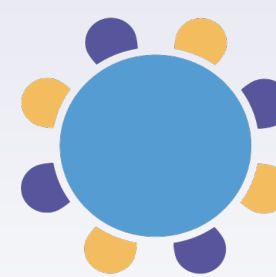


UNECE RESOURCE MANAGEMENT WEEK 2021

ENABLING SUSTAINABILITY PRINCIPLES IN RESOURCE MANAGEMENT

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Circularity strategies to secure supply

Results from international collaboration

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IRTC: what is it about?

- ▶ IRTC is an international “Round Table” project on approaches towards assessing materials criticality, taking place in the form of workshops at international conferences and online.
- ▶ Results are published as joint publications and workshop reports
- ▶ The project shall advance the research in criticality assessment, foster international exchange, identify common ground and differences, and raise awareness towards materials criticality
- ▶ It has created a network of internationally leading experts in criticality from research and industry
- ▶ Aim 2021-2022: support company decision-making via a web-tool
- ▶ More information and stay updated: www.irtc.info

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Mitigating criticality via circularity

- ▶ What circularity strategies are relevant?
- ▶ Why would a company implement circularity strategies?
- ▶ How can we make circularity work?
- ▶ Does circularity mitigate criticality?

Publication title: **The role of industrial actors in the circular economy for critical raw materials: A framework with case studies across a range of industries**

- ▶ Alexander Cimprich, Steven B. Young, Dieuwertje Schrijvers, Anthony Y. Ku, Christian Hagelüken, Patrice Christmann, Roderick Eggert, Komal Habib, Atsufumi Hirohata, Alan J. Hurd, Min-Ha Lee, David Peck, Evi Petavratzi, Luis Tercero, Patrick Wäger, Alessandra Hool
- ▶ Submitted to Resources, Conservation and Recycling

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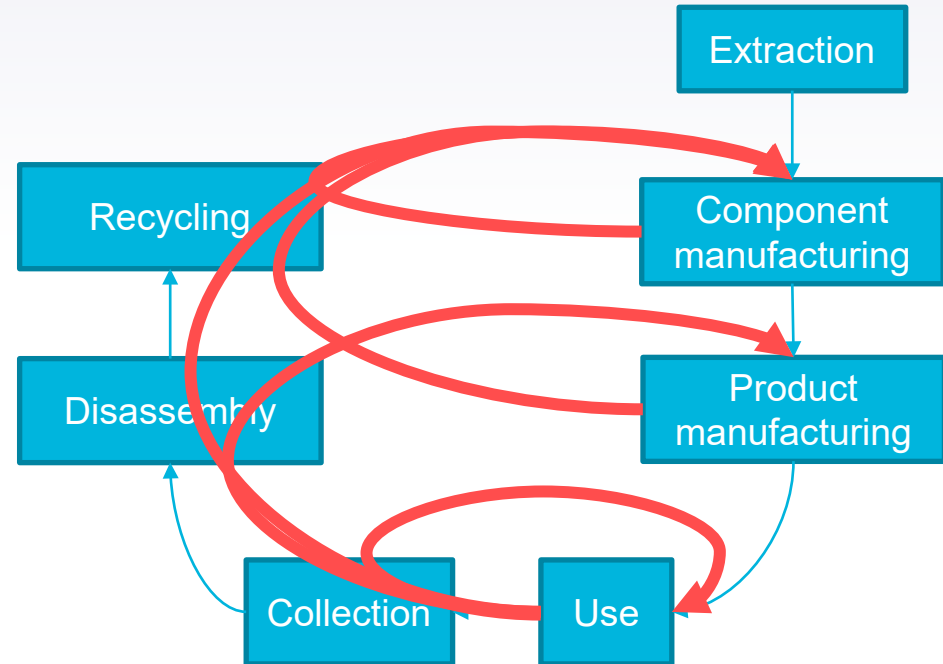
Case studies

Product	CRMs	Industrial actor
Superalloys for turbine blades	Rhenium	Jet engine manufacturer
Chemical processing catalysts	PGMs	Chemical plant/oil refinery
Permanent magnets in HDDs	REEs	Magnet manufacturer (Hitachi Group)
Consumer electronics	Various	Consumer electronics manufacturer (Apple)
Cooling for superconducting magnets in MRI machines	Helium	Hospital

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What circularity strategies are relevant?

