

“EIT Raw Materials: 1st Greek Raw Materials Community Dialogue”

Critical Raw Materials (EU - CRM) & The importance of Magnesite

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GRECIAN MAGNESITE

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- ✓ **Synopsis & Update - CRM at EU Level**
- ✓ **The European magnesite Industry: overview**
- ✓ **The Greek Magnesite Industry: A traditional Value.**



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SOURCES of REFERENCES:

- ✓ The European Commission – various publications
- ✓ Euromines
- ✓ The Sales & Marketing Department of Grecian Magnesite S.A.
- ✓ SME – Greek Mining Association
- ✓ British Geological Survey
- ✓ Natural Resources GP, Greece



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- ✓ **All countries are dependant on raw materials. This is particularly true for Europe which is highly dependent on non-energy raw materials to sustain businesses and the economy. It has been estimated that 30 million jobs in the EU are directly reliant on access to raw materials.**
- ✓ **However, very little primary production occurs within Member States themselves, with the majority produced and supplied from third countries. None of the EU28 countries is in the top 10 global suppliers of raw materials.**
- ✓ **The Total EU28 contribution to overall materials supply is estimated at around 9%, with France, Germany and Italy ranked the highest individually, largely due to industrial mineral production.**
- ✓ **Top Suppliers to the Global market: China 30%, USA 10%, Russia 5%, Brazil 4,6% Australia 4%, S. Africa 3,9%, Chile 3,4%, Canada 3,2%, India 2,5% and Turkey with 2,1%.**



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- ✓ In June 2010 the Commission published its first expert report, which established a methodology for the identification of critical raw materials.
- ✓ In its 2011 Communication the Commission formally adopted this list and proposed that it will monitor the issues to identify priority actions, examine them with Member States and stakeholders and regularly update the list of critical raw materials.
- ✓ In the 2013 list we have 21 raw materials classified as ‘critical’, among them, borates, chromium, cobalt, magnesite, phosphate rock, indium, gallium, magnesium, silicon metal and natural graphite.
- ✓ In 2016 – CRM List review.



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CRITICALITY ANALYSIS:

The EU methodology used to assess has a combination of two assessment components:

- ① Economic Importance
- ② Supply Risk – Poor governance



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Economic Importance:

This is achieved by assessing the proportion of each material associated with industrial megasectors at an EU level. These proportions are then combined with the megasector’s gross value added (GVA) to the EU’s GDP.

A key feature of the approach is that it is independent of both market size and price of the individual raw materials. Instead it focuses on the benefit these raw materials have for the European manufacturing economy, which can be viewed as more in line with a measurement of ‘Impact’.



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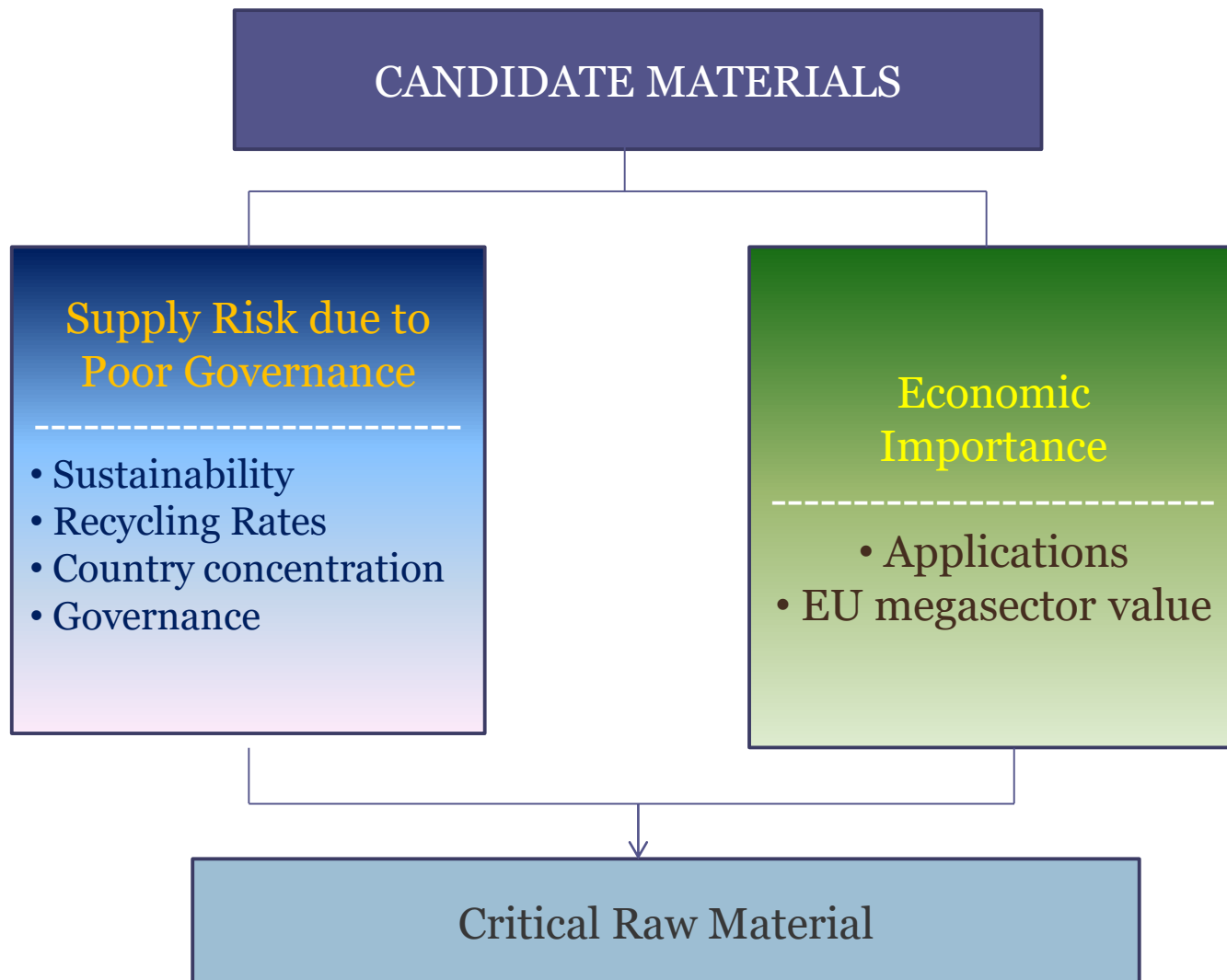
Supply Risk (Poor Governance):

