

The European Commission's science and knowledge service

Joint Research Centre



Social assessment of raw materials supply chains

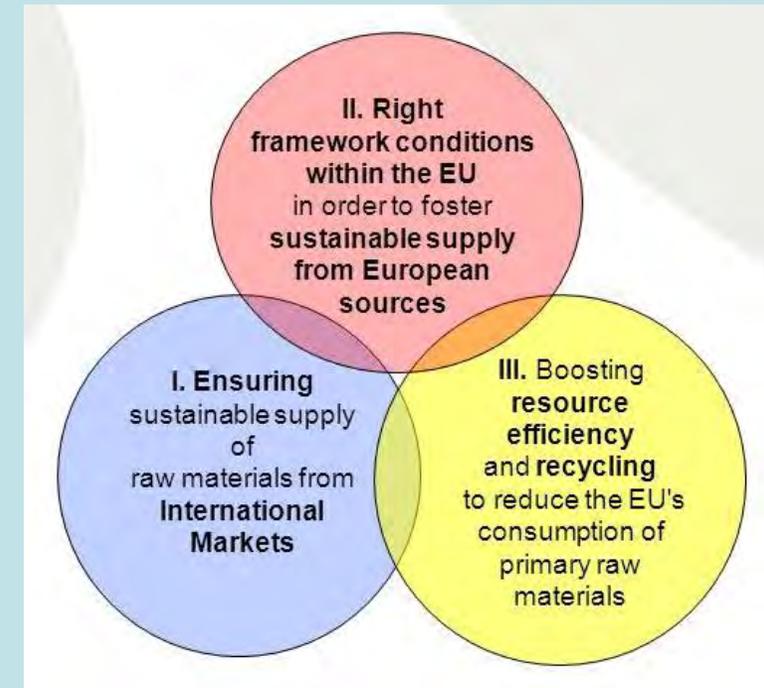
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70th LCA Discussion Forum, ETH Zürich

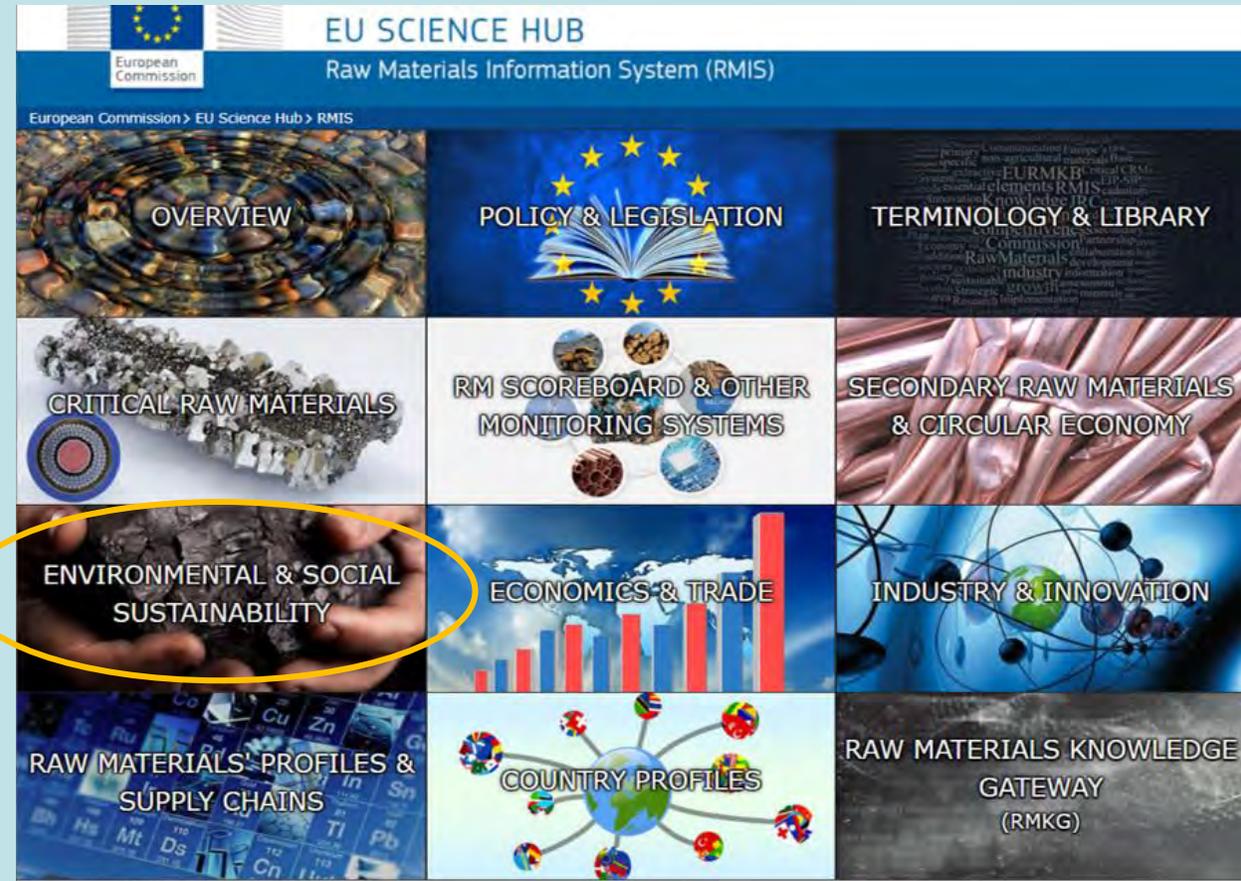
November 22, 2018

EU policy on Raw Materials

- 2008: Communication on the **Raw Materials Initiative**
 - 2010: first **Critical Raw Materials** list (supply risk based on governance)
- 2017: **Minerals trade**: Regulation (EU) laying down **supply chain due diligence** obligations for Union importers of 3TGs from conflict-affected and high-risk areas.
- 2017: **European Pillar of Social Rights**.



