



*EIT Raw Materials: 1<sup>st</sup> Greek Raw Materials Sector Dialogue*

# **Greece and Raw Materials**

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**Current status, issues, and prospects**

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**President, Greek Mining Enterprises Association**

*Athens, November 23, 2016*

# The Greek land houses a wide portfolio of minerals with countless uses in industry and daily life



**Lignite**

*2<sup>nd</sup> in the EU,  
5<sup>th</sup> worldwide*



**Magnesite**

*Largest exporter  
in Europe*



**Perlite**

*1<sup>st</sup> worldwide*



**Laterite**

*One of the largest  
producers in Europe*



**Bauxite**

*Key for the national  
aluminum industry*



**Aggregates**

*Key for the  
cement industry and construction*



**Marble**

*Global leader in quality,  
acquiring market share*



**Bentonite**

*1<sup>st</sup> in Europe,  
2<sup>nd</sup> worldwide*



**Gypsum / Pozzolan**

*Key for the  
cement industry*

# A plethora of minerals in several locations – metallic and lignite mines as well as industrial minerals (1/2)



METALLIC AND LIGNITE MINES (2010)



LEGEND: ● Feldspar // ● Huntite // ● Manganese ores // ● Mixed Sulphides // ● Magnesite // ● Ferrrous Nickel Ores // ● Bauxite // ● Lignite

INDUSTRIAL MINERAL QUARRIES (2010)



LEGEND: ● CaCO<sub>3</sub> // ● Pumice // ● Attapulgite // ● Quartz // ● Dolomite - Calcite // ● Caoline // ● Pos-solane // ● Perlite // ● Betonite // ● Gypsum // ● Glays





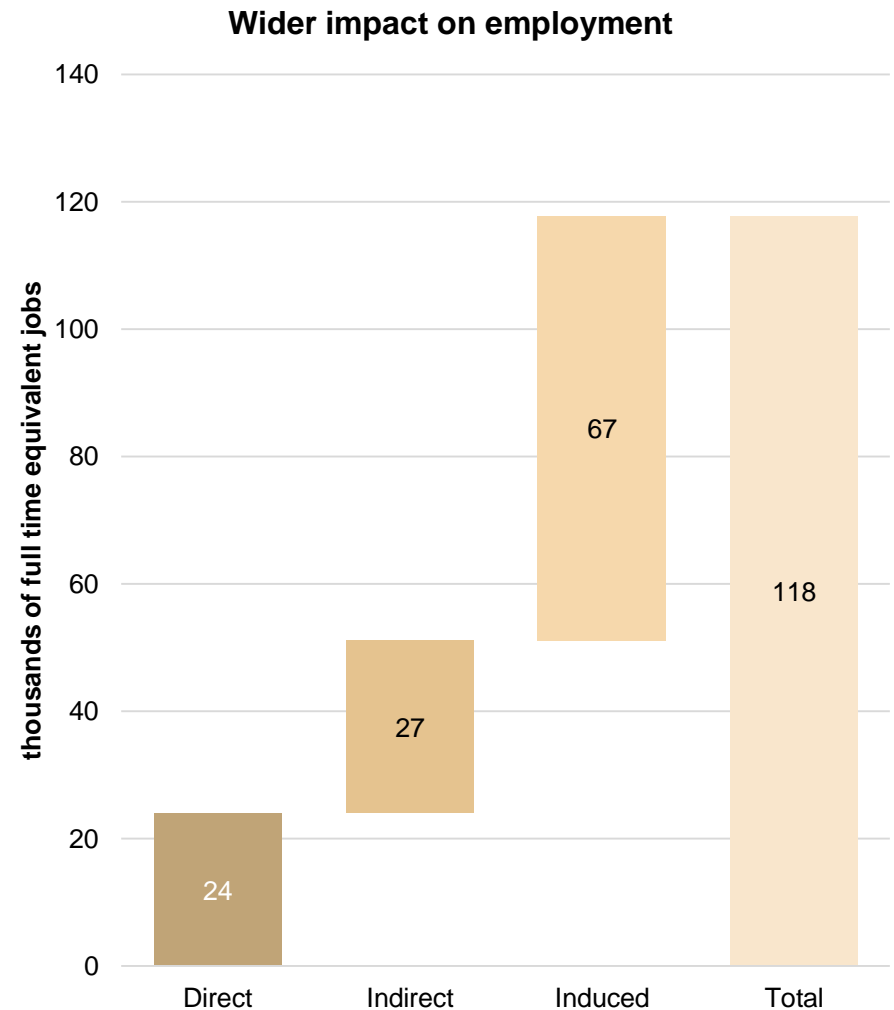
***Mineral resource centered activity***  
*has traditionally been a key driver*  
*of economic development, employment*  
*(in urban centers but mainly in the periphery),*  
*trade, and ultimately **competitive advantage***  
*for the Greek economy*