The overall supply risks are considered to arise from a combination of several factors, namely:

1. Sustainability
2. End-of-life- recycling rates, and
3. High concentration of producing countries with poor governance



Scheme of the EU criticality methodology



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The European Magnesite and Magnesite Industry:

The European industry consists of producers of natural magnesite, produced mainly in Austria, Greece, Slovakia, Spain and synthetic magnesite mainly produced in the Netherlands and Ireland, and Norway.



The EU magnesite/magnesia at a Glance:

- Direct and Indirect employment of > 40.000 jobs
- Using its large deposits, extracts ca 2,9 million mt's of primary material, ie EU magnesite industry accounts for ca > 10% of the global production of magnesite.
- A large stock of primary material in tailings (8 million mt's).
- Production of more than 1,3 million mt's of processed materials per year
- The European industry use them for the production of several main categories of end-products – the largest portion accounts for refractory products – 65%, then in animal nutrition and fertilizers, construction, ceramics, pharmaceuticals and magnesium compounds, electrical heating elements, welding fluxes, leather tanning, metallurgy, for the production of Fused Magnesia, magnesium metal, Pulp & Paper, Rubbers, brake pads, and in various environmental applications such as, industrial and municipal waste water treatment, and soil remediation and decontamination from heavy metals.



The EU magnesite/magnesia at a Glance (2):

- ✓ Deposits of both micro & macro crystalline magnesite
- ✓ In 2015, some 380.000 tpa of CCM produced
- ✓ Production of DBM in 2015 of 580.000 – not including the production of Basic Monolithic refractory Masses
- ✓ Production of Refractory Masses – final product for the steel, cement/lime, ceramics, metals and glass industries of > 350.000 in 2015
- ✓ The current overall utilization of capacity is around 52% for CCM and for DBM the utilization rate is around 70%.
- ✓ The EU magnesite industry supplies 62% of EU's demand for processed materials.



The Greek Magnesite / Magnesia industry:

- Currently two producers, Grecian Magnesite SA and Terna Mag.
- Both producers of natural micro/cryptocrystalline magnesite.
- Annual combined production of crude beneficiated magnesite of more than 470.000 tpa,
- The deposits of GM in Yerakini are exceptional in chemistry – low iron and traces of undesirable substances. Open pit mines only.
- Terna Mag operates in the island of Euboea with good quality of magnesite – open pit and underground mining
- More than 93% of the final products exported in all continents.
- Producers of magnesium, carbonate, caustic calcined magnesia, deadburned/sintered magnesia and basic monolithic refractories. More than 50 products produced.
- Grecian Magnesite SA is among the leading European exporters of magnesia compounds. Terna Mag is recently developing the activities.
- State-of-the Art R&D capacities and facilities.



The Greek Magnesite / Magnesia industry:



Grecian Magnesite S.A. - Company profile and activities

- ✓ Private mining company (Portolos family), established in 1959, with magnesite experience and activities that dates back to 1914 (Mr. J. Lambrinidis)
- ✓ Mines and Works are in Yerakini, Chalkidiki, N. Greece with an Installed capacity of > 200.000 tpa of calcined magnesia compounds (CCM and DBM)
- ✓ In addition, we operate a state-of-the-art plant for the production of basic monolithic refractory masses with an annual capacity of > 50.000 mt's
- ✓ 93% of total production exported to all continents.
- ✓ Participations outside Greece: Magnesitas Navarras, in Spain, Akdeniz Mineral Kayanaklari (AMK), in Turkey and Van Mannekus & Co. BV a significant trader and processor of industrial minerals, located in the Port of Rotterdam, the NL.
- ✓ Total Labor Force – including participations, of more than 650 employees 9320 in Greece).
- ✓ Consolidated sales of > € 70 million,
- ✓ Group Sales of > 320.000 tpa of magnesia compounds
- ✓ We are placing special emphasis on R&D of high value added products,
- ✓ Our R&D Centre is located in Vassilika, Thessaloniki commissioned in 1993



Grecian Magnesite S.A. - R&D projects completed

- ESPA 2007-2013/1477-BET-2013: Development building materials with reduced environmental footprint.
- ESPA 2007-2013/1084-BET-2013: Environmental applications of magnesia and utilization of by-products.
- MgO grades for Sorel and other Magnesia cement applications,
- Unique property and world-wide breakthrough MgO for tanning applications,
- Special environmentally friendly monolithic refractories based on Dead-Burnt MgO,
- Unique low iron MgO grades for electrical applications,
- Special Dead-Bunt grades for welding fluxes,
- Special magnesium carbonate grades for ceramic applications,
- Beneficiation of mining waste for the production of specialized products,
- High purity natural MgO for high-end applications such as Mg compounds, catalysts and polymers.





- *Project title:* New desulfurization technology for SO_x reduction with positive net environmental impact based on MgO reagents.
- *Project Code* : LIFEENV 15/GR/000338
- *Project Acronym:* LIFEPOSITIVEMgOFGD
- *Project Duration:* 1/7/2016 – 31/12/2019