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RE-SOURCING CONFERENCE 2023

Systemic Change for Responsible Sourcing

September 21 & 22, 2023

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Today‘s Agenda

10:00 – 10:15	Opening by **Professor Rupert Sausgruber** and **Professor André Martinuzzi** (WU Vienna)
10:15 – 10:30	**Maria Nyberg** (DG Grow, European Commission)
10:30 – 11:15	**Panel 1** – Understanding systemic challenges and change
11:15 – 11:45	Coffee break
11:45 – 13:15	**Parallel Sessions** – Challenges and solutions for catalysing systemic change
13:15 – 14:30	Lunch & Networking
14:30 – 16:00	**Launch of the OECD Handbook** on Environmental Due Diligence in Mineral Supply Chains
16:00 – 16:30	Coffee break
16:30 – 17:30	Wrap up & **Panel 2** – Realising solutions for catalysing systemic change
17:30 – 18:00	Closing & Outlook

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WIRTSCHAFTS UNIVERSITÄT WIEN VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS

Professor Rupert Sausgruber

New Rector of the Vienna University of Economics and Business

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WIRTSCHAFTS UNIVERSITÄT WIEN VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS

Professor André Martinuzzi

Head of the Institute for Managing Sustainability and RE-SOURCING Consortium Coordinator

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A Global Stakeholder Platform for Responsible Sourcing in Mineral Value Chains

European Commission

André Martinuzzi

Head of the Institute for Managing Sustainability
Coordinator of the RE-SOURCING project

Institute for Managing Sustainability WU

MineHutte

WORLD RESOURCES FORUM

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

MONTAN UNIVERSITÄT LEOBEN

TAL TECH

SOMO

srk consulting

AHK Deutsch – Chilenische Industrie – und Handelskammer
Cámara Chileno-Alemana de Comercio e Industria - CAMCHAL

eit RawMaterials
Connecting matters
Co-funded by the European Union

WWF

LULEÅ UNIVERSITY OF TECHNOLOGY

supply chain challenges

- Global **supply chain complexity** (number of suppliers and tiers, geography, transformation of raw materials across supply chain stages)
- **Knowledge asymmetries** about supply chain information in order to maintain competitive advantages lead to high and unequal costs, protectionism and distrust
- Market competition without a level-playing field for responsible sourcing (global, regional, national) lead to **competitive disadvantages for front-runners**
- **Lack of vertical and horizontal collaboration** across supply chain actors and industry sectors runs the risk of (non-)technological lock-ins
- **Fragmentation** of initiatives (standards, regulations, technological solutions) and limited data reliability runs the risk of incorrect data due to fraud or error.

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A Global Stakeholder Platform for Responsible Sourcing in Mineral Value Chains

European Commission

International frameworks & standards	Regulatory/Policy efforts	Industry	Civil Society
• UN Guiding Principles on Business and Human Right • OECD Guidelines • ILO Standards • ISO Standards • Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) • etc.	• US Dodd Frank Act • Africa Mining Vision • EU Conflict Minerals Regulation & Corporate Sustainability Due Diligence • EU Battery Regulation • EU Critical Raw Materials Act	• International Council on Mining and Metals (ICMM) • Responsible Business Alliance • European Partnership for Responsible Minerals • etc.	• Amnesty International • IndustriALL • Natural Resource Governance Institute • Women in Mining • Fairmined • national, regional & sectoral CSOs • etc.

Mandatory regulation

Voluntary standards & certification

Responsible investment

Knowledge brokerage & capacity building

Technological solutions (e.g. blockchain)

Research, reports & good practice guidance

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A Global Stakeholder Platform for Responsible Sourcing in Mineral Value Chains

European Commission

Our contribution to Responsible Sourcing:

- → Creating a global network
- → Designing sectoral road maps
- → Providing best practice cases
- → Forming a common understanding

Solutions for

Policy makers — Civil society — Businesses

FOCUS

3 EU key industry sectors

Renewable energy — Mobility — Electrical and electronic equipment

Your involvement:

- → 9 workshops sharing best practices & global exchanges
- → 4 conferences promoting peer learning & networking
- → Online platform for knowledge sharing & best practice cases

Objectives

- Supportive EU policy frameworks
- Globally connected responsible sourcing community
- Scaling up of best practices
- A common definition

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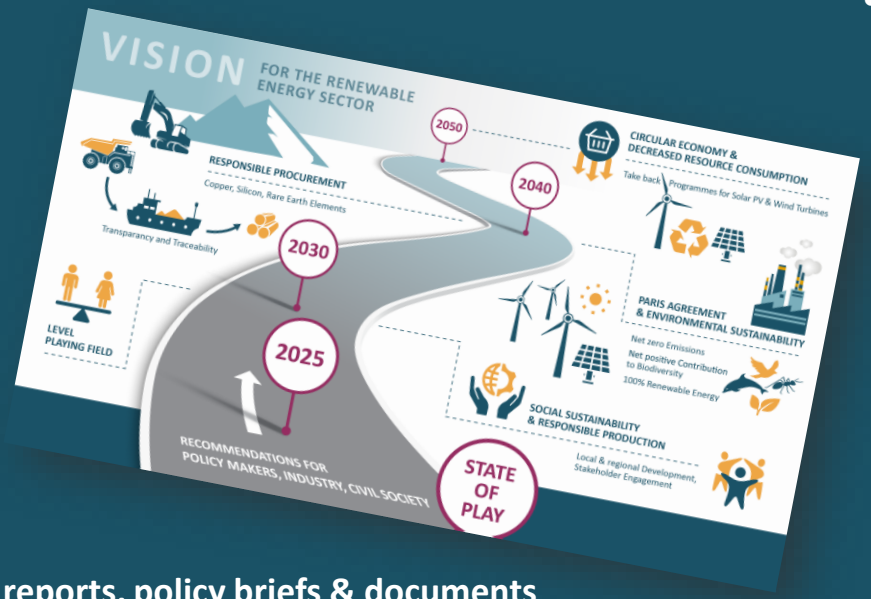
A Global Stakeholder Platform for Responsible Sourcing in Mineral Value Chains