# Today, the Greek mining industry continues to thrive

## The Greek mining industry at-a-glance:

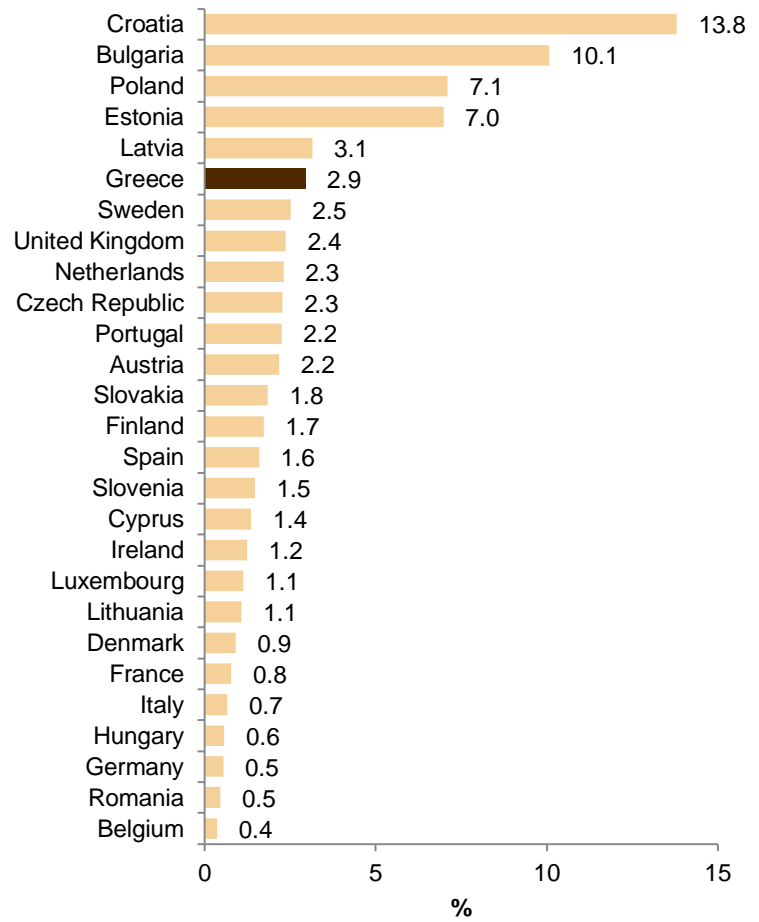
- Accounts for **3.4% of the Greek GDP**
- Comprises of more than **25 large mining companies** that are active in Greece and abroad
- Extracts over **30 different minerals**, 10 of which in quantities larger than 300,000 tons per year
- Generated a total **value of €2.3 billion in 2014**, roughly 50% of which was exported
- Constitutes almost **5% of total Greek exports**
- Employs directly roughly **20,000 individuals** and indirectly **80,000 individuals**



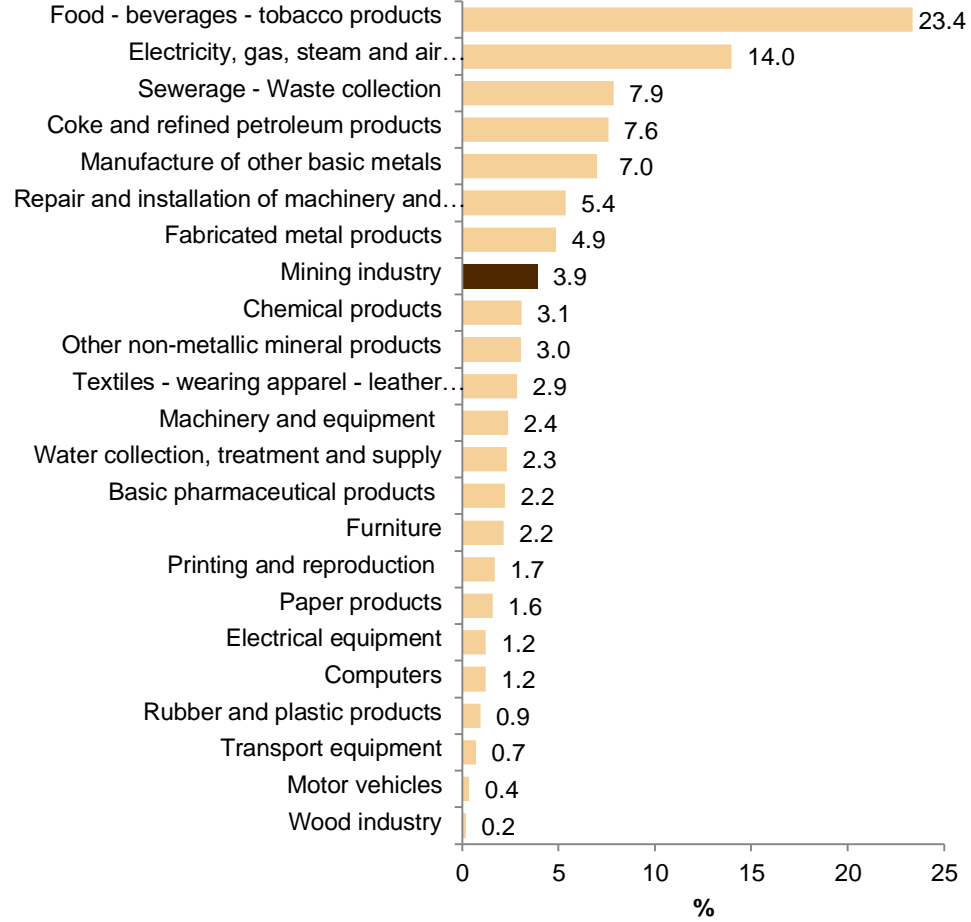
# The mining industry is a large contributor to the national economy both compared to other EU countries and other industries domestically



