Responsibility in the Mineral Resources Sector – Engine for Global Development and Social Progress

International Raw Materials Conference
„Assuming Responsibility – Promoting Sustainability in the Raw Materials Sector“

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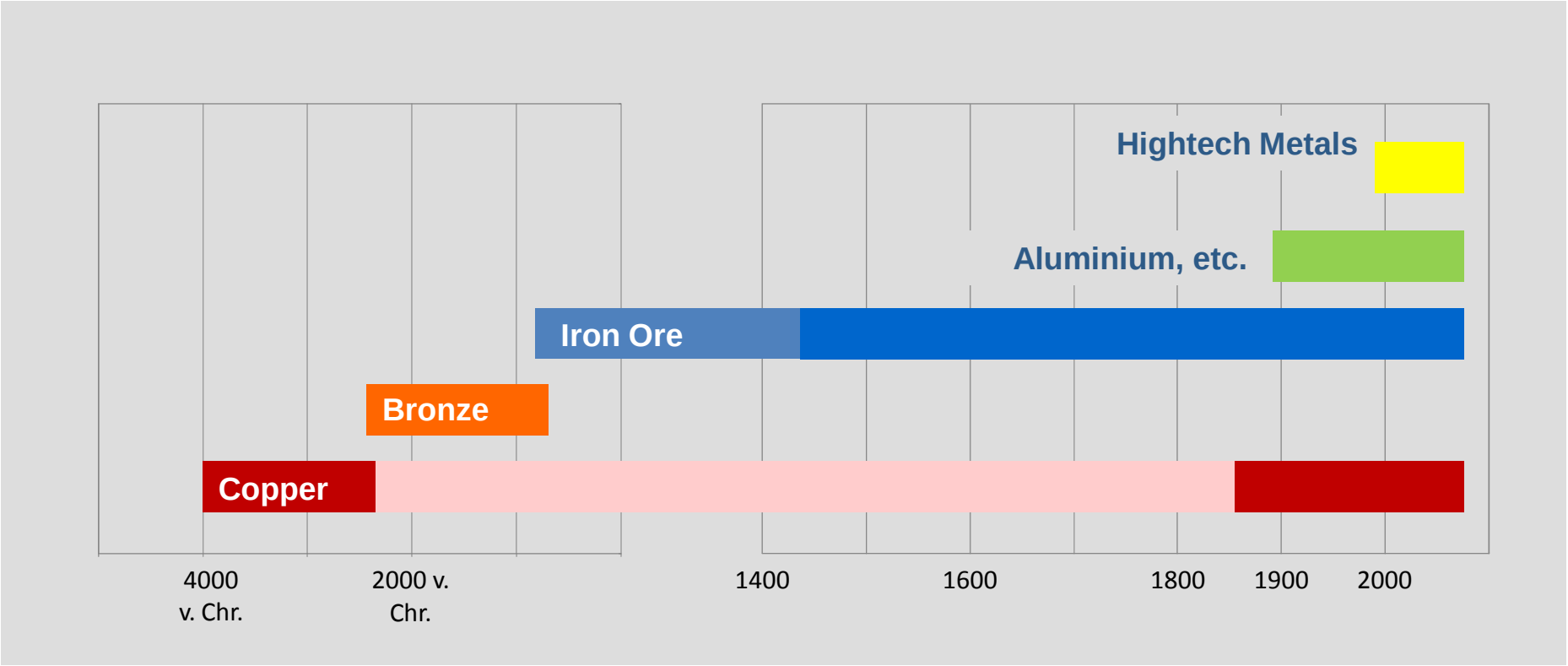
Why Do We Need Raw Materials?

We do not need the raw materials! BUT: We need their performances



Quelle: STEINBACH 2012

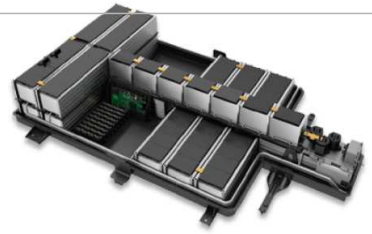
Why Do We Need Raw Materials?

Autobody:
Iron, Manganese, Titanium, Niobium, Aluminium, Copper, Nickel, Magnesium, Zinc

Automotive Electronics:
Gold, Silver, Germanium, Indium

Motor:
Copper, Aluminium, Magnesium,
Lead, Zinc, Nickel, Iron
Permanent Magnets in Electric Motors:
Neodymium, Dysprosium, Copper

Traktion Battery:
NiMH-Battery: Nickel, Lanthanium, Neodymium, Cobalt
Li-Ion-Battery: Lithium, cobalt, Nickel/Manganese, Copper



Catalytic Converters:
Platinum, Rhodium Palladium, Cerium, Lanthanium, Yttrium
Lambda Sensor:
Zirkonium, Yttrium

