Smart Soils: Smart Specialisation meets EU Soil Mission

24 January 2024

Remediation of uranium legacy sites in Centro Region in Portugal



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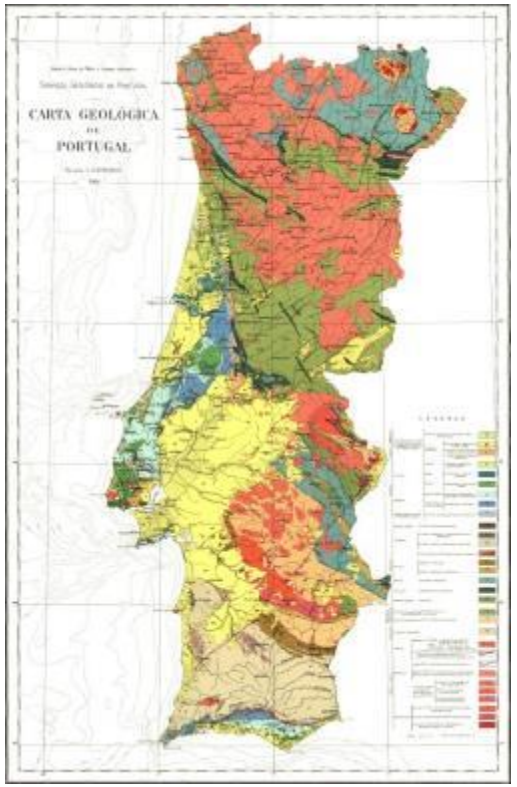
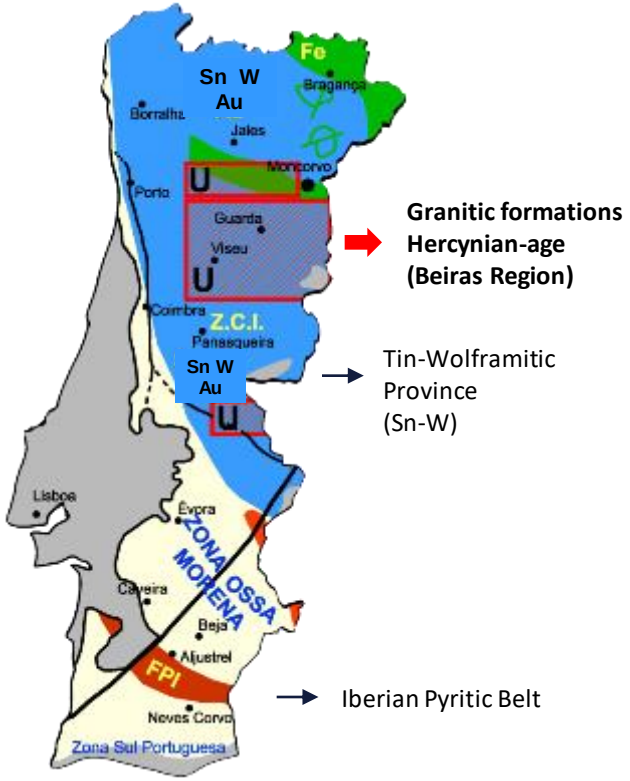
Uranium mining in Portugal

