



FRAME

FORECASTING AND ASSESSING EUROPE'S
STRATEGIC RAW MATERIALS NEEDS

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Forecasting and Assessing Europe's Strategic Raw Material Needs

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PDAC 2021, March 2021



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



FRAME consortium

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

Greek Institute of Geology and Mineral Exploration – IGME

Instituto Geológico y Minero de España – IGME

Mining and Geological Survey of Hungary – MGSZ

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

Geologische Bundesanstalt - GBA



19 Partners



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GeoERA
RAW MATERIALS



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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Challenges we face today

Global Supply of EU Critical Minerals and Metals

The pie charts show the percent distribution of the production of critical metals and minerals. In total, it is 100%

Sources: USGS, European Commission, SGU

Sb	Antimony
Ba	Baryte
Be	Beryllium
Bi	Bismuth*
B	Borate
Co	Cobalt
Fl	Fluorspar
Ga	Gallium*
Ge	Germanium*
Hf	Hafnium*
He	Helium
In	Indium*
Mg	Magnesium
Gr	Natural Graphite
Nb	Niobium
HREE	Heavy Rare Earth Elem.
	Light Rare Earth Elem.
	Platinum Group Metals
	Phosphate Rocks
	Phosphates
	Scandium
	Silicon Metal*
	Tantalum
	Tungsten
	Vanadium

➤ Raw Materials are the lifeblood of the economy and needed to achieve the Green Deal objectives

➤ Transition to a low-carbon economy

➤ Sustainable and responsible sourcing of raw materials

➤ Strategic Raw Materials for complex value chains

➤ High import dependence

➤ Where are the next deposits to be found?

➤ **input from recycling is not sufficient!**



FRAME Objectives


- Research the critical and strategic raw materials in Europe
- Build on previously + currently developed pan-European and national databases
- Expand SCRM knowledge through a compilation of mineral potential and metallogenic areas
- Predictive targeting based on GIS exploration tools
- Secondary resources - historical mining wastes
- Sustainable and responsible sourcing of raw materials




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Aligned with Commission priorities

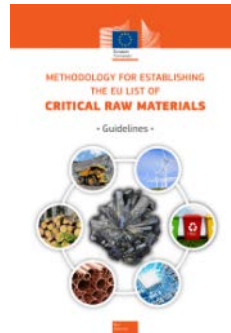
Circular Economy




Battery Initiative



Critical Raw Materials List



Responsible sourcing in Mineral supply chains
[Regulation (EU) 2017/821 of 17/05/2017]





