

## The future of raw materials exploration in Europe

**New EU project establishes reference areas for trialling new technology in three countries – Germany, Finland and Spain**



Europe is about to become more attractive for the exploration of raw materials. Partners drawn from research and industry plan to develop innovative, non-invasive technologies and test them under realistic conditions. For this purpose, three European reference areas are to be established in Germany (Geyer), Finland (Sakatti) and Spain (Minas de Riotinto, Gerena). To this end, the EU is investing around 5.6 million euros over the next three years in INFACT, a new research project in which 17 partners

from seven countries have joined forces. The project is being coordinated by the Helmholtz Institute Freiberg for Resource Technology (HIF) at the Helmholtz-Zentrum Dresden-Rossendorf.

Because the ore deposits of tomorrow are located in remote regions and deep underground, detecting these metal and mineral resources poses an ever-greater challenge in terms of technology. At the same time, the success of new exploration projects increasingly depends on the extent to which as many interest groups as possible from civil society can be brought on board. INFACT (Innovative, Non-Invasive and Fully Acceptable Exploration Technologies) brings partners from science and research, industry, government agencies and non-profit organizations into contact with local populations directly affected by exploration. Working in collaboration, these stakeholders aim to develop, exchange and disseminate environmentally-friendly technologies.

### **Three pillars: Dialogue, Innovation and Reform**

Innovative technology can make Europe attractive as a location for active exploration of raw materials, thereby contributing to a secure supply within the EU for the long term. Although the continent is one of the world's largest consumers of metallic and mineral resources and has a long history of mining, the exploration of new deposits is complicated by social, political and technical obstacles. The project participants aim to overcome these challenges.

The strategy of the INFACT project rests on three pillars: Dialogue, Innovation and Reform. The purpose of the Dialogue pillar is to raise public awareness and social acceptance for modern exploration. The project will develop a common understanding of good social and environmental practices and methodology that subsequently are to become standard across the entire EU.

### **A new generation of methods**

The Innovation pillar is all about the next generation of exploration methods and processes that will facilitate the search for ore deposits in Europe. The technologies are less invasive than traditional methods, which means that they reduce impact on the environment and at the same time push into new dimensions. For example, the scientists expect to achieve more accurate measurement

sensitivity as well as the ability to determine new physical properties below the surface. This will enable deeper and smaller deposits to be detected.

The researchers plan to make further advances in aerial exploration: for example, they are working on multisensor drones that combine different measuring sensors, allowing more mineralogical information to be obtained simultaneously than was the case before. The project partners will also use superconducting sensors (so-called SQUIDs) which are considered to be the most sensitive magnetic detectors in the field of geoscience. Real-time transmission of geophysical data is yet another important consideration within the project, aimed at facilitating the exploration of raw materials.

### **Reference areas: North, Central and South**

Up to now, there have been no EU-wide opportunities for testing new technologies under realistic conditions or for evaluating their performance in comparison to traditional methods. Three European reference areas are to be set up in intensive dialogue with the local communities and public decision makers as well as in cooperation with regional authorities and mining companies. The various technologies will be deployed by means of helicopters, aeroplanes and drones. At the end of the project, the reference areas are to remain accessible to the global industry for the long term so that the new exploration technologies can be certified. A procedure for this is to be set up within the framework of INFACT.

The three areas selected are characterized by a current or historic record of mining activity:

- North Region: Sakatti is an extensively mapped but as yet unexploited area with deposits of the copper-nickel-platinum group of elements in the far north of Finland, approximately 150 kilometers above the Arctic Circle (operator: Anglo American).
- Central Region: In the centre of this area lies the small town of Geyer in the Ore Mountains [Erzgebirge]. It is located approximately 110 kilometers south of Leipzig in eastern Germany and has a long mining tradition. There are known deposits of tin, zinc, tungsten, molybdenum, copper, iron, silver and indium.
- South Region: This reference area in Spain comprises two deposits. Cobre Las Cruces is an opencast copper mine (operator: First Quantum Minerals) approximately 20 kilometers northwest of Seville. Minas de Ríotinto is an ancient, well-known opencast polymetallic mine (operator: Atalaya Mining) located in Huelva province, approximately 65 kilometers northwest of Seville.

Building on dialogue with the local populations and exploring new technologies, the Reform pillar seeks to develop a roadmap for modern exploration, including action guidelines for politicians aimed at making Europe attractive to mining and investors.

### **The INFACT partners**

Agencia de Innovation y Desarrollo (IDEA), Anglo American Sakatti Oy, Arhus Geo, Atalaya Mining, ATClave, Cobre las Cruces, Dialogik, European Federation of Geologists (EFG), Fraunhofer IAO, GALSA (Geotech), Geognosia, Helmholtz Institute Freiberg for Resource Technology (HIF) at Helmholtz-Zentrum Dresden-Rossendorf (coordinator), Oulu Mining School, SRK Exploration Services, Supracon, SYKE, University of Eastern Finland.

**[www.hzdr.de/infact](http://www.hzdr.de/infact)**

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**Caption:** Innovative technologies for the non-invasive exploration of raw materials from the air – one of the aims of the new EU project INFACT. Photo: HZDR

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The **Helmholtz Institute Freiberg for Resource Technology (HIF)** pursues the objective of developing innovative technologies for the economy so that mineral and metalliferous raw materials can be made available and used more efficiently and recycled in an environmentally friendly manner. The HIF was founded in 2011, belongs to Helmholtz-Zentrum Dresden-Rossendorf and is cooperating closely with TU Bergakademie Freiberg.