Primary and Secondary Metals and Minerals Supply Risk & Sustainability Analyses

JRC and IEA Workshop:

Improving resilience of clean energy supply chains

12-13.12.2023

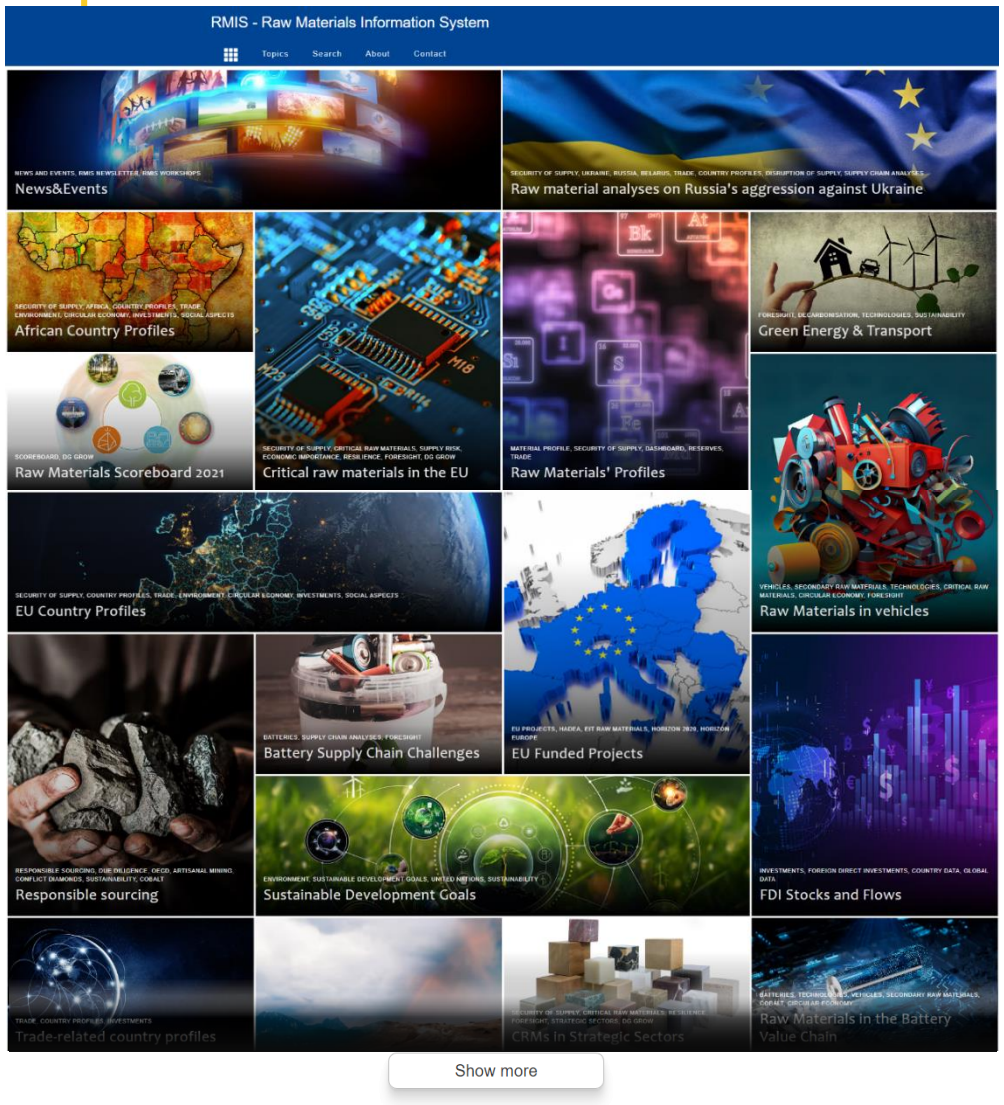
David Pennington, Konstantinos Georgitzikis, Fabrice Mathieux, Silvia Bobba, Simone Manfredi

European Commission, Joint Research Centre,

Unit D3: Land Resources and Supply Chain Assessments

European Commission

EC's Raw Materials Information System (RMIS) – 3.0



- Mandate: 2015 Circular Economy Action Plan
- Scope: non-fuel/food raw materials (mostly metals & minerals) from primary & secondary sources
- Facilitates: availability, coherence & quality of knowledge required at EU level
- Inputs, interactions, and support: EC services, Member State interactions, EU-funded projects, EU & international organisations, community, …
- Stakeholders network: 1000+; 000's of unique visitors monthly
- RMIS 3.0: March 2023, parallel to CRM Act proposal

https://rmis.jrc.ec.europa.eu/

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RMIS provides prompt responses to emerging EU-level knowledge needs : e.g., (foresight) Analyses of EU's supply risks

Internal/External Material briefs:
potash, titanium, coking coal, rare gases, nickel, PGMs,…
gallium, germanium, graphite, …



