MINING
CRITICAL RAW MATERIALS IN EUROPE: TOWARD 2020

International Day in Critical Raw Materials 2015

Mark Rachovides, President Euromines

Burgos 25 June 2015

Euromines – who we are

- Recognized representative of the European mining industry;
- Service provider to its members with regard to EU policy;
- Network for cooperation and for the exchange of information throughout the sector within Europe;
- Link to contacts with the mining community throughout the world.

Euromines represents large and small companies and their subsidiaries in Europe and in other parts of the world which provide jobs to more than **350,000 people**.

Their activities and operations produce more than **42 different metals and minerals**.

Our Key Messages

RESOURCES

Europe has a viable resource base

DEMAND

The demand for raw materials is continuously increasing

STANDARDS

The EU should maintain an enabling environment to achieve the highest standards in the extractive industries

Euromines current priorities

European Innovation Partnership (EIP) on raw materials

- Raw materials are an Engine for Growth in the EU
- Strategic Implementation Plan for the EIP on raw materials
- Competitiveness study, Critical raw materials study

Innovation/Research & Technical Development

- Horizon 2020
- Extractive industry as a major contributor to innovation in EU raw materials supply

Communication

- Improve the image of the industry as more environmentally friendly, trustworthy and innovative
- Establish and maintain good relationships with target audiences
- Share Knowledge

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Some Global Issues

Raw Materials: Increased importance

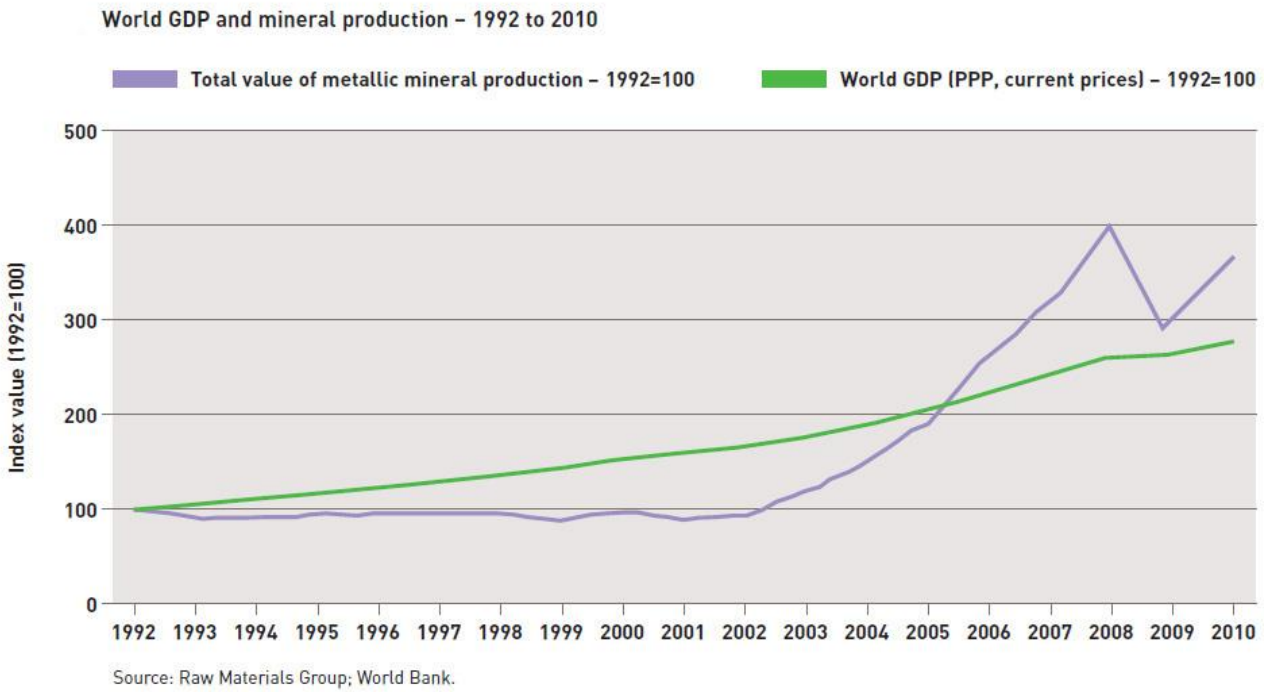
- Minerals and metals represent the basis for any industrial production process. They provide both everyday products and new solutions for modern infrastructure and technologies.

- Increase in population and living standards will continue to drive growing demand for raw materials. Due to these developments resource efficiency measures such as optimizing reuse and recycling as well as extension of lifespan of products are not expected to close the material deficit by 2050.

- European mining companies and technology companies are playing an increased global role in securing access to raw materials.

