field of sustainability, CE and their opportunities. In order to be successful, this knowledge needs to be easily integrated into the business idea development and decision-making process, i.e. there is a need for training supported by practical tools that are compatible with well-known Business Model development methods like e.g. the Business Model Canvas.

Therefore, the aim of this project is to develop an interactive guidance tool and related eLearning resources as well as a training program for incubators and consultants to support start-ups to understand, evaluate and improve sustainability issues related to their BM. They should offer a comprehensive guide over the whole Business Model design process, covering the Initiation, Ideation and Integration phase.

START YEAR

2019

END YEAR

2021

BUDGET

-

FUNDING

Erasmus+ Programme

COORDINATOR

Prospektiker - Spain

LINK

https://www.circularstart.eu/

OTHER FUNDED PROJECTS

CRAM:
Towards a Raw Materials Strategy for the European ceramic Industry

AIM

ICRAM aimed at providing data and information toward an industrial strategy for ceramic raw materials in Europe. A dual approach, by fostering an interplay between the knowledge on mineral/waste potential and that on ceramic technology, is needed to go beyond running EU projects in this field. Expected results:

1. identification of critical situations in raw materials supply (CRMs list from the ceramic industry viewpoint);
2. study of the ceramic raw materials flow in Europe;
3. technological classification of ceramic raw materials to support geological mapping and exploration;
4. industry-oriented definition of feasible alternatives (primary and secondary raw materials) to current key resources;
5. roadmap to new ceramic products and processes in function of the medium- to long-term availability of raw materials.

LINK

https://ec.europa.eu/growth/content/towards-raw-materials-strategy-european-ceramic-industry_en

START YEAR
2016

END YEAR
2019

BUDGET
TBC

FUNDING
Strategic implementation plan

PARTNERS

16 partners from 5 countries, including:

- Institute of Science and Technology for Ceramics - Italy
- University of Patras - Greece
- Laboratório Nacional de Energia e Geologia - Portugal
- Instituto Geologico Minero de España - Spain
- Ceramic Research Center Eskişehir - Turkey

BIMCLAY:
Improve Technification and LCA Qualification of Workers in Ceramic Sector with the Support of BIM Applications

AIM

BIMclay project was co-funded by the Erasmus + Programme. The project objective was to improve the qualification in the areas of LCA (Life Cycle Assessment) of workers in the ceramic sector with the support of BIM (Building Information Modeling) applications, aiming at the development of a multimedia tool based on BIM (Building Information Modeling) technology on the most advanced techniques for laying ceramic products. more innovative and sustainable.

During the project, twelve multimedia cards were developed, based on 3D animations, on the most used methods of placing clay and ceramic products.
The online platform, developed for the project, is a totally open and constantly evolving workspace, even after the end of the project, for professionals in the ceramic sector.
In addition to these results, comparative studies on the methodology for placing ceramic materials, life cycle assessment studies on ceramic materials, curriculum on courses on this subject, among others, were also developed.

START YEAR

2017

END YEAR

2019

BUDGET

174 645 €

FUNDING

Erasmus+ Programme

PARTNERS

5 partners from 3 countries, including:

- APICER – Associação Portuguesa da Indústria Cerâmica e da Cristalaria – Portugal
- Hispalyt - Asociación Española de Fabricantes – Spain
- IED – Institute of Entrepreneurship Development – Greece

LINK

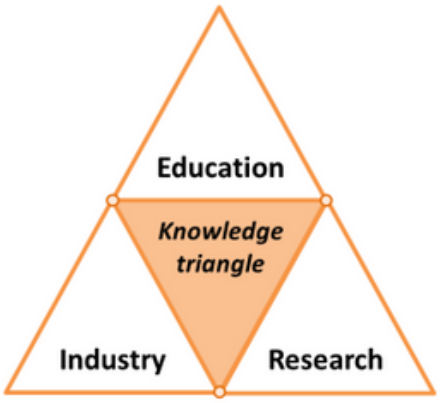
https://bimclay.eu

EUCERMAT:
EUropean CERamic MATerials

AIM

EUCERMAT was co-funded by the Erasmus + Programme. The project aimed at changing the image of ceramics in Europe. The development and implementation of innovative practices to promote ceramic sciences to the community, civil society, high school students and teachers, parents, educators in general, ceramic industry staff, is thus a huge issue.

