

Critical raw materials at EU level

Metal extraction, environmental impact and supply risk

European Association of Mining
Industries

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Outline

- General comments on the methodology
- Metals
 - **The case of tungsten – or how nature protection and single communities could stop one of the major export streams of the EU**
 - **The case of Gold – or how the banning of one chemical can “sterilise” EU deposits and the majority of world deposits**
 - **The case of Iron ore pellets – or how an EU legislation can jeopardise green technology!**
- Recommendations

Methodology – what has been done

- 41 raw materials analysed
- Time horizon: 10 years
- A pragmatic approach
- Three main aggregated **indicators**
 - economic importance
 - supply risks
 - environmental country risks

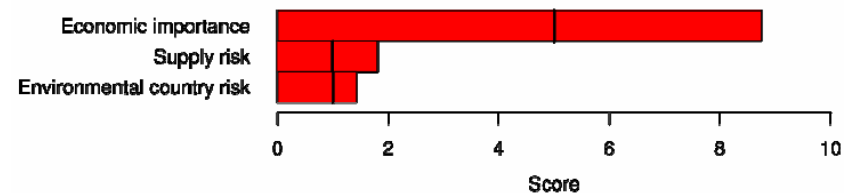
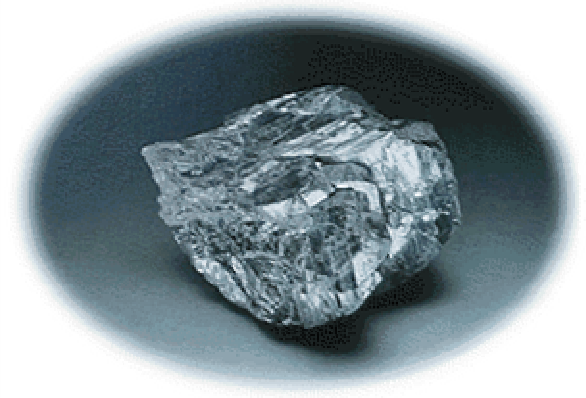
Methodology – what has not been done



- 41 raw materials analysed – some extremely important materials were ruled out at the beginning for no good reasons, i.e. gold and potash
- Time horizon: 10 years
- A pragmatic approach – with a lot of short-comings!
- Three main aggregated indicators with major flaws:
 - economic importance – today, not tomorrow: the economic importance for tomorrow's society was not featured into the statistics
 - supply risks – EU legislative risks for no access to the raw material in the future was not included in the equation
 - environmental country risks – the current analysis is based on an assessment of the general legal framework of countries, not at all on their legal framework of mining legislation. If the EU wanted to secure future supply it needs to accompany the analysis of origin of current and future supply with an analysis of the strength of the mining legislations in those countries.

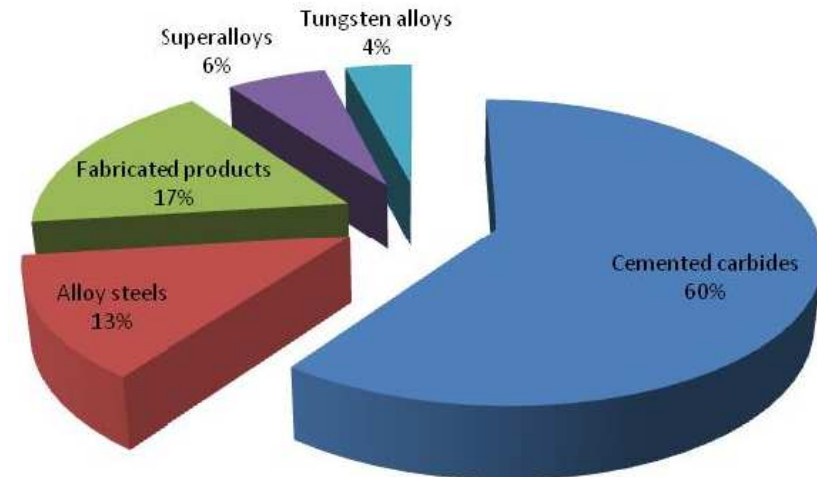
The case of tungsten – or how nature protection and single communities could stop one of the major export streams of the EU