Knowledge development for the RM policy



<http://rmis.jrc.ec.europa.eu/>

Main challenges in the EU RM sectors

- ***Sustainable supply from domestic sources***
 - Public acceptance of mining in EU
 - Social and environmental impacts
- ***Secure access from international markets***
 - Conflict minerals
 - Security of supply
- ***Circular economy potential***
 - In meeting RM demand
 - In reducing social and env. impacts

How to
assess
them?

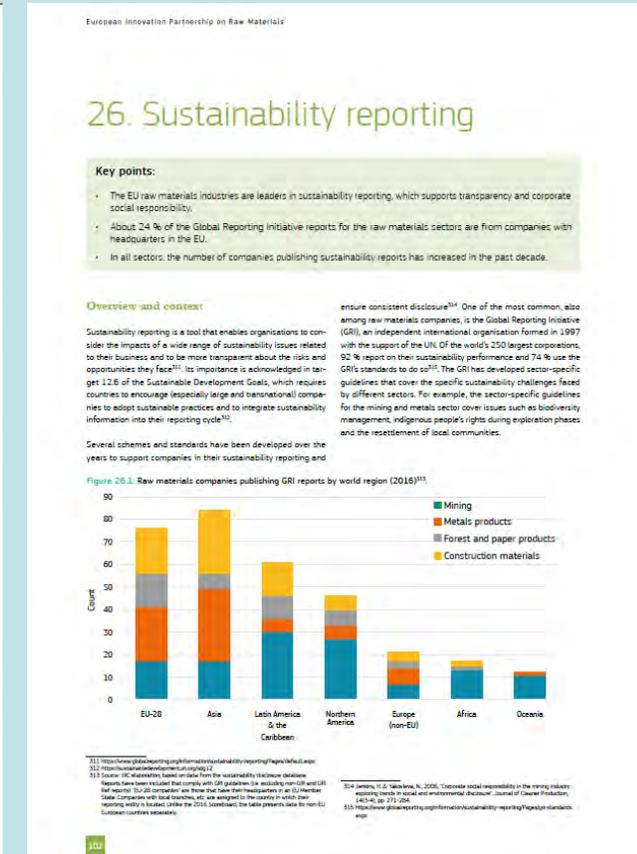
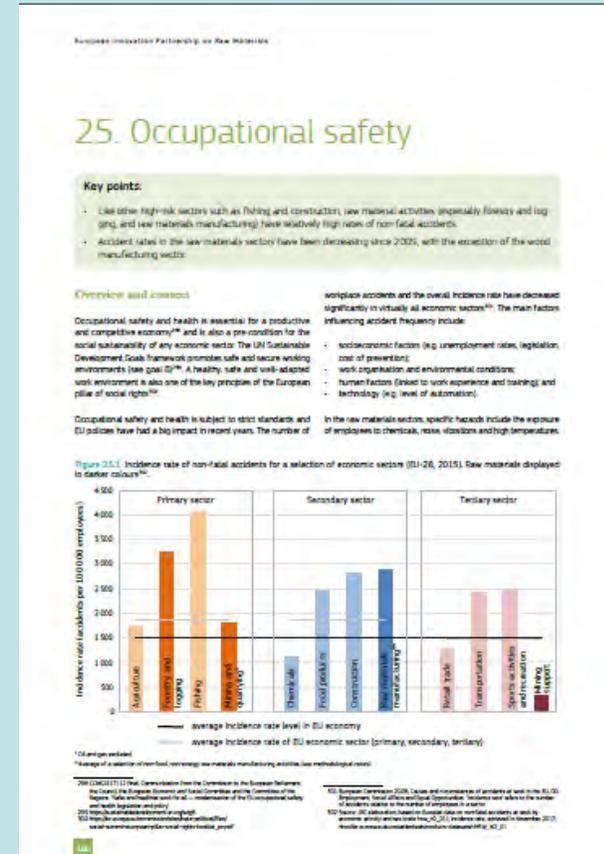


Scoreboard indicators on social sustainability

- **Occupational safety:**
 - No international comparison
- **Sustainability reporting:**
 - Indirect assessment
- **Both:**
 - No life-cycle approach

JRC further proposals for consideration:

- Social risk based metrics
- Conflict-free smelters



Applying PSILCA to assess social risk in raw materials sectors

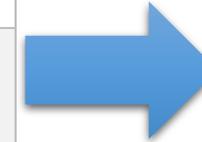
- Comparison **EU-28 average** with 6 main extra-EU producing countries
- Six economic sectors: mining – forestry – manufacturing (paper, wood, metals, minerals)
- Mapping of NACE codes (ESTAT) to Country-Specific Sectors (PSILCA)



Mancini et al. (2018) Social assessment of raw materials supply chains. A life cycle-based analysis. JRC technical report (forthcoming)