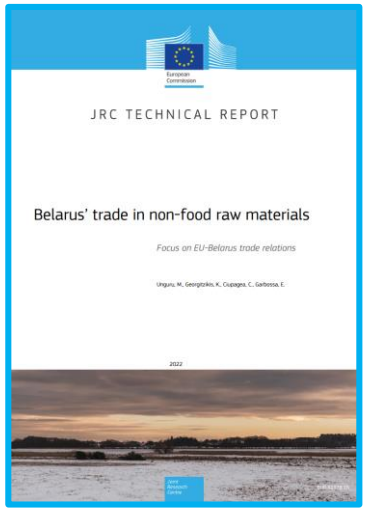




Trade related analyses:
for Ukraine, Russia, Belarus, Kazakhstan, China…



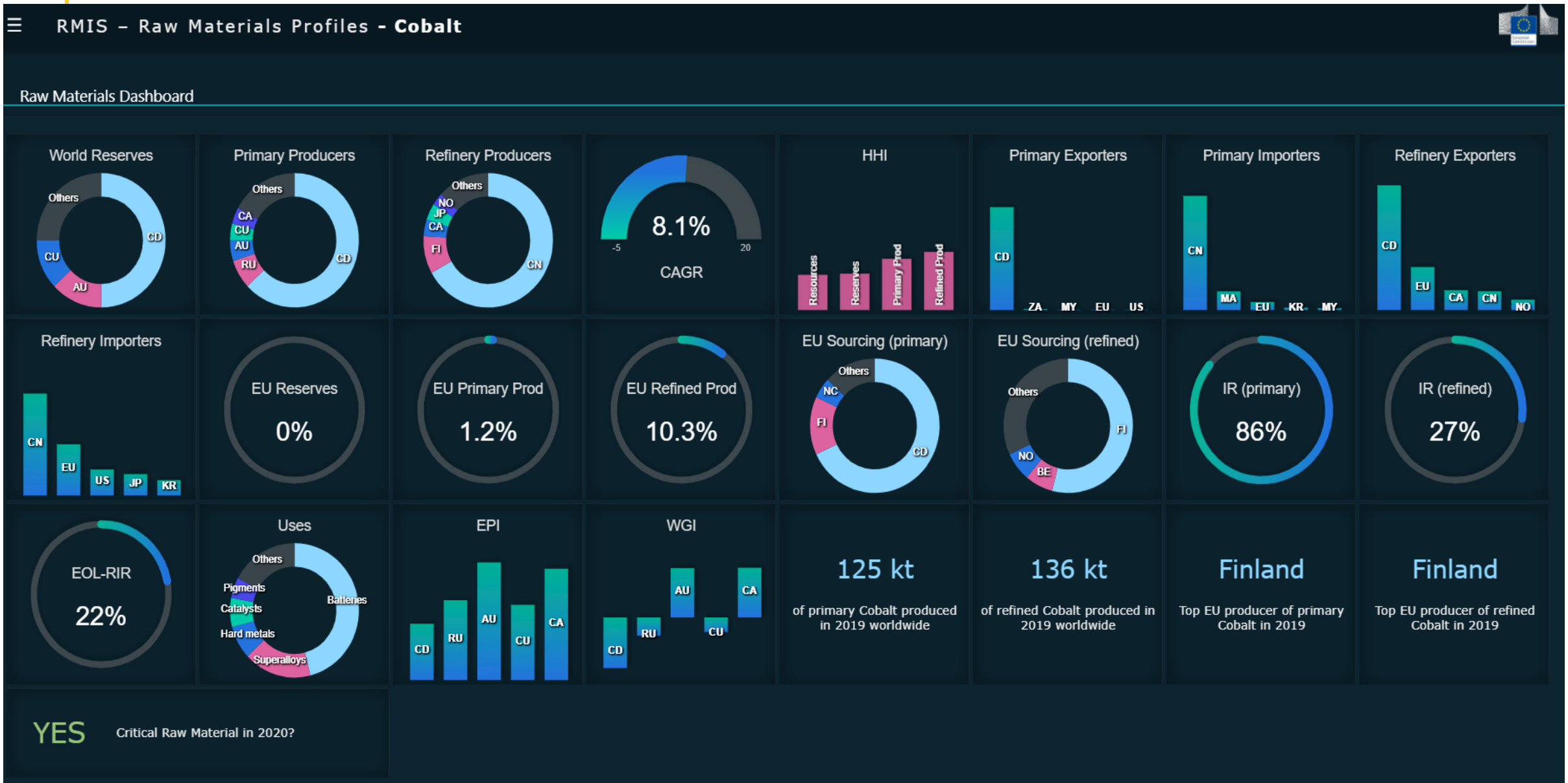




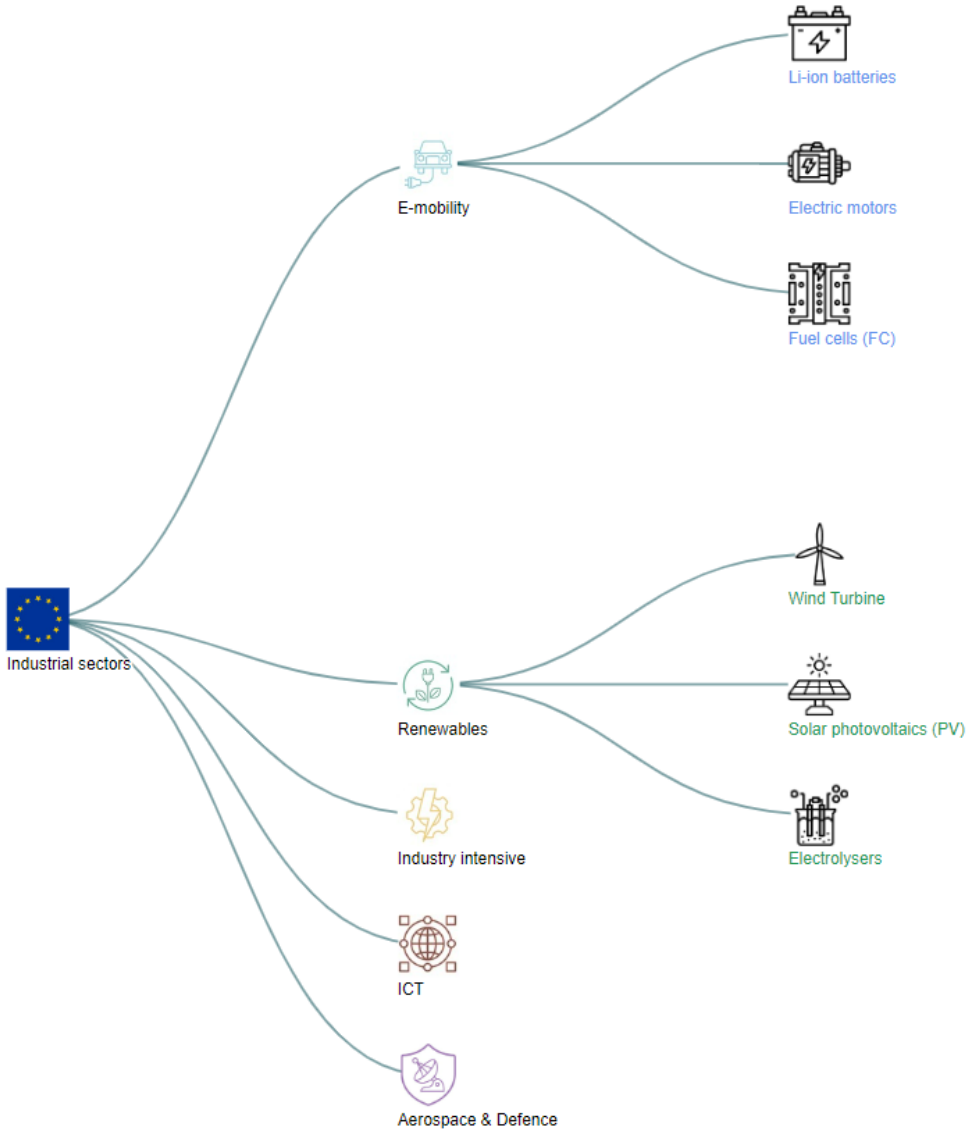
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Raw Material Profiles: Dashboard & Modules

100+ materials (analyses based on many internal and external sources)



Technology & Sector Profiles: Supply chain analyses for key technologies and sectors

