Sludge from mining and processing stone: strategies to improve resource efficiency and promote recycling according to the pillars of the European Commission

Session 4

PROCESSES AND TECHNOLOGIES FOR MATERIAL RECOVERY

Sludge from mining and processing stone: strategies to improve resource efficiency and promote recycling according to the pillars of the European Commission

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Abstract

The world increasingly need of greater varieties of raw materials and minerals, this leads to take action to promote the recovery of Critical Raw Materials (CRMs).

According to the new European mining management vision and with the EU pillars, the European Raw Materials strategy must lay the foundations for a European policy of production of strategic raw materials that raises extraction mining option, promoting recovery of CRM from recycling, provide incentives for study and research at European level for the introduction of elements and alternative technologies and encourage the creation of a European Innovation Partnership for and the dissemination of new technologies.

The waste resulting from the extraction and processing of stones, can be disposed of in authorized landfills, but properly treated and recovered, might find relocation on the market as "secondary raw material".

The following research is therefore aimed at the characterization of sludge, to determine which treatments (for normal industrial practice) can be applied to sludge in order to avoid the dangerous substances derived from the wear of cutting tools. The investigation was conducted on sludge from cutting with diamond wire, diamond saw blades, and mixed sludge. The tests performed are: particle size analysis, chemical analysis, wet magnetic separation, diffraction and SEM analysis. Magnetic separation is carried out in order to obtain two secondary materials: very fine-grained mineral fraction and metals fraction. The study performed is useful for evaluating the possible reuses of both the metal (containing CRM), and the mineral part, through the implementation of a proactive waste management strategy in order to avoid a subsequent environmental degradation.

This study is part of the WeCARE commitment (Wastes from Construction industry As a ResourcE) recognized by EIP Raw Material, which involve several European institutions, with the common aim of seeking a solution to recover and recycle sludge from construction industry and in particular processing stone.