EU & critical raw materials – implications for the industry

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Global metal mining
Policy processes

- EU - Raw Materials Initiative
- Africa - African Mining Vision
- Nordic countries
  - Finland, Sweden
- Japan, USA etc.
Why policy initiatives?

- Metal boom & high prices.
- Criticality.
- Worries about China.
- Increase government ”take”.
Mineral criticality

Supply restrictions:
- Price elasticity
- Substitution
- R&D

Reliability of Supply:
- Geological
- Technical
- Environmental & Social
- Political
- Economical

Source: Eggert 2007
EU Raw Materials Initiative

• Access to raw materials on equal terms.
• Framework conditions for domestic production.
• Reduction of consumption.
Outline

• Two myths:
  • China is holding the world at ransom.
  • China is conquering Africa.
• Nordic mining experiences in Africa.
• Nordic mining for Europe.
• Conclusions.
Global metal use

Asia 67 %
Global metal mining

China 14.8 %
Global mining - incl. coal

China 29 %
## Chinese metal supply

<table>
<thead>
<tr>
<th></th>
<th>Mine production</th>
<th>Refinery production</th>
<th>Self sufficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper (kt)</td>
<td>1 200</td>
<td>4 573</td>
<td>26</td>
</tr>
<tr>
<td>Pig iron (Mt, Fe cont)</td>
<td>168</td>
<td>581</td>
<td>29</td>
</tr>
<tr>
<td>Aluminium (Mt)</td>
<td>6</td>
<td>16.2</td>
<td>37</td>
</tr>
<tr>
<td>Nickel (kt)</td>
<td>80</td>
<td>206</td>
<td>39</td>
</tr>
<tr>
<td>Zinc (kt)</td>
<td>3 700</td>
<td>5 164</td>
<td>71</td>
</tr>
</tbody>
</table>

Source: Raw Materials Group, Stockholm 2011
Chinese metal mining

- Fragmented corporate structure.
- Many small mines.
- Low grades, under-ground.
- High cost producer.
- Vertical integration.
Rare earths, metals, China and the world
Chinese iron ore imports

China
85 billion USD

REE value 2010

Total value at mine stage for metals: 618 billion USD

Source: Raw Materials Group, Stockholm 2011
Rare earths, metals, China and the world

- China is almost as import dependent as Europe.
- Iron ore, copper are serious Chinese problems.
- Rare earths are a minor problem for Europe, which the markets will sort out.
Chinese FDI

Africa drawing: Kaianders Sempler.
Chinese foreign mines
Chinese foreign projects
Chinese foreign expansion

• Foreign expansion slow, not continuous.
• Lack of large scale experiences and technology.
• Will increase in the future.
• No Chinese companies among the top 25.
• Long term security of supply serious problem for China.

Africa drawing: Kaianders Sempler.
China summary

- China largest mining country in the world.
- Often high cost and marginal profitability.
- Serious Chinese import dependence.
- No Chinese companies in top globally.
- Chinese FDI slow and behind plans.
- Africa still has opportunity to benefit from present boom.
- Rare earths are not a problem – Chinese import dependence of base metals is.
African mining and the Nordic countries

Copper drawing: Kaianders Sempler.
Global mining - 2010

Global mining - 1984

African mining countries

1. South Africa  531
2. Ghana        73
3. Zambia       71
4. Botswana     55
5. Congo        43
6. Mauritania   33
7. Zimbabwe     26
8. Tanzania     25
9. Morocco      24
10. Angola      16

African mining and the Nordic countries

- Need for Nordic technology.
- EU policy met with doubts in Africa.
- Nordic countries without colonial history have an advantage.

Copper drawing: Kaianders Sempler.
Nordic countries

Nickel drawing: Kaianders Sempler.
Nordic mining industry

- Largest mining region in the EU.
- Most dynamic in the EU.
- Strong mining cluster.
- Politically high on agenda.
- Public in general supportive.
- > 250 Mt ore by 2020.
Nordic countries

Finland
• New strategy in place.
• Intense public debate.
• State mining support.

Sweden
• Policy process running.
• Weak leadership.

Norway
• Lagging behind.
• Sami issues.

Nickel drawing: Kaianders Sempler.
Conclusions

• Critical materials for EU are iron ore, copper and base metals not REE etc.
• China is not only a threat but also an important opportunity.
• Africa is open to business and wants to share the Nordic experiences.
• Nordic mining key role in Europe - should make its voice heard in Brussels.
• The mining industry is global.
Kiitos/Tack/
Thank you!

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Copper drawing: Kaianders Sempler.
Raw Materials Group

- Raw Materials Data: Metals/Coal/Iron Ore
- Newsletters: Metal Market Intelligence, Iron Ore, Copper, Nickel Quarterlies
- Strategy development
  - Mining companies, equipment & service
- Mineral policy, investment promotion
  - Governments, International organisations
- Pre-feasibility/Feasibility studies
  - Financial institutions, companies
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