- Production in EU:
 - Austria
 - 1.100 t / year (2% of Worlds Production)
 - Portugal:
 - 850 t / year (1.5% of Worlds Production)
- EU imports – 26% of Worlds Tungsten Production,
more than 7 times of the EU's own production



Uses of Tungsten I

- **Used in many down-stream industries:**
 - **High speed steel tools – 5 times more efficient than carbons steel tools**
 - **Light bulbs – lighting filaments**
 - **Electronics, X-Ray**
 - **Telecommunication**
 - **Radio, television, telephone, radar**
 - **Military uses**
 - **piercing bullets and shield material**



Wear-resistant materials used by the metalworking, mining, and construction industries heating, and welding applications super alloys for turbine blades

Current Tungsten Sources for the EU



- **The EU mines are near nature protection areas and two local communities could protest and prevent the extraction of tungsten in the EU.**

Panasqueira Mines - Portugal



Open-pit Tungsten Mine in Vietnam



North of Núi Phao,
Thái Nguyên,
Vietnam

Workers agree on 1% Salary Increase



- **Workers go on strike demanding better wages / salaries**

OJE

O JORNAL ECONÓMICO ONLINE

Trabalhadores da Panasqueira cancelam greve e aceitam aumentos de 1%

PORTUGAL

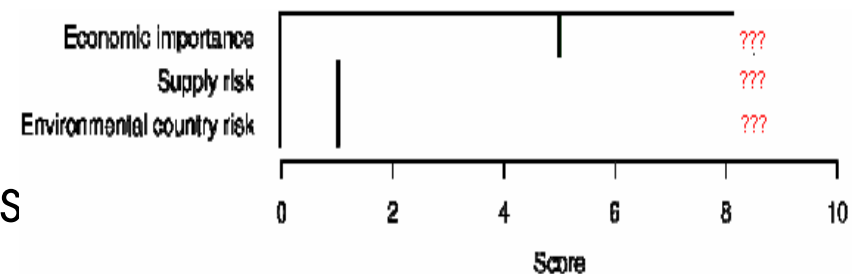
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OJE/Lusa

Os trabalhadores das Minas da Panasqueira cancelaram hoje em plenário a greve que ia decorrer até dia 30 e aceitaram um pré-acordo salarial alcançado entre o Sindicato Mineiro e a administração da empresa.

The case of Gold – or how the banning of one chemical can “sterilise” EU deposits and the majority of world deposits

- Production:
 - World Production (WP) of gold 80.777.372,751 ounces
 - Europe produces about 9% of WP
- Value in USD
 - It is worth more than \$100.3 Billion/year.
 - 14% of gold is used in Indus applications (more then \$14 Billion/year)



Benefits of Gold

- Gold is used in many green technologies
- Gold helps increase the efficiency rates of fuel cells and solar panels
 - In fuel cells the use of gold in alloys makes them 3-5 times more efficient.
 - Catalysts containing gold have 20 times more efficiency than platinum carbon catalysts and reduces the cost since it is about 19% cheaper than platinum.

The use of cyanide

- **1/4 of Cyanide is used in industry sectors other than mining**
- **It is used to manufacture:**
 - **Vitamins**
 - **Caffein**
 - **Dyes**
 - **Chelating agents for household and industrial cleansers**
- **The EU has the strictest cyanide limit values in the world. EU regulations:**
 - **The most restrictive regimes worldwide**
 - **Proven to safeguard human health and environment**
 - **Still allows economic development of regions**
 - **Requires constant innovation and modernization of the existing facilities**
 - **No additional regulation is needed in Europe to govern the safe use.**

