ABSTRACT

CONWEEB – CONVERTING CONSTRUCTION WASTE INTO ENERGY-EFFICIENT BUILDINGS

#EUGREENWEEK COMMON WORKSHOP ORGANIZED BY EU PROJECTS (INNOWEE; GREEN INSTRUCT; VEEP; RE4)

ConWEEB Workshop will present innovative solutions for converting construction and demolition waste (CDW) into new prefabricated elements for better energy efficiency of buildings. What will be presented are the results of four R&D projects currently realized within the European Union's Horizon 2020 Research and Innovation Programme.

InnoWEE: The main aim of InnoWEE (http://innowee.eu/) project is the development of new economically viable, flexible and modular solutions able to process high amount of CDW and reaching at the same time a high performance in terms of energy efficiency and environmental impact. This 48-month project is based on recovery, disassembling and selection of CDW (concrete, bricks, mortars, glass and wood), their re-use by processing them into secondary raw materials (SRM) as a substitution for natural aggregates. The SRM are further used in the production process of competitive insulating façade / radiating geopolymer panels for use in new and existing buildings including historical one to achieve better energy efficiency and lower costs with reduction of environmental impact in both the building's lifecycle and the geopolymer panels production process.

VEEP: The European precast concrete sector faces diverse needs for resource efficiency improvement (reduction in natural resource consumption and metabolization of waste materials, reduction in carbon footprint and embodied energy, design for reuse, increase in process efficiency and waste minimization, lighter solutions, enhanced thermal performance through novel cost-effective insulating materials). Aiming at facing these challenges, VEEP project main objective is to eco-design, develop and demonstrate new cost-effective technological solutions that will lead to novel closed-loop circular approaches for C&DW recycling into novel multilayer precast concrete elements (for both new buildings and refurbishment) incorporating new concretes as well as superinsulation material produced by using at least 75% (by weight) of C&DW recycled materials.

RE4: RE4 is a 42-month research project supported by the European Commission under the Horizon 2020 for Research and Innovation (Grant Agreement no. 723583) with the main aim to promote new technological solutions and strategies for the development of prefabricated elements with high degree of recycled materials and reused structures from demolished buildings. The project is coordinated by CETMA and consists of 13 partners from 8 European countries. The main purpose of project is to develop a RE4 prefabricated energy-efficient building concept that can be easily assembled and disassembled for future reuse, containing up to 65% in weight of recycled materials from CDW (ranging from 50% for the medium replacement of the mineral fraction, up to 65%). The reusable structures will range from 15-20% for existing buildings to 80-90% for the RE4 prefabricated building concept. The building component will be suitable for both new construction and building refurbishment.

Green INSTRUCT: The Green INSTRUCT project (http://www.greeninstruct.eu/) develops a prefabricated modular structural building block that is superior to conventional precast reinforced concrete panels by virtue of its reduced weight, improved acoustic and thermal performance and multiple functionalities. The Green INSTRUCT block consists of over 70% of CDW in weight. The block will be designed for easy and fast installation, being **30% lighter than conventional envelope walls** of the same size. It is expected that installations during the project will be at least **15% faster,** and on a product, stage could reach 30%. The developed prototype will adhere to

Eurocode standards and provide thermal insulation with a U value of **0,14 W/m2.oC** and acoustic insulation in the **55-60dB** range. Finally, the Green INSTRUCT building block will contribute to on site grey and stormwater management, through the integration of a vertical Green Wall, providing additional functionalities. The project is guided by a holistic view through building information modelling and optimal overall performance. This includes considering the life cycle analysis, weight, structural performance, thermal and acoustic insulation, connectivity among modular panels and other structural/non-structural components as well as the compatibility of different internal parts of each modular panel. Green INSTRUCT is a 42-month research project supported by the European Commission under the Horizon 2020 for Research and Innovation (Grant Agreement no. 723825).

The workshop will be divided into three (3) thematic sessions like selection of CDW for recycling, characterization of the materials obtained from processing the CDW and presentation of the design of the new prefabricated solutions. You will see how waste can be used again in innovative ways.

DATE: **24 MAY 2018 (THURSDAY)**
TIME: **9:15 – 17:45**
PLACE: **CSIC (SPANISH RESEARCH NATIONAL COUNCIL) BRUSSELS OFFICE: RUE DU TRÔNE, 62; 1050 BRUSSELS**