

RIS ALiCE Project

The project: **Al-rich industrial residues for mineral binders in the ESEE region-RIS ALiCE** in the frame of the **European Institute of Innovation and Technology, Raw materials (EIT-Raw Materials)** co-financed by Horizon 2020/ Europe started on March 2019 and will end on February 2022. The “RIS-ALiCE” consortium consists of partners experienced in the relevant field from seven countries (Slovenia, Bosnia and Hercegovina, North Macedonia, Serbia, Hungary, Austria and France). Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia coordinates the project.

During the past period of almost three years, the main goals of the project have been realized focusing on:

- (i) the creation of a strong network among the relevant producers/holders and end-users of Al-rich industrial residues,
- (ii) knowledge transfer,
- (iii) valorization of the Al-rich residues by production of environmentally friendly mineral binders and
- (iv) implementation of the circular economy and zero waste of Al-rich industrial residues in ESEE region.

The realized activities in the frame of the project contributed to increase of the innovation potential and competitiveness in the East and South East European (ESEE) region.

Faculty of Technology and Metallurgy, Ss. Cyril and Methodius University in Skopje (FTM-UKIM) as an academic partner from our country, together with the industrial partners: Cementarnica USJE-TITAN Group and Elektrani na Severna Makedonija (ESM) were the organizers of two National workshops. The possibility for utilization of Al-rich residues as secondary raw materials for low CO₂ binders was disseminated to the national stakeholders following the concept of circular economy.

On 26th February, 2021 FTM-UKIM was also the organizer (virtual mode) of International Workshop: **Registry of secondary mineral resources for the production of low-carbon cements** (<http://ris-alice.zag.si/ajax/DownloadHandler.php?file=34060>) aimed to promote registry among the relevant stakeholders. More than 100 participants from 23 countries participated at the workshop. The topic of the workshop was the circular economy and sustainable management of secondary mineral raw materials for their use in the production of low-carbon cements, as well as strategies and solutions that can fast track decarbonisation in the cement industry.

Knowledge transfer for 26 students (graduated, master and PhD) from 7 different countries (Serbia, North Macedonia, Slovenia, Slovakia, Italy, Austria and Montenegro) was realized in the frame of the training school (TS) entitled: **Al-rich industrial residues for inorganic materials**. TS was organized from 24th to 18th May, 2021 at Vinča Institute of Nuclear Sciences-National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia.

Aslo, RIS ALiCE was the **co-organizer of VI Student's Congress of SHTM** where part of the students presented their scientific work related to the utilization of Al-rich industrial residues.

Manual for use of Al-rich residues in low CO₂ mineral binders was published in the frame of RIS ALiCE project. It addresses the legislative aspects, governing the use of secondary raw materials in construction products, description of the most common Al-containing industrial and

mining residue (bauxite deposits, red mud, ferrous slag, ash and some other by products from industry), potentiality for their reutilisation and its economic aspects, potential requirements/barriers for the use of secondary raw materials in the cement industry and a description of belite-sulfoaluminate cements, which are a promising solution for implementing the circular economy through the use of large amounts of landfilled Al-rich industrial residue and mining waste cement clinker raw mixture.

A **new registry of secondary mineral residues** (industrial and mine waste/by-products) has been developed within RIS-ALiCE project with the data valuable for both, waste providers as waste users in Eastern-Southeastern Europe region. The registry offers a “marketplace” of secondary raw materials for their potential use in construction sector.

We invite you (especially waste holders/producers) to visit <https://alice-registry.eu/> and use the registry to share your data on secondary raw materials.

More details for RIS ALiCE can be found on the web page of the project: <http://ris-alice.zag.si/>

Prof. Emilija Fidanchevski, FTM-UKIM coordinator of RIS ALiCE project

