

Raw Materials Information System (RMIS):

the knowledge broker for raw materials security of supply, circularity and sustainability

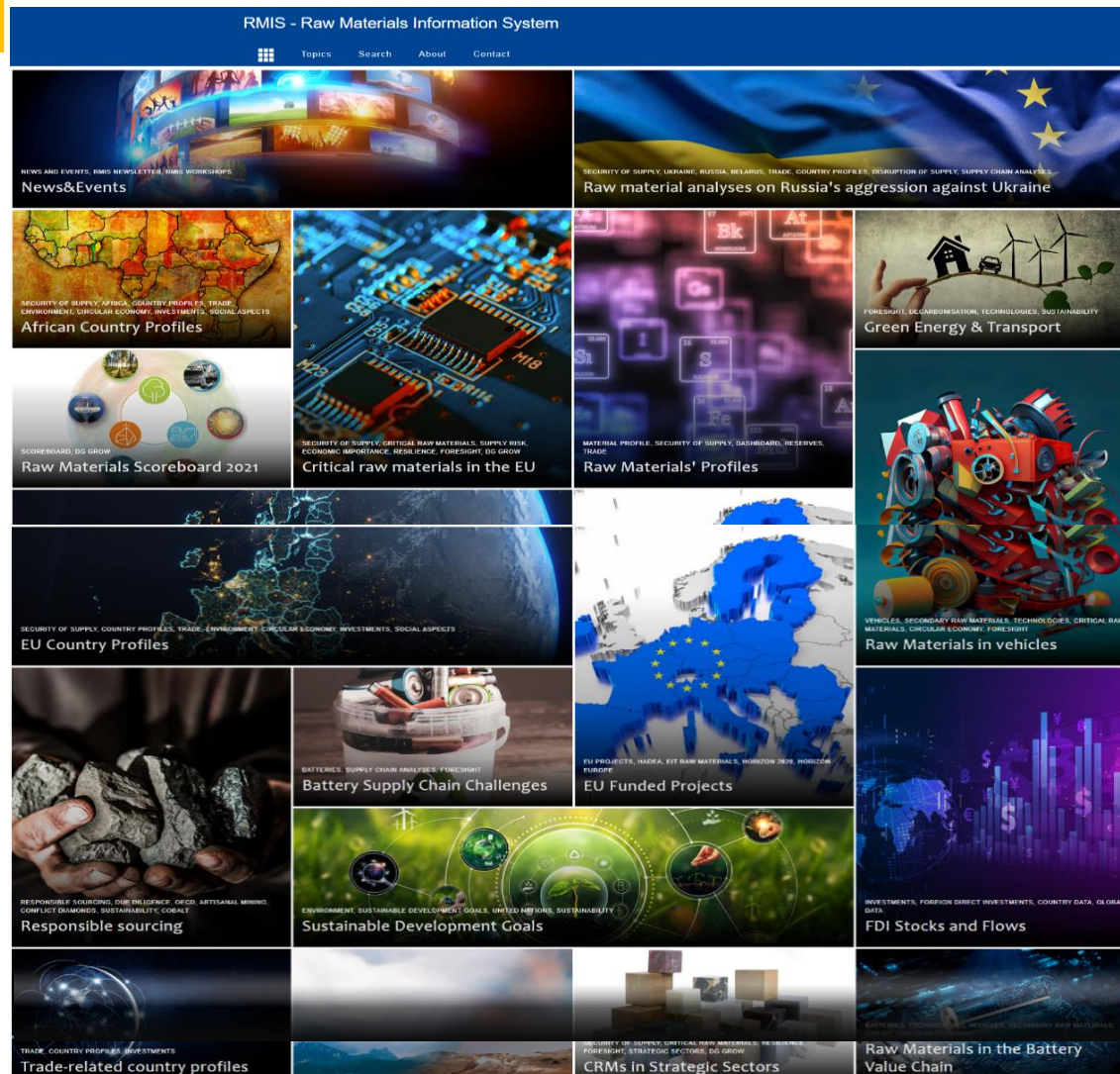
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Joint Research Centre – European Commission

