

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

# FRAME

## *Forecasting and Assessing Europe's Strategic Raw Material Needs*

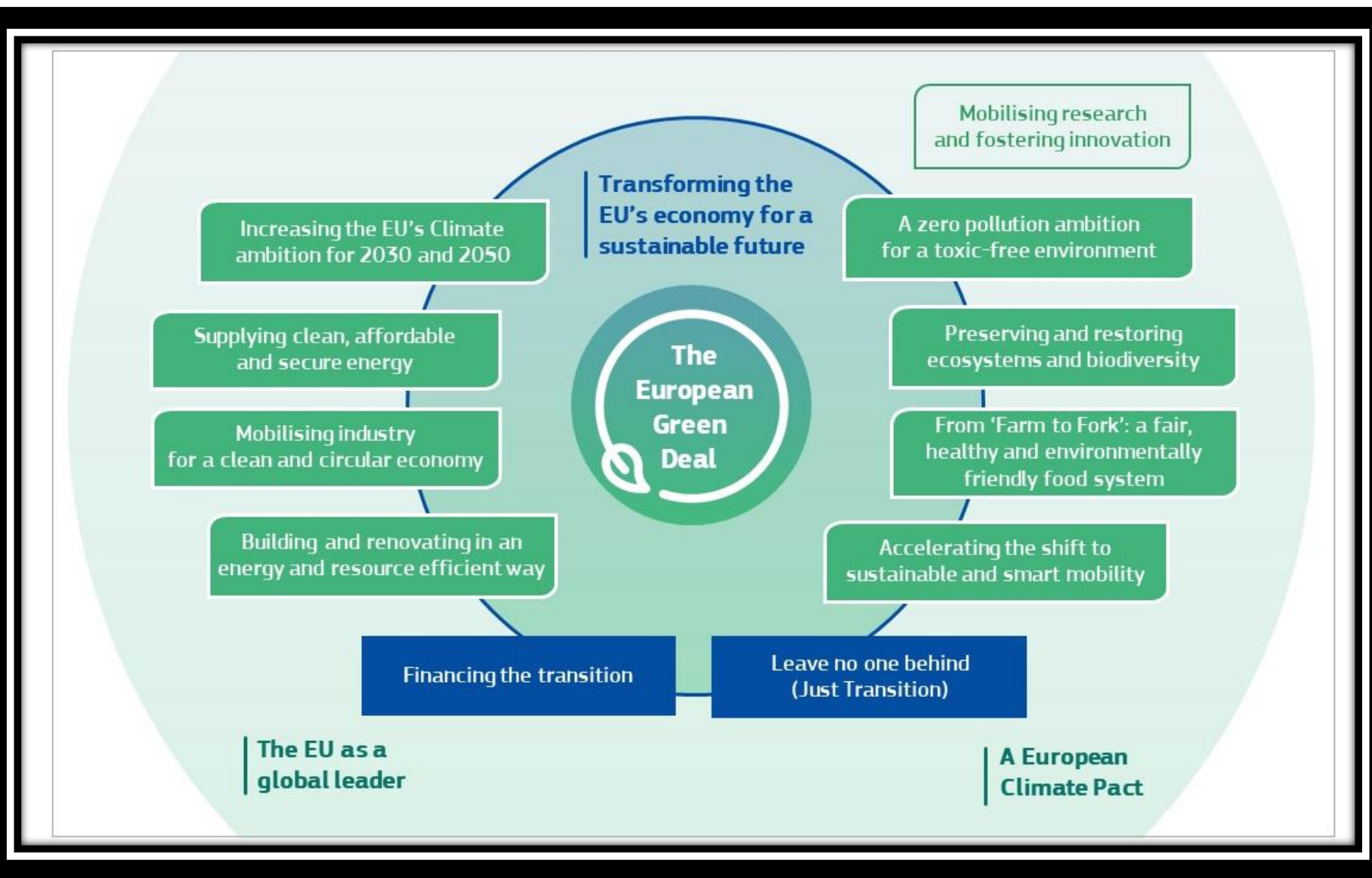
Daniel de OLIVEIRA, LNEG | FRAME Project Lead

EGU 2020, May 2020



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





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[https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)