The activities of the project aimed to create a new methodology based on a relevant functioning of the knowledge triangle in the domain of ceramic material. Thus, the joint work of the partnership was seeking to create a common space where the interaction
between research, education and innovation was optimized. To achieve these objectives the project set up various activities closely connected.



START YEAR

2015

END YEAR

2018

BUDGET

359 897 €

FUNDING

Erasmus+ Programme

PARTNERS

13 partners from 8 countries, including:

- 5 Universities
- 2 Research Institutes
- 4 Companies
- 1 Federaction of National Ceramic Societies
- 1 High-school

WINCER:
Waste synergy in the production of INnovative CERamic tiles

AIM

The WINCER project aimed to develop innovative ceramic tiles made from over 70% recycled materials from urban and industrial wastes in substitution of natural raw materials. The project aimed to recover soda lime glass cullet waste that is not currently being reused or recycled as glassware.

The WINCER project resulted in improved environmental performance by reducing the use of raw materials and reducing the maximum sintering temperature, resulting in a reduction of energy consumption and greenhouse gas emissions. The tiles have similar or improved mechanical properties to traditional tiles.

START YEAR

2015

END YEAR

2017

BUDGET

1 489 312 €

FUNDING

Eco-innovation Initiative of the European Union

PARTNERS

3 partners from Italy:

- Centro Ceramico
- Minerali Industriali
- Marazzi

LINK

http://www.wincer-project.eu

MAGF:
Microwave Assisted Gas Firing

DANISH TECHNOLOGICAL INSTITUTE

AIM

At the Danish Technological Institute (DTI), a project developed microwave-assisted gas firing (MAGF) in the clay brick and tile industry. A MAGF chamber kiln has recently been installed at the DTI. This kiln is a prototype, to be used for tests and experiments during and after the project, in order to upscale and develop MAGF technology.

The main objective is to reduce energy consumption for the drying and firing of brick, while the energy source is transformed from fossil fuels to electricity, and potentially from renewable energy. This is obtained by using new MAGF (microwave Assisted Gas Firing) technology. The goal is that the MAGF technology can be considered ready for implementation for the industry in general.

START YEAR

2014

END YEAR

2017

BUDGET

11,42 mio. DKK

FUNDING

Danish Technology Insitute

PARTNERS

8 partners from 3 countries, including:

- 4 universities (Denmark, UK, and Italy)
- 2 Danish Brickworks
- 2 companies specialized in digital modelling and industrial processing

LINK

https://www.dti.dk/specialists/masonry-and-tile-roofing/ceramic-production-using-microwaves/23527,3

HISHOCK: High-temperature Thermal Shock Resistance of Refractory Monolithics

AIM

Enable SMEs to significantly accelerate the development and optimisation of spinel-forming or spinel-containing monolithics with superior thermal shock resistance.

RESULTS

A new testing device is able to determine the thermal shock resistance of refractories induced by cyclic, high-temperature thermal shocks (e.g. between 1000 and 1600 °C). The resulting damage of the ceramic microstructure and degradation of the refractory can be determined in-situ using Laser Doppler Vibrometry or post-mortem using a new image-based interpretation method. Results show how the high-temperature thermal shock behaviour of spinel-forming monolithics is determined by the choice of raw materials/precursors.

START YEAR
2015

END YEAR
2016

BUDGET
923 295 €

FUNDING
CORNET
(national funding)

PARTNERS

- Forschungsgemeinschaft Feuerfest e. V. – Germany
- Hochschule Koblenz – Germany
- Centre de Recherches de l'Industrie Belge de la Céramique – Belgium

RESHAPE:
Sustainable Monolithic Linings by Optimisation of their Particle Shape

AIM

Improve the sustainability of monolithic refractory linings by increasing their resistance to failure during the first heating-up. This was approached by optimisation of the shape of the particles that make up the monolithics.

RESULTS

Drucker-Prager failure parameters were implemented in a FEM numerical model, simulating the first heating-up of a steel ladle lined with monolithics. This model provides a distribution of risk of failure for the lining during the heating-up process. The risk of failure was found to be significantly higher when castable formulations were used that contain cubic grains compared to splintered grains. The cohesion, and accordingly the tensile strength, appeared to be the key parameter to optimize the failure tendency of refractory castables during heating-up. The development of formulations with grains presenting even more angular and/or elongated shapes could therefore be a way to significantly improve the performance of refractory castables and shaped refractory products.

