CLUSTER PORTUGAL MINERAL RESOURCES

The importance of clusterization: Portuguese examples in circular economy and in land use planning

REMIX meeting, Fundão, Portugal
11th November 2018
BACKGROUND

Cluster of Natural Stone Partnership Portugal Mineral Resources

- Cluster of Natural Stone recognized by the Portuguese Government
- Valorpedra Association

2008-2013

2014

- Partnership Portugal Mineral Resources

2016/17

- Cluster of Mineral Resources
- Recognized by the Portuguese Government

Cluster Portugal Mineral Resources
RESULTS

Investment = (5 years) = 54 M€
More than 100 projects
CLUSTER PORTUGAL MINERAL RESOURCES

Promote knowledge and sustainable economic value for mineral resources, boosting the export capacity and the added value.

Deepening knowledge of the economic potential of resources, promoting R & D + I, improving productive investment conditions and access to markets, as well as increase skills (technical, technological, management) and stimulate inter-company and inter-institutional cooperation.
45 SMEs
2 SECTORIAL ASSOCIATIONS
10 UNIVERSITIES
2 I&D INSTITUTES
1 REGIONAL PUBLIC INSTITUTION
Objectives - 2020

- Turnover +10%
- Gross added value +10%
- Volume of exports +25%
- Employment +1%
- R&DI +5%
The importance of clusterization: Portuguese examples
THEMATIC AGENDA OF RESEARCH AND INNOVATION

CIRCULAR ECONOMY
The great challenges for the development of the Circular Economy in Portugal until 2030

A commitment for **sustainable management of resources** through: i) the sustainable **exploitation of critical and / or strategic raw materials** for our country (e.g. lithium) for greater self-sufficiency and resilience in face of external constraints; (ii) the **recovery of waste** and waste water; iii) bio economics promoting the circular, integrated and sustainable use of biological resources; and iv) **eco-innovation** for the development, demonstration and optimization of more efficient processes and innovative products and technologies.
... the following critical factors to promote R & I in the transition to CE: Collaboration Networks and Clusters - multi-actors and cross-sectoral: networks and agendas to develop and transfer knowledge; academia, the public sector, industry and small and medium-sized enterprises (SMEs); promotion of innovation clusters; international cooperation...
At the level of **sustainable management of resource cycles**, R & I in Portugal has been based on the development of ... studies on mineral resources in Portugal and Europe including **new exploration and processing techniques** (e.g. FAME, Real-Time- Mining, MINATURE 2020 projects); ...; in the **characterization of urban and industrial waste** (including **mining** and construction and demolition waste) ...
Challenges and objectives for Portugal until 2030

... - increase domestic production of raw materials, contributing to the reduction of EU external dependence (which is growing for an increasing number of elements), under penalty of irreversible losses in critical programs (e.g. electric mobility, multi-scale energy storage, petroleum products and nutrients); - increase the lifecycle duration and number of uses of the products and implement the principles of value-for-use cascades.
The main research areas to be developed in the present and future in the sub-area of sustainable management of resource cycles involve:...- analysis, evaluation and modeling of resource life cycles and their alternative uses;...Specifically, scientific research should contribute to creating knowledge and solutions for the following issues:- Which primary mineral sources exist in Portugal capable of ensuring, in whole or in part, the present and future supply of critical and / or strategic raw materials, as well as the corresponding increase in their value chains?
Challenges and objectives for Portugal until 2030

- How to map the flows of critical and strategic raw materials in the Portuguese economy and its contribution to GDP? - present analysis and simulations for the future with impacts for example in: (1) electric mobility; (2) increased energy production through the mass use of technologically sustainable systems; (3) development of digital technologies; (4) generalized rise in value chains of raw materials; and (5) requalification of the labor market.

- How can the sustainable use of primary resources and the search for alternative (secondary) sources of materials be promoted?: - What is the most appropriate mix of fonts for each type of material? What are your most vulnerable flows? - how can they influence the economic recovery of the country, creating wealth and qualified employment, while preserving or recovering ecological balances?...
Critical factors for future development

...- to promote strong synergies between the main academic and economic actors enabling the results of RTD activities to be maximized and integrated into the major European networks (e.g. SPIRE, EIP on Water and EIP Raw Materials, KIC Raw Materials), taking into account the existence of several thematic clusters recently recognized by the Government and that have these characteristics;...- improving the continuing funding capacity of research groups over time, whether in the business, academic or associative context, and the capacity of the country's laboratories and research infrastructure, on the other.

