FRAME
FORECASTING AND ASSESSING EUROPE'S STRATEGIC RAW MATERIALS NEEDS

FRAME

(Forecasting and Assessing Europe's Strategic Raw Material Needs)

Knowledge Increments in Mineral Intelligence

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+ the FRAME Consortium

Brussels, January 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731166

GeoERA RAW MATERIALS

GeoERA RM

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EUROLITHOS European Ornamental Stone Resources

MINDeSEA
Seabed Mineral Deposits in European Seas: Metallogeny and Geological Potential for Strategic and Critical Raw Materials

What is

GeoERA RAW MATERIALS

MINTELL 4EU

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https://geoera.eu/themes/raw-materials/

- Works on mutual understanding
- Vocabularies, test and show cases, incl. UNFC…
- Delivers harmonised information
- Cartographies and thematic maps …
- Accummulates expertise of regional knowledge & information to a quality controlled / cohered resource database
- Repositories, Minerals Inventory, e-Minerals Yearbook…
- Assists in identifying high potential areas for responsible sourcing and supply within Europe.

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KNOWLEDGE BASE

https://geoera.eu/themes/raw-materials/

GeoERA RAW Materials Products
- first of their kind -

- 1st combined database (MIN4EU) with data on mineral occurrences and mines, production, trade, resources and reserves (MINTELL4EU);
- 1st set of national atlases on ornamental stones (EUROLITHOS);
- 1st compilation (aggregated form) of the mineral occurrences, geology and potential for REE, lithium, cobalt and graphite and for the first time it was possible to make clusters of deposits and metallogenetic (FRAME)
- 1st pan-European maps on marine deposits (MINDeSEA);
- 1st pan-European predictivety maps on marine and landlocked CRM (FRAME and MINDeSEA)

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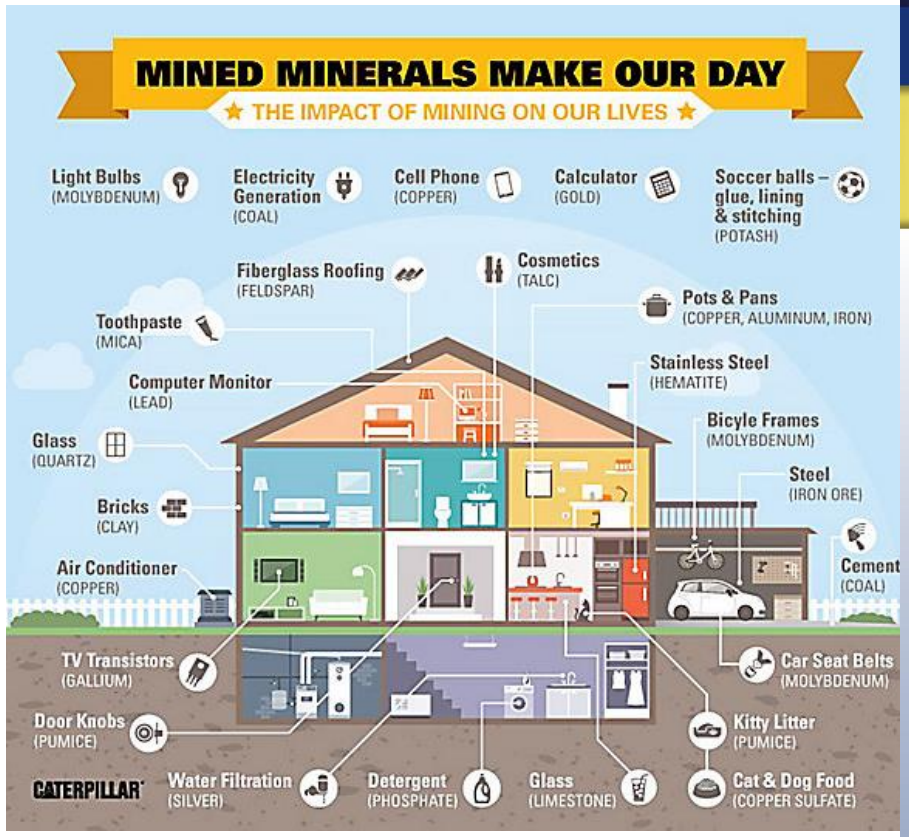
FOUNDATIONS

https://notyourgrandfathersmining.ca/minerals-in-your-life



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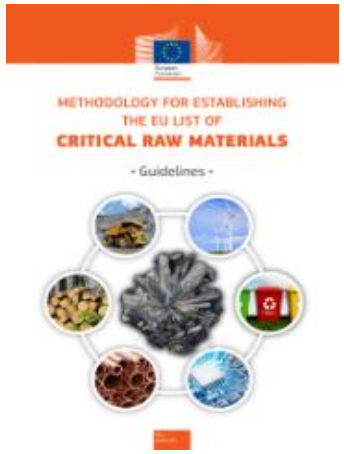
FOUNDATIONS

