



Al-rich industrial residues for mineral binders in ESEE region

Katarina Šter and Sabina Kramar

- Huge amounts of various Al-rich residues (steel slag, red mud, ash, landfills of bauxite mines) with a low recycling rate or landfilled in RIS countries present a high secondary mineral resource potential.
- A promising way of recycling these waste mineral materials is the synthesis of sustainable mineral binders with high Al content, which can be further used as an environmentally friendly construction material.



Network of interested parties

Waste holders, the mineral raw materials processing sector, the construction sector, national and EU decision makers, R&D and the education sector

Mapping and valorisation

Al-rich residues in the ESEE region (slag, ash, red mud, mine waste)
Potential for low-CO₂ mineral binder production



Matchmaking between Al producers/holders and mineral end user

Contribute to the creation of local and regional industrial ecosystems
Long-term activity will be enabled via the development of an Al-rich residues registry

Knowledge sharing and education

For students and professionals in the field of geology, mining, construction and related technology and industry
Raising awareness of the topic across the wider community



Project duration: March 2019 - February 2022 | **Project budget:** 932,355.00 EUR
Project Coordinator: Slovenian National Building and Civil Engineering Institute (ZAG)

<http://ris-alice.zag.si> | <https://eitrawmaterials.eu/> | alice.eit@zag.si



Al-rich industrial residues for mineral binders in ESEE region

Katarina Šter and Sabina Kramar

 **ZAG**

ZAVOD ZA
GRADBENIŠTVO
SLOVENIJE

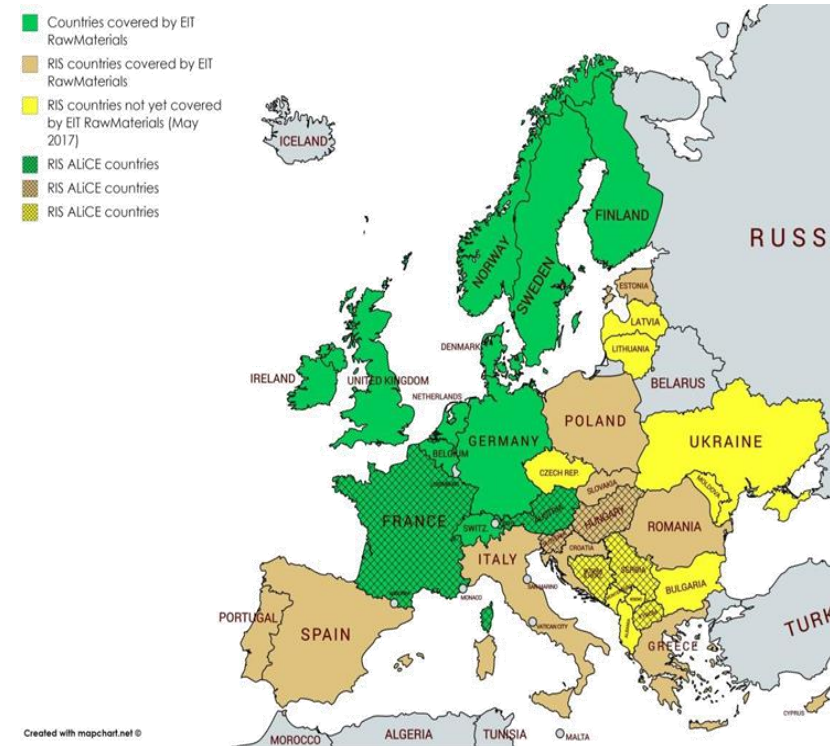
SLOVENIAN
NATIONAL BUILDING
AND CIVIL ENGINEERING
INSTITUTE

Background and motivation

- Huge amounts of various Al-rich residues (steel slag, red mud, ash, landfills of bauxite mines) with a low recycling rate or landfilled in RIS countries present a high secondary mineral resource potential.
- A promising way of recycling these waste mineral materials is the synthesis of sustainable mineral binders with high Al content, which can be further used as an environmentally friendly construction material

RIS-ALiCE project

- multidisciplinary and complementary consortium
- **15 partners:** three sides of the knowledge triangle (academia, RTO and industry)
- waste users/producers
- **7 countries**
- **5 RIS countries:** SI, HU, BiH, MK, SR

