

**FRAME**FORECASTING AND ASSESSING EUROPE'S
STRATEGIC RAW MATERIALS NEEDS

FRAME

Forecasting and Assessing Europe's Strategic Raw Material Needs

Daniel de OLIVEIRA, LNEG | FRAME Project Lead
ETPSMR event, 17 November 2020



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



[Objectives](#)
[Project Philosophy](#)
[Work Packages](#)
[Partners](#)
[News/Events](#)
[Media Kit](#)
[Photogallery](#)
[Members Area](#)



20 partners

8 work packages

- CRM & SRM
- Phosphates
- Energy Critical Elements
- Responsible sourcing (Nb-Ta)
- Abandoned mines (selected case studies)

<http://www.frame.lneg.pt/>

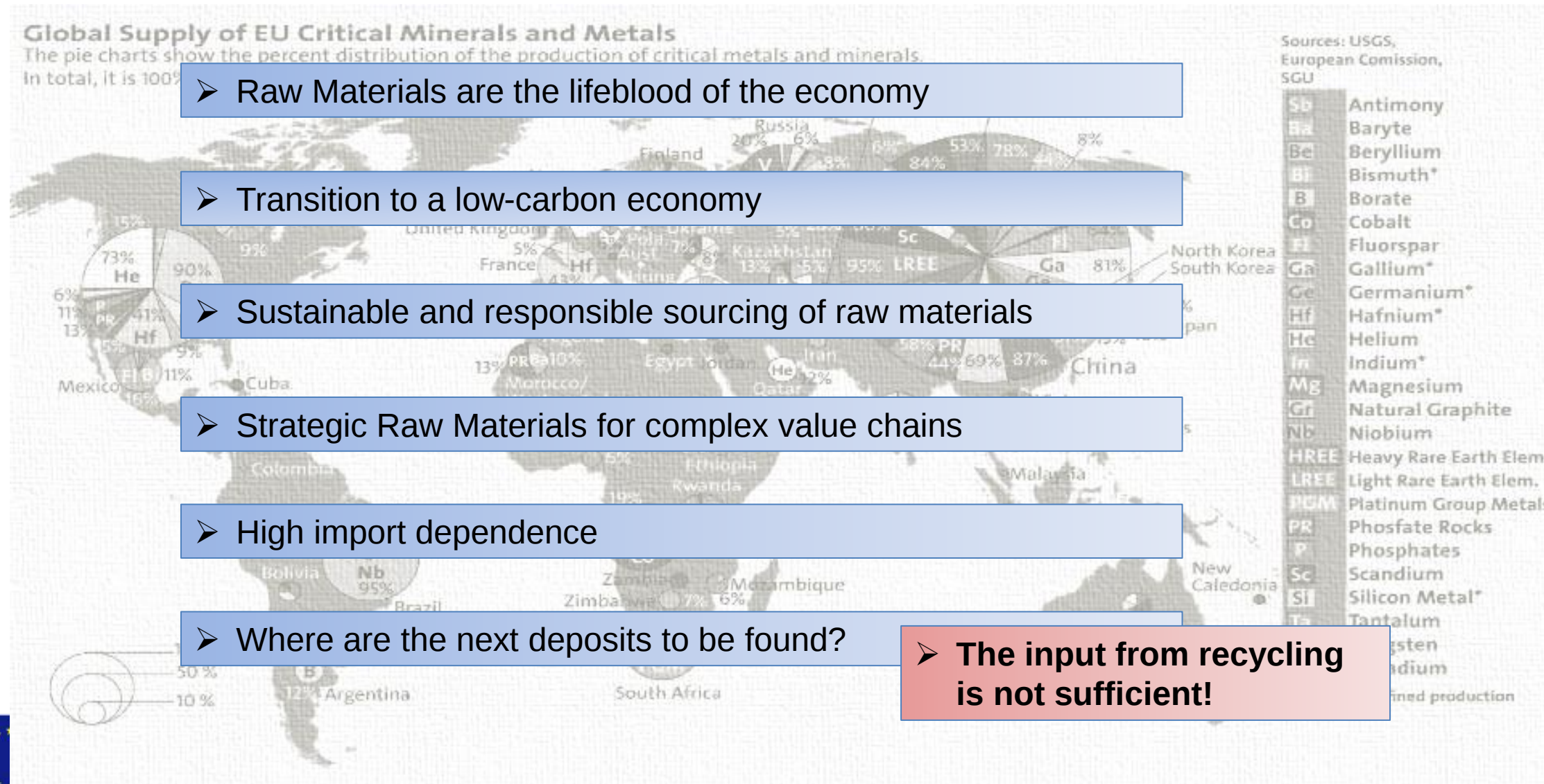
Subscribe our newsletter



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



Challenges we face today



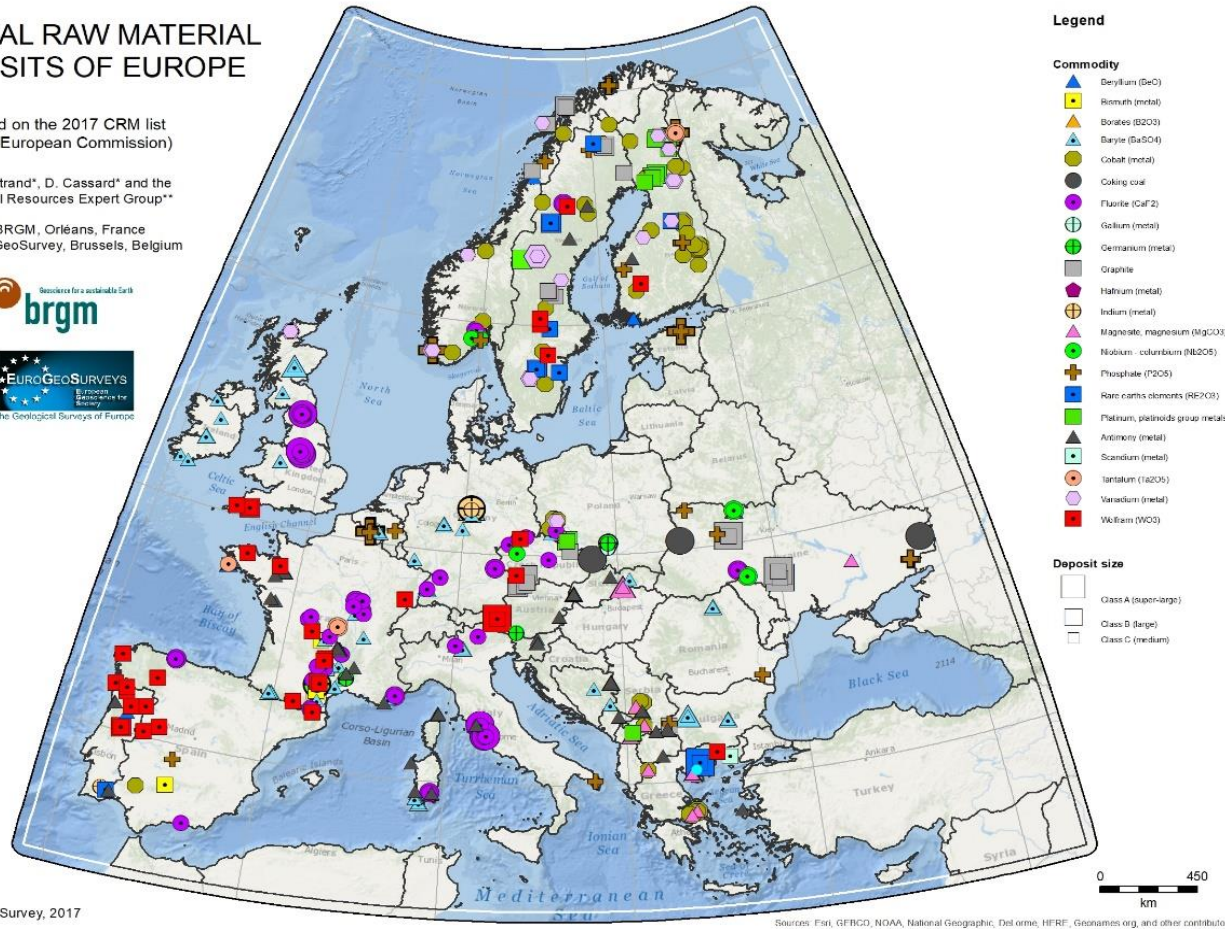
CRM Mineral Intelligence

CRITICAL RAW MATERIAL DEPOSITS OF EUROPE

(based on the 2017 CRM list
of the European Commission)