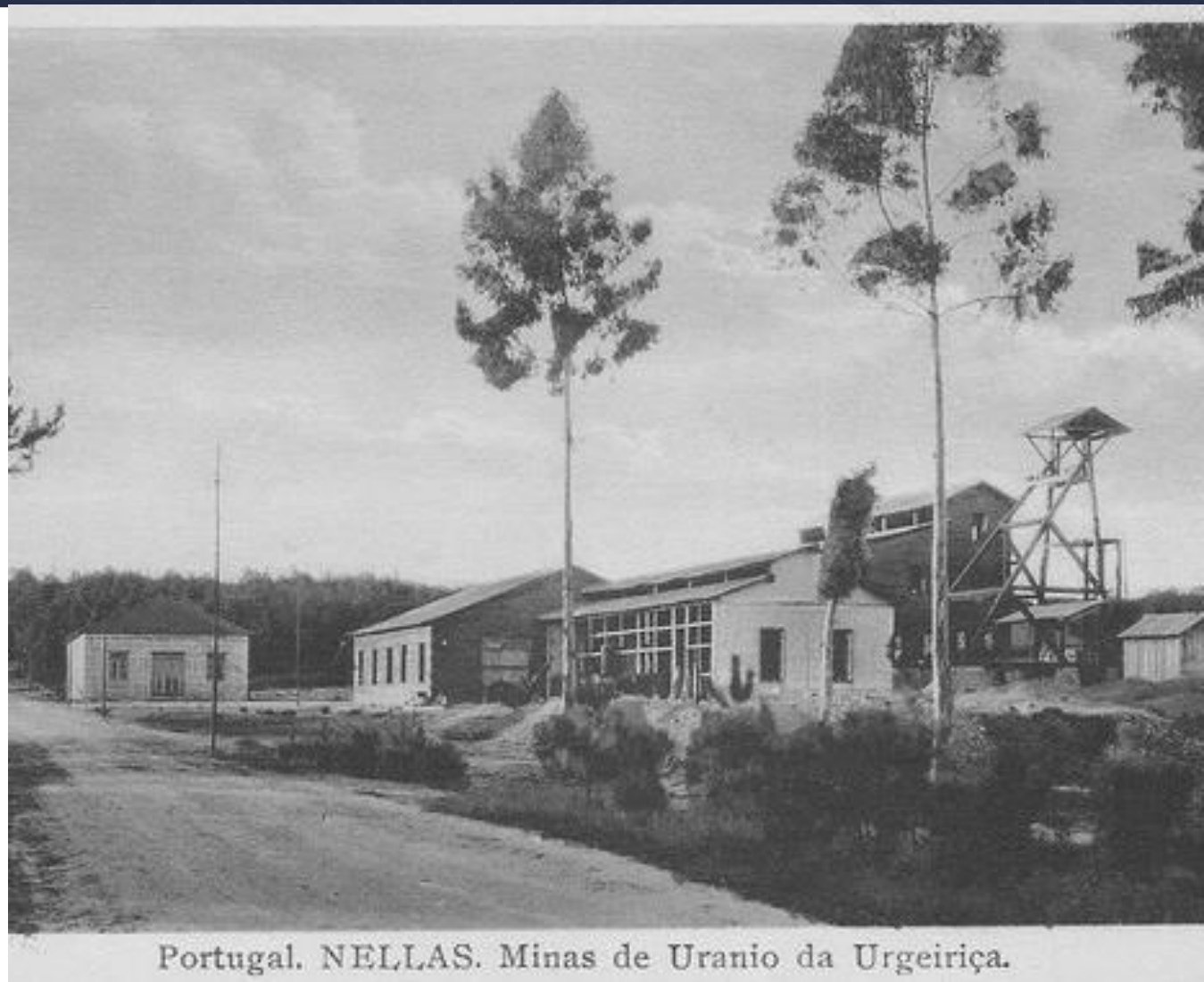
high geological, geotectonic and geodynamic diversity, which generate specific conditions for the formation of mineral resources



Mainland Geology Map of Portugal
1:1000.000 LNEG Edition



Metallogenic Portuguese Belts
Abandoned Mine Legacy, DGEG & EDM Edition



Portugal. NELLAS. Minas de Uranio da Urgeiriça.