Circular Economy

Battery Initiative

Critical Raw Materials List



Conflict Minerals Regulation

2021

The EU Raw Materials Initiative
- Critical Raw Materials for the EU -

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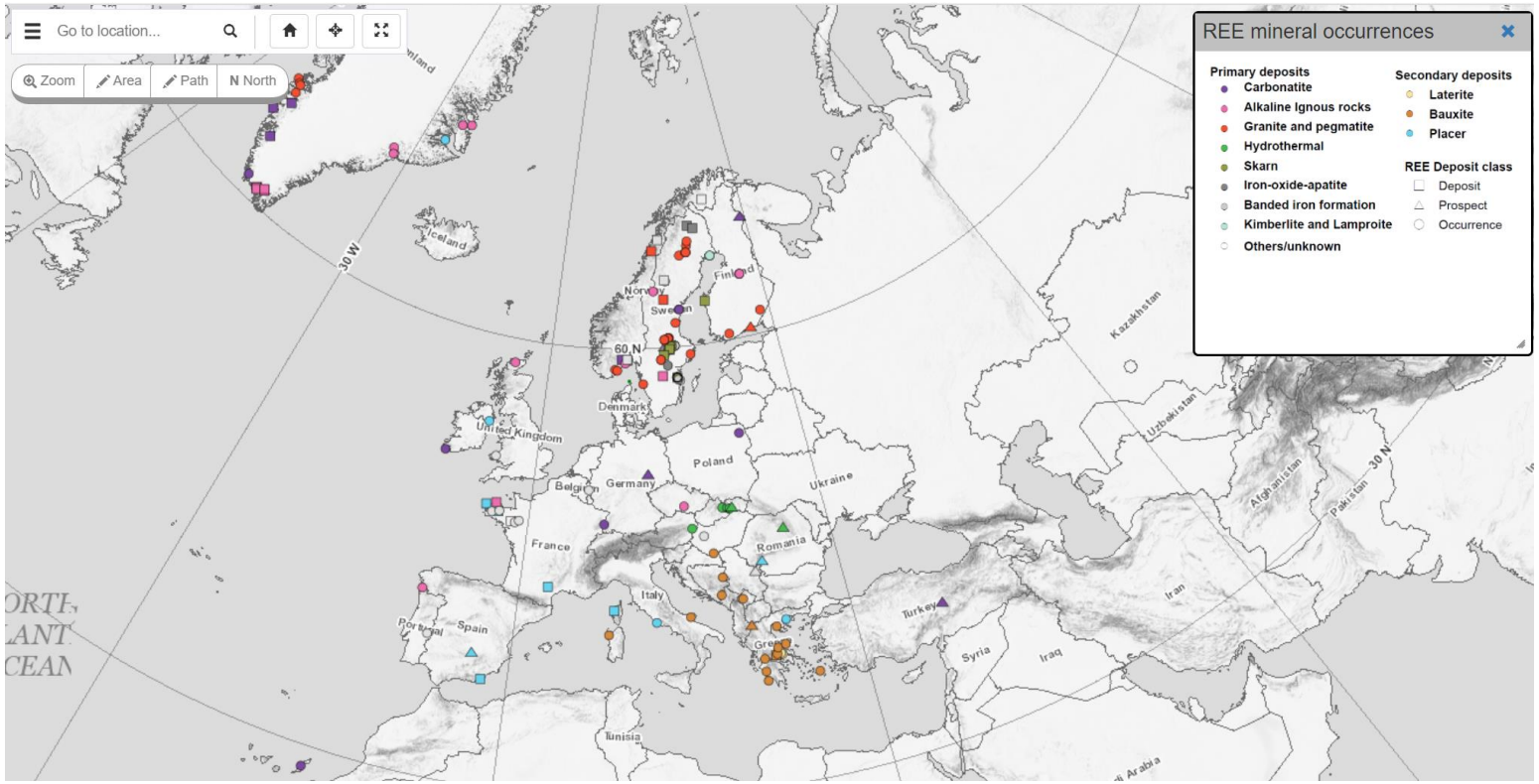
IMPACTS Min. Int.



FRAME updated and completed, ProMine, Minerals4EU (M4EU), EURARE and European Geological Data Infrastructure (EGDI) datasets on rare earth elements, graphite, cobalt, lithium, phosphor, niobium and tantalum

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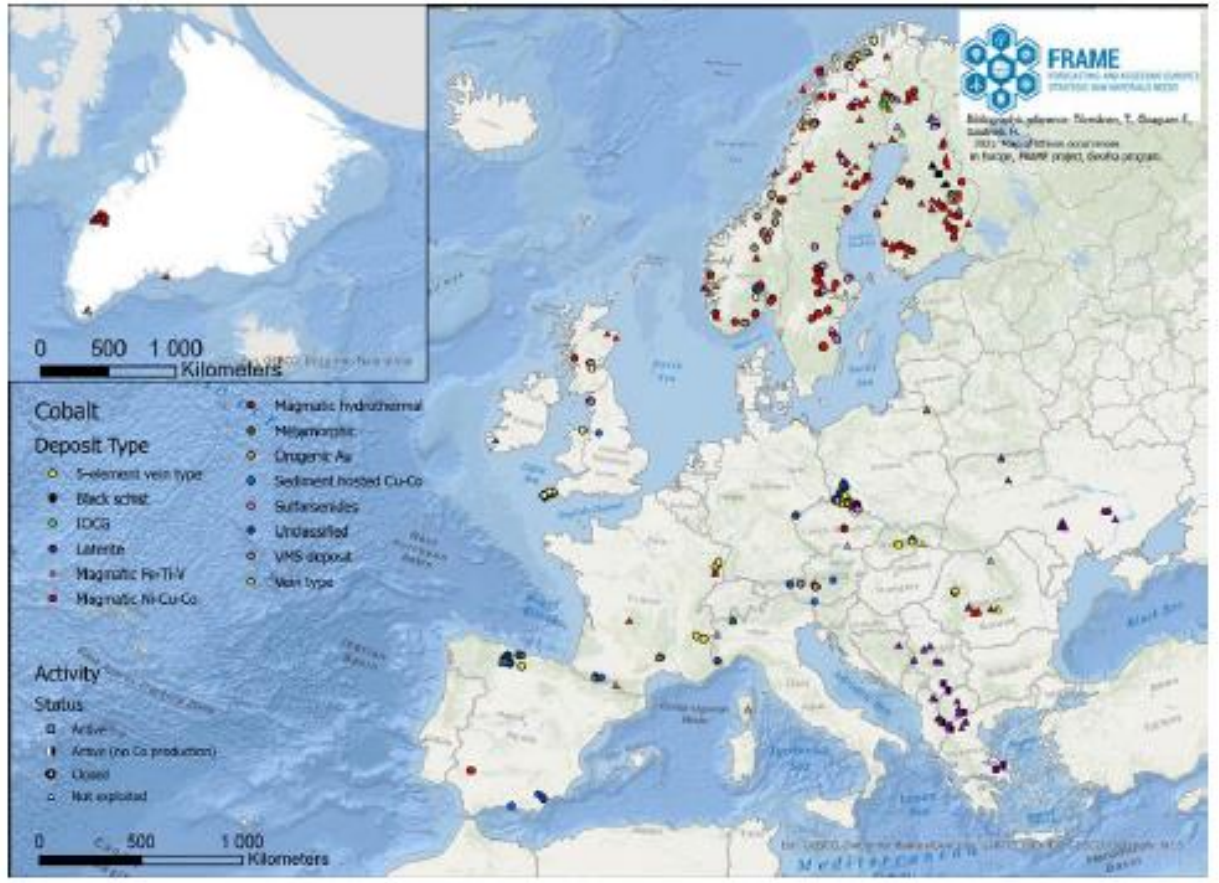
IMPACTS Min. Int.

