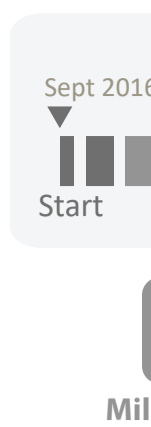


Dear Reader,

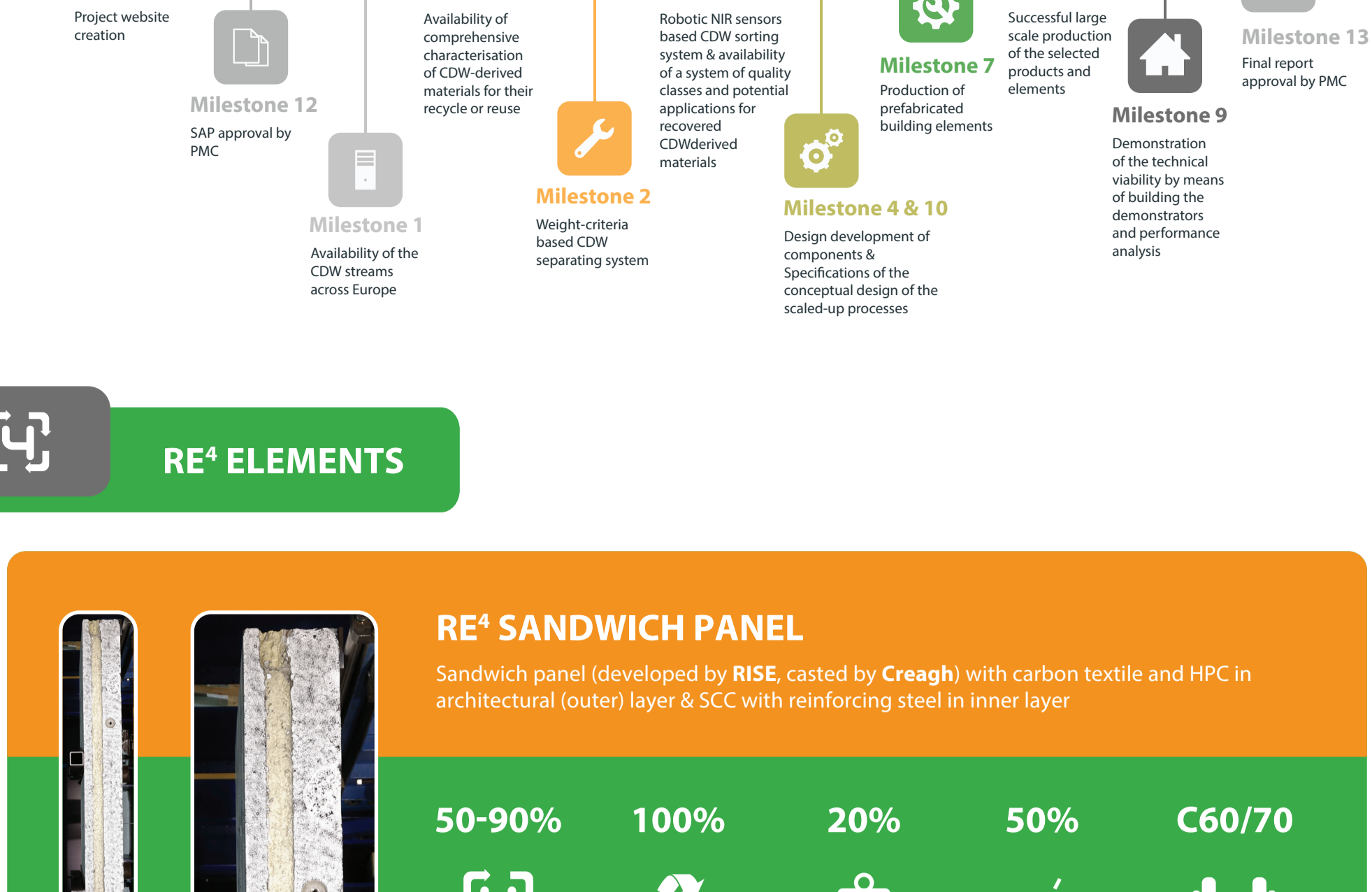
we are proudly sharing with you the fourth edition of the RE<sup>4</sup> project newsletter. The aim of this newsletter is to provide you with a summary of the news and progress achieved so far in the project. In this edition of the newsletter, you can find information about the developed RE<sup>4</sup> elements, a detailed description of the manufacturing process of the RE<sup>4</sup> timber façade panel and the production of the RE<sup>4</sup> extruded tiles.


You can also learn about upcoming and recent events of RE<sup>4</sup> project.



