

***The integrated mining ecosystem and improved governance of RIS3 – emergence new collaboration and cross fertilisation***

***Alexandra B. Ribeiro, José A. Almeida, José C. Kullberg***



NOVA University Lisbon | Centro, Portugal



European Union  
European Regional  
Development Fund

25/02/2021

# Centro 2020 Policy Instrument in REMIX



## Thematic Objective 1

**Reinforce investigation, technological development and innovation**

## Financial envelop

**ERDF 169M€**

### Investment Priority

**IP 1.2. the promotion of business investment in R&D, the development of links and synergetic between companies, research and development centers and the higher education sector**, in particular the promotion of investment in the development of products and services, in technology transfer, in social innovation, in eco-innovation, in applications of public interest, in the stimulation of demand, in networks, clusters and open innovation through smart specialization and the support of technological and applied research, pilot lines, early actions of product validation, advanced production and first production capabilities, particularly regarding key enabling technologies, and the dissemination of general interest technologies.

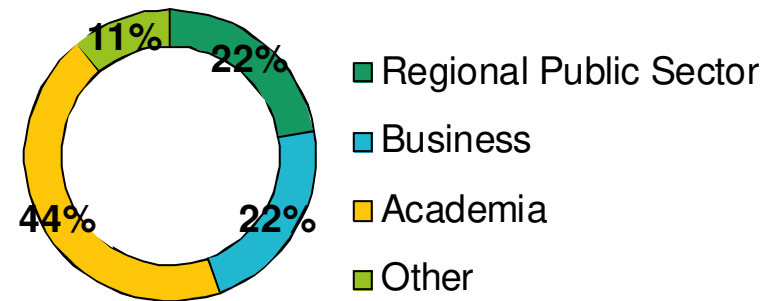
## *The integrated mining ecosystem*

Through **REMIX activities** it was possible to identify and bring together the mining ecosystem, characterized by a strong presence of academia and business sector, tough cooperation between Institutions is hard to implement

