Regional Specialization Strategy in Critical Raw Materials in Centro of Portugal (PT)

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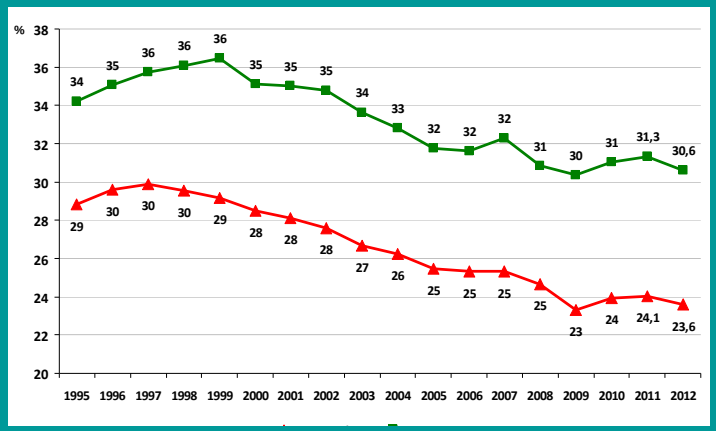
CENTRO REGION (PT) IN THE NATIONAL CONTEXT

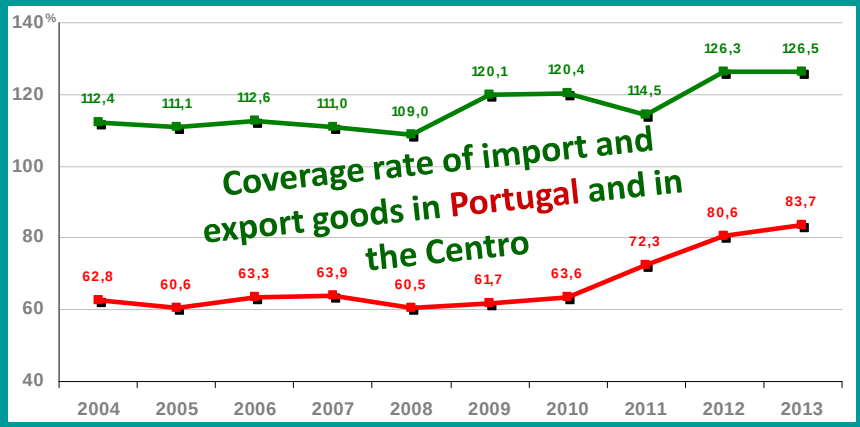
• **Population (2011): 2 256 364 inhabitants;**	(22.0% of Portugal)
• **Area: 28,200 km²**	(31,0% of Portugal)
• **Gross Domestic Product, GDP (2014);**	(18.0% of Portugal)
• **GDP *per capita* (2014): 14.392 euros;**	(86.0% of Portugal)
• **GDP in PPS *per* inhabitant (2014);**	(67,4 / EU28 = 100)
• **Exports of goods (2014): 9.648 million euros ;**	(19,0% of Portugal)

