The IRTC project: a cross-border dialogue on criticality

Alessandra Hool, IRTC Coordinator, ESM Foundation, Switzerland

SCRREEN workshop Ljubljana, March 30, 2023

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International Round Table on Materials Criticality – IRTC (I)

- Project on approaches towards assessing and mitigating materials criticality, funded by EIT RawMaterials
- Network of internationally leading experts in criticality from research and industry
- Round Table discussions, at international conferences and independently
- Results are consecutively published as joint publications
- Currently in third round:
  - 2018-2020 IRTC
  - 2020-2022 IRTC-Business
  - 2022-2025 IRTC-Training

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International Round Table on Materials Criticality – IRTC (II & III)

- Web-tool for company decision-making
- From 2023: Annual international conference
  - First edition took place in February 2023 (www.irtc-conference.org)
  - Next edition in February 2024 in Torino
- From 2024: Training courses for professionals
  - Basic understanding how criticality is assessed and can be mitigated
  - Advanced stage: apply screening to own case/company
  - ISO-certified process

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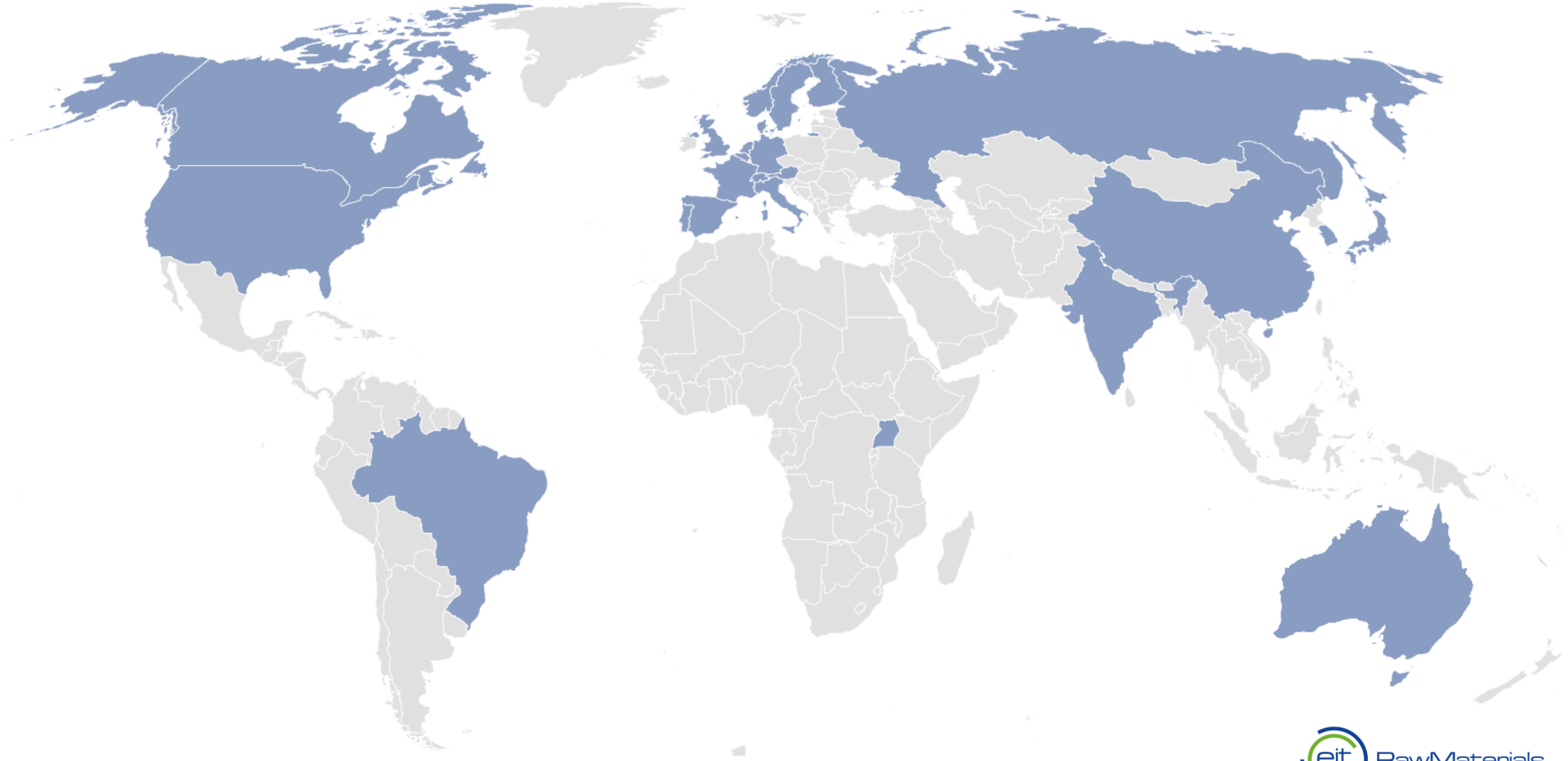
Geographic project participation