A Clean Planet for all
A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy

Brussels, 28.11.2018
COM(2018) 773 final
Raw materials are indispensable enablers for carbon-neutral solutions in all sectors of the economy. Given the scale of fast growing material demand, primary raw materials will continue to provide a large part of the demand. But a reduction of materials input through re-use and recycling will improve competitiveness, create business opportunities and jobs, and require less energy, in turn reducing pollution and greenhouse gas emissions.

Sustainable and responsible mining and sourcing of raw materials approaches are needed to decouple climate objectives from negative environmental impacts associated with necessary technology materials.

Public acceptance in these areas will be key to ensure the competitiveness of EU industry as it transforms.
The problem

SPECIFIC INTEGRATED PLANS FOR EACH 5 EXTRACTIVE CENTERS

EXTRACTIVE INDUSTRY ECONOMICAL DEVELOPMENT

NATURAL PARK NATURA 2000
Land Valorisation Studies

1. Geology and aptitude for ornamental stone.
2. Geomorphological and speleological heritage.
3. Paleontological heritage.
4. Flora and Habitats.
5. Fauna.
6. Groundwater Resources.
7. Noise, vibrations and air quality.
8. Landscape heritage and Karstic environments.
Landscape rehabilitation plan – Codaçal area

- Meadow areas (birds alimentation) – Limestone slabs;
- Creation of small forests and bushes with autochthonous species;
- Creation of natural barriers for minimization of visual impacts;
- Scarps.
The Methodology

Natural Values

- Exceptional natural values
  - Nature conservation areas
    - Compatibility with extractive industry but with compensation measures
  - Mineral resource without economic viability
    - Compatibility with extractive industry

- High natural values
  - Mineral resource with economic viability

- Median/low natural values
  - Mineral resource without economic viability

Recovered areas

Geological and cultural heritage areas

Licensed quarries
The Results

Codoçal Area
98 ha
19 ornamental stone quarries

<table>
<thead>
<tr>
<th>Mineral resource</th>
<th>Exceptional or high natural values</th>
<th>Land Class</th>
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</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Compatibility with extractive industry</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Compatibility with extractive industry but with compensation measures</td>
</tr>
<tr>
<td>No</td>
<td>Yes or No</td>
<td>Nature conservation areas</td>
</tr>
</tbody>
</table>
Main Objectives Achieved:

• Guarantee the rational utilization of the mineral resource;

• Manage properly the use of the land during the extraction phase, allowing the reconversion of it for other land uses in the post-quarrying phase;

• Assure a correct management of the quarrying waste;

• Guarantee a proper management of the non-quarrying waste;

• Assure the best health and safety conditions of the quarries’ workers;

• Minimize the environmental impact.
Keys to Success

• Definition of the correct exploitation methods;
• Definition of rules for articulation with contiguous quarries;
• Definition of the most appropriate quarrying waste management;
• Definition of an integrated landscape rehabilitation methodology;
• Parity between mineral resources and the other natural resources;
• Without economical development we cannot take care of our environment;
• Involvement of all the stakeholders, especially the INDUSTRY (project developed with the industry and for the industry).
Partners

**Project Promotors**
- Assimagra
  Recursos Minerais
- ICNF
  Instituto da Conservação da Natureza e das Florestas

**Integrated Project Promotor**
- Direcção Geral de Energia e Geologia

**Technical Support**
- CEVALOR
- LNEG
- VISA consultores
- biodesign

**Counties**
- Alcobaça
- Porto de Mós
- Santarém
- Rio Maior

**Financial Support**
- valor pedra
  associação
- COMPETE
- Qualidade e Desenvolvimento Económico
- União Europeia
EUROPEAN ENTERPRISE PROMOTION AWARDS
2015

1ST PRIZE FOR SUPPORT TO ECOLOGICAL MARKETS DEVELOPMENT AND RESOURCE EFFICIENCY
PERSISTENCE, RESILIENCE, TEAM WORK!
Civilization exists by geological consent, subject to change without motive

Will Durant

(American writer, historian and philosopher, Pulitzer Price in 1968)

THANK YOU!

MUITO OBRIGADO!

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