

EXCEED ROUTE: LITHIUM MINING RESIDUES AS SECONDARY RESOURCES FOR CONSTRUCTION MATERIALS THROUGH ALKALI ACTIVATION

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Mining activities are increasing in EU region due to rise in need for the battery minerals that could help in achieving the sustainability goals by encouraging the use of alternative energy sources. It also means the generation of mining residues during the process. Without proper management of these residues, it is not possible to achieve complete circularity or sustainability in future. Hence, EXCEED project is proposed and funded by Horizon Europe to create cost-effective, sustainable and responsible extraction routes for recovering distinct critical metals and industrial minerals as by-products from key European hard-rock lithium projects.

The project consortium consists of 14 partners from 6 countries with 50% industrial partners to pilot the results from the research and innovation activities during the project period. This covers the mining industries that are interested in removing their residues and industrial minerals for rare-earth element, followed by processing them further as a secondary resource for construction materials.

There is a dedicated work package to cover the valorization of industrial and mineral residues as secondary resources for construction materials (See, Fig. 1). Presence of feldspar in the lithium residues makes them a perfect material for ceramic applications. Use of these ceramics as roof/ wall tiles and as an alkali activated ceramics in refractory applications will be evaluated and piloted at Wienerberger (Belgium). It is challenging to modify the reactivity of these materials due to their crystallinity, however, supplementary cements or activation at low alkali environment is expected to produce an optimum hybrid cement. Resulting cement-based construction materials will be piloted at Betolar (Finland). Additionally, bloated aggregates using the residues is examined for lightweight aggregate application. As an overall idea, alkali activation (called as chemical treatment) at different concentration level plays an important role in the conversion of lithium residues into construction products.

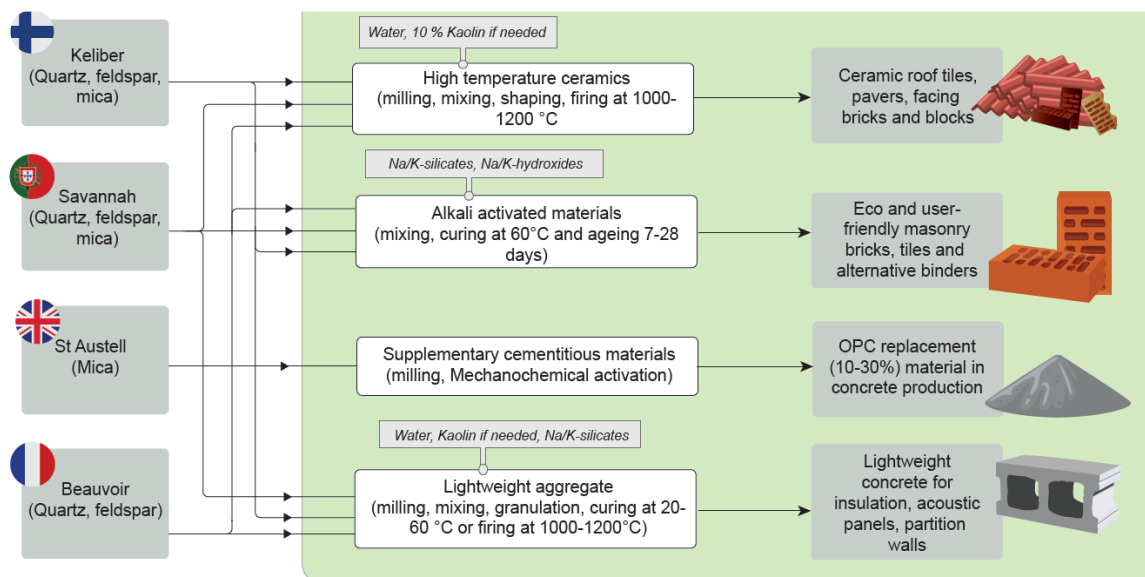


Figure 1 – Valorization of residual and industrial minerals in EXCEED project