

The left side of the slide features a photograph of a quarry or construction site. In the foreground, there are large piles of light-colored gravel or sand. In the background, a conveyor belt system is visible, transporting material from a forested area into the quarry. The sky is blue with some clouds.

Raw materials for our future viability – the role of domestic raw material extraction, recycling and imports.

REWIMET-Symposium Ressourcenmanagement 2025

Prof. Dr. Volker Steinbach
Vice President BGR

Clausthal-Zellerfeld, 13.08.2025

Renewable energy



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Smart Cities – 5G

Cu, Ge, Ga, As, Ag, Au, Ta



Industry 4.0 – Virtual Reality

Cu, Ge, Ga, Ag, Au, Ta

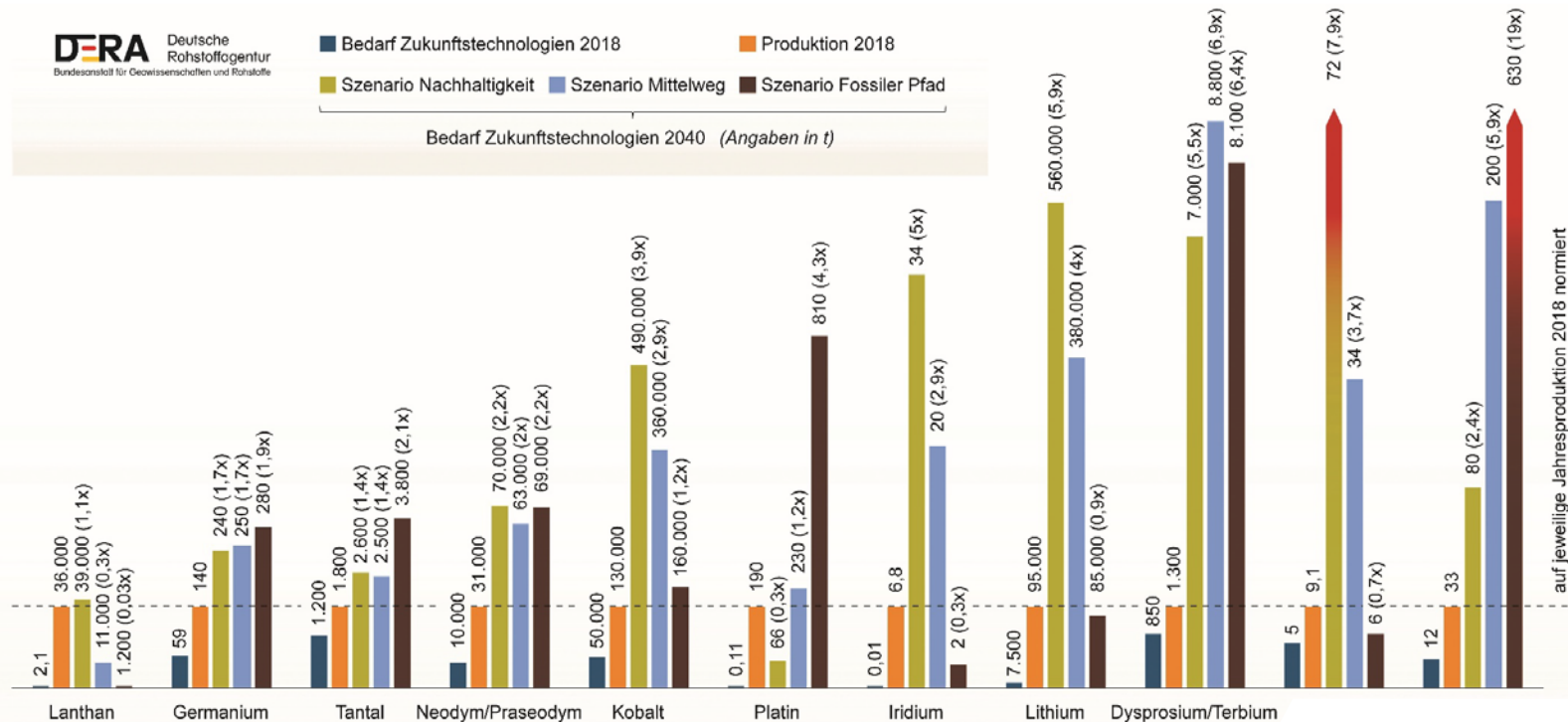


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"Raw materials for emerging technologies" - Review of 2021 study -

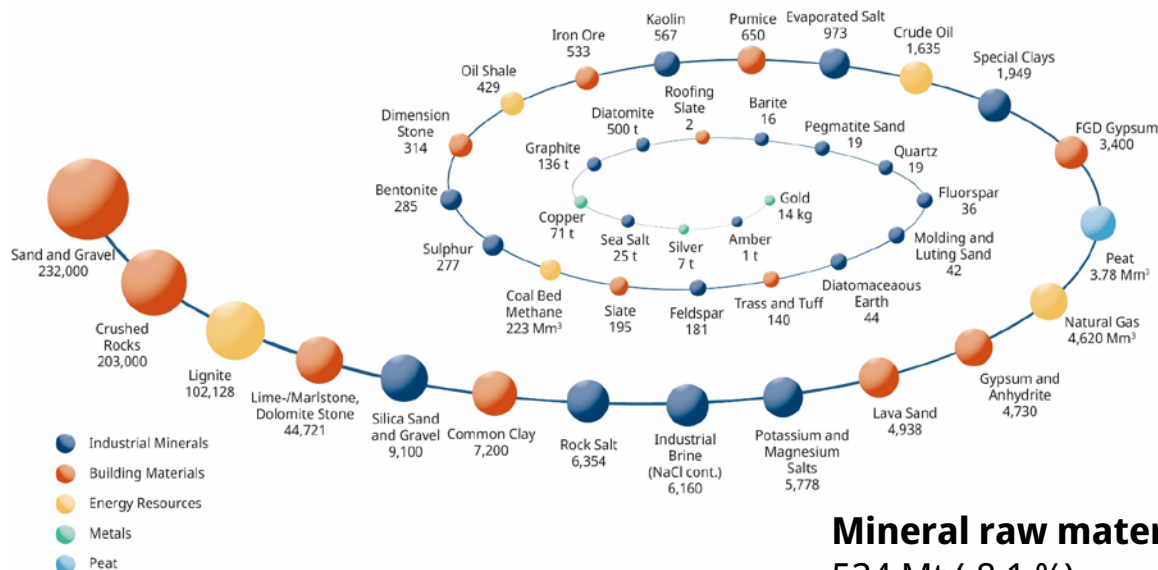
■ Bedarf Zukunftstechnologien 2018 ■ Produktion 2018
■ Szenario Nachhaltigkeit ■ Szenario Mittelweg ■ Szenario Fossiler Pfad