**Share of mining & quarrying in total industry GVA per EU country, 2014**



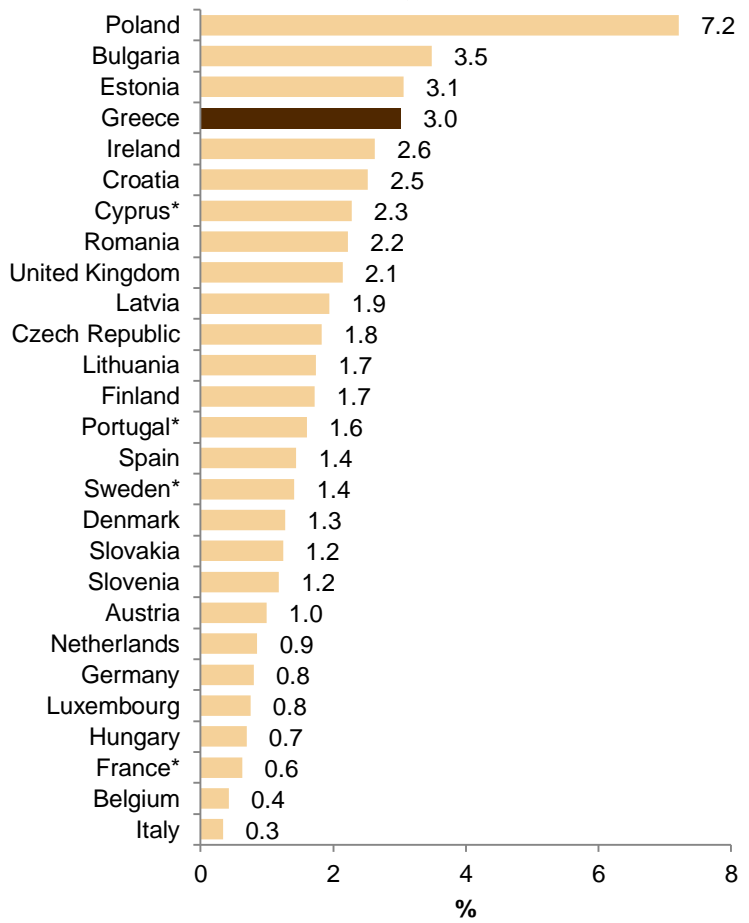
**Composition of GVA per Industry subsector, 2014**



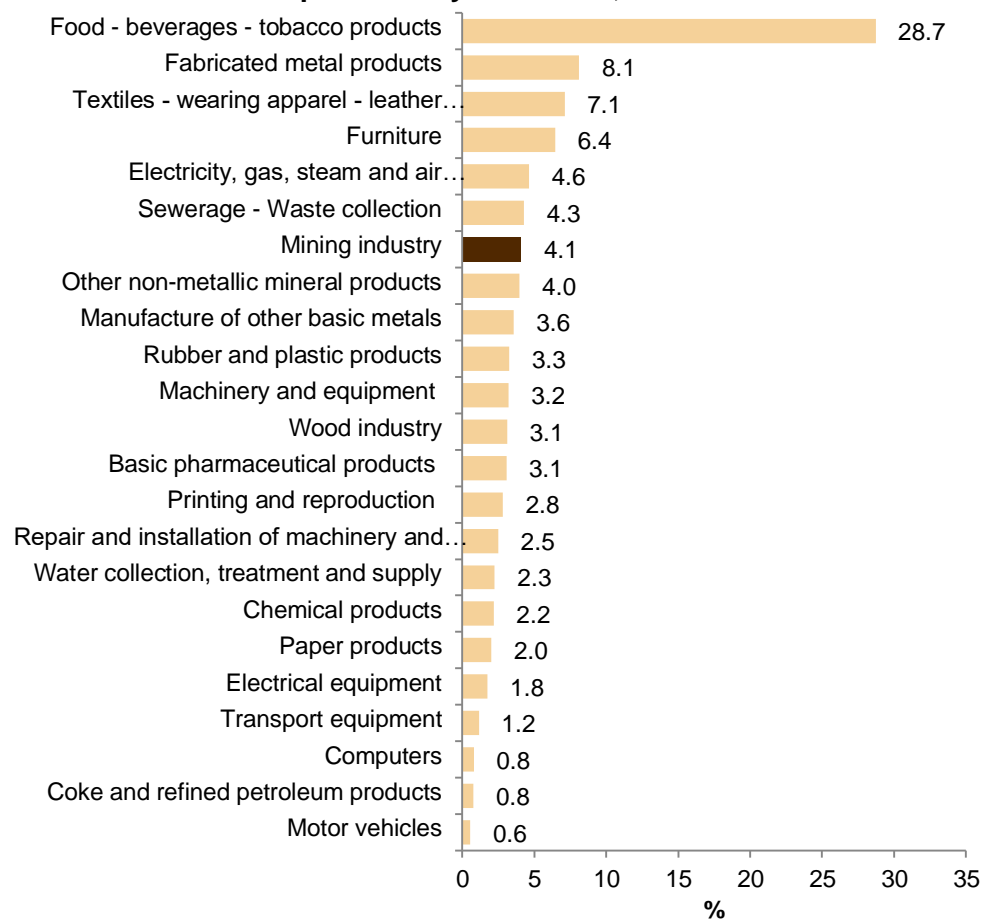
# The mining industry is a top employer – especially in the Greek periphery: 4% of the Greek workforce, exceeded by only three countries in the EU