CENTRO REGION (PT) IN THE NATIONAL CONTEXT

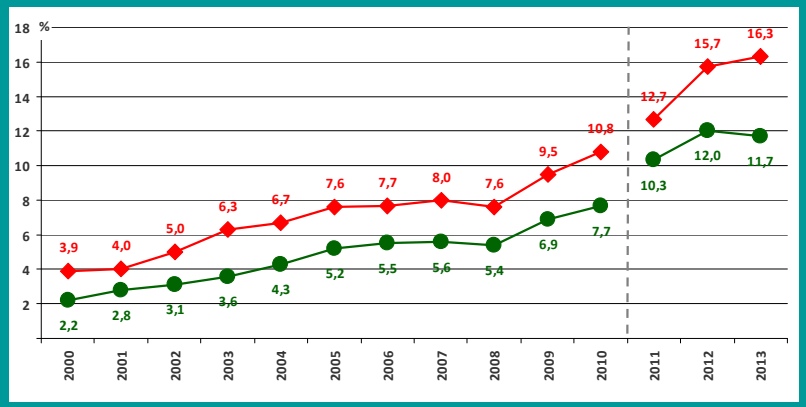
GVA in industrial sector



Exports/Imports of Goods

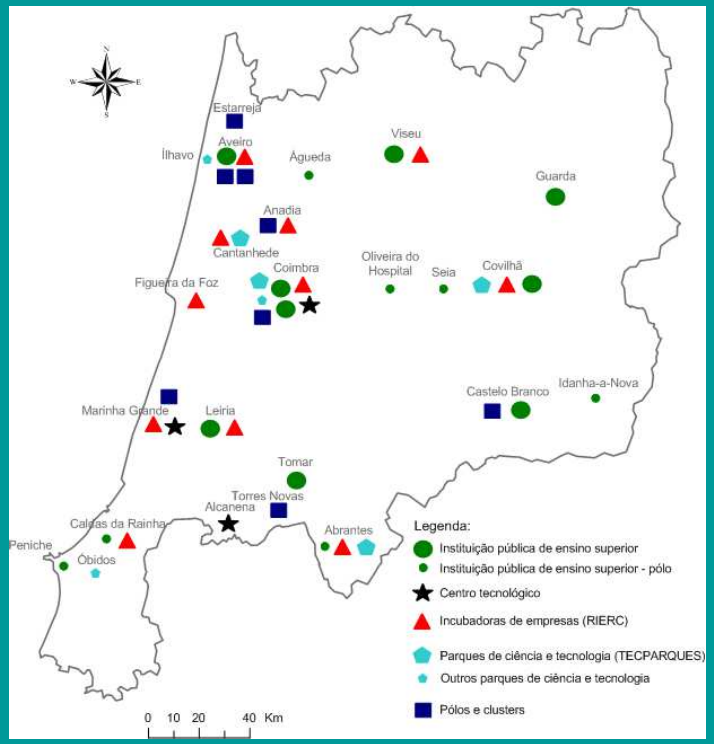


Relative Resilience of Employment



CENTRO REGION (PT)

A BALANCED SCIENTIFIC AND TECHNOLOGICAL SYSTEM



- 9 public higher education institutions
- 3 technology transfer centers
- 11 business incubators (in a network)
- 7 science and technology parks
- 3 clusters and 5 poles of regionally-based Competitiveness

+

73.000 companies

A polynuclear network of medium-sized cities

CENTRO REGION (PT) - REGIONAL STRATEGY - THE RIS3

4 innovation hubs, based in 8 tematic domains and in cross cutting priorities were defined in the RIS3 process of the Centro Region

Forest	Tourism
Agriculture	Sea

Materials	ICET
Health	Bio technology

Cross cutting priorities

- Sustainable resources
- Energy efficiency
- Territorial cohesion
- Internationalization

1. Sustainable industrial solutions
2. Valorization and efficient use of natural endogenous resources
3. Technology supporting quality of life
4. Territorial innovation

CENTRO REGION (PT) - REGIONAL STRATEGY - THE RIS3

1. Sustainable industrial solutions	Promotion of sustainable materials, products and processes leading to a new industry as a reply to societal challenges such as the efficient use of resources, circular economy, mitigation of climate changes and Industry 4.0.
2. Valorization and efficient use of natural endogenous resources	Valorization of endogenous resources, mapping and preserving them as well as creating new added value products for different sectors. Monitoring and integrated management of endogenous resources.
3. Technology supporting quality of life	Development of technologies and solutions for health prevention, diagnosis and new treatments. Healthy and active ageing solutions. ICT systems development. Welfare and health tourism integrated offer.
4. Territorial innovation	Territory innovation projects development from low density rural areas innovation to sustainable cities solutions as a test bed for green and low-carbon economy as well as for tourism qualification and regional competitiveness.