Selection of relevant impact categories based on a set of criteria

CRITERIA	
RELEVANCE	1. Relevance for the RM supply chain: each impact category is assessed based on its link with and pertinence to the RM sectors.
	2. Policy relevance : each impact category is assessed based on the importance of the theme from a policy perspective (based on authors' judgement)
IMPACT ASSESSMENT	3. Link between topic and the indicators: within each impact category, it is assessed if the indicators proposed in PSILCA have a direct link with the topic of the impact category
	4. Basis for indicator risk assessment: for each indicator, it evaluates if the scheme used to assign the risk level is based on reference values used elsewhere or if it is based on own judgement
DATA QUALITY CRITERIA	5. Reliability of the data sources: for each indicator, it assesses if data providers are reliable sources
	6. Appropriate geographic and technical resolution of the indicator data: it assesses if the indicators used in each impact category are country and sector specific



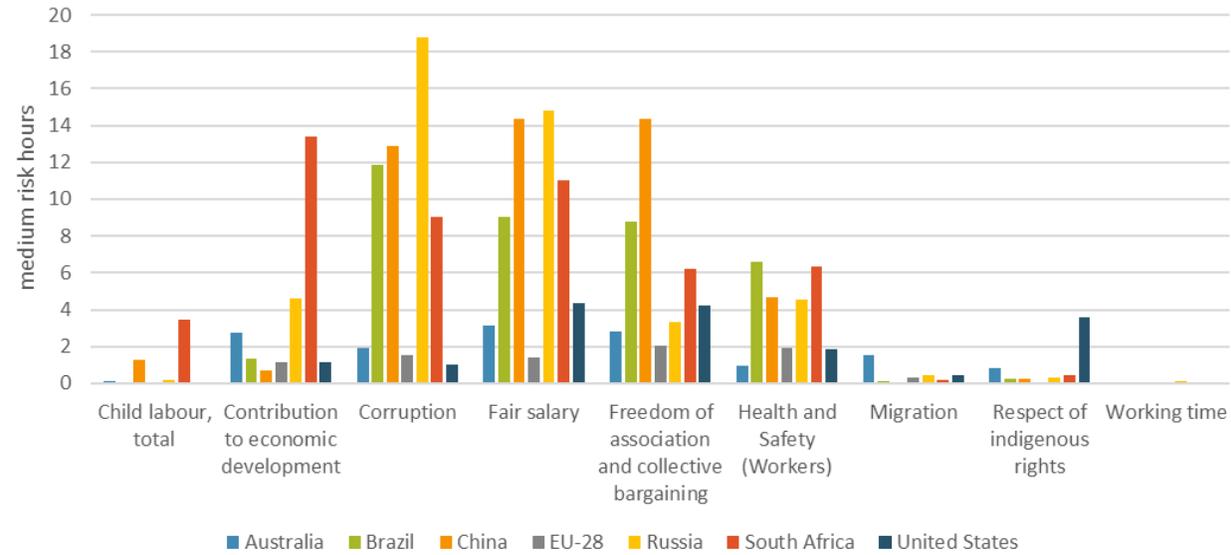
- Health and Safety *
 - Freedom of association and collective bargaining
 - Child labour
 - Fair salary *
 - Working time *
 - Respect of indigenous rights *
 - Migration *
 - Corruption
 - Contribution to economic development *
- * Sector specific (at least one indicator)

Stakeholders categories	Subcategories	Indicators
WORKERS	Health and Safety	Rate of non-fatal accidents at workplace
		Rate of fatal accidents at workplace
		DALYs due to indoor and outdoor air and water pollution
		Presence of sufficient safety measures
		Workers affected by natural disasters
	Freedom of association and collective bargaining	Trade union density
		Right of Association
		Right of Collective bargaining
		Right to strike
	Child labour	Child labour, total
	Fair salary	Living wage, per month
		Minimum wage, per month
Sector average wage, per month		
Working time	Hours of work per employee, per week	
LOCAL COMMUNITIES	Respect of indigenous rights	Presence of indigenous population
		Human right issues faced by indigenous people
	Migration	International migrant workers in the sector
		International Migrant Stock
		Net migration rate
VALUE CHAIN ACTORS	Corruption	Public sector corruption
Active involvement of enterprises in corruption and bribery		
SOCIETY	Contribution to economic development	Contribution of the sector to economic development
		Public expenditure on education
		Adult illiteracy rate (15+ years), male
		Adult illiteracy rate (15+ years), female
		Adult illiteracy rate (15+ years), total
		Youth illiteracy rate, male
		Youth illiteracy rate, female
		Youth illiteracy rate, total