G. Bertrand*, D. Cassard* and the
Mineral Resources Expert Group**

* BRGM, Orléans, France
** EuroGeoSurvey, Brussels, Belgium



© BRGM, EuroGeoSurvey, 2017

Bertrand et al., 2018

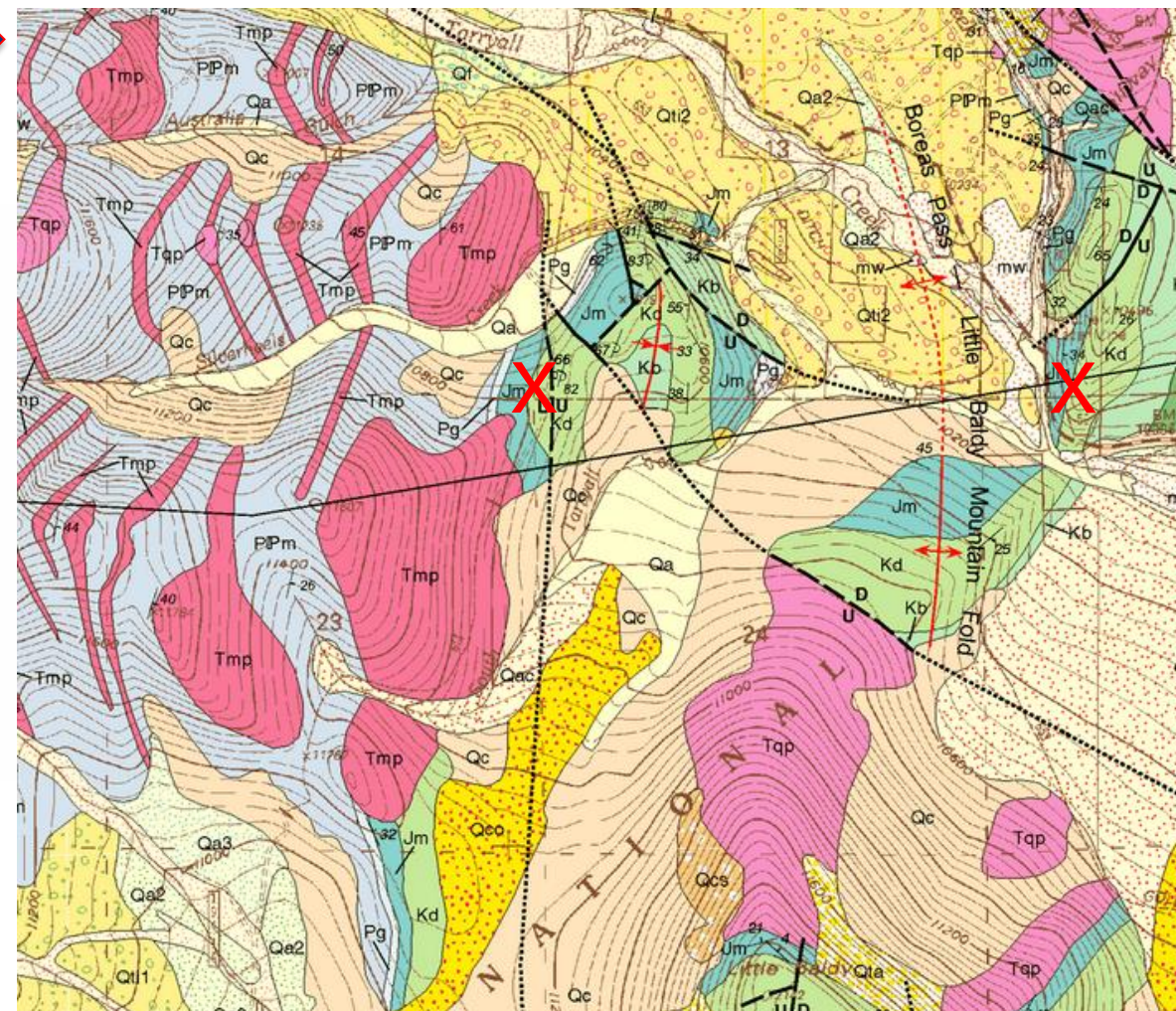
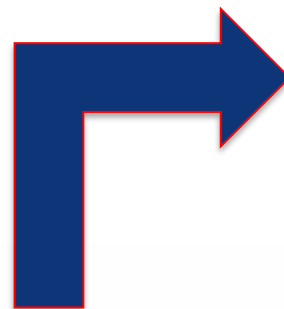
Where to next?



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



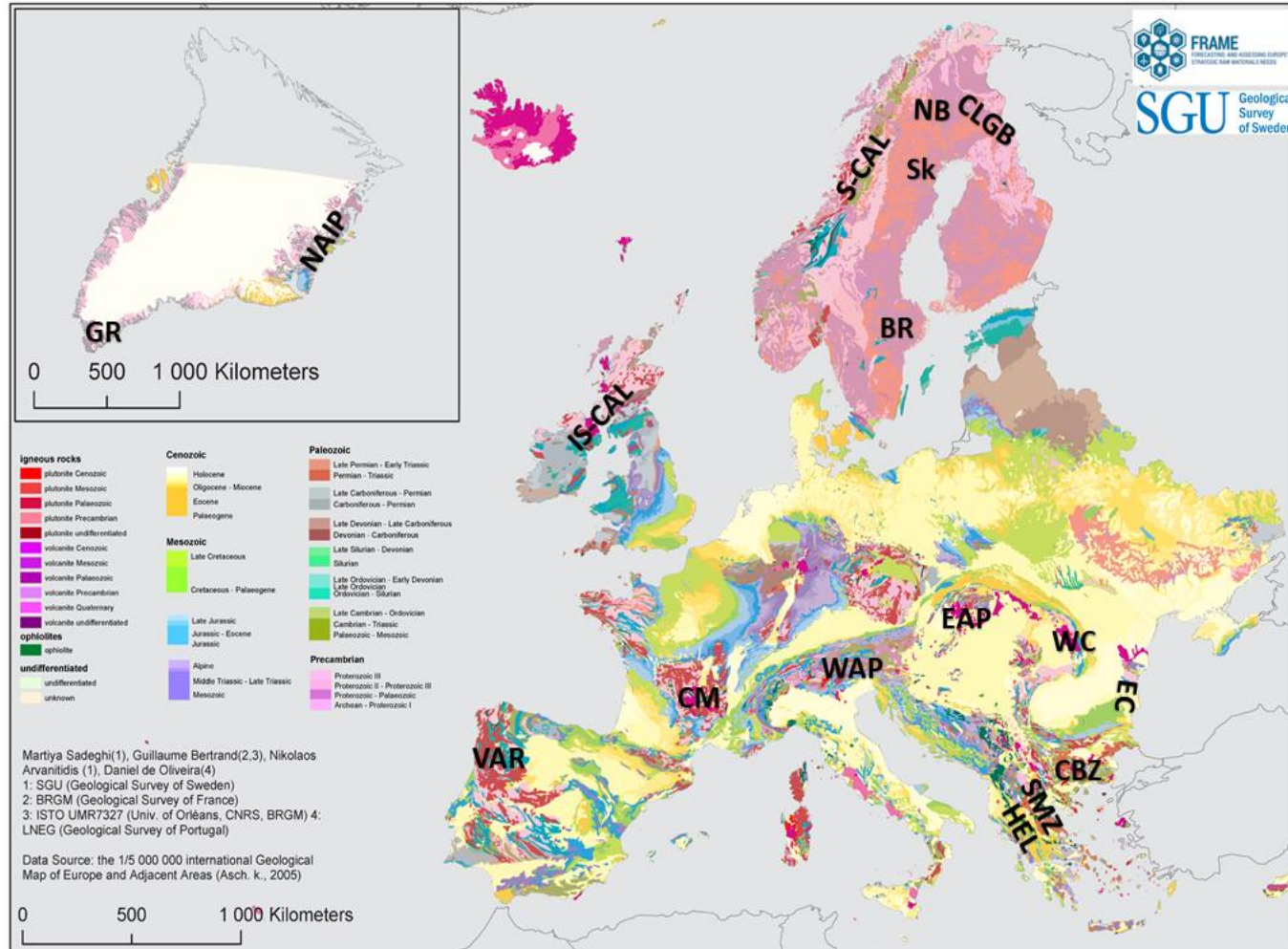
Where am I going
to find a new
deposit of...?