START YEAR
2016

END YEAR
2018

BUDGET
795 400 €

FUNDING
CORNET
(national funding)

PARTNERS

- Forschungsgemeinschaft Feuerfest e. V. – Germany
- Hochschule Koblenz – Germany
- Institut Interuniversitaire des Sols, silicates et Matériaux – Belgium

THEREVOMON:
Optimization of the sintering behaviour of refractory monolithics during heating-up

AIM

Investigate, understand and optimise the sintering behaviour of monolithic refractory materials to develop high-performing monolithic refractories with enhanced properties and increased lifetime.

RESULTS

Matrix design provides an effective means to enhance the performance of refractories in service. The combination of material characterization over a large range of temperatures and exposures time, with technological practice-oriented testing as well as numerical simulation, proved to be successful both in terms of understanding the behaviour of a refractory material under thermomechanical loading and of predicting its resistance to damage.

All results point towards the benefit of shifting the brittle to ductile transition in monolithics towards lower temperatures, promoting early sintering, densification and maintaining high toughness at high temperatures.

START YEAR
2017

END YEAR
2018

BUDGET
727 400 €

FUNDING
CORNET
(national funding)

PARTNERS

- Forschungsgemeinschaft Feuerfest e. V. – Germany
- Hochschule Koblenz – Germany
- Instytut Ceramiki i Materiałów Budowlanych – Poland
- Stowarzyszenie Producentów Materiałów Ogniotrwałych – Poland

ECOFILLINK

AIM

The aim of the project is to reduce the environmental impact generated by ink containers used for digital decoration of ceramic tiles. The EcoFILLink project also aims to implement environmental improvements in packaging design and waste management processes in accordance with the circular economy.

Waste from plastic containers contaminated with ink-jet inks currently amounts to 500 t per year and a volume of 10,650 m3. Recycling these containers is a problem due to their complexity and the dirt released on contact with water, since 5% of the ink remains adhered to the container internal walls, representing losses of 3.6 million euros per year.

ITC-AICE and AIMPLAS are aware of the importance of designing a new plastic container for storage and transport of ink-jet inks that minimizes its environmental impact through the implementation of different circular design strategies for containers and waste management in line with the circular economy to ensure that resources remain in the economy as long as possible.

START YEAR

2020

END YEAR

2021

BUDGET

315 110 €

FUNDING

European Regional Development Fund

PARTNERS

2 partners from Spain:

- The Technological Institute for Ceramics
- AIMPLAS, Plastics Technology Centre

REWACER

AIM

REWACER is an initiative that contributes its experience and knowledge obtained in carrying out numerous projects related to the field of water in the ceramic sector. The Institute of Ceramic Technology (ITC) collaborate with the company Estudio Cerámico, SL, the Technological Institute of Energy (ITE) and the firm SAMCA, who define this action as: "an innovative proposal aimed at creating a new water reuse service in the province of Castellón whose fundamental objective is to promote a circular economy of water".

REWACER is funded by the Valencian Innovation Agency (AVI), and as a priority, it is going to carry out a critical study for the implementation of a circular water economy model in the province of Castellón, which will help acquire the appropriate knowledge to develop a new business/service model in the efficient management of water in the province, and that, at the same time, promotes the recovery of treated water from its regeneration and therefore its reuse.

This new water service will consist of supplying the water demand of the ceramic industrial sector with the secondary effluent from the WWTPs (Urban Wastewater Treatment Plants) located in the province of Castellón, thus avoiding part of the discharge of treated water to other channels. or to the sea

START YEAR

2019

END YEAR

2020

FUNDING

Valencian Innovation

PARTNERS

- Institute of Ceramic Technology (ITC)
- Estudio Cerámico, SL
- Technological Institute of Energy
- SAMCA

SOST-RCD

AIM

The SOST-RCD project, which is funded by the Valencian Innovation Agency (AVI), is aligned with the principles of the circular economy and aims to convert waste materials from construction and demolition into new resources (RCD), thus advancing towards a more sustainable building.