Bedarf Zukunftstechnologien 2040 (Angaben in t)



Germany – A Mining Country

Raw Materials Production 2023



Source: BGR 2024

Mineral raw materials:

534 Mt (-8,1 %)

€9.4 bn (-14.6 %)

Total value:

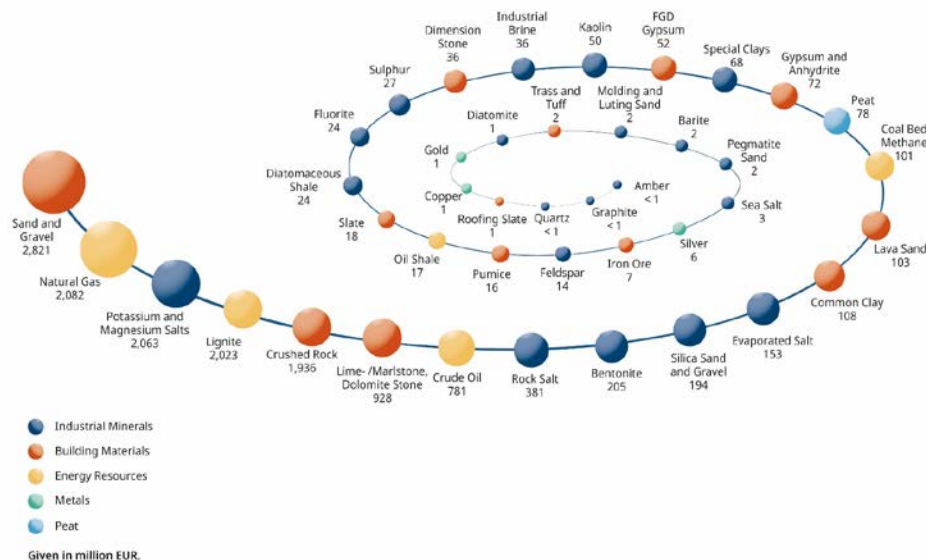
€14.5 bn (-22,8 %)



Quantitatively, the majority of our raw materials demand is sourced domestically.

No Industry Without Raw Materials

– Domestic Raw Materials Balance (2023)



Source: BGR 2024

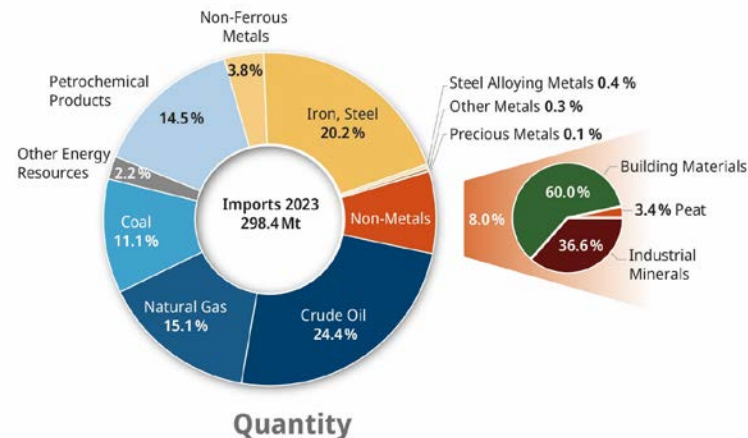
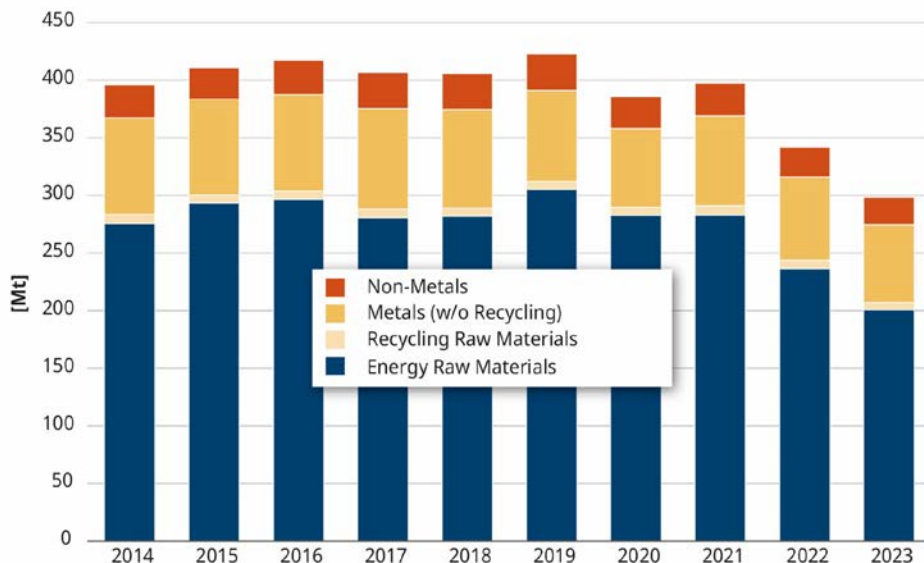
- **Domestic production:** €14.5 bn
- **Imports:** €216.2 bn
(ores, concentrates, semi-finished products, fossil fuels, petrochemical products)
- **Recycling:** approx. €35 bn (11 metals*)

Share of secondary raw materials in domestic metal production:

73 % lead
72 % aluminum
42 % raw steel
43 % copper

*Al, Cu, Fe, Mg, Ni, Pb, Sn, Zn, Ag, Au, Pt

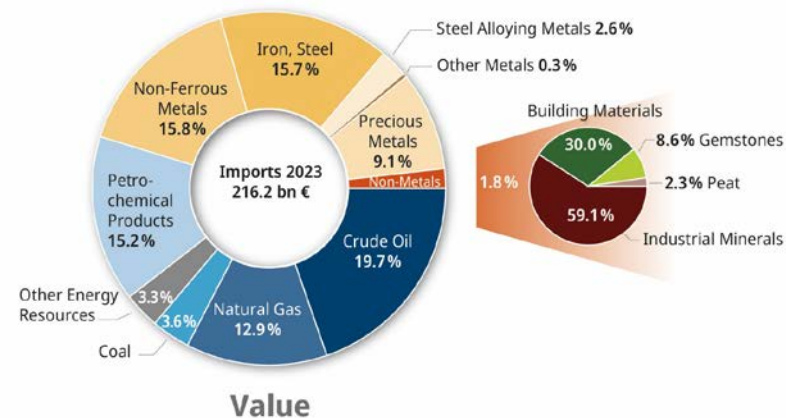
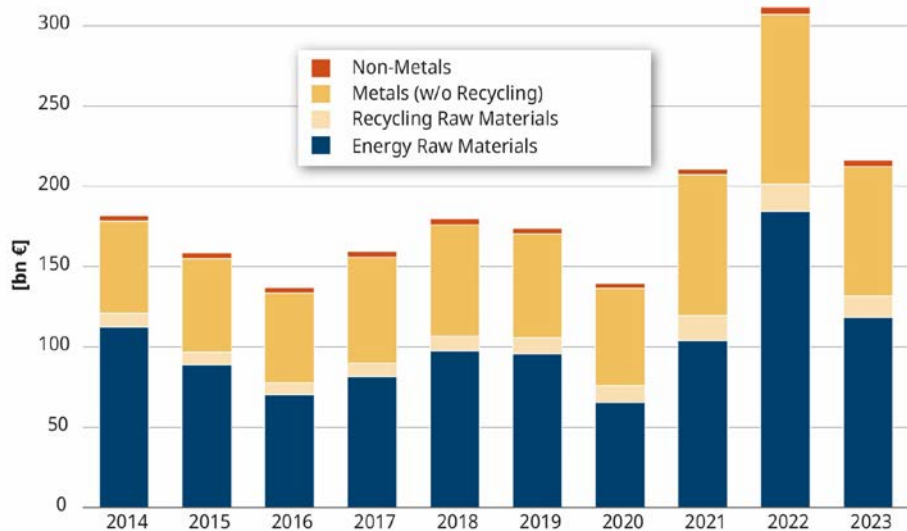
German raw materials import – Quantity



Source: BGR 2024

A reliable raw materials supply is essential for the competitiveness of the German economy!

German raw materials import – Value



Source: BGR 2024

A reliable raw materials supply is essential for the competitiveness of the German economy!

German Raw Materials Imports by Supplying Countries (2023)



Source: BGR 2024

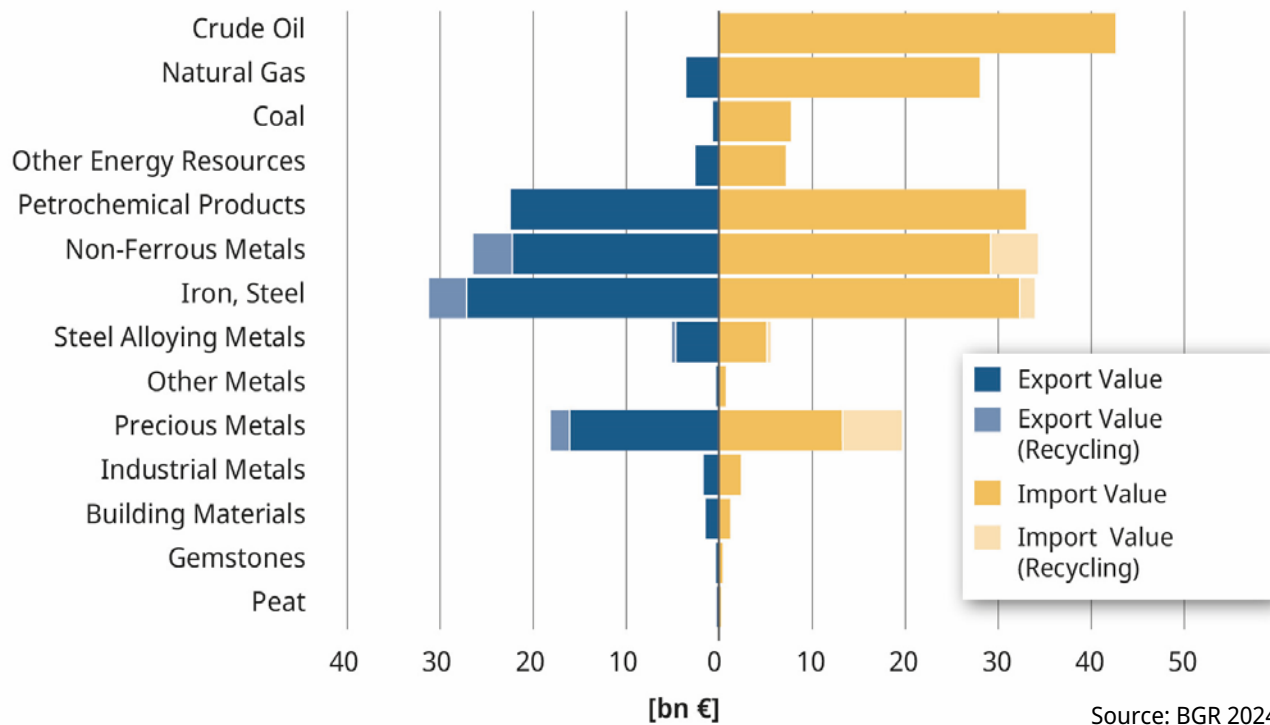
Important supplying countries of selected critical metals (quantity):

Antimony:	China 57%, Slovenia 49%
Bauxite:	Guinea 92%
Gallium:	Slovakia 63%, China 28%
Germanium:	Denmark 60%, China 36%
Hafnium:	USA 29%, France 25%
Cobalt:	Canada 22%, Belgium 14%
Li-carbonate:	Chile 69%, USA 14%
Ti ore/conc.:	S. Africa 41%, Norway 36%, China 71 %, Austria 22%
REE:	China 98 %
Bismuth:	