Bulbs: Tungsten, Cerium, Yttrium, Terbium

Light Alloy Rim:
Aluminium

Quelle: STEINBACH 2012

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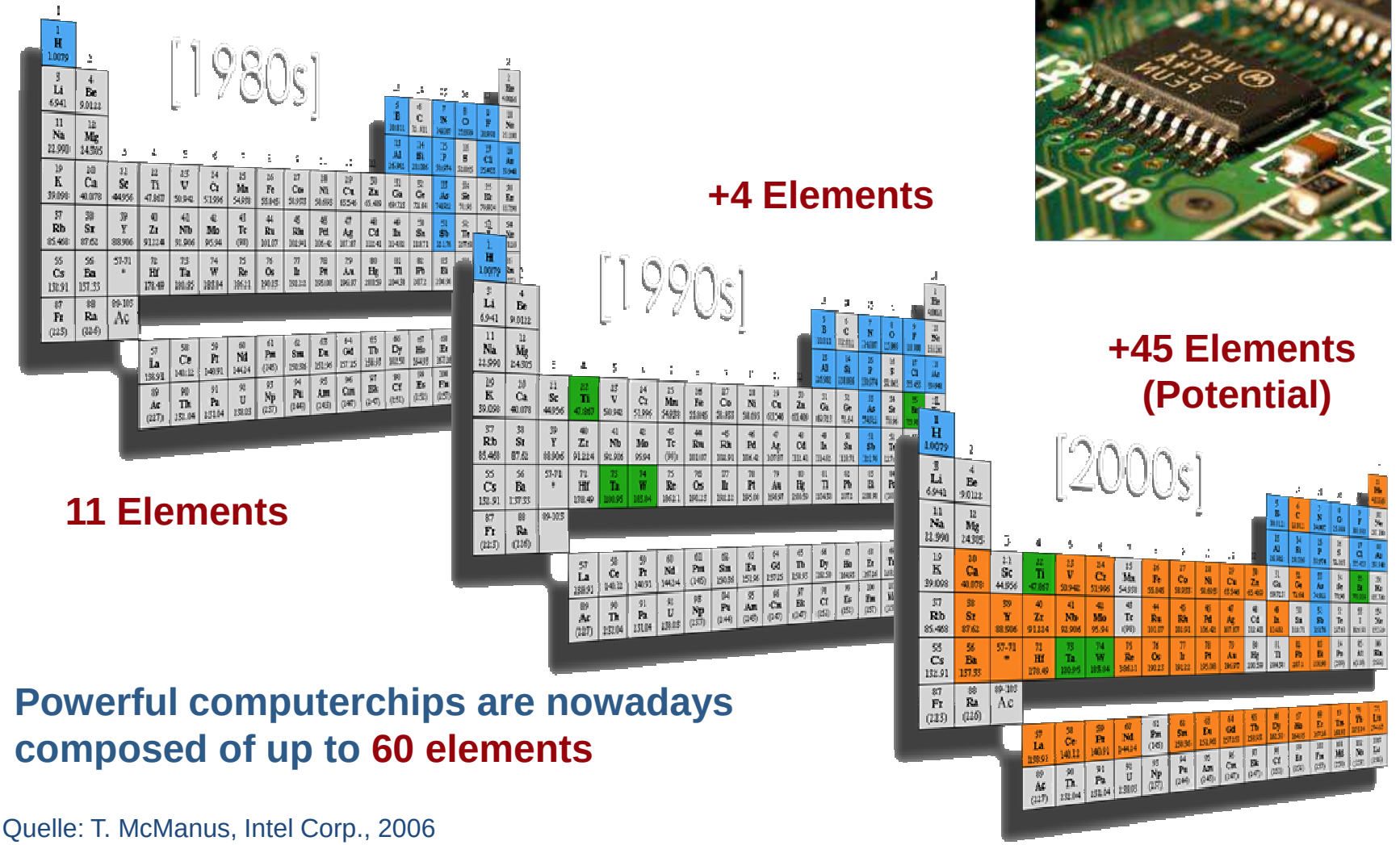
Increasingly Complex Products – Example Computer Chips



11 Elements

+4 Elements

+45 Elements (Potential)