**Share of mining & quarrying in total industry GVA per EU country, 2014**



**Composition of employment per Industry subsector, 2014**

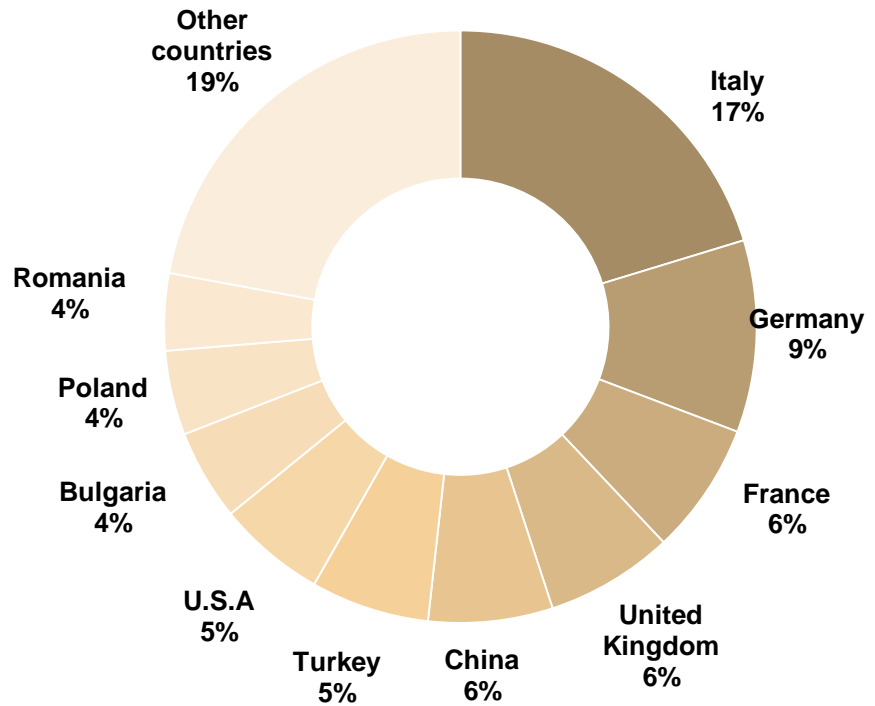




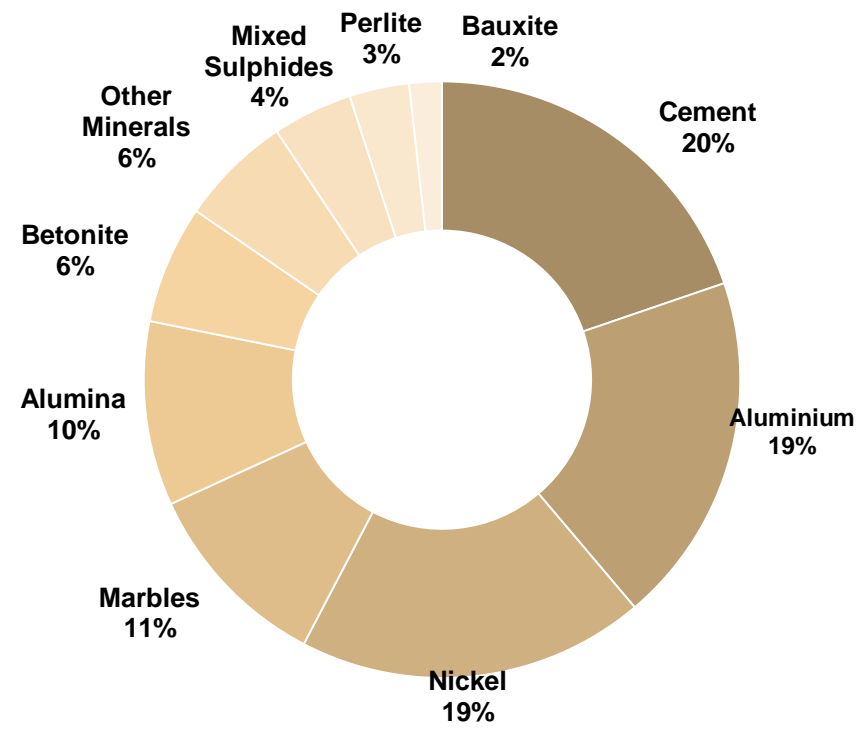
**Roughly half of total sales are abroad – mainly in Europe; 75% of total sales in the products that are exported to a diversified group of countries**



**Exports in value terms per country of destination, 2014**



**Exports in value terms per mineral, 2013**





## *... fixed assets*

- Total expenditure for resource exploration €4.7 million (2015)
- Plants / Warehouses / Ports

## *... equity*

- Kerneos / European Bauxites (2015)
- Rhone Capital / S&B (2012)
- IMERYYS / S&B (2015)
- Sibelco SCR / Ankerpoort / White Minerals S.A. (2013)
- Thermolith / SIDENOR / Macedonian Olivinites S.A. (2012)