SOST-RCD is coordinated by La Torreta Quarry, which is part of Origen, the materials division of Simetría Grupo, and was created with a main scientific and technological objective, focused on the research and development of new technologies aimed at generating products from of RCD.

The main characteristic of these new products is that they have the same characteristics as construction materials made from virgin raw materials. At the same time, they help improve the current management systems for this type of waste that would normally end up in landfills, proposing and showing the economic and environmental advantages offered by this type of recovered and therefore more sustainable materials.

The project is broken down into three activities. In the first of them, the starting points of the project have been established with regard to the state of the art of the production techniques of current materials, the characterization of the input RCD and the establishment of the global situation of the RCD, both in its generation and in its treatment. The second activity focuses on laboratory-scale work to valorise RCD in different applications: aggregates for concrete and mortar, baked clay products and alkaline-activated products, colloquially known as geopolymers. Finally, in the third activity, pilot-scale tests will be carried out to obtain the different materials under study, carrying out quality controls to validate these applications.

FUNDING

Valencian Innovation Agency

PARTNERS

- Ceramic Technology Institute
- AIMPLAS, Plastics Technology Centre
- Metalworking, Furniture, Wood, Packaging and Related Institute (AIDIMME)
- Concrete Science and Technology Institute of the Polytechnic University of Valencia (ICITECH - UPV)

In short, SOST-RCD implies a significant impact on the value chain of the construction sector, in addition to promoting the circular economy as a business model in the productive system of the Valencian Community. With this, a new market is opened by incorporating innovative techniques that are still practically unknown in the sector, which involve new designs of processes, treatments and use of waste to give a new life to another type of construction and building that results in the well-being of those who inhabit the spaces and in the implementation of new economic models aligned with the Sustainable Development Goals.

LINKS

- https://www.itc.uji.es/en/el-proyecto-sost-rcd-convierte-residuos-de-construccion-y-demolicion-en-recursos-para-una-construccion-mas-sostenible/
- https://simetriagrupo.com/el-proyecto-sost-rcd-convierte-residuos-de-construccion-y-demolicion-en-recursos-para-una-construccion-mas-sostenible/

VALUES Project:
Recovery of waste for its use as secondary raw materials

AIM

The Values project proposes an innovative comprehensive process to recover calcium carbonate from the sludge generated in the paper industry, currently taken to landfills, and use it as a resource in the manufacture of ceramic materials and rubber for footwear, thus reducing energy use, the footprint of carbon and the impact on virgin raw materials.

Sectors such as paper, ceramics and rubber, thanks to the recovery of calcium carbonate obtained from sludge residues from the paper industry. The calcium carbonate obtained may be used as a secondary raw material, replacing natural calcium carbonate, for which processes that use intensive energy consumption are used and it is that the high consumption of water by the paper industry leads to the generation of large volumes of wastewater which, once treated, generate, large amounts of sludge, an inevitable residue of that treatment. Paper industry sludge is made up of organic matter and mineral fillers such as kaolin and, mainly, calcium carbonate. Proper processing of these sludges will allow the combustion of organic matter, leaving as a residue a calcium carbonate of adequate purity and fineness that can become an alternative source of virgin calcium carbonate, used in various industrial sectors, such as polymers, rubber, paper, etc. Regarding the ceramic industry,

FUNDING

Valencian Innovation Agency

CO- FUNDING

European Union through the Operational Program of the European Regional Development Fund (ERDF) of the Valencian Community 2014-2020

COORDINATOR

- GREENE WASTE TO ENERGY, SL

PARTNERS

- EVA TALKING SL
- ITC-AICE,

the application of the circular economy concept to the paper, rubber and ceramic sectors would allow the transformation of a waste that today goes to landfills, towards obtaining a new resource, which would reduce the consumption of virgin raw materials, as well as the impact on natural reserves of limestone, a non-renewable natural source of calcium carbonate.

LINKS

- https://www.itc.uji.es/en/itc-aice-potencia-la-valorizacion-de-residuos-para-utilizarlos-como-recursos/

EROS Project:
Circular Economy in composites: from the wind and aeronautical sector to the ceramic and plastic industry

AIM

The main objective of EROS is to implement a real circular economy system based on the recycling of wind blades and waste from the aeronautical sector to be transformed and used in other sectors such as the ceramic industry, specifically in the ceramic tile supports themselves, and the elements that make up their surfaces, such as glazes, ceramic frits and inks for decoration.