Powerful computerchips are nowadays composed of up to 60 elements

Quelle: T. McManus, Intel Corp., 2006

Responsibility in Mineral Supply Chains

Mining - Processing - Smelter - Manufacturing

1. Responsible Mining

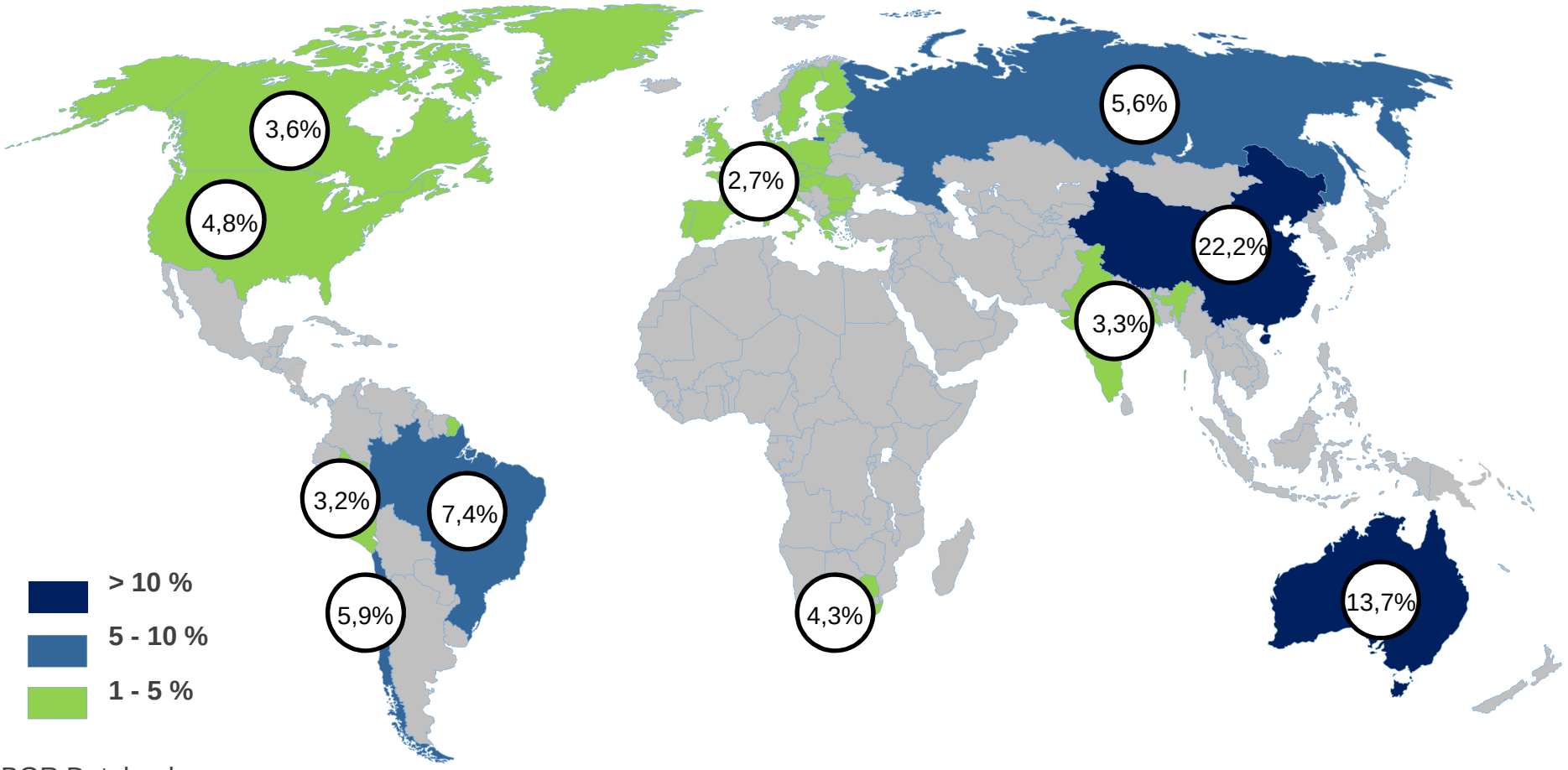
2. Responsibility in Mineral Supply Chains

Commodity Markets are Global

German imports of mineral commodities

Raw Material Producers (2013)

Top 10 mining countries (total value of world production 2013: 882 billion US$)



BGR Databank

*Metals, Industrial Minerals, Diamonds, Phosphate, Potash
The top 10 countries cover 74 % of world production

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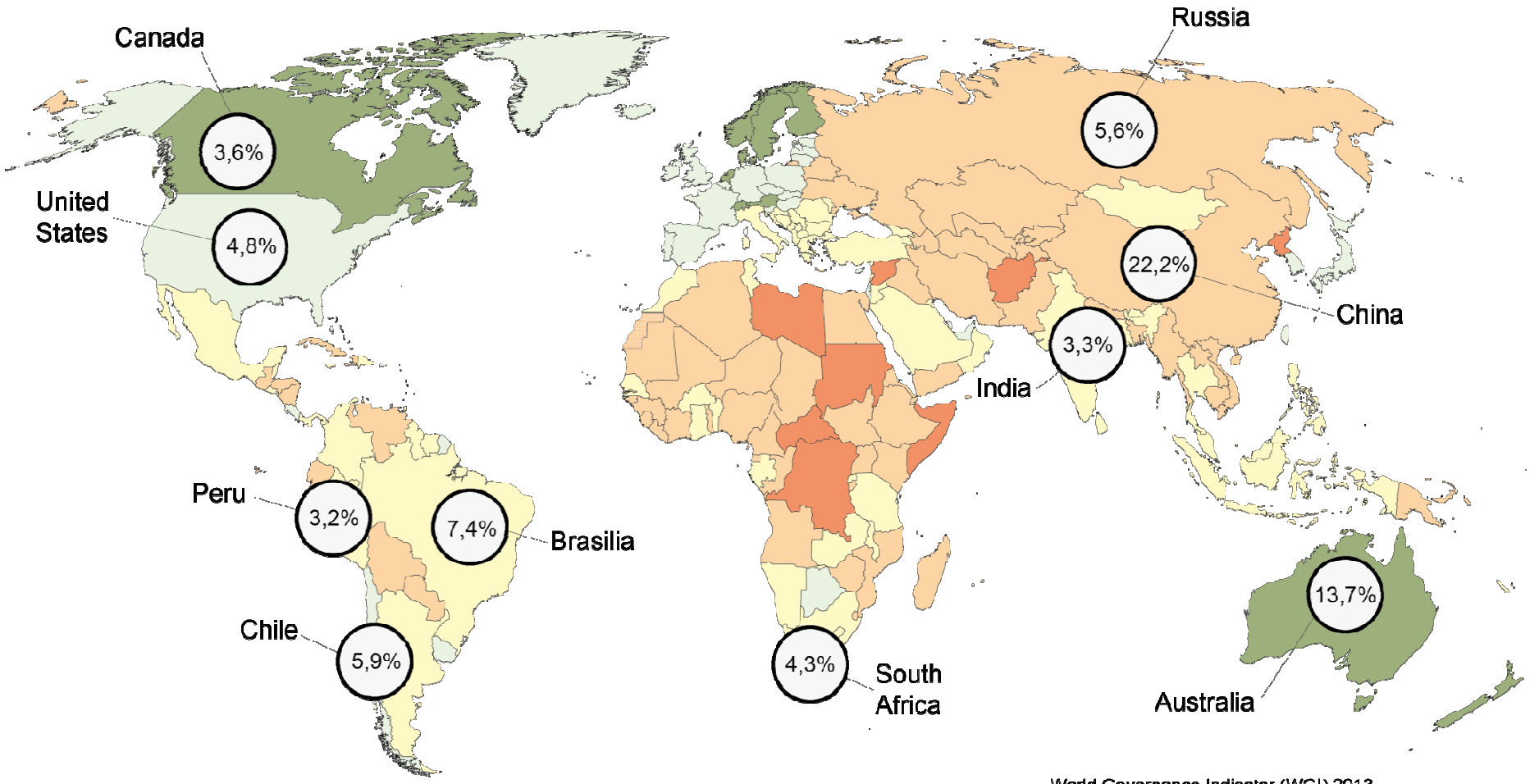
Responsible Mining: Mining Countries and Governance



