13th Japanese-German Environment and Energy Dialogue Forum

Value network for the circular flow of critical minerals

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A member of MUFG, a global financial group

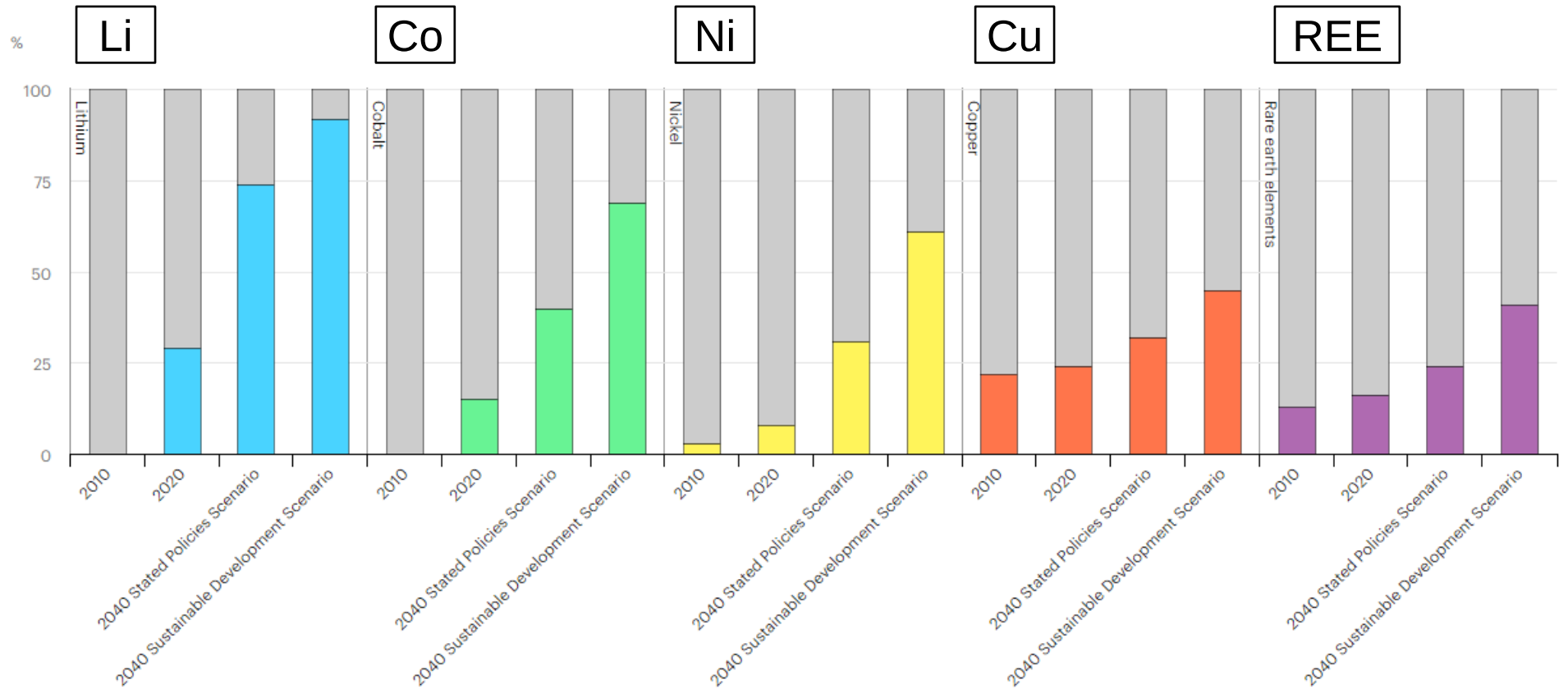
Profile

Kotaro Shimizu (清水　孝太郎)