The use of cyanide

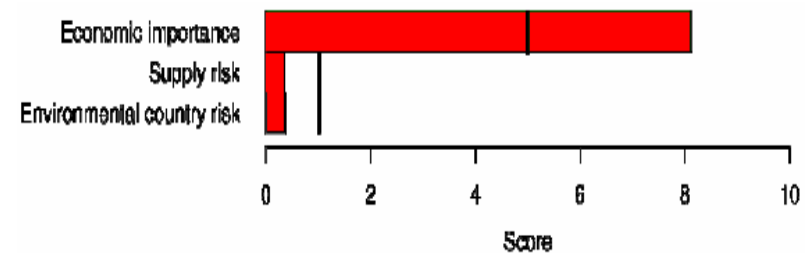
- **Currently there is no alternative available that would be environmentally less harmful.**
- **The majority of gold deposits today are processed with cyanide.**
- **A banning of the chemical would sterilise a large amount of deposits and increase the price of gold substantially.**

In light of the EU policies on the safe use of chemicals, it is questionable whether the banning of cyanide will not follow the precedent case of mercury where the EU bans the use of mercury and then changes the light-bulbs to energy saving light bulbs which are produced in China and include mercury which then has to be deposited in the EU.

The case of Iron ore pellets – or how an EU legislation can jeopardise green technology!

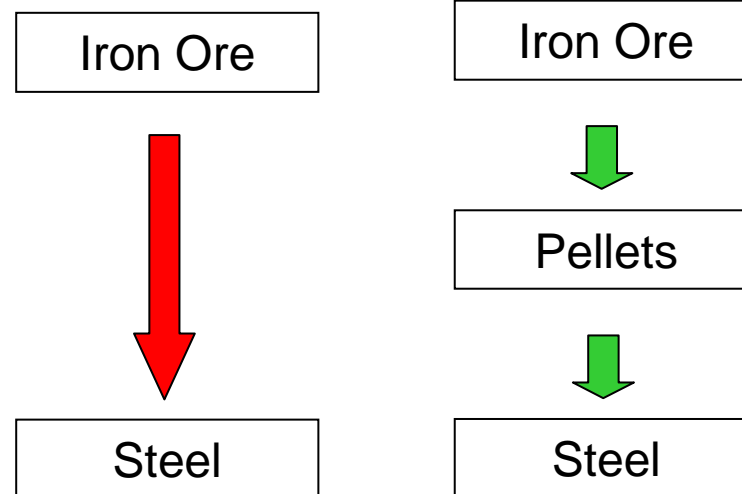


- World production 2.220 million tons
- Europe produces about 1.6% of world production
- In 2009 EU imported 149.000 tons, about 7% of world production
- It is facing strong competition from other countries, such as Brazil



Steel Production

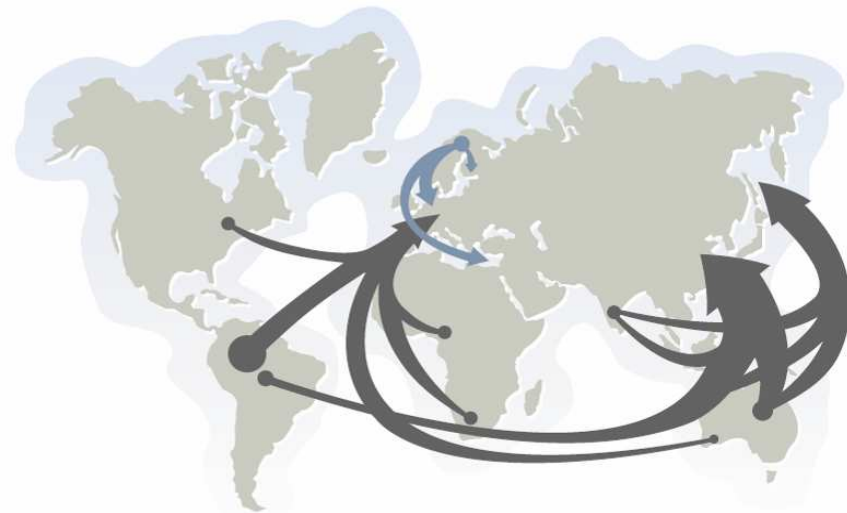
- Two main production methods of steel:
 - With or without pellets



