

**Non-technical
challenges of the
valorization of domestic
European resources**

REMIX
Interreg Europe



European Union
European Regional
Development Fund

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GKZ Freiberg, Saxony, Germany

REMIX Closure Conference, Wroclav, 15.5.2019
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



2. Mining becomes increasingly important

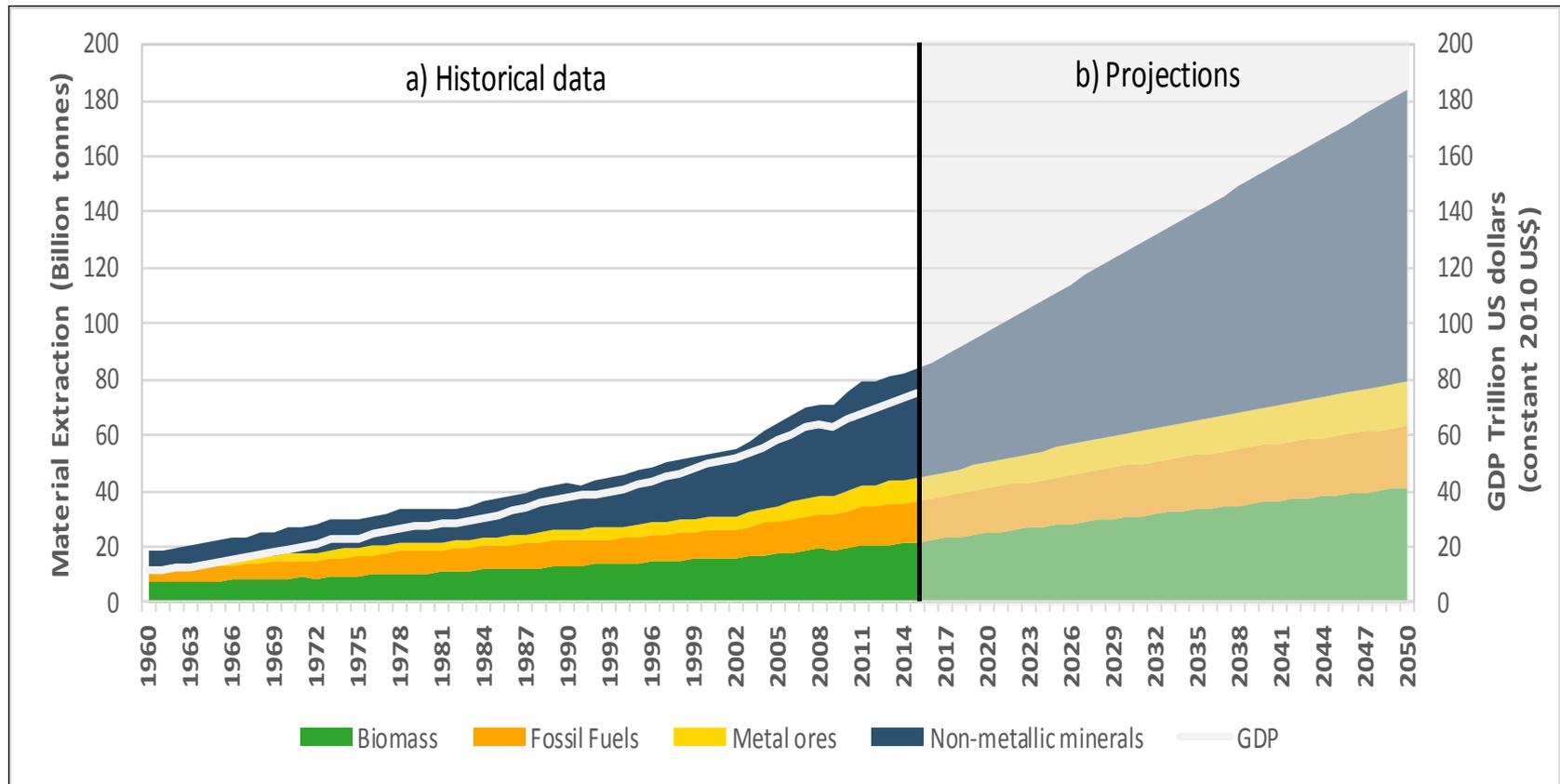
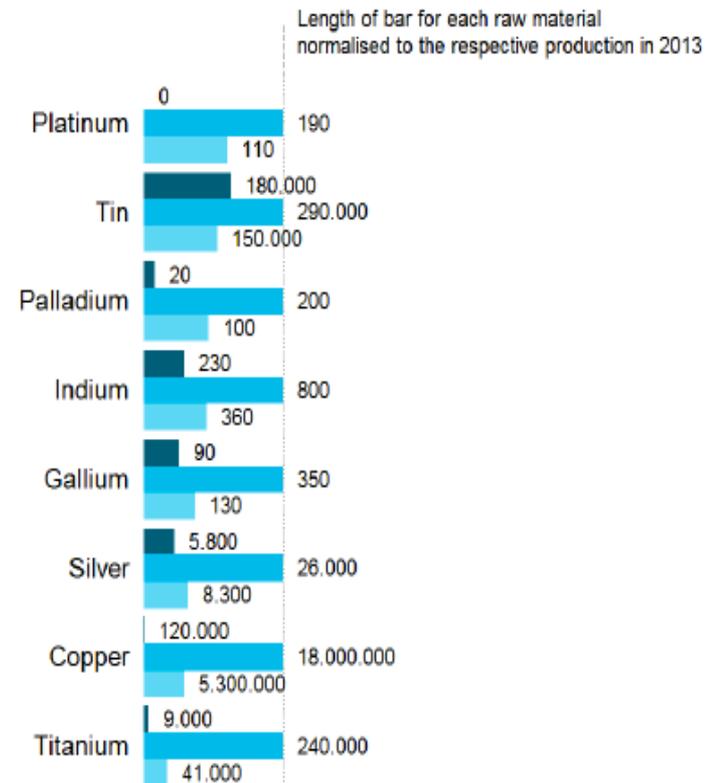
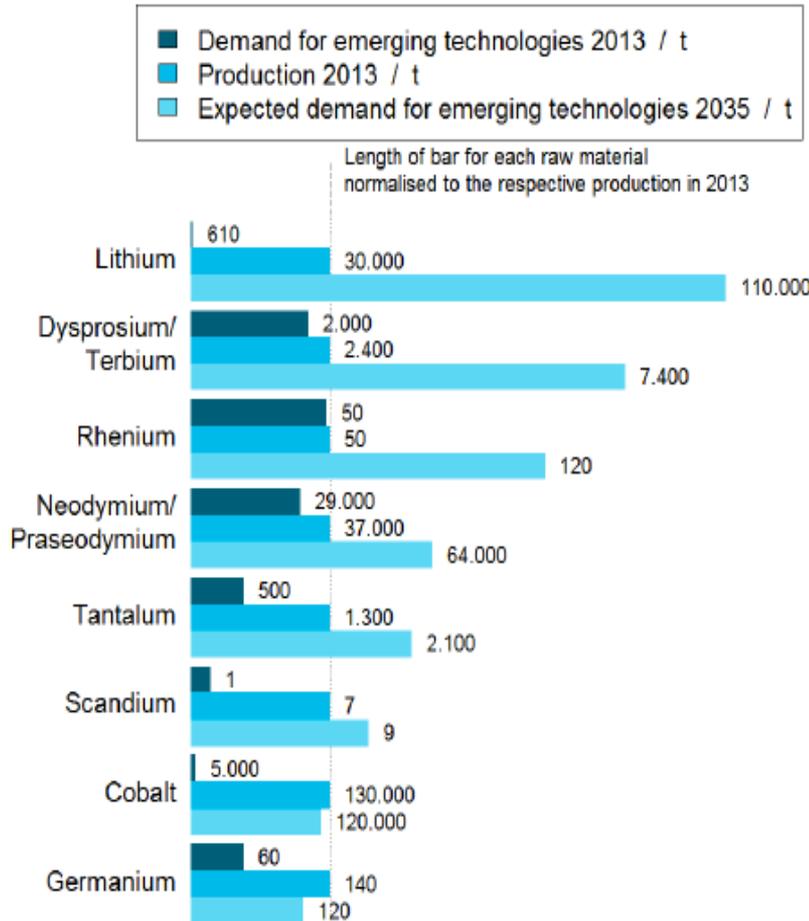