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Round Table topics

Resources for Future Generations, June 16 – 21, 2018, Vancouver, Canada
How methodology determines what is critical

EcoBalance, October 9 – 12, 2018, Tokyo, Japan
Criticality and the Circular Economy

TMS Annual Meeting and Exhibition, March 10 – 14, 2019, San Antonio, Texas
How does industry manage criticality?

ISIE Conference, July 7 – 11, 2019, Bejing, China
In-use stocks and secondary supply of CRMs

Independent workshop, May 19, 2020, online
Identifying risks in industry supply chains

UNECE Resource Management Week, April 18, 2020, Online
Critical Raw Materials: How can we make supply sustainable?

Independent workshop, November 17, 2020, Online
Building resilient economies – the role of policy

EC RawMaterials Week, November 16, 2021, Brussels and online
How companies improve critical raw materials circularity

Independent workshop, March 22, 2022, Online
The energy-material nexus: CRM demand, CRM footprints, and their interplay

https://irtc.info/round-tables/

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First IRTC Conference, February 2023

15 FÉVRIER 2023 16:00

Open plenary discussion with the Conference Chairs Current...

IRTC 2023 – RAW MATERIALS FOR A SUSTAINAB...

17 FÉVRIER 2023 08:45

Welcome, Constanze Veeh (DG GROW), Xavier Constant (Nyrstar)...

IRTC 2023 – RAW MATERIALS FOR A SUSTAINAB...

17 FÉVRIER 2023 14:00

Keynote conversation: Addressing criticality in policy and...

IRTC 2023 – RAW MATERIALS FOR A SUSTAINAB...

17 FÉVRIER 2023 14:45

Session 7: Industry case studies

IRTC 2023 – RAW MATERIALS FOR A SUSTAINAB...

12:30	**Highlight lecture by Pierre Heeroma, LKAB** The Rare Earth discovery in Kiruna and its impact on European supply security	
12:50	Lunch + poster session *Standing lunch, networking & poster exhibition*	
14:00	**Keynote conversation: Supplying critical raw materials** Karen Hanghøj (BGS), Gavin Mudd (RMIT) and Anders Sand (Boliden); moderated by Dieuwertje Schrijvers (WeLOOP)	
14:45	**Session 3: Sourcing and trade** Chaired by Paul Lusty (BGS), Nedal Nassar (USGS) and Carlos Peiter (Centre for Mineral Technology, Brazil)	**Session 4: ESG and regulation** Chaired by Carolin Friedrich (Stakeholder Reporting), Louis Maréchal (OECD), and René Kleijn (Leiden University)
14.45	Examining three decades of global dysprosium supply chain through a material flow analysis *Disna Eheliyagoda (Aarhus University & Grundfos), Badrinath Veluri (Grundfos), Devarajan Ramanujan (Aarhus University), Gang Liu (University of Southern Denmark)*	Global mineral resource governance for sustainable development *Paul Ekins (University College London, UNEP Resource Panel), Patrice Christmann (Krysmine)*
15.00	Nickel supply: primary metallurgical processing capacity does not satisfy changing demand *Jamie Faubert, Steven Young(University of Waterloo)*	Elements and Social Risk Assessment *Tatiana Vakhitova (ANSYS)*
15.15	The revival of the RE French industry *Alain Rollat (Carester, France)*	Applicability of Country Governance Indicators for Assessing Environmental and Social Criticality *Konstantin Kühnel (BGR), Philipp Schütte (BGR), Vanessa Bach (TU Berlin), Gudrun Franken (BGR), Matthias Finkbeiner (TU Berlin)*
15.30	Discussion with speakers and the audience, led by the Session Chairs	Discussion with speakers and the audience, led by the Session Chairs