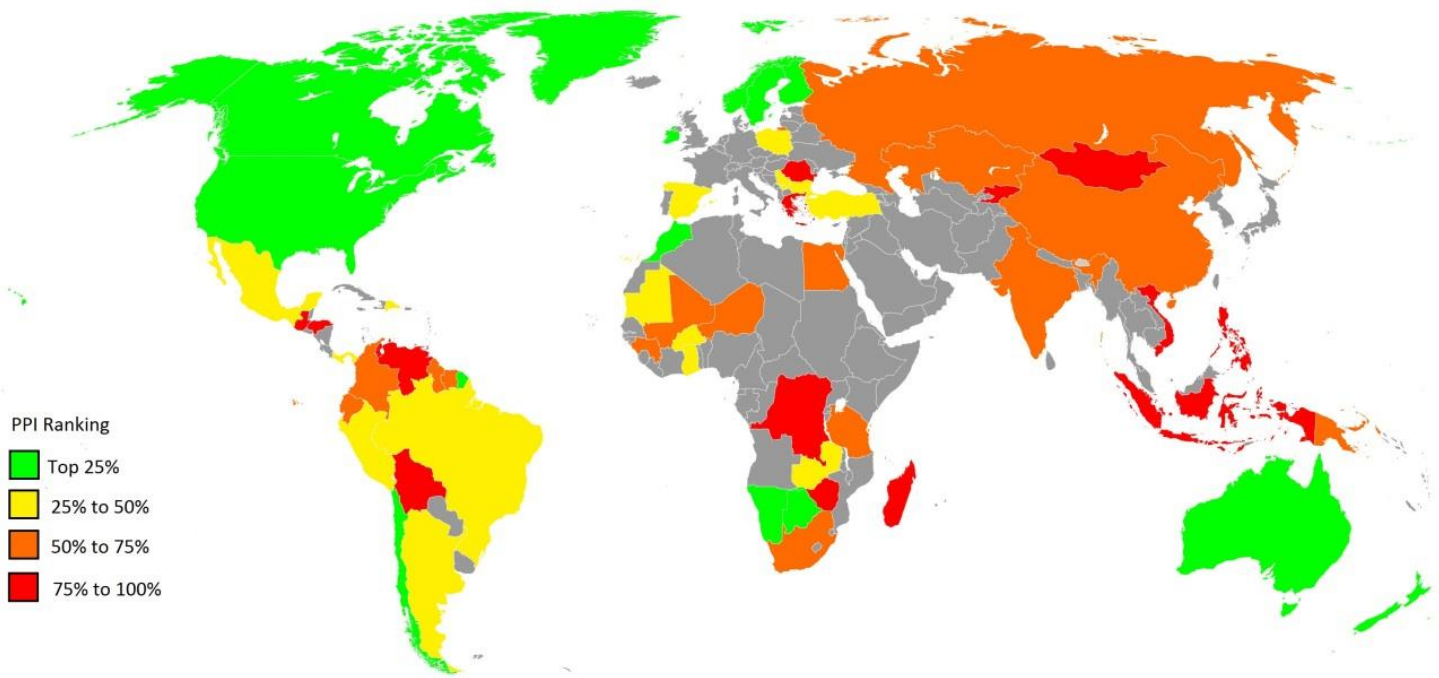
Trends in the nominal value of world mineral production

- In 2010, the nominal value of world mineral production was nearly four times higher than it had been in 2002. During this period, growth in value has been significantly greater than growth in world gross domestic product (GDP).



Fraser Institute
Policy Potential Index

The Fraser Institute published the 2012/2013 annual survey of mining and exploration companies to assess how mineral endowments and public policy factors such as taxation and regulation affect exploration investment.



The **Policy Potential Index** (PPI) is a composite index, measuring the overall policy attractiveness of the 96 jurisdictions in the survey.

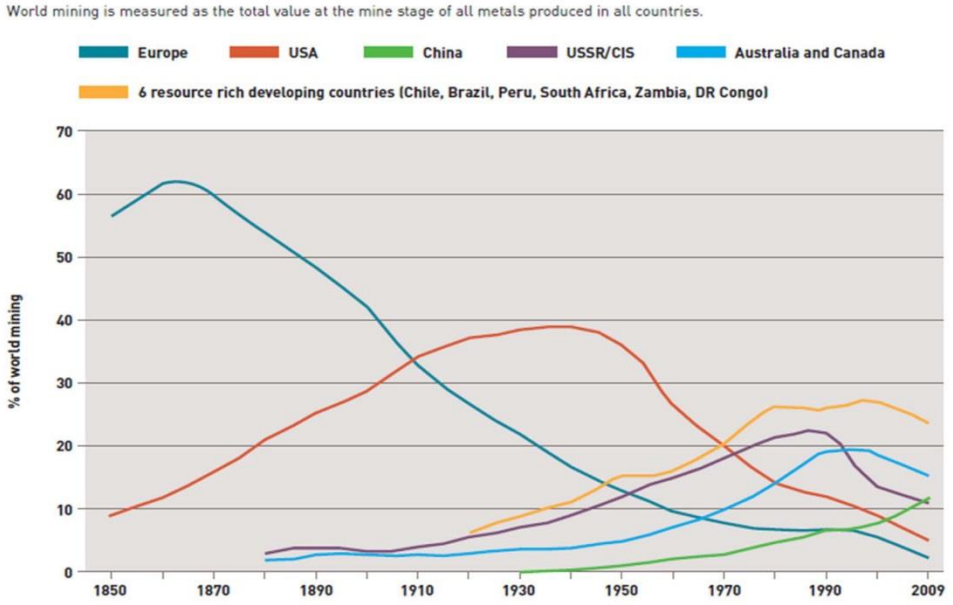
Export restrictions

- Important raw materials sources are increasingly located in parts of the world which lack political and economic stability. Over 50% of major reserves are located in countries with a per capita gross national income $10 per day or less.

- There are over **450 export restrictions** on more than **400 different raw materials**.

- The OECD Inventory confirms a transparency deficit in the design and implementation of export restrictions.