Figure 2 – Global material extraction by: a) historical (world, 1960-2014) and b) projected data (world, 2015-2050)
 (Source: Raw materials Scoreboard 2018 in preparation, UNEP, World Bank)

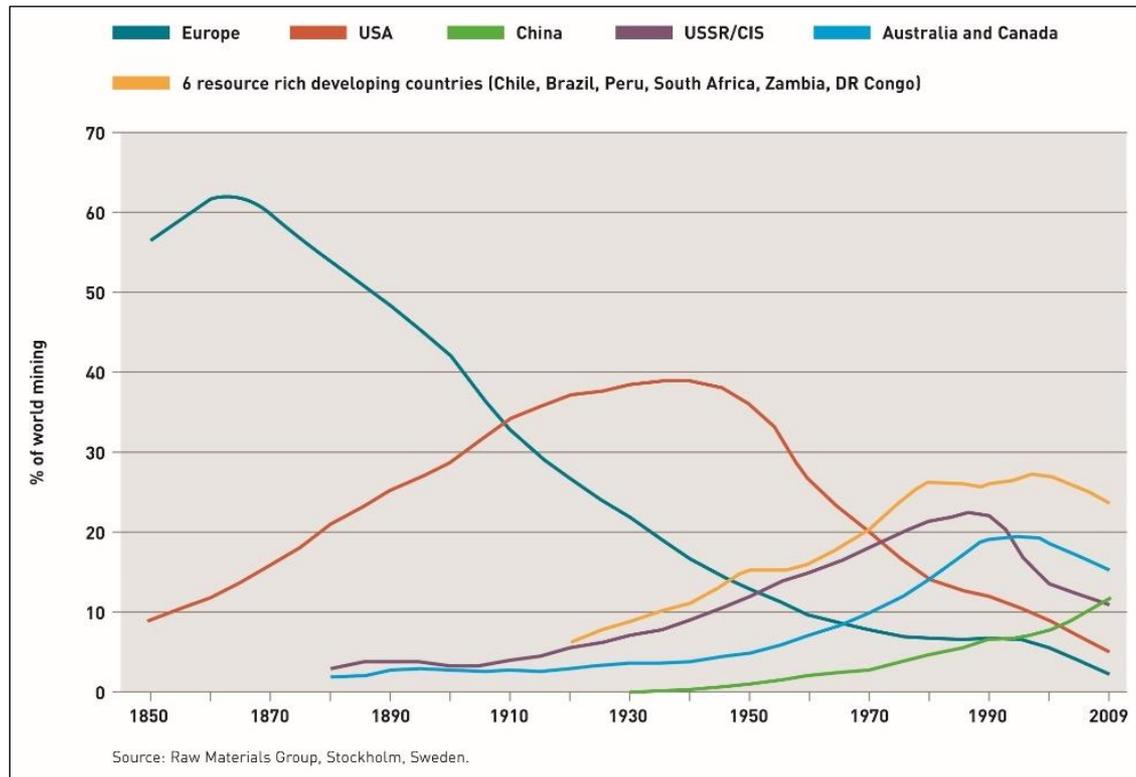
2. Demand for emerging technologies requires more mining and advanced CE



Marscheider-Weidemann, Langkau, Hummen, Erdmann, Tercero Espinoza, Angerer, Marwede & Benecke (2016). Rohstoffe für Zukunftstechnologien 2016. DERA Rohstoffinformationen 28. Berlin

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

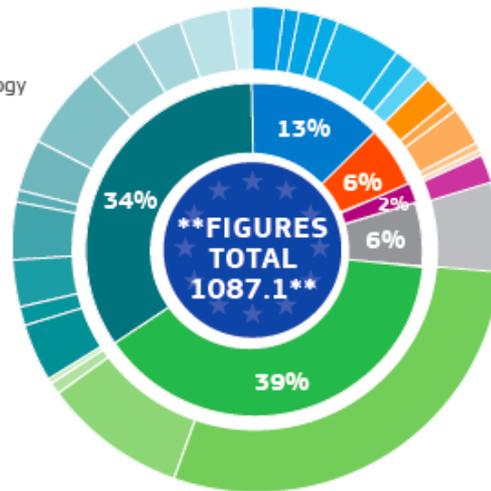
- Development and international cooperation
- Humanitarian aid
- Neighbourhood and enlargement
- Foreign policy instruments