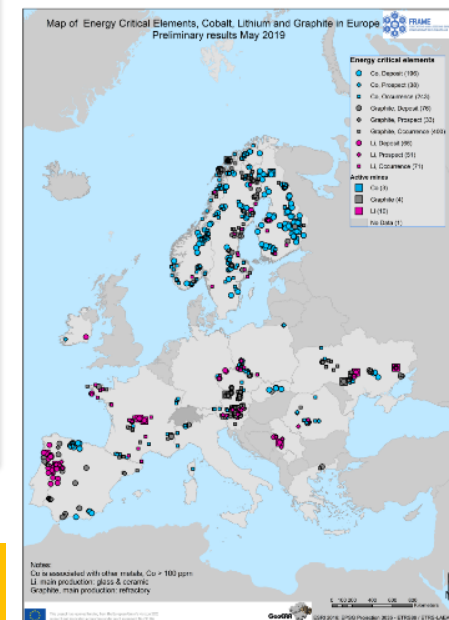
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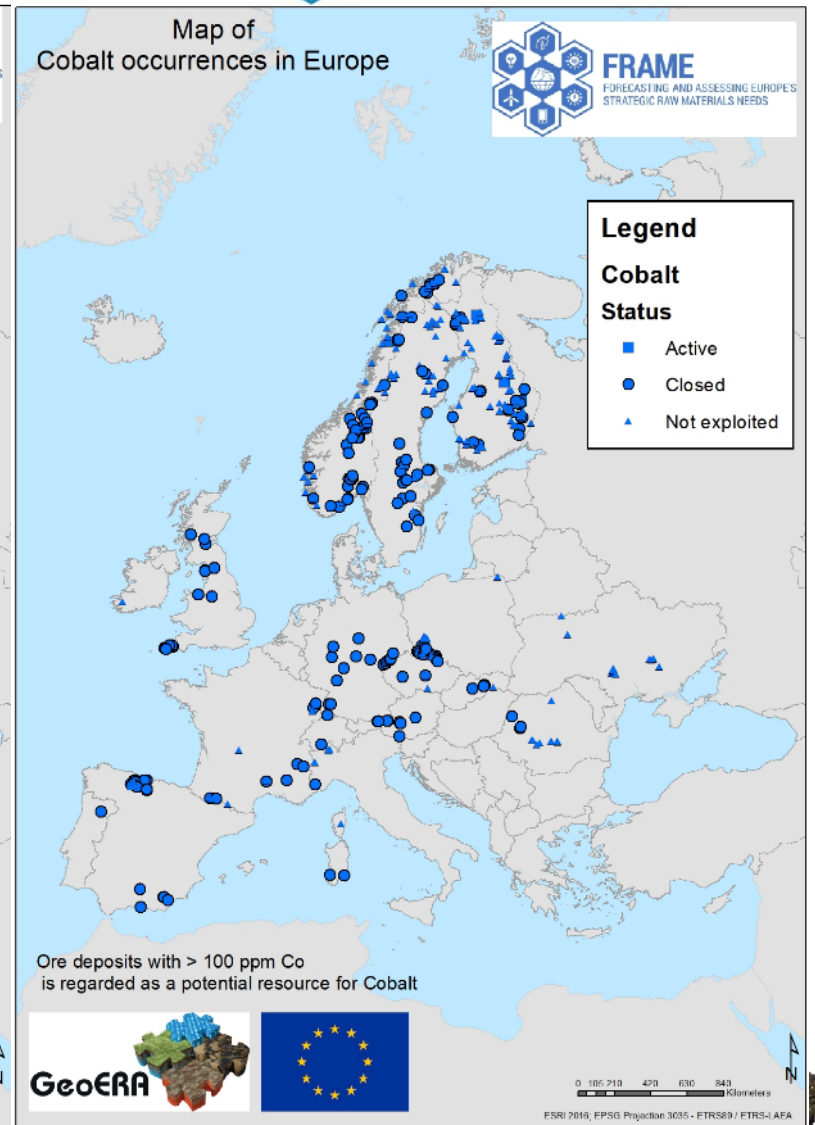
