Non-technical challenges of the valorization of domestic European resources

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What kind of challenges is raw materials sector facing in Europe?
The good news first:

1. An EC paradigm shift and commitment: Raw Materials become a societal challenge

1. Excellent Science
   - European Research Council
   - Future and Emerging Technologies
   - Marie Curie Actions
   - Research Infrastructures

2. Industrial Leadership
   - Leadership in Enabling & Industrial Technologies
     - Information and communication technologies
     - Nanotechnologies
     - Advanced materials
     - Biotechnology
     - Advanced manufacturing and processing
     - Space
   - Access to Risk Finance
   - Innovation in SME

3. Societal Challenges
   - 7 Challenges
     - Health, Demographic Change and Wellbeing
     - Food security, sustainable agriculture and maritime research and the bio-economy
     - Secure, Clean and Efficient Energy
     - Smart, Green and Integrated Transport
     - Climate Action, Resource Efficiency and Raw Materials
     - Europe in a changing world: Inclusive, Innovative and Reflective Societies
     - Secure Societies – Protecting Freedom and Security of Europe and its Citizens Reflective Societies

Joint Research Centre (JRC)
Widening Participation
Science with and for Society
European Institute of Innovation and Technology (EIT)
Joint Programming P2P
Joint Technology Initiatives (JTI) P2B
2. Mining becomes increasingly important

Figure 2 – Global material extraction by: a) historical (world, 1990-2015) and b) projected data (world, 2015-2050)
(Source: Raw materials Scoreboard 2018 in preparation, UNEP, World Bank)
2. Demand for emerging technologies requires more mining and advanced CE
The bad news:
1. Europe’s decline in mining though raw materials supply dependency increases

Share of world metals mining by world region (1850-2009)
(Source: EU 2016 RM Scoreboard; © ICMM, 2012, ‘Trends in the mining and metals industry — Mining’s contribution to sustainable development’)
2. How far does the EC Commitment to Raw Materials go?

EU budget 2014-2020
In billion euro and in percentage, current prices

**Economic, social and territorial cohesion**
€371.4
- Research and innovation
- Information and communications technology
- Small and medium-sized enterprises
- Low-carbon economy
- Climate change and risk
- Environment and resource efficiency
- Transport and energy
- Employment
- Social inclusion
- Vocational training

**Competitiveness for growth and jobs**
€142.1
- Education
- Energy
- Industry and small and medium-sized enterprises
- Networks and technology
- Research and innovation
- Transport

**Global Europe**
€66.3
- Development and international cooperation
- Humanitarian aid
- Neighbourhood and enlargement
- Foreign policy instruments

**Security and citizenship**
€17.7
- Migration and home affairs
- Health and food safety
- Culture
- Justice

**Sustainable growth: natural resources**
€420
- Agriculture
- Rural development
- Fisheries
- Environment and others

**Administration**
€69.6
- Lawmaking
- Institutions cost and staff

Note: Commitments; adjusted for 2018.
2. How far does the EC Commitment to Raw Materials go?

**HORIZON 2020 BUDGET (EUR 78.6 billion, current prices)**

- **Industrial Leadership** EUR 17.0 billion
- **Excellent Science** EUR 24.4 billion
- **Euratom** EUR 1.6 billion
- **European Institute of Innovation and Technology** EUR 2.7 billion
- **Societal Challenges** EUR 29.7 billion

**Funding for Societal Challenges calls**

1. Health, demographic change and wellbeing
   - €669 million
2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy
   - €716 million
3. Secure, clean and efficient energy
   - €917 million
4. Smart, green and integrated transport
   - €756 million
5. Climate action, environment, resource efficiency and use materials
   - €526 million
6. Europe in a changing world - inclusive, innovative and effective societies
   - €212 million
7. Secure societies – protecting freedom and security of Europe and its citizens
   - €393 million

*Additional €7540 million will be dedicated to Cost-Effective Calls Interest-of-things, Industry 2030 and the Circular Economy, Smart and Sustainable Cities*
The challenges
Challenge 1: avoid the word mining

Commission proposal for a € 100 billion R&I funding programme (2021-2027)
- Digital and Industry: €15 billion (Circular Industries (incl. “Raw Materials”), Low-Carbon and Clean Industries

- Pillar 1: Open Science
  - European Research Council
  - Marie Skłodowska-Curie Actions
  - Research Infrastructures

- Pillar 2: Global Challenges and Industrial competitiveness
  - Clusters
    - Health
    - Inclusive and Secure Society
    - Digital and Industry
    - Climate, Energy and Mobility
    - Food and natural resources
  - Joint Research Centre