Location of mining by region, 1850 - present



Source: Raw Materials Group, Sweden

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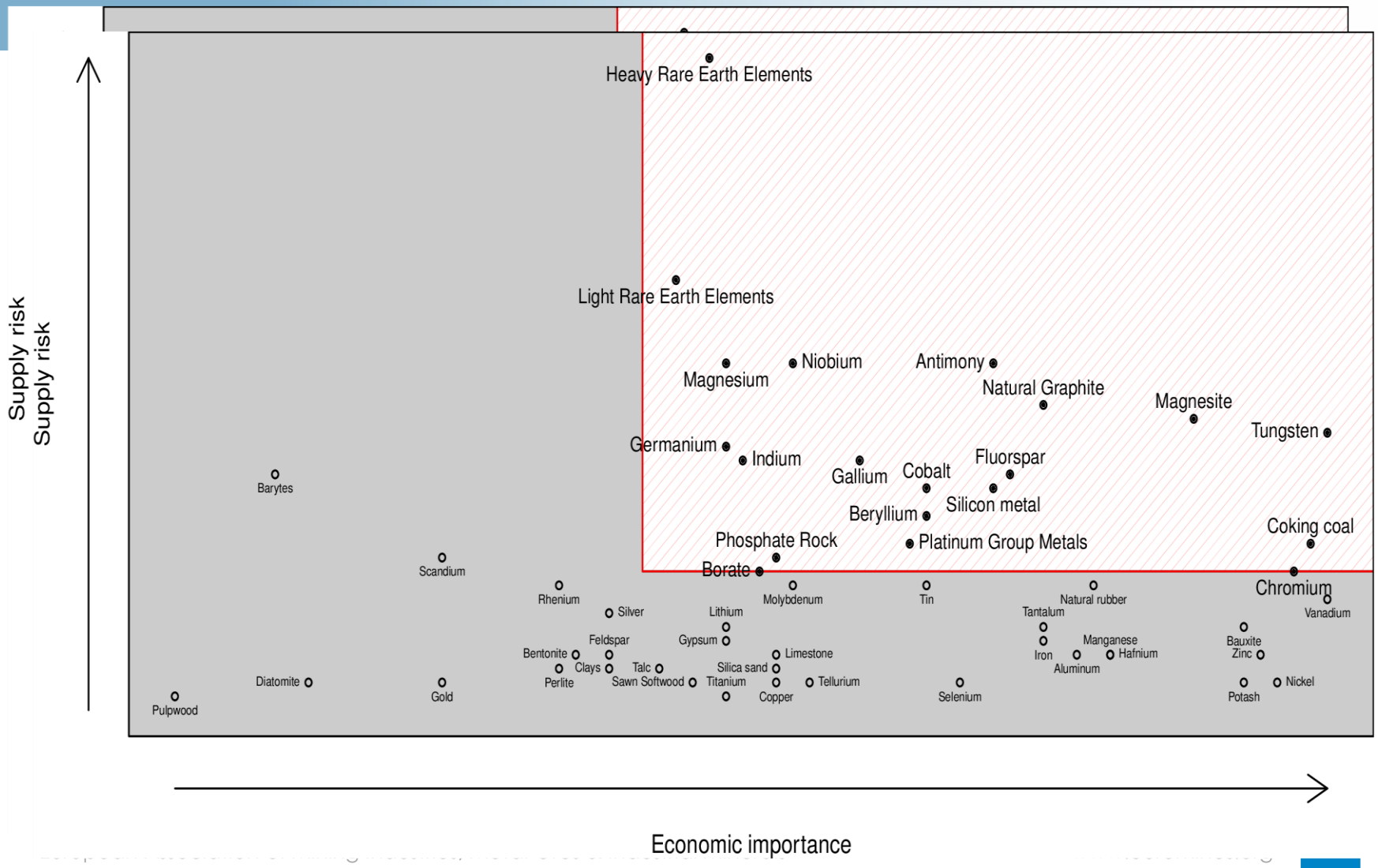
How are we doing?

EU critical raw materials assessment - Outcome 2014



Criticality list 2014

Already in the old CRM list

- antimony, beryllium, cobalt, fluorspar, gallium, germanium, HREE, indium, LREE,
- magnesium, natural graphite, niobium, platinum group metals, tungsten
- All except tantalum, REE now split into HREE and LREE

- **In the old candidate list, but new to CRM list**
- Borate, chromium, magnesite

- **New to candidate list (and CRM list)**
- Coking coal, phosphate rock, silicon

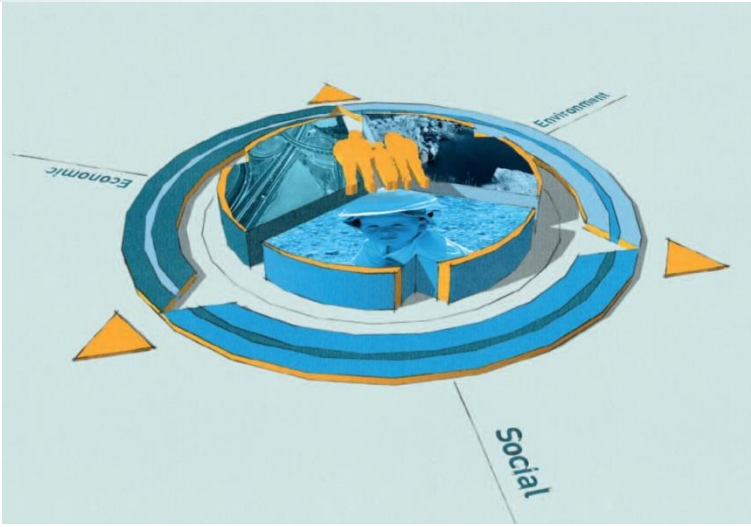
- **CRM list 2013 is larger than in 2010**
- **21 raw materials classified as "critical"**
- **40% of the candidates classified as "critical" , higher than 2010 (≈ 1/3)**