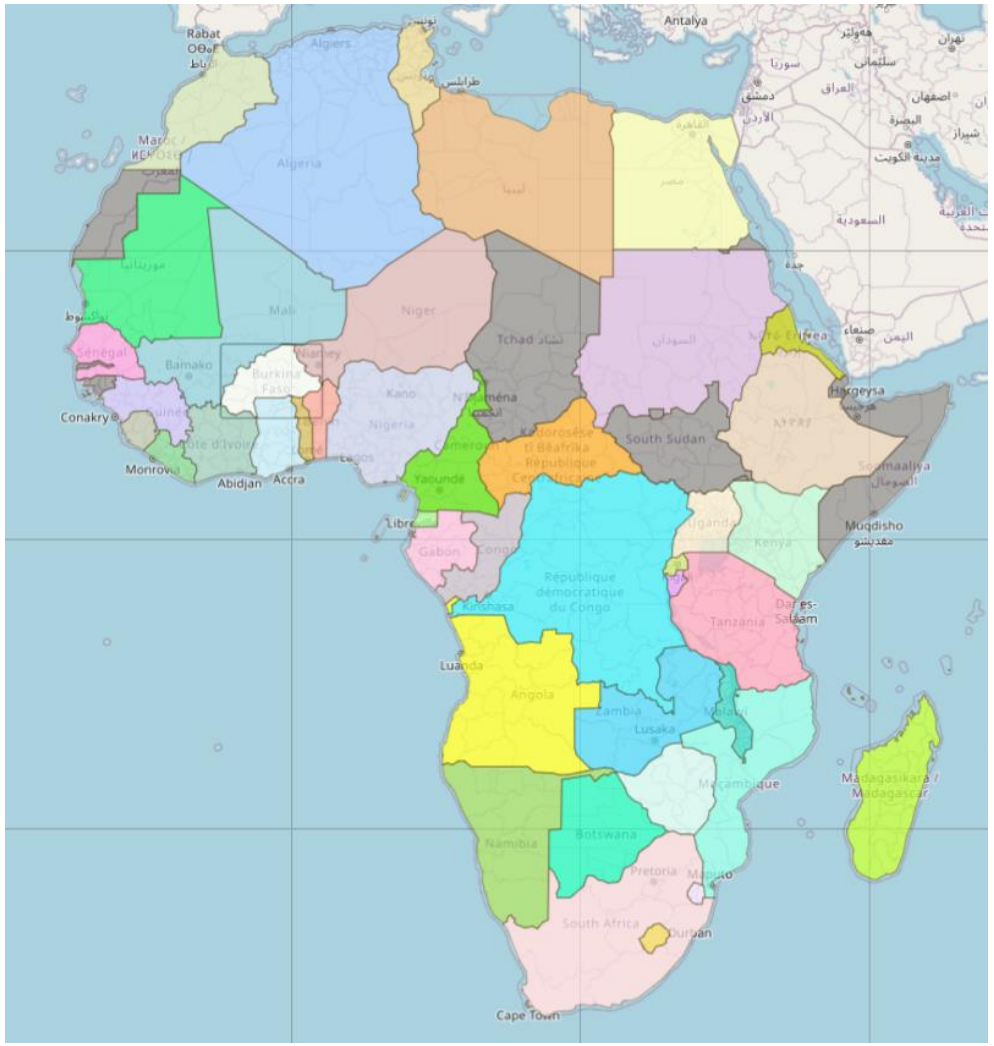


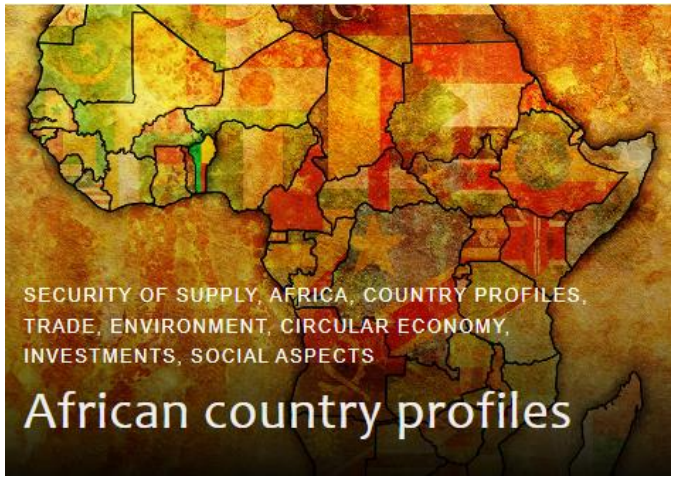
(link/complements RM up-coming profiles module)

- value chain links (primary & secondary) – detailed models (batteries, vehicles, chips, …), forecast studies, …;
- related materials, components and assemblies;
- (potential bottlenecks);
- future raw materials demands (forecasts)
- Circularity
- …

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RMIS Country Profiles: Africa, LAC, EU, …