European Commission

Roadmaps 2050

- Targets and milestones to achieve responsible sourcing until 2050
- One for each sector
- Recommendations for policy, industry and civil societ/academia



50 reports, policy briefs & documents
60 videos, webinars, interviews

Good Practice Guidelines

- In total 11 good practice case studies how to implement responsible sourcing
- Divided into policy, industry and civil society
- Cross-sectoral synthesis extracting major aspects of all good practice guidelines

Common vision of Responsible Sourcing

- Condensing our work on Roadmaps and Good Practice
- Adding non-EU perspectives from three Global Advocacy Forums in Chile, South Africa and China
- Attempting to combine the global and local perspectives

www.RE-SOURCING.eu

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Maria Nyberg

DG GROW - Internal Market, Industry, Entrepeneurship and SMEs
Policy Officer

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EU policy for secure and sustainable supply of raw materials for the green and digital transition

Maria Nyberg, policy officer,
DG GROW- Internal Market, Industry, Entrepreneurship and SMEs
maria.nyberg@ec.europa.eu

European Critical Raw Materials Act

Ensuring a secure and sustainable supply of critical raw materials for the Union

- **Strengthen all stages of the European CRM value chain**
- **Improve EU capacity to monitor and mitigate risks of disruption to CRM supply**
- **Diversify EU CRM imports to reduce strategic dependencies**
- **Enhance CRM circularity and sustainability**

EU raw materials policy

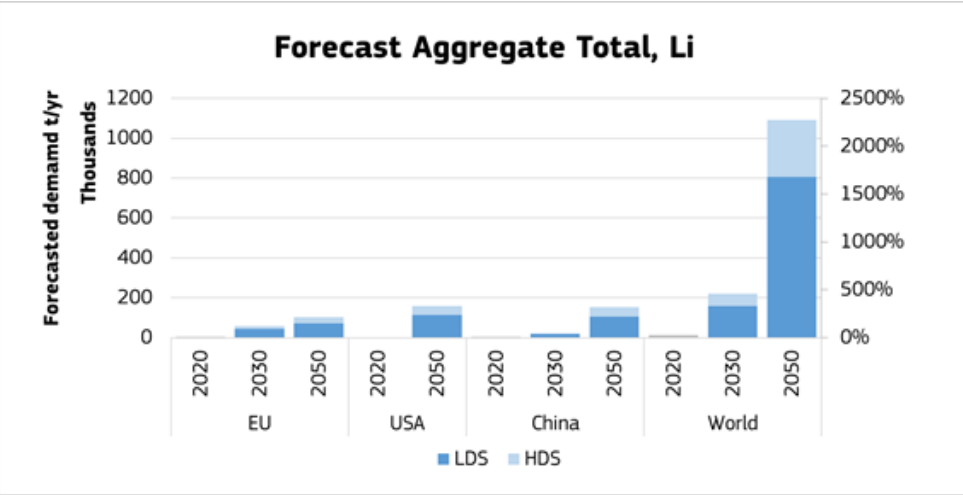
- Raw materials initiative 2008
- First CRM list 2011
- EIP Raw Materials 2012
- Strategic Implementation Plan 2013
- CRM Action Plan 2020
- European Raw Materials Alliance (ERMA) 2020

Sustainability framework raw materials

- Strengthen circularity, responsible sourcing from third countries, increase sustainable mining
- EU sustainability acquis- environment, social, economic/governance
- Sector-specific guidance extraction in Natura 2000
- EU principles for sustainable raw materials
- EIA, Water Framework Directive, EWD, Conflict Minerals Regulation, Batteries Regulation, CSDDD, CSRD. Sust criteria for mining Taxonomy.

Critical raw materials (CRMs) key for the EU economy, new geopolitical context

- Driven by the **twin transition** and defence and space needs, significant **growth in CRM demand,** with risk of global supply/demand imbalances, situation of “permacrisis” aggravates this trend



Demand forecasts aggregated for lithium (2023 Foresight Report)

Lithium demand for batteries in the EU is expected to **grow by 12 times by 2030** and **by 21 times by 2050.**

- EU is heavily dependent on third country supply for CRMs that are key for strategic technologies
- Strategic dependencies and risk of supply chain disruption