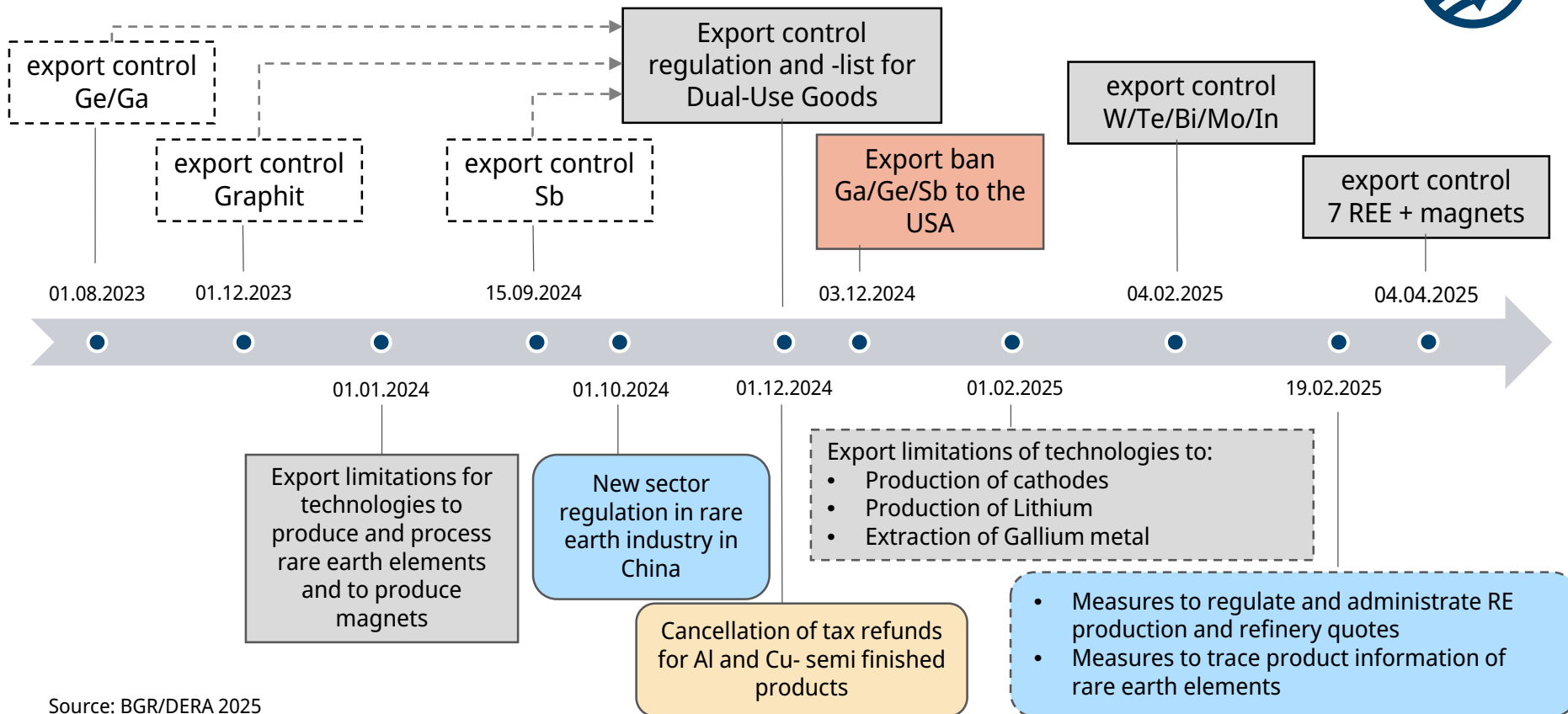
Major supplying countries (import value share > 10 %)

Germany's dependence on imports of metal ores and concentrates is almost 100 %!

Foreign trade balance by value in 2023



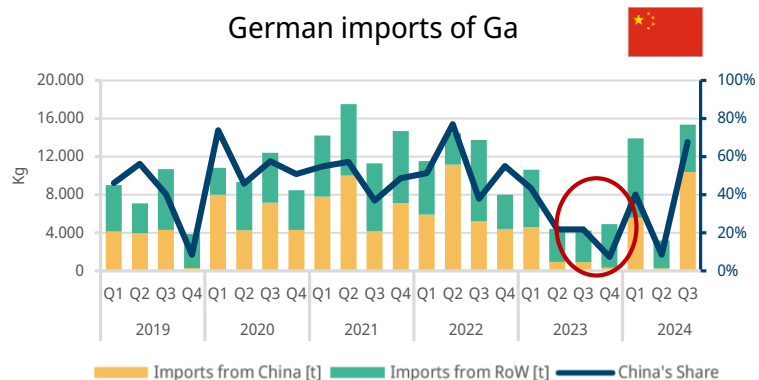
Chinese export restrictions



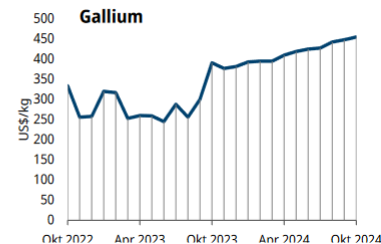
Source: BGR/DERA 2025

Chinese export restrictions - Ga

German imports of Ga



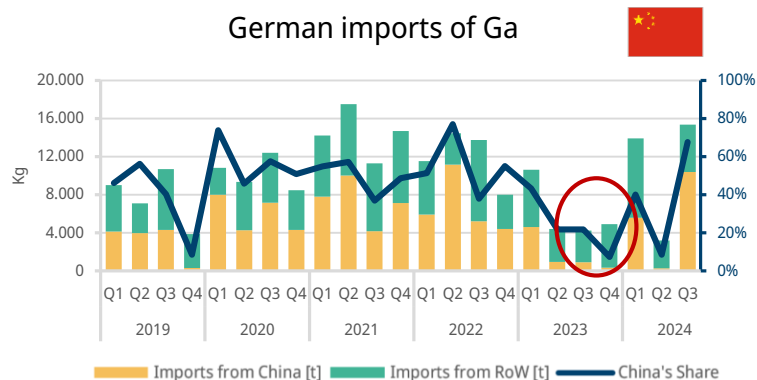
GALLIUM		 ASIAN METAL 亚洲金属网
min. 99,99 % fob China		
Änderung zum Vormonat:	6,84 US\$/kg / 1,53 %	
Durchschnitt Nov 2023 - Okt 2024	414,08 US\$/kg	
Durchschnitt 2019 - 2023	273,28 US\$/kg	
Entwicklungstrend	51,5 %	