Close cooperation with non-consortium members in the Mineral Resources Expert Group of EuroGeoSurveys to supply extra data

> 60%



MREG
MINERAL RESOURCES EXPERT GROUP
EuroGeoSurveys

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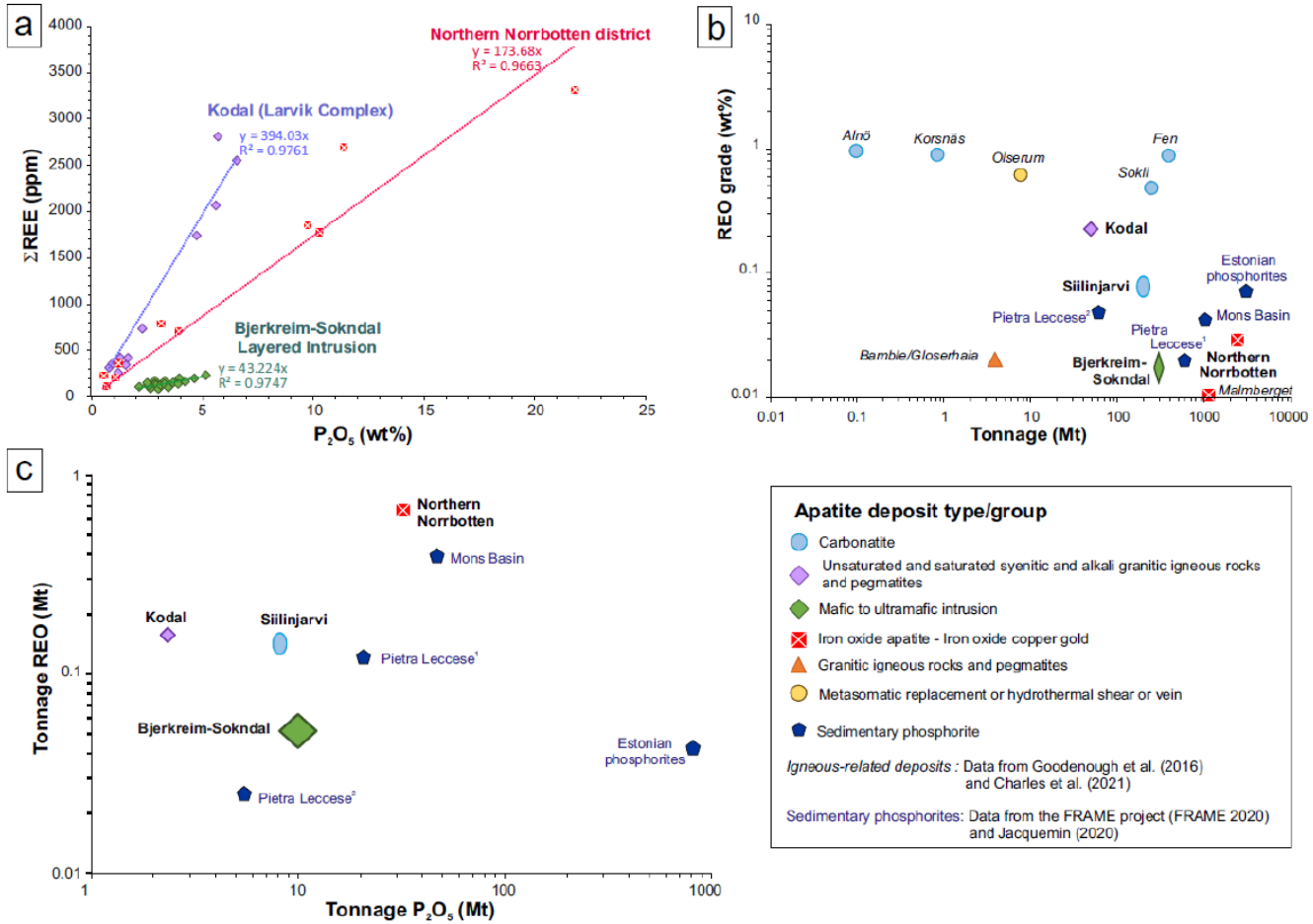
IMPACTS Min. Int.

- Acquisition of new mineralogical and geochemical data on selected phosphate deposits and occurrences;
- Chemistry of apatite + igneous P deposits;
- + procedure to prepare samples and analyze phosphate deposits to provide internally consistent geochemical data at a European level