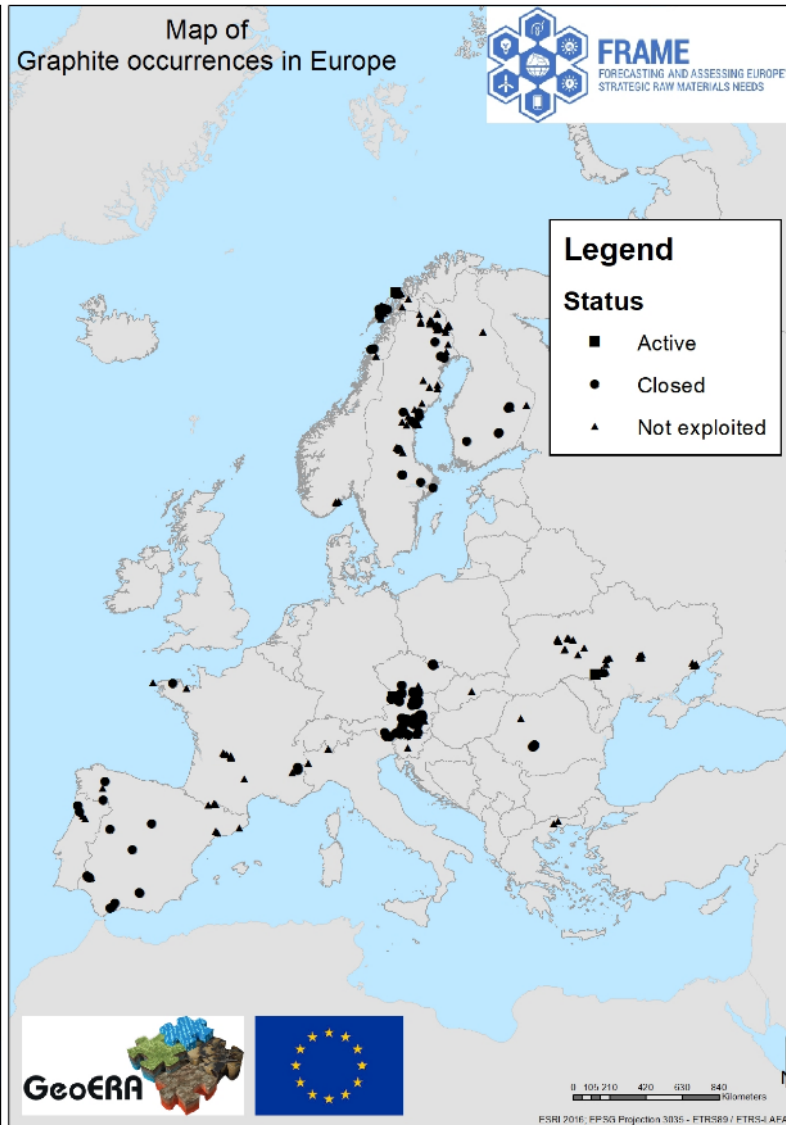
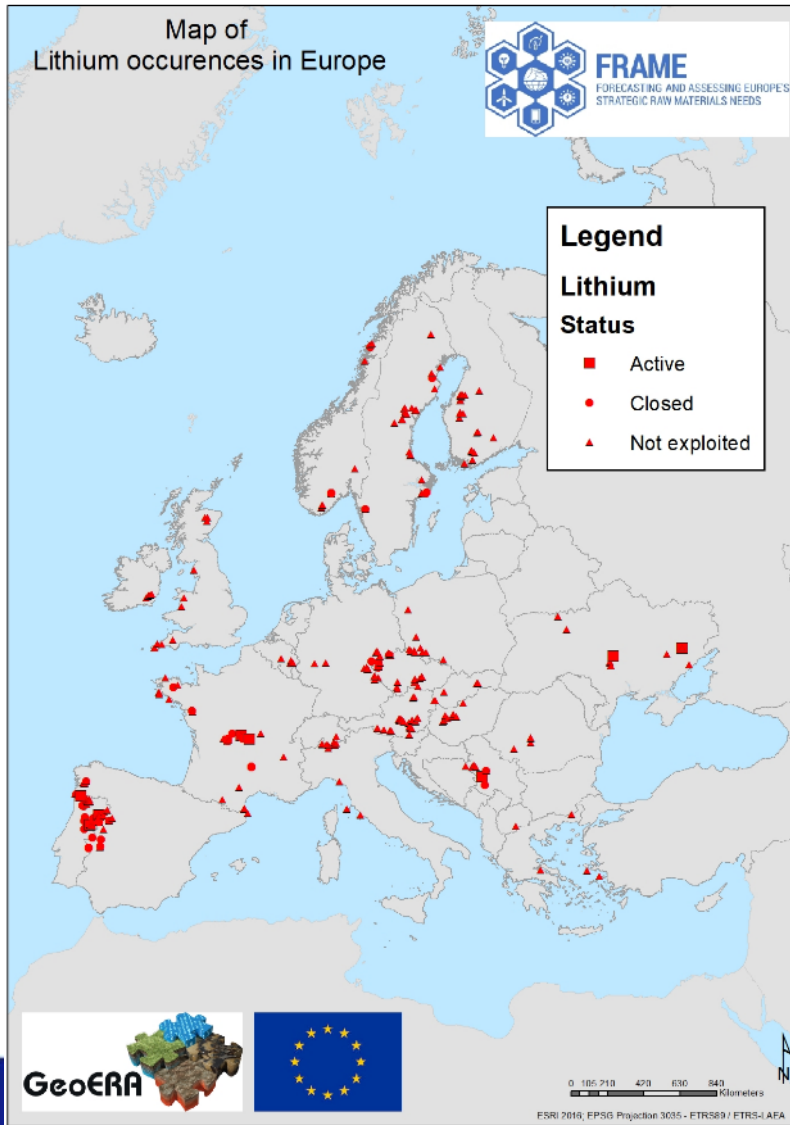
Preliminary results: *Energy Critical Elements Map of Europe*