The EU's iron ore pellet sector is heavily exposed to international competition producing pellets from less CO₂ efficient ores



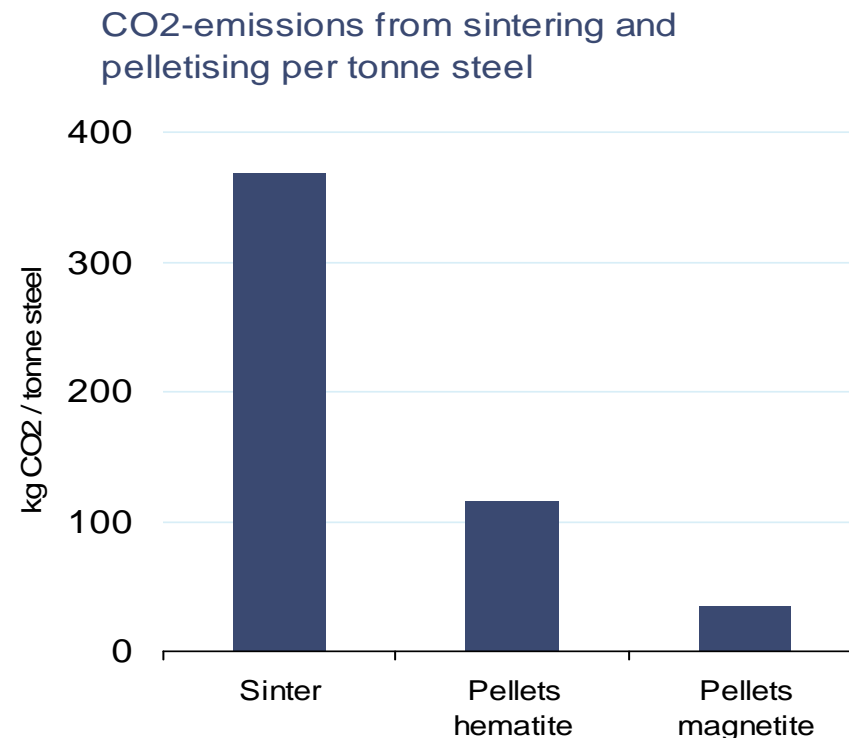
- Price on iron ore set in annual/quarterly negotiation and based on benchmark price.
- Highly likely that spot market will determine EU-price in the future.
- No possibility to pass on EU specific costs.
- Significant international competition from Brazil, Canada, Australia, China.
- Significant local employer.



Steel produced using green iron ore pellets significantly reduce total CO₂-emissions



- The use of green iron ore pellets enables the shift from a grey to green economy.
- Green iron ore pellets emit 10% of the CO₂ emissions of sinter.
- Green iron ore pellets reduce total CO₂ emissions per tonne steel produced.