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



CRM Mineral Intelligence: the next steps



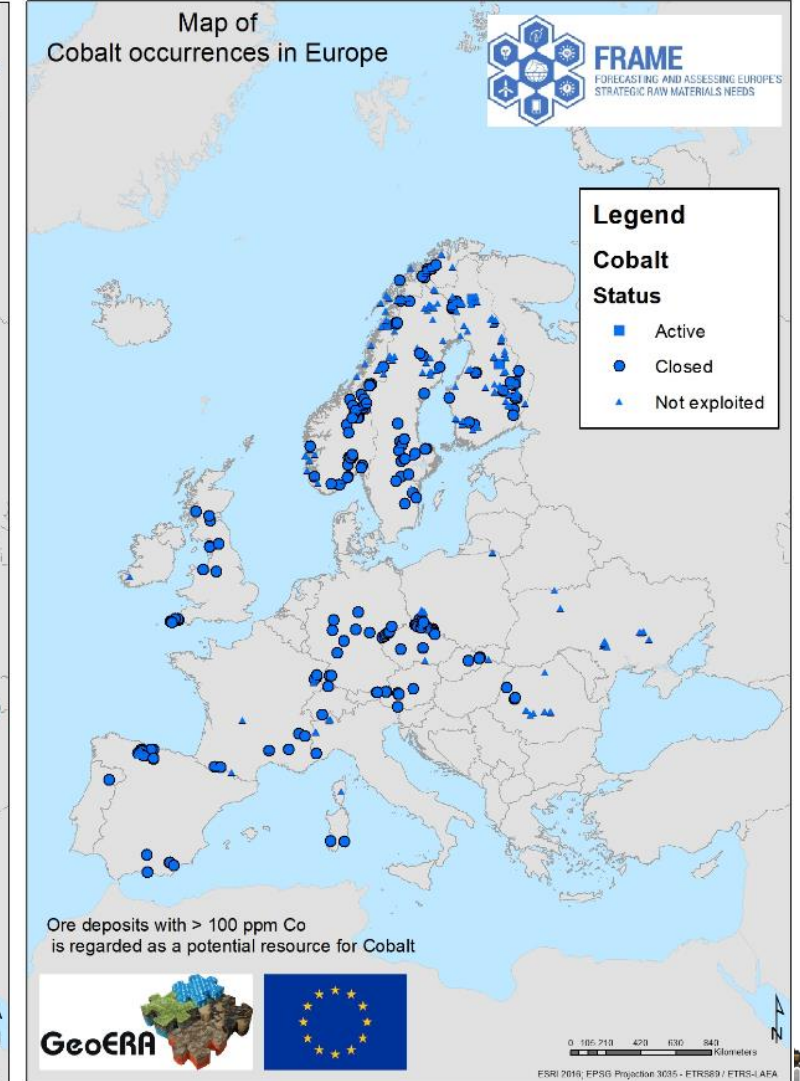
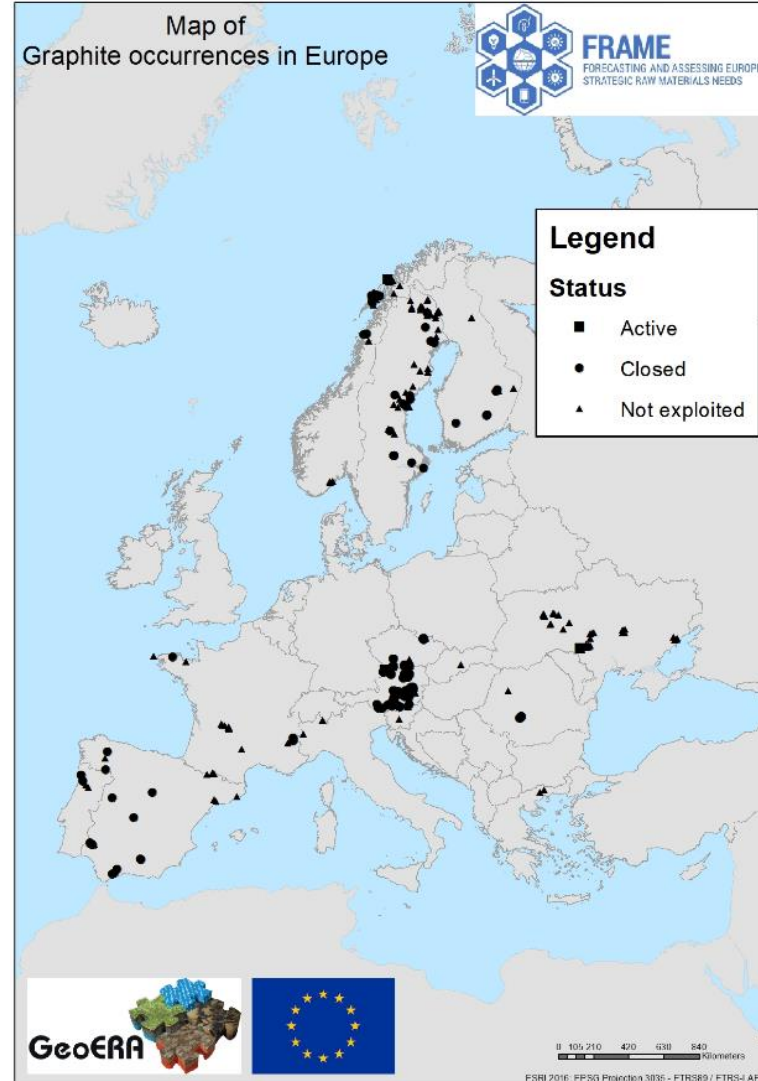
