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New Exploration Tools for European Pegmatite Green-Tech Resources feeding the energy transition

DISCOVER

PEGMATITES

IN EUROPE

ETPSMR - *Raw Materials for the Clean Energy Transition* – 17.11.2020 – Wolfgang Reimer, GKZ Freiberg



Funded by the Horizon 2020
Framework Programme of the
European Union GAP 869274

The image features the European Union flag, which is a blue field with twelve yellow stars arranged in a circle. The flag is shown waving on a flagpole against a blurred background of other flags and buildings. The text is overlaid on the right side of the image.

BACKGROUND: LATEST DISCERNMENTS FROM THE EC

With its latest Communication to the European Parliament on “Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability”, the European Commission recognizes that the “Access to resources is a strategic security question for Europe’s ambition to deliver the Green Deal”.

The new industrial strategy for Europe proposes to reinforce Europe’s open strategic autonomy, warning that Europe’s transition to climate neutrality could replace today’s reliance on fossil fuels with one on raw materials, many of which we source from abroad and for which global competition is becoming more fierce.

The EU’s open strategic autonomy in these sectors will therefore need to continue to be anchored in diversified and undistorted access to global markets for raw materials”.

OUR RESPONSE: MORE EXPLORATION



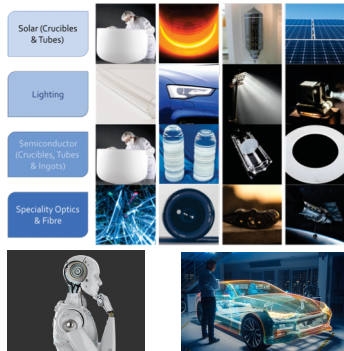
THE SOURCE

Many of the raw materials for green energy production can be sourced from a rock type known as pegmatite. This is an igneous rock, formed underground, from magmas that are enriched in fluids and often in rare metals. They tend to crystallize with interlocking crystals usually larger than 2.5 cm in size. Most pegmatites are found in sheets of rock, like dikes and veins, often near large masses of igneous rocks called batholiths. Granitic and syenitic pegmatite deposits are the chief source of commercial feldspar, high-purity quartz, sheet mica, and beryllium, tantalum–niobium, and lithium minerals. Some pegmatites are mined for gem minerals, mica, molybdenite, cassiterite, tungsten minerals, rare-earth minerals. Economic lode concentrations generally may occur in unzoned or in zoned pegmatite bodies (i.e., those in which two or more different rock types are systematically disposed).

Pegmatites we focus on are of LCT and NYF type that may show economic grades of critical materials. They are small but occur in large numbers, allowing exploitation with little investment, but hard to find. Efficient exploration is the key to their domestic mining



FEEDING THE ENERGY TRANSITION – PEGMATITE BOUND COMMODITIES FUELING OPTICS, FIBRES, SEMICONDUCTOR, SOLAR, BATTERY, ADVANCES TECHNOLOGIES



OVERALL AIM AND OBJECTIVE

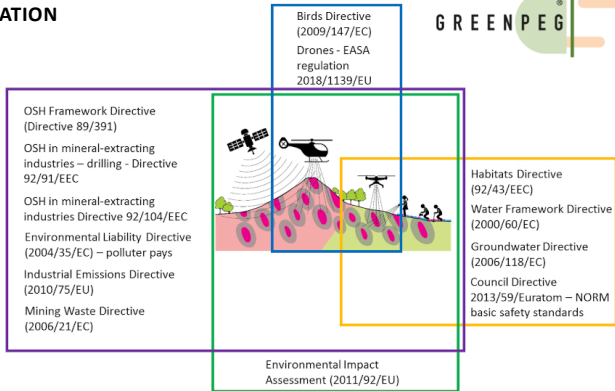
- better investor approach and promotion of European deposits
- Equipping potential users (industry, surveys) with GREENPEG inventions in order to improving access to, and quality of, geological and geophysical data
- Reduce costs in fulfilling the legal requirements regarding EIA.
- Reduce drilling and sampling by trenching and other measures with direct impact on nature.
- Reduce noise and dust emissions, and reduce operational costs.