EU mines are among the most efficient in the world

- EU companies are at the forefront of innovation in raw-materials supply
- World renowned development and manufacture of mining and mineral processing equipment
- Competing in a global market through stand-out productivity performance
- Meeting or exceeding the EU's strict environmental & safety standards

Meeting "base-load" demand

- Upgrading & maintaining infrastructure (health, transport, energy,…)
- Accommodating increased urbanisation
- Deploying new sustainable technologies

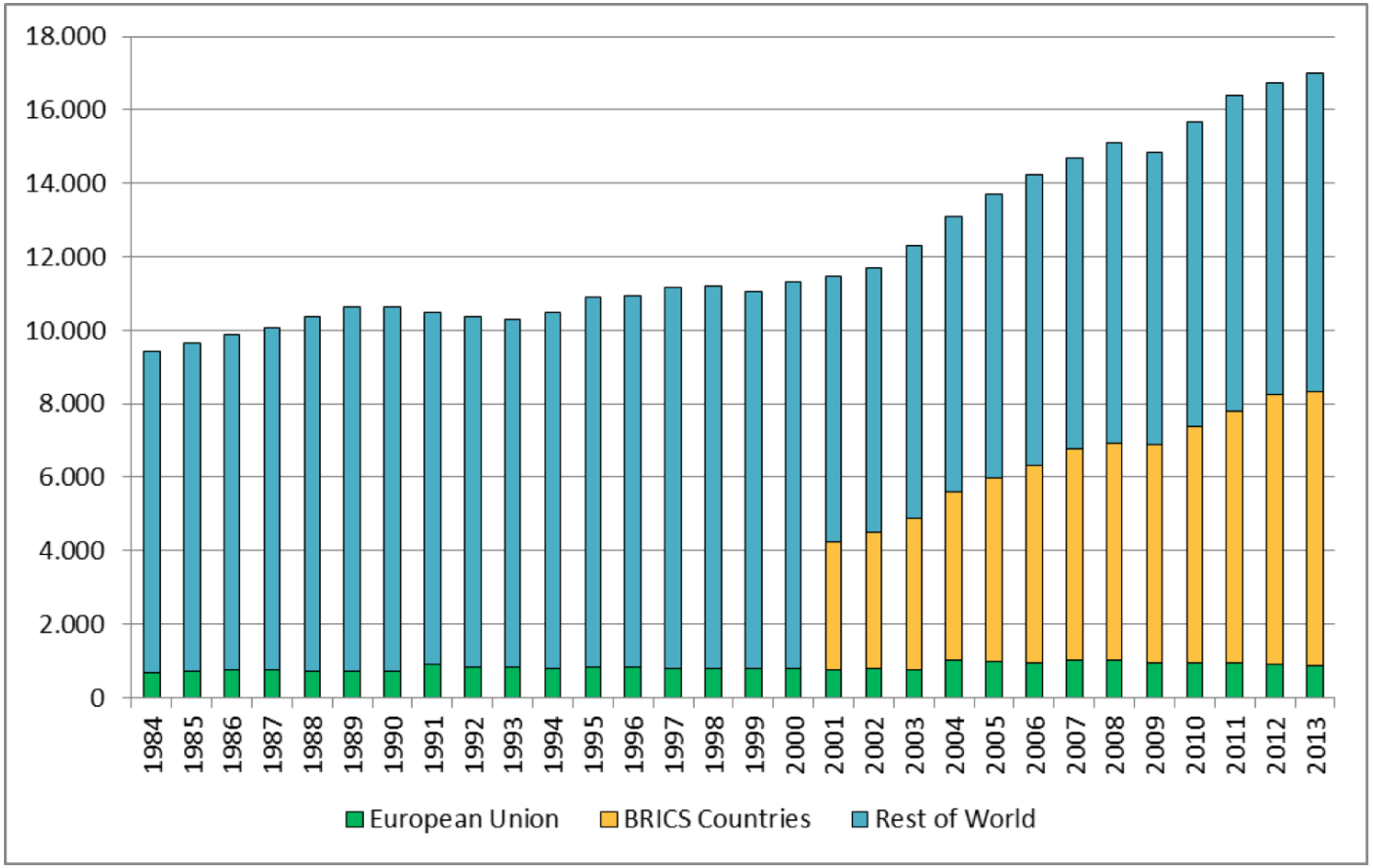


- Sharing equitably the benefits of new technologies
- Re-balancing lifestyles and employment across EU regions

The EU mining industry consistently adds more to proven reserves than it takes away