- ▶ Material recycling at end of life
- ▶ New scrap recycling
- ▶ Repairing
- ▶ Regeneration
- ▶ Reuse



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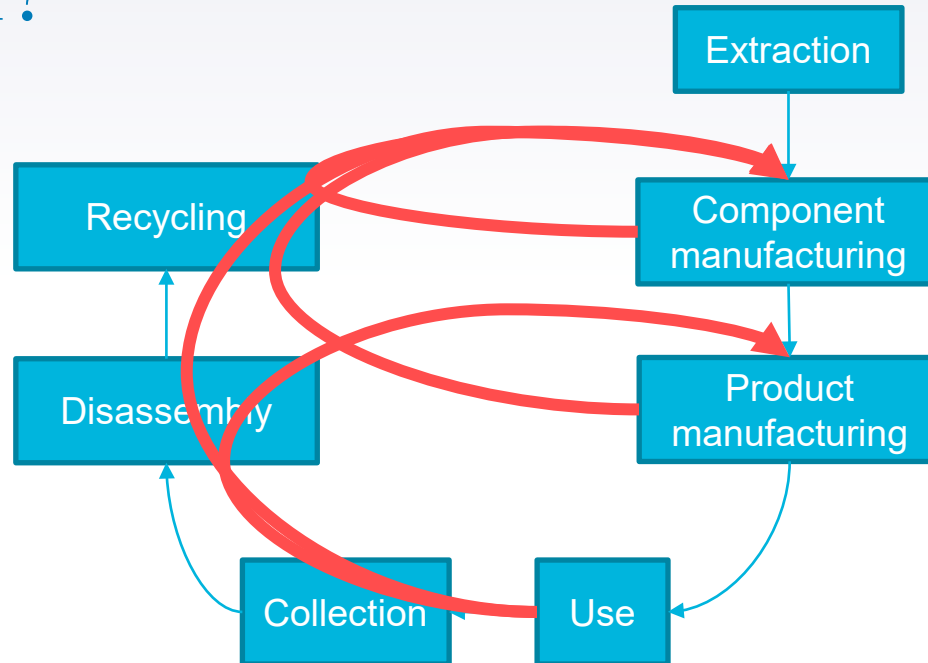
Why would a company implement circularity strategies?

- ▶ Cost savings
- ▶ Reduced exposure to supply insecurity
- ▶ Reduced exposure to price volatility
- ▶ Regulatory constraints
- ▶ Brand reputation

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How can we make circularity work?