## *... human capital*

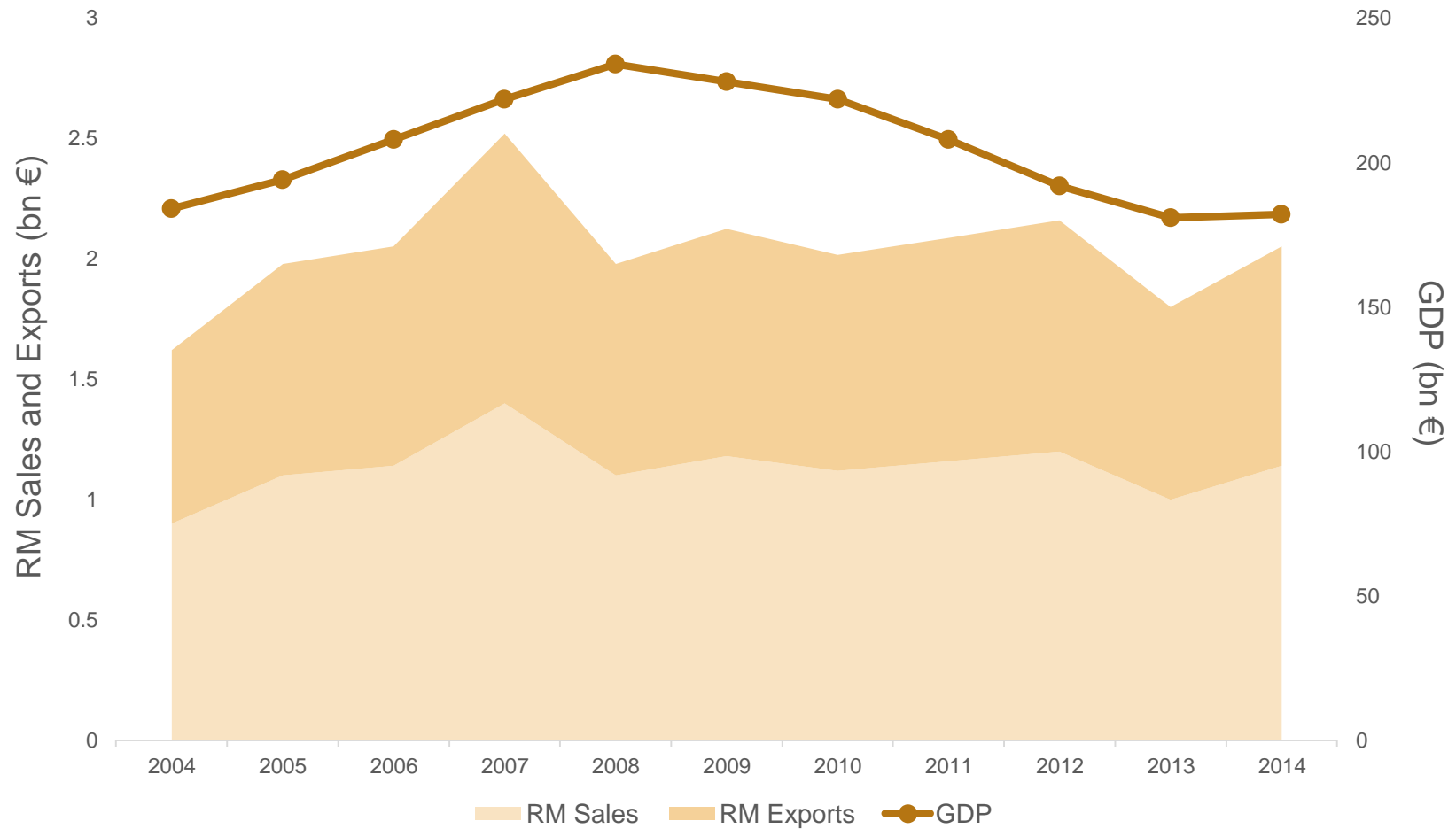
- 4 companies run graduate programs (350 positions each year) in country plagued by youth unemployment
- 130,000 hours of training in 2015 (8.3 hours per capita)

***GMEA members are planning €1.7 billion worth of investments by 2019***

# The Greek mining industry has weathered effectively the economic crisis



### GDP, Raw Material Sales and Exports Evolution





### ***“The Resilience Recipe”***



### ***Promising Outlook***

- World population projected to increase to 9.7 billion by 2050, according to the UN
- Lignite production is projection to increase until 2020
- Positive outlook for metals (especially aluminum)
- Substantial increase in marble and industrial mineral sales accelerated by the recovery of the Greek economy in 2017



# A National Minerals Policy is key to unlocking this potential

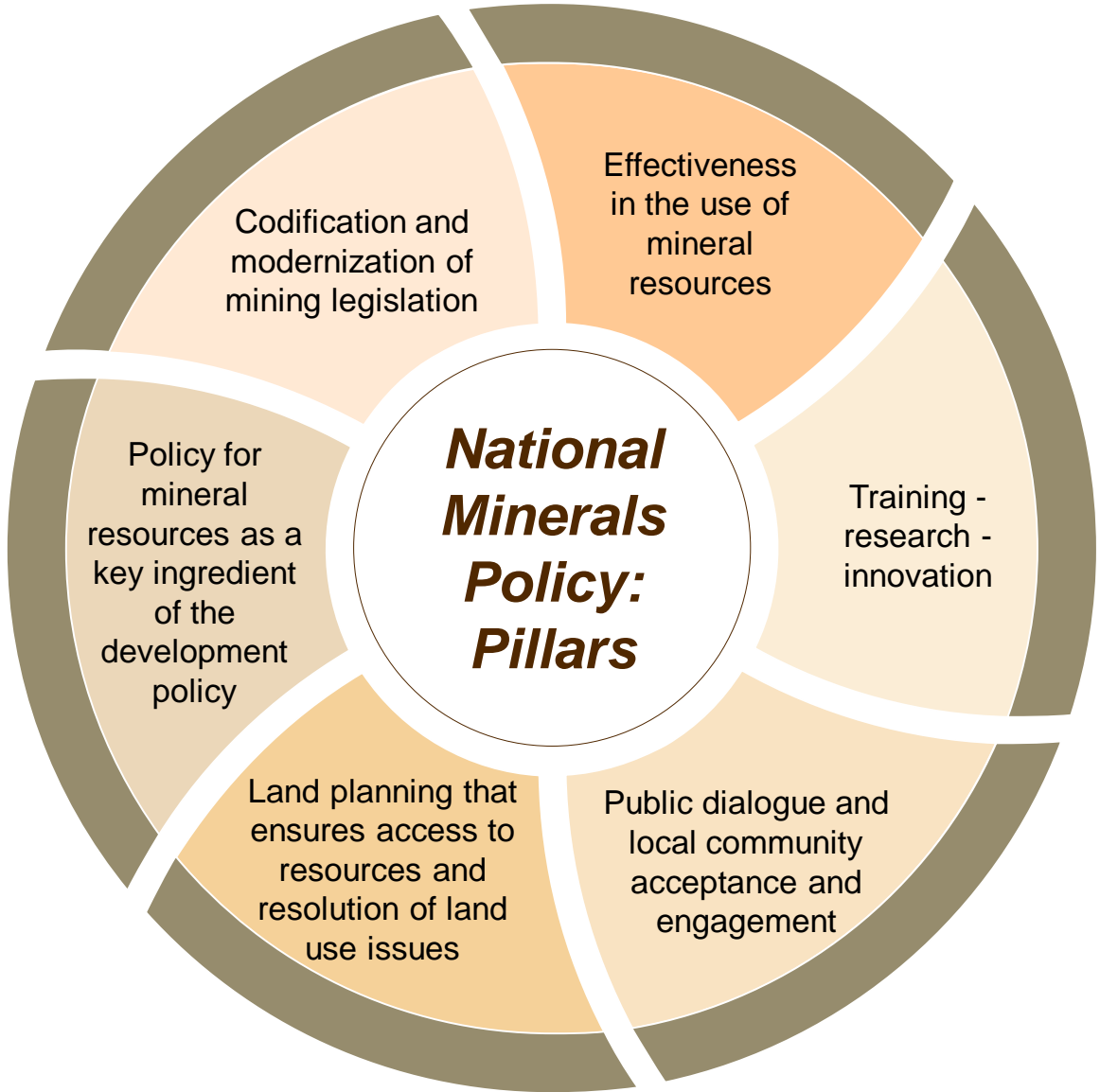
The provisions of a national minerals policy must reflect the **national strategy for mineral resources** built around the following objectives:

- Ensure optimal exploitation of resources
- Actively promote innovation
- Safeguard sustainable development
- Impose rigorous healthy, safety, quality, and environment standards
- Consider reasonable offsets for the local society
- Foster enterprise
- Encourage R&D in new minerals and/or applications
- Render the industry competitive globally
- Promote the circular economy



***Implementation of such a policy would spur innovation, improve productivity, and deliver substantial benefits to the Greek economy***

# The National Minerals Policy currently in place ticks many of these boxes in line with EU policies and regulations...



...however, its implementation has been hindered by several shortcomings



- Time consuming and unnecessary complex licensing process for exploitation of mineral resources
- Bureaucracy and multiple – often conflicting – laws for the same issues or select aspects of the same issues
- Inability of the legal system to distinguish justified versus unjustified appeals that create a huge disincentive for new investments
- Antiquated quarry code that does not account for new trends and discoveries in research and exploitation of minerals
- Lack of comprehensive urban planning that does not reflect the potential of mineral resources
- Absence – due to the ineffectiveness of IGMR (IGME) – of thorough knowledge and understanding of the potential of mineral resources and their degree of exploitation
- Social resistance towards new mining projects for fear of subpar environmental practices that is perpetuated by insufficient audit mechanisms
- Last but not least, unstable tax and labor law that adversely impact competitiveness and investment in all industries - not exclusive to mining



# The National Minerals Policy should pave the way for sustainable management of mineral resources in Greece



A comprehensive and coherent **National Minerals Policy** should pave the way for **sustainable management of mineral resources in Greece**; the key elements of such a policy would be the following:

<i>Land Planning</i>	<i>Licensing</i>	<i>Other Legal Issues</i>	<i>Research - Training - Knowledge</i>	<i>Social License to Operate</i>
<ul style="list-style-type: none"><li>• Map existing mineral resources</li><li>• Special provisions for regions with high value resources</li><li>• Provisions for post-mining land uses</li><li>• Revision of regional urban planning</li><li>• Update management studies for protected areas</li></ul>	<ul style="list-style-type: none"><li>• Streamline processes based on urban planning</li><li>• Issues specific directives and manuals</li><li>• Avoid overlaps</li><li>• Implement Digital Registry for Environmental Works (based on N.4014/2011)</li></ul>	<ul style="list-style-type: none"><li>• Codify legislation</li><li>• Frequently update all relevant resources</li><li>• New quarry law</li><li>• Ease in the startup of new activities</li></ul>	<ul style="list-style-type: none"><li>• Reinforce / Support research institutions</li><li>• Create GIS database</li><li>• Train on matters of sustainability in universities</li><li>• Include modules in the secondary education curricula</li><li>• Best practice sharing</li></ul>	<ul style="list-style-type: none"><li>• Effective function of inspecting authorities</li><li>• Avoid illegal mining</li><li>• Establish financial guarantees</li><li>• Rationalize allocation of benefits to local institutions</li><li>• Rehabilitate old mining sites</li><li>• Establish a forum for the Policy</li></ul>



However, without systematic implementation and elimination of some weaknesses of the Greek Administration none of the aims will be accomplished

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To that end, several critical success factors have been identified – some of which address weaknesses of the Greek Administration:

- Access to land / port and other logistics infrastructure
- Stable and equitable tax environment
- Fast and coherent legal decisions
- Access to innovation and research funding
- Upgrade and support of all University departments and faculties of geosciences and vocational education primarily but also information technology

# The implementation of the National Minerals Policy would position both the industry and the Greek economy to reap significant benefits