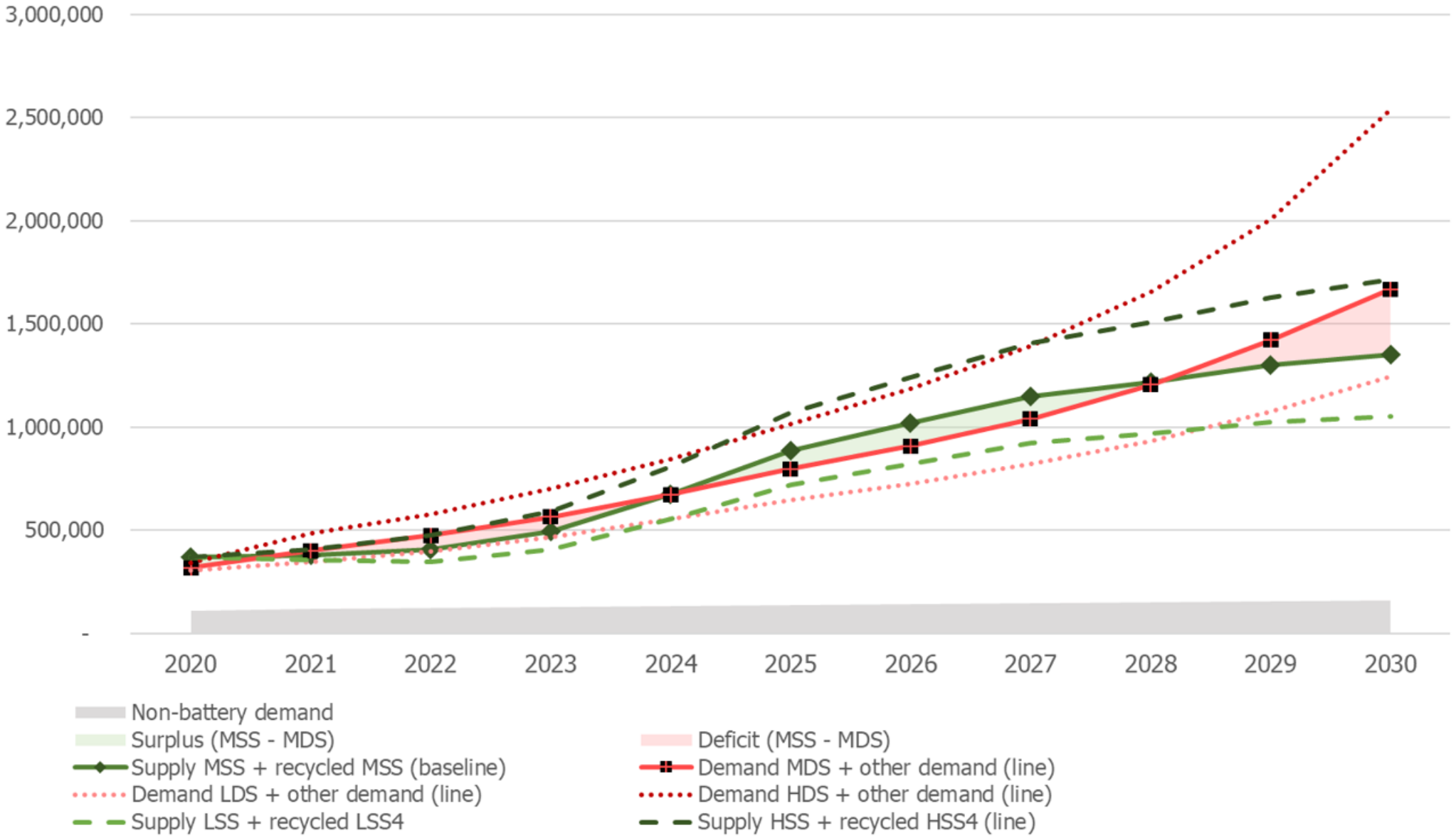




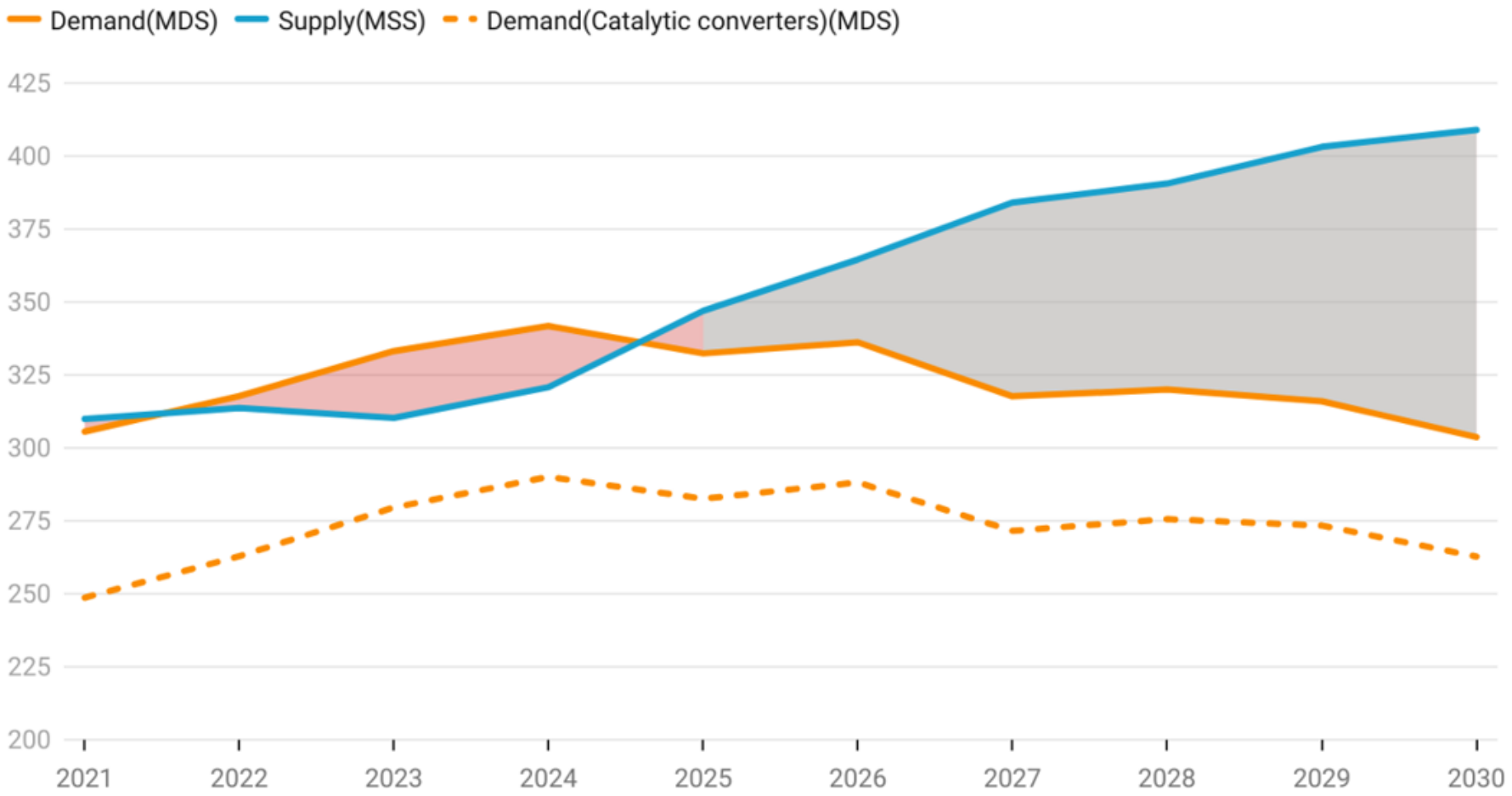
- Public summaries available e.g. 45 of 54 African countries
- Concise quantitative summaries for non-food/fuel RMs
- Includes 20+ indicators related to trade, investments, environmental & social sustainability, circular economy & resource efficiency, governance, ...

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Combined Supply & Demand Forecast Modelling:
Refined Li production, global, in tons of LCE



Global supply-demand of palladium (t)

