GJETC Outreach Event, 27th May 2025

Renewables and critical raw materials

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Agenda

1. Background and research design of the fact sheet
2. CRMs in Germany and Japan
3. Policies & strategies in Germany/EU and Japan
4. Policy recommendations and potential areas of cooperation
5. Questions and discussion

Background

- Critical Raw Materials (CRMs) are **essential for renewable energy technologies**
- CRM essential for **energy transition** towards renewable energies and digitalization
- Local resources in Japan and Germany limited; both countries **depend on imports**
- China controles large part of the value chain of CRM
- Global demand of CRM is rising; current policies may **not be sufficient** to secure long-term supply of CRM

Research Design

Focusing on critical minerals for Battery storage & EVs

- Batteries (EVs) is one of the largest sector for critical minerals
- Significant automobile industry in Germany and Japan

Mineral coverage

- Electrolyte: lithium
- Cathode: nickel, manganese, cobalt
- Anode: graphite

Key questions

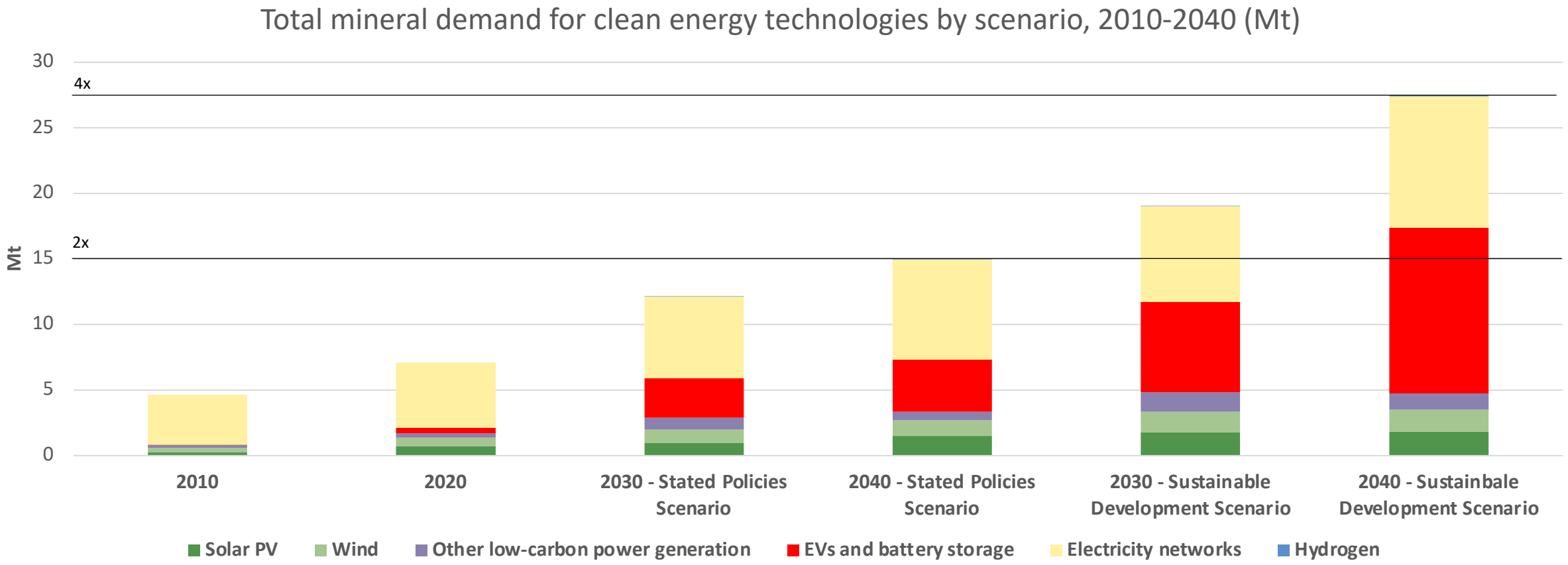
- How much will demand grow and what supply insecurity risks are for battery minerals?
- What government policies in place and under discussion in Germany and Japan?
- How could mineral security of supply be enhanced?
- What area can Germany and Japan cooperate to enhance security of supply of battery minerals?