09/11/2023 Ecomondo, Rimini

RMIS: overview, scope, facts & figures



- The **Raw Materials Information System (RMIS)** is the EC's knowledge platform on non-energy, non-food raw materials from primary to secondary sources (mostly **metals & minerals**)
- Facilitates availability, coherence and quality of knowledge required at EU level
- Supports EC policy, interactions with MSs, community, EU-funded projects, EU & international organisations
- **RMIS 3.0** version released March 2023 in parallel to Critical Raw Materials (CRM) Act

RMIS 3.0 content & topics

KNOWLEDGE PRODUCTION → KNOWLEDGE INTEGRATION AND DISSEMINATION → POLICY SUPPORT

ADVANCED MATERIALS AFRICA ARTISANAL MINING AUTONOMY BATTERIES
CIRCULAR ECONOMY CLIMATE CHANGE COUNTRY DATA
CRITICAL RAW MATERIALS DECARBONISATION DUE DILIGENCE EMPLOYMENT
ENVIRONMENT EU PROJECTS FOOTPRINT FOREIGN DIRECT INVESTMENTS
FORESIGHT GLOBAL DATA GOVERNANCE HEALTH DEVICES HORIZON 2020 HORIZON EUROPE
INDUSTRIAL EMISSIONS INVESTMENTS LAND USE LEGISLATION LIBRARY
LIFE CYCLE ASSESSMENT MATERIAL AND COUNTRY PROFILES
MATERIAL SYSTEM ANALYSIS MEMBER STATES MINERAL INVENTORY MINES LOCATION MONITORING
OPEN STRATEGIC AUTONOMY POLICY POLLUTION RESILIENCE RESPONSIBLE SOURCING
SCOREBOARD SECONDARY RAW MATERIALS SECTORS SECURITY OF SUPPLY
SOCIAL ASPECTS STRATEGIC MATERIALS SUPPLY CHAIN ANALYSES
SUSTAINABILITY SUSTAINABLE DEVELOPMENT GOALS
TECHNOLOGIES TRADE VEHICLES

- RM governance, policy & legislation
- Foresight analyses / security of supply
- Strategic autonomy, criticality, resilience
- Critical, Strategic and Advanced materials
- Circular Economy – secondary raw materials
- Economics & trade
- RMs monitoring indicators
- Flows in strategic/priority value chains
- Material flow/system analyses
- Environmental sustainability via environmental footprint
- Social sustainability / Responsible sourcing / SDGs

Raw Materials' Profiles: Dashboard

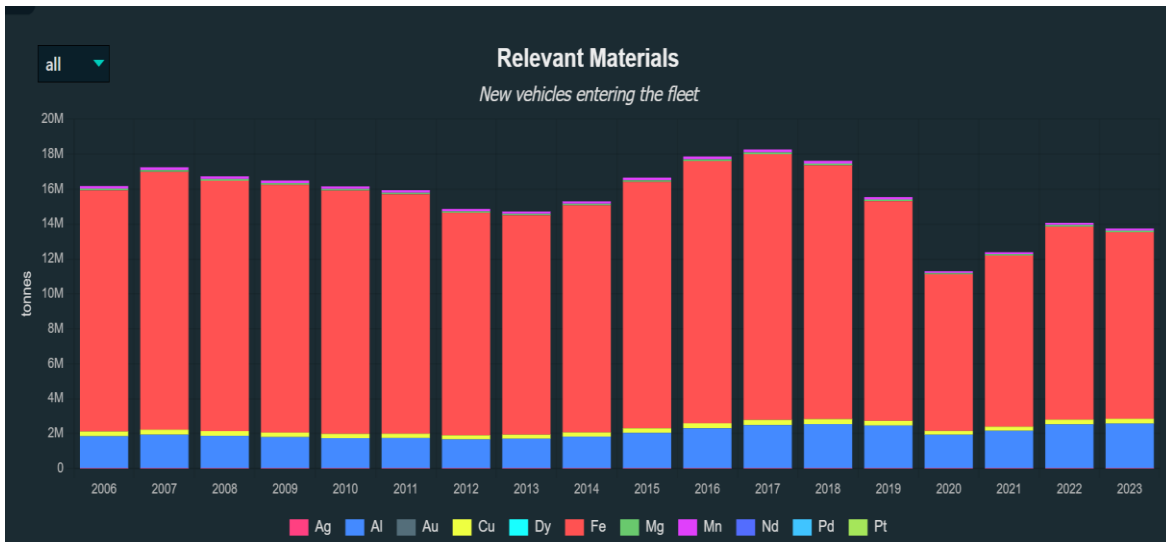
Covers 100 materials, complements EC Critical Raw Materials assessment