FRAME Results



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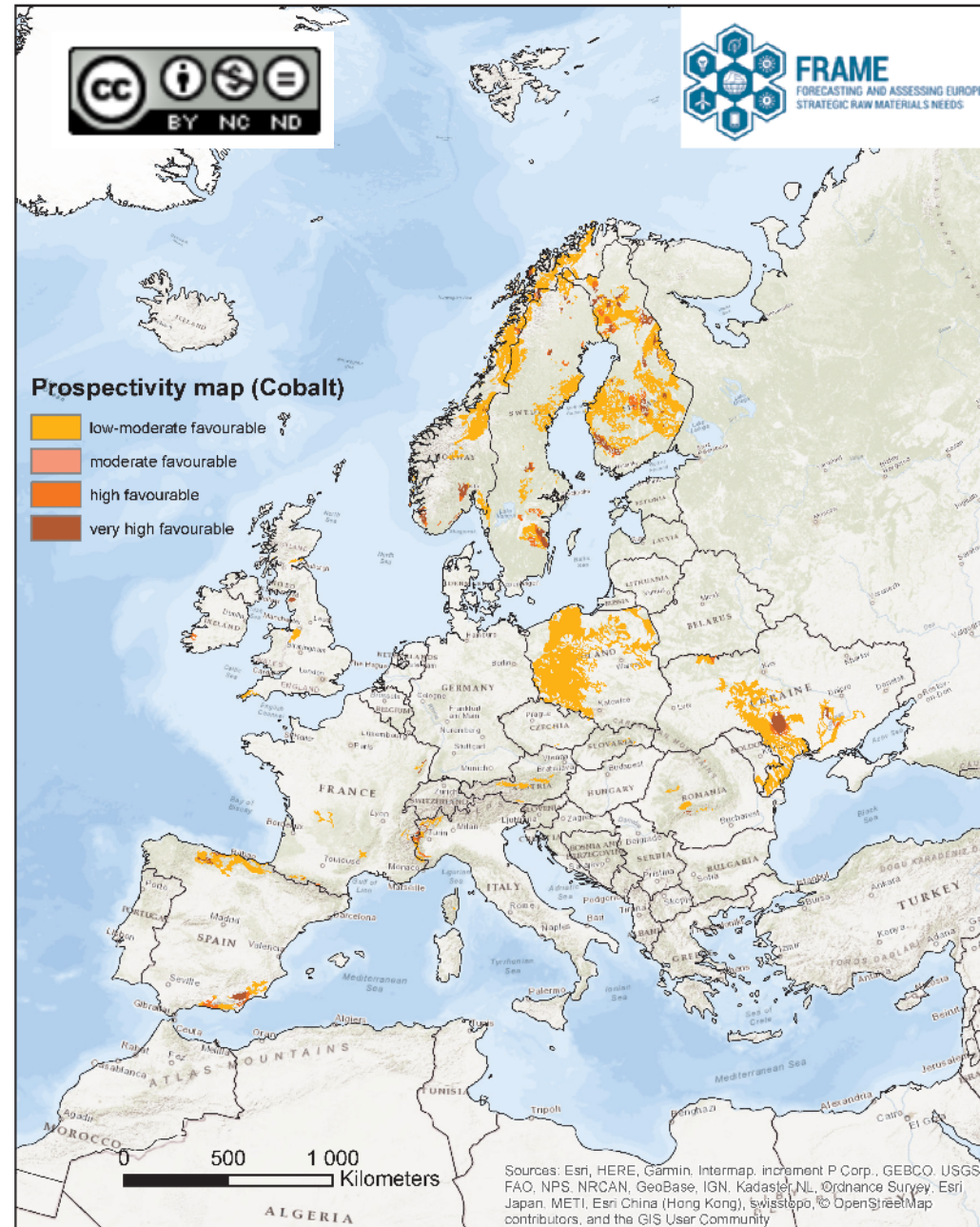