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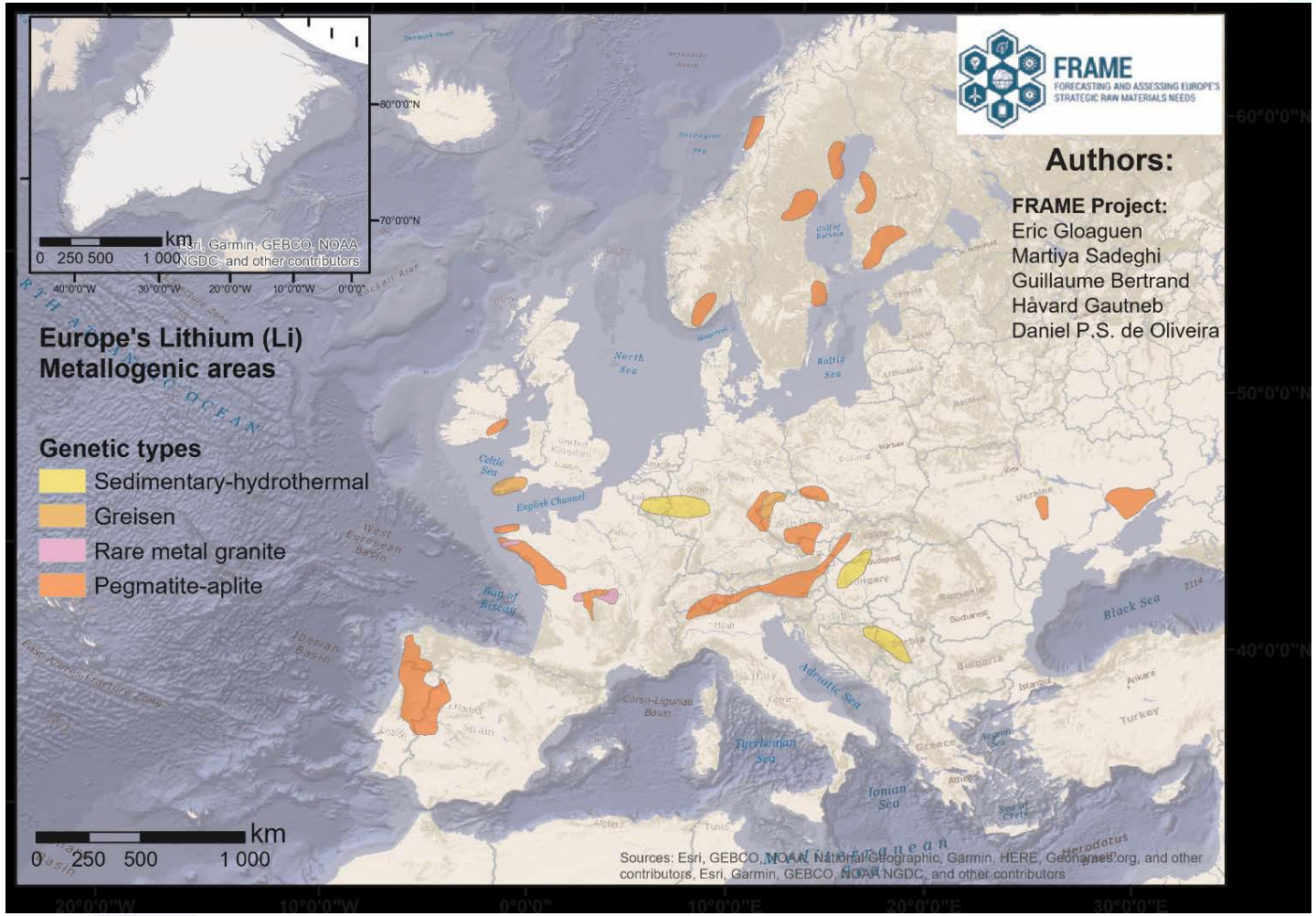
IMPACTS Min. Sc.



Establishment of metallogenic areas for several critical elements in Europe

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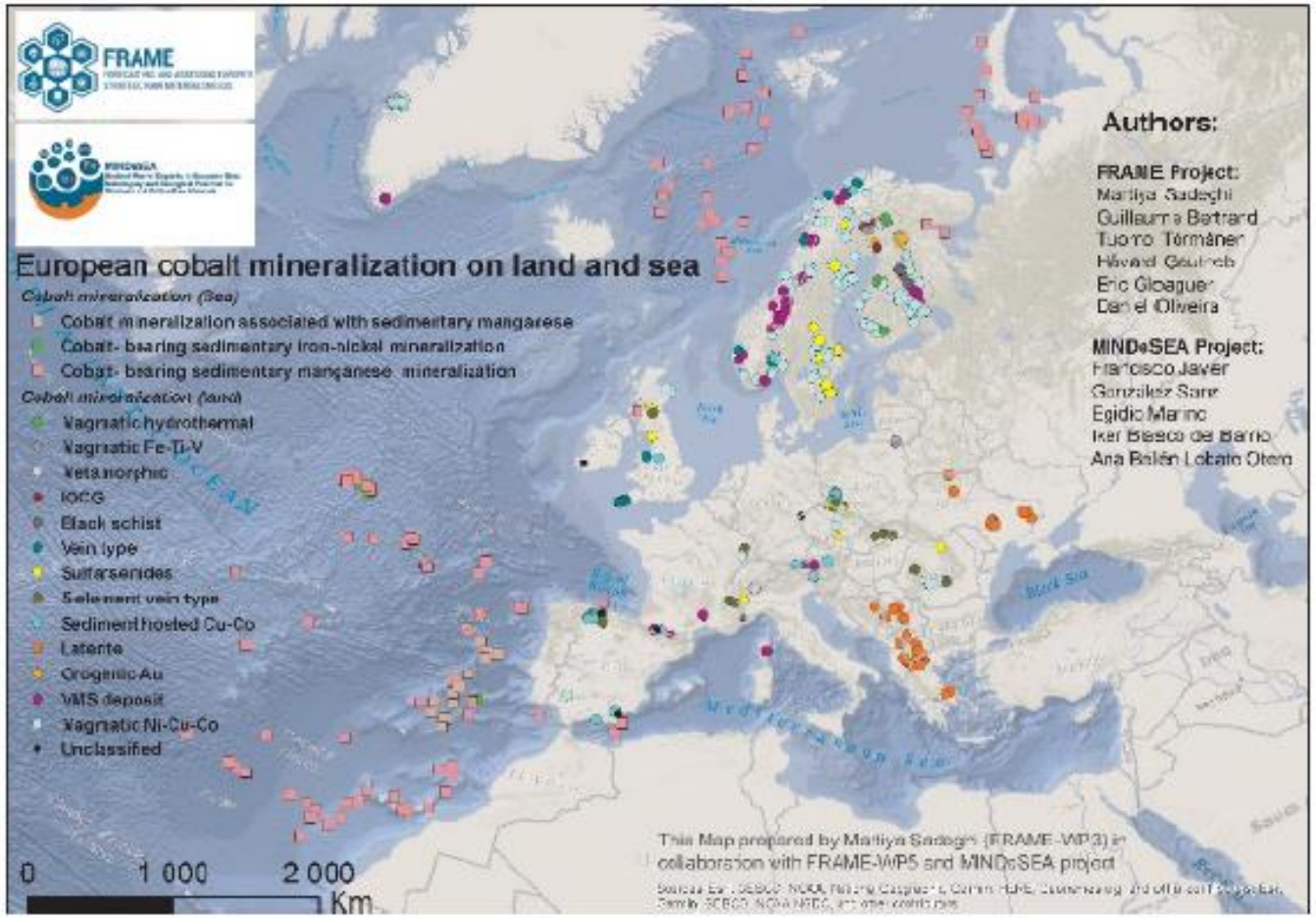
IMPACTS Min. Int.