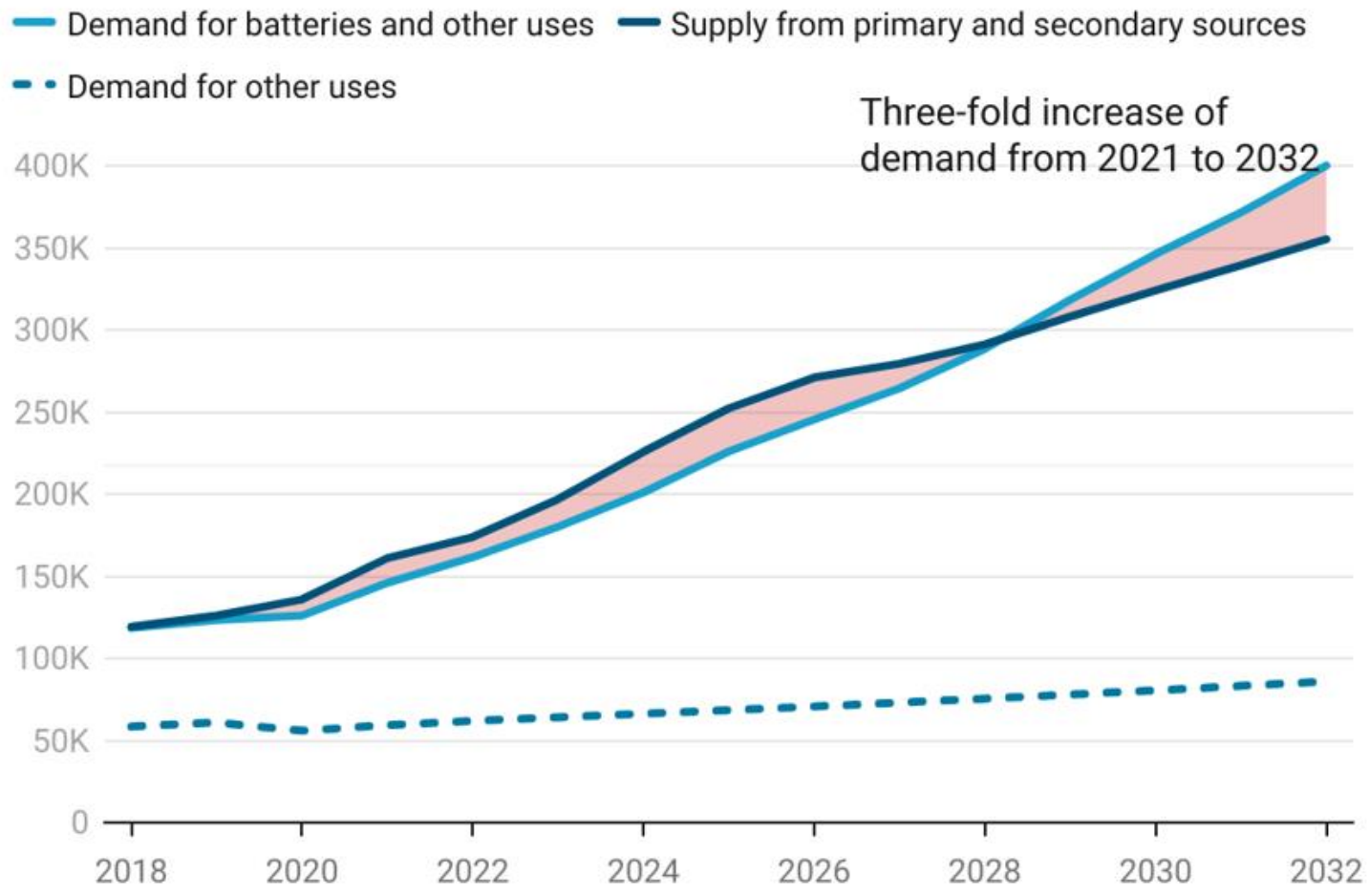


Medium Supply Scenario (MSS) and Medium Demand Scenario (MDS) (most plausible or baseline scenarios). Forecast period: 2022-2032. Latest supply data update: primary supply & recycling Mar 23. Latest demand data update: Mar 23. Supply includes primary sources and recycling. Demand does not include heavy-duty vehicles (catalytic converters) in 2023-2030. Investment is considered in the future equal to the historic (20-year) net annual average

Source: EC Raw Materials Information System (RMIS)

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Global supply-demand of cobalt (t)



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

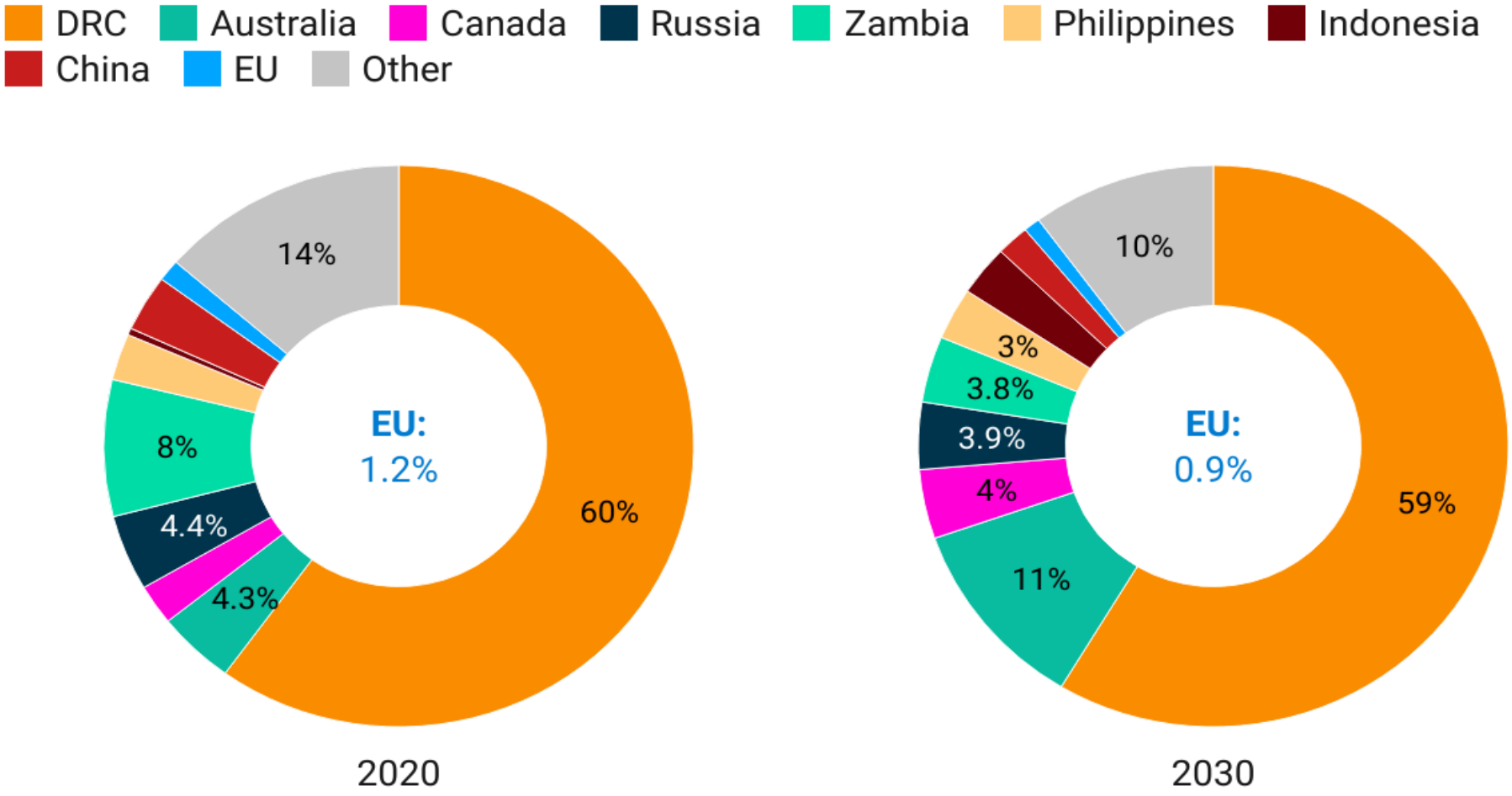
Latest supply data update: primary supply Sep 21, recycling Oct 21. Latest demand data update: Oct 21