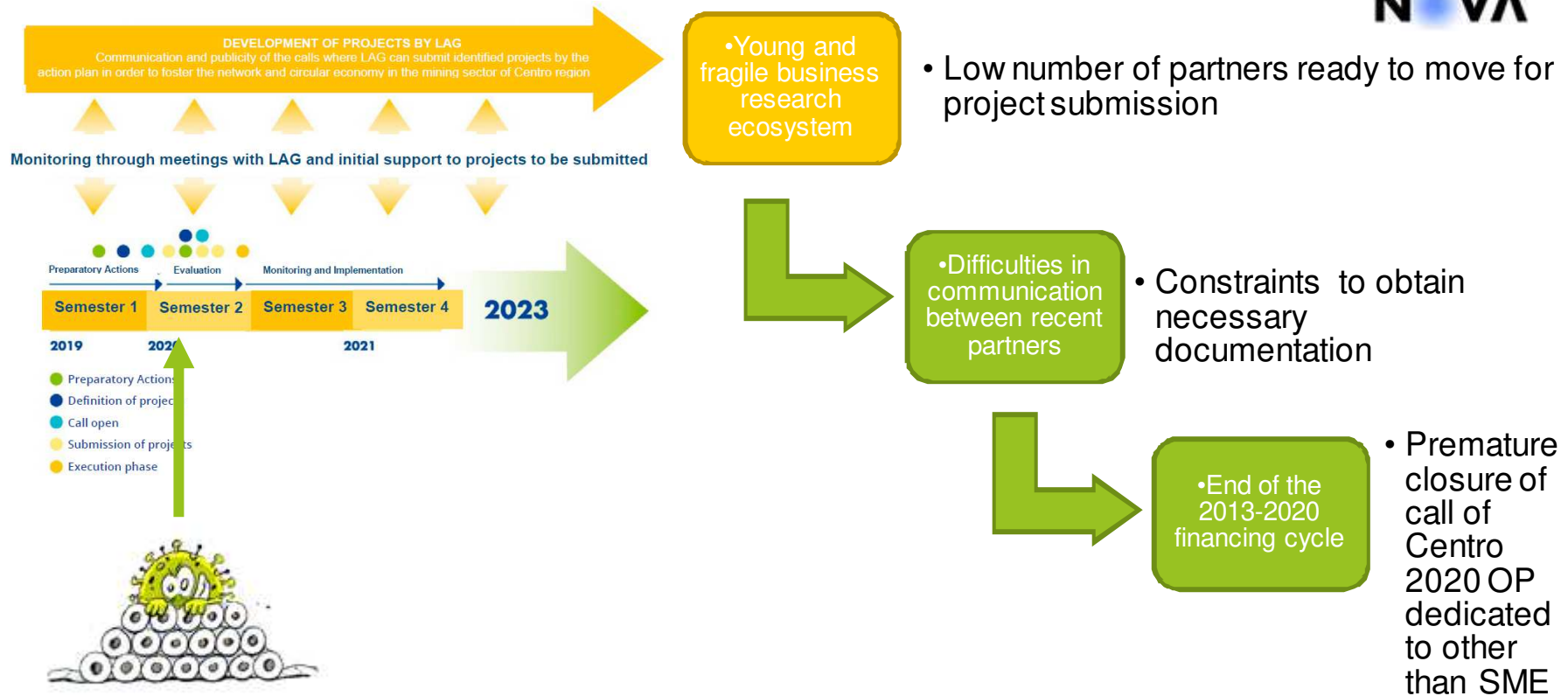


**Difficulties in the submission of joint projects to Centro 2020 OP Objective 1.2 calls**

## Centro Region Mining Ecosystem

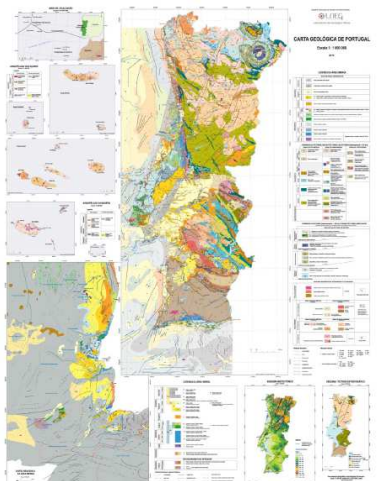


# Cascading effects of Covid-19



## Major projects supported in Centro Region

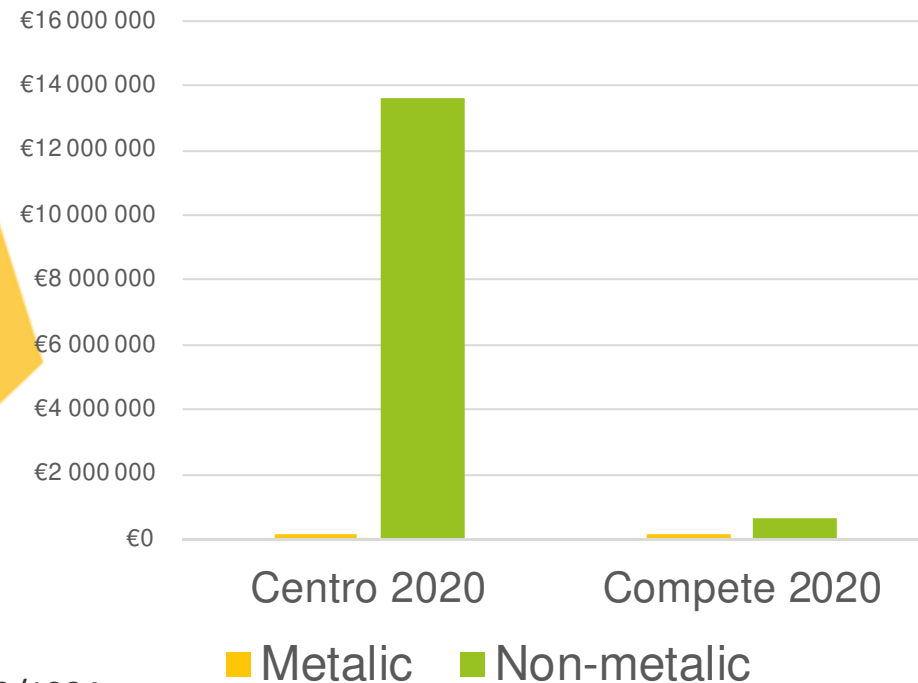
continue to be in non-metallic sector, though high and recent interest in metallic elements