Topics of scientific sessions

- Stakeholder Perspectives
- Sourcing & Trade
- Design for Circularity
- Industry Case Studies
- Methods
- ESG & Regulation
- Changing Demand
- Policy Case Studies

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Publications

- Schrijvers, Dieuwertje et al. 2020. “A Review of Methods and Data to Determine Raw Material Criticality.” *Resources, Conservation and Recycling* 165: 105223
- Schrijvers, Dieuwertje et al. 2020. *Material Criticality: An Overview for Decision-Makers*. IRTC Business Brochure
- Helbig, Christoph et al. 2021. “Selecting and Prioritizing Material Resources by Criticality Assessments.” *One Earth* 4(3)

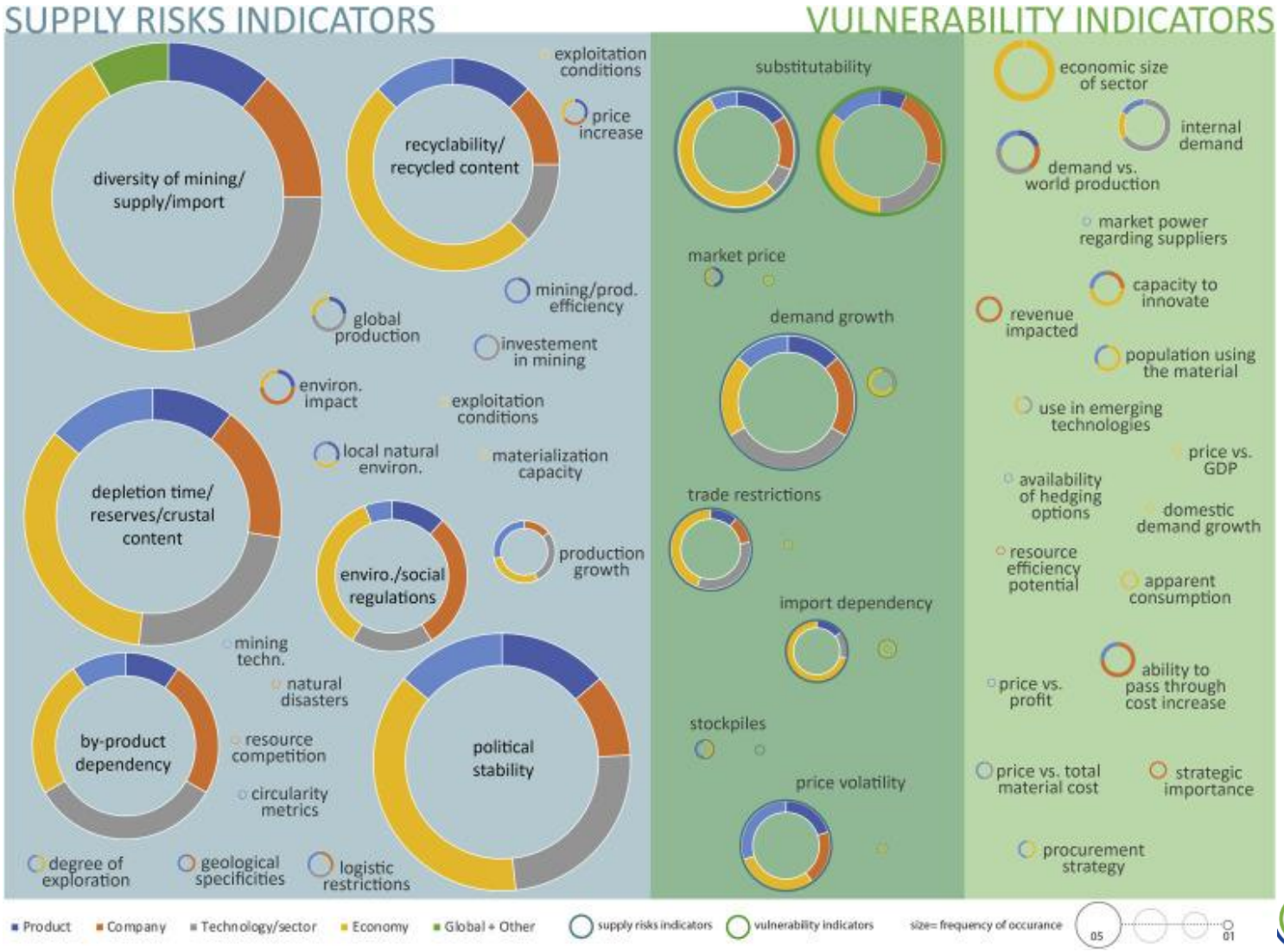
- Tercero Espinoza, Luis et al. 2020. “Greater Circularity Leads to Lower Criticality, and Other Links between Criticality and the Circular Economy.” *Resources, Conservation and Recycling* 159: 104718
- Cimprich, Alexander et al. 2022. “The Role of Industrial Actors in the Circular Economy for Critical Raw Materials: A Framework with Case Studies across a Range of Industries.” *Mineral Economics*.
- Hool, Alessandra et al. 2022. “How Companies Improve Critical Raw Material Circularity: 5 Use Cases: Findings from the International Round Table on Materials Criticality.” *Mineral Economics*