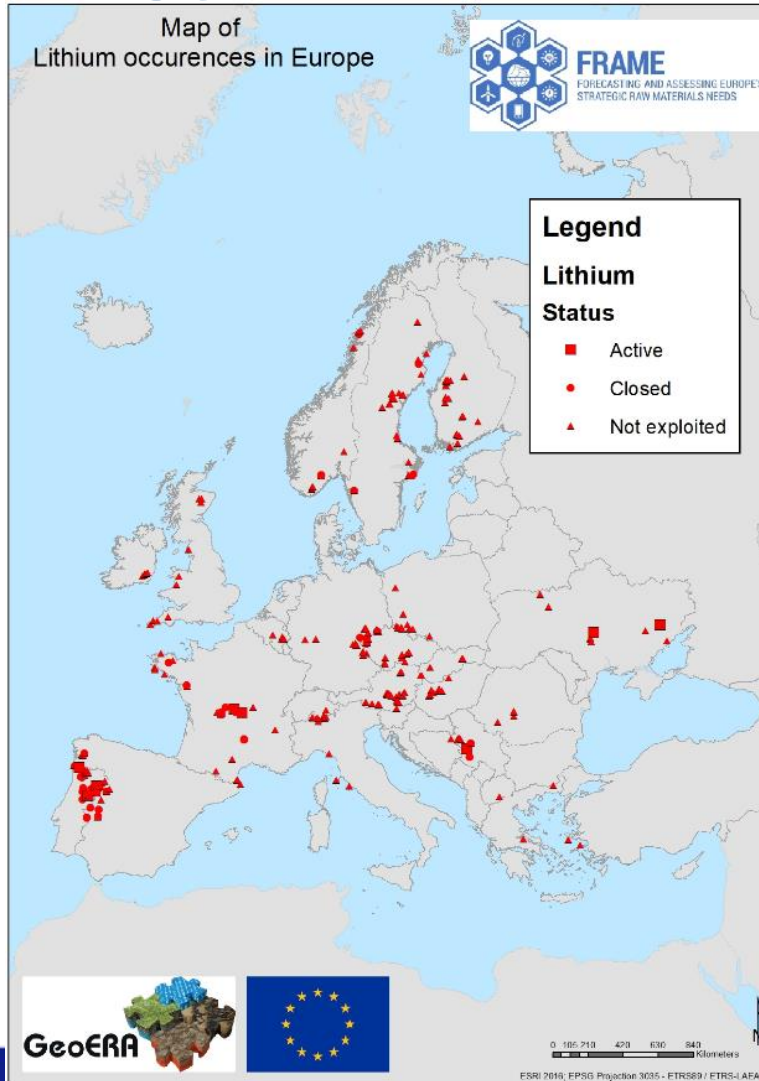
Geological map of Europe and Greenland modified after [Asch \(2005\)](#) and the main metallogenetic areas in Europe



