

Design and Environmental Assessment With a case study of permanent magnets recycling

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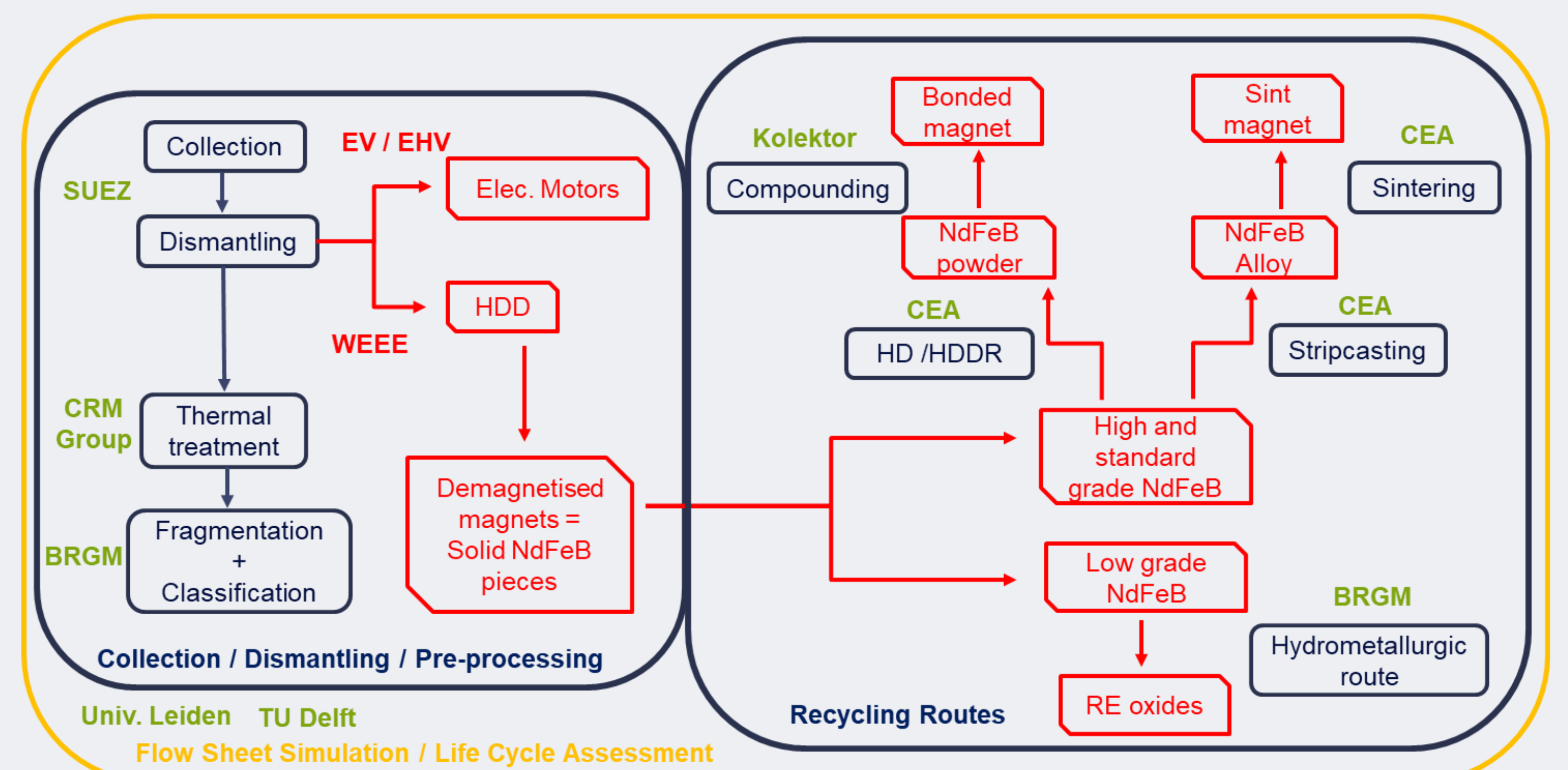
Challenges of Rare Earth Magnet Recycling

- Difficult to dismantle
- Lack of awareness of REE recycling
- Uncertainties in recycling technology development
- Potential environmental impacts of recycling
- ...