Security and citizenship €17.7

- Migration and home affairs
- Health and food safety
- Culture
- Justice

Administration €69.6

- Lawmaking
- Institutions cost and staff



Sustainable growth: natural resources €420

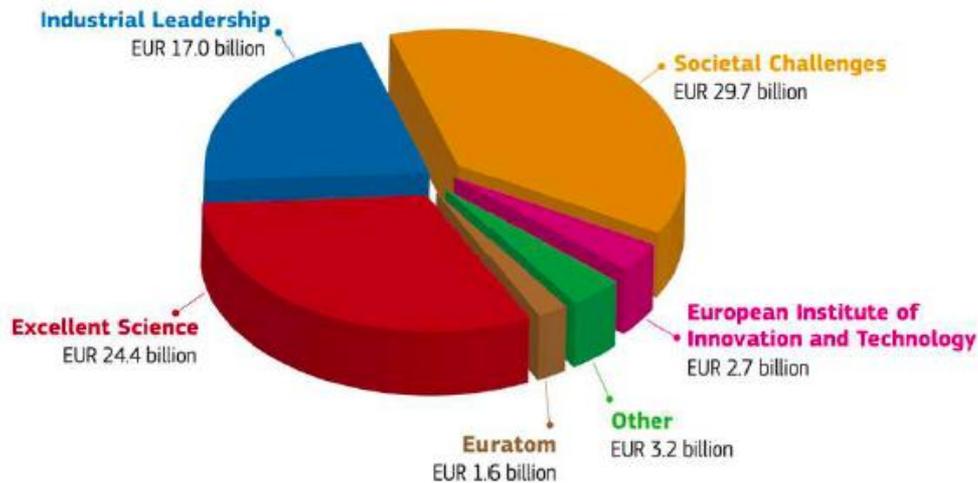
- Agriculture
- Rural development
- Fisheries
- Environment and others

Note: Commitments; adjusted for 2018.

Source: European Commission, Reflection Paper on the future of EU finances, 2017.

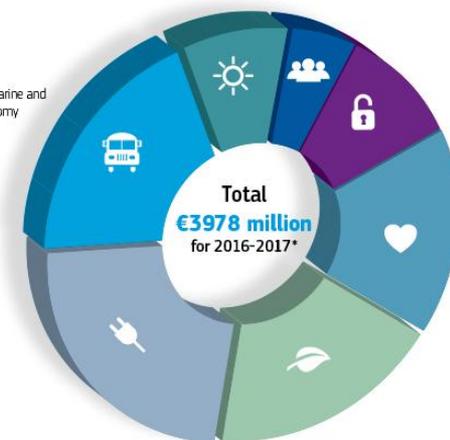
2. How far does the EC Commitment to Raw Materials go?

HORIZON 2020 BUDGET (EUR 78.6 billion, current prices)



Funding for Societal Challenges calls

1. Health, demographic change and wellbeing
€658 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 raw materials
€326 million
6. Europe in a changing world - inclusive, innovative and reflective societies
€212 million
7. Secure societies – protecting freedom and security of Europe and its citizens
€393 million



* Additional €1,040 million will be dedicated to Cross-Cutting Calls: Internet of things, Industry 2020 in the Circular Economy, Smart and Sustainable Cities