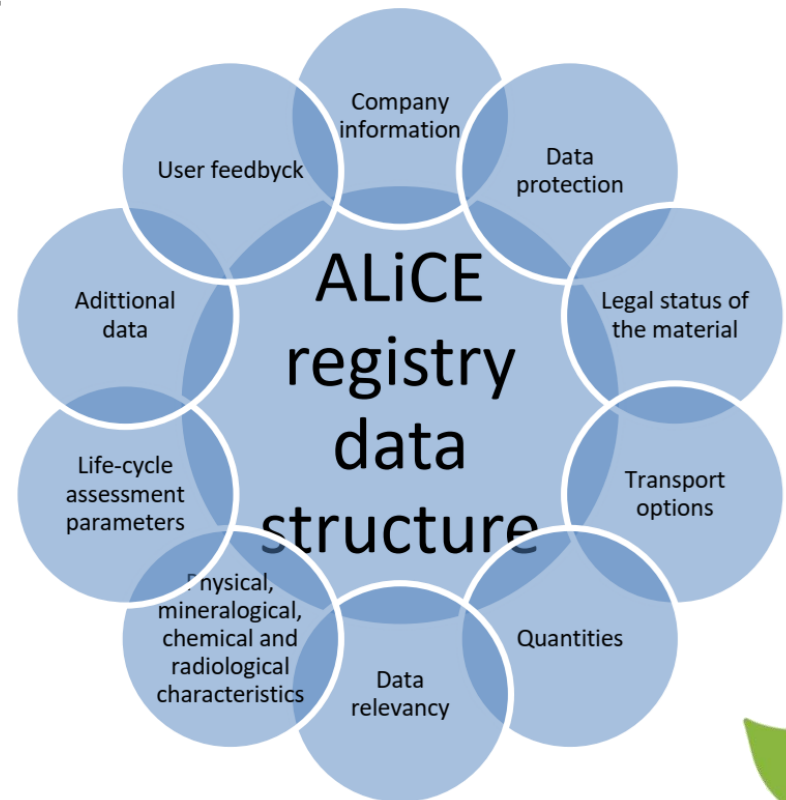


Network of interested parties

- waste users/producers,
- mineral raw materials processing sector,
- construction sector
- national and EU decision makers,
- R&D and education sector
- waste transportation sector,
- permitting authorities,
- research institutes,
- policy makers,
- waste recycling plants,
- investors,
- and many others

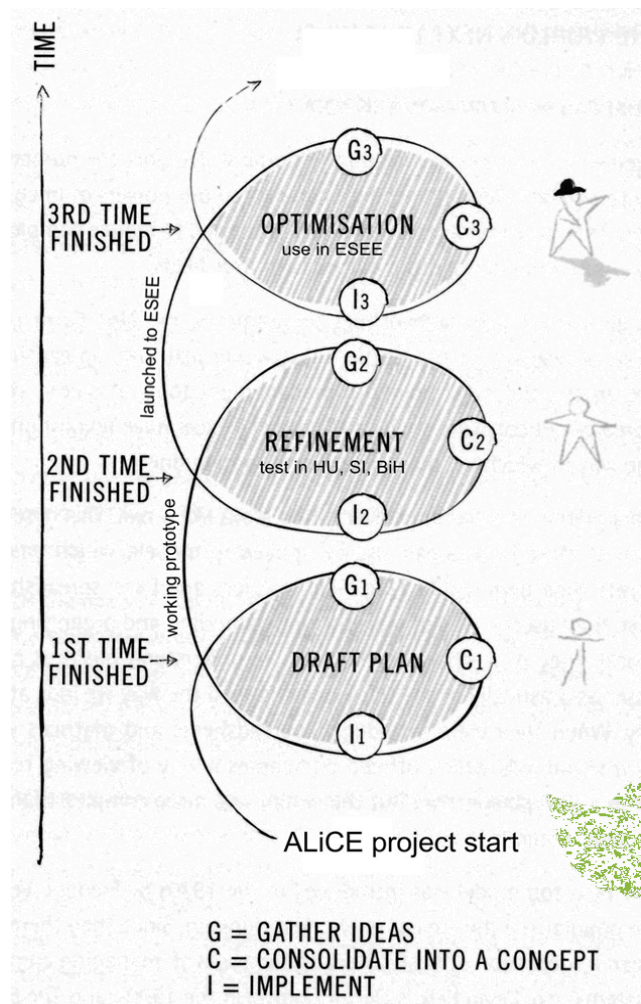
Matchmaking between AI waste users/producers

- Contribute to the creation of local and regional industrial ecosystems
- Long-term activity will be enabled via the development of an **AI-rich residues registry**



Objective of RIS-ALiCE registry

- Registry is a part of the RIS-ALiCE project.
- To link holders of Al-rich waste and residues, and potential consumers of such waste.
- To serve as a tool to help cement plants and other potential users to evaluate the potential supply of such materials in the future.
- To ease valorization of Al-rich wastes for their potential use for cement production.



Holders of Al-rich residues will be able to

- easily put their waste on the "market",
- have a complete control over which data to contribute and what can be done with it,
- chose who exactly can modify their data.



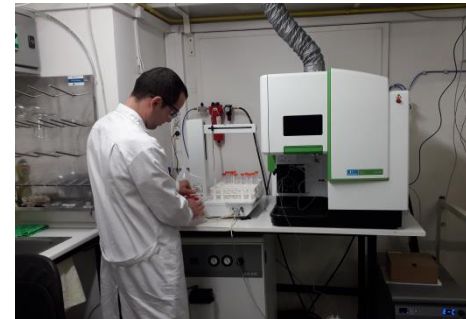
Cement plants will be able to

- easily search for potential supply of Al-rich materials,
- quickly valorize such materials for production of Al-rich cements,
- make better decisions regarding future Al-rich cement production.



Mapping and valorisation

- Al-rich residues in the ESEE region (slag, ash, red mud, mine waste)
- Potential for low-CO₂ mineral binder production
- Aluminium-containing residues are characterized with respect to their chemical, physical and radiological composition using different analytical methods



Al-rich residues in the ESEE region

Bauxite
mines



SI → 39 possible sites

B&H → 5 possible sites

HU → 23 possible sites



Red mud



SI → 1 possible sites

B&H → 2 possible sites

HU → 3 possible sites



Al-rich residues in the ESEE region

Ash



SI



3 thermal power plants
Fly ash, bottom ash
Paper industry, sludge

B&H



5 possible sites

HU



18-20 possible sites



Slag



SI



3 possible sites

B&H



1 possible sites

HU



possible sites (steel)
5-10 possible sites (Al)



Knowledge sharing and education

- For students and professionals in the field of geology, mining, construction and related technology and industry
- Raising awareness of the topic across the wider community





Thank you for your attention



<http://ris-alice.zag.si>
<https://eitrawmaterials.eu/>



alice.eit@zag.si



This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under the Horizon 2020, the EU Framework Programme for Research and Innovation