Share of world mine production by value
(*Metals, Industrial Minerals, Diamonds, Phosphate, Potash.
The top 10 countries cover 74 % of world production)

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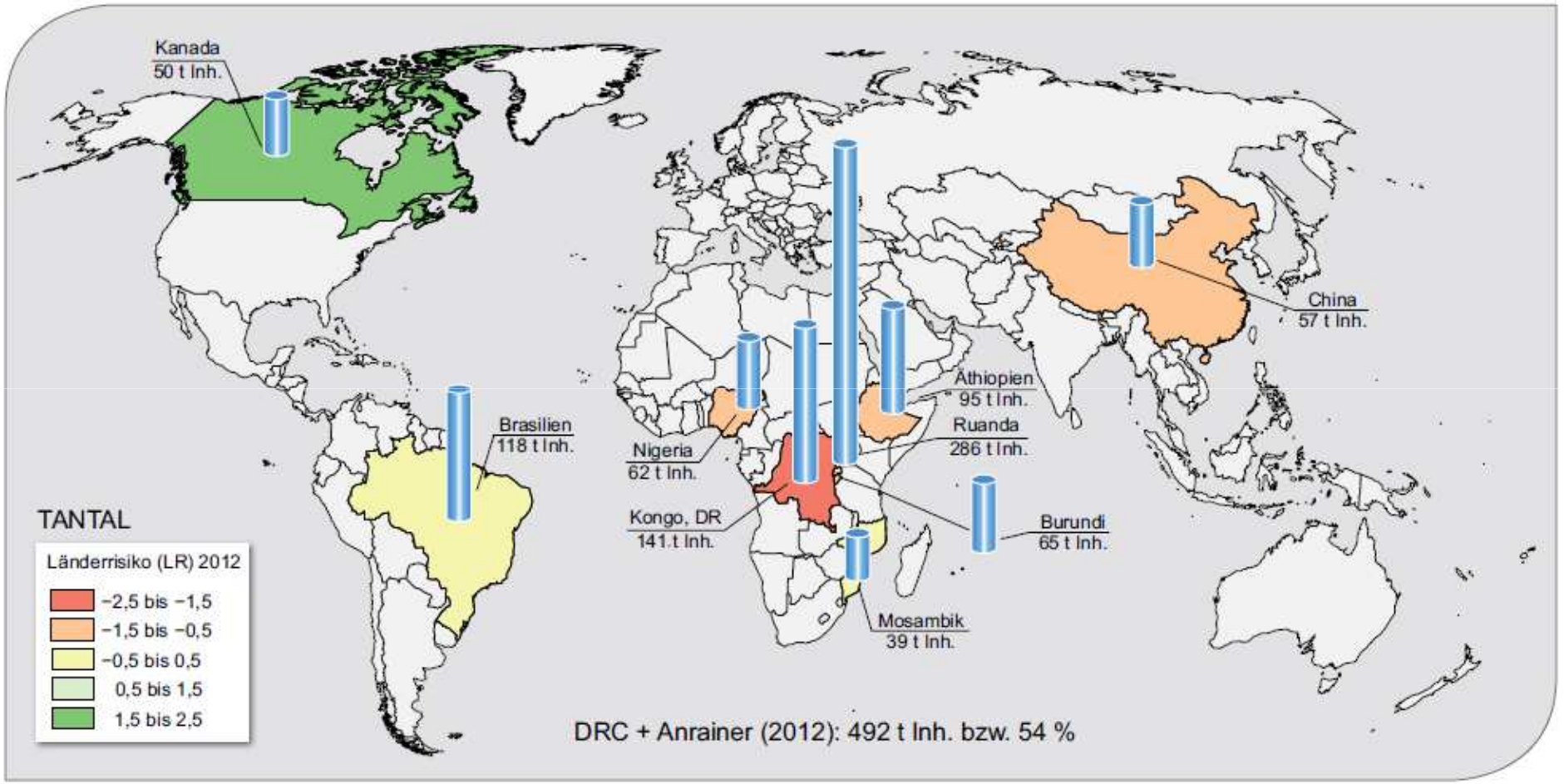
Mining Countries and Governance: Example Tantalum