Critical and strategic raw materials commonly identified by EU and Japan

Focus of this fact sheet

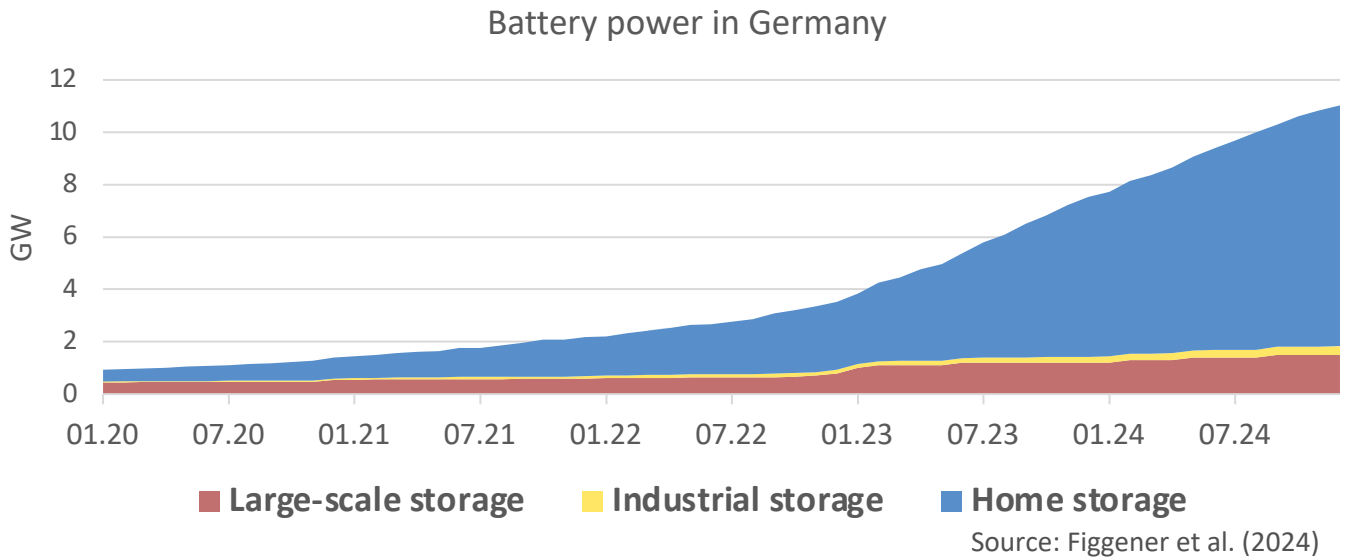
Lithium	Cobalt	Nickel	Manganese	Graphite
Antimony	Beryllium	Bismuth	Gallium	Germanium
Magnesium	Niobium	Phosphorus	Platinum	Silicon
Strontium	Tantalum	Titanium	Tungsten	Vanadium
Rare earth elements				

Fact sheet focuses on battery storage and EVs

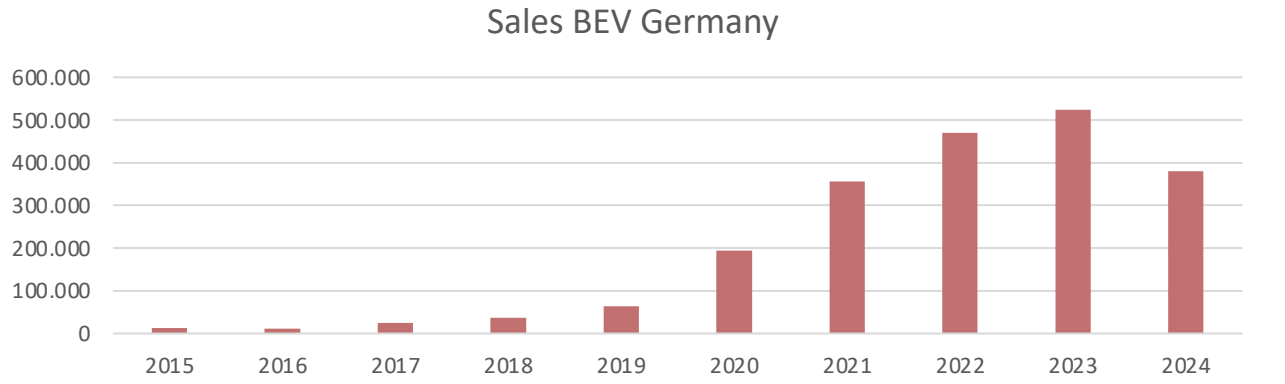


Source: European Council (2024)