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Uranium mining in Portugal

286 uranium occurrences

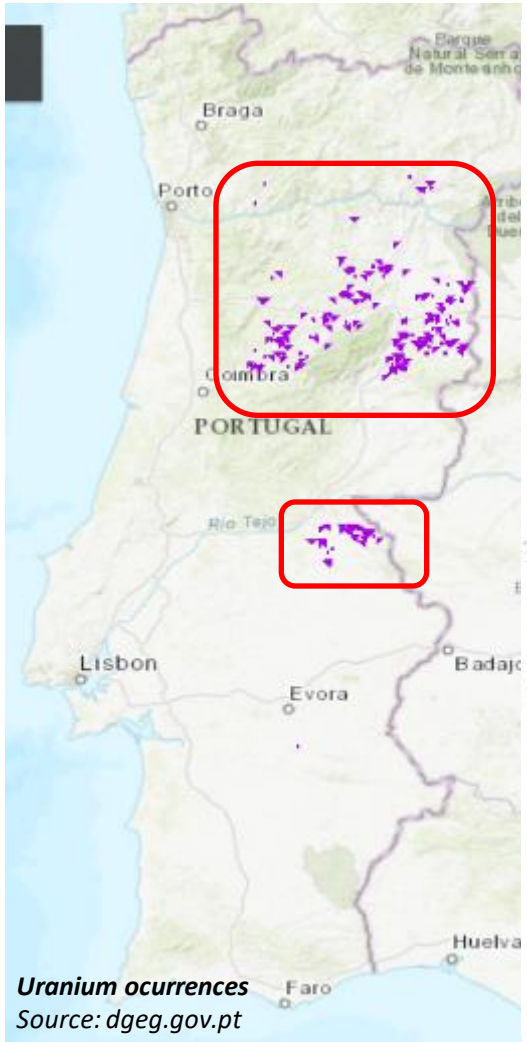
62 radium/uranium mining sites

Operation from 1907-1991

- 50 g Ra until 1944
- 3720 tU in U_3O_8 to 1991

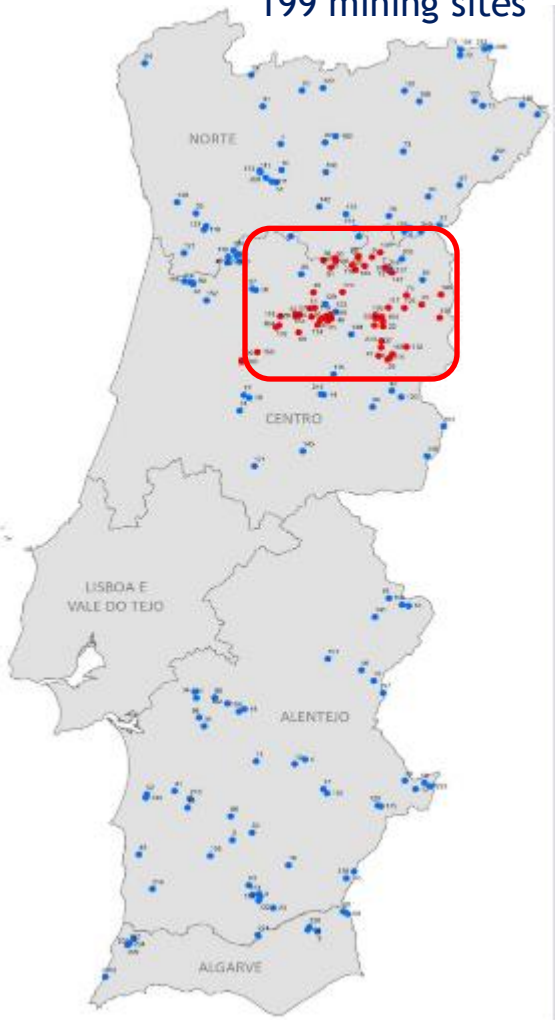
Exploration methods:

- Underground mines, open pits, both
- In situ leaching with acidic solutions



Uranium ocurrences
Source: dgeg.gov.pt

199 mining sites



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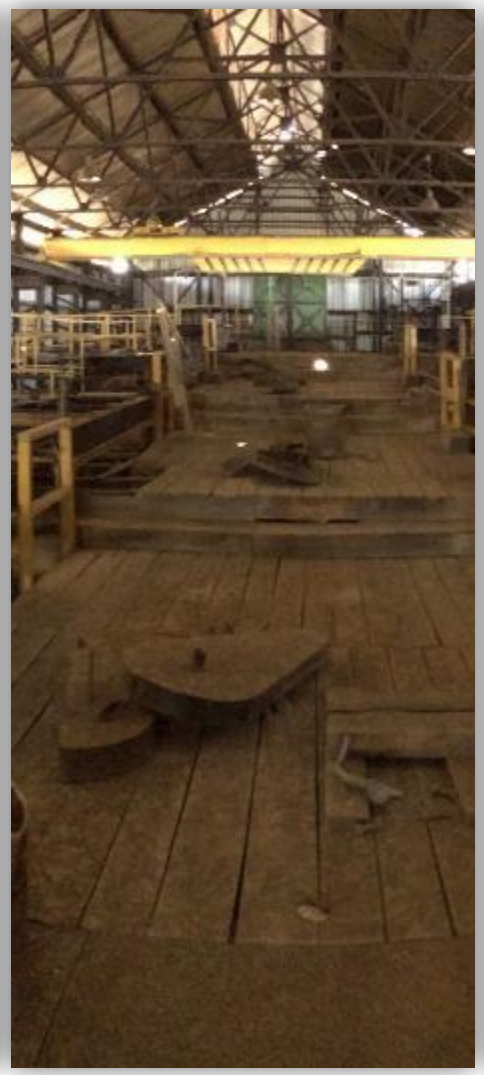
Remediation of uranium legacy sites in Portugal

Starting point

- Uranium exploitation since 1907
- Villages grew around mines
- Existing exposure situations
- Environmental liabilities
- Degraded mining infrastructures
- Complex social situation after mine “closure”
- Social Pressure on “old workers” vindications
- Mistrust about “remediation” process

Remediation of uranium legacy sites in Portugal


Remediation of uranium legacy sites in Portugal

Considering:

- Environmental Framework Law (DL 11/87 of 7 April)
- National Plan of Environment Policy (1995)
- Mining Framework Law (DL 90/90)
- The National Environment Legislation
- European Directives

That aims to:

- **Eliminate the risk factors for public health and safety**, resulting from water pollution, soil contamination, heaps and any unprotected areas;
- **Rehabilitate the surrounding landscape and natural conditions** of development in accordance with the previous habitat;
- Ensure the **preservation of significant heritage** of old mines, both economic and archaeological and the valorization of archaeological remains related to mining activity;
- Provide conditions for **future use of reclaimed areas** such as agricultural or forestry use, tourist and cultural promotion, or another that promotes the community development.