Current Issues in Mining: Managing ASM

Managing Artisanal and Small Scale Mining

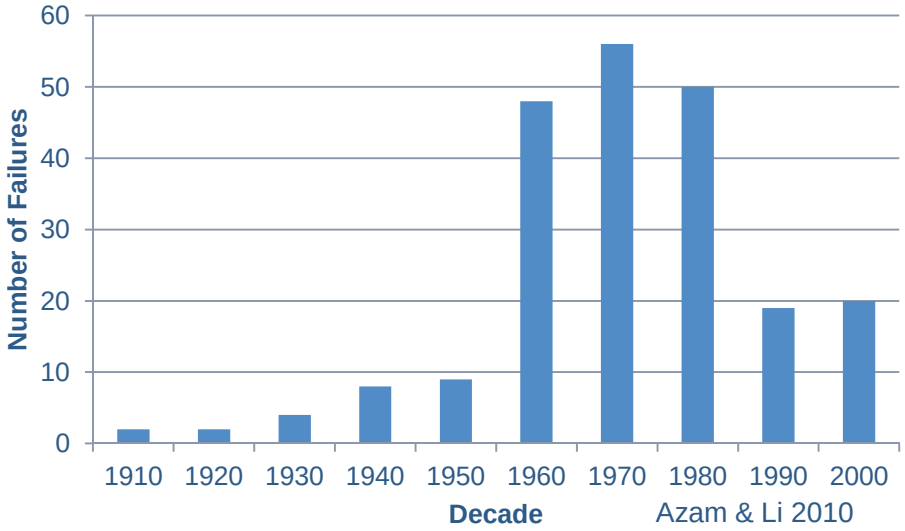
- 11.5% of the total value of world mining production comes from ASM
- around 110 million direct dependents in 2015 (four times more than in 1993)
- mostly high value minerals and metals (gold, tin, tantalum, gemstones)

		ASM share of the world production (%)
Metals	Antimony	<1%
	Chrome	18
	Cobalt	19
	Copper	4
	Gold	8
	Iron	3
	Lead	2
	Manganese	10
	Platinum	2
	Silver	15
	Tantalum	61
	Tin	45
	Tungsten	4
	Zinc	3
Mass commo-dities	Coal	13
	Sand and gravel	30
	Fluorite	16
(semi-) precious stones	Diamonds	14
	Gemstones	80

Current Issues in Mining: Managing Waste

Tailings dam failure can cause severe damage to people and effected environment. Most failures occurred during the 60s to the 80s due to:

- dyke construction with residual materials from the mining operations
- sequential dam raise along with an increase in effluents
- lack of regulations on design criteria, especially in developing countries
- high maintenance cost after mine closure (Rico et al., 2007)




Planta Bellavista, Chile


La Africana, Chile

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Current Issues in Mining: Managing Ressources

Example Chile:

- new mining projects with high water consumption have to use desalinated water
- land use and environmental protection: recent enforcement on mine closure
- evaluation of the mineral potential of mining waste:

  within the framework of Raw Material Partnership cooperation of BGR with Chilean partners on mineral potential of mining residues and recovery of strategic elements

Current Issues in Mining: Managing Revenues

Example Botswana:

- Botswana got insights into the diamond mining sector and a profound knowledge, especially pricing of diamonds due to 50/50 joint venture with De Beers
- balanced tax and minerals policy originates from understanding constraints and the potential of diamond mining
- revenues used to invest in infrastructure, education, training, health, according to national development plan, counter-cyclic investment

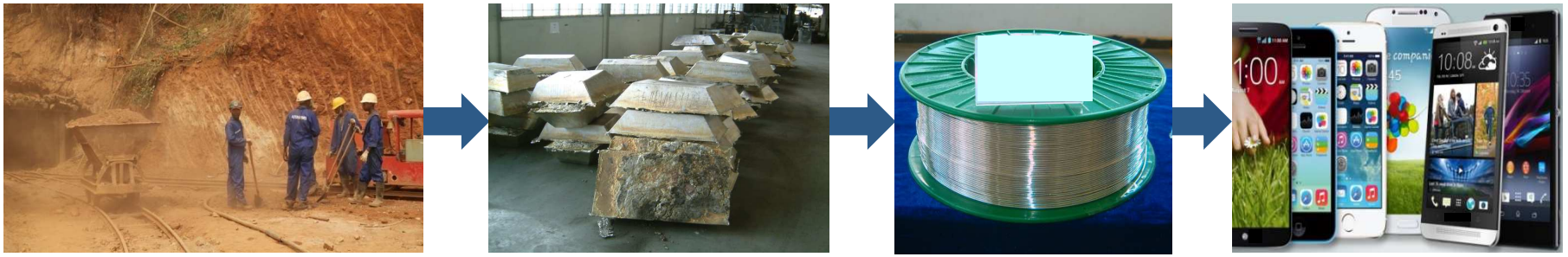
- investment abroad to prevent pressure on the local exchange rate and to reduce risk of "Dutch disease" that exists in several minerals exporting countries