The challenges

Challenge 1: avoid the word mining

Horizon Europe

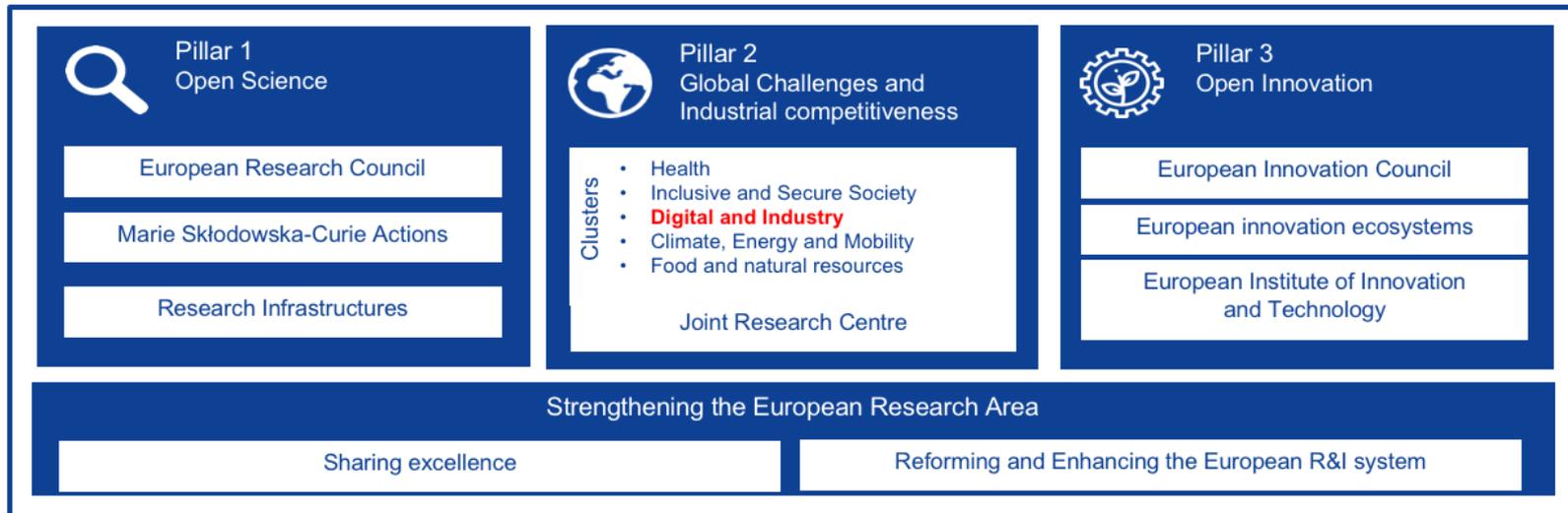


2021-2027



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)



Raw
Materials

Lesson learnt? Prosperity is not self-evident

Fotos: Zache-Motik,
Dominik Butzmann
Roboter-Motive: picture alliance,
Sebastian Gollnow, dpa

Wohlstand ist nicht selbstverständlich

Für Deutschlands Zukunft. Unser Europa
steht für Wachstum, gute Jobs und soziale Sicherheit.

CDU

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 Industrial production and technology

- Increasing economic efficiency and competitiveness, 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

WIHTOUT 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”



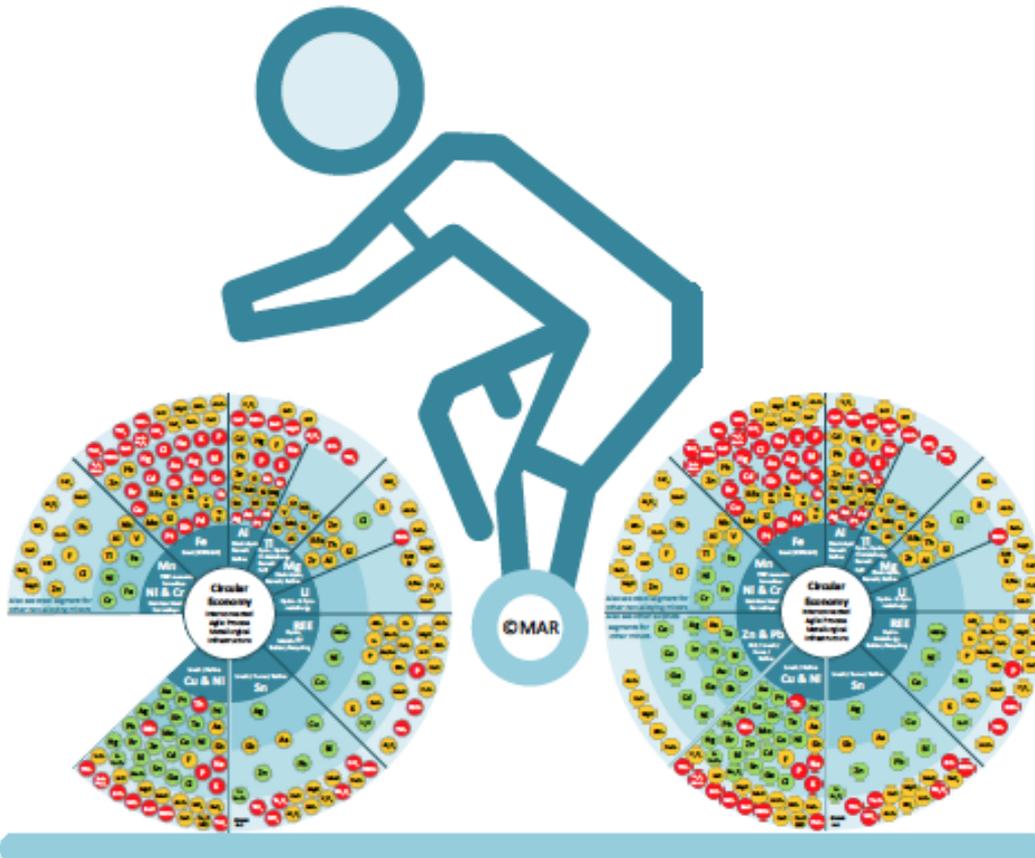
CE-SC5-08-2018-2019-2020: Raw materials policy support actions for the CE