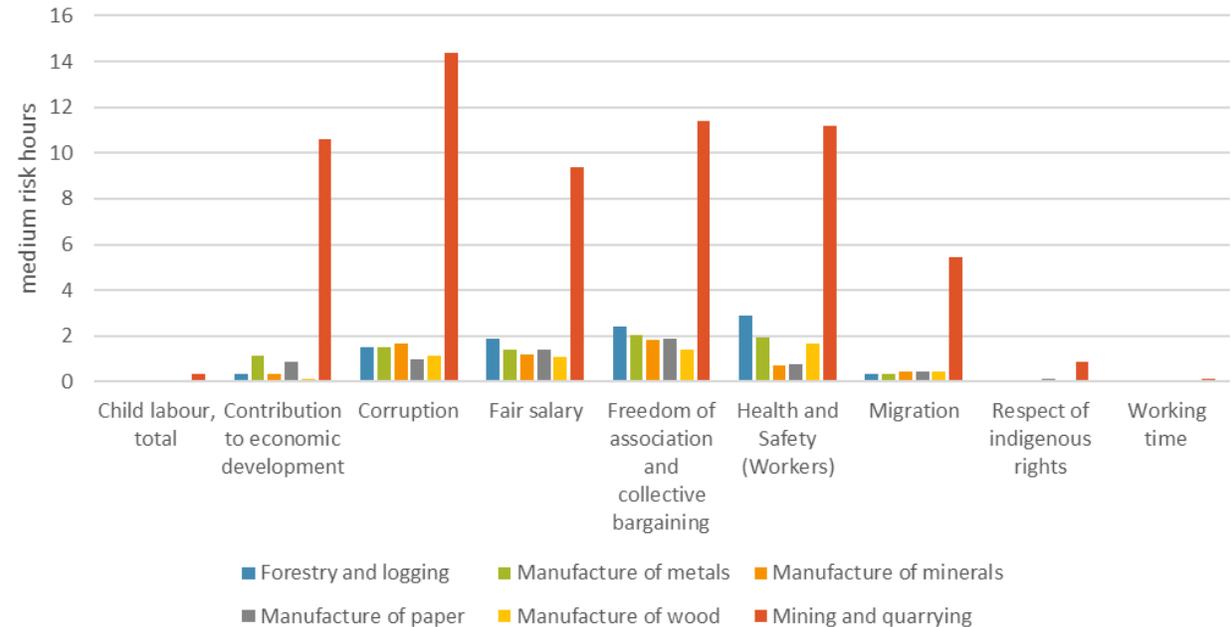
Results: risk hotspots

- International comparison:
 - child labour-South Africa;
 - freedom of association-China;
 - respect of indigenous rights-USA
- EU sectors comparison:
 - mining and quarrying (incl. oil&gas)

Manufacture of basic metals



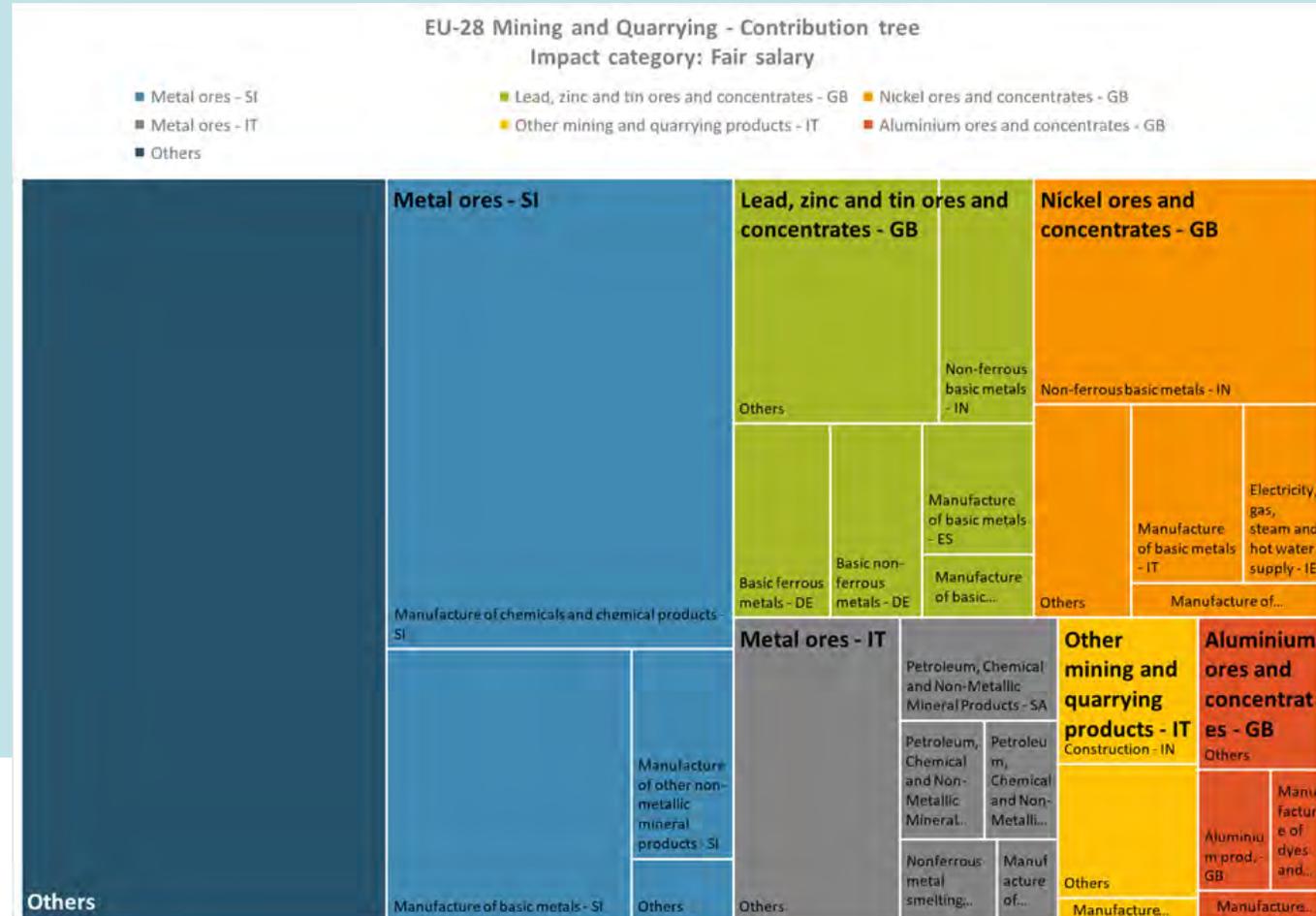
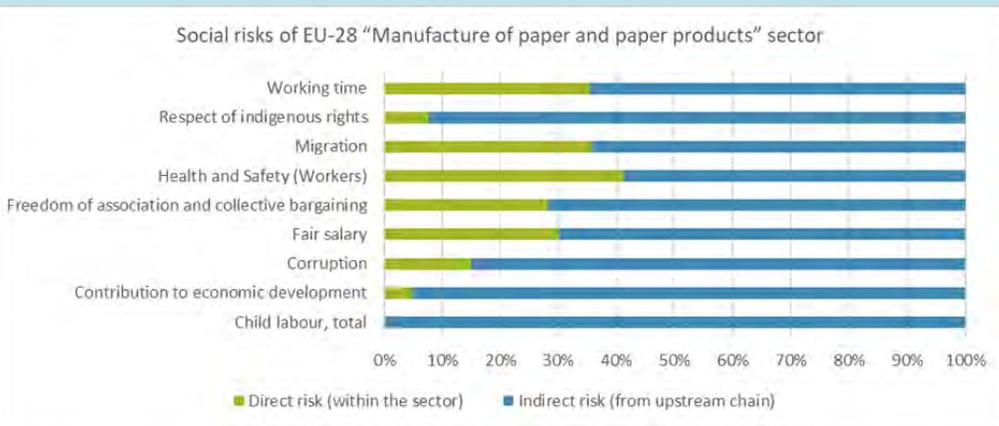
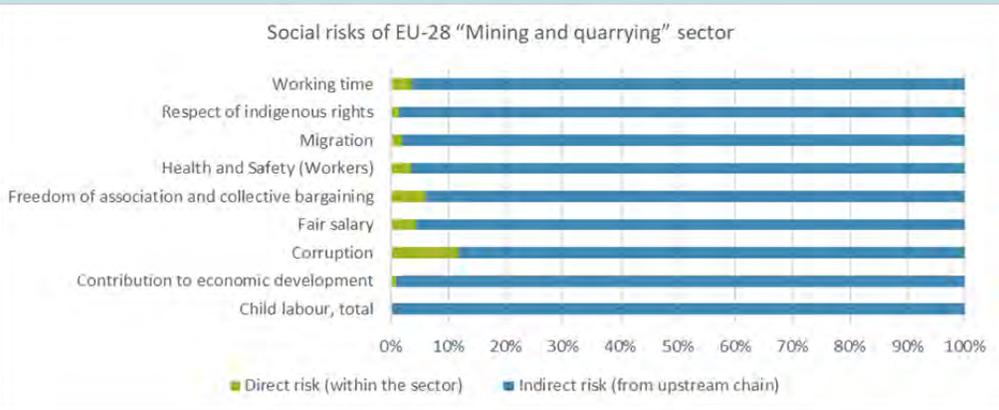
EU sectors comparison