Today‘s Challenges in Mining

Efficient Use and Protection of Natural Resources	Social Acceptance	Good Governance
- water, energy, efficient use of deposits - reduce emissions, prevent soil and water contamination - minimize land use and optimize re-use / reclamation after closure	- early consultation, - optimize benefits for local population, as few resettlements as possible - long term job creation for the local population, post-mining society	- building a reliable governance framework as well as qualified management and mining oversight by authorities

- **development of national frameworks**
- **international standards set international framework, benchmark**

Responsibility in Mineral Supply Chains



From Mining to Manufacturing

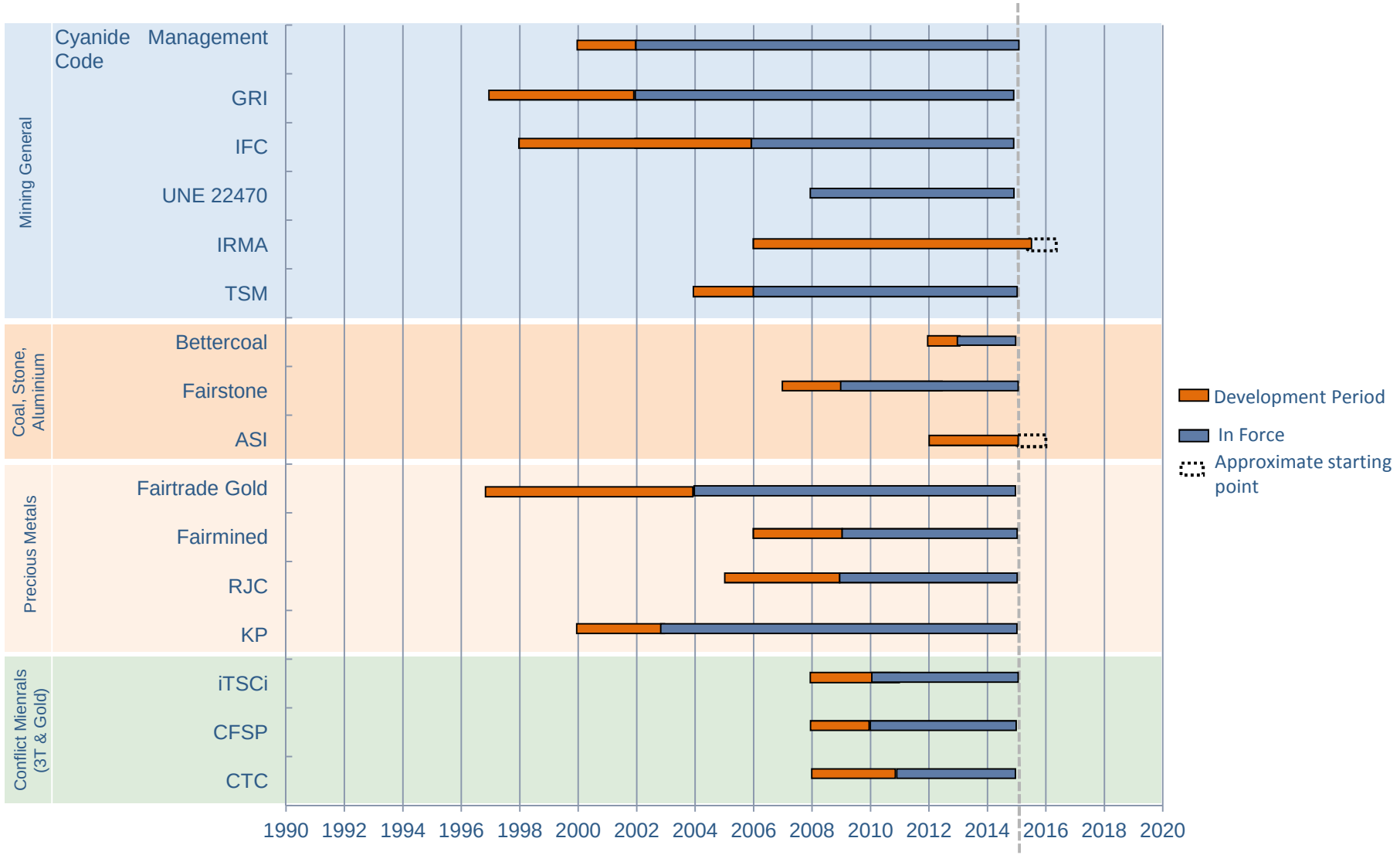
Commodity markets give no information on standards of production:

- for buyers and downstream supply chain, for consumers, financing institutions

How can consumers, downstream industry know about production standards?

1. **global standard guarantees quality of production, no need for traceability e.g. commodity exchange standards (LBMA)**
2. **certification standard and chain of custody system ensures ethical production e.g. Fair Trade**

Responsibility in Mineral Supply Chains



Responsibility in Mineral Supply Chains

Responsible Jewellery Council

Example Responsible Jewellery Council

- covering every step in the jewellery supply chain, from mine to retail
- for gold, platinum group metals and diamonds
- more than 600 companies and trade associations are members, about 400 of them certified,
- sets responsible ethical, social and environmental standards such as human rights, labour rights, environmental impact, mining practices, product disclosure and supply chain due diligence