- Schrijvers, Diuewertje et al. (forthcoming). “A model for critical raw materials risk assessment and mitigation”

- In discussion: Dynamics of international policies and criticality

https://irtc.info/references/

Criticality methods



Schrijvers et al. (2020)

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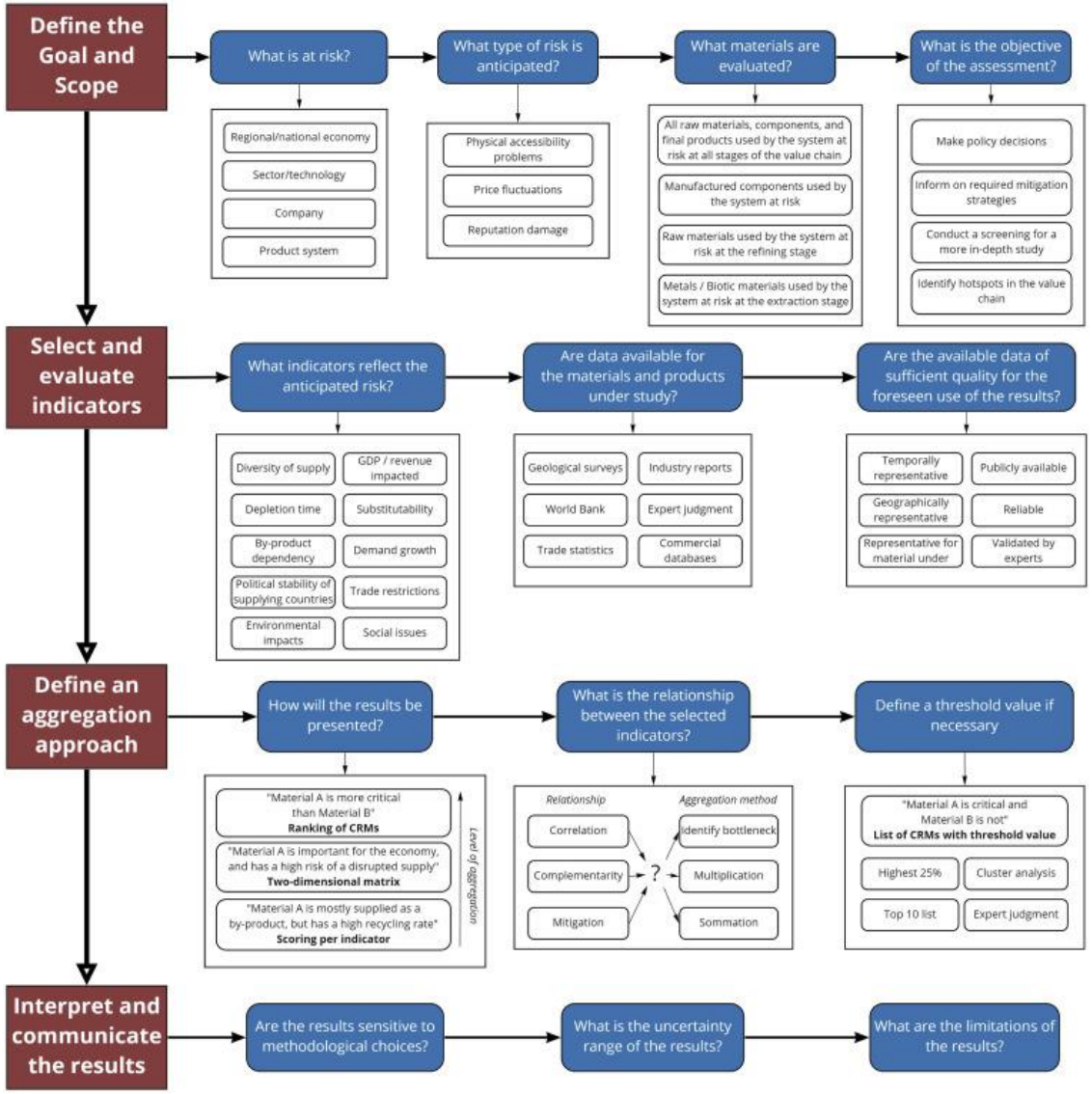
Criticality methods