- Bilateral collaboration between FRAME and MINDeSEA projects - land and sea
- + Production of land-Sea maps containing phosphate, cobalt

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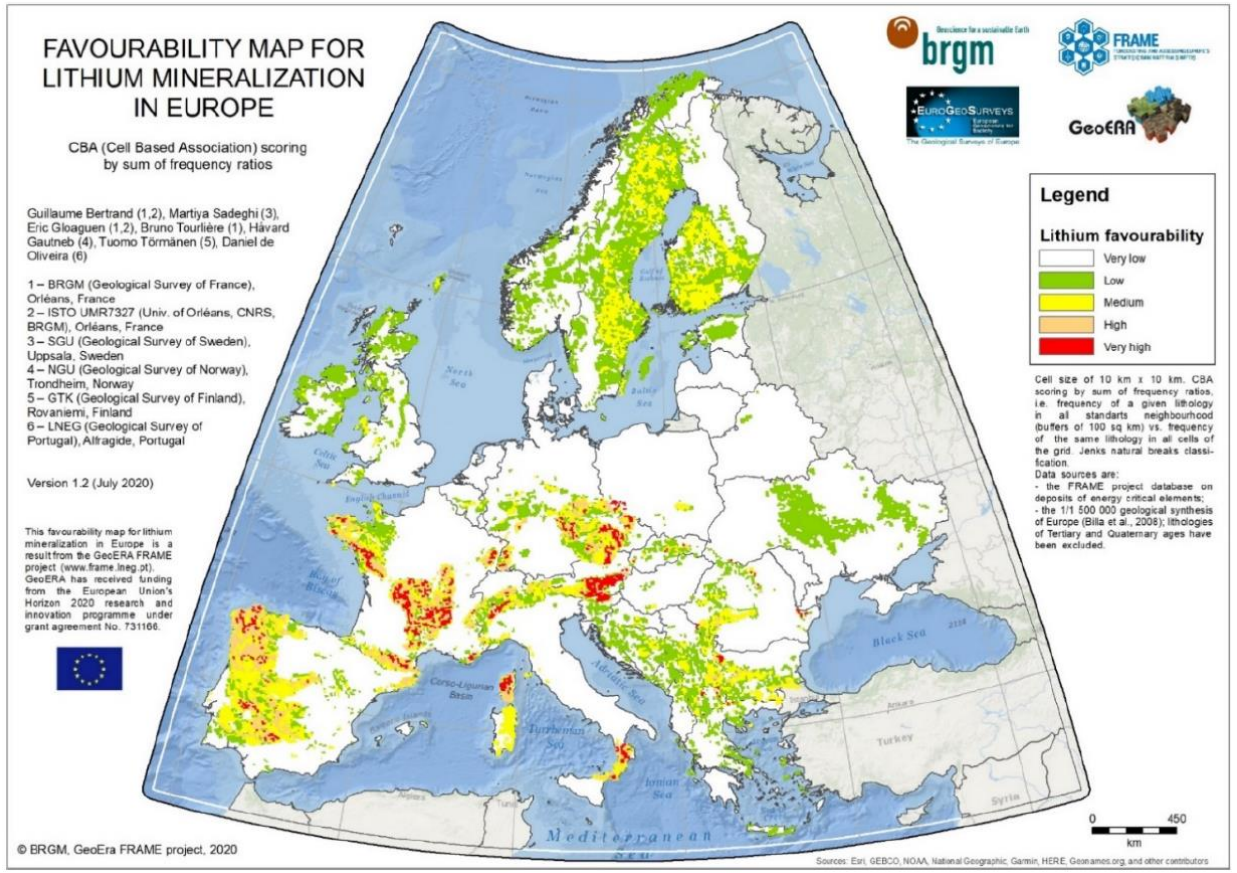
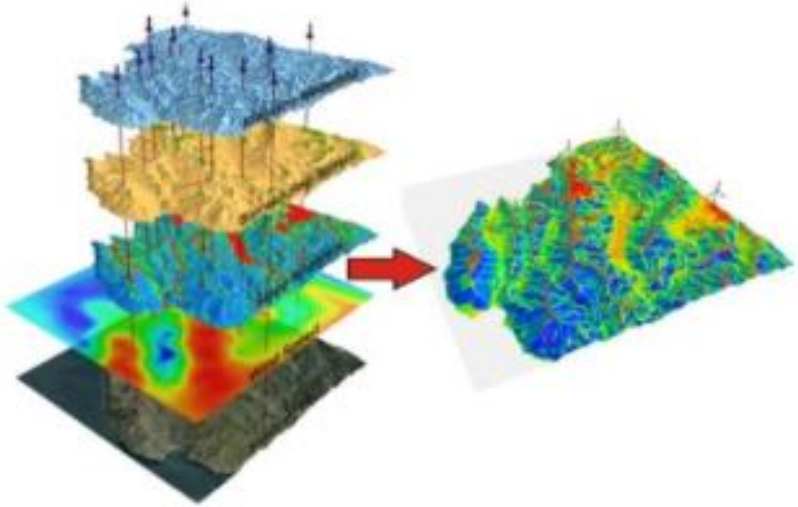