Responsibility in Mineral Supply Chains

International Requirements and Guidelines Regarding Conflict Minerals

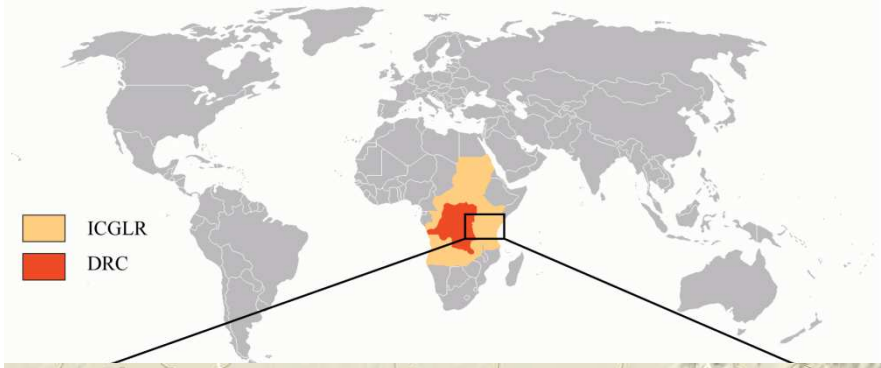
- **OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-affected and High-risk Areas, 2010**
- **USA: Dodd-Frank-Act: Section 1502 (Conflict Minerals Act):**
  Reporting requirements for US stock exchange listed companies to report on the so-called conflict minerals (tantalum, tin, tungsten, gold) in their supply chain
- **EU draft regulation for responsible supply chains of minerals from conflict-affected and high-risk areas** (proposed regulation 05. March 2014)
  certification of importers for 3T and gold based on OECD due diligence guidance

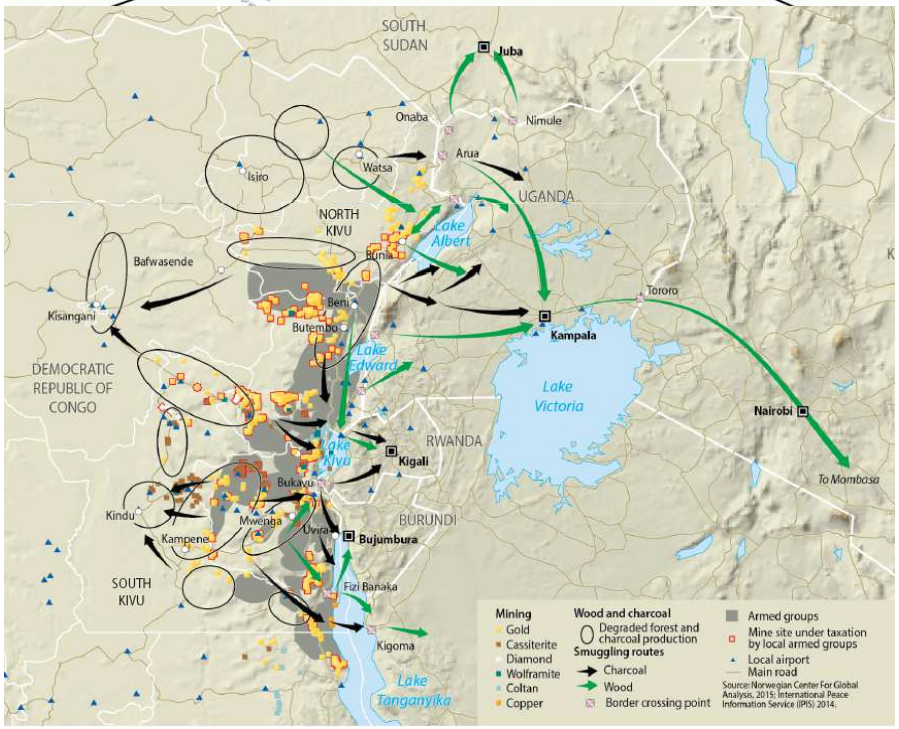
→ **Responsibility is required for the whole supply chain of minerals**

Responsibility in Mineral Supply Chains – Conflict Minerals

- militarization and illegal taxation of mineral production & trade in parts of eastern DR Congo
- contributes to sustaining or catalyzing conflict, aggravates social problems
- transit of „conflict minerals“ affects whole Great Lakes region
- end user demand for „conflict-free“ products
- Dodd/Frank Act (US-SEC):
  due diligence reporting for minerals (tin, tantalum, tungsten, gold) from DR Congo and neighboring countries

Certification and supply chain due diligence –
instead of disengagement





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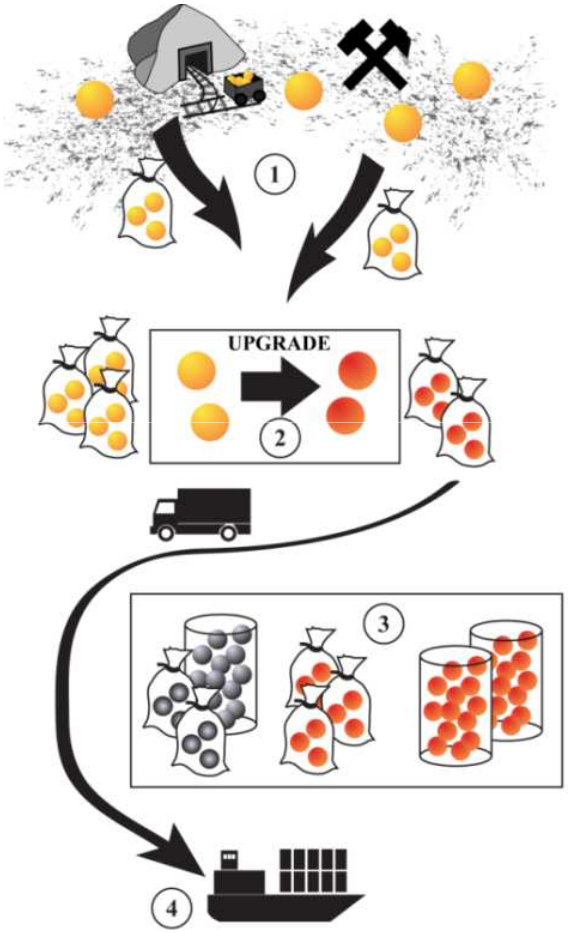
Responsibility in Mineral Supply Chains