- Ensure continuity of supply of raw materials
- Shield from raw material price volatility
- Ensure compliance with EU policies and regulations
- Create new job positions – besides mining in logistics, exploration, research etc.
- Set the foundation for attracting investment
- Eliminate antagonistic relationships with other prominent local industries (eg: tourism) and promote joint value creation
- Promote better utilization of infrastructure (especially transportation)

***Verheugen  
Directive, 2007***

***The mining industry could emerge as the national champion for the broader benefit of the Greek economy and the Greek people and a considerable source of competitive advantage***



- Innovation is usually associated with cutting edge technologies but not with minerals
- However, there is still a lot of unexplored potential in Greece's wide raw material portfolio
- Innovation often lies in re-using and upcycling, in other words enhancing the circular economy

## *Innovation manifests itself in several ways in the mining industry:*

Treatment of mining and processing waste and of low grade and complex ores

Deep sea Exploration / Exploitation

Processing of industrial minerals with improved processing efficiency

Deep underground Exploration / Exploitation

Recycling of Industrial manufacturing wastes and End-of-life waste

Application-led substitution

Metallurgy processes

Processing of aggregates and dimensional stone with improved processing efficiency

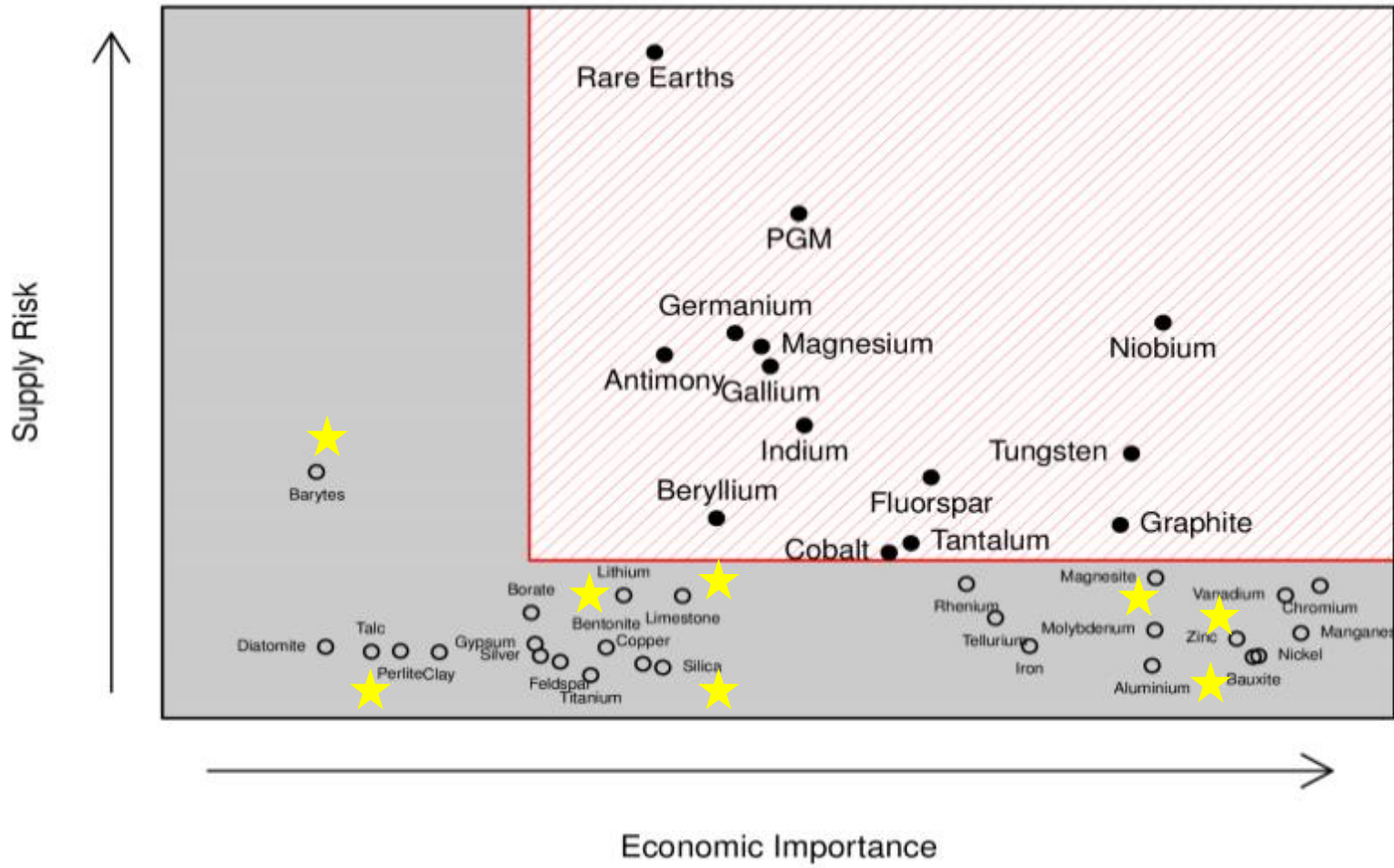
Resource Efficient Paper Recycling Processes