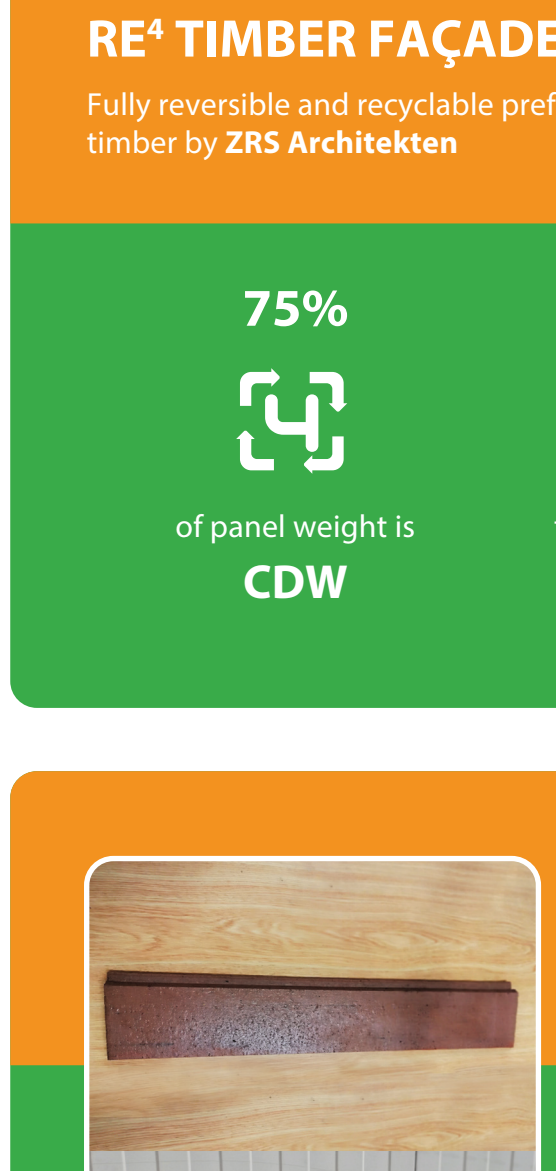
WHERE WE ARE

WE ARE HERE





RE<sup>4</sup> ELEMENTS



RE<sup>4</sup> SANDWICH PANEL

Sandwich panel (developed by RISE, casted by Creagh) with carbon textile and HPC in architectural (outer) layer & SCC with reinforcing steel in inner layer


50-90%

100%


20%

50%


C60/70




percents of CDW




panels are fully REUSABLE




reduction of WEIGHT



outer layer THICKNESS



mechanical STRENGTH




RE<sup>4</sup> TIMBER FAÇADE ELEMENT

Fully reversible and recyclable prefabricated timber façade element made of 75% CDW timber by ZRS Architekten


75%

100%


ZERO



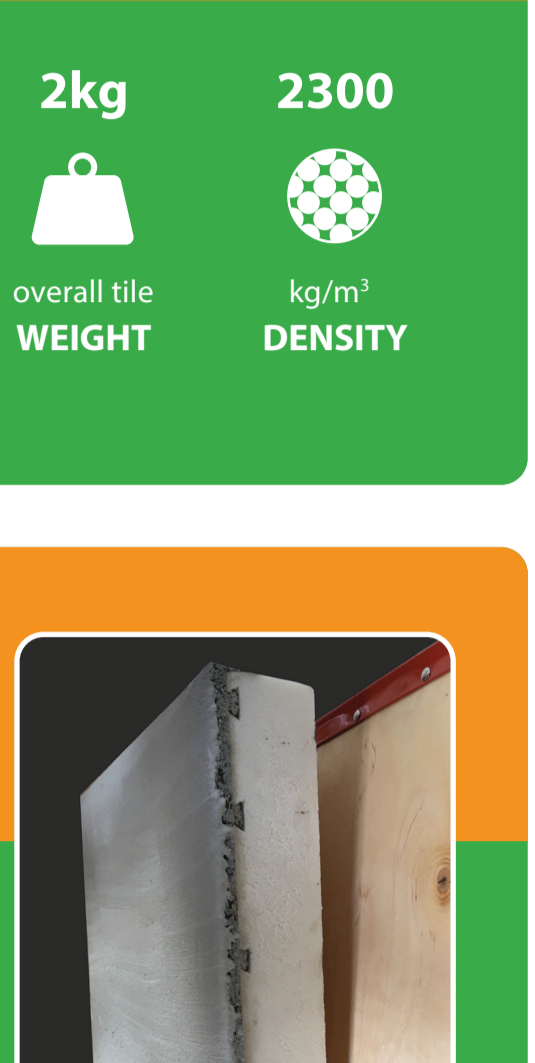
of panel is CDW




the element is fully REUSABLE



requirement of LBE





RE<sup>4</sup> EXTRUDED TILES

Extruded tiles by Vortex Hydra with easy installation and a future disassembly. Used for walls cladding just by hooking on metallic frame screwed on the substrate wall