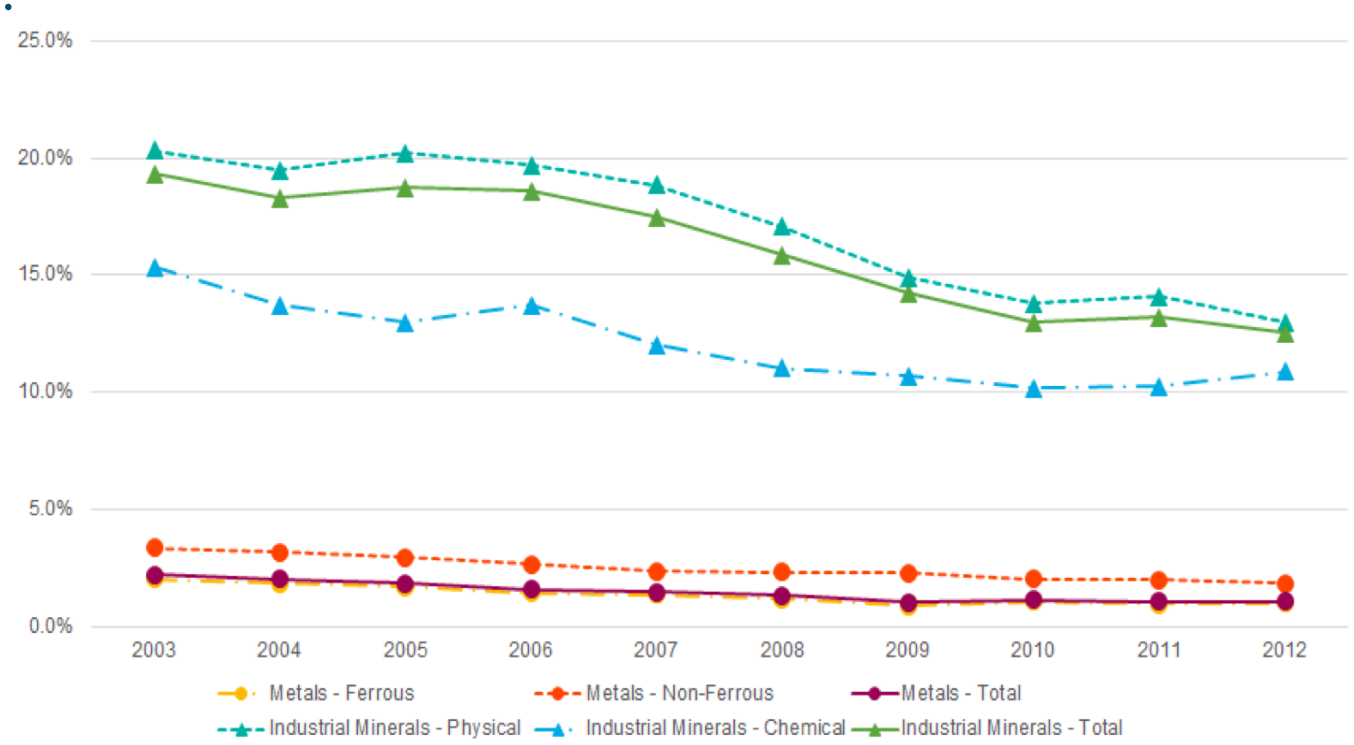
World Mining production 1984-2013 (Million Tonnes)

Source: BMWFW World Mining Data 2015



EU 28 share of Global Output

Source: BGS



EC study on competitiveness of Raw Materials Sector April 2015

- EU28's relative share of global NEEI output seems to have decreased over the last 10 years **BUT** Global output itself has increased significantly in that period.
- The EU has excellent transport networks and infrastructure.
- Strong support for R&I activity especially from public funds combined with a wide range of academic facilities provide a fertile environment for new innovative technologies to be developed within the EU.
- A stable investment climate *but*…Policy and legislation may, in some cases, impact negatively.
- Whilst there is political will to ensure security of supply, political opposition, as well as public opposition, especially locally, can work to hinder the development of the extractive industries.

Some CRM examples

Source: BMWFW World Mining Data 2013

- There are still far too many Zeros in the EU
- Tungsten production is growing but market conditions are tough
- Fluorspar production is holding steady
- Cobalt has grown from 27T in 2009 to 2061T in 2013
- BRICS production of Coking coal has mushroomed. EC produced 21MT in 2013 down 10% since 2009 but world production grew 26% to exceed 1BT in 2103
- EU Magnesite production grew 40% 2009-2013 but its global share remained 11%
- Generally production has not grown at comparable rates to competitors

EC study on competitiveness of Raw Materials Sector April 2015

- **Comprehensive data is lacking**, but it is understood that some of EU operators experience higher costs, specifically in labour and energy compared to competitors.
- There is a lack of knowledge of mineral endowment. A number of countries promote private sector investment in exploration. Such measures are rarely found in the EU28.
- The mining depth for some metals in the EU is deeper than in many countries and thus is likely to result in higher costs.
- Although R&D activity in Europe receives strong public sector support and funding, current levels of private funding are higher in comparator countries. 'Leakage' of R&I knowledge outside the EU is also a risk.

Market Overview

- For a small number of minerals the EU is the world leader in production, e.g. salt. However, only for gypsum and potash does the EU account for over 10% of global production.
- Economic and market data appear to show the EU as having a declining importance in the global market since 2003, as evidenced by its declining share of the world production, whilst the trade data indicate large trade deficits for ores.
- Performance is not uniform, there are significant variations. For example, recent data demonstrates that the EU28 trade balance is positive for semi-finished critical metals and for non-aggregate construction minerals.

Cost Structures

- The EU generally has higher labour and energy costs but there is little reliable data on energy efficiency.
- This is particularly relevant to metal mining. Energy is required for mining and beneficiation of ores and thus higher unit costs place the sector at a significant competitive disadvantage.
- Much depends on the extent to which innovation within industry has allowed for the higher unit costs to be offset by improved productivity with respect to these input factors.
- Data on labour productivity and profitability is poor and it is difficult to draw specific conclusions. The best performers are countries which tend to have large open-pit mining operations, so the data may reflect, in part, the nature of the mineral endowment settings rather than a more fundamental structural problem of competitiveness.
- Open-pit mining is also influenced by a wide range of other social, environmental and economic factors.