Critical & Strategic Raw Materials – De-risking and Sustainability Knowledge

Value chain modelling/analyses

current/future of value chain demands, ownership, locations, extraction/processing options, circularity potentials

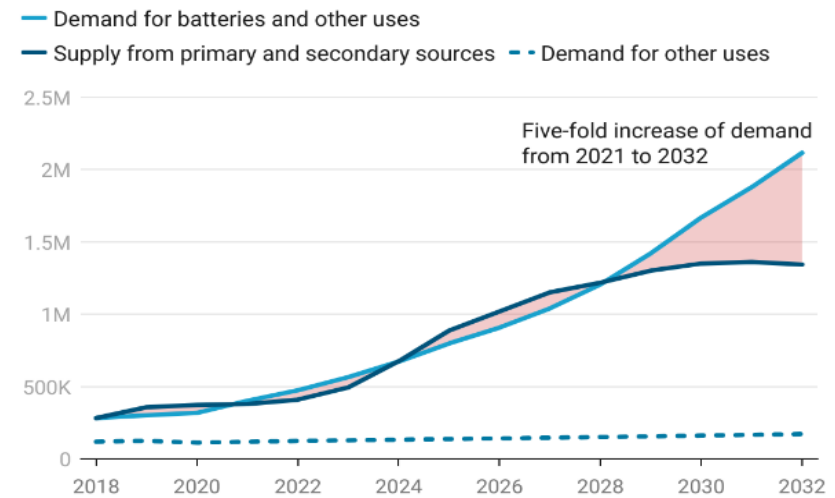


Focused assessment e.g. Ukraine, China, Gallium, Germanium, ...