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. Europe's competitors in mining will not have to care in these issues
3. The EC's understanding of responsible sourcing cannot want 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 hysteria

Figure 3: End of the "CE ride" in case of inhibited lead metallurgy

Challenge 6: Misunderstandings



Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

euromines
Ibec

EUROPEAN TECHNOLOGY PLATFORM
ON SUSTAINABLE MINERAL RESOURCES

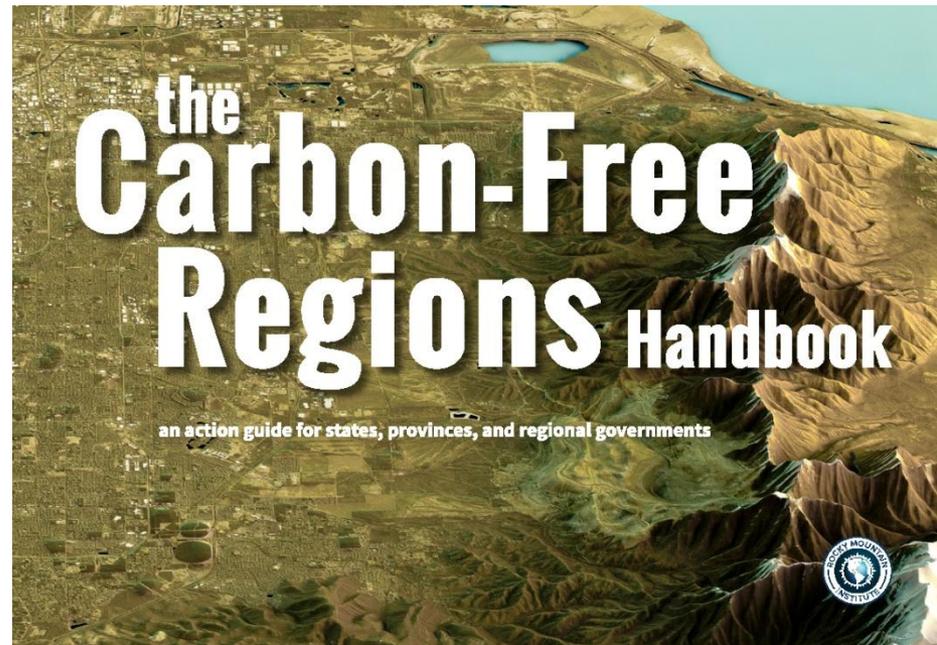
Molybdenum
Aluminium
Iron
Copper
Zinc

International Conference on New Technologies and Policies for Mining and Mining Products
“Pushing boundaries beyond -
Circular by 2020?”

The role of New Technologies and Policy Approaches
for a future mining industry in Europe

9 March 2015, 9:00h - 17:00h

Venue:
Main auditorium: Paccar Theatre, Science Gallery, The Naughton Institute,
Trinity College Dublin.