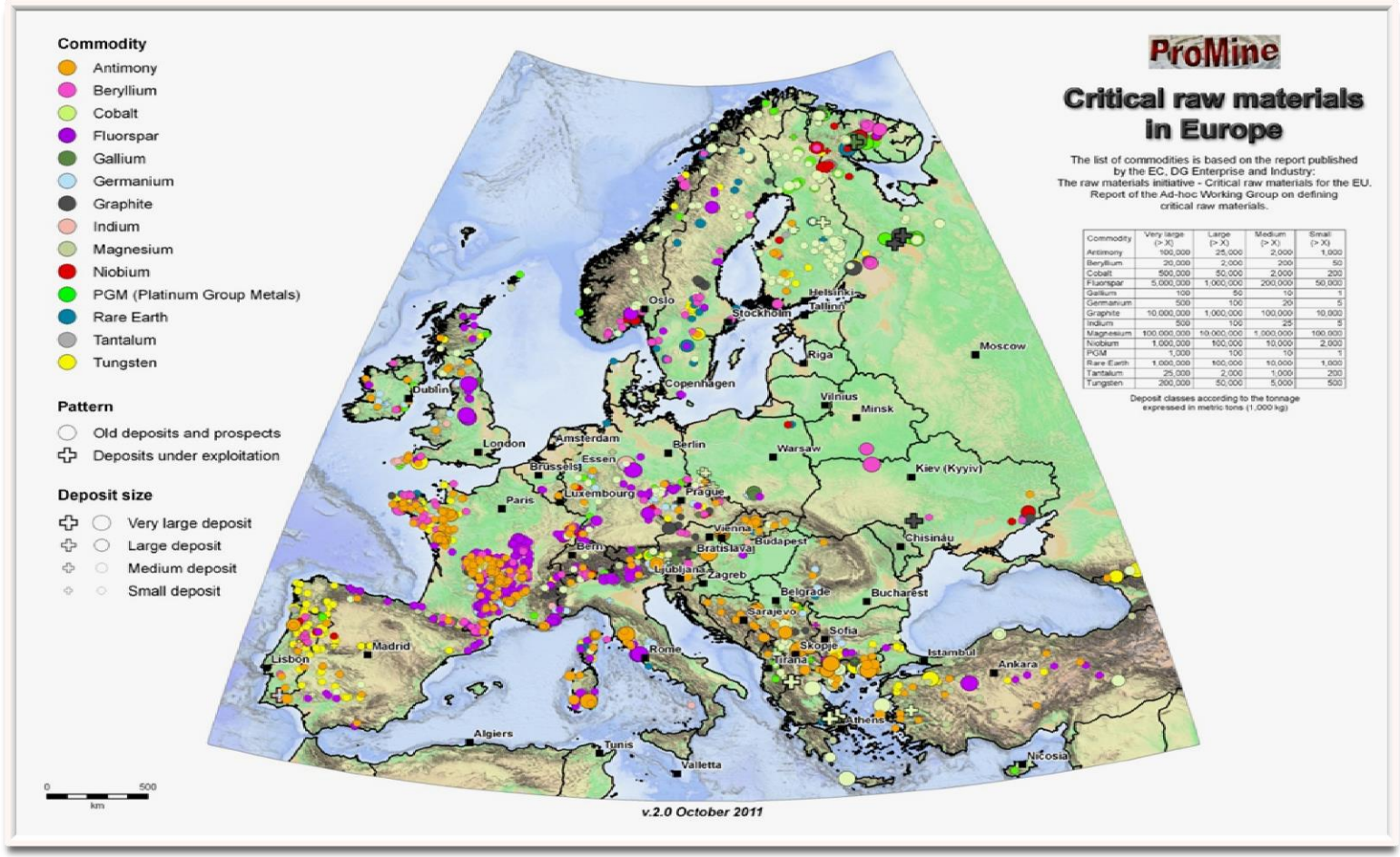
Suggestions toward improved competitiveness 1

Improve knowledge of mineral endowment

There has been a lack of investment in basic geological survey work. The fundamental knowledge base is much weaker than it could be. This increases the risk of undertaking exploration activity, which, in turn, holds back the development of the EU's indigenous resources.

More basic research is required to improve our understanding of Europe's geology and thus to conduct more efficient and effective exploration. Other countries have been able to incentivise exploration by the private sector via the use of tax breaks and other fiscal instruments. The EU should seek to improve the knowledge of mineral endowment using modern techniques and seek to incentivise relevant research.

Increasing knowledge is key



- Established by the EIT (European Institute of Innovation & Technology, Budapest) Governing Board on 09 December 2014
- 135 partners across Europe
- EIT Raw Materials has the ambitious vision of turning the challenge of raw materials dependence into a strategic strength for Europe.
- This KIC (Knowledge and Innovation Community) will integrate multiple disciplines, diversity and complementarity along the three sides of the knowledge triangle (business, education and research) and across the whole raw materials value chain.
- EIT Raw Materials will **be the strongest consortium ever created** in the world in the raw materials field.