Remediation of uranium legacy sites in Portugal

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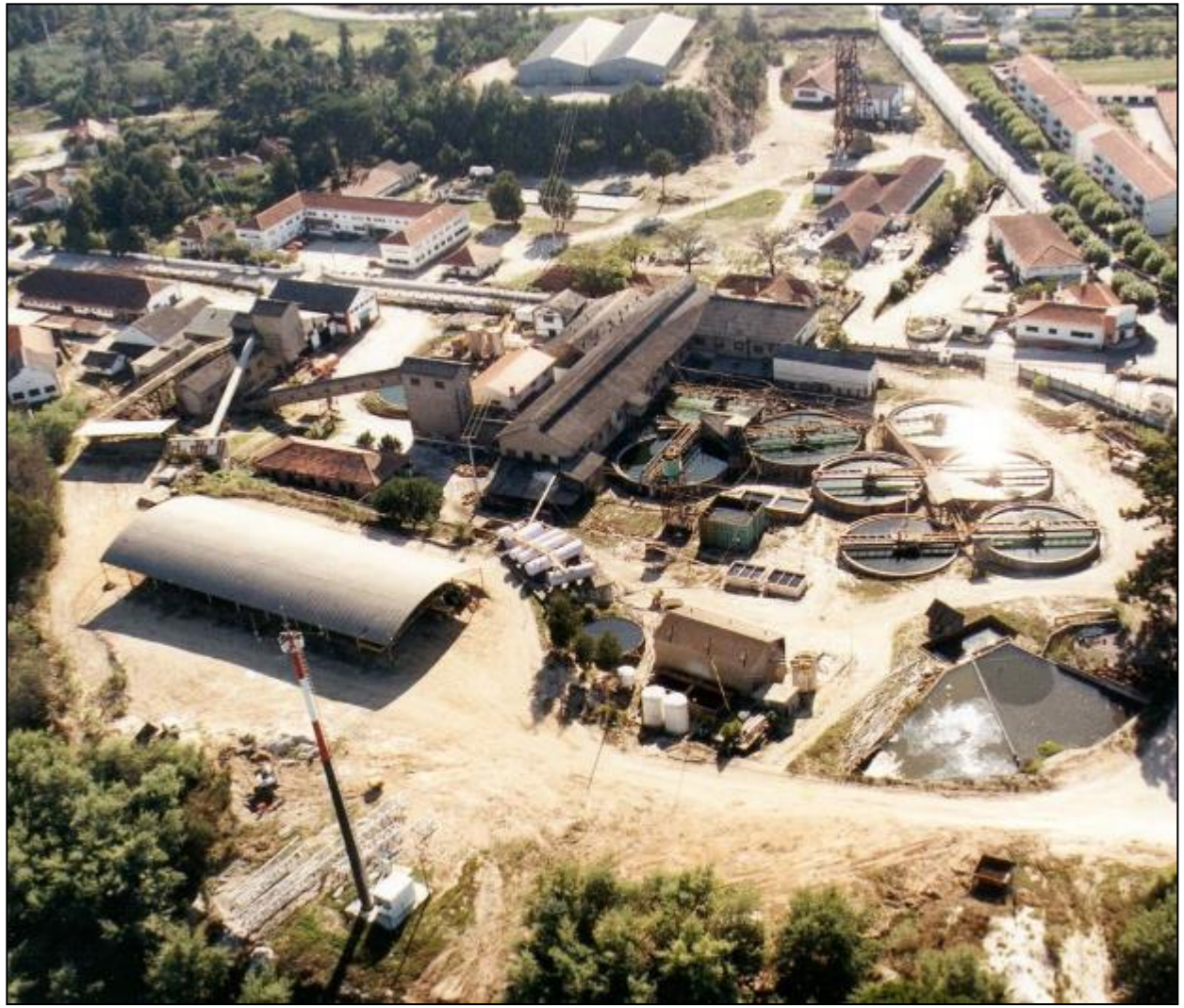

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Perspectives for sustainable post-remediation management

- **Promoting "Industrial Tourism":**
  - Identified end-use for relevant historical sites
  - Guide to the Portuguese Geological and Mining Points of interest (www.roteirodeminas.pt)
  - Contribute to preservation of mining heritage infrastructures
  - Contributes to preservation of history of uranium mining and milling in Portugal
  - Promote **socio-economic development** of mining region
  - Fosters sense of ownership and community
  - **Honors the memory of uranium mining community**

Creation of the Uranium Mining Museum (Urgeiriça)

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Perspectives for sustainable post-remediation management

- **Generation of renewable energy** (e.g. solar)
  - Auto-consumption
  - Renewable energy communities
  - Injection in the national grid
- **Promotion of a "Research Centre" in Urgeiriça**
  - Collaboration with universities
  - R&D Projects
  - Training Activities
  - Laboratories
  - Start-up companies
- **Industrial/institutional beneficial reuse**

Seibersdorf Interim Storage (Photo: NES GmbH

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Final Considerations

- Remediation in Portugal contributed to effective reduction of risks to public and the environment, promoting mining heritage preservation and **safe beneficial reuse** of former degraded areas.
- Important to promote and maintain effective **stakeholder participation** throughout the remediation process.
- Post-remediation management is essential to ensure the **sustainability of remediation in the long-term**.
- **Collaborative, pro-active and holistic approach**, considering technical, social, economic aspects to address challenges and seize opportunities in remediated sites, contributing to the achievement of several **Sustainable Development Goals.**

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