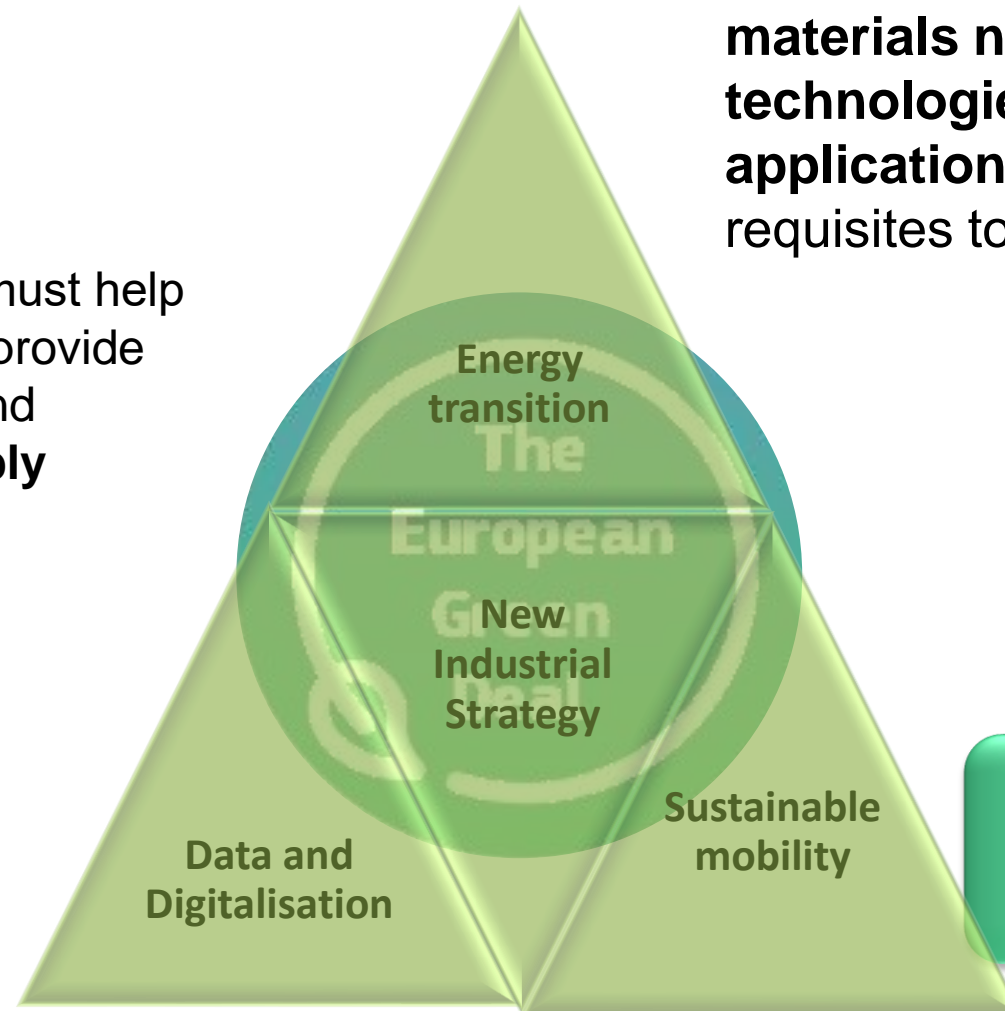
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“Access to resources is also a strategic security question for Europe’s ambition to deliver the Green Deal.”

“The [European Defence] Fund must help develop technological skills and provide incentives to **build integrated and competitive cross-border supply chains.**“ (COM(2017) 295 final)

“**Ensuring the supply of sustainable raw materials, in particular of critical raw materials necessary for clean technologies, digital, space and defence applications [...]** is therefore one of the prerequisites to make this transition happen.”



**2025 target**  
**13 million zero- and low-emission vehicles**



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## Additional Challenges

- ❖ Climate change mitigation
- ❖ Future generation needs
- ❖ Healthy ageing
- ❖ Industry 4.0 and digitalisation
- ❖ Responsible economic and societal wealth

All rely upon sustainably *produced* **mineral raw materials** that are and *subsequently (re-)used in all steps of the value chain*



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# 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*

*Hellenic Survey of Geology and Mineral Exploration – HSGME*

*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 – GeolInform-GIU*

*Institutul Geologic al Romaniei – IGR*

*Geološki Zavod Slovenije – GZS*

*Istituto Superiore per la Protezione e la Ricerca Ambientale - ISPRA*



**19 Partners**



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# 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

