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.
Al-rich industrial residues for mineral binders in ESEE region

Katarina Šter and Sabina Kramar
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 Al waste users/producers

- 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
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-CO$_2$ 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 site
- 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 site
- 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

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