CENTRO REGION (PT) - REGIONAL STRATEGY - THE RIS3

HUBS AND THEMES IN CRITICAL RAW MATERIALS

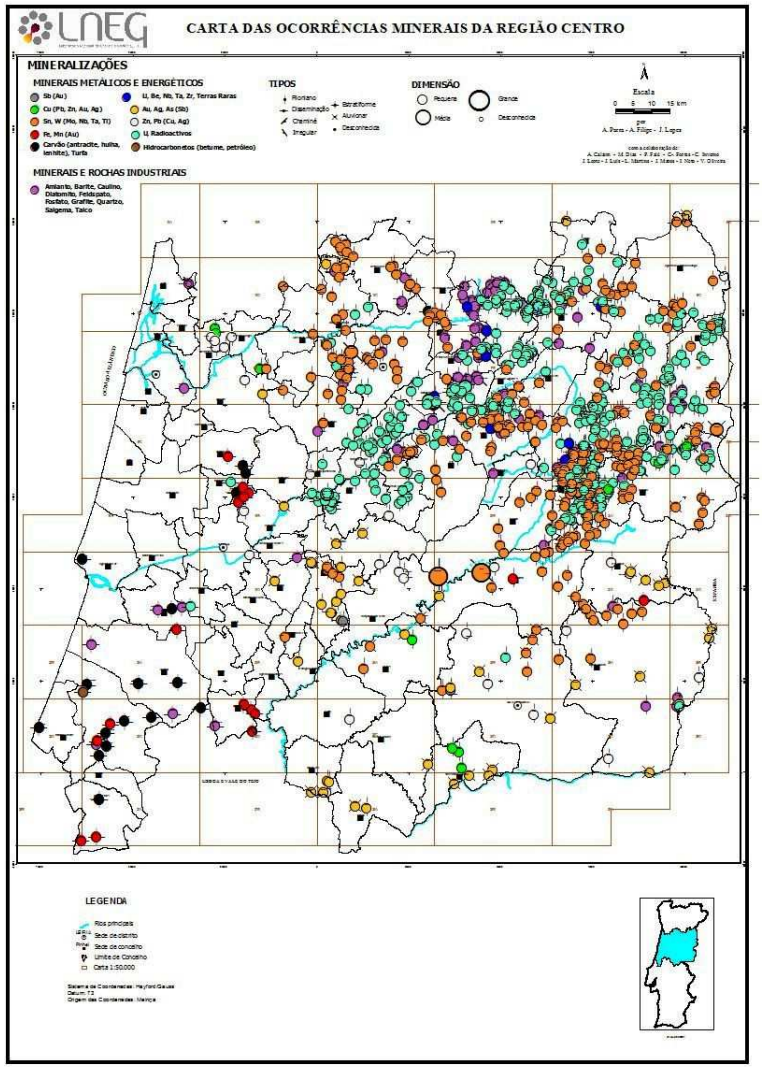
1. Sustainable industrial solutions

- Promotion of projects that will lead to an efficient use of resources (energy, water and materials) including decarbonization and reducing other impacts as well as **the valuation of mineral resources in the region**;
- Recycling, reuse and recovery of waste and by-products as **secondary raw materials**, including industrial symbiosis.

2. Valorization and efficient use of natural endogenous resources

- **Promotion of study and research initiatives of the geological resources of the region**;
- **Promotion of enhancement projects of geological resources of the region, particularly in the application of new technologies for the detection and exploitation of deep deposits (land and sea) and metallic low concentration deposits.**

CENTRO REGION (PT) - MINERAL OCCURRENCES



	metallic and energetic minerals
●	**Antimony** (Au)
●	Copper (Pb, Zn, Au and Ag)
●	Tin, **Tungsten** (Mo, Nb, Ta, Tl)
●	Iron, **Manganese** (Au)
●	Coal
●	Uranium, **Beryllium**, **Niobium**, Tantalum and Zirconium
●	Gold, Silver, Arsenic (Sb)
○	Zinc, Lead (Cu, Ag)
●	Uranium
●	Hydrocarbonates
●	nonmetallic minerals

CENTRO REGION (PT) - CRITICAL RAW MATERIALS

In a small scale, the following critical raw materials occur in the Centro Region:

- Antimony;
- Manganese;
- Beryllium;
- Niobium.