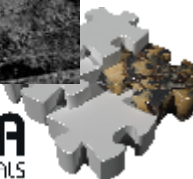
**WP 8** – Link to Information Platform



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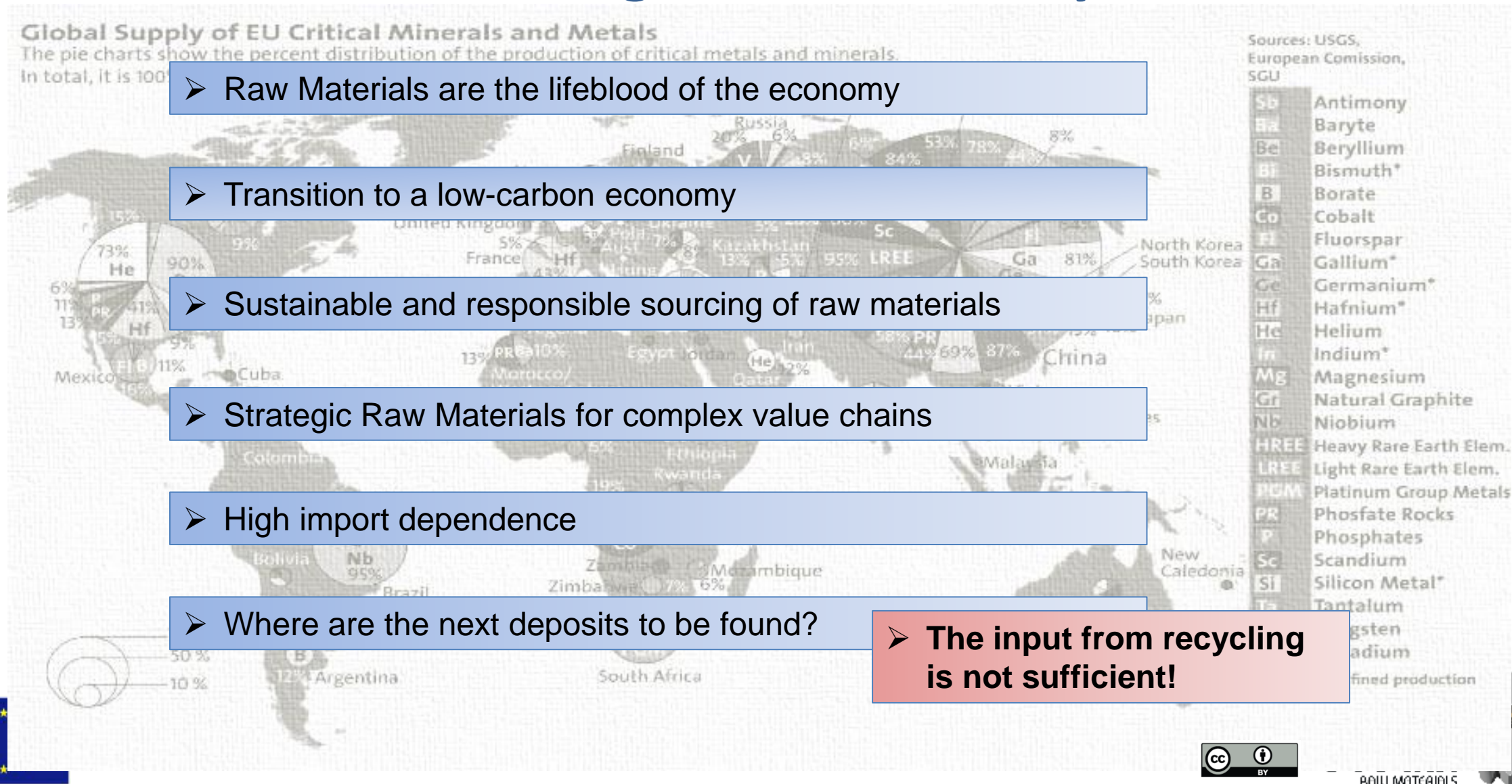


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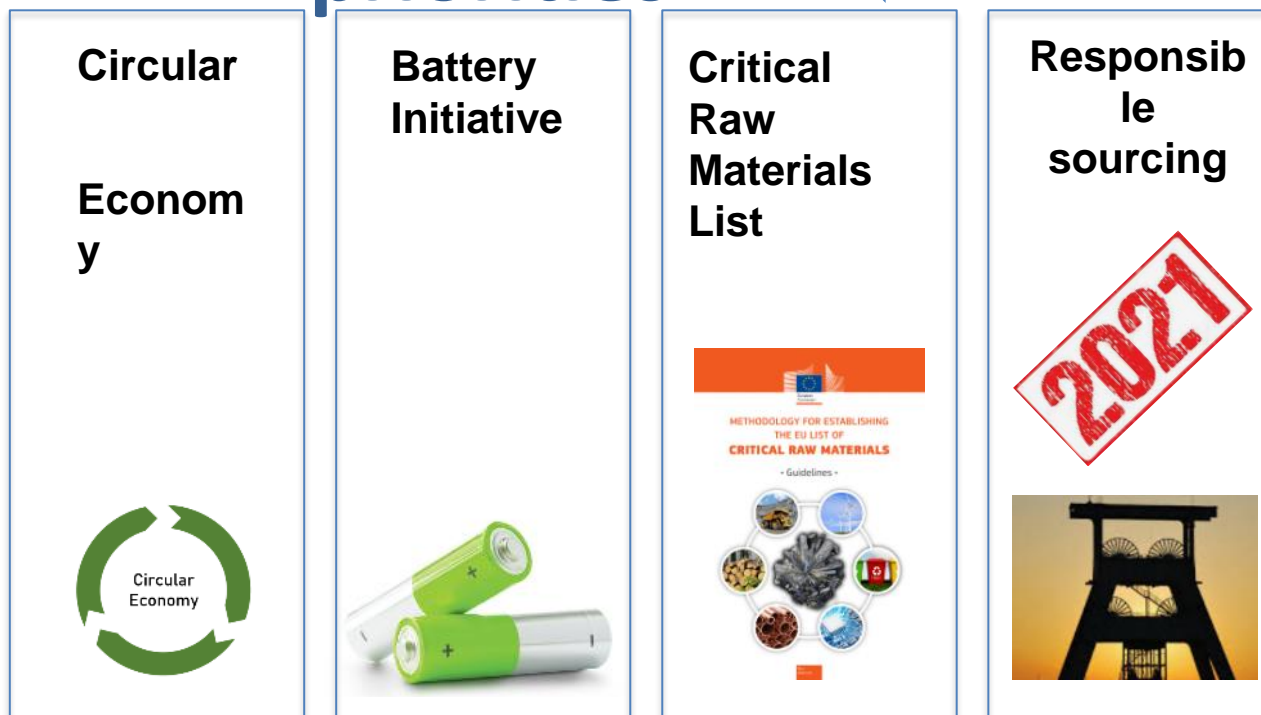
# Challenges we face today