Predictability mapping using both Cell Based Association and Fuzzy Weight of Evidence methods



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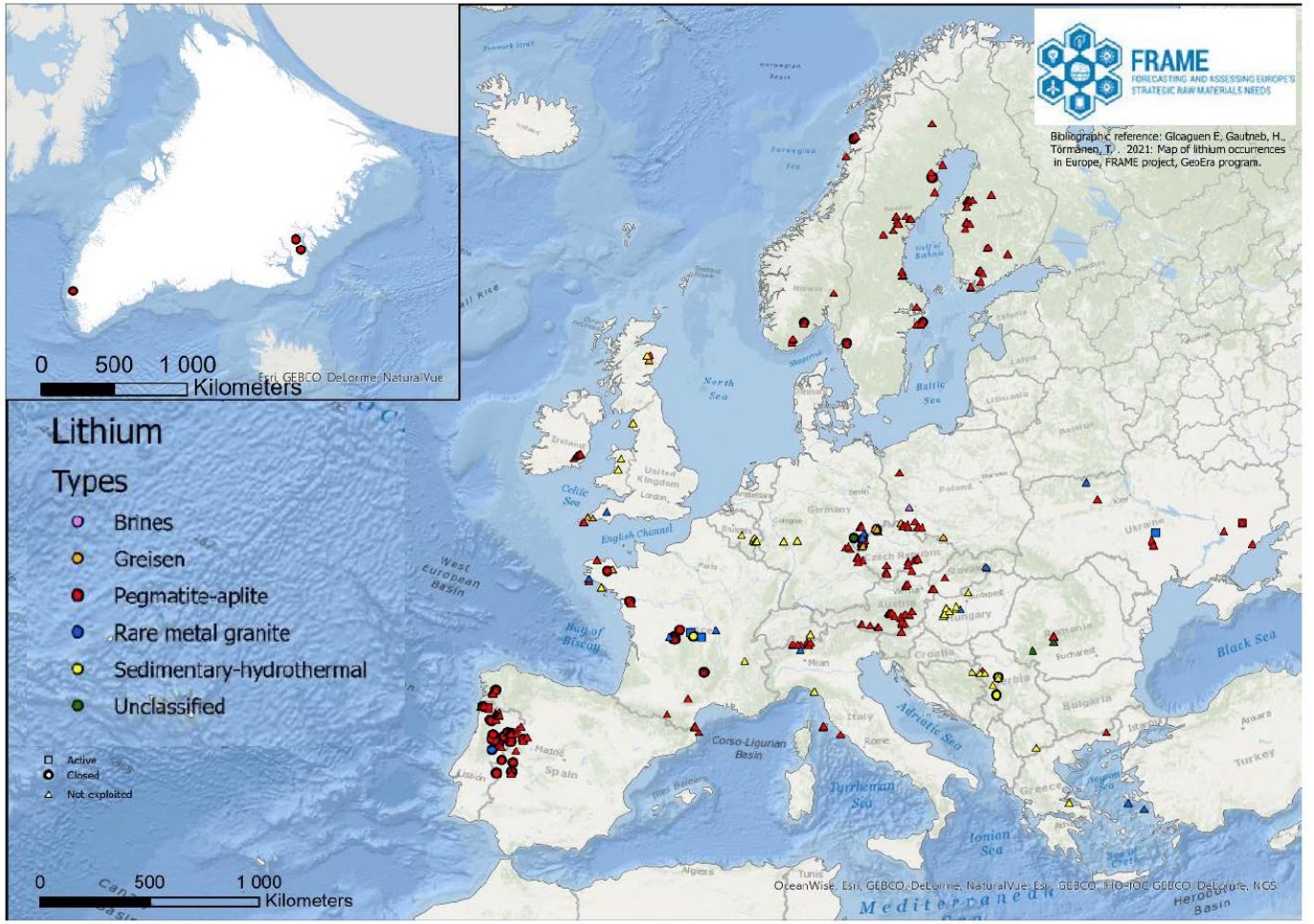
IMPACTS Min. int.

- Compilation of new and more complete data - lithium, cobalt and graphite;
- Classification of the Li-type deposits into brine, hard-rock, magmatic Li, Magmatic-hydrothermal Li and sedimentary-hydrothermal Li;
- Separation of the European graphite deposits are of the so-called flake and amorphous types;
- The Frame project, for the first time, compiled in an aggregated form, the occurrences, geology and potential for Lithium Cobalt and Graphite and for the first time it was possible to make clusters of deposits and metallogenetic provinces for most of Europe