FRAME – Preliminary Results:

Predictability Mapping (Potential for Co in Europe)



This project has received funding from the European Union innovation programme under grant agreement No 73116



FAVOURABILITY MAP FOR PHOSPHATE MINERALIZATION IN EUROPE

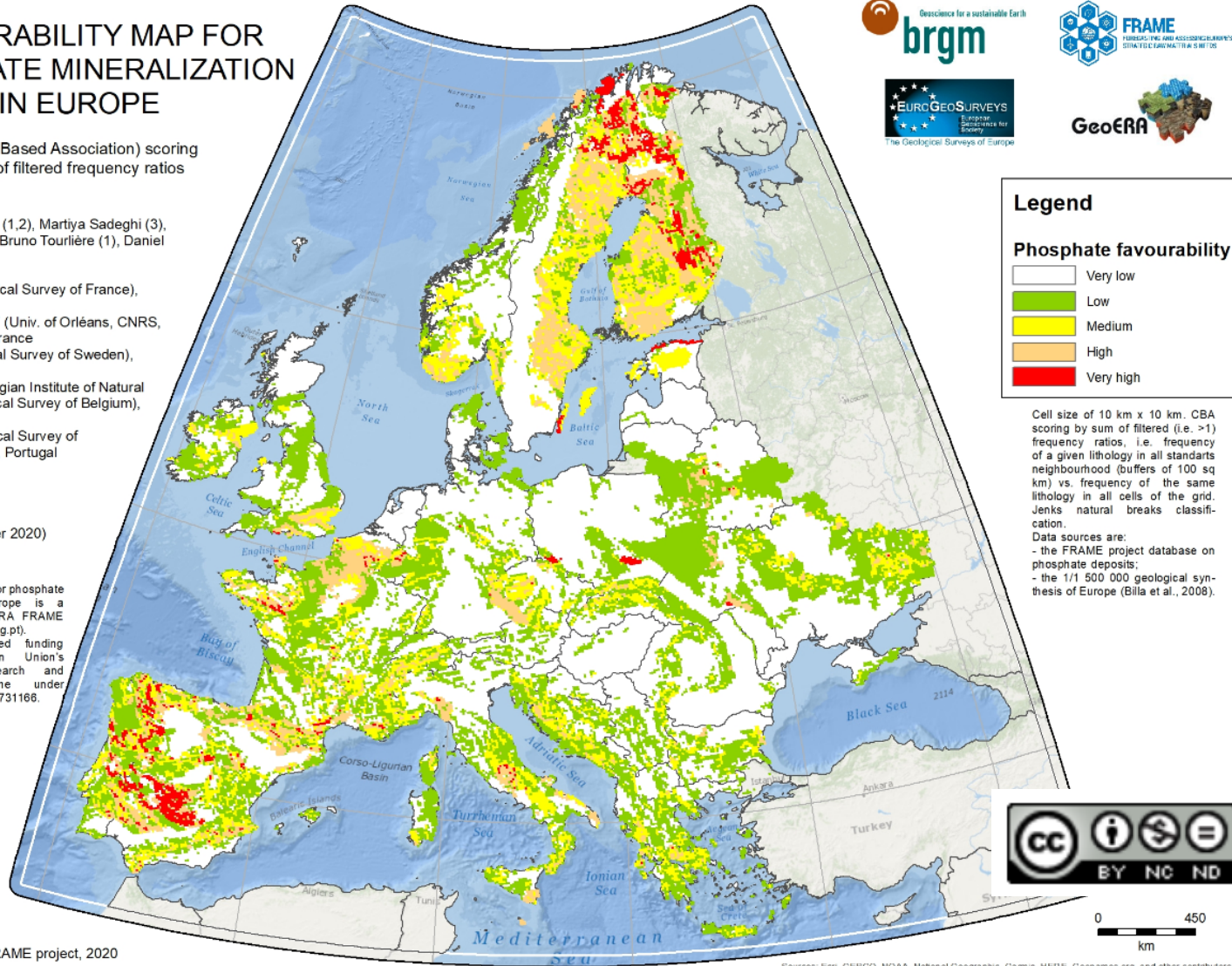
CBA (Cell Based Association) scoring by sum of filtered frequency ratios