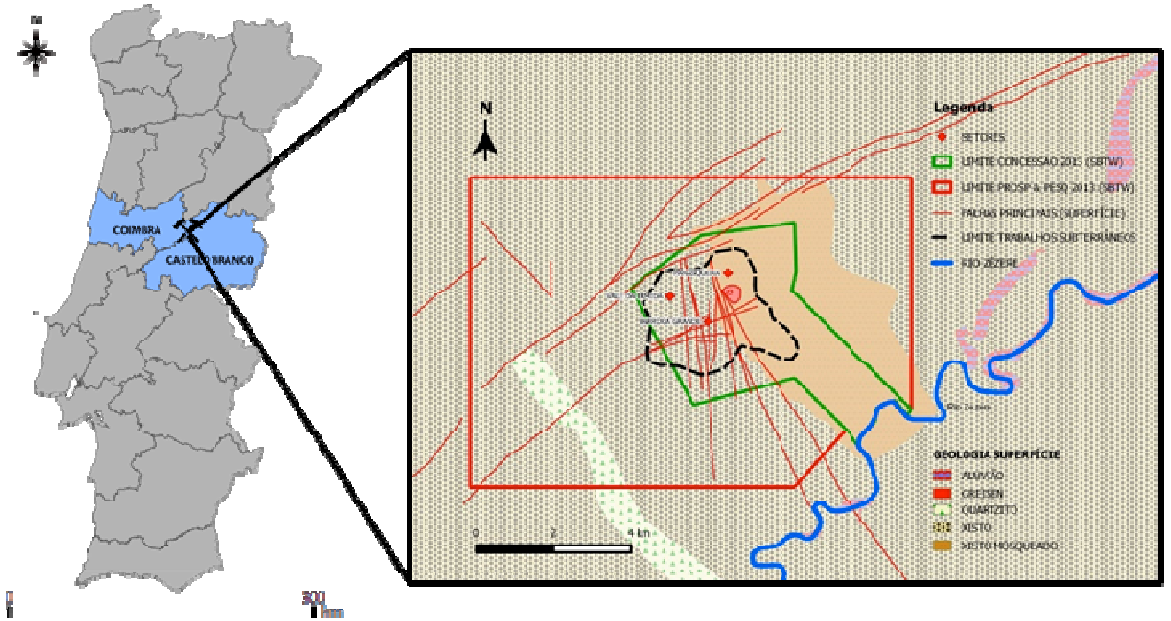
In small, medium and large scale, the following critical raw material occurs in the Centro Region:

- Tunsgten.

CENTRO REGION (PT) – CRITICAL RAW MATERIALS

PANASQUEIRA MINE - TUNGSTEN (W)

Portugal has been the main European producer of Tungsten but exploration is currently restricted to a single mine (Panasqueira).



In: Comunicações Geológicas (2014) 101, Especial II, 829-832
Study of Sn spatial distribution on W-Sn(Cu) Panasqueira ore deposit F. Pinto, R. Vieira, P. Ferraz, F.Noronha

CENTRO REGION (PT) – CRITICAL RAW MATERIALS

PANASQUEIRA MINE - TUNGSTEN (W)

Aerial view

Waste tailings

CENTRO REGION (PT) – CRITICAL RAW MATERIALS

PANASQUEIRA MINE - TUNGSTEN (W)

Today, there are doubts about the lifetime of the Panasqueira Mine. According to MINDAT.ORG, the mine will last approximately 40 more years.

The Centro Region has a favorable geological setting for the occurrence of new Panasqueira-type deposits, although, at a larger depth.

New technologies must be developed for prospecting deep deposits as well as mining exploitation.

CENTRO REGION (PT) – CRITICAL RAW MATERIALS

PANASQUEIRA MINE - TUNGSTEN (W)

The mine waste tailings of the Panasqueira Mine have a great potential for recuperation of other metals, including critical raw materials.

New technologies, including biotools, must be developed for the recycling, reuse and recovery of the mine waste tailings.

Thank you for your kind attention

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