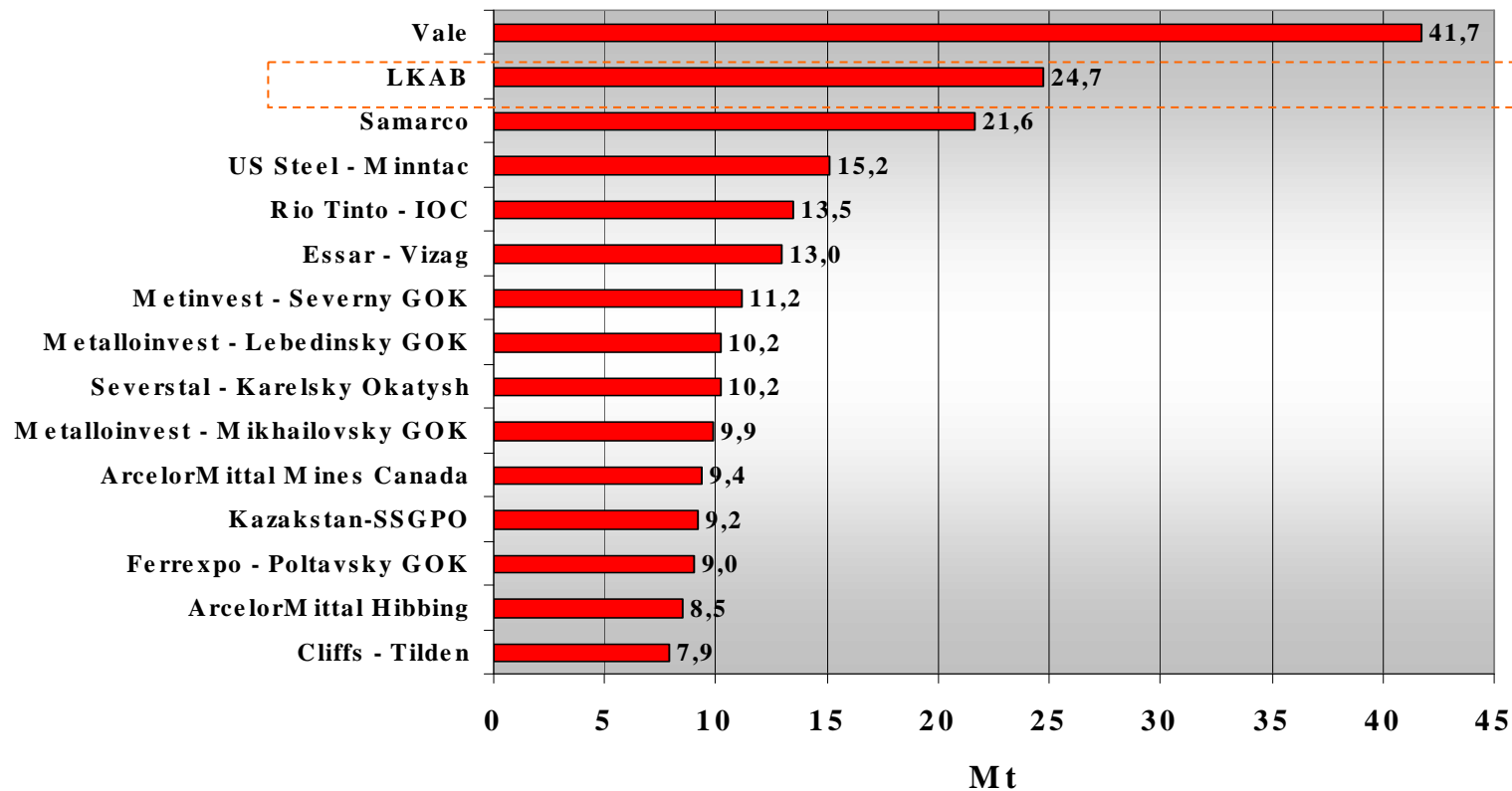
The EU ETS and Iron Ore Pellet Production



- Under the European Union Emission Trading Scheme (ETS) in the allocation scheme for free allowances
 - the pelletising plants linked to the mining company is disadvantaged in contrast to the pelletising plant integrated into the steel plant.
 - A future pelletising plant in planning is disadvantaged by being compared to those two although having a different raw material.