Development of battery power and BEV sales in Germany



Source: Figgener et al. (2024)



Source: Kraftfahrt-Bundesamt (2024)

Germany's current total battery power:
11.2 GW

Required stationary storage capacity:
100 GW by 2030
180 GW by 2045

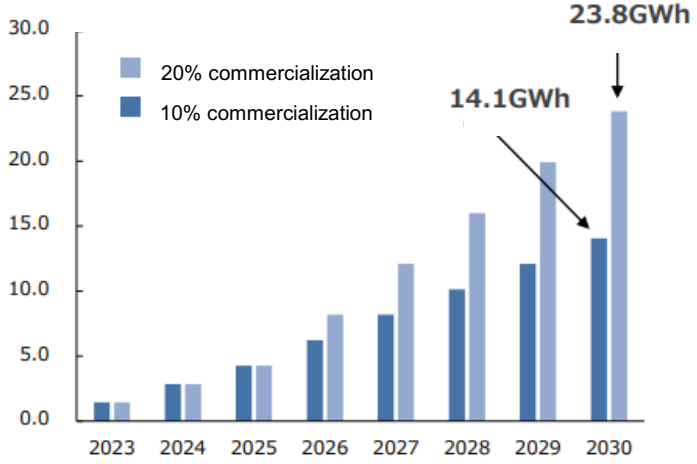
Target: 15 mn BEV by 2030

Market share BEV 2024: 13.5%
April 2025: 18.8%

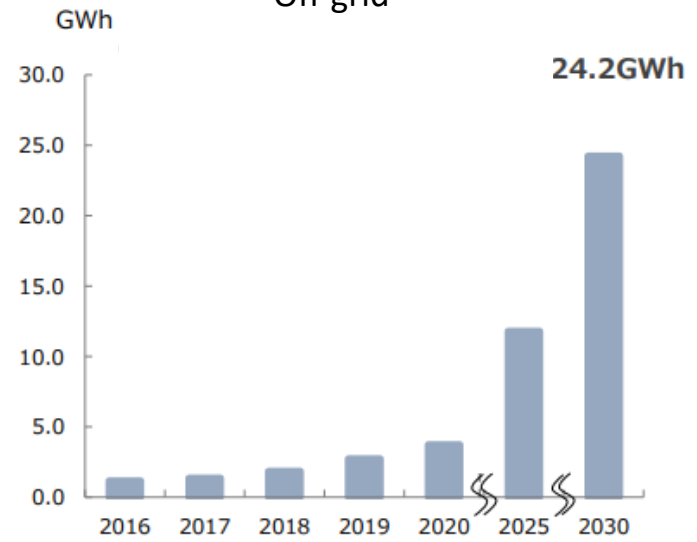
Status in Japan – rising demand & high dependency on particular countries

Power stored in battery storages

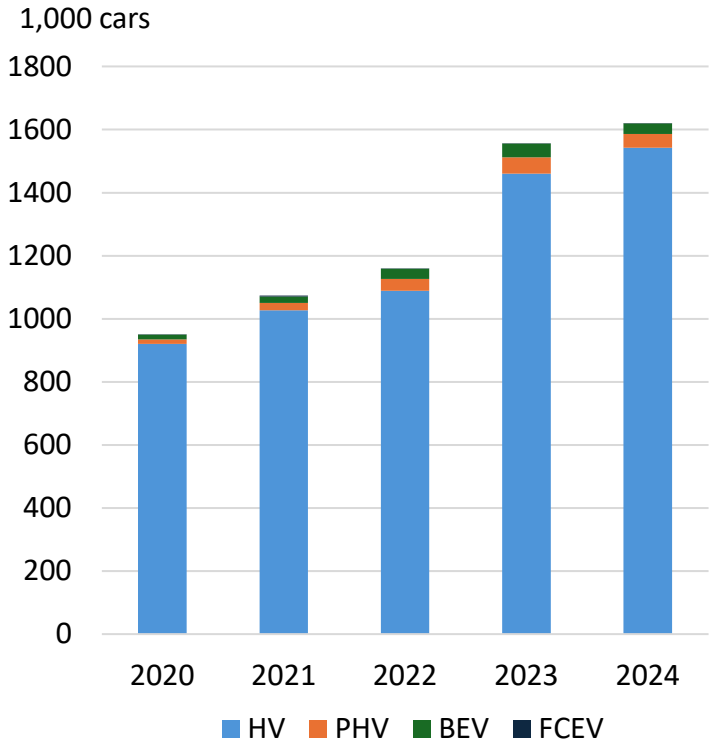
On-grid



Off-grid



EV sales



Sources: METI (2023), JADA (2025), Trade Statistics (2025)