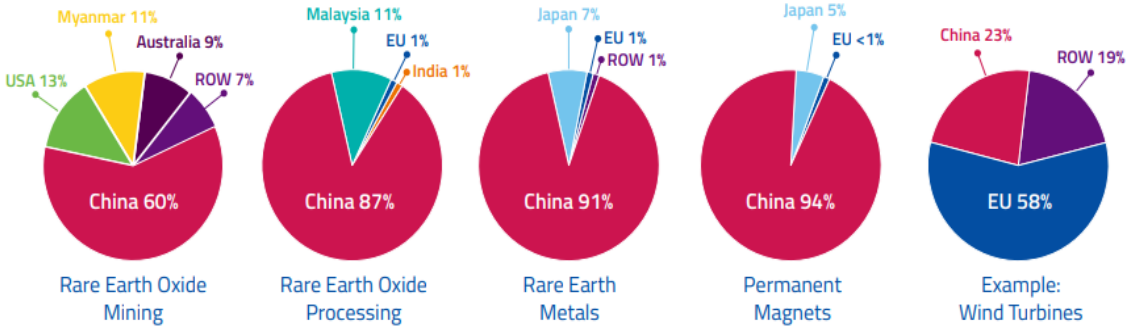


Fig. 3: From rare earths mining to wind turbine manufacturing: estimated market shares in 2019. Sources: Team analysis and Roskill 2018; Adamas Intelligence 2019; Peteves 2017; Carrara et al. 2020; IEA 2021; USGS 2021.

Source: European Raw Materials Alliance (ERMA)

European Commission

CRM, SRM, Benchmarks

Defining critical and strategic raw materials

CRM

Whole EU economy, based on :

- supply risk
- economic importance

SRM

SRM are a subset of CRM:

- Key for strategic technologies (twin transition, defence and space)
- Forecast demand risks outstripping supply

2030 benchmarks

Towards more SRM supply security

- EU's **extraction** capacity cover at least **10%** of the EU's SRM consumption
- EU's **processing** capacity cover at least **40%** of the EU's SRM consumption
- EU's **recycling** capacity cover at least **15%** of the EU's SRM consumption

Towards more diversification of supply

- Not more than **65%** of EU consumption of each SRM should come from a single third country.

Where do we stand today?

SRM	EU sourcing (t) processed stage	EU Extraction satisfies:	EU processing satisfies:	EU processing at specified grade satisfies:	End-of-Life Recycling Input Rate	Biggest EU supplier
Bismuth	3 858	-	26%	-	0%	65% China
Boron - metallurgy grade	76 361	0%	29%	N/A	1%	*99% Türkiye*
Cobalt	22 148	8%	92%	-	22%	*63% DRC**
Copper	3 234 239	25%	72%	-	55%	*19% Poland*
Gallium	33	-	0%	-	0%	69% China
Germanium	14	-	50%	-	2%	45% China
Lithium - battery grade	1 832	8%	0%	0%	0%	79% Chile
Magnesium metal	127 631	-	0%	0%	13%	97% China
Manganese - battery grade	956 798	1%	31%	0%	9%	*41% South Africa*
Natural Graphite - battery grade	76 801	1%	~0%	~0%	3%	*40% China*
Nickel - battery grade	300 212	16%	23%	7%	16%	29% Russia
Platinum Group Metals	95	-	1%	-	12%	94% South Africa, Pd 40% Russia
Magnet REE*	34	0%	0%	0%	1%	LREE 85%; HREE 100% China
Silicon metal	417 941	-	34%	-	1%	33% Norway
Titanium metal	4 136	0%	0%	0%	0%	37% Kazakhstan
Tungsten	10 481	20%	19%	-	42%	31% China
Benchmark		10%	40%		15%	65%

*(Nd, Pr, Tb, Dy, Gd, Sm, Ce); Dependence at extraction stage in italic. Overview of both stages in:
European Commission, Study on the Critical Raw Materials for the EU 2023 – Final Report

Logic

Defining critical and strategic raw materials

CRM

Whole EU economy, based on :

- supply risk
- economic importance

SRM

SRM are a subset of CRM:

- Key for strategic technologies (green, digital, defence and space)
- Forecast demand risks outstripping supply
- Difficulty to scale up production

European Commission

Strengthening the value chain

Strategic Projects

Across the whole SRM value chain: extraction – processing - recycling

Selected by the Commission with advice from the Board based on

- Contribution to security of supply
- **Sustainability**
- Technical feasibility
- Cross-border benefits in EU/ **Economic and social benefits in third countries**

Benefits

- **Priority Status** in national and EU law: for administrative and judicial procedures
- **One-stop-shop approach**
- **Permitting** - **Legal time-frames**
  - Extraction: 24 months
  - Processing & Recycling: 12 months
- Provisions to facilitate and timely deliver **environmental assessments and authorisations without weakening environmental and social protection**
- **Enabling conditions to implement Strategic Projects**
  - The Critical Raw Materials Board provides coordination and advice to secure remaining financing
  - Provisions to facilitate the conclusion of off-take agreements

National exploration programmes

Member States shall draw up national programme for general exploration targeted at CRM.
Where applicable, build on UNFC
(United Nations Framework Classification for Resources)

Sustainable and circular CRMs

CIRCULARITY

- **National measures on CRMs circularity**
- Maximising potential from **extractive waste facilities**
- Preparing the ground for massive recycling of **permanent magnets**

SUSTAINABLE CHOICES

- Strategic projects need to be sustainable (Art. 5)
- Recognition of **certification schemes (Art 29, criteria in Annex IV))** on the sustainability of CRMs/ **Requirements for compliance sustainability EU legislation and international instruments** (Annex III)
- Empowerment to set, at a later stage, information requirements on **the environmental footprint** of CRMs placed in the EU market

Diversity EU CRM imports to reduce strategic dependencies

- Strategic projects in third countries
- Strategic raw materials partnerships
- Trade tools and agreements

To conclude

- Possible adoption co-legislators European Parliament and Council of the European Union before EP elections June 2024