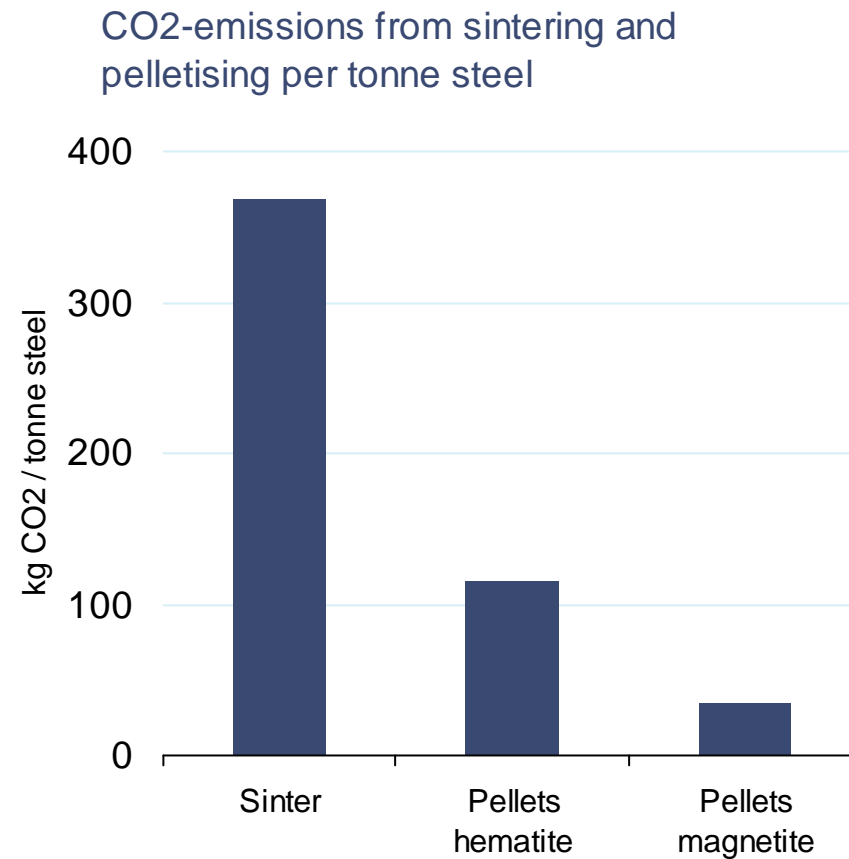
LKAB is a significant supplier to the EU steel industry

Current installation is the second largest pellets provider on a global scale...



Steel produced using green iron ore pellets significantly reduce total CO₂ emissions

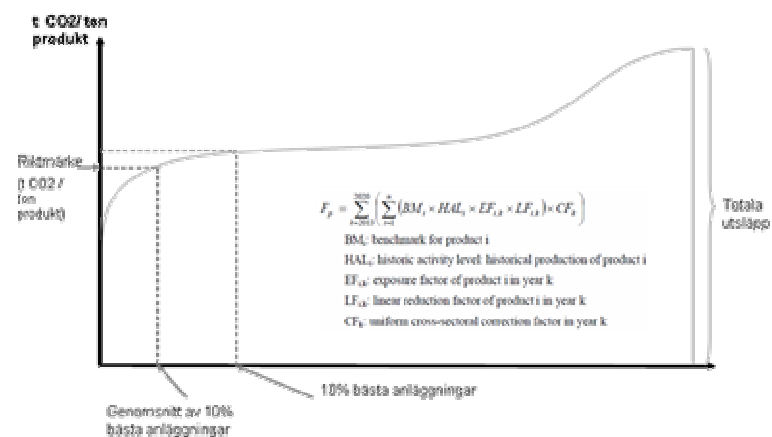
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EU ETS to give 100% free allocation based on benchmarks?