Battery mineral net imports & top exporter to Japan (2024)

	Quantity	Top exporter (share)
Copper	5.2MT	Chile (25%)
Lithium	46.7KT	China (62%)
Nickel	792.4KT	Philippines (49%)
Manganese	892.6KT	South Africa (70%)
Cobalt	2.3KT	Finland (53%)
Graphite	27.4KT	China (91%)

Germany‘s strategies for demand reduction and supply chain diversification

Raw material strategy (17 measures are based on three pillars):

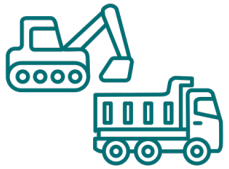
1. Domestic raw materials
2. Imports of raw materials
3. Circular economy and secondary raw materials as a source of raw materials

Paths to a sustainable and resilient raw material supply

1. Circular economy, resource efficiency and recycling
2. Diversification of raw material supply chains
3. Ensuring a fair and sustainable market framework.

Currently no policy strategy exists which emphasizes demand reduction to address the supply and demand gap of CRM

Critical Raw Material Act: EU objectives for 2030 to reduce dependence on thrid countries to access CRM



at least **10%** of the EU's annual consumption from EU extraction

at least **40%** of the EU's annual consumption from EU processing

at least **25%** of the EU's annual consumption from domestic recycling

no more than **65%** of the EU's annual consumption from a single third country

EU plans for target achievement

- a "Critical Raw Materials Club" for all like-minded countries willing to strengthen global supply chains
- strengthening the World Trade Organization
- expanding its network of Sustainable Investment Facilitation Agreements and Free Trade Agreements
- pushing harder on enforcement to combat unfair trade practices