85%

100%


480N

2kg


2300




percents of CDW




tiles are fully REUSABLE



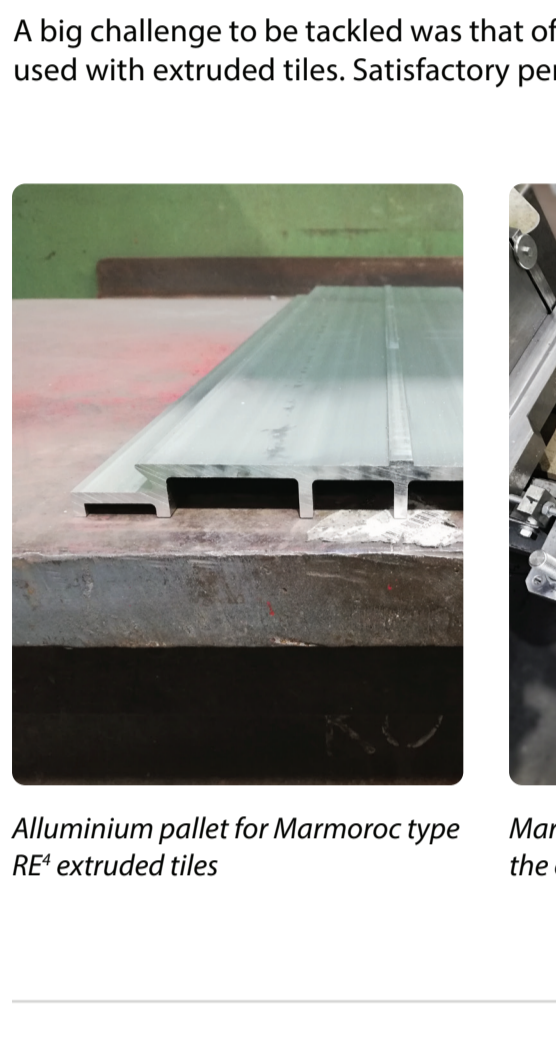
three-point BENDING



overall tile WEIGHT



kg/m<sup>3</sup> DENSITY




RE<sup>4</sup> EXTRUDED PANELS

Façade panels are manufactured on the basis of a concrete recipe typical of extruded products, with fine sand (replaced with CDW sorted aggregate), Portland cement 4.25, water and superplasticizer


100%

100%


10mm




of sand replaced with CDW

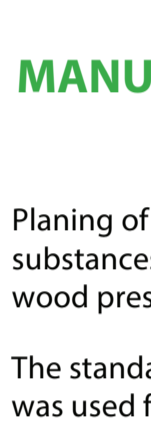


concrete layer is fully REUSABLE



concrete layer THICKNESS





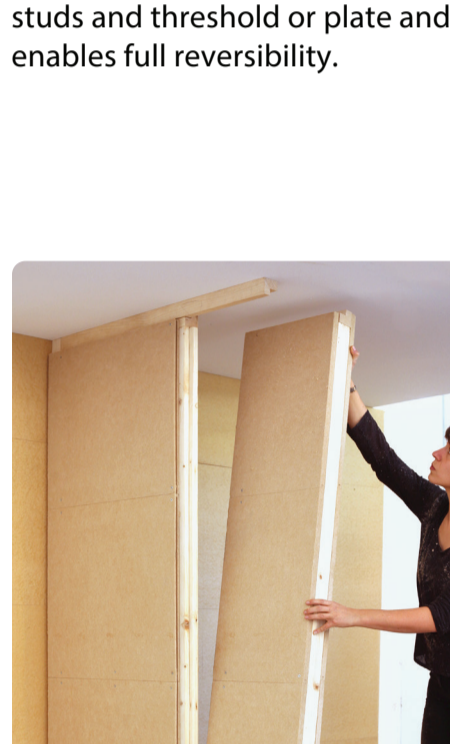
PROJECT PROGRESS

PRODUCTION OF RE<sup>4</sup> EXTRUDED TILES

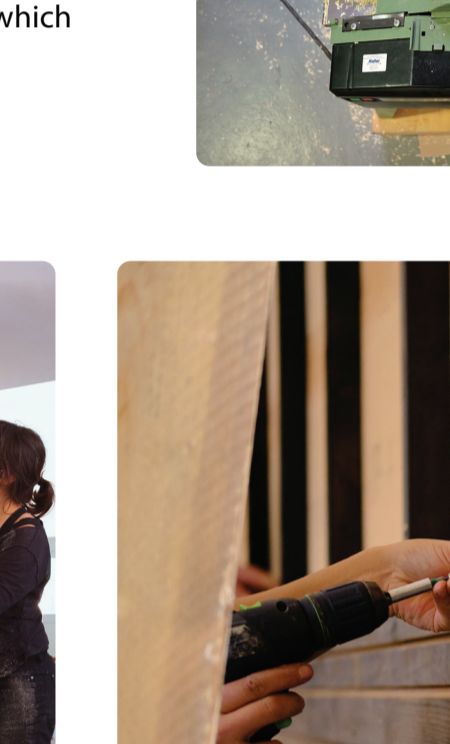
Within the spirit of the RE<sup>4</sup> project, the efforts have been focused on a type of product which ensured both an easy installation and a future disassembly, namely a **Marmoroc®** (Sweden patent) **type extruded tiles**, a kind of extruded façade stone, which is used for walls cladding just by hooking them on a metallic frame screwed on the substrate wall.