Data source: GTT, DERA-Preismonitor (Asian Metal, SMM)

Chinese export restrictions – Ga & Ge

German imports of Ga



GALLIUM

min. 99,99 % fob China

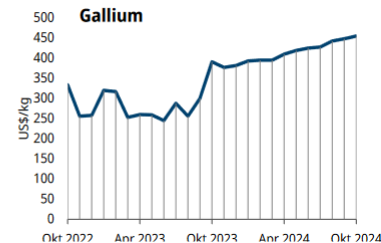


Änderung zum Vormonat: 6,84 US\$/kg / 1,53 %

Durchschnitt Nov 2023 - Okt 2024 414,08 US\$/kg

Durchschnitt 2019 - 2023 273,28 US\$/kg

Entwicklungstrend 51,5 %



German imports of Ge



GERMANIUM

Dioxide, 99,999 %

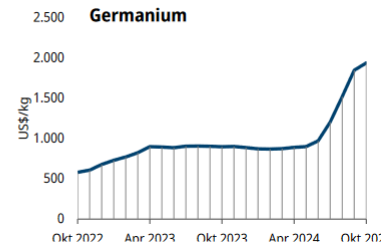


Änderung zum Vormonat: 91,07 US\$/kg / 4,93 %

Durchschnitt Oktober 2024 1.938,30 US\$/kg

Durchschnitt 2019 - 2023 745,75 US\$/kg

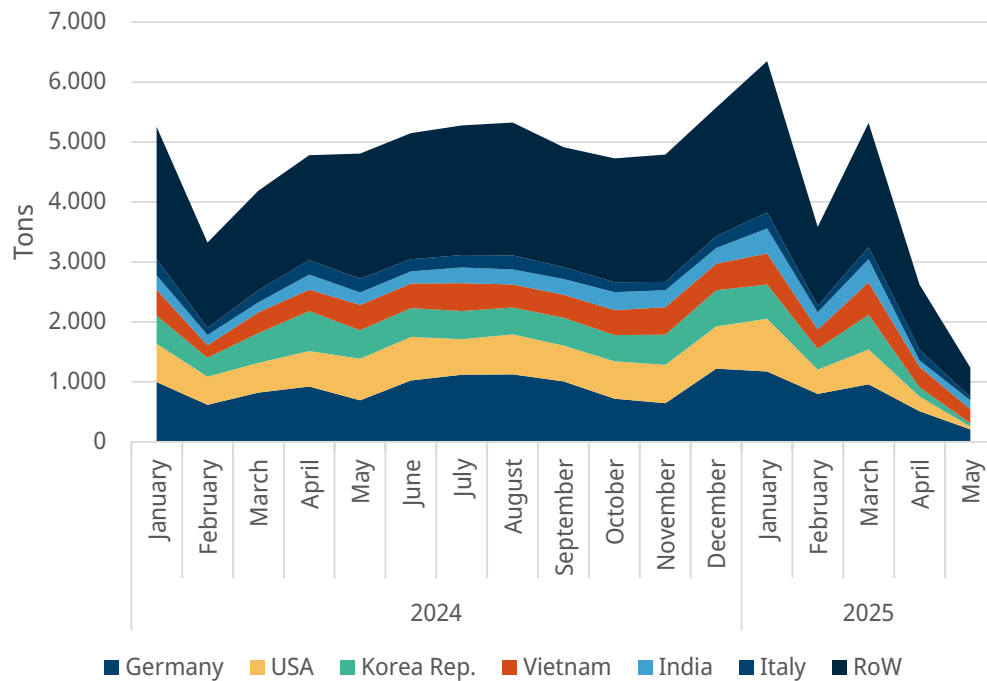
Entwicklungstrend 159,9 %



Data source: GTT, DERA-Preismonitor (Asian Metal, SMM)

Chinese export restrictions – REE & magnets

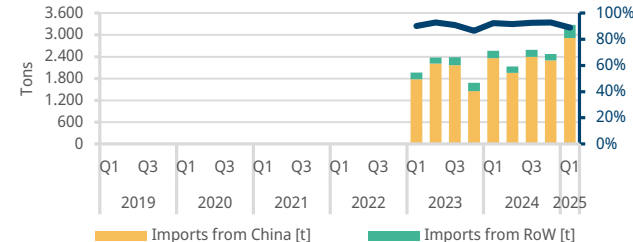
China's exports of permanent magnets with REE