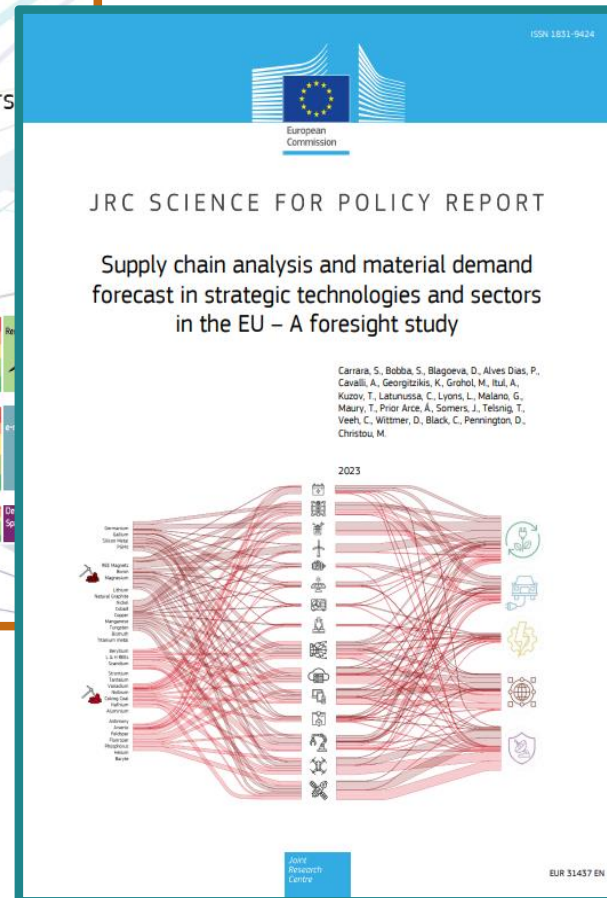
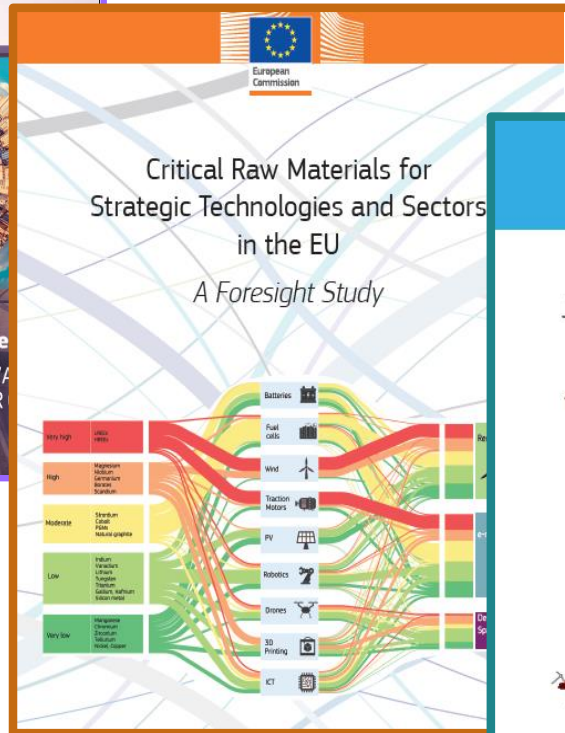
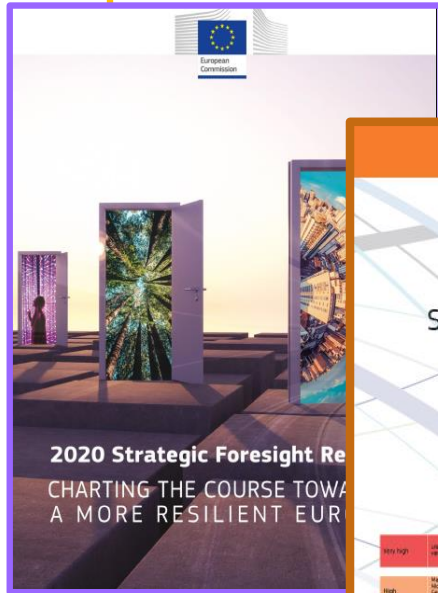
future supply vs demand, in-depth risk and diversification analyses

Forecast of global Supply-Demand balance for lithium [t LCE]

Medium Supply Scenario (MSS) and Medium Demand Scenario (MDS) (most plausible or baseline scenarios)