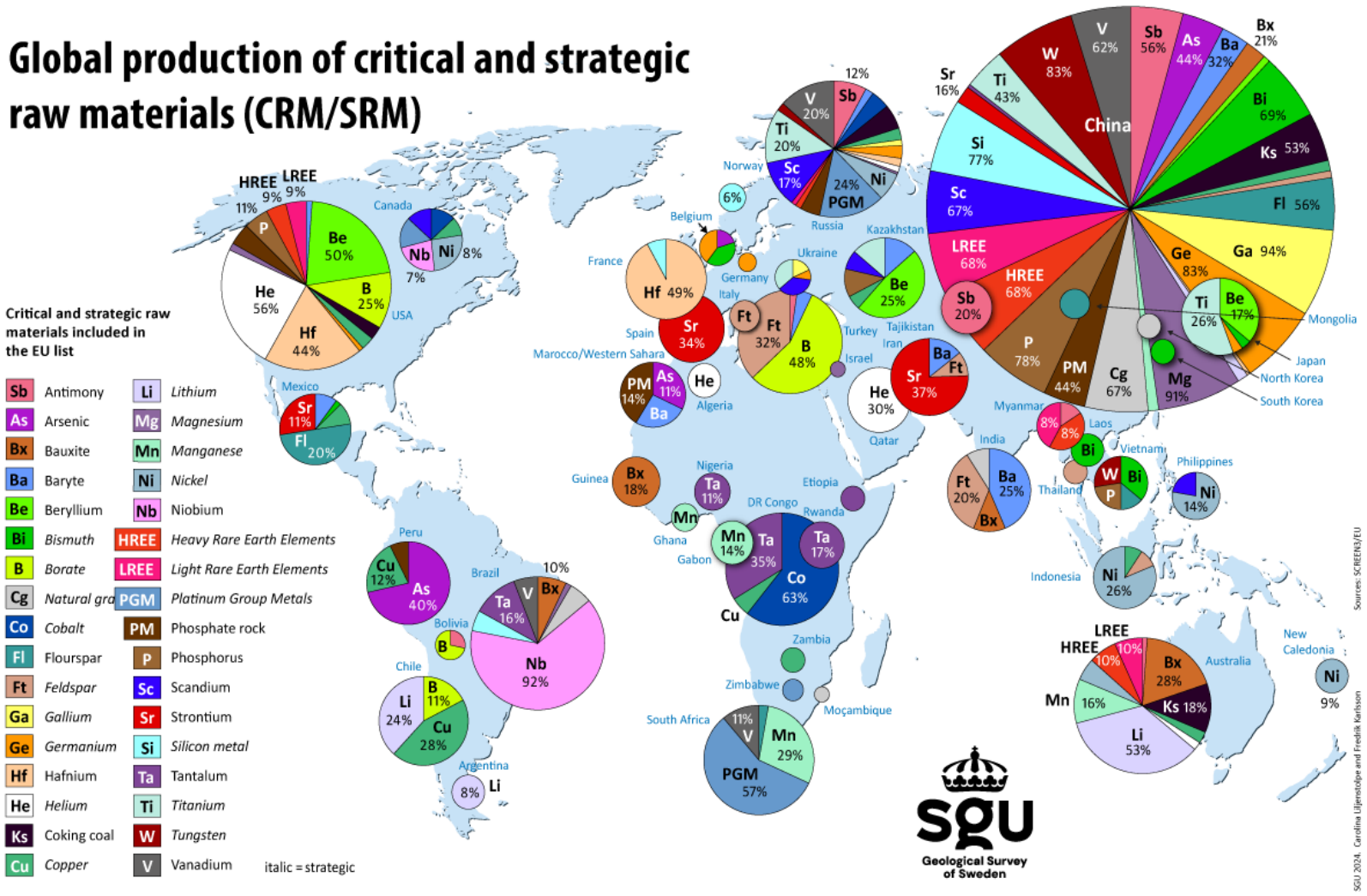
Japan‘s critical mineral policy

- Stockpiling in place since 1983
- China’s rare earth embargo in 2010 urged Japan to enhance mineral supply security measures
- Battery storage industry strategy (2022)
  - ➢ intends to achieve production capacity of 600GWh/y worldwide (incl. 150GWh in Japan) in 2030, commercialize all-solid-state battery around 2030
- Policy measures to secure stable supply of critical minerals (2023)
  - ➢ targets to cover annual demand of 100 kt of lithium, 90 kt of nickel, 20 kt of cobalt, 150 kt of graphite, and 20 kt of manganese
  - ➢ provides financial support for mining, processing, technology developments
- The 7th Strategic Energy Plan (2024)
  - ➢ emphasizes securing adequate stockpiling, supply diversifications, domestic resource development to enhance Japan’s economic security
  - ➢ aims to achieve self-sufficiency rate of 80% for copper and other base metals by 2030