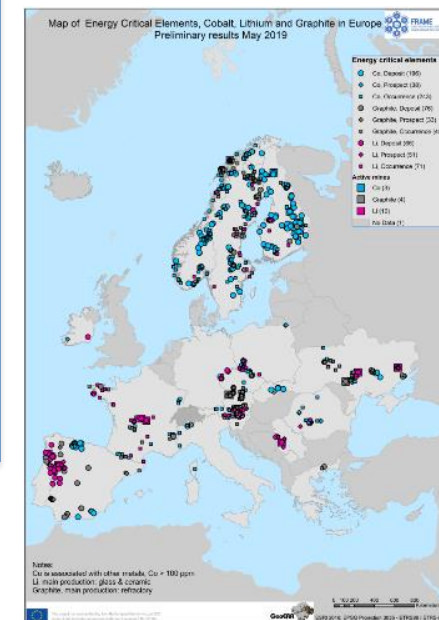
Aligned with  
**Commission  
priorities**

- 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
- Predictive targeting based on GIS
- exploration tools
- Secondary resources - historical mining wastes
- Sustainable and responsible sourcing of raw materials

materials in the Euro  
innovation programme under grant agreement



*Preliminary  
results: **Energy  
Critical  
Elements Map  
of Europe***



[www.frame.lneg.pt](http://www.frame.lneg.pt)