- CRM Act Press Release
- CRM Act (Draft Regulation)
- CRM Act (Communication)
- 2023 JRC Foresight Study
- 2023 Study on CRMs for the EU
- CRM Factsheets

https://single-market-economy.ec.europa.eu/sectors/raw-materials/raw-materials-week_en

European Commission

Critical raw materials

34 raw materials defined as critical by their high

- ➢ Economic importance
- ➢ Supply risk

… based on a regular assessment of available data in an established methodology

- Antimony
- Arsenic
- Bauxite
- Baryte
- Beryllium
- **Bismuth**
- **Boron (battery grade)**
- **Cobalt**
- Coking Coal
- **Copper**
- Feldspar
- Fluorspar
- **Gallium**
- **Germanium**
- Hafnium
- Helium
- **Heavy/Light Rare Earth Elements (Magnet REE)**
- **Lithium (battery grade)**
- **Magnesium (metal)**
- **Manganese (battery grade)**
- **Natural Graphite (battery grade)**
- **Nickel – battery grade**
- Niobium
- Phosphate rock
- Phosphorus
- **Platinum Group Metals**
- Scandium
- **Silicon metal**
- Strontium
- Tantalum
- **Titanium metal**
- **Tungsten**
- Vanadium

Note: A subset of the CRMs are classified as „**strategic raw materials**“ due to their use in strategic technologies and strong projected demand growth. Certain measures under the CRMA apply only to them.

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Systemic Change for Responsible Sourcing

September 21 & 22, 2023

Parallel Session – ELECTRONICS
11:45 – 13:15

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Insights from the Electronics Sector

Roadmap for Responsible Sourcing in the electronics sector

Irene Schipper/Alejandro González

SOMO-Centre for Research on Multiantional Corporations, Amsterdam

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement № 869276

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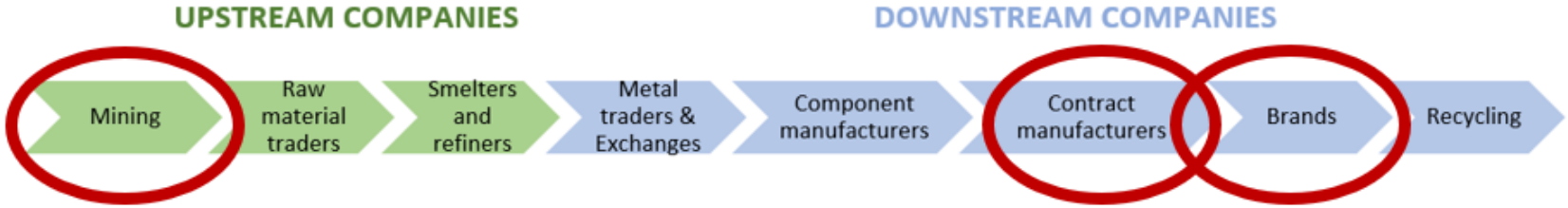
Electrical and electronic equipment (EES) - Scope

- Focus on electronics products

- Supply chain:
  - Mining & Processing
    - 3TG and mica
  - Manufacturing
    - Contract Manufacturers (includes EMS & ODM)
  - Brand companies



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The Roadmap: Milestones and recommendations for EU policy makers, international industry and civil society organisations for three targets.

Target 1: Respect for Human Rights

-Filling gaps in human rights protection
-Create level playing field with robust due diligence laws

Target 2: Circular Economy and Decreased resource Consumption

- Reduction in resource consumption is key
- Focus design on longevity, reuse and recyclability

Target 3: Responsible Production

- Reduction of inequality
- Protection of workers, improvement of working conditions

VISION FOR THE ELECTRONICS SECTOR

Tin, tungsten, tantalum, gold and mica

CIRCULAR ECONOMY & DECREASED RESOURCE CONSUMPTION

- Longevity, reuse, recycling, waste reduction
- Reduction of energy consumption and virgin materials
- Renewable energy
- Transparency about environmental outcomes and impacts
- New economic and business model

2025

2030

2050

RESPONSIBLE PRODUCTION

- Fair pay and workers' rights
- Supply chain transparency and accountability
- Responsible procurement and purchasing
- Respect for planetary boundaries
- Tax justice & tax transparency

RESPECT FOR HUMAN RIGHTS

- Comprehensive mandatory due diligence
- Inclusive, participatory and published social audits
- Transparency, accountability, access to remedy
- No forced labour
- Primacy of human rights and ecological sustainability

RECOMMENDATIONS FOR POLICY MAKERS, INDUSTRY, CIVIL SOCIETY

STATE OF PLAY

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THANK YOU
for your attention!

- Irene Schipper
- I.schipper@somo.nl
- Alejandro González
- A.Gonzalez@somo.nl

Color code for your opinion

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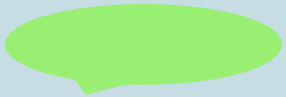
Which are the most important (urgent) recommendations ?	Please mark the Roadmap by using the post-its as indicated	Which recommendations can YOU contribute most to ?
	*I represent*	
	INDUSTRY	
	POLICY	
	ACADEMIA CIVIL SOCIETY	

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Systemic Change for Responsible Sourcing

September 21 & 22, 2023

Parallel Session – MOBILITY
11:45 – 13:15

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A Multi-Stakeholder Approach