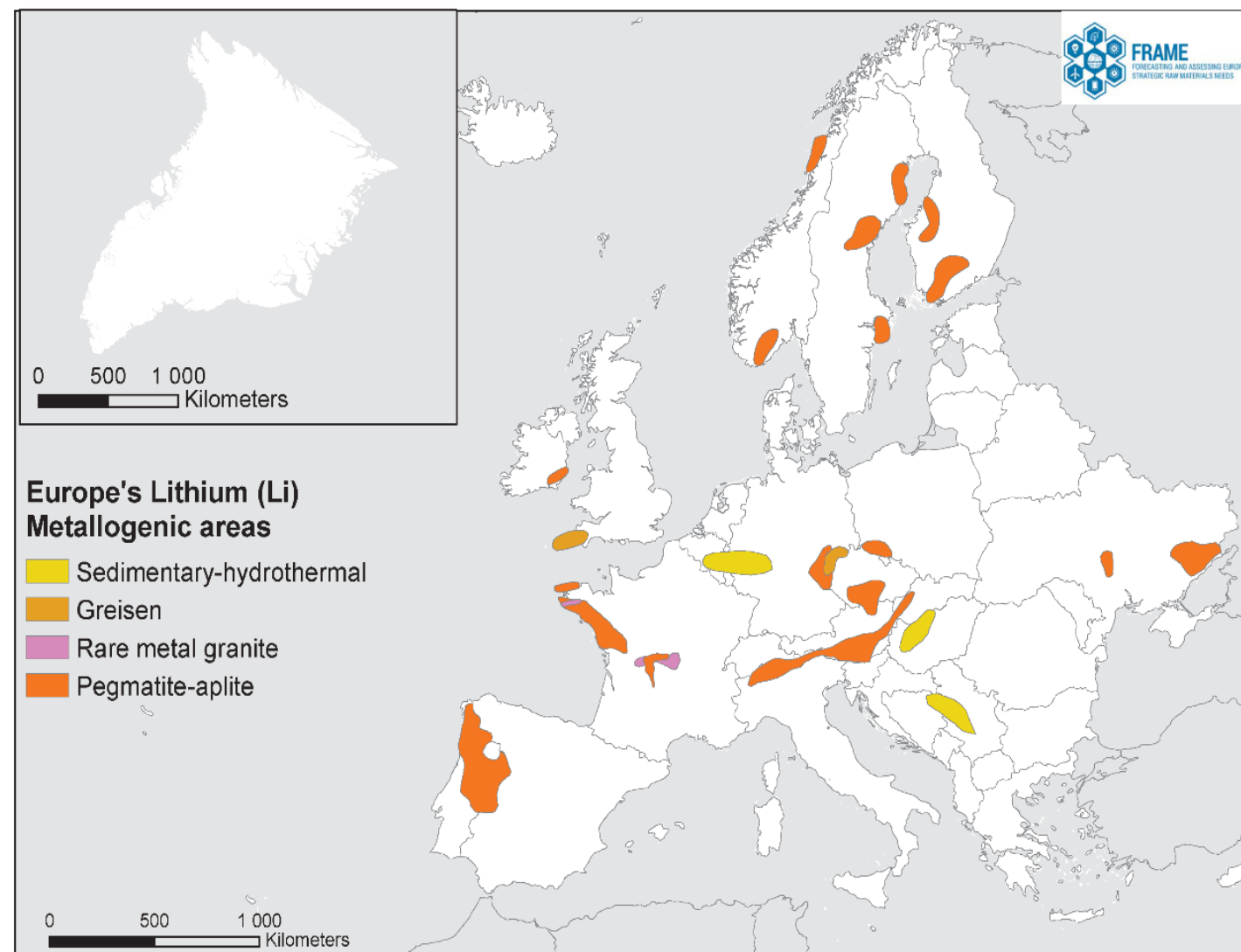
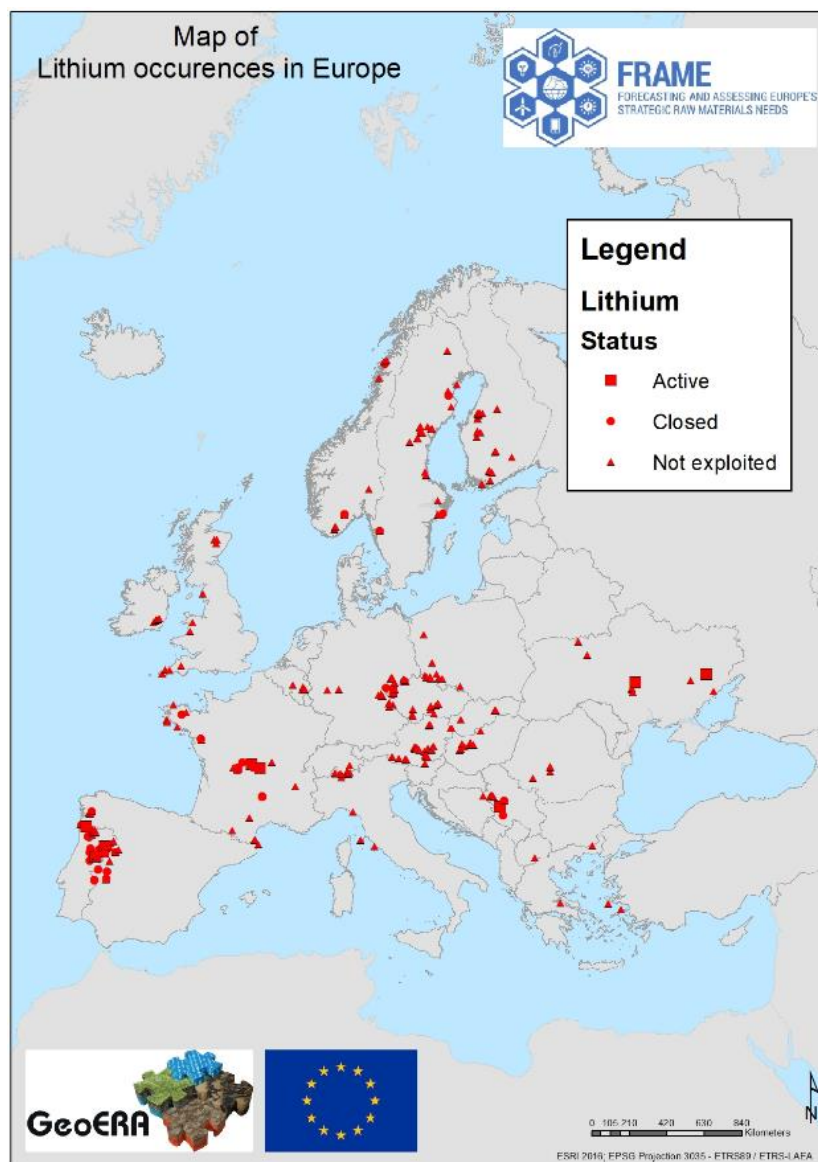
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731166