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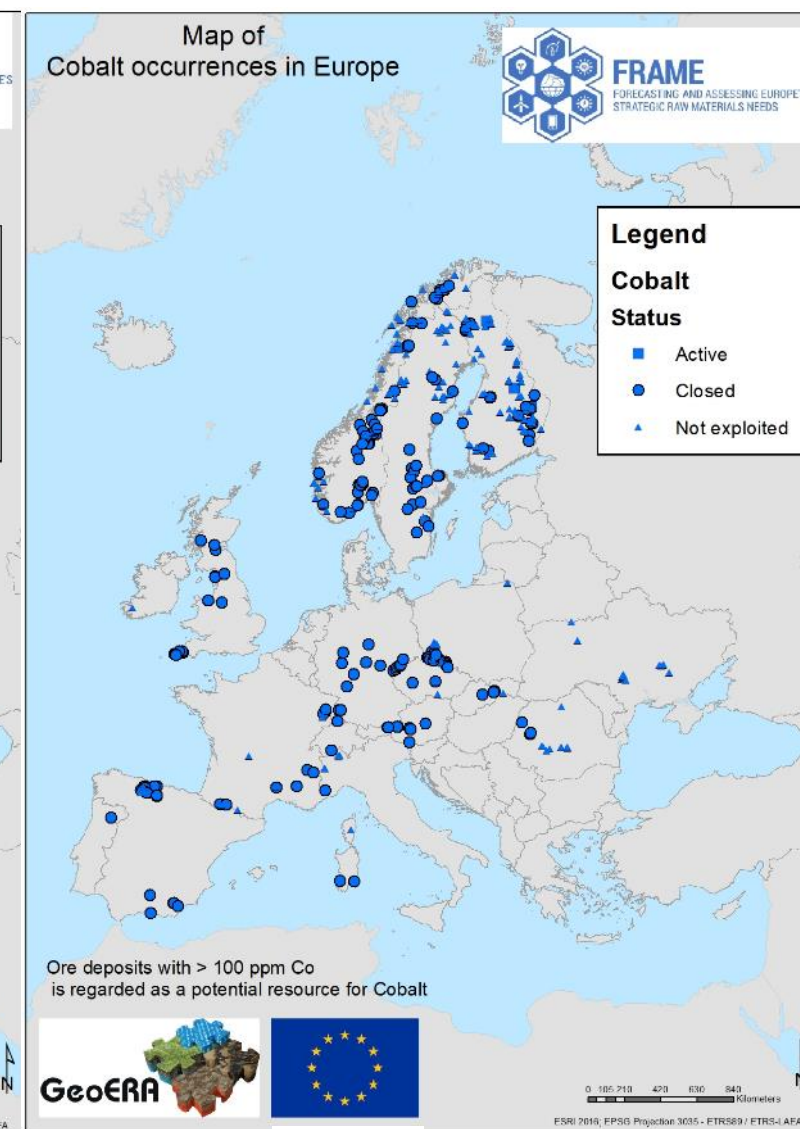