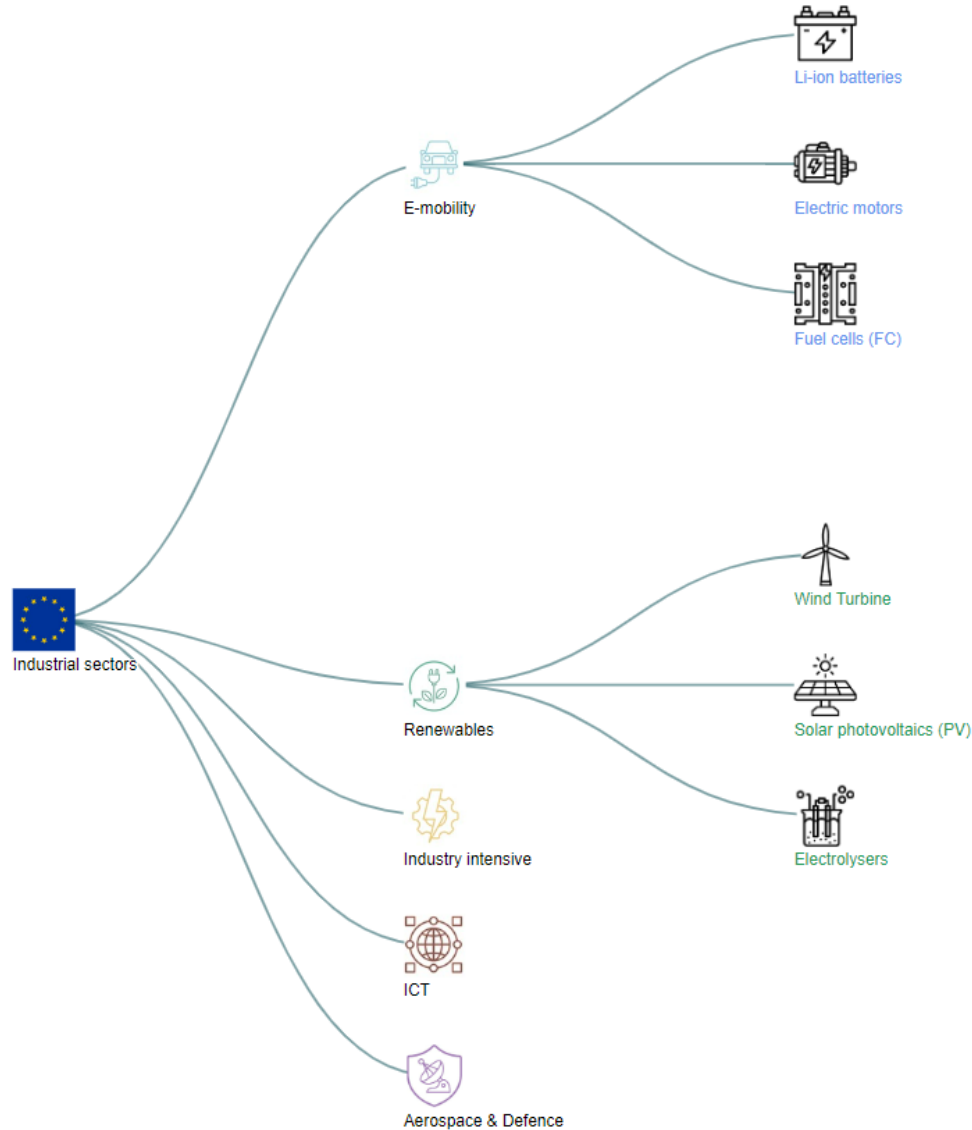
Foresight analyses for strategic technologies & sectors



Systematic and detailed analysis of the **complete value chains**, from raw and processed materials to components, assemblies and systems, for **15 key technologies across five strategic sectors**:

- *renewable energy*,
- *electromobility*,
- *industrial*
- *digital*
- *aerospace-defence*

Technologies & Sectors Profiles



Analysis on the **supply chain structure** of key technologies for strategic sectors:

- relevant materials, components and assemblies;
- potential bottlenecks;
- supply risk;
- future demand;
- policy-relevant scenarios or market trends.

RMIS provides prompt responses to emerging knowledge needs : e.g., (foresight) Analysis of EU's supply risk

Material-specific briefs for potash, titanium, coking coal, rare gases, nickel, PGMs,...

SCIENCE FOR POLICY BRIEF

European Commission

How Materials & the war in Ukraine

Potash: Impact assessment for supply security



HIGHLIGHTS

- EU's import dependency on potash has been increasing since 2018. Total EU imports of all forms of potash peaked in 2020, of which more than half were sourced from Russia and Belarus.
- A significant share of potash exports originating from Belarus and Russia are destined for Brazil, China, India, Indonesia and the EU.
- The global potash market may be subject to further price volatility, adding to soaring fertilizer prices and food security concerns.
- Russia and Belarus are crucial to the global potash supply. Together they accounted for about 35% of global potash production in 2020. Russia and Belarus are the world's second and third largest potash exporters after Canada. Ukraine does not produce potash.
- Canada could compensate for potash supply disruption in the event of severe supply deficits in 2022. The EU import value and Ukraine 9% of 2020 import value.
- The sanctions imposed on Belarus and Russia will impact potash flows to international markets in the short term. The extent of disruption to potash supply worldwide is highly uncertain.
- In the medium term, EU domestic supply from ongoing mine projects is expected to reduce dependence on Belarusian and Russian imports from 2023 onwards.

QUICK GUIDE - This briefing is one of a series of overviews about potential supply disruption of non-food, non-energy raw materials due to Russia's war against Ukraine.