Roadmap for the Mobility Sector

Responsible Sourcing of Raw Materials until 2050

Stefanie Degreif, Hannah Bachmann, Dr. Johannes Betz

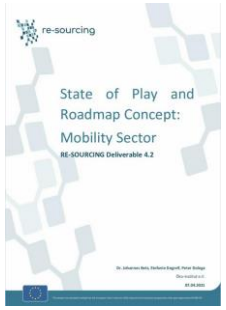
Öko-Institut e.V.
Resources & Transport Division

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement № 869276

Roadmap Process

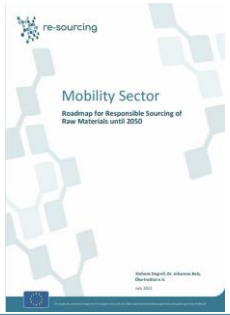
Important publications (Mobility Sector):

State of Play

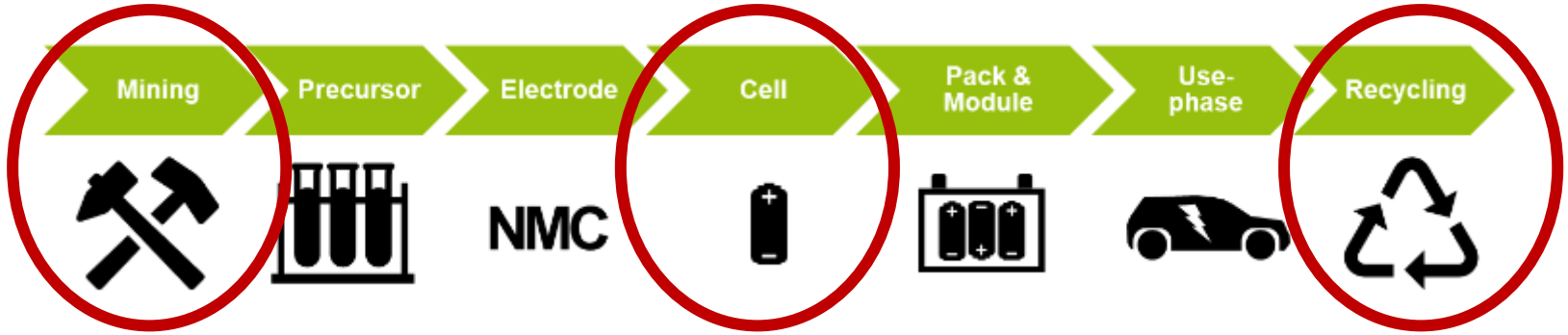


Good Practice Guidelines

Roadmap



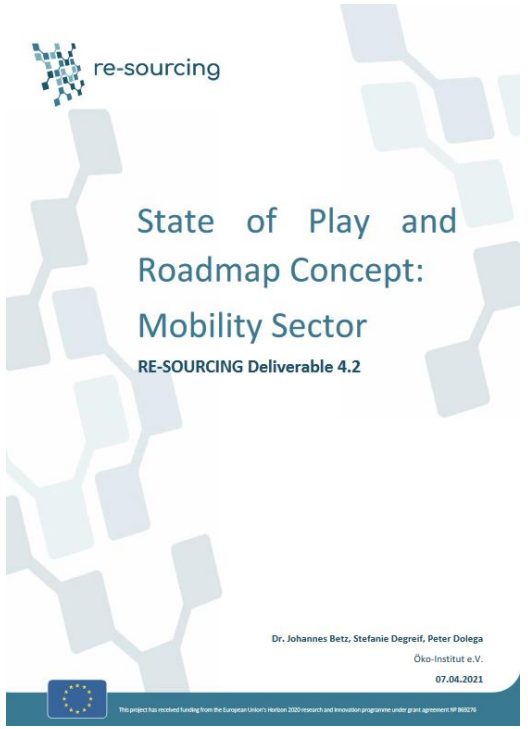
MOBILITY SECTOR – FOCUS on Li-Ion-Batteries



And OEMs

- **Lithium**
- **Cobalt**
- **Nickel**
- **Graphite**

Roadmap based on:



VISION FOR THE MOBILITY SECTOR

2050

2040

2030

2025

STATE OF PLAY

RECOMMENDATIONS FOR POLICY MAKERS, INDUSTRY, CIVIL SOCIETY

Lithium, cobalt, nickel and graphite (natural and synthetic)

RESPONSIBLE PROCUREMENT

- Transparency
- Local development
- Mining in EU

CIRCULAR ECONOMY & DECREASED RESOURCE CONSUMPTION

- Reuse – Repurposing – Recycling
- Change mobility patterns (e. g. e-bus, bicycle)
- Increased efficiency