Aggregates, previously sorted by other partners within the RE<sup>4</sup> project, have been mixed with water and cement and processed through an extruder machine. Extruded products have been properly cured and then tiles produced within the **Vortex Hydra** facility have been delivered to the sites where demo-buildings are erected for further on field investigation.

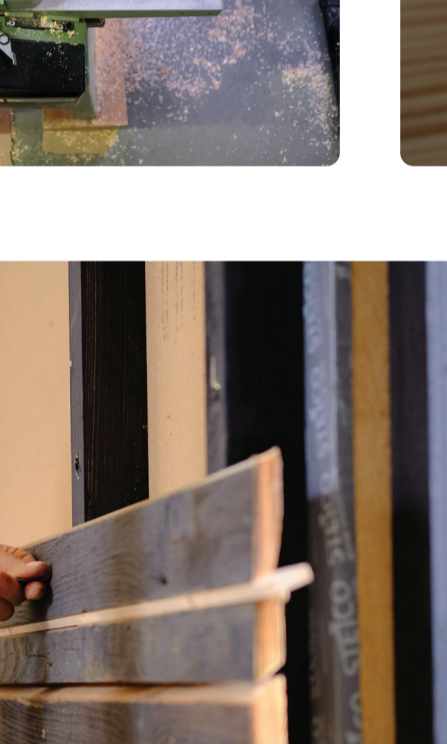
A big challenge to be tackled was that of dealing with recycled aggregates that exhibit a bigger size compared to the that of virgin sand normally used with extruded tiles. Satisfactory percentages of CDW derived aggregates were targeted.



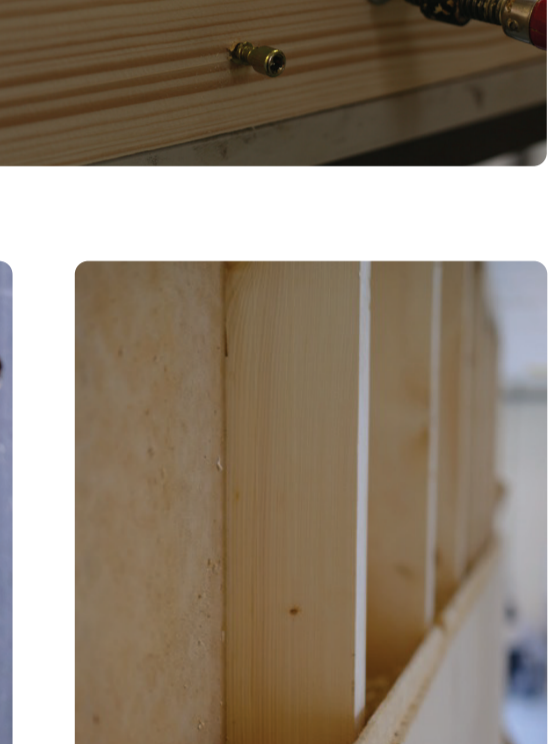
Alluminium pallet for Marmoroc type RE<sup>4</sup> extruded tiles