SCIENCE FOR POLICY BRIEF

European Commission

How Materials & the war in Ukraine

Titanium metal: Impact assessment for supply security



HIGHLIGHTS

- Russia is a substantial source of titanium for the aerospace industry globally, making supply chains vulnerable to disruption. Two-thirds of titanium metal in Europe is consumed by the aerospace sector.
- The EU is particularly exposed to imports of wrought titanium from Russia (16% of import value in 2020). The EU imports unwrought titanium and powders from both Russia (9% of 2020 import value) and Ukraine (9% of 2020 import value).
- The EU relies fully on imports of titanium sponge. Dependence on imports of wrought titanium products is significant.
- Imports of titanium metal in the EU are mostly in the form of wrought products (85% by value in 2020). The EU is the top importer globally of wrought titanium (end products & articles).
- An imminent shortage of titanium is not expected worldwide. High inventory levels and lower titanium demand in the post-pandemic period can mitigate impacts in the short-term. Spare capacity in Japan and Kazakhstan, and emerging capacity in Saudi Arabia, are capable to fill supply gaps for unwrought titanium.
- The most plausible sources for the EU in order to shift supply from Russia in the medium-term are its existing trade partners, Kazakhstan and Japan for unwrought titanium, and the US and the UK for wrought products.

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SCIENCE FOR POLICY BRIEF

European Commission

How Materials & the war in Ukraine

Coking coal: Impact assessment for supply security



HIGHLIGHTS

- Coking coal is one of the essential raw materials for primary steel production.
- The trade of coking coal is highly concentrated on the export side, with Australia being the dominant global supplier and Russia the world's third largest producer and exporter.
- EU's dependency on coking coal imports rose from 2015 to 2019 due to declining domestic production. The reliance on Russian imports decreased since 2018. Russia accounted for 13% of EU imports of coking coal in 2021.
- Replacing Russian supply in the EU is feasible. The alternatives to Russian imports are limited to geographically distant sources, i.e. Australia, the United States of America, Canada and Mozambique, which are current EU trade partners.
- Trade options that could ensure substitution of Russian imports in the EU: all additional exports from Australia, the USA, Canada and Mozambique in 2022-2024 are directed only to the EU and other countries that are phasing out Russian imports; EU non-Russian supply in the rest of the world is re-oriented to the EU and other countries that are phasing out Russian imports and reduced elsewhere by deflected Russian trade flows.
- The risk of supply disruption due to the Russian-Ukrainian war is rising due to the current tight market balance globally, which is projected to last at least until 2024. Competition for non-Russian supply is expected to intensify.

QUICK GUIDE - This briefing is one of a series of overviews about potential supply disruption of non-food, non-energy raw materials due to Russia's war against Ukraine.

SCIENCE FOR POLICY BRIEF

European Commission

How Materials & the war in Ukraine

Rare Gases (Krypton, Neon, Xenon): Impact assessment for supply security



HIGHLIGHTS

- Russia and Ukraine are significant sources of rare gases (krypton, neon, xenon). Russia's invasion of Ukraine affects the rare gases supply.
- The EU sourced about half of its rare gases imports from Russia and Ukraine in 2021. China and the US are the potential sources for EU's import diversification.
- Industry stakeholders could mitigate the impacts in the short term. The supply disruption might be severe with associated price inflation until production capacity is developed elsewhere combined with conservation/recycling/substitution strategies to handle shortages.
- EU's resilience to supply chain disruption in the short term is reinforced through its sizable production base for rare gases. In addition, domestic capacity could be theoretically expanded and EU-based companies are world leaders in air separation. EU's ambition to strengthen its semiconductor industry by 2030 requires the expansion of production capacity for rare gases to prevent shortages in the medium term.
- As Ukraine is a leading producer of purified neon gas, a critical input for the manufacture of semiconductors, neon's supply disruption poses the greatest challenges. A neon scarcity worldwide could substantially impact industrial supply chains reliant on semiconductors.
- Impacts are probable in the broader EU manufacturing sector by worsening the shortage of imported semiconductors for key industries.

QUICK GUIDE - This briefing is one of a series of overviews about potential supply disruption of non-food, non-energy raw materials due to Russia's war against Ukraine.