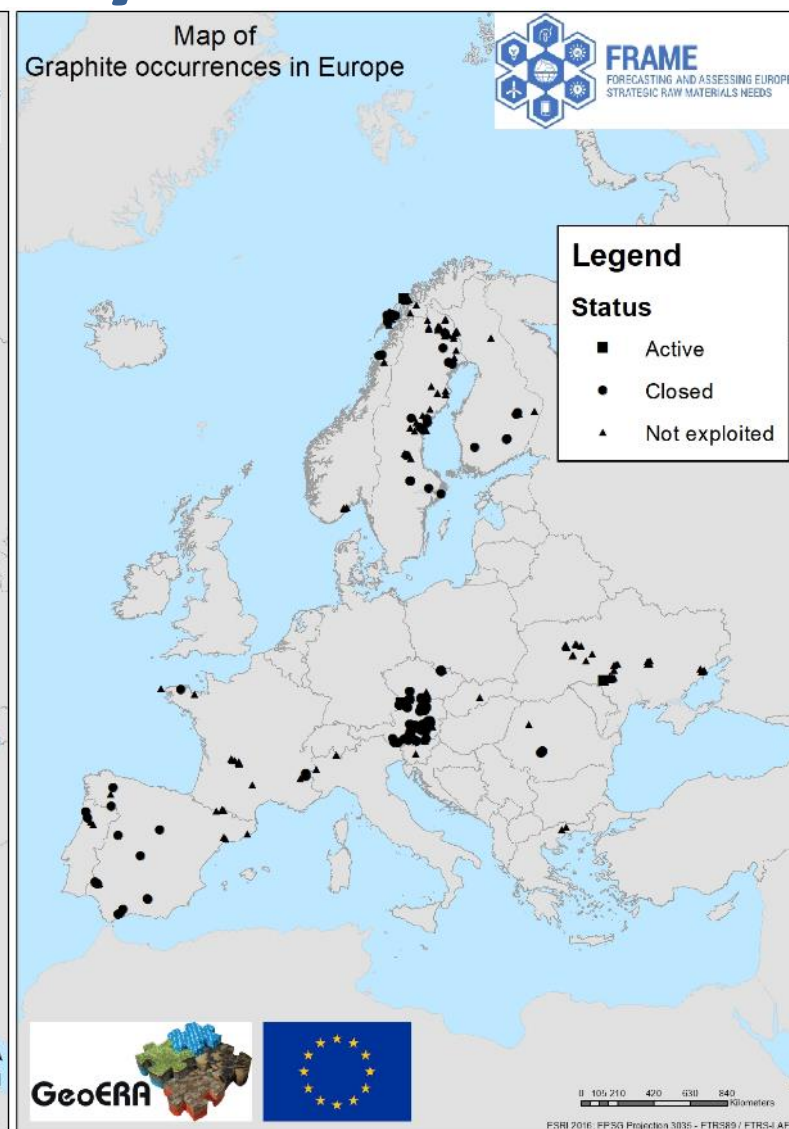
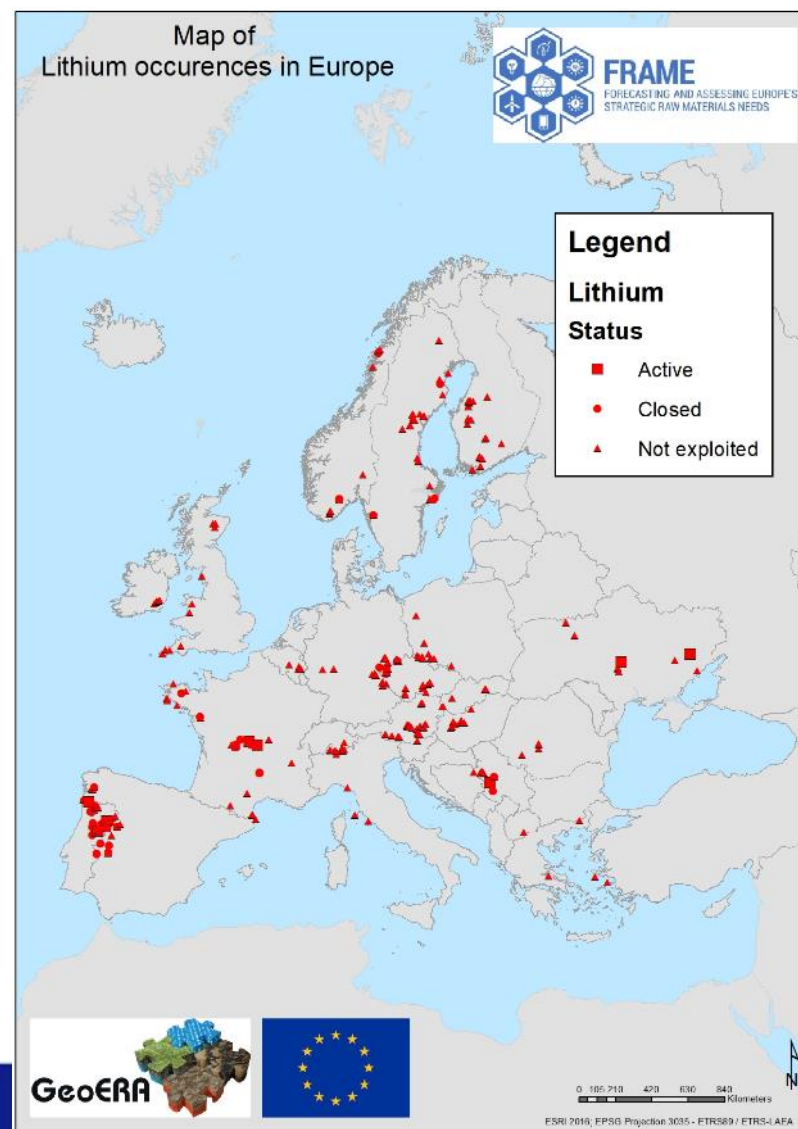