Suggestions toward improved competitiveness 2

Address costs of energy

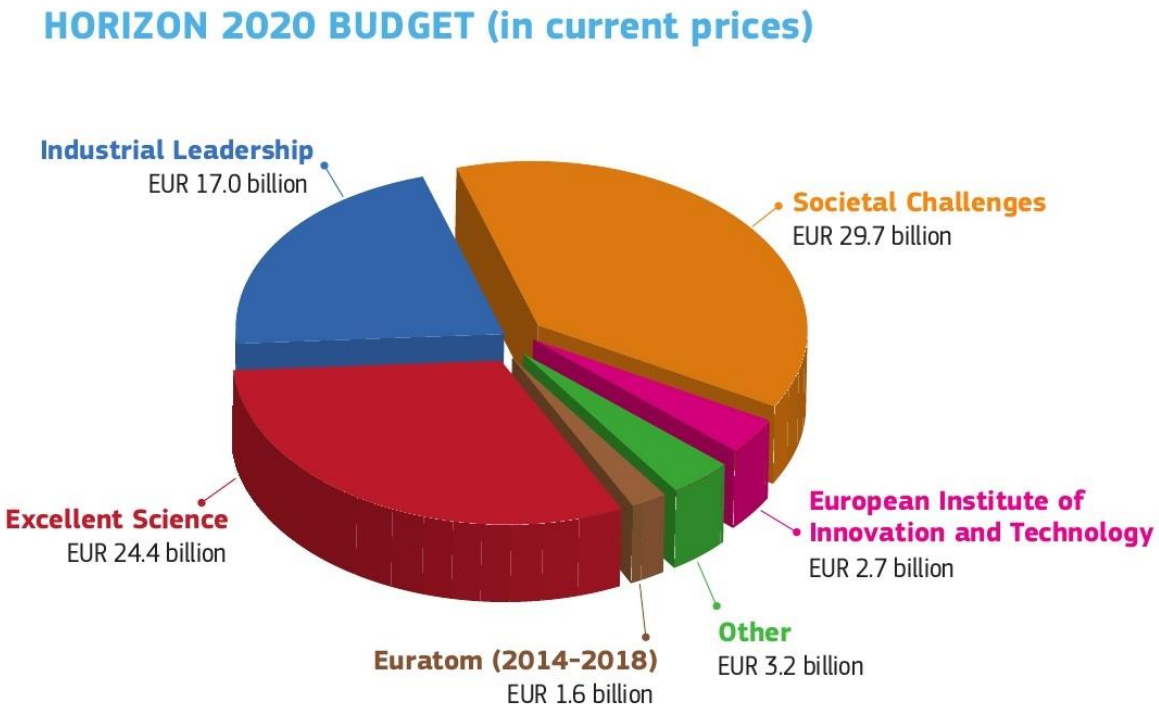
Energy costs in some parts of the EU are higher than some competitor nations.

Building on the efforts already made at an EU level at reducing the costs of energy, consideration should also be given to the amount energy used by processes. Operators within the EU could be incentivised to benchmark their energy consumption and engage in knowledge sharing activities that may help reduce energy consumption further.

Focus R&I on more efficient extraction methods

The EU should look to focus and increase funding for R&I activity on helping to reduce the costs associated with deep deposits and recovering the value of materials contained in tailings. Effort should be made to promote the sharing of best practice within the EU.

EU RTD funding



- EIP-Horizon 2020 funding
- KIC on Raw materials
- Many calls on Raw Materials
- National Platforms
- ERAMIN joint calls

Suggestions toward improved competitiveness 3

Simplify the regulatory framework

Policies within the EU are generally stable and mature compared to many competitor countries, but the regulatory framework is regarded as being time consuming and complex with quite unpredictable outcomes by industry. This may deter investment in the EU as the length of time from the commencement of permitting to starting extractive operations can be very long.

Member States should be encouraged to review the legislation impacting on mining and quarrying activities and seek to simplify requirements by following better regulation principles. The EU could facilitate this process through several instruments, starting from sharing of best practice. Additionally the EU can also ensure that Member States' are actually calculating and monitoring the impact of legislation in line with best practice

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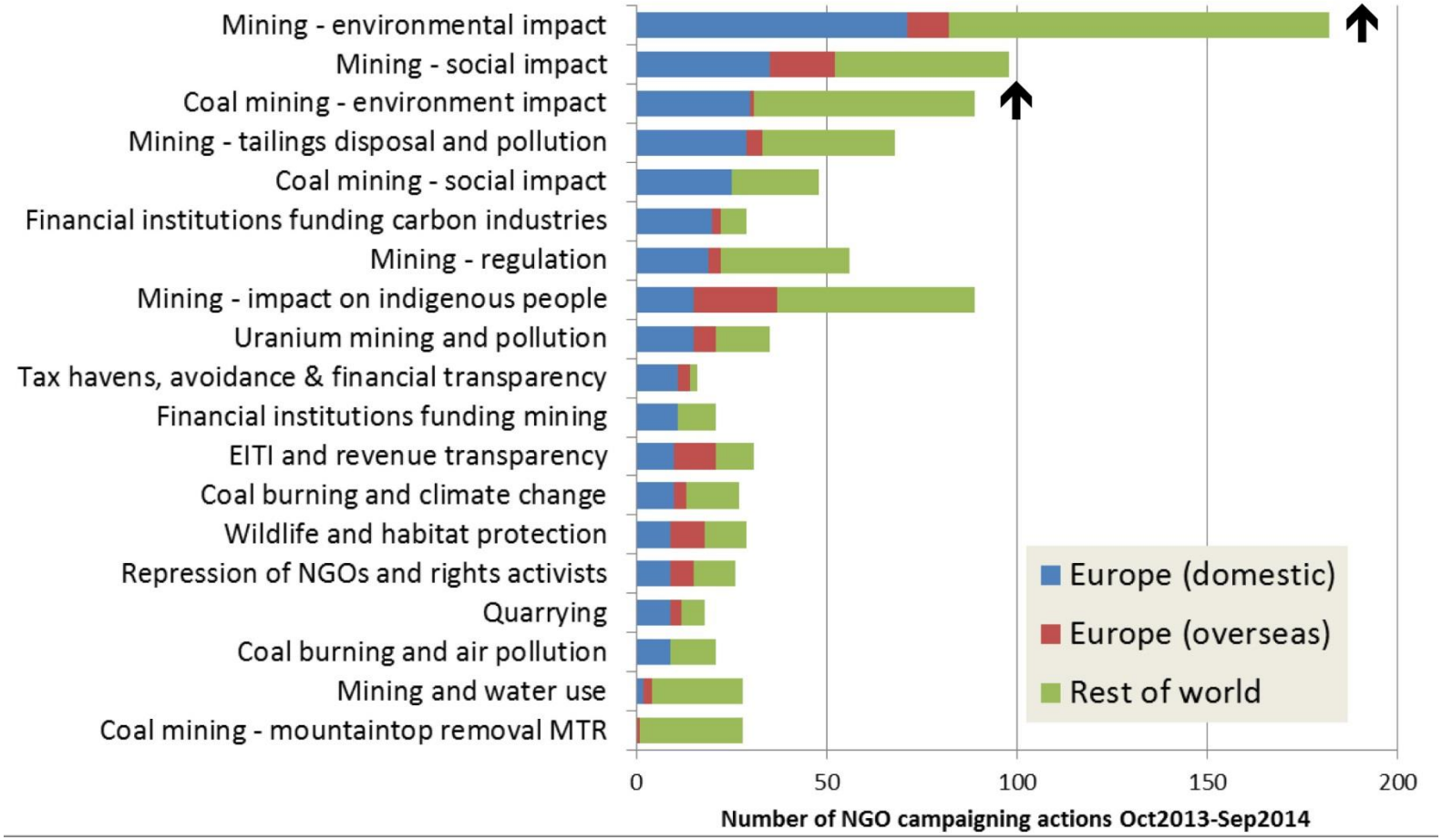
Public Acceptance