Challenge 7: SLO undermines mining law

Source: S3, Saxony

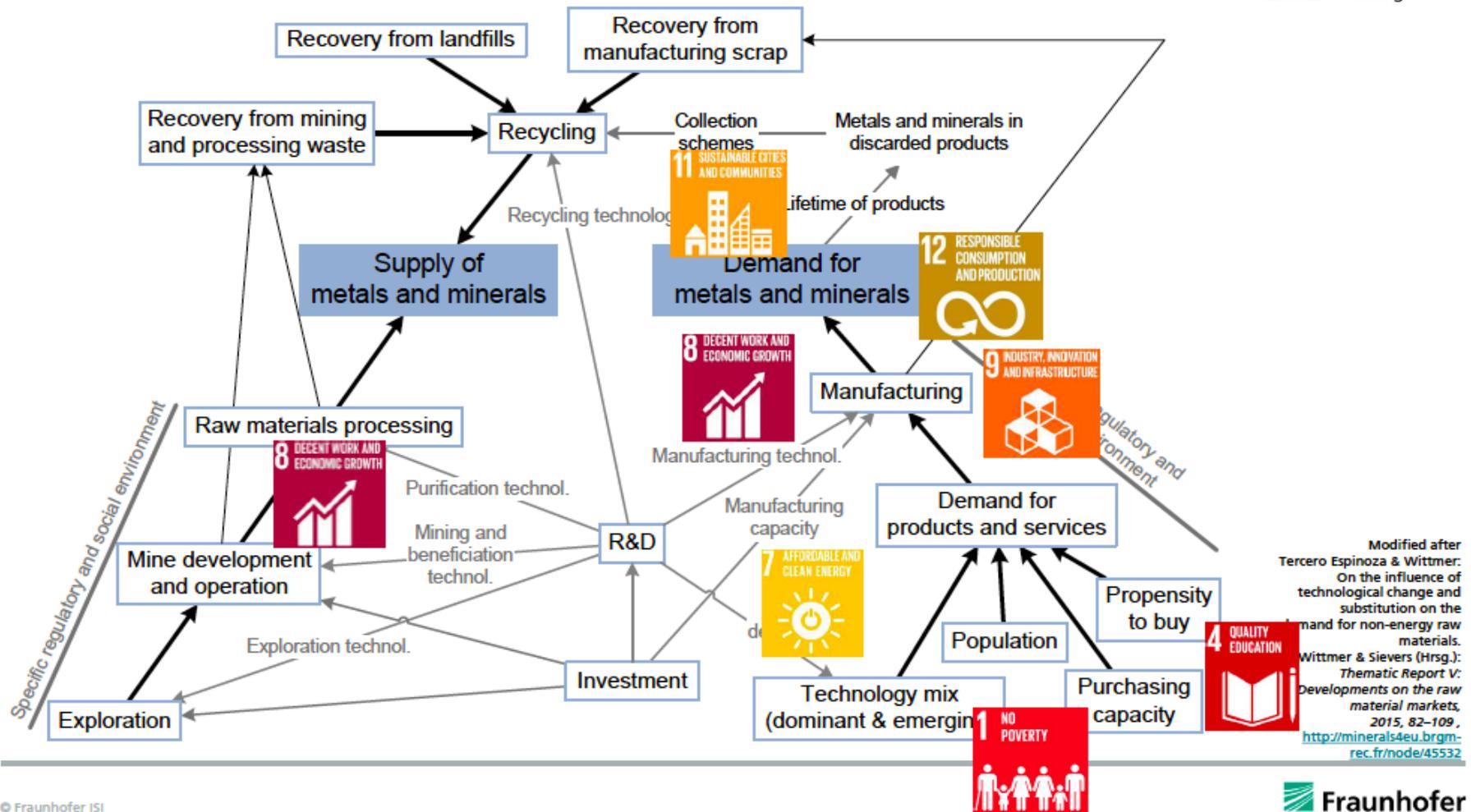


KOHLE:KULTUR
schicht:ende



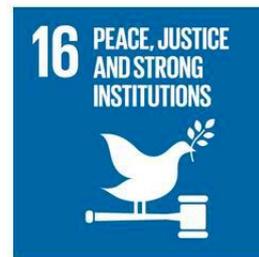
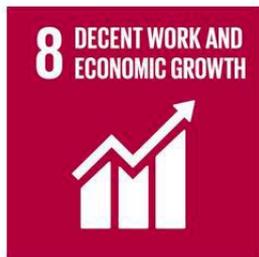
Challenge 8: Development goals without Raw Materials