German imports of REE

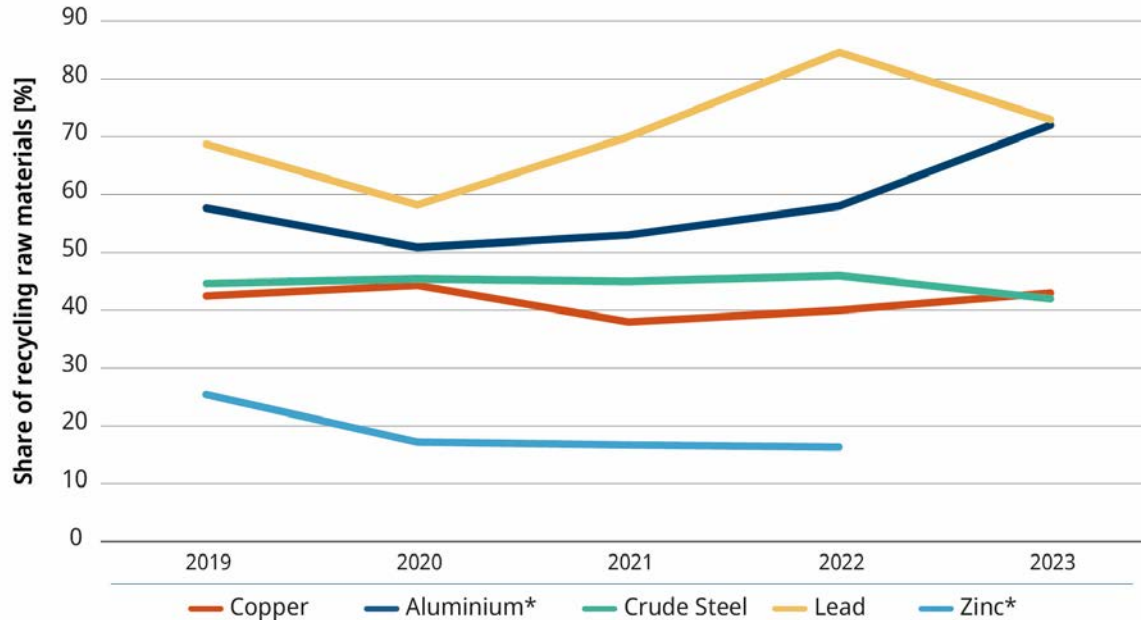


German imports of permanent magnets with REE



Data source: GTT

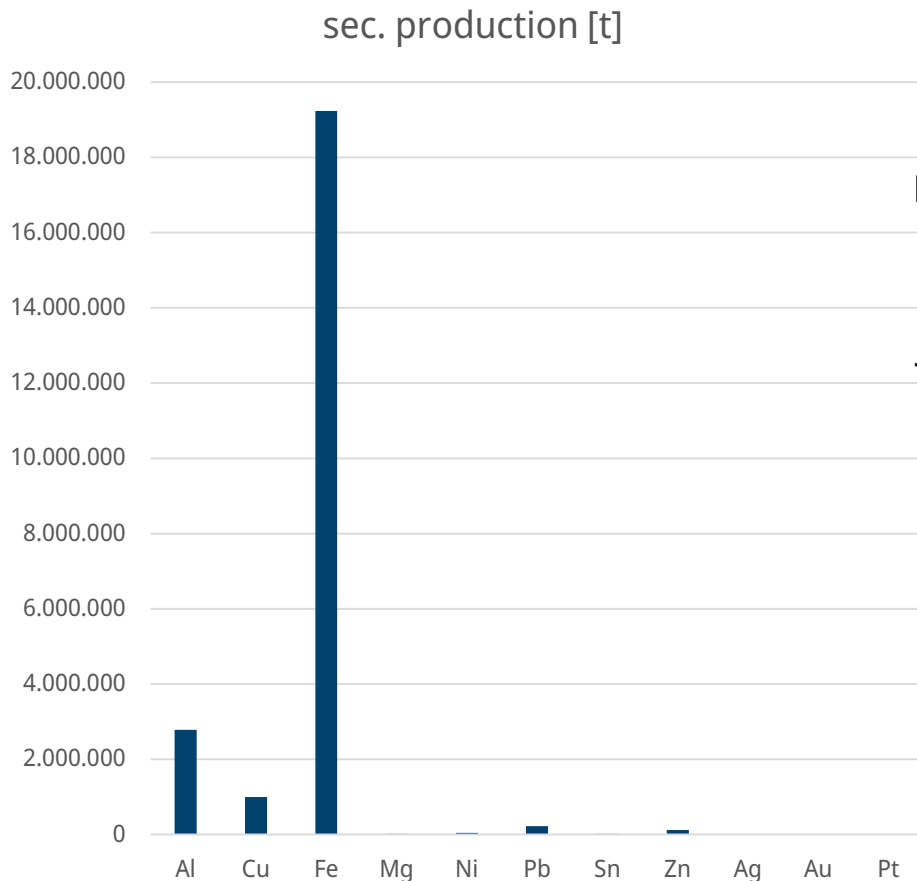
Secondary Raw Materials



Source: BGR 2024

Recycling can contribute to the supply of base metals and reduces the dependence on imports

Metal Recycling in Germany – quantity (2023)



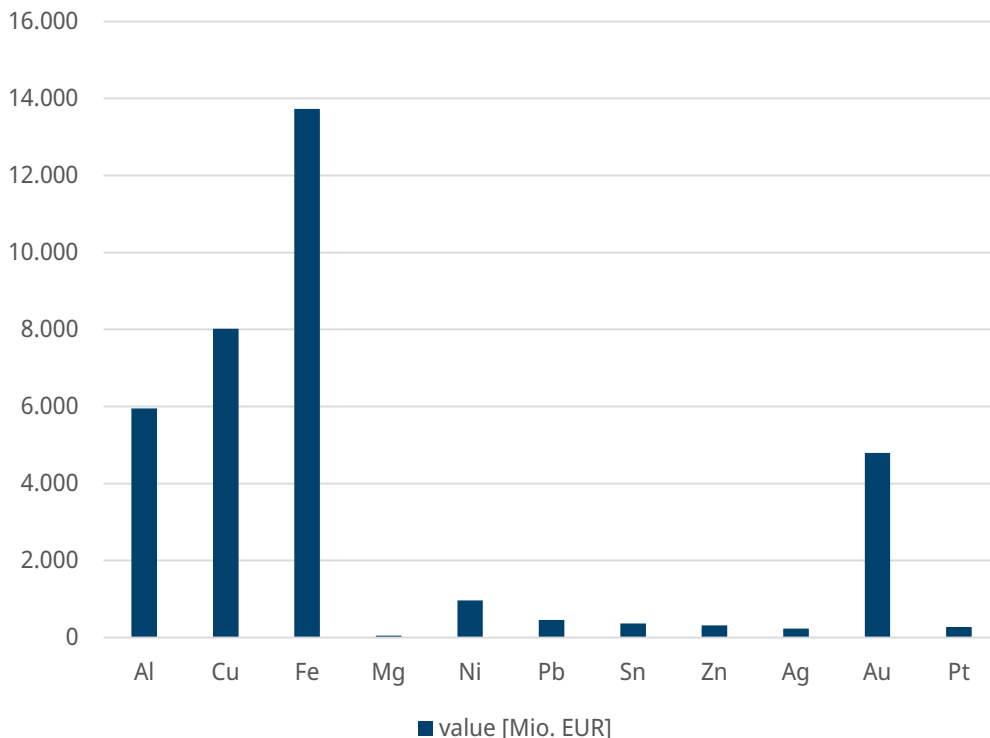
Recycling of 11* metals ca. 23.4 mio t

*Al, Cu, Fe, Mg, Ni, Pb, Sn, Zn, Ag, Au, Pt

Source: BGR 2024

Metal Recycling in Germany – value (2023)

value [million EUR]