Helbig et al. (2021)

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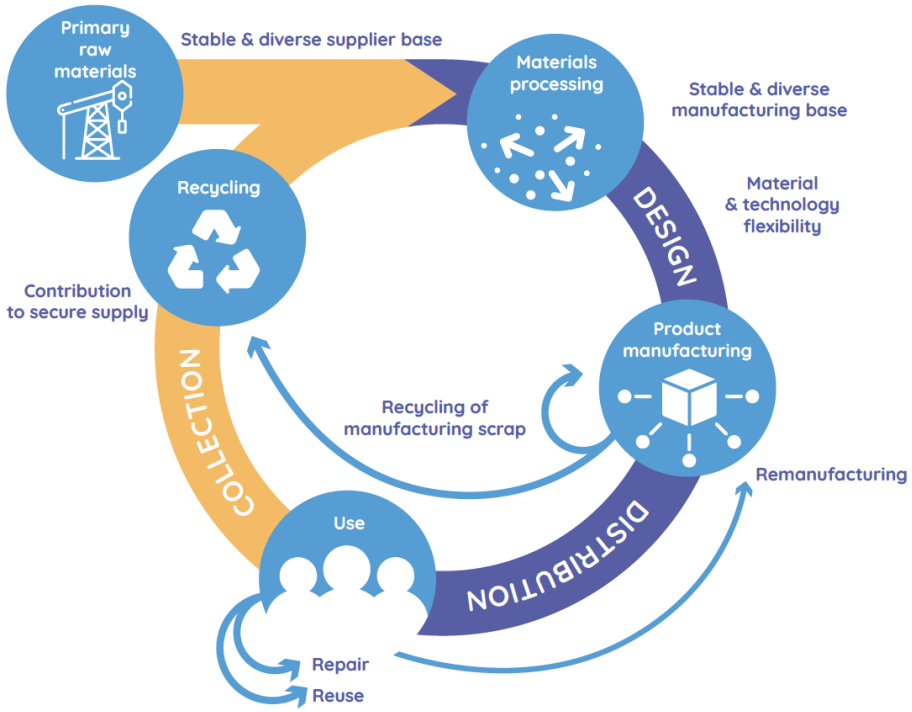
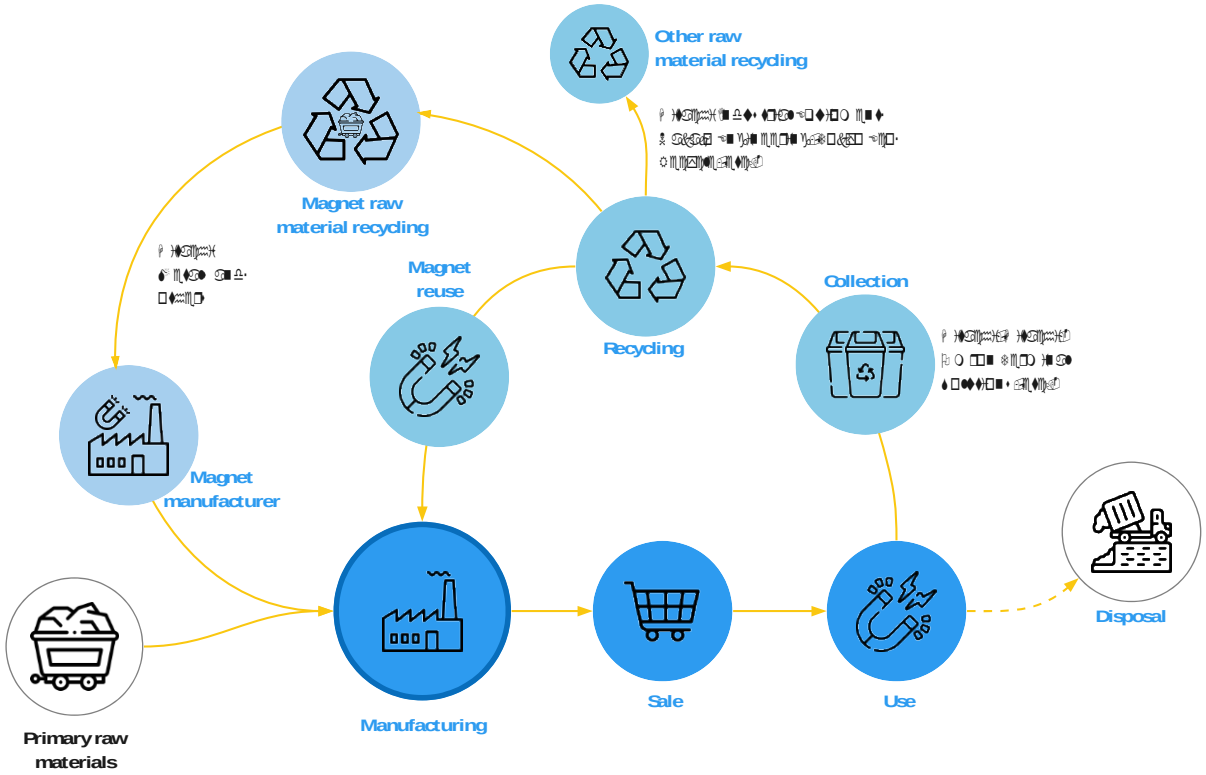
CRM Circularity