- Pillar 3: Open Innovation
  - European Innovation Council
  - European innovation ecosystems
  - European Institute of Innovation and Technology

- Strengthening the European Research Area
  - Sharing excellence
  - Reforming and Enhancing the European R&I system
Lesson learnt?
Prosperity is not self-evident
Challenge 2: Raw Materials fail in RIS3

RIS3 - GERMANY
Sustainable economy and energy:
  ▪ Energy storage, electricity grids, photovoltaic construction & energy efficient cities, green economy, bio-economy, sustainable agricultural production, securing provision of raw materials, future city, future construction and sustainable consumption

Electricity, gas, steam and air conditioning supply

Energy
  ▪ Consumption efficiency, production and distribution efficiency, other power and storage technologies, Renewable energy sources

Knowledge
  ▪ Biological, engineering and computer and information sciences, Mathematics

Digital transformation
  ▪ Intelligent inter-modal & sustainable urban areas (e.g. smart cities)

Sustainable innovation
  ▪ Bioeconomy, Resource efficiency, Sustainable agriculture, Sustainable energy & renewables, Sustainable production & consumption
Challenge 2: Raw Materials fail RIS3

S3 – SAXONY

ICT and digital communication, Information and communication technologies
- Increasing economic efficiency and competitiveness, Improving industrial production and technology

Industrial production and technology
- Improving industrial production and technology

Knowledge
- Engineering Sciences, Mathematics, computer and information sciences

Digital transformation
- Advanced or High performance computing, Artificial intelligence, cognitive systems, Big data, data mining, database management, Digitising Industry

Biotechnology

New materials

S3 – BAVARIA

Electricity, gas, steam and air conditioning supply

Environment
- Monitoring facilities for measurement of pollution

Energy
- Consumption efficiency, production and distribution efficiency

Knowledge
- Earth and related environmental sciences

Digital transformation
- Cleaner environment & efficient energy networks and low energy computing

Social innovation
- Social innovation with regard to environmental issues

Life sciences. Biotechnology and systems biology
Challenge 3: Bad Raw Materials Policies

In most cases....

- NOT politically independent
- NOT exceeding political legislature period
- NOT budgeted

- WITHOUT time frame
- WITHOUT road map
- WITHOUT strategy to implement and communicate in the broader public
- WITHOUT impact on S3
- WITHOUT media content
Challenge 4 Heal the world
“The EC and Responsible Mining”

CE-SC5-08-2018-2019-2020: Raw materials policy support actions for the CE

Need for the industry to engage in responsible sourcing and responsible business conduct and to perform relevant due diligence that goes beyond legislative obligations – it is rooted in the growing expectations of consumers, civil society, governments and procurement managers (buyers). While it is very difficult for individual operators to meet such expectations due to the limited availability of the necessary information, downstream industries increasingly require all operators in their supply chain to address risks by performing due diligence.

Note: The global supply chains testify that there is no one regulation that governs World Trade. The EC founded own principles of fair trade and market involvement. These are given in the strategic implementation plan (SIP) of the European Innovations Partnership of Raw Materials (EIPRM) under the International Cooperation Pillar.

1. We do not show the consumers what is already done (also by law!) to make mining sustain.
2. Europes´competitors in mining will not have to care in these issues
3. The EC´s understanding of responsible sourcing cannot wan´t be mandatory to all
4. The consumer judges unilateral (only what is going on in his backyard)
Challenge 5: Ideology-driven policies

Carrier element lead and the EC lead ban (REACH) and the societal histeria
Challenge 6: Misunderstandings
Challenge 7: SLO undermines mining law

Source: S3, Saxony
Challenge 8: Development goals without Raw Materials
Better: Raw Materials – a subject on its own
Challenge 9: Regulations

European Union

- 92/104/EEC: Directive on the minimum requirements for improving the safety and health protection of workers in surface and underground mineral-extracting industries
- 1999/31/EC: Directive on the landfill of waste
- 2000/60/EC: Directive establishing a framework for Community action in the field of water policy (definition of European Water Policy)
- 2006/12/EC, and 2008/98/EC: Directive on wastes
- 2006/21/EC: Directive on the management of waste from extractive industries (and amending Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage)
- 2006/118/EC: Directive on the protection of groundwater against pollution and deterioration
- 2009/147/EC: Directive on the conservation of wild birds
- 2011/92/EU: Directive on the assessment of the effects of certain public and private projects on the environment
- 2019/130/EC: Cancer Protection Directive, modifying 2004/37/EC (Directive on the protection of workers from the risks related to exposure to carcinogens or mutagens at work)
Challenge 9: Regulations