Marmoroc type RE<sup>4</sup> tiles coming out the extruder



Longitudinal cutting phase of Marmoroc type RE<sup>4</sup> extruded tiles



Marmoroc type RE<sup>4</sup> extruded tiles


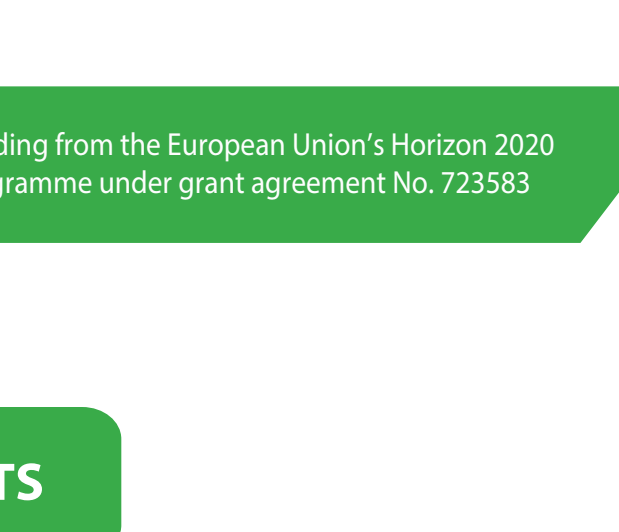



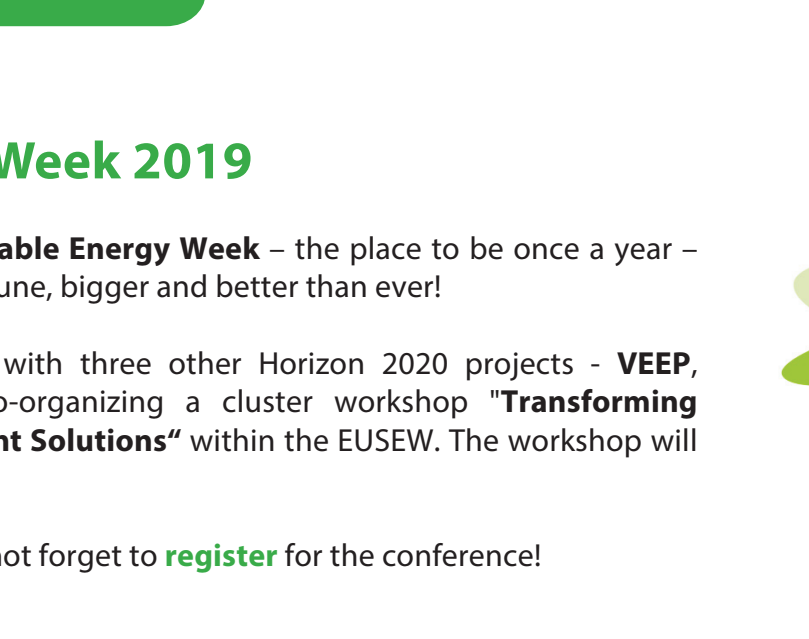

MANUFACTURING PROCESS OF RE<sup>4</sup> TIMBER FAÇADE PANEL

by ZRS Architekten

Planing of CDW wood to omit harmful substances from previous chemical wood preservatives.

The standard reserved connection that was used for the connection between studs and threshold or plate and which enables full reversibility.






ZRS developed an innovative internal partition wall system which fosters the idea of prefabrication to enable easy installation and dismantling.

Requirements regarding fastening (fixations and distances) have to be met in relation to the weight and dimensions of the weather boards itself to make sure that deformations of the weather boards are kept to a minimum.

The hollow space in the manufactured panels was filled with a wood shaving insulation.




For the demonstration two different types of claddings are provided on the same façade element in order to test the weathering effect in relation to the orientation of the weatherboards.


Both types of weatherboards are manufactured according to the requirements set out in DIN 68800-2, which allows the omission of chemical wood preservation.

Façade battens are angled min. 16° on top and bottom (especially for horizontal cladding).



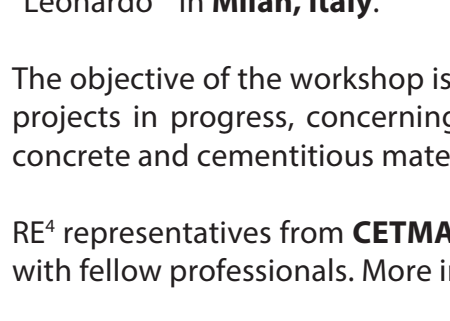
Claddings are installed with:

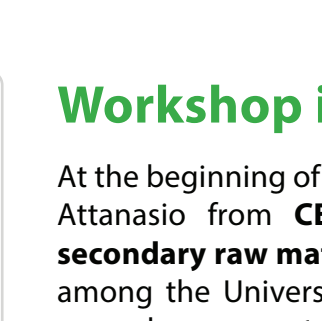


- min. distance of 7 mm to each other
- min. 20 mm ventilation layer

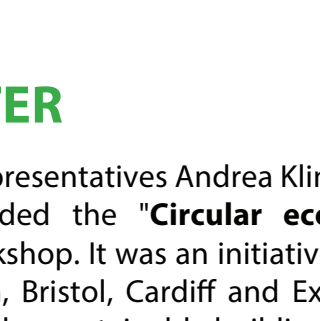




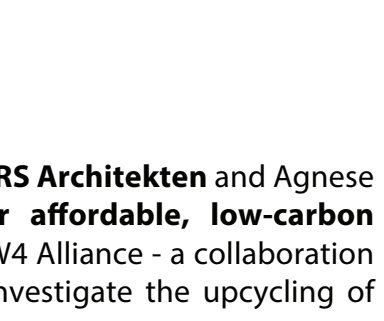




PARTNERS








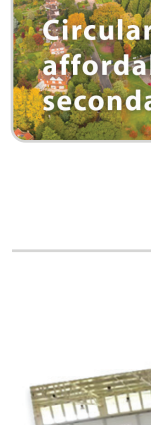






This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 723583






UPCOMING EVENTS

EU Sustainable Energy Week 2019

The Policy Conference of the **EU Sustainable Energy Week** – the place to be once a year – is back in Brussels between 18<sup>th</sup> and 20<sup>th</sup> June, bigger and better than ever!