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# FRAME – Preliminary Results

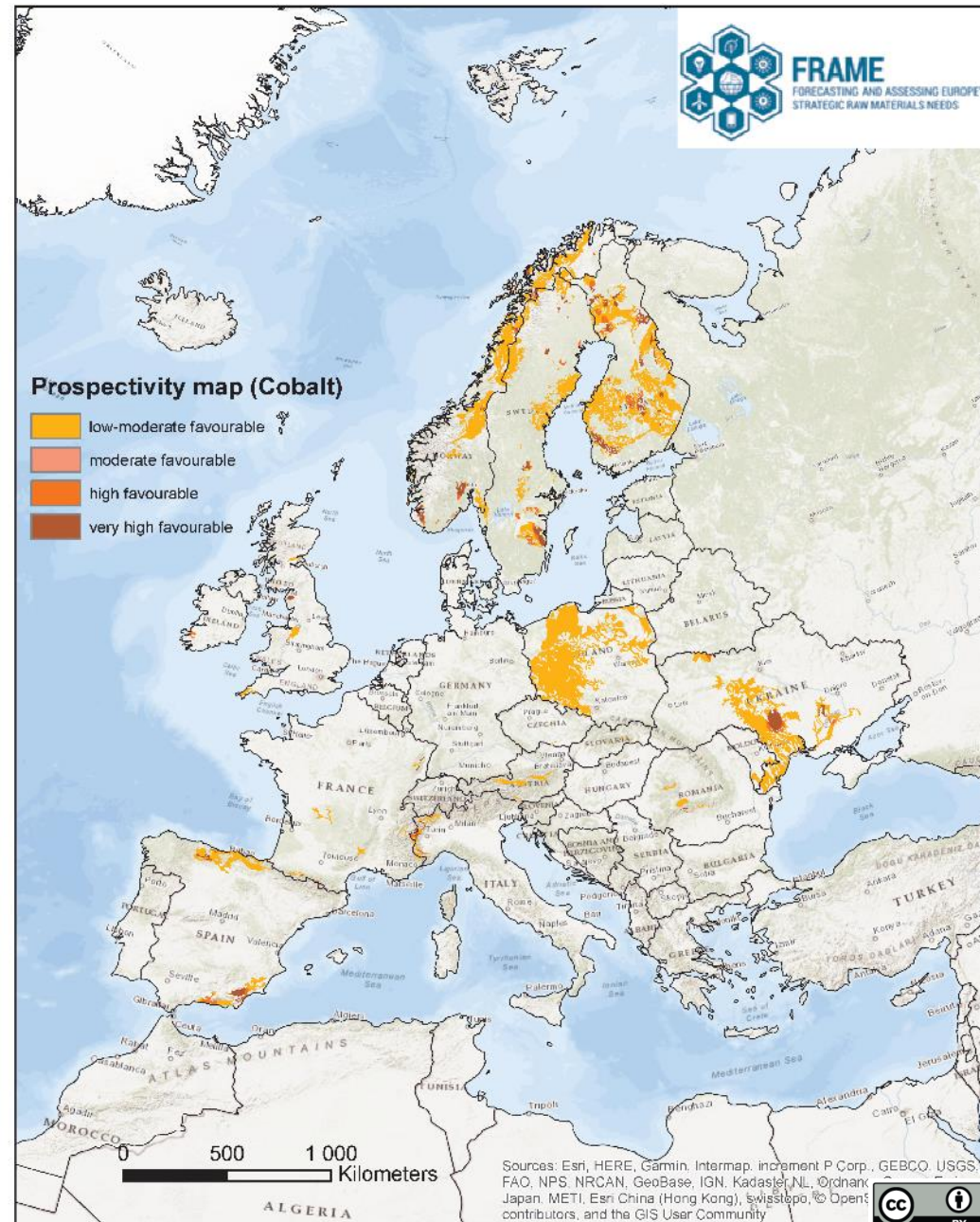


# FRAME – Preliminary Results:

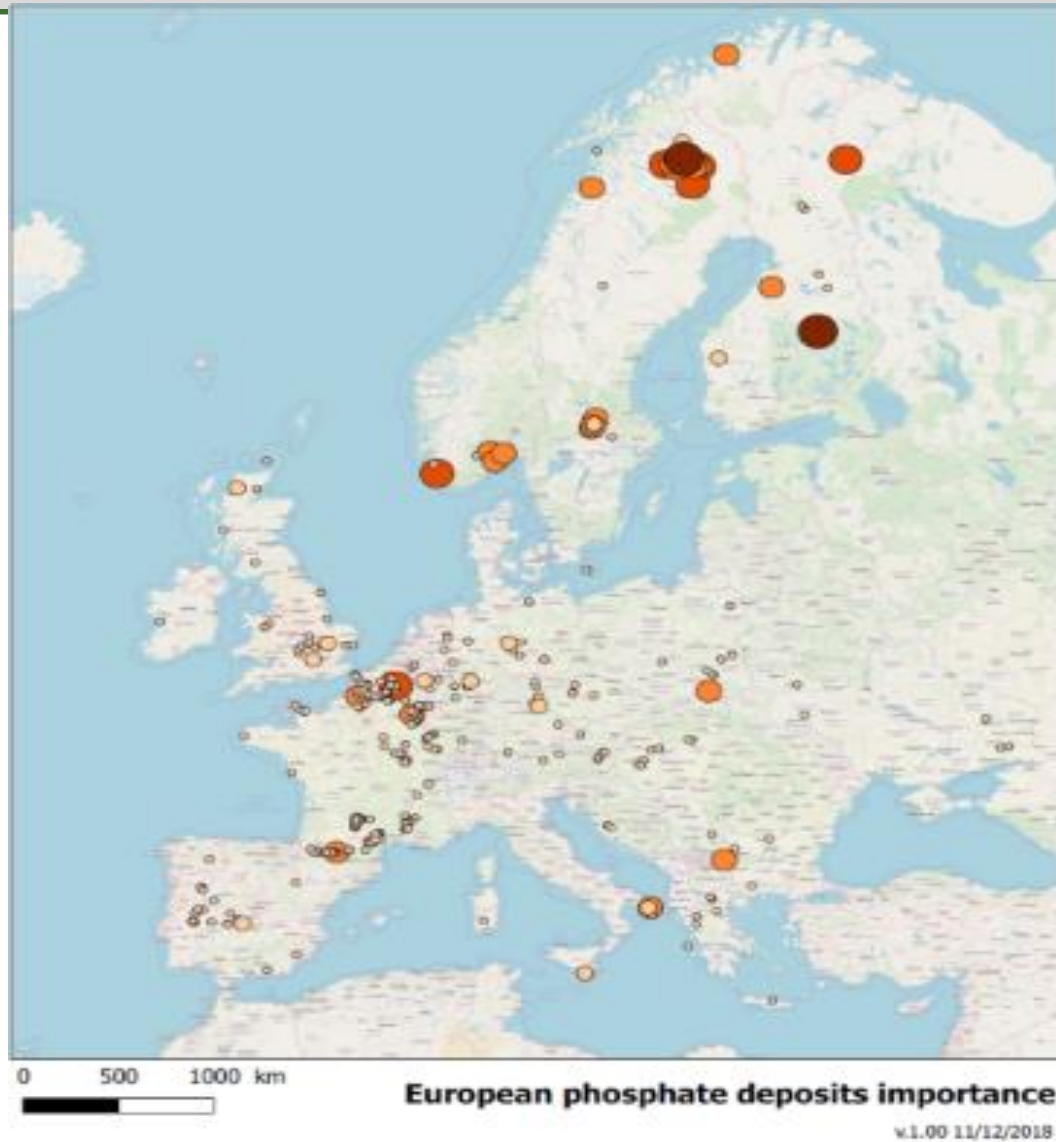
## Predictability Mapping (Potential for Co in Europe)



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







# FRAME – Preliminary Results

## Phosphate deposits and occurrences in Europe

Decrée, S., Burlet, C., Goovaerts, T., Batista, M.J., de Oliveira, D.P.S., Al-Bassam, K., Malyuk, B., Coint, N., McGrath, E., Bauert, H. (2019). Overview of the European phosphate deposits and occurrences: A project dedicated to phosphate mineralizations and associated critical raw materials. Proceedings of the 15th SGA Biennial Meeting, Glasgow, United Kingdom, 27-30 August 2019; volume 4, pp. 1720-1723.