Federal Republic of Germany

- BbergG: Federal Mining Law
  - UnterlagenBergV (Mining Regulation on matters of safety and of surveying and alignment)
  - EinwirkungsBergV (Mining Regulation on Impacted Areas): description of how the impacted area is to be defined and lists the angles of impact
  - GesBergV (Mining Regulation on Employees’ health protection)
  - ABBergV (General Federal Mining Regulation)
- BauGB (Legal Code on Construction)
- UIG (Environmental Information Law)
-AwSV (Regulation on Plants Management with Substances dangerous to Water)
- OGewV (Surface Water Regulation) and GrwV (Ground Water Regulation): definition of harmful water contaminations
  - Realizations of the 2000/60/EC (EU Water Framework Directive) and other directives in German law
- WHG (Water Management Law): German law on the use and protection of ground and surface water
- EinwirkungsBergV (Mining Regulation on Impacted Areas): description of how the impacted area is to be defined and lists the angles of impact
- BWaldG (Federal Forest Law)
- Regulation on operational safety
- ArbSchG (Law on the protection of employees)
- ASiG (Law on Work Safety)
- BetrSichV (Regulation on the Security in Plants)
- TRGS (Technical Rules on the dangerous substances) based on GefStoffV (Regulation on dangerous Substances)
- ChemG (Law on Chemicals):
  - Concerning protection from dangerous substances
- VersatzV and DepV (backfill and landfill Regulation)
  - Concerning the use of disposals for further mining purposes
- AtG (Atom Law), StrlSchG (Radiation Protection Law), StrlSchV (Radiation Protection Directive)
  - Definition and Regulation of the handling of ionising radiation
- KrWG (Law on Circular Economy)
- AVV (Regulation on the Classification of Waste): German adoption to the European Catalogue of Waste Categories
- SprengG (Law on Blasting Operations)
- VwVfG (Law on the Administrative Proceedings): Important in the proceedings of planning approval
- UVPG (Environmental Tolerability Law): Environmental Impact Assessment
- UVP-V (Regulation on the Environmental Tolerability of Mining)
- BNatSchG (Federal Environmental Protection Law)
  - Regulating e.g. continuous ecological functionality-measures, CEF-measures: ecological preemptive compensatory measures
- BBodSchG (Federal law on Soil Protection)
- BImSchG (Federal Immission Control Law)
- BImSchV (Federal Immission Control Regulation)
- REI-Bergbau: Regulation on the Monitoring of Emission and Immission in Mining activities
- StandAG (Law on the Search and Selection of a Site for a Repository for Heat-Generating Radioactive Waste): on the permission for drilling
Challenge 9: Regulations

Free State of Saxony

- SächsNatSchG (Saxonian Environmental Protection Law)
- SächsWG (Saxonian Water Legislation): regulating proceedings of demarcating protected areas
- SächsWaldG (Saxonian Forest Law)
- SächLPIG (Saxonian State Planning Law)
- SächsBO (Saxonian Building Regulation)
- SächsUIG (Saxonian Environmental Information Law)
- SächsBergVO (Saxonian Mining Regulation)
- RoG (Regional Planning Law)
- RoV (Regional Planning Regulation)
- SächsABG (Saxonian Waste Management and Soil Protection Law)

Total: 48
Challenge 10: UTOPIA

CleanMyMac X
Your Mac. As Good as New.

Clean world: German Greens want all newly registered cars to be emission-free by 2030
Calculating the UTOPIA

The Saxon Lithium deposit development of Zinnwald/Altenberg by Deutsche Lithium GmbH

Resources: 125.000.000 kg Li
Life time: 30 years

Number of vehicles in Germany: 65 mio
Average consume of Li in EV batteries: 20kg per unit

→ Zinnwald deposit enables to supply Li for „only“ a tenth of German vehicles
→ But: over a period of 30 years

Mathematics help! Greta.
The VISION: Mining as a public service

Mining as a public service

Fiskal engagements in Germany and motivation: public service

Deutsche Bahn (Federal railway): basic mobility
Deutsche Lufthansa (airline): basic mobility?

In former times:
Preussag
Metallgesellschaft

Stocking:

Questions:
Distinct Budgets in federal responsibility:
• Bankenrettungsfond
• Car manufacturing Rettungsfond 2008