- Born in Sapporo city, Hokkaido, Japan（日本国北海道札幌市）
- Present titles:
  - Chief analyst, Head of Environment and Energy unit, Policy Research and Consulting Division, Mitsubishi UFJ Research and Consulting Co., Ltd.
  - Vice president, International Rare Earth Industry Association
  - Executive director, the Circular Economy Association
  - Lecturer, International Institute for Mining Technology, Japan
  - Endowed chair, Global business management, Economic and social policies, Chuo University, Japan
  - Secretary, committee on the comprehensive system of resource utilization, the Mining and Materials Processing Institute of Japan
  - Invited researcher, Environmental Research Institute, Waseda University
- ISO/committee members:
  - Expert, ISO/TC298 (Rare Earth)
  - Expert, ISO/TC323 (Circular Economy)
  - Expert, ISO/TC333 (Lithium)
  - Expert, ISO/TMB/SAG Critical Minerals
  - Expert, ISO/TC207/SC5 (Life cycle assessment) – TC323/JWG14 (Secondary materials)
- Education:
  - Bachelor of Science, Earth Sciences Major, Department of Science, School of Education, Waseda University, Japan, 2000
  - Master of Science, Department of resources and environmental engineering, Faculty of Science and Engineering, Waseda University, Japan, 2002
- Speakers:
  - "Policies toward an economic evolution with resource-efficient business in Japan", Asia Pacific Circular Economy Roundtable, Taiwan Circular Economy Network（財團法人資源循環台灣基金會）, Kaohsiung Exhibition Center, 17th October 2019.
  - "Critical assessments and actions to reduce criticality in Japan", 3rd EU Critical Raw Materials Event - Session II: How can we reduce criticality? EU Raw Materials Week, European Union DG-GROW, Le Plaza Hotel Brussels, 18th November 2019.
  - “Global trends on mineral resources from the perspective of uneven-distribution on resource occurrences”, Hearing at the House of Councilors, Japan, 10 February 2021.
    - https://www.youtube.com/watch?v=fU-8za3X1TE
  - "Critical minerals: How to secure stable and resilient supply chains? Views from Europe and Japan", Speaker and panelist at the IFRI Webinar, French Institute of International Relations (IFRI), 7 July 2022
    - https://www.youtube.com/watch?v=G0QgmIYWUSQ
    - https://www.youtube.com/watch?v=S39Y3wEueZU