Source: EC Raw Materials Information System (RMIS)

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Geopolitical Risks Forecasts and Options Analyses

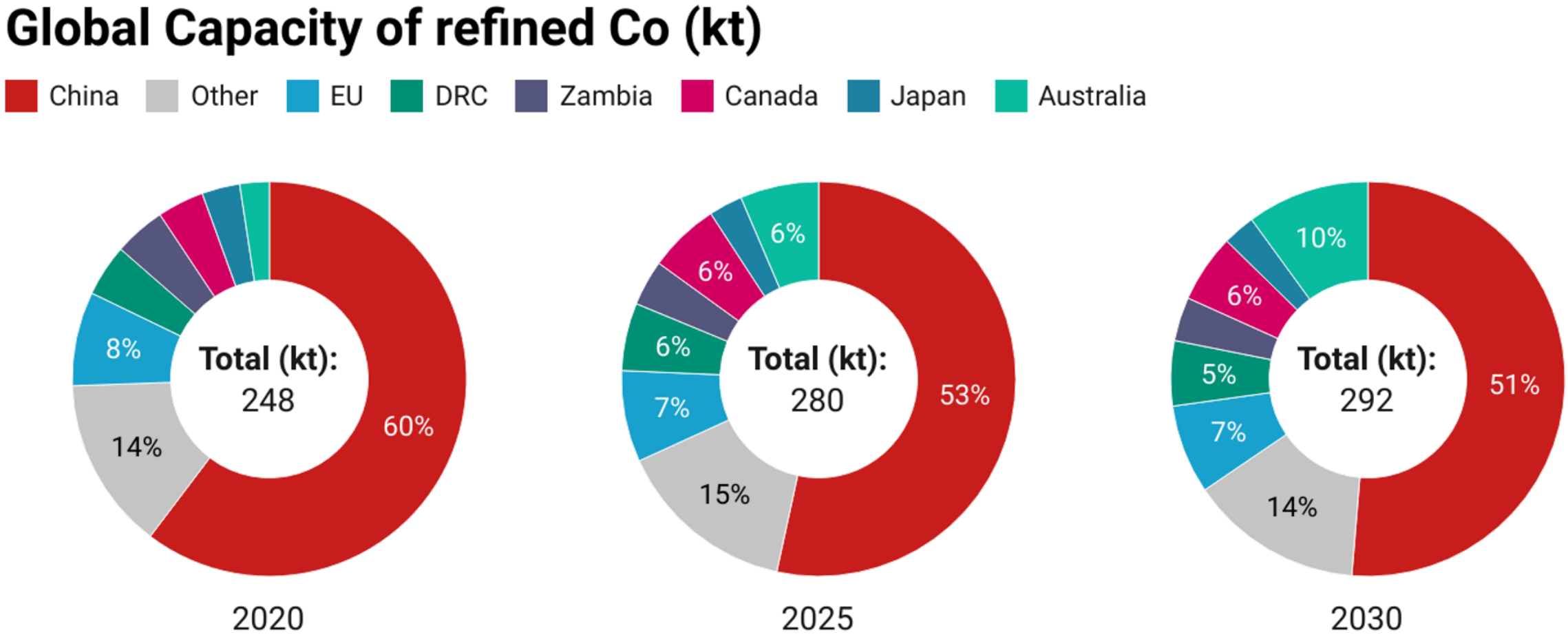
Co mine capacity by location



Source: EC Raw Materials Information System (RMIS)

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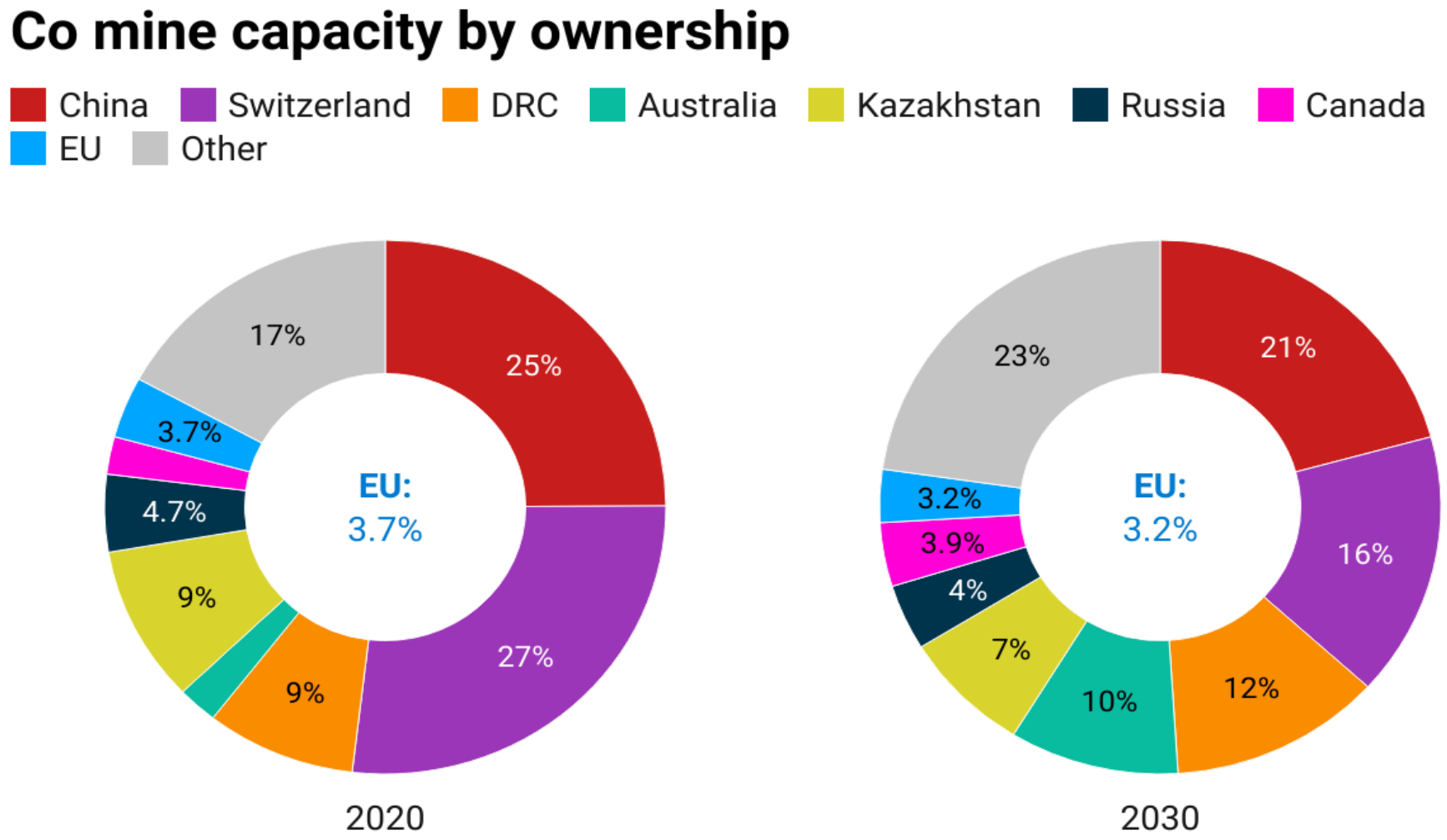
Geopolitical Risks Forecasts and Options Analyses