Guillaume Bertrand (1,2), Martiya Sadeghi (3), Sophie Decree (4), Bruno Tourlière (1), Daniel de Oliveira (5)

- 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 – GSB (Royal Belgian Institute of Natural Sciences - Geological Survey of Belgium), Brussels, Belgium
- 5 – LNEG (Geological Survey of Portugal), Alfragide, Portugal

Version 1.0 (October 2020)

This favourability map for phosphate 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.



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

FRAME – Preliminary Results


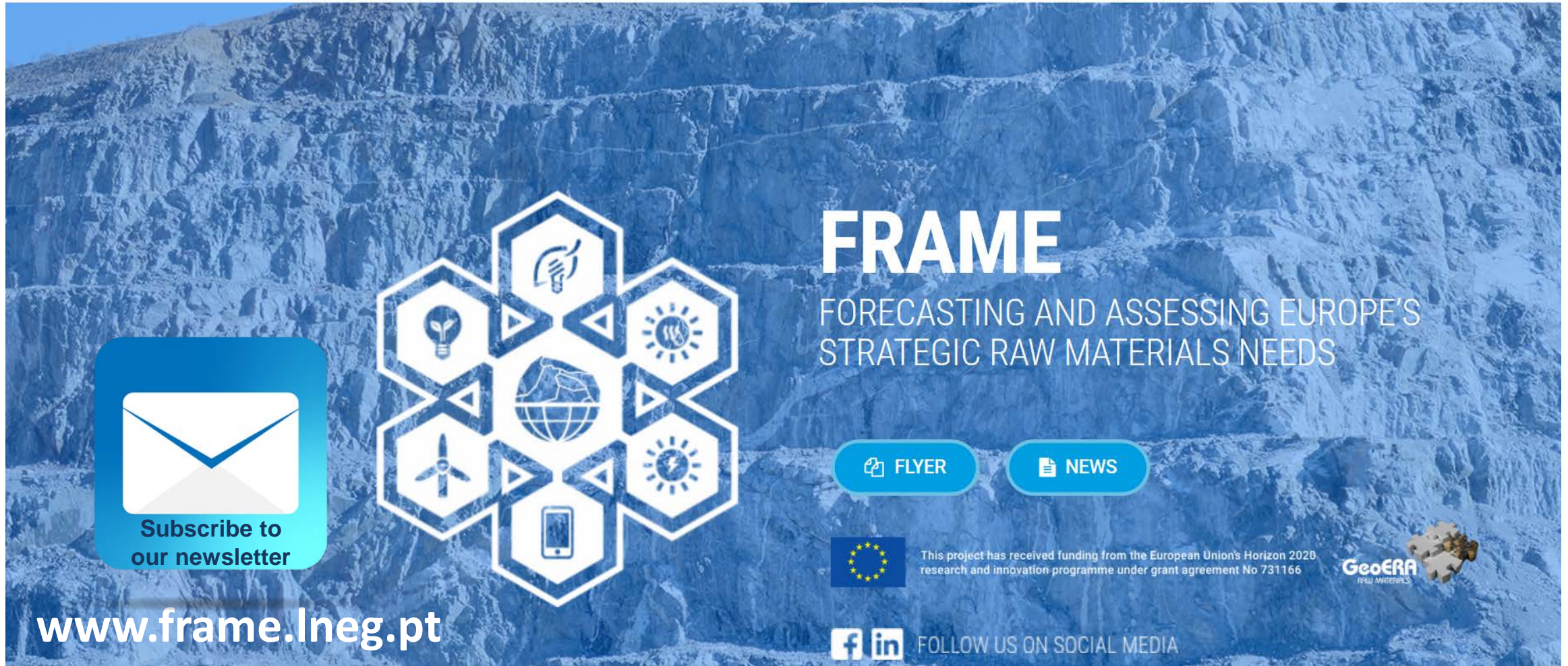
Phosphate Favourability Mineralisation in Europe



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