Energy Critical Elements



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



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



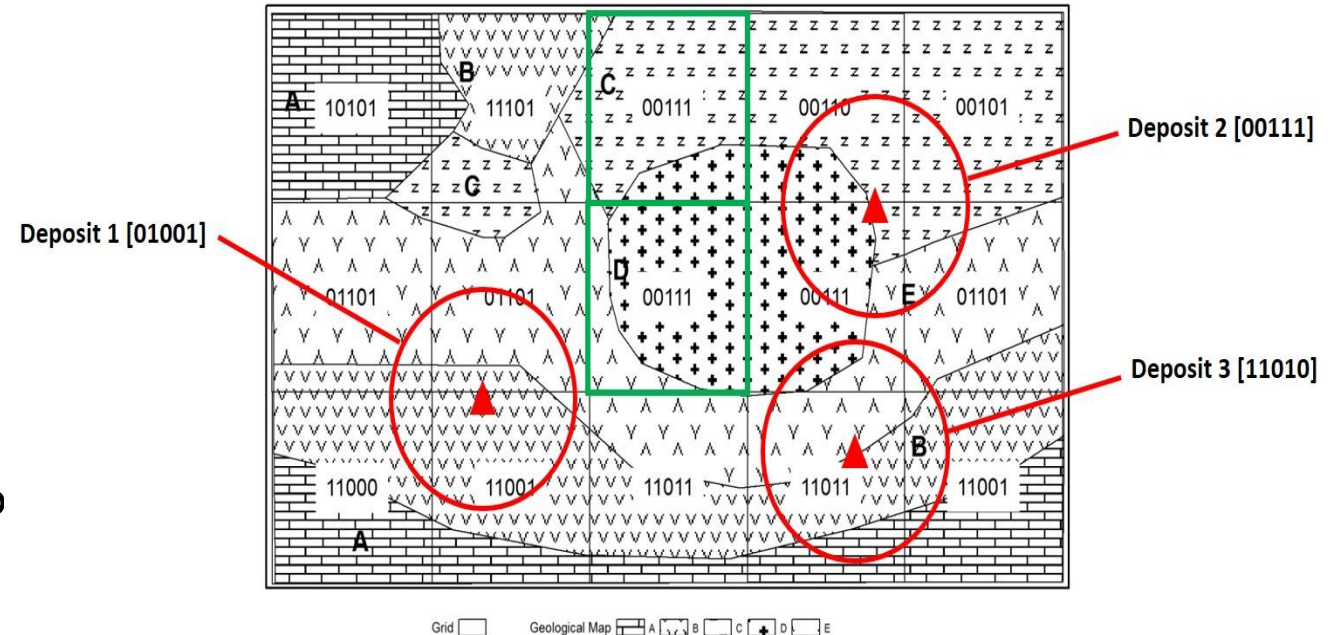
Cell Based Analysis (CBA) method

to apply

- 1) a set of known deposits containing the targeted commodity in the area of study (learning set)
- 2) a map of relevant geological features

- Superimpose a regular grid ("cells") over the area of study
- Build an attribute table
- Codes the presence (1) or absence (0) of each lithology in each cell of the grid

3) identify the lithological associations related to known deposits by drawing a buffer around each deposit



After Sadeghi et al., 2020

RESOURCE GEOLOGY

Free Access

From Predictive Mapping of Mineral Prospectivity to
Quantitative Estimation of Number of Undiscovered Prospects