Source: EC Raw Materials Information System (RMIS)

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Geopolitical Risks Forecasts and Options Analyses

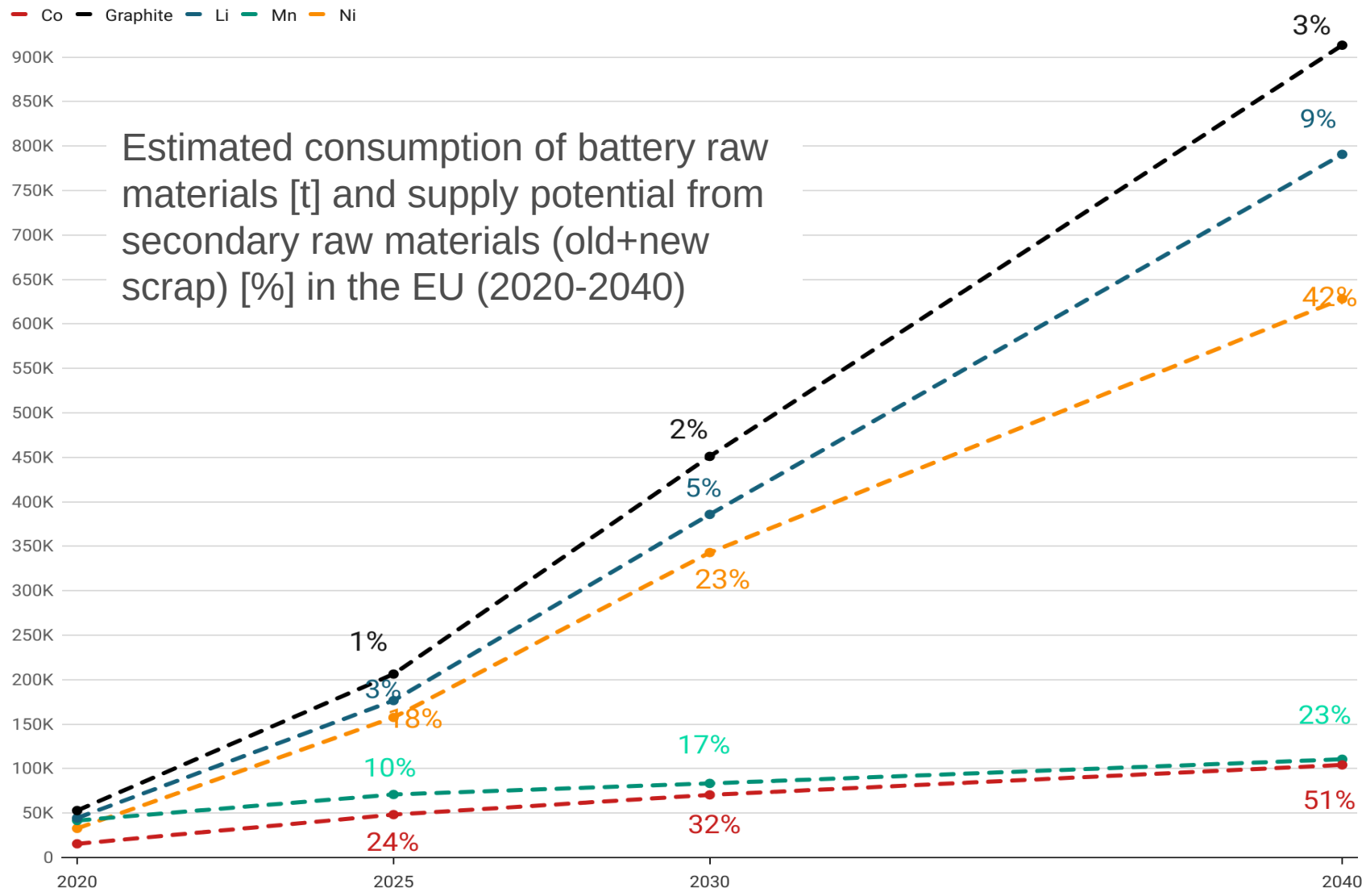


Latest supply data update: Sep 21

Source: EC Raw Materials Information System (RMIS)