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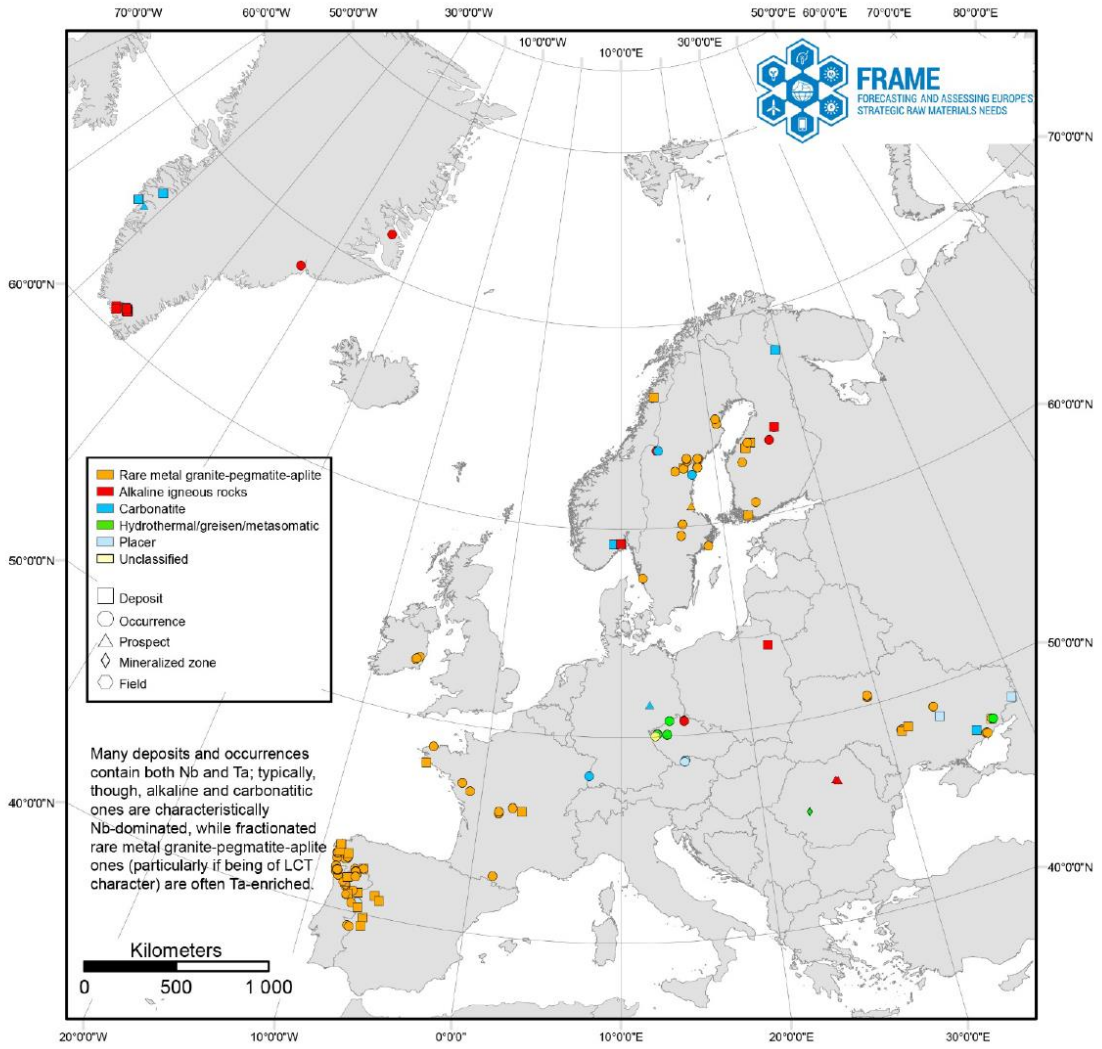

- FRAME carried out a looked at the "Conflict Minerals", namely Nb-Ta, ahead of the EU legislation comprehensive characterization of the European and African Nb-Ta deposits;
- New petrographic and quantitative mineral chemical analyses
- - identification of different Nb-Ta minerals - Ta-enriched cassiterite, columbite-(Fe), columbite-(Mn), tantalite-(Fe), tantalite-(Mn), tapiolite (*s.l.*), wodginite, ixiolite, microlite minerals, Nb-bearing rutile, Ta-Nb-bearing rutile and Ta-rich rutile ("strüverite")

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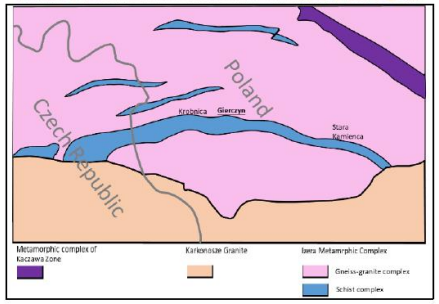
CRM potential collected from 160 mine sites and specific case studies were undertaken in a dozen old mines; e.g., St. Leopold historical mine in Gierczyn (Poland)



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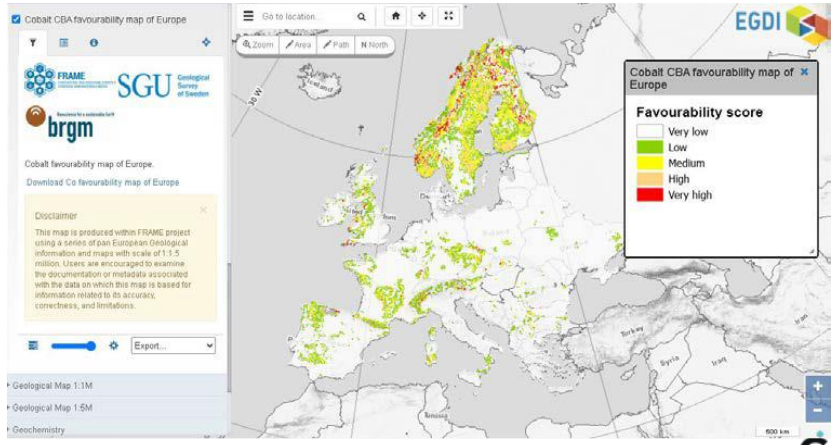
IMPACTS in EU DB

FRAME worked together with the other Raw Materials projects, - A strong network was established among the FRAME, MINDeSEA, Mintell4EU and GIP-P projects to facilitate on-going support);

- **Together with GIP-P and MINTELL4EU projects implemented important issues in a global context of the overall system of information, including:**
- **FRAME integrated results through the EGDI Portal (metadata, structured and unstructured data (EU-MKDB architecture)**
- **FRAME was instrumental in the improvement of the present harvesting system and its quality assurance**