Current NGO agenda on mining



Source: SIGWATCH data ©2014

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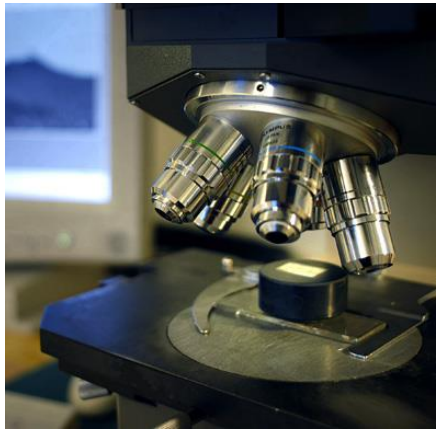
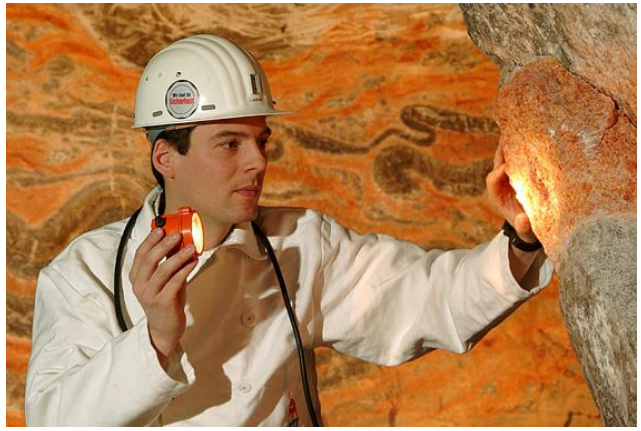
The EU Mining Industry Towards 2020

Sustainable production, Environmental-friendly products

- Create possibilities to keep production in the EU and attract as much investment in new facilities as possible.
- Extraction of metals and minerals in the EU should be encouraged.
- Developing new mining technologies and exporting them to the rest of the world.





Ensuring the international level playing field

WTO

DG Trade together with the US and Japan launched a first case at WTO against export restrictions on some of the critical raw materials and won the case

- bauxite, coke, fluorspar, magnesium, manganese, silicon carbide, silicon metal, yellow phosphorus and zinc.

A second case

- several rare earths, tungsten and molybdenum.

CHINA and Vietnam

- Euromines position against the EU's acceptance of China and Vietnam as market economies with the aim to protect European producers and European investment from unfair trade
- Alliance of industries concerned formed

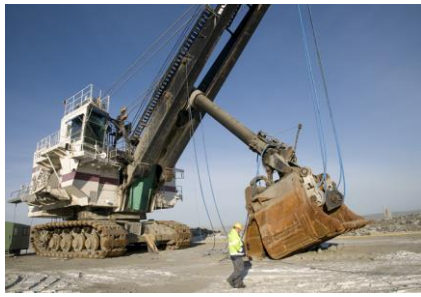
USA and Canada: Trade agreements

Participation in international dialogue

- EU scientific dialogue with Japan and USA on critical raw materials
- OECD
  - Monitoring OECD activities on various guidance for multi-nationals and internationally operating companies
- Worldwide
  - Crans Montana Forum, Dakhla March /Brussels, June 2015
- Industry
  - Cooperation in ICMM for the development of best practice guides
  - SME guide to implement ISO standards
  - ETP SMR cooperation with South Africa
- INTRAW project, international dialogue with Australia, USA, Canada, South Africa, Japan

Euromines: Forward Vision

- Achieve 100% **responsible** and **balanced** sourcing of mineral resources for the EU
- Ensure **full value-chains** that will strengthen the economy
- Position the EU as the **"international partner of choice"** for sustainable transformation of primary and secondary mineral resources
- Attract the necessary inward **investment in the EU**
- Achieve mining **employment** as a high multiplier of wealth
- Adopt and implement reasonable **energy** polices that ensure longer term returns
- Act to maintain the **competitiveness** of its industries



We are responsible for our future

Thank you for your kind attention

In case of any questions please contact:

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