Trade-related country fiches for Ukraine, Russia, Belarus, Kazakhstan, China...

JRC TECHNICAL REPORT

European Commission

Russian trade in non-food raw materials

Focus on EU-Russia trade relations

Unguru, M., Georgievska, K., Dupage, C., Garbosa, E.

2022



JRC TECHNICAL REPORT

European Commission

Ukraine's trade in non-food raw materials

Focus on EU-Ukraine trade relations

Unguru, M., Georgievska, K., Dupage, C., Garbosa, E.

2022



JRC TECHNICAL REPORT


European Commission

Belarus' trade in non-food raw materials

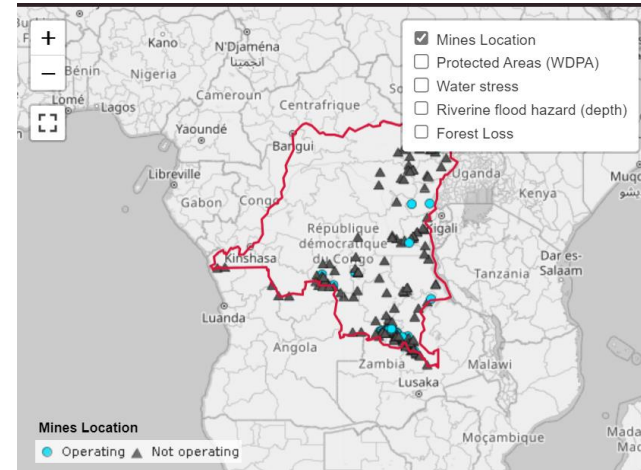
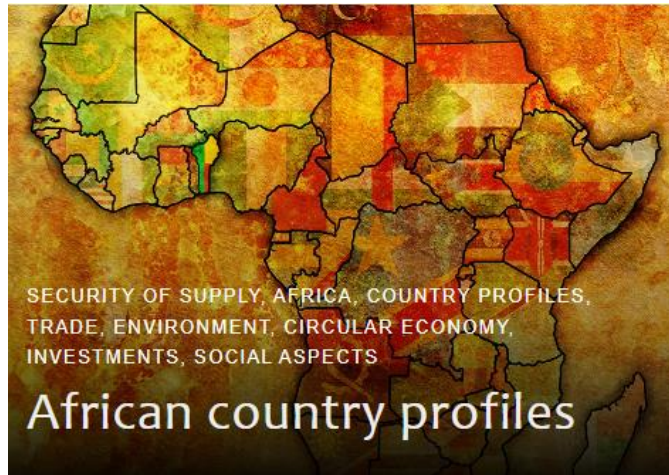
Focus on EU-Belarus trade relations

Unguru, M., Georgievska, K., Dupage, C., Garbosa, E.

2022

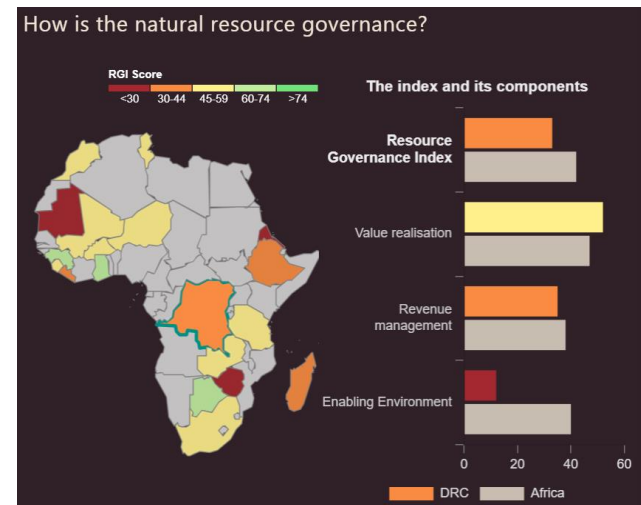


RMIS Country Profiles EU and Extra EU (e.g. for Africa)



Country Raw Materials Profiles

current/future mines locations, ownership, potentials, sustainability performance, trade, ...