LEVEL PLAYING FIELD

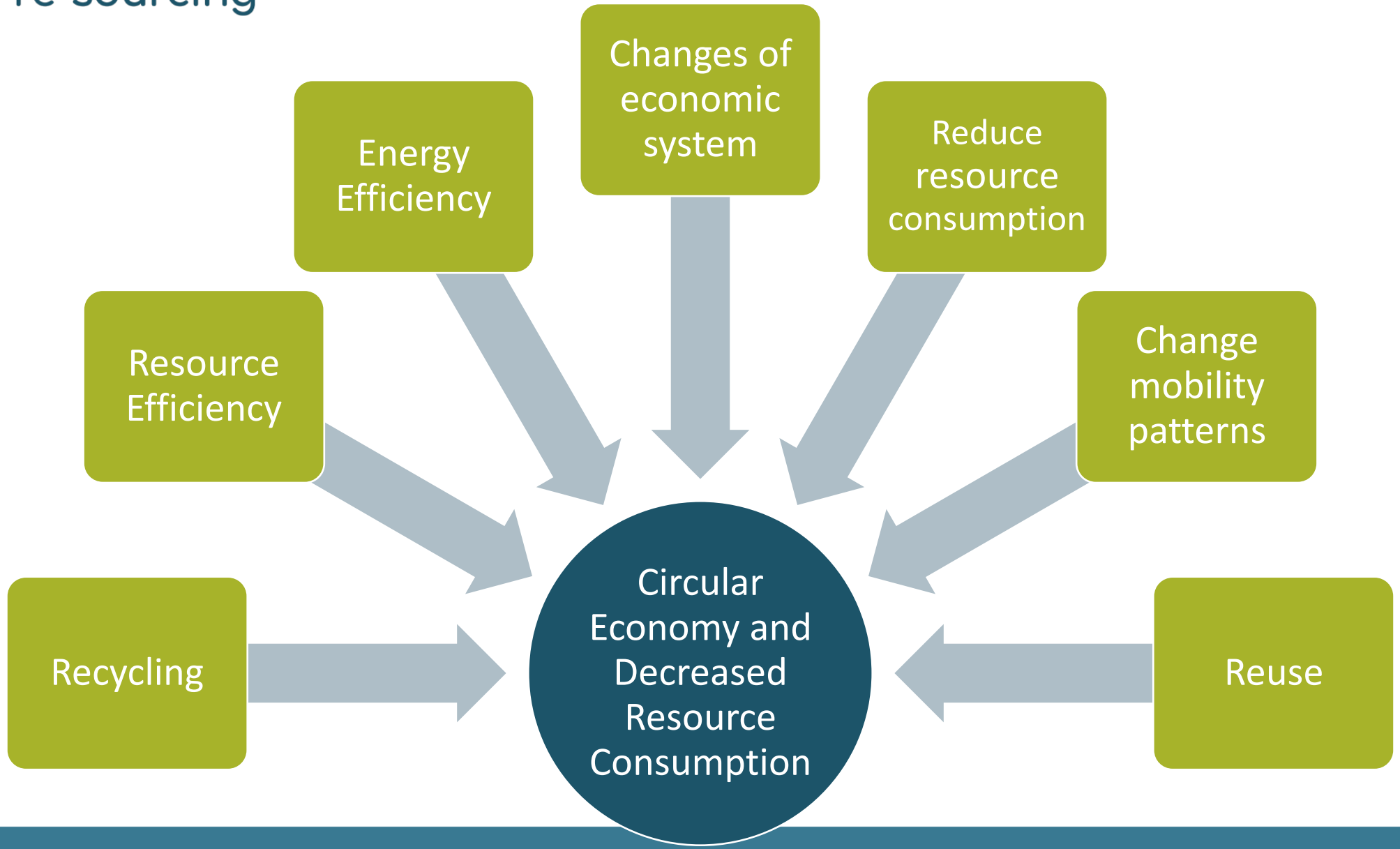
- Formalisation of ASM (artisanal and small-scale mining)
- International cooperation
- Mandatory minimum standards

1

Target 1:
Circular Economy and Decreased Resource Consumption

Circular Economy is a framework of three principles:

- Eliminate waste and pollution
- Keep products and materials in use
- Regenerate natural systems


Changes of economic system
Energy Efficiency
Reduce resource consumption
Resource Efficiency
Change mobility patterns
Circular Economy and Decreased Resource Consumption
Recycling
Reuse

Circular Economy & Decreased Resource Consumption

Actions up to 2025

2025 Milestones

- **Resource efficiency** (incl. design for recycling) & waste policies implemented
- **Growth** in the number of registered **cars** in the EU (at local level) **is stopped** and the shift to other kinds of transport continued
- Set **energy efficiency (kWh/km) limits** for EVs
- Incentives for **changing behaviour** (public transportation use, car sharing, home office, etc)

Actions up to 2030

2030 Milestones

- **Major advances in circular economy**
- **Number** of registered **cars decreased by 10%** in the EU (compared to 2021; while BEV share is increasing)
- Optimised **resource management** (efficiency and recycled materials)
- **Peak of primary materials demand** in absolute terms
- Move away from continuous economic growth
- Major shift from cars with **ICE to EVs**; 2035: only BEVs are sold

Continuous Actions

2040 Milestones

- **Circular economy** implemented in the EU
- **Reduction** of **resource intensity** per battery **by > 50%** compared to 2021
- **Sufficiency** and fundamentally changed behaviour in transport
- **Number** of registered **cars decreased by 30%** in the EU (compared to 2021)

up to 2040 & 2050

2050 Milestones

- **Reduction of primary resource consumption by > 80%** compared to 2035 for traction batteries
- **Recycling rate for batteries > 90%** (high-quality recycling)
- **No more ICEs** on the roads in the EU