Recycling of 11* metals ca. 35 bn €

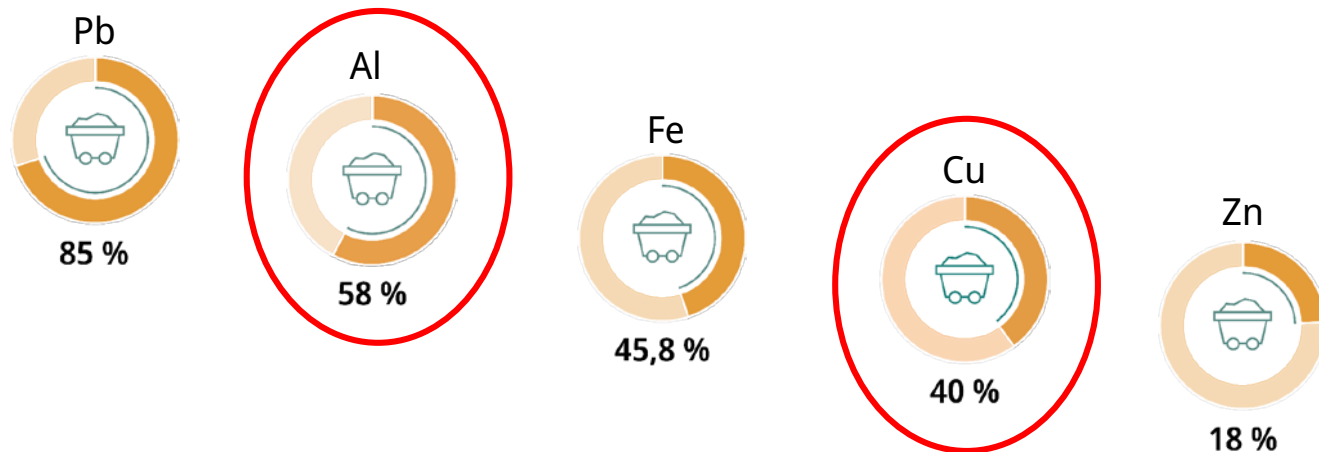
*Al, Cu, Fe, Mg, Ni, Pb, Sn, Zn, Ag, Au, Pt

→ Metal recycling accounts for a value ~ 1/3 of the import of metals

Source: BGR 2024

Recyclingatlas: Data on CRMs

Recycled Content



→ Only reliable data for 2 (!) of the CRMs in Germany!

Source: DERA 2023

Recyclingatlas

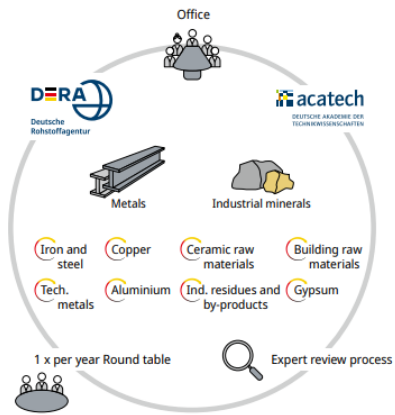


Download
Engl. Version

Platform for dialogue on secondary raw materials

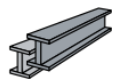


Detailed discussion of obstacles and options for the recycling of metals and industrial minerals



2 years
380 people
32 work meetings

94 options for action
• 9 overarching fields of action



Metals Overarching fields of action



Product design for recycling



More consideration for recycling in legislation



Transparency of material flows



Mandatory uniform standards for collection, separation and sorting

material specific actions



58 DERA Rohstoffinformationen

Final report - executive summary
Platform for dialogue on secondary raw materials
Courses of action for strengthening the contribution of secondary raw materials in ensuring the security of metal and industrial mineral supply



Federal Institute for Geosciences and Natural Resources



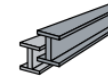
Key findings



Barriers:

- Planning a new recycling plant requires time, authorization and public acceptance
- Recycling must be economically viable (taking price volatility into account)
- New products - new processes! (but: often only small quantities in products and/or not enough flows)
- Recycling requires energy!
- Predictable, constant input flows needed
- infrastructure and transportation (collection, consumer awareness)
- Market demand, customers/buyers for the metals

Potentials:



Metals Overarching fields of action



Product design for recycling



More consideration for recycling in legislation

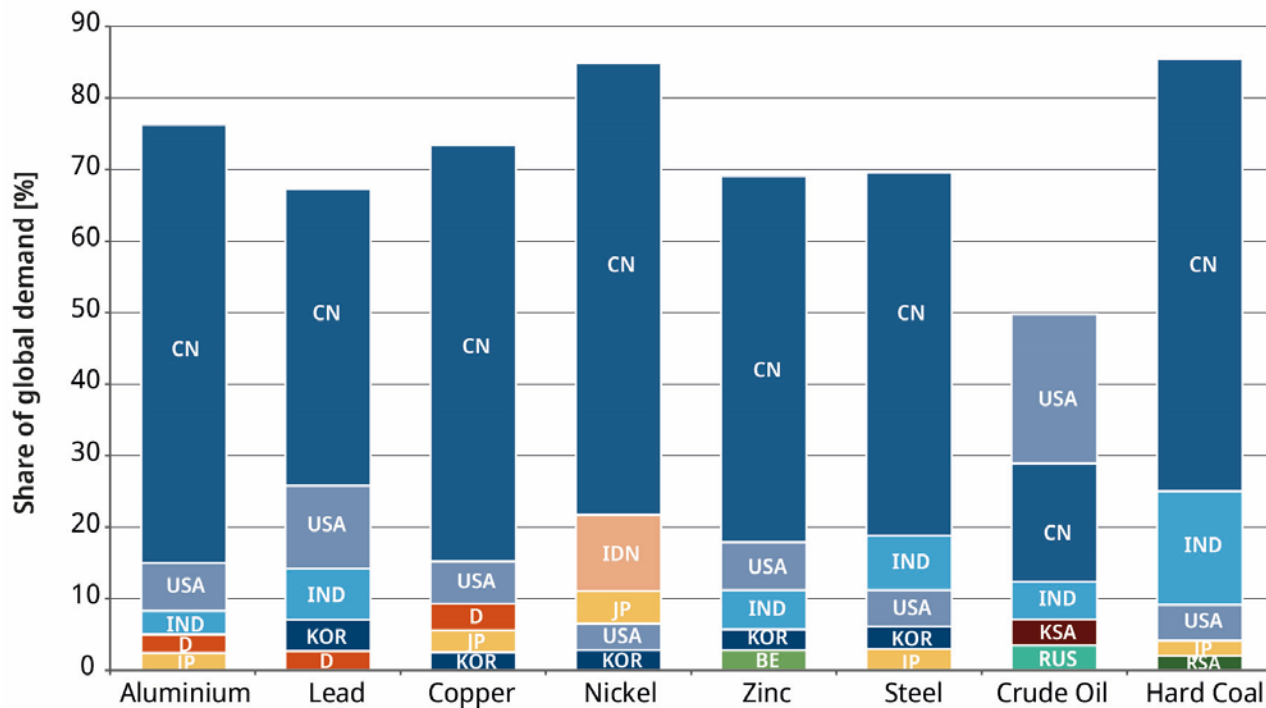


Transparency of material flows



Mandatory uniform standards for collection, separation and sorting

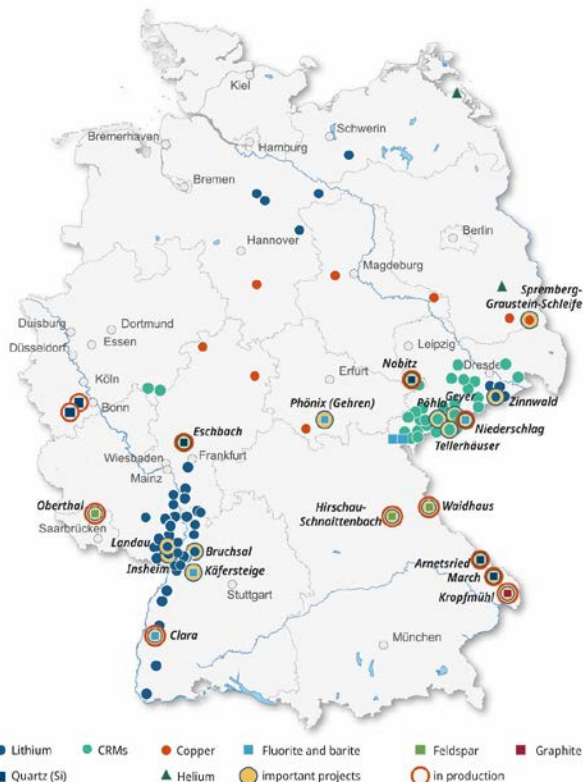
Share of the five largest countries in global demand for key industrial raw materials (2023)



Source: BGR 2024

Critical Raw Materials Potential in Germany?

– Current Exploration Projects



Status: May 2024

Source: BGR 2024

BGR Bundesanstalt für Geowissenschaften und Rohstoffe

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Rohstoffe

Kritische mineralische Rohstoffe in Deutschland – Gewinnung und Exploration

Sören Henning, Michael Szuriles, Torsten Graupner, Corinna Eicke

Unterirdige Gewinnung im Graphitbergwerk Kropfmühl (Bayern). Foto: Graphit Kropfmühl GmbH (mit J. Henning).

Eine sichere und nachhaltige Versorgung mit mineralischen Rohstoffen ist von zentraler Bedeutung für die heimischen Wirtschaftsketten und damit für die Wettbewerbsfähigkeit der Industrie- und Technologiebranchen in Deutschland. Aufgrund der wachsenden Weltbevölkerung und der Urbanisierung, der Industrialisierung der Schwellenländer, der fortschreitenden Digitalisierung sowie der Verkehrs- und Energieumstände steigt der weltweite Rohstoffbedarf an mineralischen Rohstoffen stetig. Dies gilt insbesondere auch für Deutschland. So sind insbesondere Ernte und Ausbau der Verkehrsinfrastruktur, umklimatisierte Wohngebäude, Errichtung von Windkraft- und Photovoltaikanlagen, Herstellung von Batterien für die Elektromobilität und Anlagen zur Erzeugung von Wasserstoff mit einem erheblichen Bedarf an einer Vielzahl mineralischer Rohstoffe verbunden.

DERA Deutsche Rohstoffagentur

www.bgr.bund.de

August 2024

Raw Material Supply Strategies

1. Commodity price hedging

A lack of knowledge prevents many companies from using commodity price hedging.

2. Passing on increased raw material prices

Passing on raw material prices to customers in the short term is largely determined by competitive pressure on the sales market.

3. Stockpiling

Stockpiling is not seen as a long-term strategy because it involves high costs and ties up liquidity.

4. Supplier diversification

Larger companies with a high demand for raw materials can more successfully diversify their suppliers to minimise supply risk.

5. Long-term contracts

Raw material suppliers have more bargaining power than purchasers when negotiating long-term contracts.

6. Purchasing groups

Purchasing groups between companies in different sales markets are the most viable option due to the low level of competition between members.

7. Increased material efficiency

Material efficiency projects require a corporate culture of continuous improvement.

8. Recycling

Recycling is mainly used to improve sustainability and corporate reputation, rather than as a means of securing a supply of raw materials.

9. Material substitution

Substituting raw materials is a strategic business decision which affects many processes throughout the company and requires the full support of senior management.

10. Vertical integration

Vertical integration is primarily used by companies in a strong financial position and with a substantial demand for raw materials.

11. Business tools

Business tools will become a widely used means of risk mitigation over the next few years.



Securing raw material supply:
Benchmarking of measures of foreign manufacturing
companies and recommendations for action

»Auftragsstudie«

Raw materials for our future viability – the role of domestic raw material extraction, recycling and imports.

REWIMET-Symposium Ressourcenmanagement 2025

Prof. Dr. Volker Steinbach

Vice President BGR

Thank you for your attention!