Competitiveness,

governance, disruption impacts, jobs, environmental footprint, due diligence, ...

- Profiles available in RMIS for 45 out of 54 African countries
- Provide concise quantitative summaries for non-food, non-energy RMs
- Complement and explicitly link to the overarching JRC's **Africa Knowledge Platform (AKP)**
- Includes 20+ indicators related to trade, investments, environmental & social sustainability, circular economy & resource efficiency, governance.
- (forthcoming new profiles for **LAC** countries...)

Environmental footprint of raw materials

European Platform on LCA | EPLCA

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WELCOME TO THE EUROPEAN PLATFORM ON LIFE CYCLE ASSESSMENT

The EPLCA is the EU's knowledge base that responds to business and policy needs towards sustainable production and consumption.

The EPLCA supports the methodological development of Life Cycle Assessment (LCA) for the analysis of supply chains and end-of-life waste management.

The EPLCA fosters LCA as an essential integrated environmental assessment in support to the EU policy making process and the ambition of Green Deal, and many other policy initiatives, with specific reference to the Circular Economy Action Plan, the Farm2Fork, the Biodiversity Strategy, the Chemical strategy, and many more.

Environmental Footprint



ILCD



Life Cycle Projects



Common Tools & Data



- Life cycle assessment based studies of critical and strategic raw materials.
- Methodological development in support to assessing the environmental profile of CRMs
- Product and organisation environmental footprint as in EC recommendations of 2021
- Addressing all levels: corporate, plant/facilities, products, materials, individual chemicals

Boosting circularity...

- From to the technological assessment of the **circularity potential of existing products** containing CRMs ...to the **definition of criteria for the ecodesign of future products** to enhance circularity

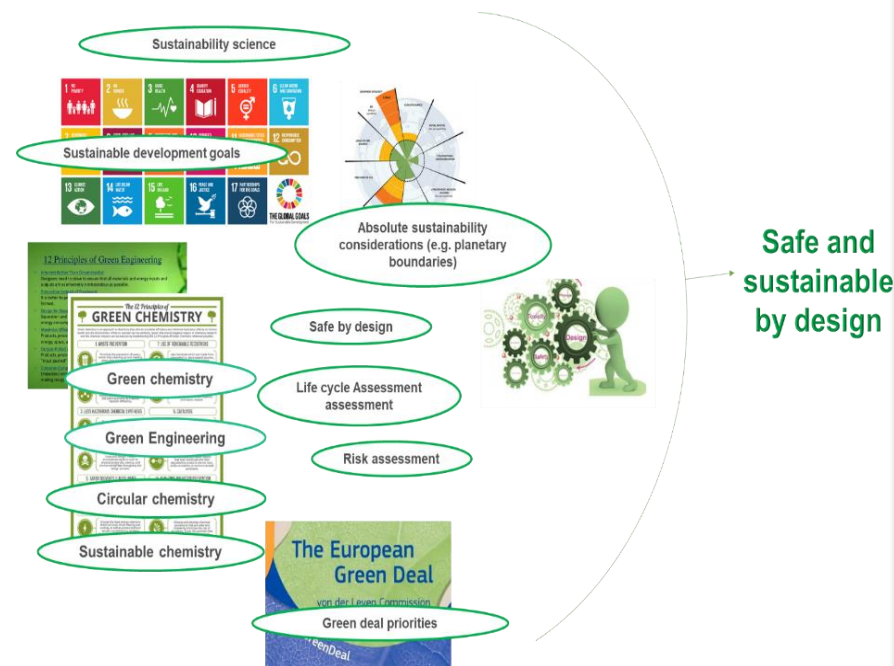


<https://data.europa.eu/doi/10.2760/207541>



...and unveiling substitution opportunity

- Advanced materials related initiatives and funds
- Safe and sustainable by design chemicals and materials
- Essential to avoid regrettable substitutions, namely promoting safer alternatives which have a better environmental profile along their entire life cycle



Caldeira, et al. (2022). *Safe and Sustainable chemicals by design chemicals and materials - Framework for the definition of criteria and evaluation procedure for chemicals and materials.* <https://doi.org/10.2760/487955>

Thank you



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