2

Target 2:
Responsible Procurement

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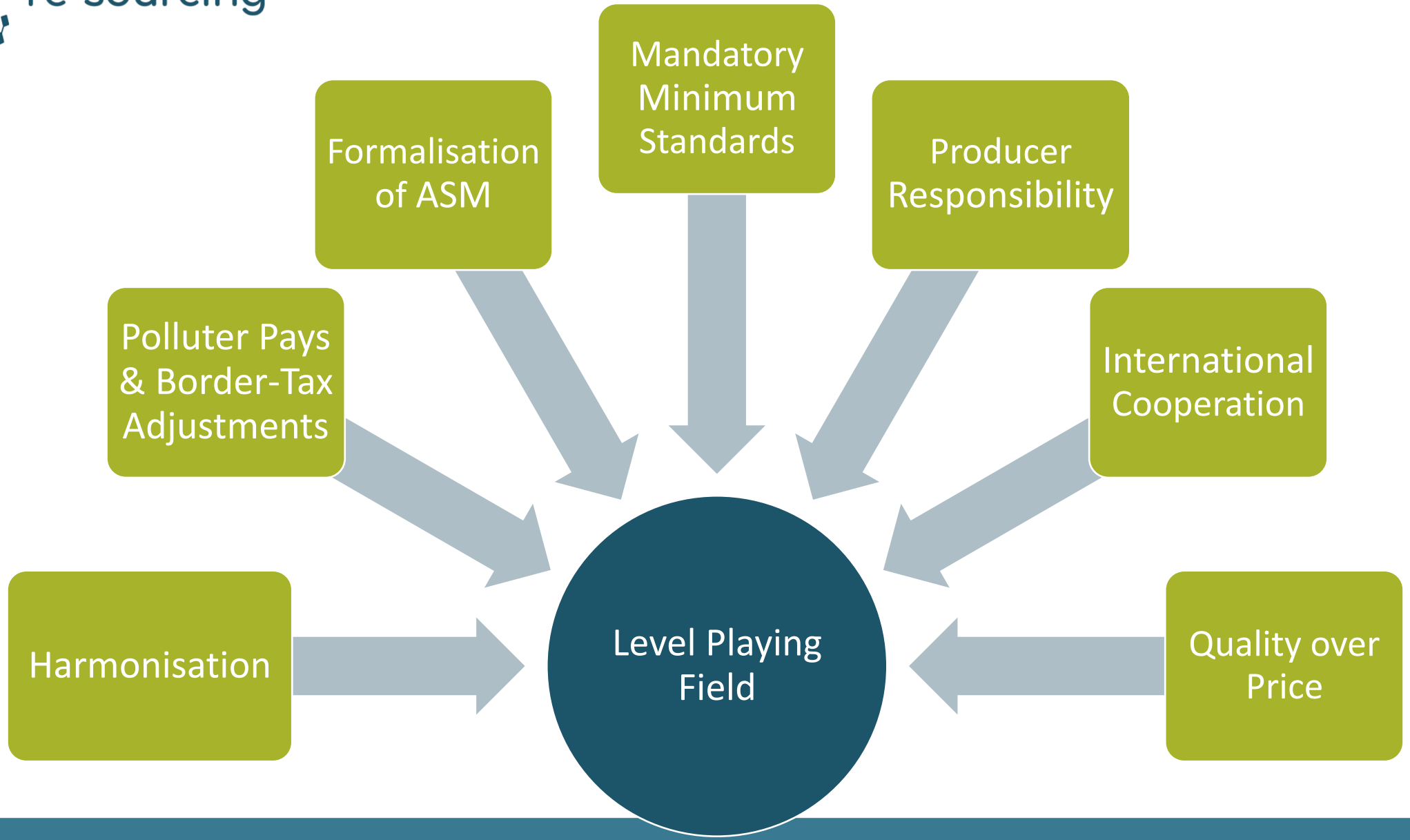
Definition „Sustainable Product“
Local Development
Supply Chain Due Diligence
Supplier Assessments
Standards Tracing & Recycling
Intra-Supply Chain Cooperation
Transparency
Responsible Procurement
Mining in EU

3

Target 3:
Level Playing Field


Mandatory Minimum Standards
Formalisation of ASM
Producer Responsibility
Polluter Pays & Border-Tax Adjustments
International Cooperation
Harmonisation
Level Playing Field
Quality over Price

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THANK YOU

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement № 869276

Backup

Responsible Procurement

Actions up to 2025

2025 Milestones

- Widen the view of responsible sourcing to all three pillars of sustainability: **ESG**
- A standard for reporting of **tracing raw materials** is implemented
- Strong **standards for smelting and recycling**
- All actors together find a common understanding of a **'sustainable product'**
- **Supply Chain Due Diligence** is included from now on in all **Trade Agreements** within G7 for all materials

Continuous Actions

2030 Milestones

- Supply Chain Due Diligence Law
- Zero financial crime
- **SLO** successfully implemented for new mines, cell production and recycling sites
- Within the EU, **100%** of minerals/semi-products purchased come **from responsible sources or responsible recycling processes**

up to 2030 & 2040

2040 Milestones

- Use of **renewable energy** along the entire supply chain in the EU

Actions up to 2050

2050 Milestones

- **No** more **negative impacts**
- Use of renewable energy along the entire supply chain globally

Level Playing Field

Actions up to 2030

2030 Milestones

- **'Polluter Pays' principle** and introduction of **Border-Tax Adjustments**
- Extended producer responsibility (**EPR**)
- **Harmonised** sustainability & reporting criteria
- Harmonised **EU mining** & production policies
- International **application of standards** for responsible mining
- European **common understanding** of working conditions, environmental topics and local development in Europe, and import requirements for responsibly sourced products
- Voice of civil society in producing countries in the permitting process as a mandatory step (**FPIC**)
- Formalisation of **ASM is supported** by all actors and the material is used

Continuous Actions

2040 Milestones

- Achieving **sustainable conditions** in all pillars of sustainability **in EU and all imports** (raw materials, semi- / finished products)

up to 2040 & 2050

2050 Milestones

- **Global common understanding** and fulfilment of **sustainable production** methods
- **International level playing field** is achieved