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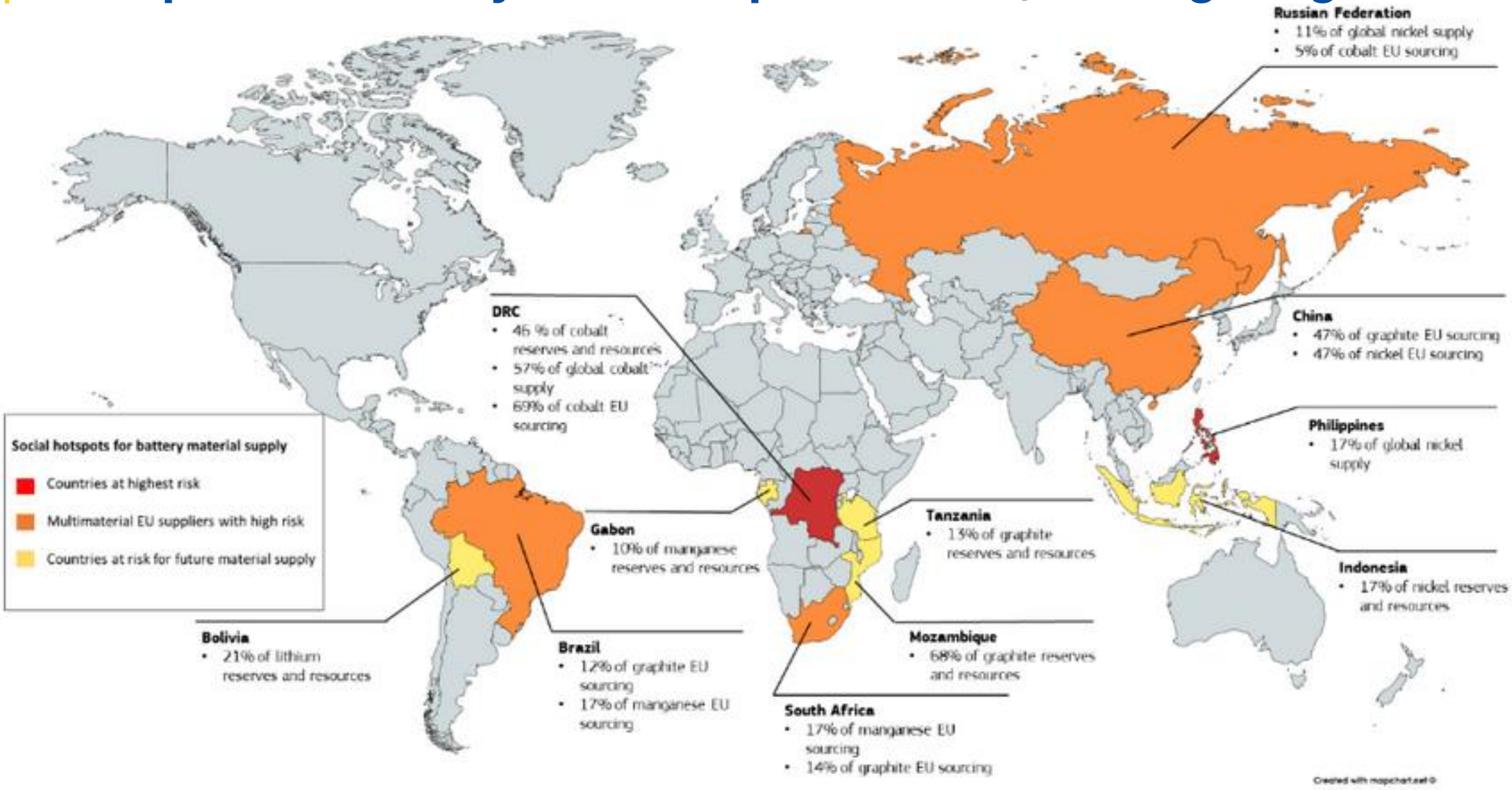
Secondary Raw Material Modelling & Forecasts (recycling)



Source: EC Raw Materials Information System (RMIS)

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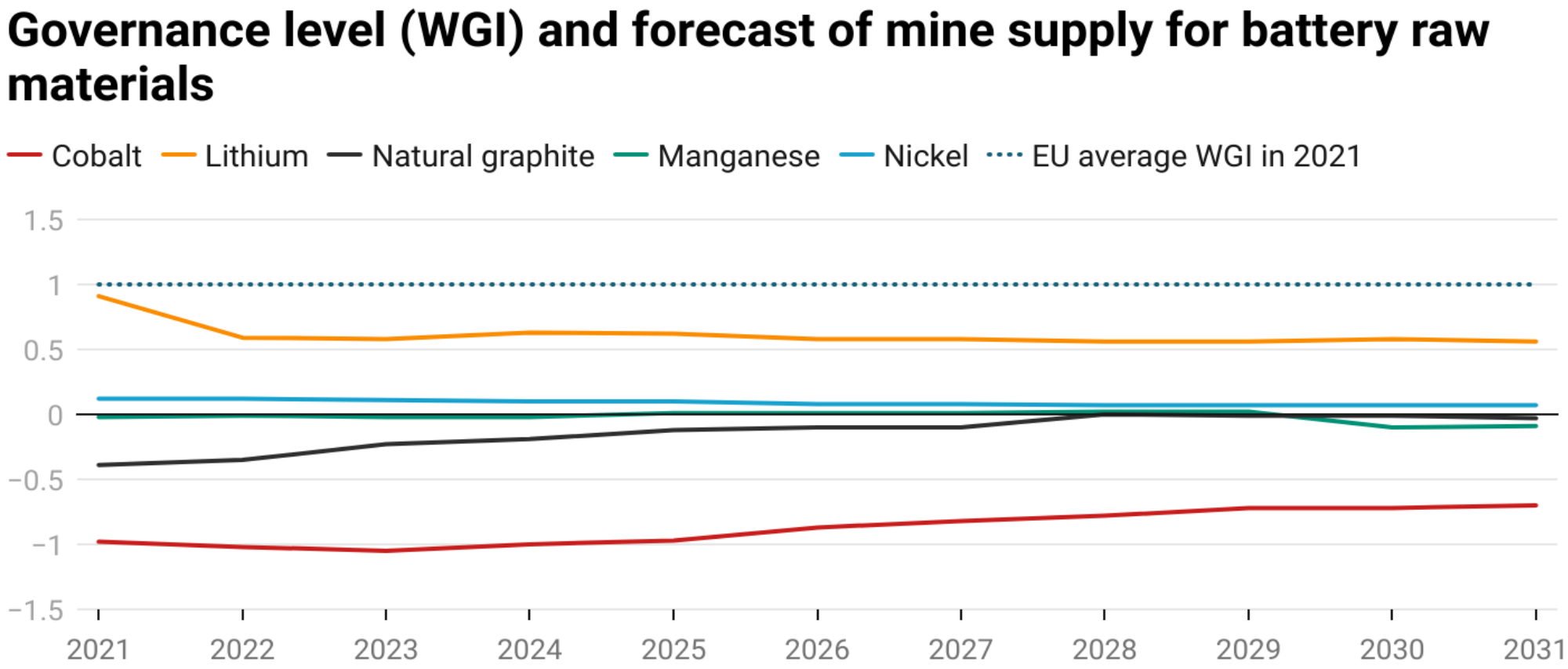
Supply - social and Environmental Impact Analyses: Hotspots in battery material production, mining stage



Mancini, L., Eslava, N., Traverso, M. and Mathieux, F., Responsible and sustainable sourcing of batteries raw materials. Insights from hotspot analysis, corporate disclosures and field research. Publications Office of the European Union, Luxembourg, 2020

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Supply – World Governance Index Based Forecasts



NB: The average value of the six World Governance Indicators (WGI) (Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption) is used for each producing country in the supply forecast. The WGI ranges from -2.5 to 2.5; higher values correspond to higher performance. WGI values refer to 2021

Source: EC Raw Materials Information System (RMIS)

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Thank you



rmis.jrc.ec.europa.eu

Contacts:
ec-rmis@jrc.ec.europa.eu
david.pennington@ec.europa.eu
simone.manfredi@ec.europa.eu

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