Tercero et al. (2021)



Hool et al. (2022), Cimprich et al. (2021)

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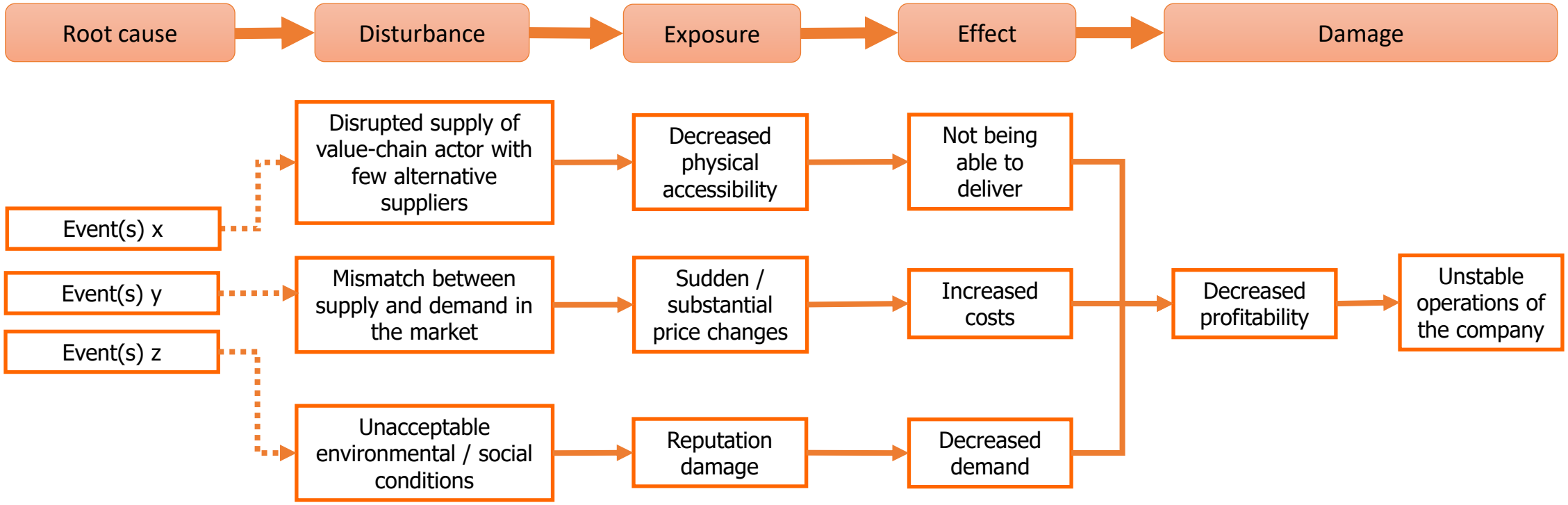
Raw material risk model