We require critical minerals

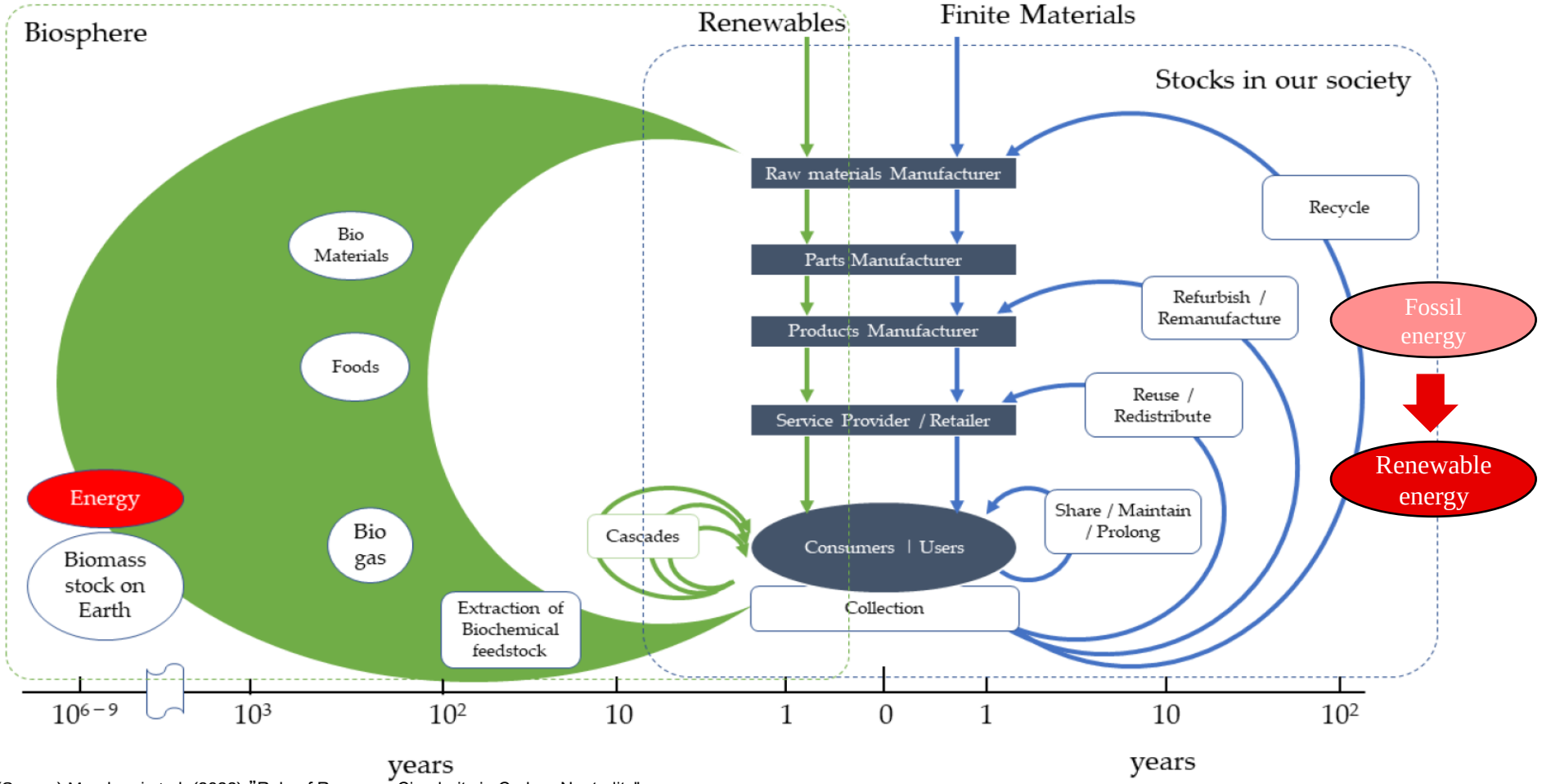
Share of clean energy technologies in total demand for selected minerals by scenario, 2010-2040



(Source) IEA “The Role of Critical Minerals in Clean Energy Transition” (May 2021) (https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary)

