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ALiCE: Al-rich industrial residues for low-CO₂ Cement clinkers

- Idea/problem:

Cement (OPC) clinker production is related to **large CO₂ emissions** - consequently, much efforts have been done on the development of alternative binders, like **belite-sulfoaluminate clinkers**, which have many advantages comparing to OPC: *lower energy use, lower CO₂ emissions and consumption of secondary raw materials.*

However, **for belite-sulfoaluminate clinkers more Al, with respect to OPC, is needed in the cement raw mix**. An increased demand for Al-rich resources is thus expected in the near future. These resources could be **bauxite deposits** or **Al-rich waste** (there are huge amounts of waste not consumed currently and still disposed which can represent a valuable raw materials).

Since mentioned **Al-sources are localized**, a proper database is needed to asses the **possibility of their use in clinker production**.

- Expected synergies and complementarities:

Circular economy, from waste to product. Exchange and cooperation between experts from building sector, material science, mineral resources, waste producers, and mineral end-users. Better energy efficiency and lower use of natural raw materials for the cement production.

- Outcomes:

Networking of interested parties: waste holders, researchers, mineral end-users. **Matchmaking** between cement plants and Al-producers, **transfer of knowledge** on the new low-CO₂ cements. **Database of Al-rich residues** and **database of cement plants in the ESEE region** (identification of Al-sources-location, material quantity estimation, suitability and their availability to local cement plants-transport, LCA). The land-filling of some potentially useful materials can be significantly reduced and **natural resources preserved**. Such strategy will contribute to the **CO₂ reduction** and to „closing the loop“ of product lifecycle.

- Market & Business opportunities: Construction sector, waste management sector, mineral raw materials processing sector
- Partners already identified: SI-ZAG (AP, building research institute), SI-GeoZS (AP, mineral resources), SI-Salonit Anhovo (TP, cement plant)
- Wanted additional partners: waste producers & holders (Al-rich residues), cement plants, experts in LCCA & -S-LCA, APs from ESSE region