Example: BGR Support to Due Diligence Implementation through Mineral Certification in the Great Lakes Region



1. Inspection, mine site certification (CTC), improving practice in ASM
2. Traceability in the supply chain, analytical fingerprint
3. Audit of exporter

Financed by BMZ, BMWi

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Conclusion:

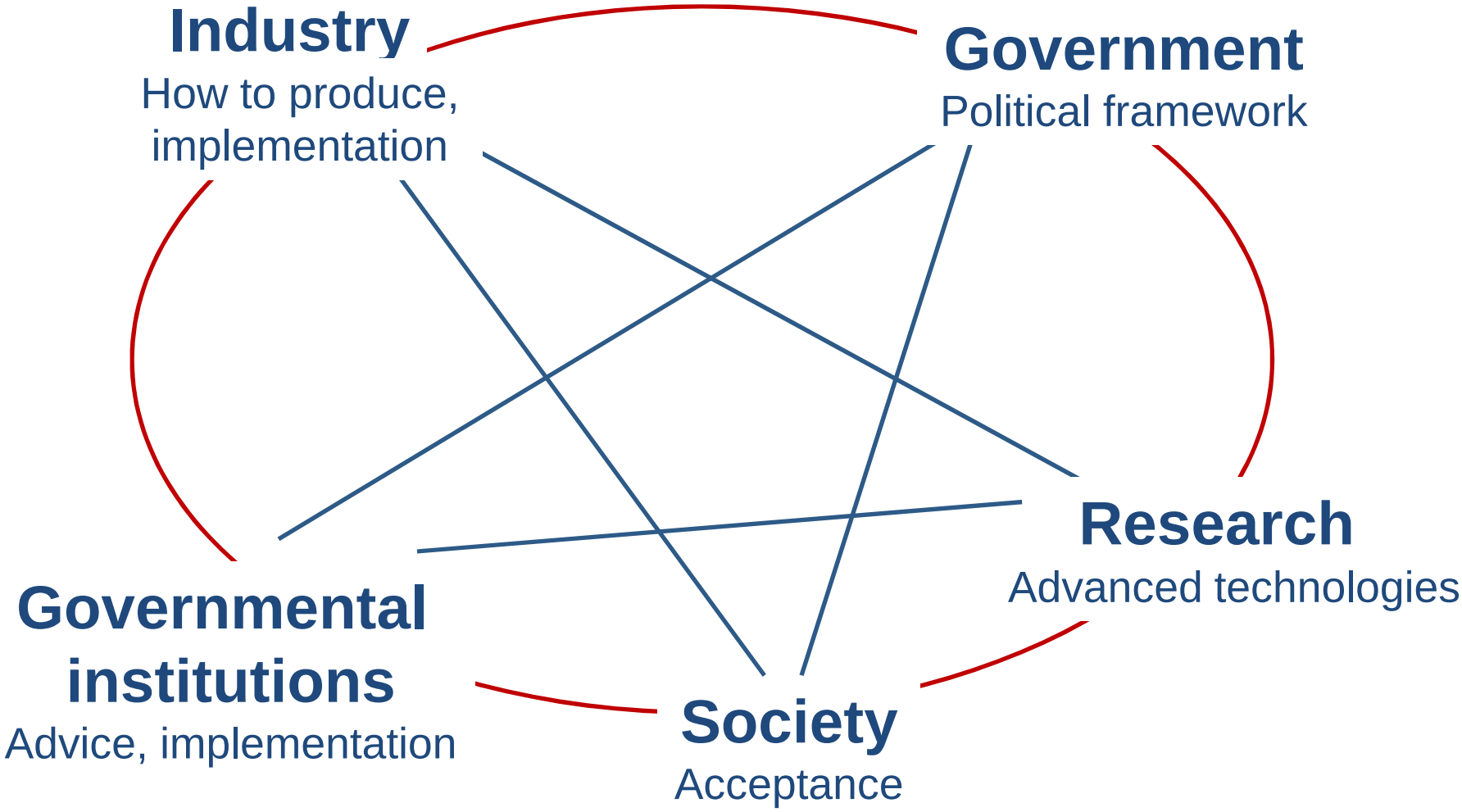
We need minerals for our development and the development of future generations

Mining, trade, manufacturing and consumption have economic, social and environmental impacts (benefits and risks)

It is not a question **IF** Raw Materials are produced, but **HOW**

It is our responsibility to find and implement solutions!

Responsibility in the Mineral Resources Sector: Stakeholders



Quelle: STEINBACH 2016