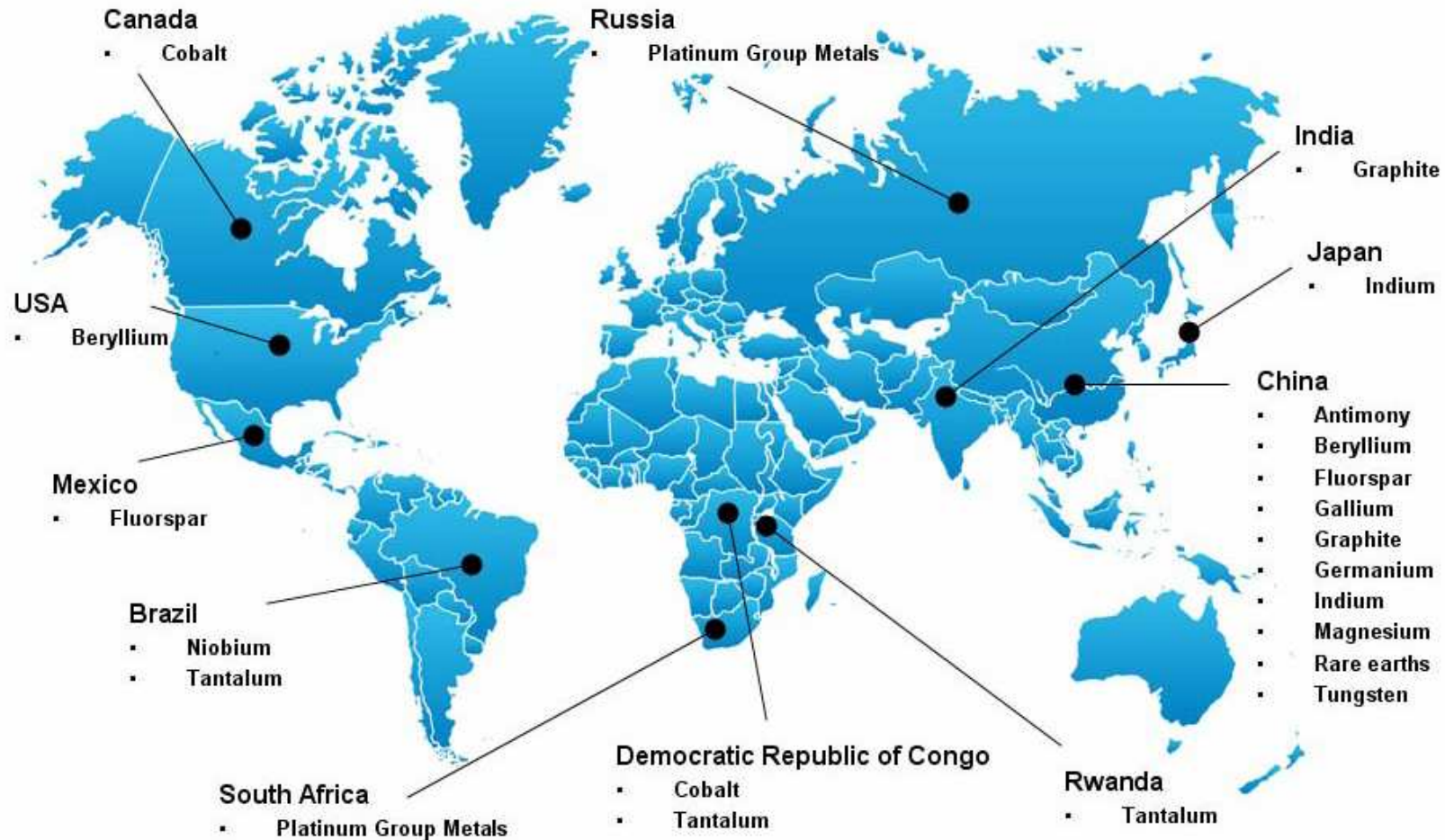
- Allocation to average of the top 10% best installations.
- The directive specifies that the best performing installations should receive 100% free allocation.
- Fall-back sectors are at disadvantage for best performing installations.
- LKABs installations are among the top 10% best installations globally and should receive full free allocation for CO2 emissions.
- An allocation based on a product benchmark would ensure correct implementation of the directive.

Allocation based on a product benchmark



An allocation based on a fall-back option for the sector results in an incorrect interpretation of the directive 2009/29/EC and is not in line with the design of the EU ETS.

Is the EU's supply risk due to an environmental risk factor? – and if so where?



Conclusion

- **The methodology needs a serious review and further development.**
- **The concept of human rights and democracy of individuals and its implementation has to be reviewed in the light of a wider public interest if we do not want to end up in unreasonable situations.**
- **EU' legislation needs to be reviewed with regard to its negative impact on the supply situation and long-term green technologies.**

Therefore instead of trying chasing paper dragons, why not resolve home made problems?