Modified after Tercero Espinoza & Wittmer: On the influence of technological change and substitution on the demand for non-energy raw materials. Wittmer & Sievers (Hrsg.): Thematic Report V: Developments on the raw material markets, 2015, 82-109. <http://minerals4eu.brgm-rec.fr/node/45532>

Better: Raw Materials – a subject on its own



Challenge 9: Regulations

European Union

- 1992/43/EEC: Directive on the conservation of natural habitats and of wild fauna and flora (indicating Natura 2000 Special Protected Areas)
- 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 hoe 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)
- OGWV (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 hoe 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 (Reguation 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

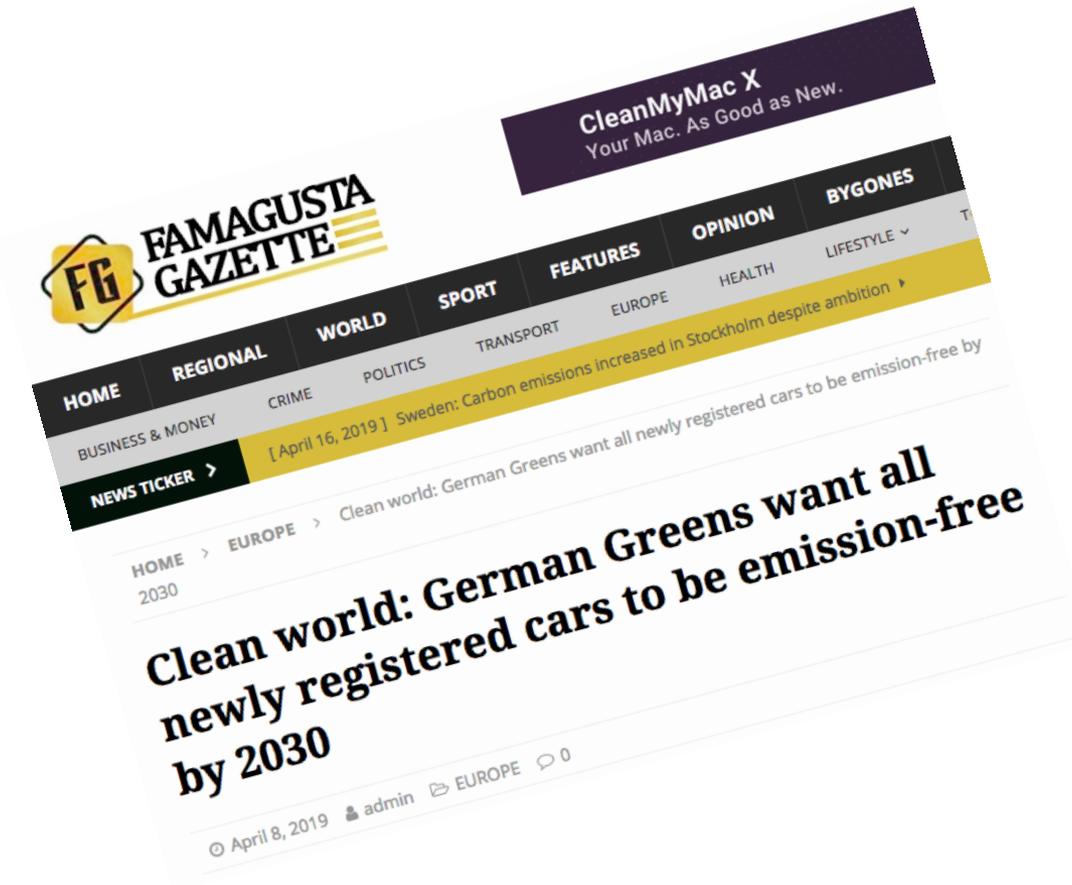
Free State of Saxony

- 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)

10

Total: 48

Challenge 10: UTOPIA



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