Schrijvers et al. (forthcoming)

Mitigation measures

Price agreements with suppliers

Diversify supply

Compensation

Increase resource efficiency

Develop substitutes

Pass on costs to customers

Use available substitutes

Diversify demand

Vertical integration

Improve trade relationships

Flexible product quality requirements

Increase recycling rates

Transparency

Exploration

Dematerialization within company

Certification

Internal recycling

Ecodesign

Stockpiling

https://weloop-irtc.web.app/tools

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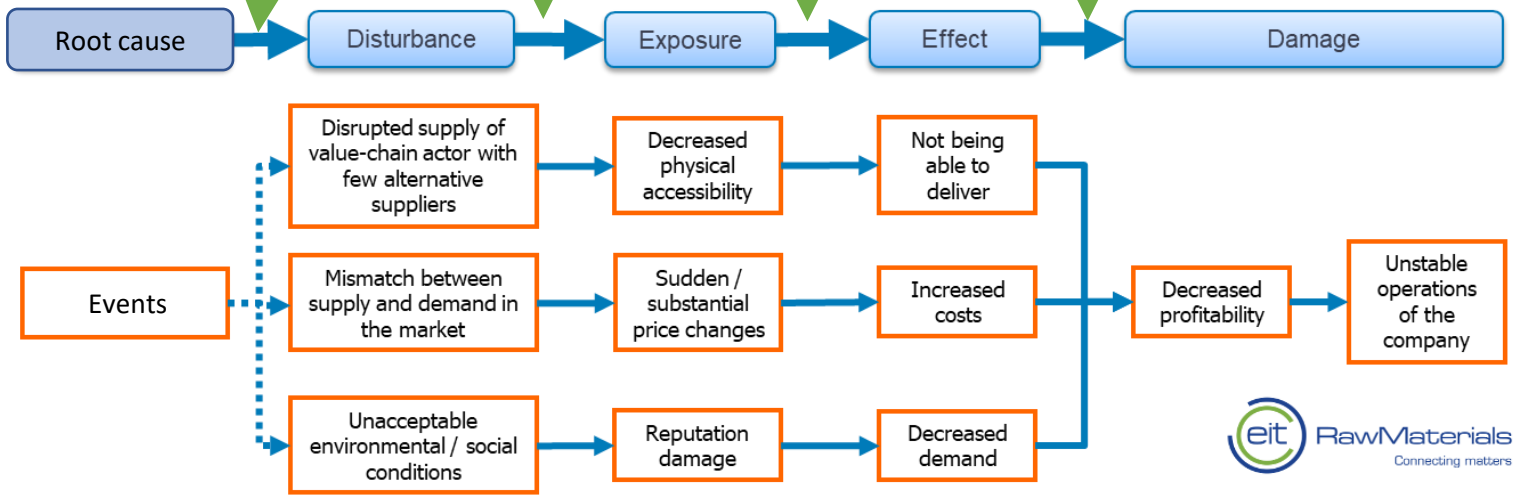

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Raw materials
for a sustainable future

IRTC 2024
Torino

https://www.irtc-conference.org

Save the date:
Feb. 21-23, 2024

Possibilities to engage

- Become a member of IRTC's scientific or industry board
- Bring in your ideas for topics or publications
- Submit your abstract for IRTC24
- Host IRTC25?

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References

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