This waste will also be transformed, applying the CE principles, to be reused as resources in the transport sector.

EROS aims, in this way, to reduce the consumption of fossil resources while maintaining long-term sustainability in the supply chain, and also eliminates the negative impact that these materials leave on the environment at the end of their useful life.

The work of the ITC, in this R&D action that began last July and will end in 2022, consists of collaborating with companies in the sector in the following tasks:

- Define the requirements of the recycled materials to be introduced in the ceramic tile manufacturing process (supports, glazes, frits, etc.) and subsequent characterization
- Develop and characterize new sustainable ceramic materials
- Establish a methodology for manufacturing ceramic tiles using fiberglass as flux
- Manufacture of demonstrators to validate the solutions developed

FUNDING

Ministry of Science , Innovation and Universities

PARTNERS

- Institute of Ceramic Technology (ITC)
- Keraben Grupo, SA
- Fritta, SL, Sofitec
- Reciclalia SL

LINK

https://www.itc.uji.es/en/el-itc-colabora-en-eros-economia-circular-para-incorporar-residuos-de-otros-sectores-a-la-ceramica-y-el-transporte/

CIRCULARCARBON

AIM

The CIRCULARCARBON project was born with a demonstrative objective that exemplifies a circular economy concept based on innovative technologies aimed at promoting the energy transition and the decarbonisation of the economy within the industrial fabric of the Valencian Community. Specifically, it is a demonstrator that allows the use of abundant waste in the Valencian Community for the production of a value-added product such as activated carbon and its application in key devices in the energy transition, such as energy storage systems. (batteries) and the improvement of the environment through water and gas treatment processes. On the other hand, the energy concept is integrated as a fundamental and transversal pillar to the entire process of life cycle analysis (LCA) of the project, since energy is analyzed from its inclusion in the system (clean generation and storage) to the generation of storage systems (battery demonstrator) that would close a sustainable cycle. Therefore, the project consists of 3 Demonstrators: one for the generation of activated carbon from waste and another two to be applied in energy storage systems and in environmental uses.

LINK

https://www.itc.uji.es/en/no-te-pierdas-el-ultimo-video-del-proyecto-circularcarbon/

FUNDING

Valencian Institute of Business Competitiveness (IVACE) through the FEDER Regional Development Funds

PARTNERS

- KERABEN
- BP Oil
- GREENE
- TORRECID
- GENIADABAR.

WATCH VIDEO HERE

E-CO-LADLEBRICK:
Ecological and Economical waste management of the ladle refractory bricks by implementing circular economy criteria

AIM

The main aim of the E-CO-LadleBrick project is to achieve an innovative waste management for worn ladle bricks in steel mills by implementing Circular Economy criteria based in a "4R model" (Reduce, Reuse, Remanufacture and Recycle). The project aims at both MgO-C and high-alumina bricks. The management of ladle refractory material waste in European Steelworks currently has no consistent technology, with most of it being dumped in landfills. At the same time all steelmakers are worried about ladle refractory costs and risks but the improvements are achieved based on partial assumptions or trial and error.

This Circular Economy Project answers to this situation based on a “4R” model, combining waste reduction by means of monitoring and optimizing the ladle refractory consumption (via remaining brick thickness) with processes for Reusing/Remanufacturing and Recycling the ladle refractory brick waste. The final optimized application will come from an expert decision tree and accompanied by the corresponding LCA studies. This innovative approach and knowledge aims to be totally transferable to other steel companies with both significant environmental and economic benefits.

START YEAR

2019

END YEAR

2022

BUDGET

1 300 000 €

FUNDING

RFCS 847249

PARTNERS

4 partners from 3 countries, including:

- Forschungsgemeinschaft Feuerfest (FGF) - Germany
- Sidenor I+D S. A. - Spain
- Foundation Tecnalia Research & Innovation - Spain
- 2.-0 LCA Consultants APS - Denmark

LINK

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/org-details/986412401/project/847249/program/31061225/details

Cerame-Unie The European Ceramic Industry Association