



August 2022 – SEMACRET Project Launch

**SEMACRET aims to promote sustainable exploration for green transition Critical Raw Materials in the EU securing the continued supply for its industries.**

**Critical Raw Materials** are fundamental to feed the EU industrial value chains and strategic sectors and the green energy transition. Currently, supply of primary Critical Raw Materials is <3% for many important commodities which leaves the EU in a vulnerable position depending mostly on imports from third countries. The EU aims to boost the internal production of Critical Raw Materials to secure its autonomy and ensure responsible sourcing of these raw materials.

## **Orthomagmatic mineral systems: a source of metals from the mantle to the crust**

**Critical raw materials are hosted in different mineral systems.** The orthomagmatic mineral systems, the research target in this project, host important green (critical) raw materials including Nickel (Ni), Copper (Cu), Cobalt (Co), Vanadium (V), Titanium (Ti), Chromium (Cr) and platinum-group metals (PGM), in mantle derived magmas that reach the continental crust.

**There are currently only 2 mines in operation producing these metals in the EU,** though there is potential for additional mining in several EU countries.

## **Research focus**

We start with ore deposit genesis to refine ore deposit models with the **Mineral Systems Approach (MSA) concept**, which is fundamental for exploration. The full factors of the MSA will be translated to exploration criteria, which is a challenge for regional exploration targeting. These exploration criteria



will be converted to multiple data layers followed by prospectivity modelling, and different sub deposit types will be modelled separately, as their ore formation processes are different. In a local scale, different methods (e.g., geology, geophysics, geochemistry, artificial intelligence) will be integrated together as solutions for vectoring towards high potential ore bodies, thus enabling a more efficient and accurate evaluation of mineral resources. We will also develop means to promote social awareness of (critical) raw materials and their responsible sourcing through collaboration of geosciences, social sciences and artificial intelligence. In addition, the mineral exploration and production potential of relevant raw materials will be investigated and harmonized with UNFC (United Nations Framework Classification for Resources) and UNRMS (United Nations Resource Management Systems), the coordinator Prof. Shenghong Yang summarized the research focus. The outputs of the project are socially and environmentally sustainable means of finding (=exploration) orthomagmatic Critical Raw Materials.

## Locations and team?

Our research will be conducted at five reference sites in **Finland, Portugal, Poland and the Czech Republic** representing different geological, social and environmental conditions. Our team gathers specialists from the academia and industry, representing a wide range of research fields, such as geology, geophysics, geochemistry, mathematical modelling, resource modelling, artificial intelligence, geoinformatics and social sciences (e.g., social geography, environmental policy).

**The project is coordinated by Oulu Mining School in the University of Oulu**, and the consortium is composed of 16 parties from 12 different countries including EU, South Africa, and UK. The EU and UKRI invest 6.67 M and 0.83 M Euro respectively, with a total budget of 7.5 M euros for the project, which will be implemented from 1 June 2022 to 31 May 2025.

## SEMCRET Consortium:

Oulun Yliopisto (Finland)

Cardiff University (UK)





Instituto Dom Luiz (Portugal)

Faculdade de Ciências da Universidade de Lisboa (Portugal)

Ceska Geologicka Sluzba (Czech Republic)

Panstwowy Instytut Geologiczny (Poland)

Center National De La Recherche Scientifique (France)

Technische Universitaet Wien (Austria)

Helmholtz–Zentrum Dresden–Rossendorf (Germany)

Supracon Aktiengesellschaft (Germany)

Aarhus Geophysics APS (Denmark)

Ita-Suomen Yliopisto (Finland)

Universita Degli Studi Di Milano (Italy)

New Resolution Geophysics Europa (Spain)

Imperial College of Science Technology and Medicine (UK)

University of the Free State (South Africa)

Magnus Minerals Oy (Finland)

**#SEMCRET #SustainableExplorationEU #CriticalRawMaterialsEU**

Follow the project on [www.semcret.com](http://www.semcret.com)



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