We are happy that RE<sup>4</sup> project (along with three other Horizon 2020 projects - VEEP, INNOWEE, Green Instruct) will be co-organizing a cluster workshop **"Transforming Construction Waste Into Energy Efficient Solutions"** within the EUSEW. The workshop will take place on Tuesday 18<sup>th</sup> June.

Find **more about the workshop** and do not forget to **register** for the conference!



SUSTAINABLE PLACES 2019

June 5-7, 2019

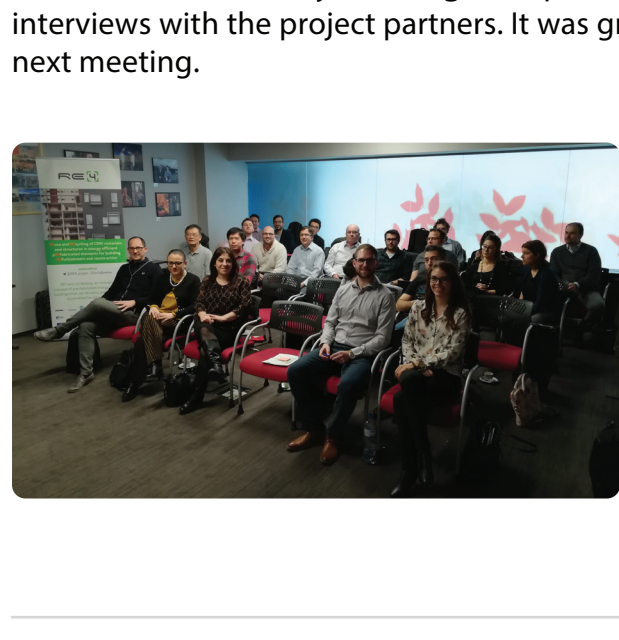
Cagliari, Italy

SUSTAINABLE PLACES 2019

RE<sup>4</sup> project is going to be exhibited at the **Sustainable Places 2019** conference. It will take place from 5<sup>th</sup> to 7<sup>th</sup> June 2019 at the beautiful Lazzaretto Cultural Center in Cagliari, Italy.

The scope of Sustainable Places is captured directly in its name. It is a platform for sharing ideas and thoughts about designing, building and retrofitting the places we live and work in a more sustainable way.

You can find more information at <https://www.sustainableplaces.eu/>.



NEW BOUNDARIES OF STRUCTURAL CONCRETE 2019

September 19th & 20th 2019


Milano, Italy

NEW BOUNDARIES OF STRUCTURAL CONCRETE 2019

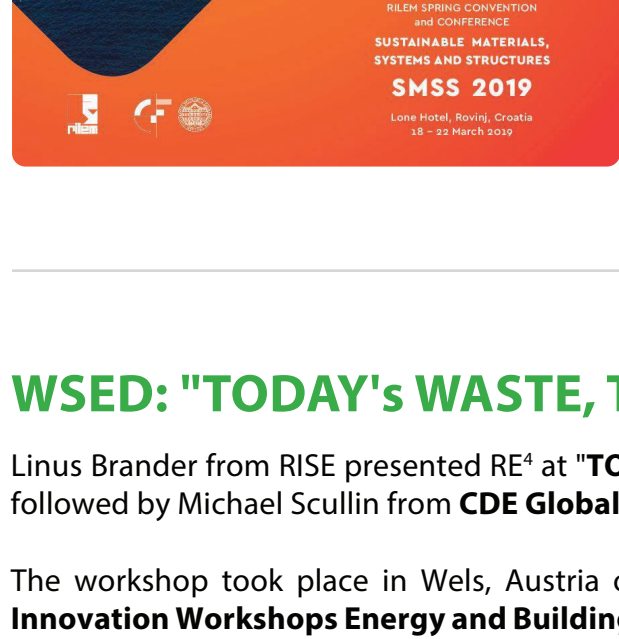
On 19<sup>th</sup> & 20<sup>th</sup> September 2019, **New Boundaries of Structural Concrete 2019** workshop (organized by ACI-Italy Chapter & DICA - Politecnico di Milano) will be held at the Campus "Leonardo" in Milano, Italy.

The objective of the workshop is to collect and to disseminate the latest results of the research projects in progress, concerning the production, application, durability and sustainability of concrete and cementitious materials.

RE<sup>4</sup> representatives from CETMA will be there to present our project and share our knowledge with fellow professionals. More information at <http://www.aciitaly.com/events/nbsc2019/>.