The Project develops **two innovative, competitive toolsets at TRL7 for the exploration of buried LCT and NYF pegmatites, including three new instrumental techniques and devices (piezoelectric sensor, helicopter-complementary nose stinger magnetometer, drone-borne hyperspectral imaging system) and two new datasets for prospect scale (<50 km²) and district scale (50-500 km²) exploration.**



RESPONSIBLE EXPLORATION

GREENPEG work plan incorporates a careful analysis of environmental, social and safety impacts within the implementation of the new technological approach, assessing these aspects through the entire life cycle of exploration techniques being developed and sharing best practices in these spheres between partners, industry bodies and international research projects.





APPROACH – We light up the darkness

GREENPEG's approach is based on a well-designed strategy based on the specific characteristics of the target pegmatite ores:

- 1) Low contrast of petrophysical properties compared with their wall rocks;
- 2) High mineralogical variability in different pegmatite types;
- 3) Relatively small ore body volumes (0.01 to 5 million m³) and lateral extent;
- 4) The occurrence of pegmatites in clusters (fields);
- 5) The existence of Li, B, F, Cs, Be, Ta and Sn halos (10 to 100 m scale) around pegmatite bodies.

Field-testing approaches will be divided into three investigation scales: (1) province scale (500 - 10000 km²); (2) district scale (50 - 500 km²); and (3) prospect scale (<50 km²). The methodology testing and optimization is being performed in three representative European demonstration sites: in Wolfsberg, Austria; south Leinster, Ireland; and Tysfjord, Norway.

DEMONSTRATION SITES



Tyskfjord, Norway



Wolfsberg, Austria



Leinster, Ireland



MESSAGES



1. The „Call of duty“ of the Commission to more explore and exploit European domestic resources is wishful thinking if not considering that mining is for money and private entrepreneurship follows optimal conditions to invest. Or: we recognise a raising responsibility of the state to carry out exploration as part of the countries surveying and/or as a public business in exploiting the mineral wealth
2. In the same way, the state has largely withdrawn from geological exploration and points to the responsibility of industry in terms of securing raw materials
3. Since we cannot force the industry to mine in Europe, the state in particular is called upon to either optimize the conditions or generate data in the cost-intensive phase of the preliminary exploration. This is primarily the task of the geological services. In this regard the main target customers of GREENPEG inventions are → Industry and Geological Surveys endowing them with a set of powerful tools and interpretation methods to substantially increase their portfolio, stimulate entrepreneurship, establishing more resource inventories, broaden our knowledge bases of industrial minerals and critical raw materials.
4. GREENPEG results enable emissions to be reduced and thus requirements for fulfilling the legal requirements of the EIA to be met better, which in turn can lead to more acceptance among those affected.
5. Indirectly, this will promote professional careers and education in mining. This in turn will help feed the resource base for green technology “Made in Europe”.

CONSORTIUM

Potential User Group, represented by:

- Mining operators / services providers (FELMICA, BLI, ECM) + Geological survey (NGU)



industrial and academic knowhow for the technological developments and independent fact-based validation of GREENPEG inventions + EISA:

- Technical consultancy (TERRA, IFU,) + Academic research institutions (UIO, UCD, UPV, UNEXE, UPORTO)

Market analysis for upscaling and market implementation

- Business consultant (PNO), industry led cluster (GKZ)

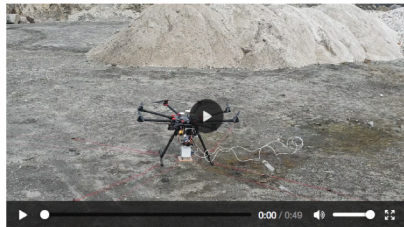
Exploitation management and clustering from different project activities (CSA, R&I)

- Dissemination and communication (GKZ)

Coordination / administrative background (UIO)



And lift off – drone borne sensors at work



GREENPEG „Fan-Shirt“ on request





CONTACT

Welcome to the GREENPEG website!

Both of us, Carla and Wolfgang, are available to answer your questions about the project and are curious about your opinion on the goals and aim of GREENPEG. Connect with us! Become a Fellow of GREENPEG and subscribe to our newsletter and public events. If we have more in common, let us know about your project and activities for clustering opportunities! In our Media Corner, find selected information about GREENPEG, images and recordings.

CONTACT

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