Comparison – Germany/EU and Japan

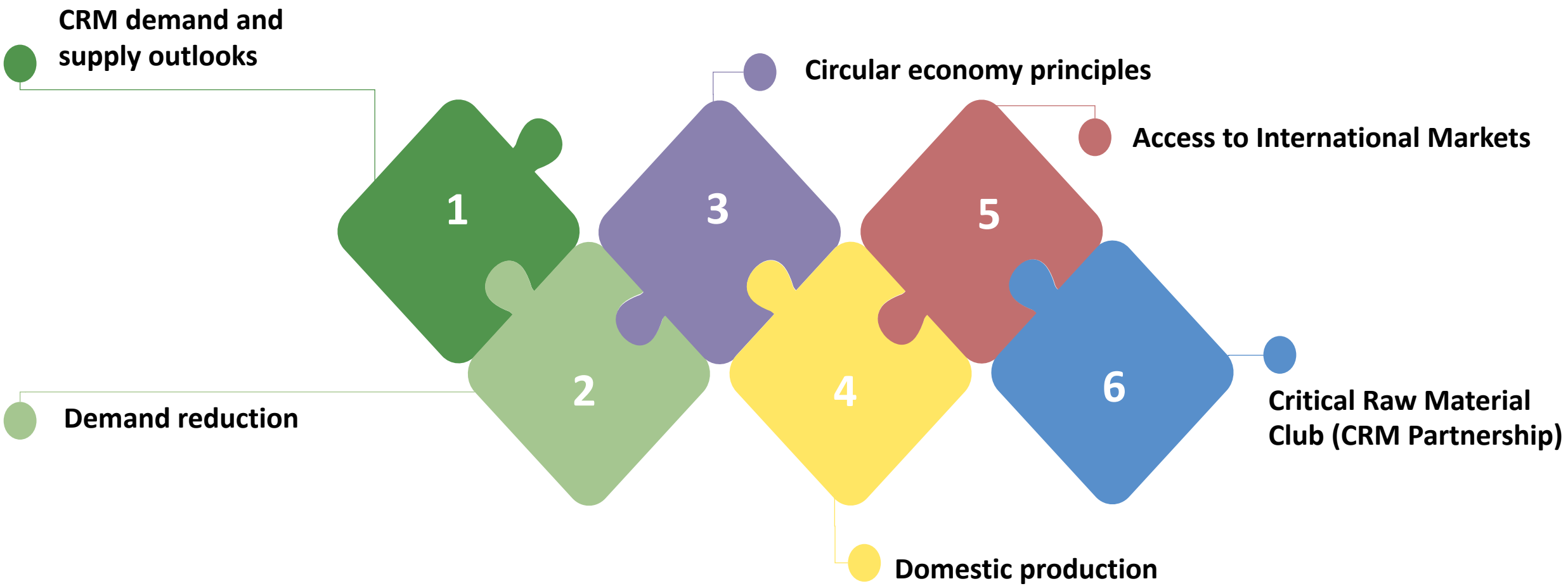
	Germany or EU		Japan
CRMs identified	34		35
Stockpiling	✓		✓
Resource development	Domestic and international		Domestic and international
Supply diversification	✓		✓
CRM Targets	10% from EU extraction	By 2030	NA (80%< self-sufficiency target for base metal by 2030)
	40%< from EU processing		
	25%< from recycling		
	<25% from single third country		
Demand control through	Circular economy, resource efficiency, and recycling		Recycling, resource efficiency, alternative material development
Key words in relation to external policies	"CRM club", WTO, Sustainable Investment Facilitation Agreements, FTA, anti-unfair trade		WTO, Resource diplomacy, securing trading environment

Self-sufficiency of CRM will not be reached – aim to diversify the supply



- Combination of first mover advantage, excess production, lower ESG standard, demand creation could have contributed to China‘s dominance in CRMs

Policy recommendations and potential areas of cooperation



Policy recommendation and potential areas of cooperation

CRM demand and supply outlooks

- Any policy, strategy, and cooperation should be based on long-term outlook of CRM demand and supply
- Including mining, processing and final products
- Examining how China has become the dominant country in CRM supply chain
- Regular monitoring and analysis of CRM industries and markets
- Share insights and intelligence among each other to secure stable supply while maintain high ESG standards

Demand reduction

- **Substitution** of conventional technologies with innovative and alternative technologies
  - R&D in alternative technologies e.g., Sodium-ion- or Iron-air-batteries
- **Efficiency and sufficiency** measures along the whole value chain
  - Energy efficiency measures e.g., in transport or electricity generation - not only save energy at best, but also reduce the need for CRM
  - Measures such as car-pooling, public transport, cycling and walking can contribute to reducing the CRM demand

Policy recommendation and potential areas of cooperation

Circular economy principles

- Recycling and the use of secondary raw materials will become increasingly important for the future raw material supply
- Binding quotas for the use of secondary raw materials that increase over time should be established

Domestic production

- Increasing domestic production
- Reduce complexity and duration of mining permission processes (high ESG standards)
- Evaluate deep-sea mining; environmental impact to be evaluated
- Local acceptance should be considered
  - concepts for subsequent utilization
  - local value creation
- not only consider the expansion of mining capacity, but also focus on increasing the processing capacity of CRMs.

Suggestions to increase reliability of the CRM supply

Access to International Markets

- International cooperation instead of competition
- Non-binding raw material partnerships should be updated by clear obligations and incentives
- Preservation of human rights when considering CRM partnerships
  - incentivized by strengthening local value creation
  - negative list for companies can be established if human rights or environmental standards are violated
  - to credits to implement ESG standards can be a positive incentive

Critical Raw Materials Club (Partnership)

- Based on the measure proposed by the EU ‚CRM Club for like-minded countries willing to strengthen global supply chains‘ should be established
- Mid-size economies & key-producer countries
- Aligning values: democracy, sustainability & competitiveness
- Advantage: alternative supply chain independent of China, leverage for negotiations, shared know-how
- Stock pilling
- Implementing & enforcing ESG in mining

For further information please visit gjetc.org

Thank you for your attention

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