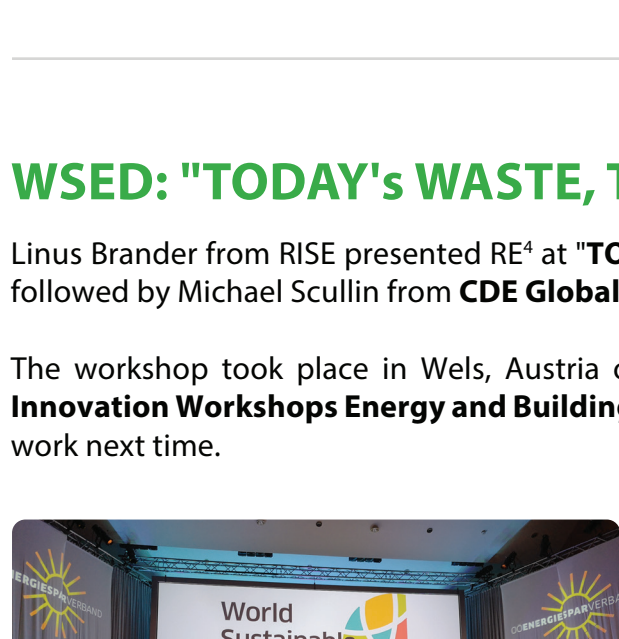
PAST EVENTS



Circular economy for affordable, low-carbon secondary raw materials

Workshop in EXETER

At the beginning of May, our representatives Andrea Klinge from ZRS Architekten and Agnese Attanasio from CETMA attended the **"Circular economy for affordable, low-carbon secondary raw materials"** workshop. It was an initiative of the GW4 Alliance - a collaboration among the Universities of Bath, Bristol, Cardiff and Exeter - to investigate the upcycling of secondary raw materials to develop sustainable building materials.

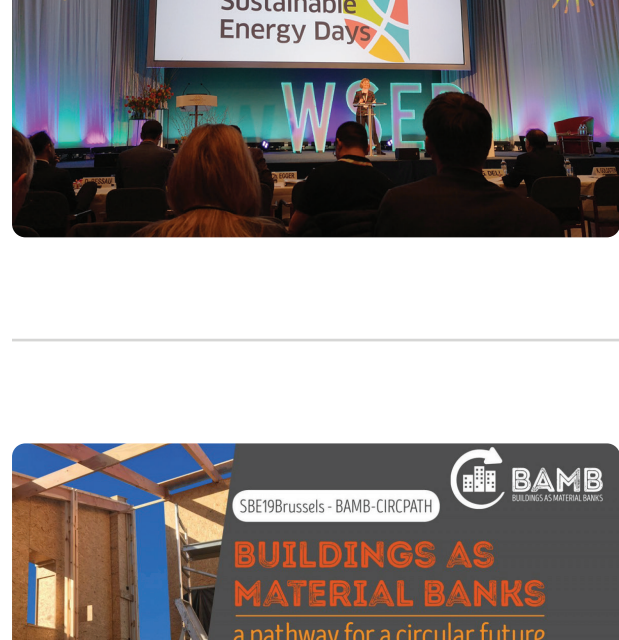


ECO-SMART Breakwater in LECCE

ECO-SMART Breakwater in LECCE

On 29<sup>th</sup> March, RE<sup>4</sup> project was presented during the final event of the project **Eco Smart Breakwater** at Ectekne - Università Degli Studi Di Lecce Campus, in Lecce, Italy.


The showcase of RE<sup>4</sup> project results was led by Diagnostics and Civil Engineering Area - CETMA. We are happy that we had the opportunity to present RE4 ideas and hope to see you next time!



General Assembly Meeting in PRAGUE.

General Assembly Meeting in PRAGUE.

RE<sup>4</sup> General Assembly Meeting took place on 19<sup>th</sup> & 20<sup>th</sup> March 2019 in Prague, Czech Republic. During the meeting, we recorded short interviews with the project partners. It was great to meet with our partners and discuss the future of RE<sup>4</sup> project. We already look forward to the next meeting.




RILEM Conference in Croatia

RILEM Conference in Croatia

Our project partners from the **Queen's University Belfast** presented RE<sup>4</sup> project at the **RILEM conference** on Sustainable Materials Systems and Structures in Rovinj, Croatia from 18<sup>th</sup> to 22<sup>nd</sup> March 2019. The project was presented via paper **"REUSE AND RECYCLING OF CDW MATERIALS AND STRUCTURES IN ENERGY EFFICIENT PREFABRICATED ELEMENTS FOR BUILDING REFURBISHMENT AND CONSTRUCTION - RE"**.

The scope of the conference was to gather scientists, practitioners, members of technical committees and users of technical recommendations, to meet and discuss the future sustainable development of materials, systems and structures in a holistic, global way.




WSED: "TODAY's WASTE, TOMORROW MATERIAL!"

WSED: "TODAY's WASTE, TOMORROW MATERIAL!"