FRAME augmented and updated pan-European data sets, namely

> 135 new docs added



EGDI

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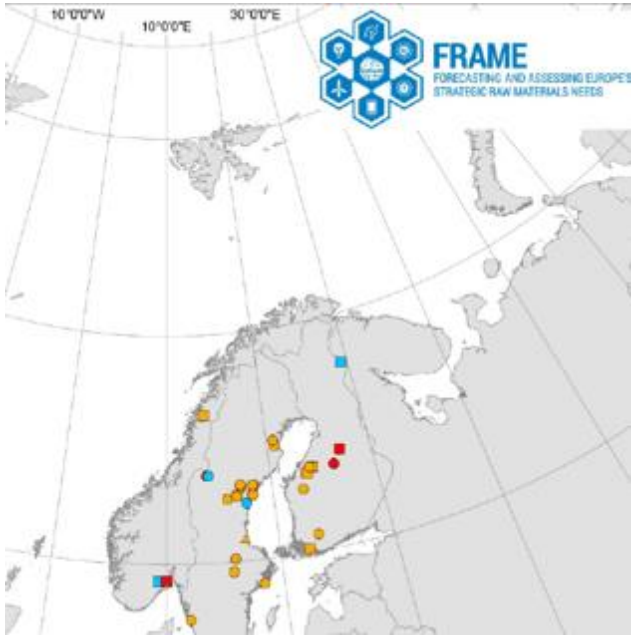
TRANSITION

Point Data



Area Data

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GEN IMPACT

FRAME made a significant attempt to further unlock the mineral potential for a renewed raw materials sector in Europe as a driver for domestic raw material value chains

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Thank you for listening

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INTRODUCTION

Coordinating partner: Laboratório Nacional de Energia e Geologia, I. P. - LNEG

Federal Institute for Geosciences and Natural Resources – BGR
Bureau de Recherches Géologiques et Minières – BRGM
Czech Geological Survey – CGS
Geological Survey of Estonia – GSE
Geological Survey Sweden – SGU
Geological Survey Ireland – GSI
Geological Survey of Finland – GTK
Geological Survey of Croatia – HGI-CGS
Hellenic Survey of Geology & Mineral Exploration – HSGME
Instituto Geológico y Minero de España – IGME
Mining and Geological Survey of Hungary – MBFSZ
Geological Survey of Norway – NGU
Polish Geological Institute – PGI-NRI
Royal Belgian Institute of Natural Sciences – RBINS
State Informational Geological Fund of Ukraine – GeoInform-GIU
Institutul Geologic al Romaniei – IGR
Geološki Zavod Slovenije – GZS
Istituto Superiore per la Protezione e la Ricerca Ambientale – ISPRA
Geological Survey of Austria - GBA

20 Partners

The FRAME Team

19 partners @ Mid-Term Review Meeting, 10/02/2020

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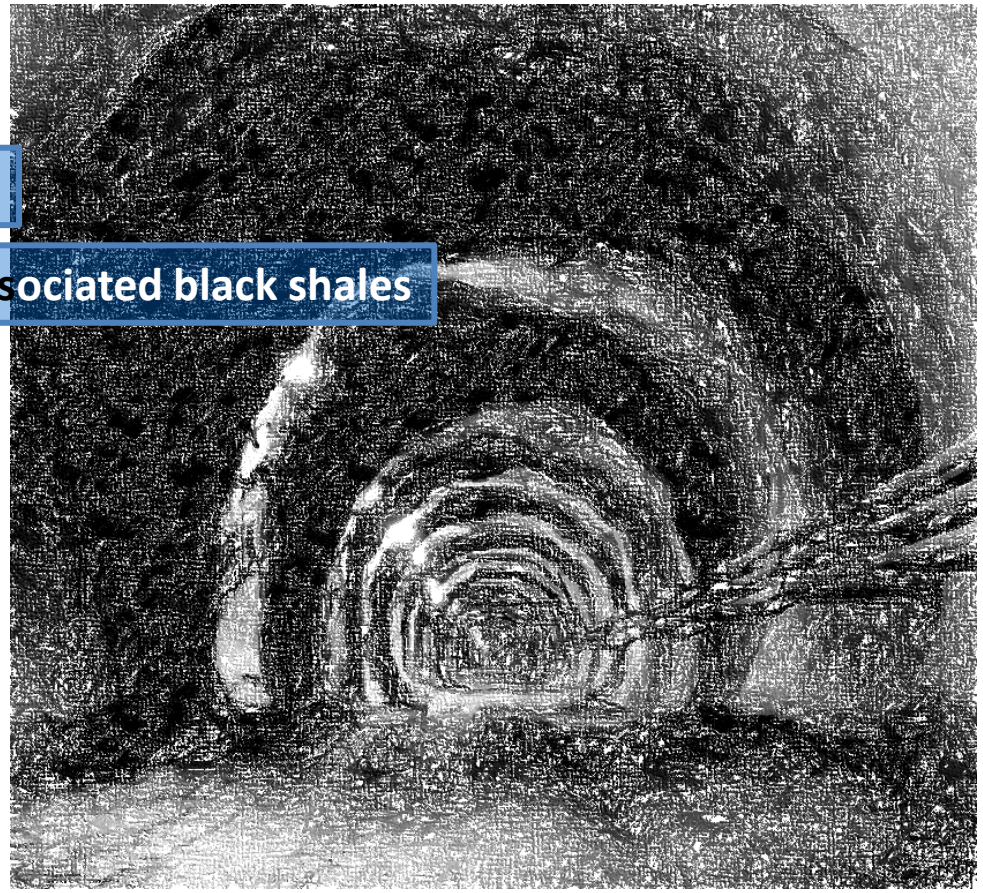
INTRODUCTION

Work Packages

- **WP 1 – Project Coordination**
- **WP 2 – Communication, Dissemination and Exploitation**
- **WP 3 – Critical and Strategic Raw Materials Map of Europe**
- **WP 4 – Critical Raw Materials in phosphate deposits, and associated black shales**
- **WP 5 – Energy Critical Elements**
- **WP 6 – Conflict free Nb-Ta for the EU**
- **WP 7 – Historical mining sites revisited**
- **WP 8 – Link to Information Platform**



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