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WP 11 – Sustainable concepts and technologies

I.FAST 1st Annual meeting

Denise Völker, DESY

Task 1.4: Ecological Concepts (DESY, Denise Voelker)

Focus 1: Rare earths for permanent magnets

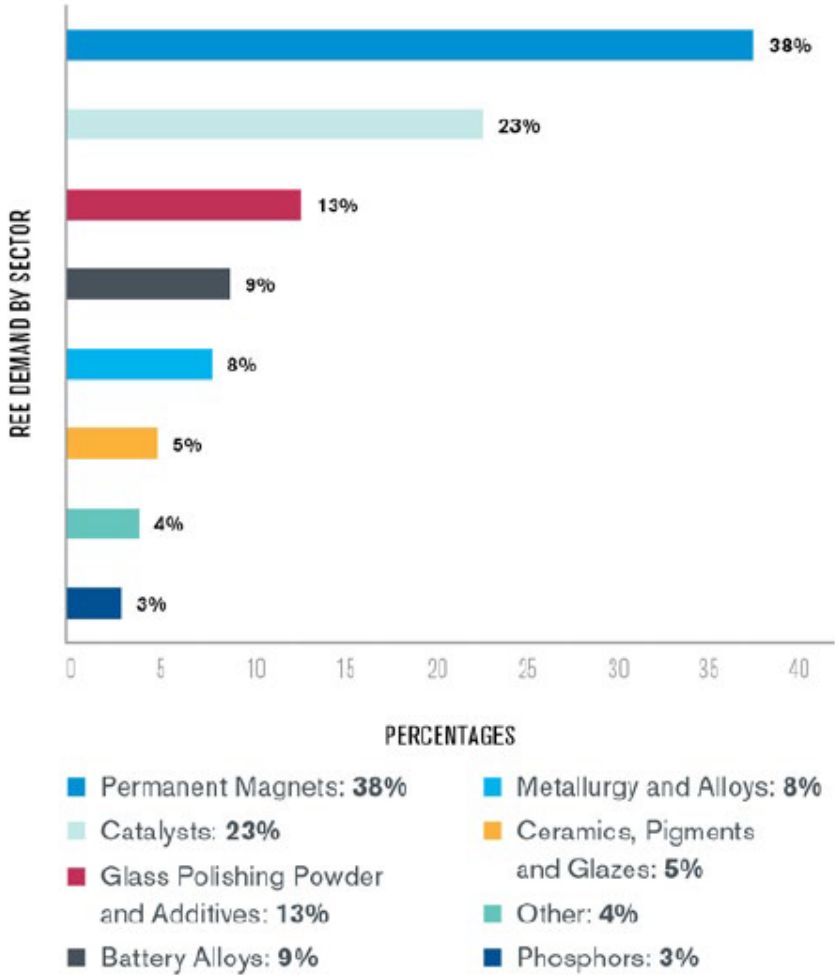
- Huge energy savings versus destructive mining and processing
- At PETRA IV up to 100 PM
- In 2019 38% of rare earth elements demand was for PM
- Other player/fields concerned with rare earths (and therefore possible partners):
  - wind power stations, battery producers etc.
  - Producers of loudspeakers, hard drives etc.
  - Space technology
  - Formula 1
- Currently no alternative sources or certified mining and processing available

→ investigation on social and environmental impacts of mining and processing for PM will be presented soon

→ Next step: approach industry

→ Workshop planned for Jan 2023

FIGURE 1: BREAKDOWN OF 2019 REE DEMAND BY SECTOR



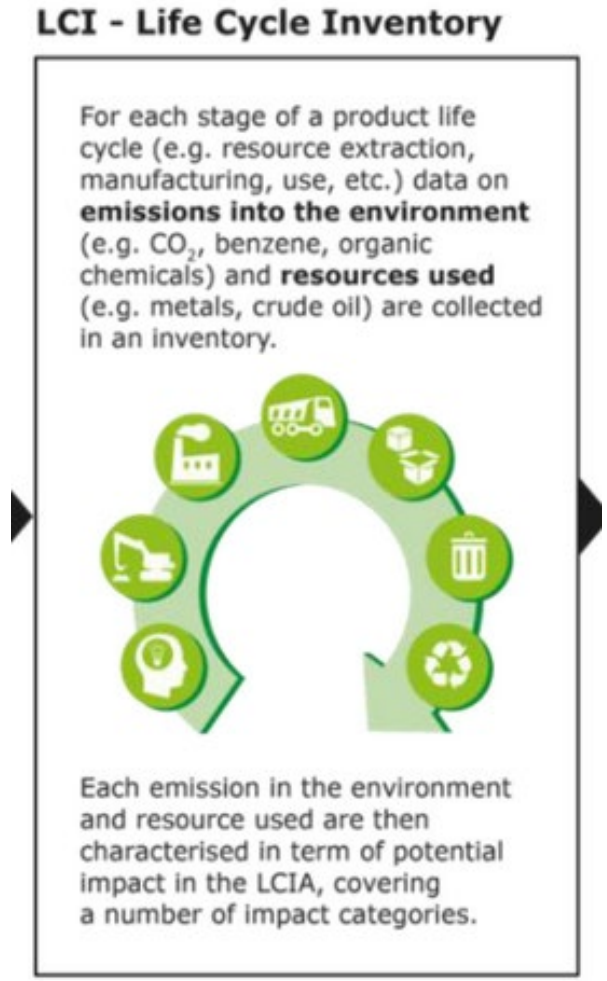
Source:
https://kleinmanenergy.upenn.edu/research/publications/rare-earth-elements-a-resource-constraint-of-the-energy-transition/

Task 1.4: Ecological Concepts (DESY, Denise Voelker)

- Focus 2: Life cycle assessment (LCA) of technological components
  - Consider entire life cycle of machines and components meaning construction – running – deconstruction
  - LCA contains:
    - Life Cycle Inventory (LCI)
    - Life Cycle Impact Assessment (LCIA)
    - Life Cycle Interpretation phase
    - Cost analysis (invest versus operation versus decommissioning
  - Goal: implement life cycle management already in planning phase of new RIs

→ Currently identification and contact of experts on technical life cycle thinking

→ Workshop planned for Jan 2023



Example: Content of a Life Cycle Inventory
Source: https://eplca.jrc.ec.europa.eu/lifecycleassessment.html