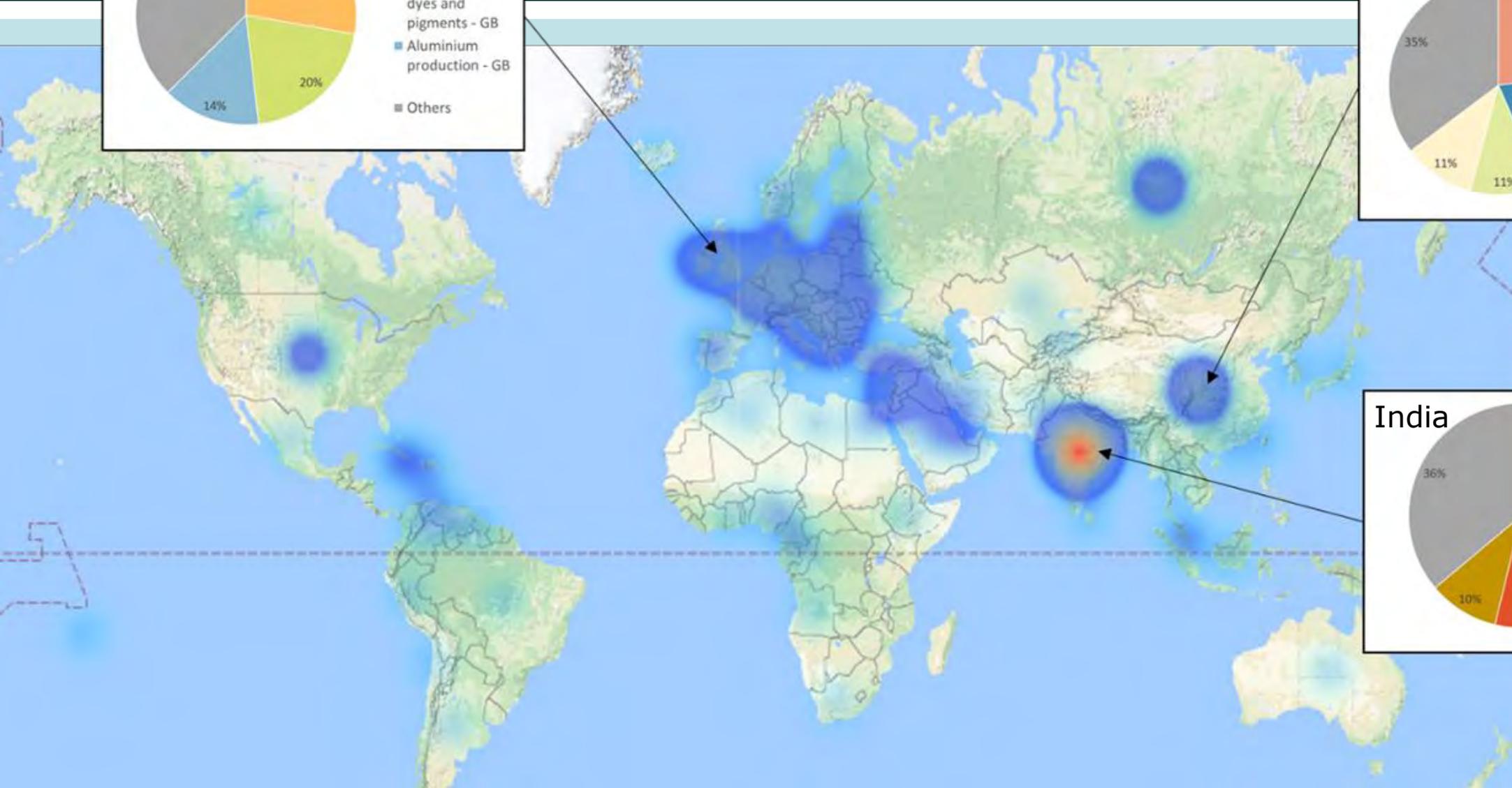
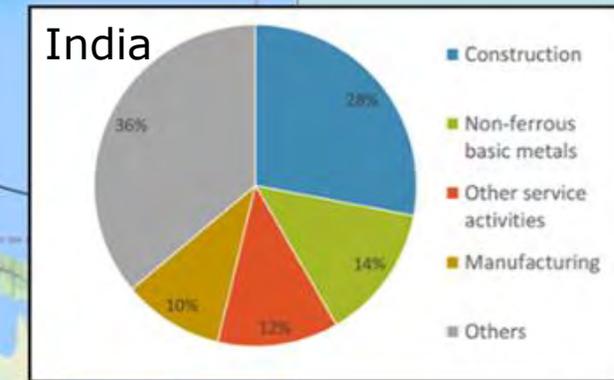
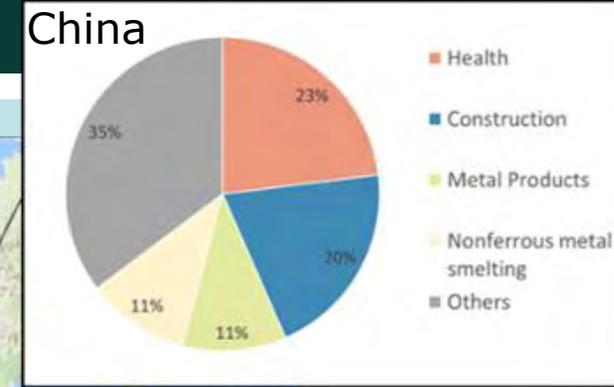
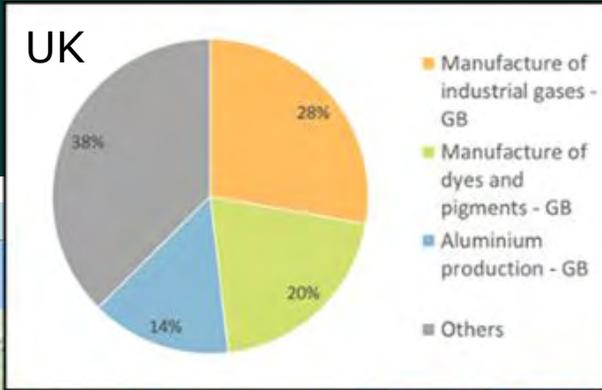
Results: contribution analysis

