

Smart exploration: Sustainable mineral resources by utilizing new Exploration technologies



The European challenge:

The geological evolution of Europe has resulted in generation of a variety of mineral resources such as iron, base and precious metals, REEs, PGEs, phosphate, chromium, aluminum, and a range of industrial and construction materials. These materials are essential for the sustainable economic growth of the EU, for its continued technological development and innovation, as well as for maintaining and improving the quality of life. There are challenges for their exploration; the chase is steadily moving towards greater depths, particularly near the existing mines where continued supply needs to be secured and environmental impacts of mining minimized. Enhanced subsurface geological information, deposit concepts and exploration methods are required to realize the great unexplored potential at depth in major mining camps, but also the potential that new greenfield regions can offer due to the enhanced geological knowledge.

The Project

Smart Exploration, consisting of a research and application team supported by a group of technologically advanced SMEs and mining industries, will primarily focus on developing cost-effective, environmentally-friendly tools and methods for geophysical exploration in highly challenging brownfield areas to meet the ever increasing community (social acceptance) and environmental issues, as well as reduce the return time (from exploration to production). Smart Exploration, however, realizes that long-term greenfield exploration is essential and that reducing exploration costs in these regions can have great consequences for development rates and a sustainable supply of raw materials at the same rate as whole world growth. Therefore, new innovative ideas will also be tested for greenfield exploration to increase the potential of finding new major deposits of relevance to the EU. The goals will be achieved via the development of (1) non-invasive new sensitive exploration instruments and tools covering airborne, surface, downhole and in-mine modular-based geophysical systems, (2) new exploration targets through multidisciplinary and integrated approaches, (3) novel reprocessing and handling of legacy exploration data that will generate additional information and targets for detailed exploration, and (4) validating and co-implementing all these developments, to maximize their impact, at relevant exploration sites covering greenfield, near-mine and in-mine areas using known targets. We anticipate that these developments will not only generate new technological and methodological markets for the EU, but will also allow improved exploration in the EU countries and beyond. The composition of the consortium, along with the commodities being considered, will allow exploitation of the project developments and guarantee their successful application beyond the project life.

Partners:

Geological Survey of Sweden (SGU); Nordic Iron Ore AB (NIO); Ludvika Kommun (LK); GeoVista AB (GeoVista); MIC Nordic AB (MicNordic); BitSim AB (BS); Amkvo AB (Amkvo); Yara; University of Helsinki (UH); University of Turku (UT); SkyTEM Surveys ApS (SkyTEM); Aarhus University (AU); Delft University of Technology (TUDelft); Seismic Mechatronics B.V. (Seismech); European Association of Geoscientists and Engineers (EAGE); Sociedade minerira de Neves-Corvo (Somincor); Laboratório Nacional de Energia e Geologia I.P. (LNEG); Technische Universität Bergakademie Freiberg (TUBAF); Institute of Geophysics, Polish Academy of Sciences (IG PAS); Geopartner Sp. z o.o. (GP); Proxis Sp. z o.o. (Proxis); National Technical University of Athens (NTUA); Helas Gold S.A (HG); Seismotech sltd (ST); Delfi Distomon S.A. (DD)



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