EV motors from VALOMAG partner's lab

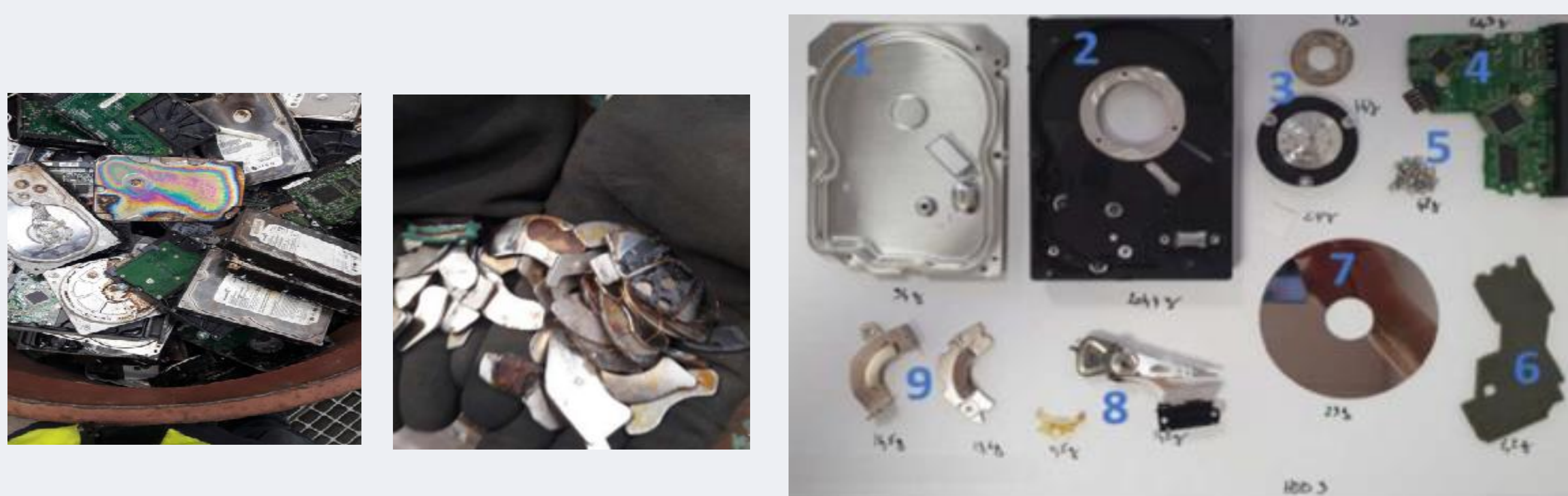
The VALOMAG project aims for a technological solution to recycling



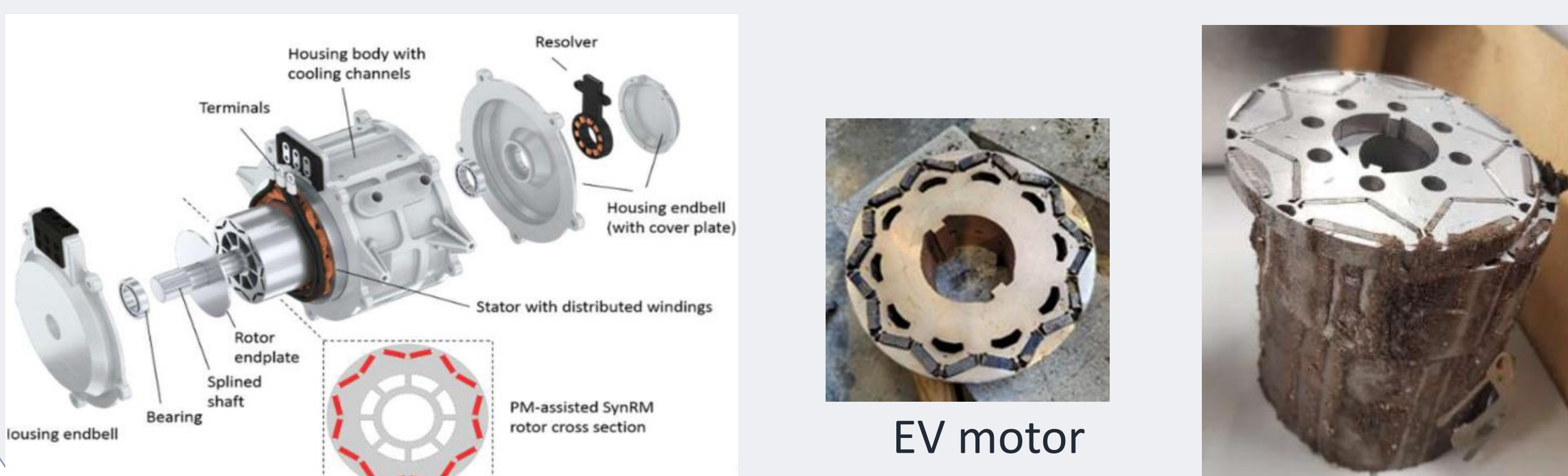
Legend: Partner involved (green), Materials (red), Process step (grey)

But technology is not enough. We need better product design!

Bad examples of RE magnet design



Hard Disc Drive



EV motor

Source: VALOMAG & Nordelöf, A., et al. (2019)

Good examples of RE magnet design



Modular Products



Easy to dismantle motor



Framed magnet

Source: P. Upadhayay, et al. (2017)

Open questions

- How to do environmental assessment for designers?
- Do we need better data or better methods or 'just' better software with user friendly GUI?
- If you have any ideas, please get in touch!
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Recommendations

- RE products call for more attention to "design for recycling".
- Recycling helps strengthen the RE supply chain resilience.
- Combining LCA with other methods offers more potential to impact technology development.