High share of indirect impacts in mining and quarrying

Contribution tree: mining and quarrying in EU, impact category "fair salary"



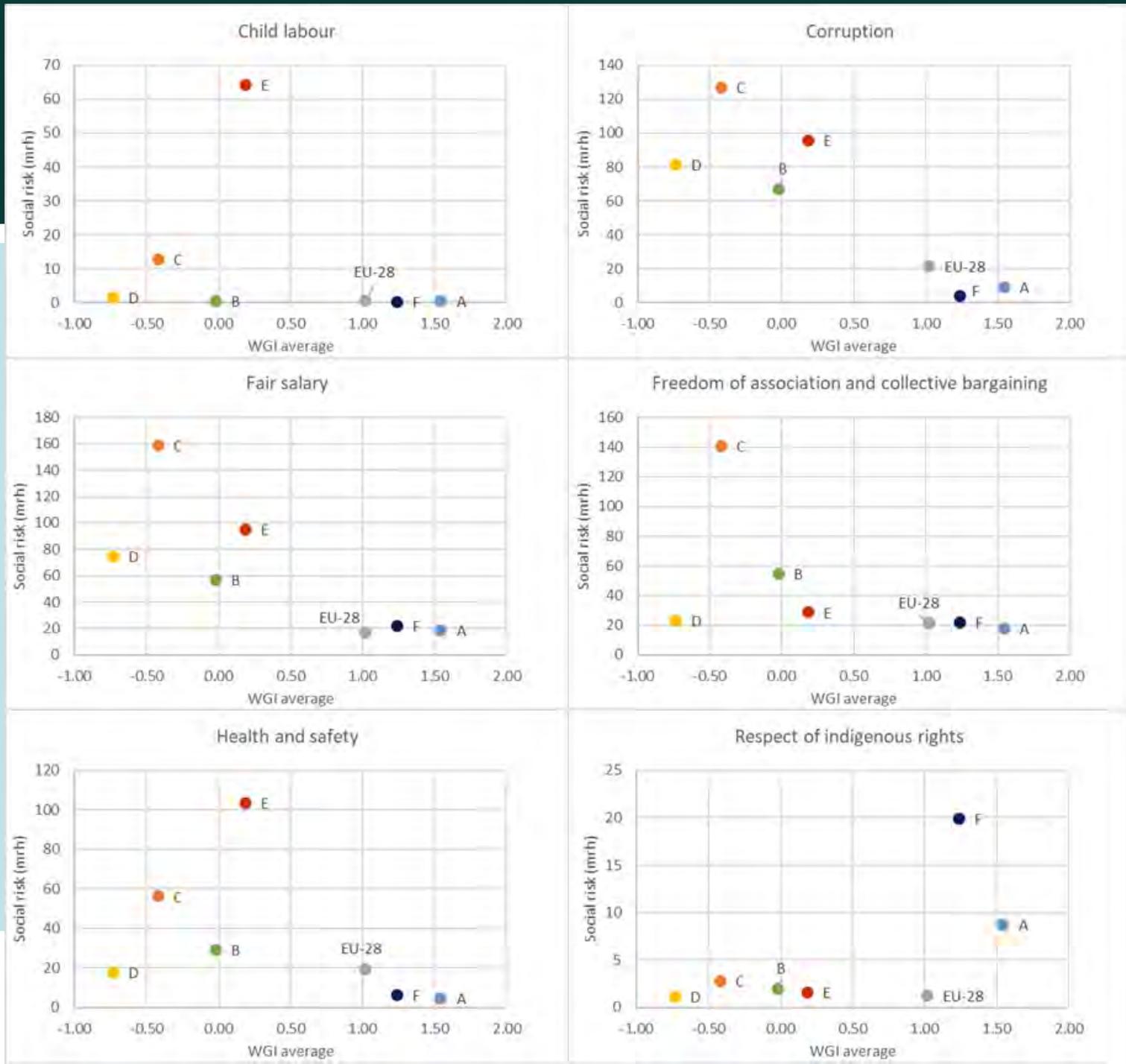
Location analysis: mining and quarrying in EU, for the impact category "fair salary"



Social risk and governance

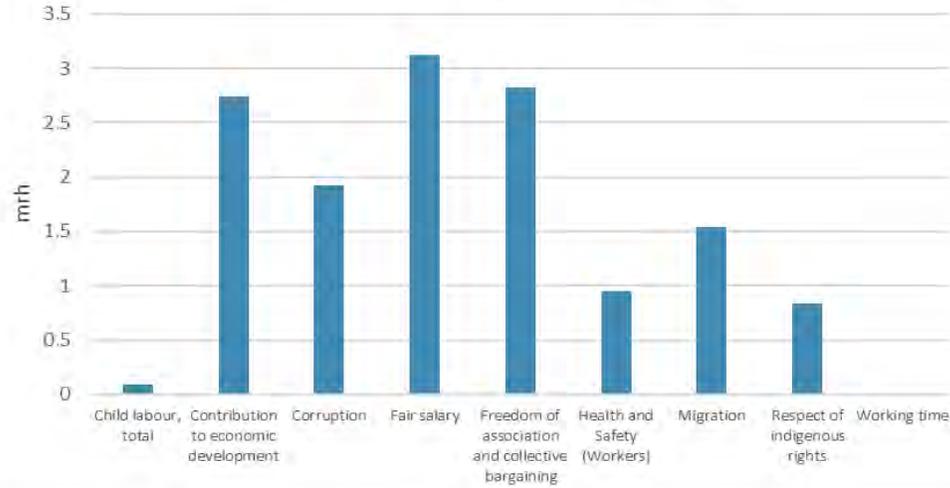
- In some subcategories, countries with low governance have also high risk
 - Corruption
 - Fair salary
 - Health and safety
- No links in other subcategories
 - Child labour
 - Respect of indigenous rights
 - Freedom of association

Legend: A: Australia, B: Brazil; C: China; D: Russian Federation; E: South Africa; F: USA