Linus Brander from RISE presented RE<sup>4</sup> at **"TODAY's WASTE, TOMORROW MATERIAL - Circular Economy in Construction"** workshop. He was followed by Michael Scullin from CDE Global who was in charge of our interactive poster session.

The workshop took place in Wels, Austria on 28<sup>th</sup> February 2019 and was a part of **World Sustainable Energy Days 2019**, the session **Innovation Workshops Energy and Buildings**. It was a pleasure to talk with fellow colleagues about RE<sup>4</sup> project and we cannot wait to show our work next time.




BAMB 2020 final event

BAMB 2020 final event

RE<sup>4</sup> representatives from ZRS Architekten presented a paper titled **"Strategies for circular, prefabricated buildings made from waste"** at the BAMB 2020 final event.

The event was called **"BUILDINGS AS MATERIAL BANKS – A PATHWAY FOR A CIRCULAR FUTURE"** (SBE19 Brussels – BAMB-CIRCPATH) and was held in Brussels from 5<sup>th</sup> to 7<sup>th</sup> of February 2019.

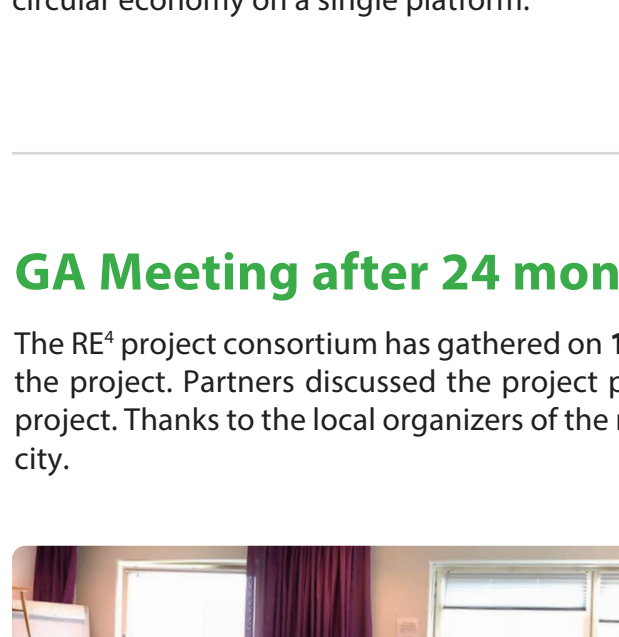


Article in European Energy Magazine

Article in European Energy Magazine

We are very proud that an article about RE<sup>4</sup> project was published in the winter edition of the **European Energy Magazine**!

You can read it **online** as well!  
Find the article about RE<sup>4</sup> project on **page 31**.




Presentation at MATERPLAT 2018

Presentation at MATERPLAT 2018

On 14<sup>th</sup> November 2018, ACCIONA representatives gave a talk about strategies to reuse and recycle Construction & Demolition waste at the General Assembly **MATERPLAT 2018**. MATERPLAT is an **Advanced Materials and Nanomaterials Spanish Technological Platform**, fostering and promoting innovation in the advanced materials and nanomaterials R&D&I Spanish system, by building a framework of encounter and collaboration between the different agents of the company, science, and technology Spanish system.

During the presentation, ACCIONA also introduced RE<sup>4</sup> project as one of the possible solutions.



SeRaMCo Conference

SeRaMCo Conference

RE<sup>4</sup> project representatives attended a mid-term conference of the European project **SeRaMCo: "Secondary Raw Materials for Concrete Precast Products"**. It aims to replace primary raw materials with high-quality materials recycled from construction and demolition waste.

The conference took place on 28<sup>th</sup> & 29<sup>th</sup> November 2018 at the **University of Luxembourg**.



8<sup>th</sup> ECTP conference

8<sup>th</sup> ECTP conference

Alessandro Largo from CETMA gave a presentation during the 8<sup>th</sup> edition of the **ECTP conference "When EU Construction Industry shapes high-tech Sustainable Built Environment"**. The Conference took place in Brussels on 13<sup>th</sup> & 14<sup>th</sup> November 2018.

Take a look at the presentation on our **website**.



Ecomondo in Rimini

Ecomondo in Rimini

RE<sup>4</sup> project was presented by RINA at **Ecomondo in Rimini** together with other H2020 projects on 9<sup>th</sup> November 2018. Ecomondo is the leading expo for the green and circular economy.

It is an international event with an innovative format that brings together all sectors of the circular economy on a single platform.



GA Meeting after 24 months in Sweden

GA Meeting after 24 months in Sweden

The RE<sup>4</sup> project consortium has gathered on 17<sup>th</sup> & 18<sup>th</sup> October in Gothenburg, Sweden for the **General Assembly meeting after 24 months** of the project. Partners discussed the project progress, shared the results with the consortium and planned activities for the next period of the project. Thanks to the local organizers of the meeting – partners from RISE, the consortium had a chance to attend a night sightseeing tour in the city.



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