Work package 4

Improving the Supply Chain of Cobalt

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Research within WP4 will focus on improving the cobalt supply chain through investigation into the **geometallurgy of cobalt** with direct **engagement of industry**. It has long been recognized that the hydrometallurgical extraction of cobalt as a by-product of copper and/or nickel production is inefficient in Co recovery due to non-optimal selectivity of flotation and/or leaching conditions. Geometallurgy holds promise as a planning and assessment tool which attempts to harness the influence of geotechnical variables, such as rock hardness and fracture toughness, on the preferred mining and processing schedule. It considers the entire mining value chain, with integrated process monitoring and control and safeguarding of the environment. **Geometallurgy** of cobalt-bearing sulfide ores from the **Polish Kupferschiefer** and deposits in the **Central African Copperbelt** (CAC) will be studied in order to develop **environmentally-friendly extraction of cobalt** from these resources. Experimental laboratory work will be conducted to develop **a geometallurgical model** which integrates the effect of mineralogical and geotechnical properties of characteristic ore types, flowsheet design, process variables such as grind size and reagent type and dosage. Laboratory experiments will investigate the effect of ore types, leaching conditions (atmospheric versus pressure leaching, effect of temperature) and selection of environmentally-benign lixiviants.

A major **industry-science technology forum,** brokered by Cobalt Development Institute will be organized as one of the key tasks in WP4. The forum will aim to drive technology transfer, increase stakeholder engagement and promote awareness of security of supply. Specifically, it will seek to establish the implications of CoG3 project findings towards improving the geo- and bio-geoengineered recovery of cobalt. Session focused on mineral processing will be organised with CoG3 industry partners. There will also be a session focussed on downstream users of cobalt specifically addressing the issue of how bioengineered cobalt compounds (produced in WP3) can be tailored to specific industrial and biomedical needs

Finally, WP4 will integrate the results of WP1, WP2 and WP3 with a view to refining and extending the geometallurgical modelling of cobalt recovery. New information on cobalt deportment in key mineral phases, as gained from WP1, will be integrated with geotechnical and bulk assemblage mineral data and assessments obtained from WP4, in order to develop more sophisticated **ore assessment models**. The use of geometallurgical analysis for the screening of the types of the other potential ores suitable for bioleaching, as defined in WP3, will be investigated. This will provide a valuable insight into where **future cobalt supplies** may be recovered using more sustainable processing methods.