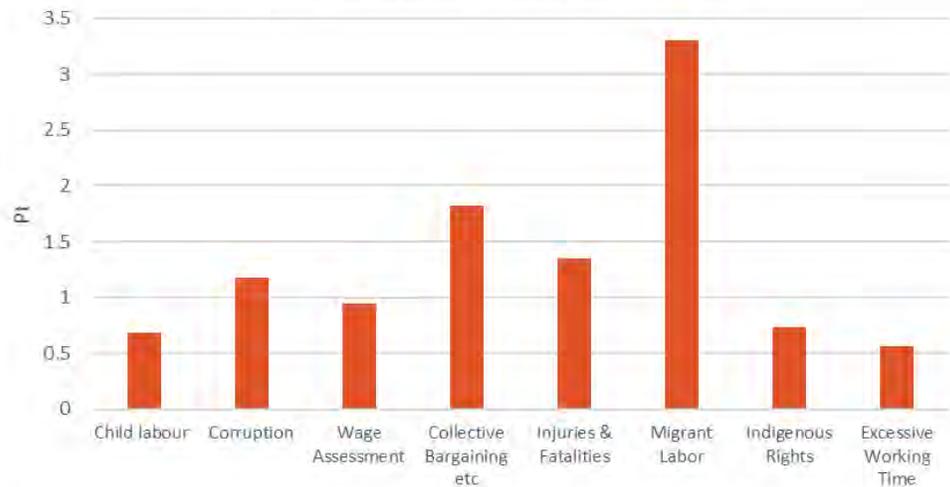


Comparison with SHDB

1 US\$ AU Manufacture of basic metals (PSILCA)



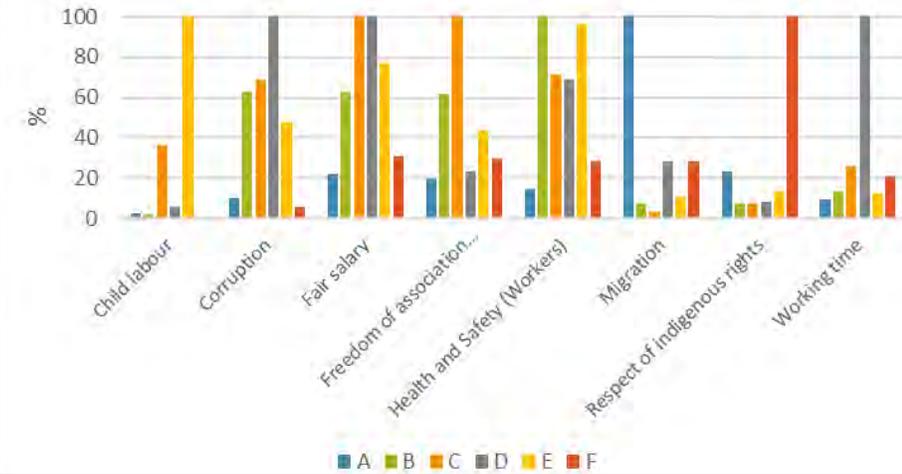
1 US\$ AU Manufacture of basic metals (SHDB)



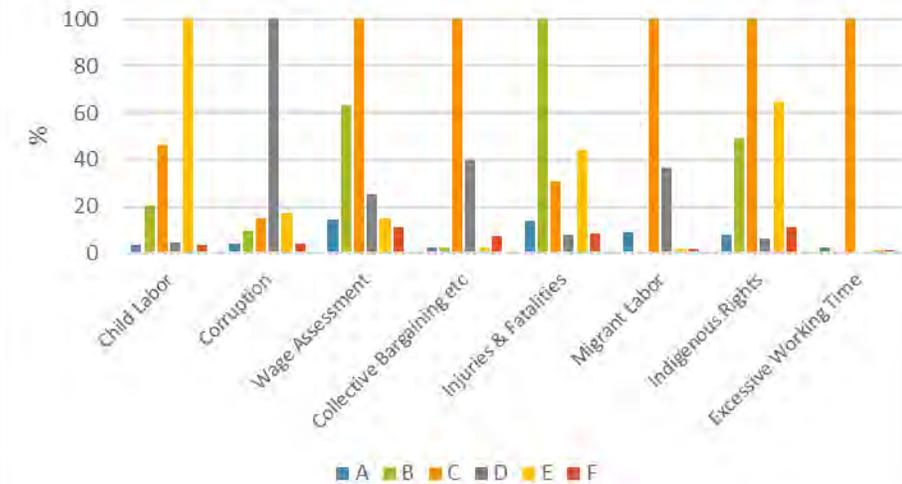
- Different characterization of some categories (e.g. migration, indigenous rights)
- Different I/O models
- PSILCA has more recent data
- Different worker hours models
- Almost same hotspots in relative results (for most categories)



Social risk in manufacture of metals, PSILCA



Social risk in manufacture of metals, SHDB



Data quality

	Reliability of sources	Completeness conformance	Temporal conformance	Geographical conformance	Further technical conformance
Child labour	2	4	5	3	5
Contribution to economic development	2	2	3	1	3
Corruption	4	3	1	1	3
Fair salary	2	2	1	1	1
Freedom of association (...)	2	2	4	1	5
Health and safety	1	2	2	3	2
Migration	2	2	3	1	3
Respect of indigenous rights	2	3	1	1	n.a.
Working time	2	2	3	1	2

- **Child labour:** data are not sector-specific; data older than 5 years for most of the countries; not available for all countries.
- **Corruption:** low reliability of one of the data sources (Transparency International).
- **Freedom of association and collective bargaining:** no sector-specific. For some countries data are older than 5 years.

* OECD (2014) Foreign bribery cases according to their occurrence in activity sectors

Sources of uncertainties and limitations

- Combination of more models
- Social data can be based on different reporting systems
- Aggregation in EU-28 average
- Cut-off in the calculation
- Data granularity (crucial for mining, which include energy mat.)
- “medium risk hours” concept
- Positive impacts
- Limited availability of sector based data

Conclusions:

Relevance and challenges for policy support

- Framework for social assessment
 - 1st and 2nd pillar of the EU RM Initiative
- Social implications of high import dependence for RM
- Increase awareness and social acceptance



- Sensitive issues and topics
- Life cycle approach for extractive sectors
- Input-Output models
- Links with:
 - OECD Responsible minerals
 - SDGs

Outlook



Characterization of materials trade flows



EU Battery Action Plan



Assessment of SDGs contribution



Any questions?

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