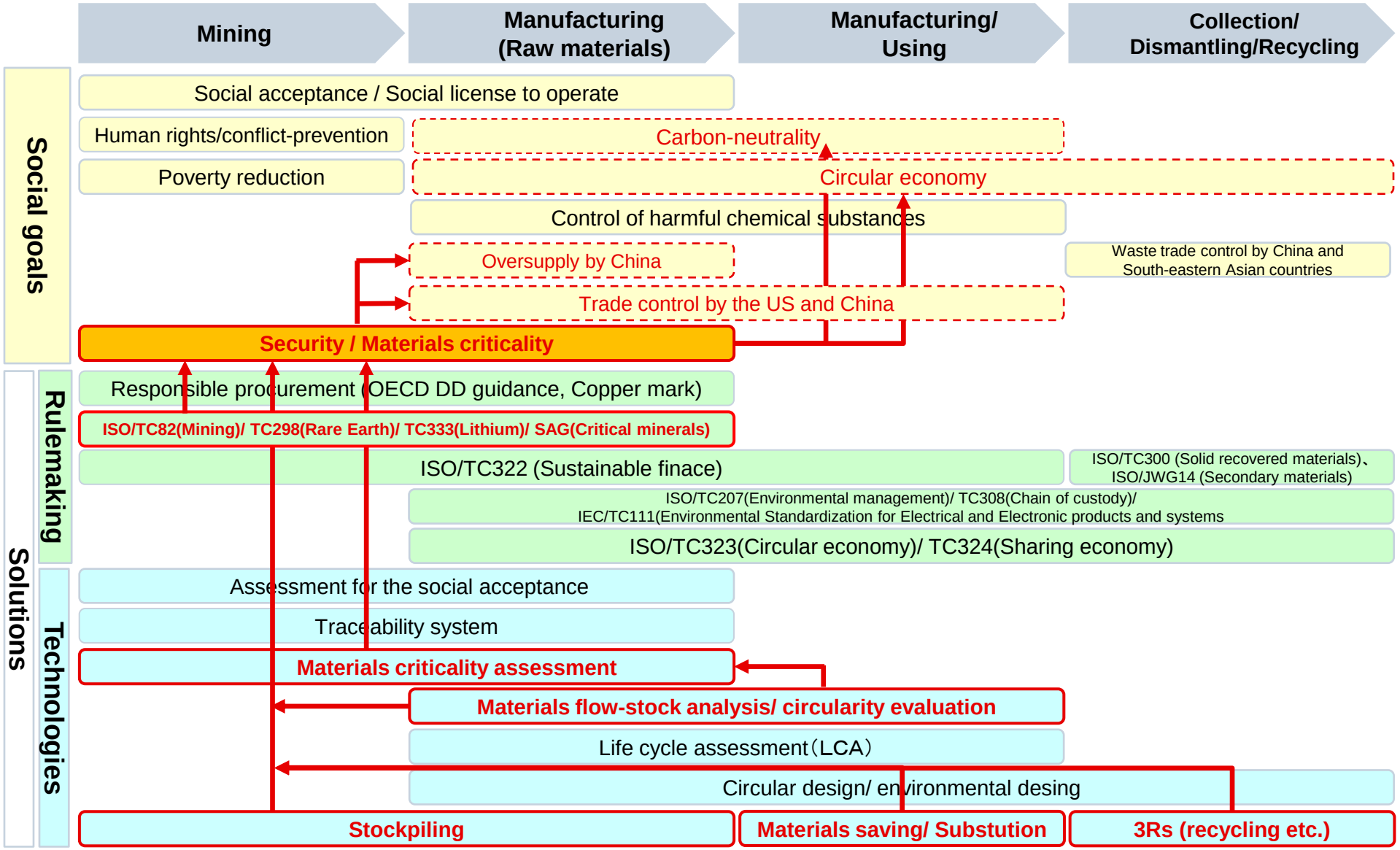
Value creation from circular economy and energy aspects

Circular economy is an economic system that uses a **systematic approach** to maintain a **circular flow of resources**, by regenerating, retaining or adding to their **value**, while contributing to sustainable development



(Source) Murakami et al. (2022) "Role of Resource Circularity in Carbon Neutrality"

Social goals and technologies and rule-making as solutions



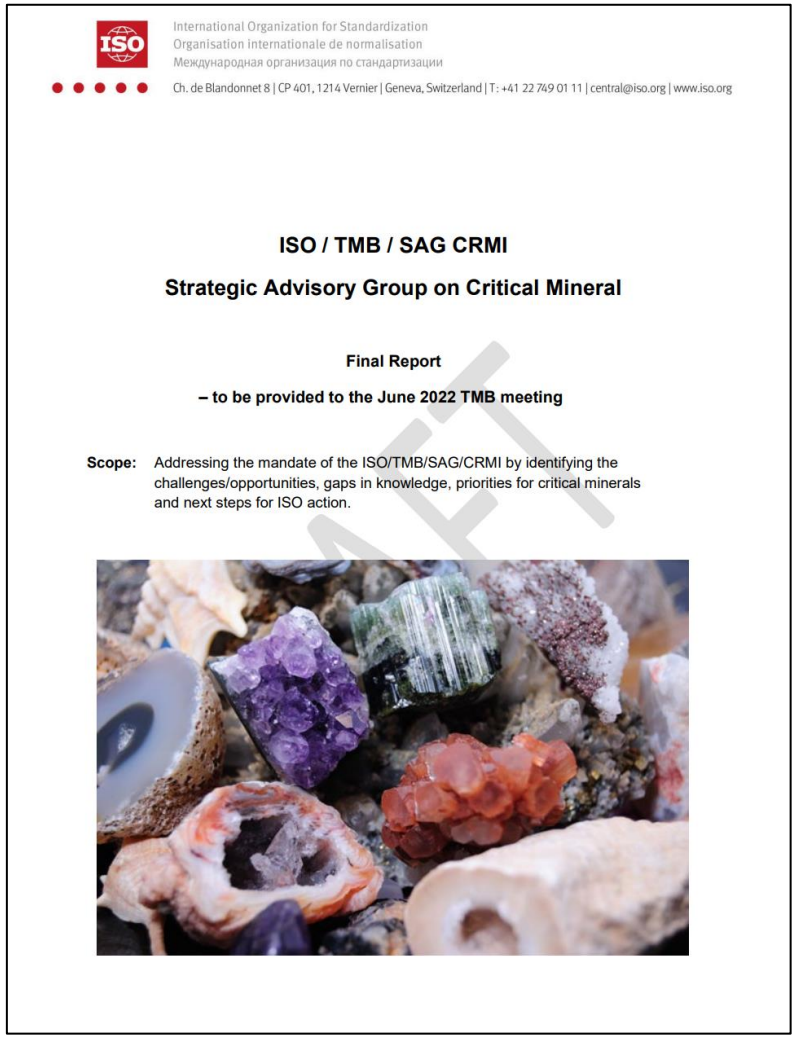
International rule-making on sustainability (ISO/SAG Critical minerals)