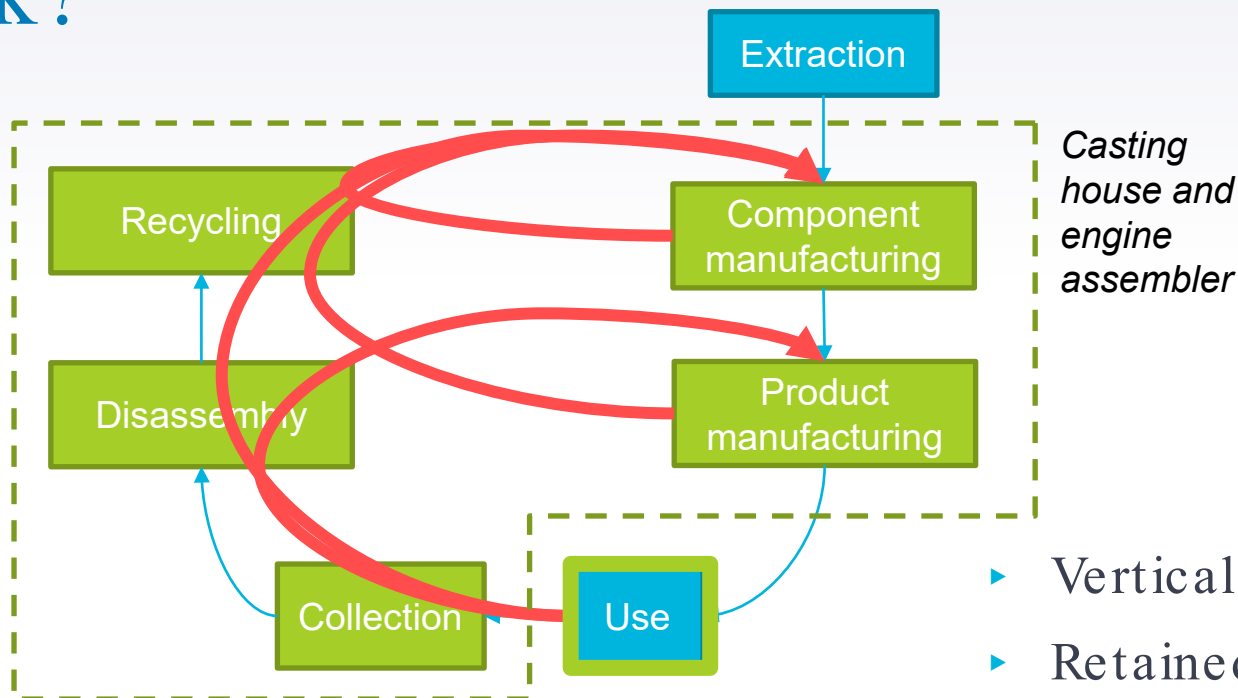
*Rhenium –
Jet engine
manufacturer*



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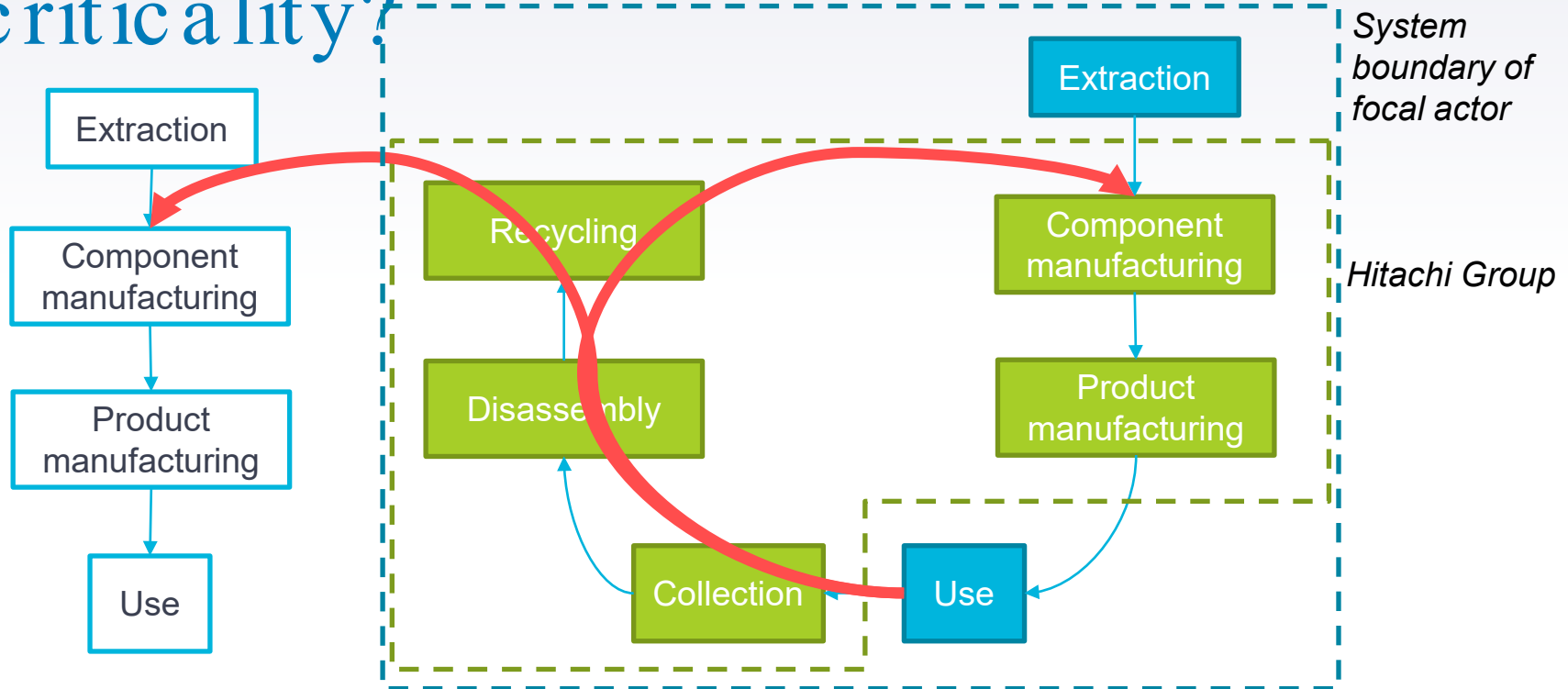
How can we make circularity work?

*Rhenium –
Jet engine
manufacturer*



- ▶ Vertical integration
- ▶ Retained ownership
- ▶ B2B relationships

Does circularity mitigate criticality?



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Summary

- ▶ Different types of circularity strategies could effectively decrease demand for raw materials: recycling of old scrap/new scrap, reconditioning, remanufacturing, reuse
- ▶ Circular strategies can be effective to decrease costs, vulnerability to price spikes, comply with regulations, and strengthen reputation
- ▶ Vertical integration of the value chain, retainment of ownership, and creation of mutual benefits are favourable conditions for circularity
- ▶ Closed-loop circularity supports criticality mitigation, this is limited for open loops
- ▶ www.irtc.info

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Outlook

- ▶ Which factors affect the technical and economic feasibility of circularity strategies?
- ▶ How could circularity strategies be impacted by external factors (e.g. changing technology, consumer preferences, market conditions)
- ▶ What is the interplay of company functions and corresponding interests/ authority/ time horizon/ risk tolerance in the design and implementation of circular business models?
- ▶ What is the role of legislative and regulatory environment in motivating/ impeding circularity strategies?

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