## **· FRAME's (Forecasting and Assessing Europe's Strategic Raw Materials Needs) contribution to the "European Green Deal"**

Authors: Daniel P. S. de Oliveira, Maria João Ferreira, Martiya Sadeghi, Nikolaus Arvanitidis, Sophie Decrée, Håvard Gautneb, Eric Gloaguen, Tuomo Törmänen, Helge Reginiussen, Henrike Sievers, Lídia Quental Quental, and Antje Wittenberg.

## **· Lithium, Cobalt and Graphite occurrences in Europe, Results from GeoEra FRAME project wp 5**

Authors: Håvard Gautneb, Eric Gloaguen, and Tuomo Törmänen.

## **· Prospectivity mapping of niobium and tantalum in Europe; a part of the GEOERA- FRAME project**

Authors: Martiya Sadeghi, Guillaume Bertrand, Helge Reginiussen, Nikolas Arvanitidis, Erik Jonsson, and Daniel P.S. de Oliveira.


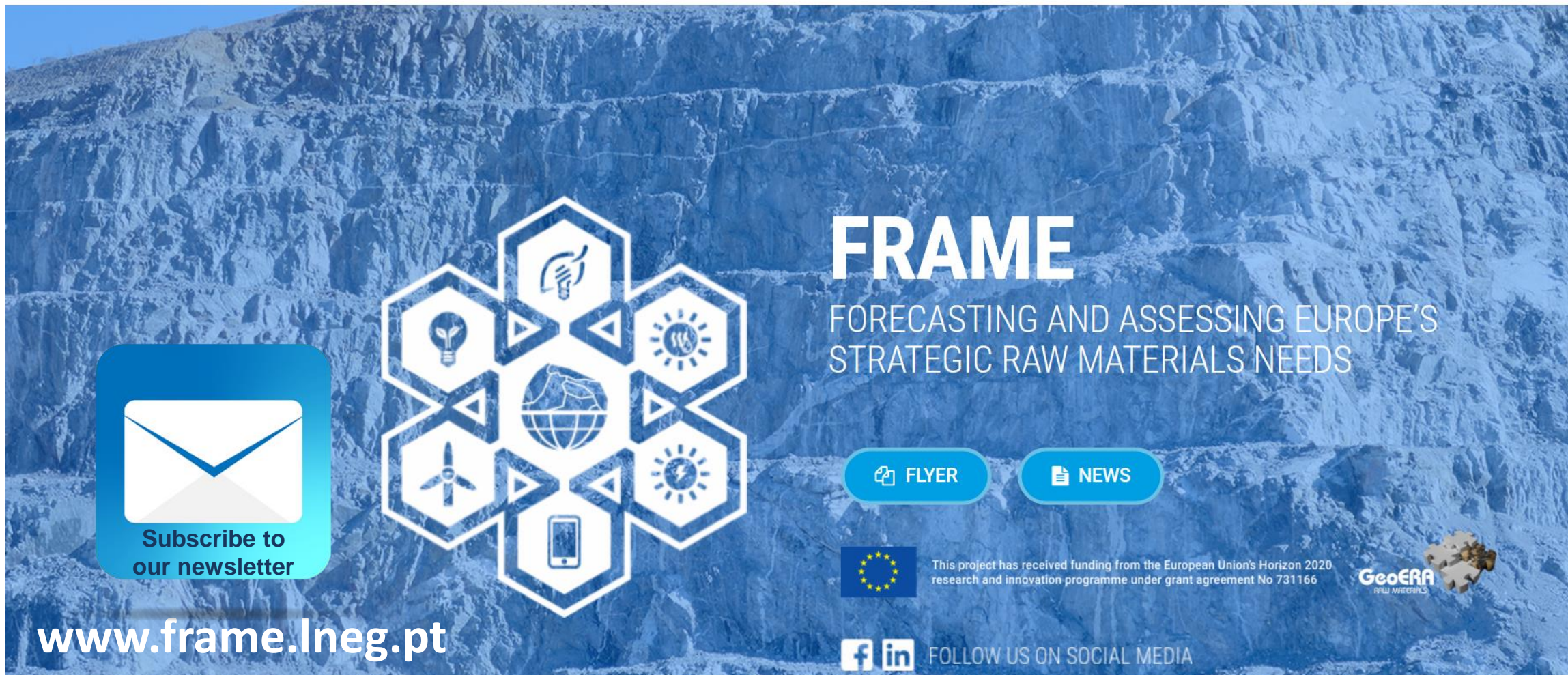
## **· FRAME: towards conflict-free Nb-Ta for the European Union**

Authors: Helge Reginiussen, Erik Jonsson, Susana María Timón Sánchez, Alejandro Díez Montes, Klemen Teran, Rute Salgueiro, Augusto Filipe, Carlos Inverno, and Daniel P.S. de Oliveira.




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