New 1/1000000 Geologic chart – 2020

Source: <https://repositorio.lneg.pt/handle/10400.9/1034>

## Typology of projects supported in 2013-2020 for mineral natural resources and amounts



# Recent interest in metallic elements

## Lithium race



Lisbon's actions will also have repercussions beyond its borders. Its reserves may be modest compared to Australia and Chile, the world's top lithium producers, but **Portugal is central to Europe's bid to cut reliance on lithium imports.**

Tapping European deposits of the "white gold" is an important part of the European Union's ambition to secure more of the battery value chain as the continent's carmakers roll out electric vehicles, a European Commission spokesperson said.

Portugal, which produced about **1,200 t of lithium last year, currently sells almost exclusively to the ceramics industry, rather than producing high-grade lithium needed for car batteries.** It is already Europe's largest lithium producer, but Portugal remains a small player compared to Australia and Chile, with output of 42,000 t and 18,000 t respectively.

Europe, with just 3% of global battery production capacity, has no lithium refineries and relies on imported raw materials.

As the world seeks to phase out fossil fuels, dozens of miners, such as Australia's Fortescue, have applied for **almost 100 licenses to explore for lithium in Portugal.**



### Lithium mining in Portugal

Across Portugal, Europe's largest producer of lithium, a battle is brewing between companies eager to exploit the country's 60,000 tonnes of known lithium reserves – a key ingredient in batteries for electric cars, mobile phones and energy storage – and locals determined to block exploration on their turf.

Tapping into European deposits of the so-called "white gold" is an important part of the continent's ambition of reducing its dependency on foreign suppliers and capturing a larger part of the continent's lithium battery value chain, according to a spokesperson for the European Commission.

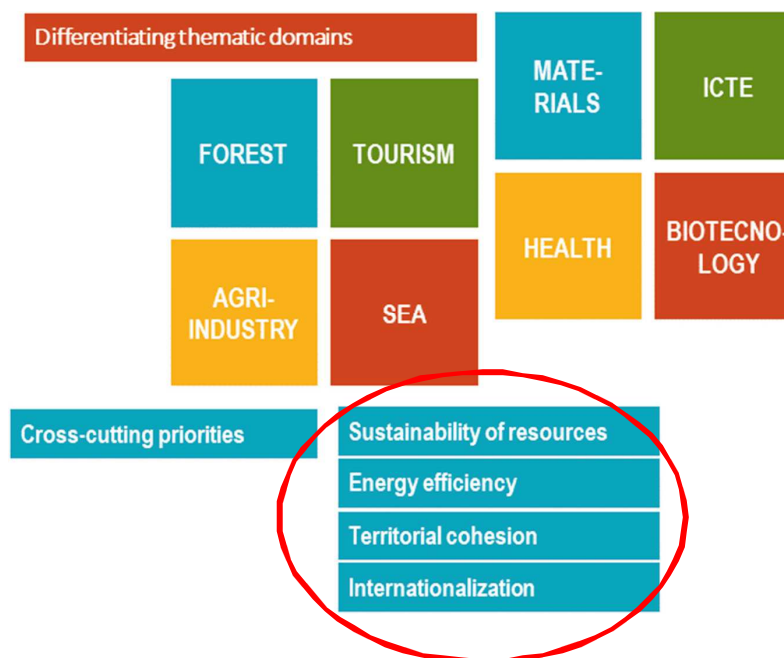
Note: Lithium reserves data from 2010. Sources: Institute for Nature Conservation and Forests (ICNF); National Laboratory for Energy and Geology (LNEG); Shuttle Radar Topography Mission from Nasa via SRTM Tile Grabber; Natural Earth; The University of North Carolina at Chapel Hill; European Environment Agency; OpenStreetMaps; Maps4News

P. K. Dutta, 14/02/2020

# Governance of RIS3

Clearly mention in next RIS 3:

- **Metallic Natural Resources**
- **Circular Economy Models**



# Emergence new collaboration



## Action 1) Sustainable Industrial Actions

Sectorial actions	Partners and role	Estimated costs
1.1 Development and implementation of Appropriate Process Technologies (APT) for industrial beneficiation of substances produced in mining projects	Universities, R&D centres, LNEG, technological and biotechnological companies – Research and development	1M€
1.2 R&D projects in automation, remote operations, telemetry, communication and intercommunication in underground environment		2 projects 1M€ each
1.3 Development of innovative technologies for sustainable exploitation of metallic and non-metallic mineral resources with the purpose to turn the processes more efficient, less costly, and, at the same time, reducing mining waste	Metallic and non-metallic mining companies and EDM – Provide data, implementation and testing	4 projects 350 000€ each
1.4 Turn mining wastes in raw materials and also reinforcing the circular economy (e.g. metal recovery from tailings and dumps, stone aggregates, geopolymers)	Mineral Resources Cluster – facilitator and dissemination  Municipalities – the same as the mining companies in the case of being owners of mining wastes	4 projects de 350 000€ each
<b>Total investment</b>		<b>5,8M€</b>



# Emergence new collaboration

## Action 2) Improvement and valorisation of endogenous resources

Inspired by Poland (Lower Silesia) provide excellent models for the development of the needs found not only in Centro region but also in other Portuguese regions (e.g. Alentejo), since they have developed a “Database with geochemical maps of selected areas”



Sectorial actions	Players involved and role	Estimated costs
2.1 Assessment and mapping of the potential in deep metallic deposits with focus on critical minerals	Universities, R&D centres and LNEG – Research, development and mapping Metallic and non-metallic mining companies and EDM – Provide data, access to test sites and support research work Mineral Resources Cluster – promote links between research entities and companies as well as dissemination CCDR Centro – Provide data and build database	500 000€
2.2 Mineral resources assessment of the mining tailing and dumps		350 000€
2.3 Assessment and mapping of geothermal potential for the production of electricity;		250 000€
2.4 Assessment and mapping of lithium resources;		300 k€
2.5 Geological mapping, exploration and inventory of the available mineral resources;		1 M€
2.6 Streamline access to exploitation and sustainable supply of resources, under properly framed legal conditions, with participation and follow-up of all stakeholders and interested parties – development of Centro region policy for mining		250 000€
2.7 Innovative technologies to restoration, environmental monitoring and control of the old mining sites		4 projects of 200 k€ each
2.8 Assessment of the groundwater resources and the impacts of global change;		250 k€
2.9 Assessment of the potential of unconventional water sources (quarries and other abandoned sites)		200 k€
<b>TOTAL investment</b>		<b>3.9M€</b>

# Emergence new collaboration



## Action 3) Territorial Innovation

Inspired by example from Cornwall and Isles of Scilly we learned from transforming a disused tin mine site into an environmentally pioneering earth science cluster, attracting international mining and minerals businesses, developed by a cluster of business and also from Poland with the “Revitalisation of a closed coal mine into a living science and art centre”

Sectorial actions		Estimated costs
3.1 To promote tourism in the mining regions, in partnership with local decision-makers, NGOs and local associations through the promotion of the old or present mining activities but also to allow the mineral dependence awareness of our society among the young people using innovative dissemination tools; includes also the promotion of the "Roteiro de Minas - Guide of the Portuguese geological and mines sites"	Universities and R&D centres National Laboratory of Energy and Geology (LNEG) Directorate General for Energy and Geology (DGEG) Mineral Resource Cluster (MRC) Metallic and non-metallic mining companies EDM Design and multimedia companies Mining and old mining workers Associations	3x200k€
3.2 Preservation of the mining heritage supported in cultural centres, museums and other similar structures	(MWA) Municipalities Regional centres for the dissemination of science (CCV) Center Portugal Regional Coordination and Development Commission (CCDRC)	5M€
<b>Total investment</b>	Turismo Centro de Portugal	<b>5.6M€</b>

# *Cross fertilisation needs*



## **Stimulating innovation by means of cross-fertilisation of knowledge**

The **goal** is to **reinforce regional and inter-regional collaboration** at a national level, as it happens in REMIX for Centro and Alentejo.

**Also reinforce cross-border level and international for cross-sector collaboration in R&I, in order to better face global challenges.**



# REMIX

Interreg Europe



European Union  
European Regional  
Development Fund

Thank you!

Questions welcome



*Project smedia*