Emmanuel J. M. Carranza

<https://doi.org/10.1111/j.1751-3928.2010.00146.x>



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



FAVOURABILITY MAP FOR LITHIUM MINERALIZATION IN EUROPE

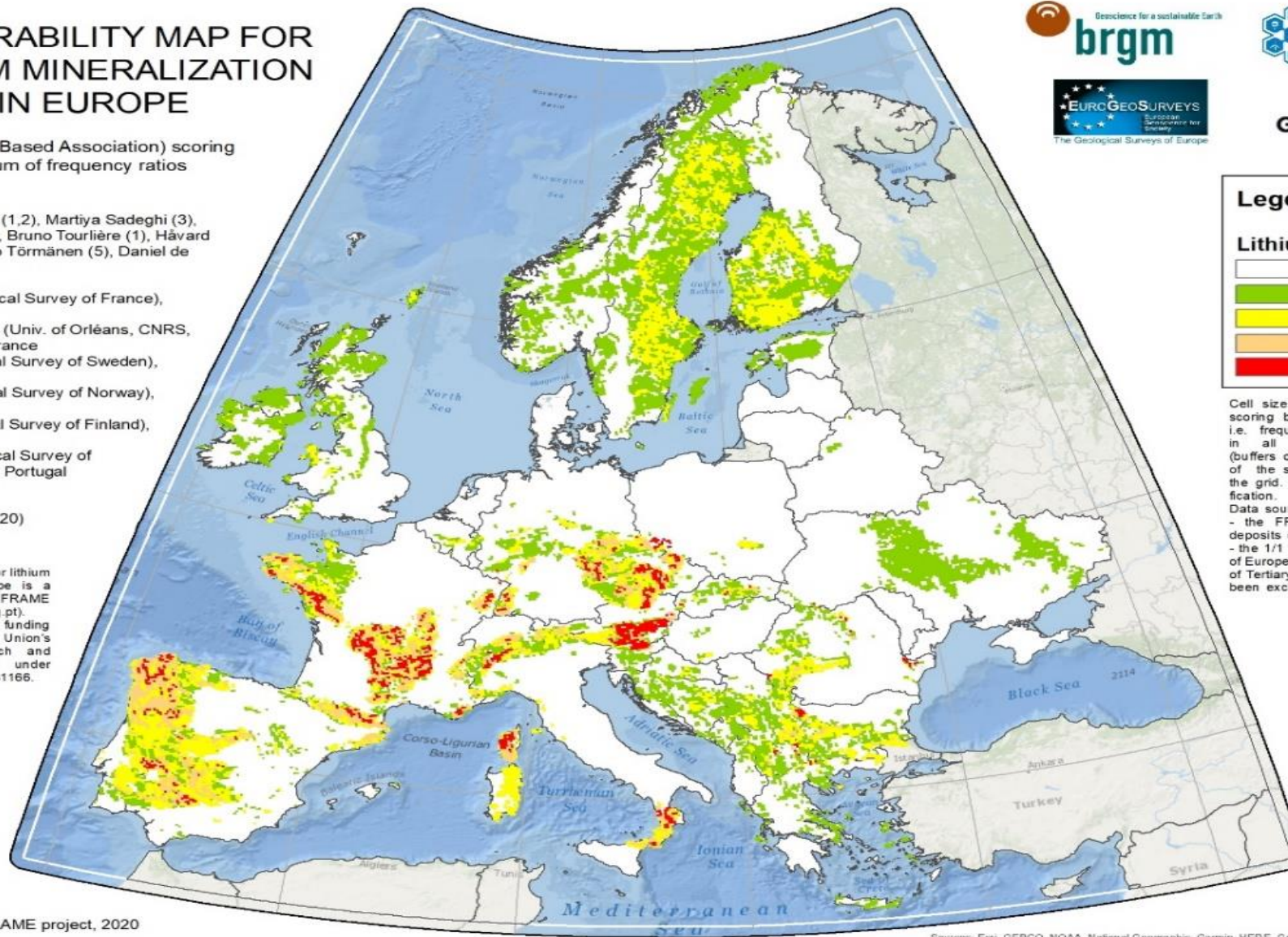
CBA (Cell Based Association) scoring
by sum of frequency ratios

Guillaume Bertrand (1,2), Martiya Sadeghi (3),
Eric Gloaguen (1,2), Bruno Tourlière (1), Håvard
Gautneb (4), Tuomo Törmänen (5), Daniel de
Oliveira (6)

- 1 – BRGM (Geological Survey of France),
Orléans, France
- 2 – ISTO UMR7327 (Univ. of Orléans, CNRS,
BRGM), Orléans, France
- 3 – SGU (Geological Survey of Sweden),
Uppsala, Sweden
- 4 – NGU (Geological Survey of Norway),
Trondheim, Norway
- 5 – GTK (Geological Survey of Finland),
Rovaniemi, Finland
- 6 – LNEG (Geological Survey of
Portugal), Alfragide, Portugal

Version 1.2 (July 2020)

This favourability map for lithium
mineralization in Europe is a
result from the GeoERA FRAME
project (www.frame.lneg.pt).
GeoERA has received funding
from the European Union's
Horizon 2020 research and
innovation programme under
grant agreement No. 731166.



Legend

Lithium favourability

	Very low
	Low
	Medium
	High
	Very high

Cell size of 10 km x 10 km. CBA
scoring by sum of frequency ratios,
i.e. frequency of a given lithology
in all standards neighbourhood
(buffers of 100 sq km) vs. frequency
of the same lithology in all cells of
the grid. Jenks natural breaks classification.

Data sources are:

- the FRAME project database on
deposits of energy critical elements;
- the 1/1 500 000 geological synthesis
of Europe (Billa et al., 2008); lithologies
of Tertiary and Quaternary ages have
been excluded.

© BRGM, GeoEra FRAME project, 2020

Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other contributors

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

Highlights

- A cohesive taskforce of scientists working together for common European goals
- Innovation in mineral prospectivity science
- Unlocking the mineral potential for a renewed raw materials sector in Europe as a driver for domestic raw material value chains



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



[Objectives](#)[Project Philosophy](#)[Work Packages](#)[Partners](#)[News/Events](#)[Media Kit](#)[Photogallery](#)[Members Area](#)

Thank you for your attention



FRAME

FORECASTING AND ASSESSING EUROPE'S
STRATEGIC RAW MATERIALS NEEDS



Subscribe to
our newsletter

[FLYER](#)[NEWS](#)

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



www.frame.lneg.pt



FOLLOW US ON SOCIAL MEDIA



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