【Definition】

- **Critical mineral: A critical mineral is defined as an essential mineral or mineral-based resource necessary for a particular economic activity, whose supply is deemed to be at risk and whose absence would have detrimental consequences to a commercial entity and to the economic, environmental, security and social well-being of a country, common economic region or specific region.**
  - **NOTE: In this definition, 'mineral' includes metallic and non-metallic elements which in many cases are compounds or alloys.**

【Mandates in 2022-2023】

- **To further provide strategic advice related to the organisation of the ISO work on critical minerals, including the development of overarching guidance on common chemical analysis techniques,**
- **To investigate the market need for focused standards on sustainability issues related to critical minerals, and the possibility to develop a general guidance for critical mineral supply chain participants.**



International Organization for Standardization
Organisation internationale de normalisation
Международная организация по стандартизации

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ISO / TMB / SAG CRMI

Strategic Advisory Group on Critical Mineral

Final Report

– to be provided to the June 2022 TMB meeting

Scope: Addressing the mandate of the ISO/TMB/SAG/CRMI by identifying the challenges/opportunities, gaps in knowledge, priorities for critical minerals and next steps for ISO action.

(Source) ISO (https://isotc.iso.org/livelink/livelink/fetch/-15620806/15620808/15623592/17584461/SAG_on_Critical_minerals.pdf?nodeid=22165610&vernum=-2)

Rule-making for sustainable critical minerals supply chain

		TC308 (Chain of custody)	TC298 (Rare earth)	TC333 (Lithium)	TC345 (Specialty metals and minerals)	PC348 (Sustainable raw materials)	IWA45 (Sustainable critical mineral supply chain)
	Chair	NLD	CHN	CHN	FRA	DEU	AUS
Recommendations from SAG Critical minerals	Chemical analysis		REE (WG4)	Li (WG2, 3, 4, 6,7)	Co・Cr・Gr・Sb etc. (excluding REE and Li)	IWA is prioritized until Jun. 2024 because of overlapping	
	Sustain-ability		REE (WG5)	Li (WG5)		All	All
			New JWG (JWG6)				
	Trace-ability	Possibly?	REE (WG3)			All	

Suggestion

- **A value network is required for a sustainable supply chain of critical minerals.**
- **For values creation, designs and technologies for the value network should be promoted as well as rule-making to level-playing-field.**
  - **Internationally collaboration within members sharing objectives will include**
    - **researches and developments**
    - **standardization.**
  - **International joint research projects for**
    - **traceability**
    - **impurity-controlled recycling**
    - **verified reusing and remanufacturing**
    - **renewable energy based circulation etc.**
  - **International standardization for**
    - **Traceability**
    - **measurement and declaration of sustainability efforts by organizations**
    - **terms and definitions of sustainable goods distinguished from others**
    - **prioritized custom tariff and custom procedure for sustainable trading etc.**