Material-led substitution

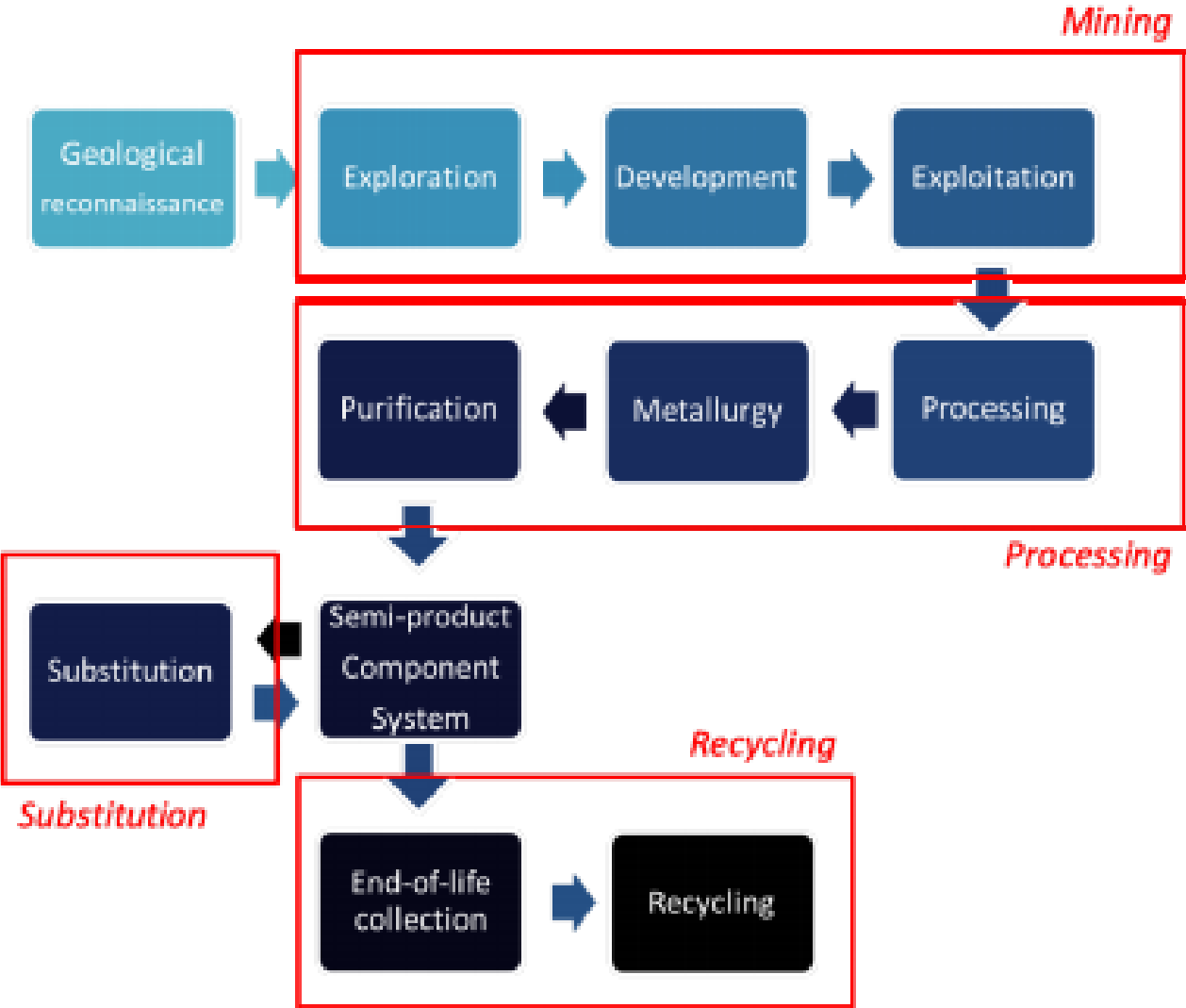
# An assessment on the criticality of raw materials for European manufacturing highlights areas with potential for innovation



## EU Critical Raw Materials



# There is scope for innovation across the entire mining value chain



# Innovation is a core business requirement for the mining industry in Greece and in Europe as a whole



... and as an **offense mechanism** for spurring growth:

- Expanding client base
- Transforming into strategic partners for clients through providing tailor-made, integrated solutions
- Catering to new applications / industries / geographies
- Creating more efficient (“doing more with less”) and effective solutions (“doing better”)
- Developing new business and entrepreneurs

... both as a **defense mechanism** against a number of challenges:

- Dependence on imports
- Dependency on finite resources
- Exposure to price volatility and international trade turbulence
- Substitution of high environmental footprint materials
- Resource efficiency increase

To reach the national champion status we do not need to re-invent the pick, we must be brave towards the implementation of the policy (1/2)



**Lavrio Silver Mines**



**The Parthenon**

**5<sup>th</sup> century B.C.**



**Penteli Marble**



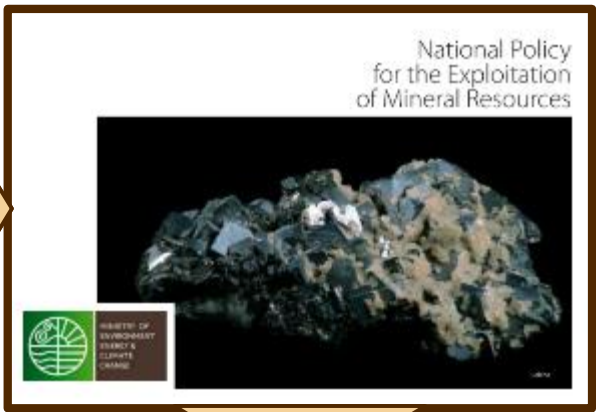
**Pericles**

**Largely thanks to mining the 5<sup>th</sup> century B.C. was the “Athenian Golden Age”, an age of prosperity, establishment of democracy, and significant progress in sciences, philosophy, arts and culture**

# To reach the national champion status we do not need to re-invent the pick, we must be brave towards the implementation of the policy (2/2)



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*With world class reserves, substantial logistics advantage, extroversion, and through innovation and implementation of the National Minerals Policy... just imagine what we can do now...*





Thank you for your attention!

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