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Project RE-SOURCING:
Global Stakeholder Platform for Responsible Sourcing

12 partners (lead: WU), AB and PSC
Duration: 1 November 2019 – 31 October 2023
Goals:

- Set up an international platform on responsible sourcing
- Frame for a definition on responsible sourcing
- 3 sectors: Renewable Energy, **Mobility**, Electronics
- 3 sectors with good practice examples to transfer good approaches in the field of responsible sourcing (-> flagship lab, good practice guidance document) and sectoral **roadmap**
- 3 Global Advocacy Fora (Latin America, Asia, Africa)

Color code for your opinion

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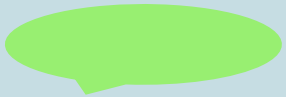
Which are the most important (urgent) recommendations ?	Please mark the Roadmap by using the post-its as indicated	Which recommendations can YOU contribute most to ?
	*I represent*	
	INDUSTRY	
	POLICY	
	ACADEMIA CIVIL SOCIETY	

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RE-SOURCING CONFERENCE 2023

Systemic Change for Responsible Sourcing

September 21 & 22, 2023

Parallel Session – RENEWABLE ENERGY
11:45 – 13:15

W-LAN
Wi-Fi-SSID: wu-conference
Username: **wu0121**
Password: **opi8QnV#u7**

re-sourcing

Insights from the Renewable Energy Sector

Responsible Sourcing in Mineral Value Chains

Michael Tost
Montanuniversität Leoben, Austria

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement № 869276

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Renewable Energy Sector - Scope

- Mining & Processing
  - Copper
  - Rare Earth Elements
  - Quartz/Silicon Metal
- Manufacturing & Recycling
  - Wind Turbines
  - Solar PV Modules
- Supply Chain
  - Procurement

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State of Play Report
Issues and Challenges for Sustainability along the supply chain
Flagship Lab
Good Practice Examples to support the implementation of responsible sourcing
Consultation Process
• Series of 5 webinars
• Expert interviews
• Written feedback
Roadmap & Good Practice Guidance
09/2021

VISION FOR THE RENEWABLE ENERGY SECTOR

2050

2040

2030

2025

CIRCULAR ECONOMY & DECREASED RESOURCE CONSUMPTION

Take back Programmes for Solar PV & Wind Turbines

RESPONSIBLE PROCUREMENT

Copper, Silicon, Rare Earth Elements

Transparancy and Traceability

PARIS AGREEMENT & ENVIRONMENTAL SUSTAINABILITY

Net zero Emissions

Net positive Contribution to Biodiversity

100% Renewable Energy

LEVEL PLAYING FIELD

SOCIAL SUSTAINABILITY & RESPONSIBLE PRODUCTION

Local & regional Development, Stakeholder Engagement

RECOMMENDATIONS FOR POLICY MAKERS, INDUSTRY, CIVIL SOCIETY

STATE OF PLAY

4 **Target 4:** Responsible Procurement

Main Aspects:

- Mandatory supply chain due diligence
- Transparency of mineral supply chains
- Resilient supply chains


Responsible Procurement
Actions until 2025
2025 Milestones
• Standard for tracing raw materials
• Include Supply Chain Due Diligence in all Trade Agreements
• Resilient supply chains
Continuous Actions
2030 Milestones
• Achievement of SDGs along Supply Chain
• Supply Chain Due Diligence Law
• Zero financial crime
• Local & Regional Development
until 2030 & 2040
2040 Milestones
• Mandatory Supply Chain Due Diligence for all international actors
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Recommendations

Policy Makers

Mining:
Enable responsible mining in Europe, no more ‘burden-shifting’

Manufacturing:
Raw materials and products imported from outside the EU need to fulfil the same sustainability requirements as operations inside the EU

Policy Makers

General:

- Implement supply chain due diligence law, mandatory for all international players
- Implement respective control mechanisms

Industry

General:

- Assess and understand strategic vulnerabilities of companies’ supply chains
- Decrease GHG emissions along a company’s supply chain by introducing tailor-made climate protection projects

Industry

Manufacturing:
Take decisive action against modern slavery and forced labour in the supply chains of solar PV and wind turbines

Mining:
Support local procurement

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THANK YOU

for your attention!

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Color code for your opinion

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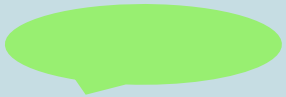
	INDUSTRY	
	POLICY	
	ACADEMIA CIVIL SOCIETY	

The OECD Handbook on Environmental Due Diligence in Mineral Supply Chains

OECD Handbook on Environmental Due Diligence in Mineral Supply Chains

- Rooted in existing OECD Recommendations:
  - **OECD Guidelines for Multinational Enterprises**
  - **Due Diligence Guidance for Responsible Business Conduct**
  - **Due Diligence Guidance for Responsible Supply Chains of Minerals from CAHRAs**
- Support tool to help companies implement existing guidance; does not represent new guidance

Key considerations and principles

- Due Diligence for environmental impacts should be risk based
- Scope: covers all minerals and metals, all geographies
- For use by all companies in mineral supply chains, from miner to refiner to manufacturer
- Looking only at risks of impacts in the upstream and mid-stream segment of the supply chain
- Specific emphasis on artisanal and small scale miners
  - The objective here is to encourage sustained responsible engagement with ASM, rather than de-risking through disengagement.

Structure of the Handbook

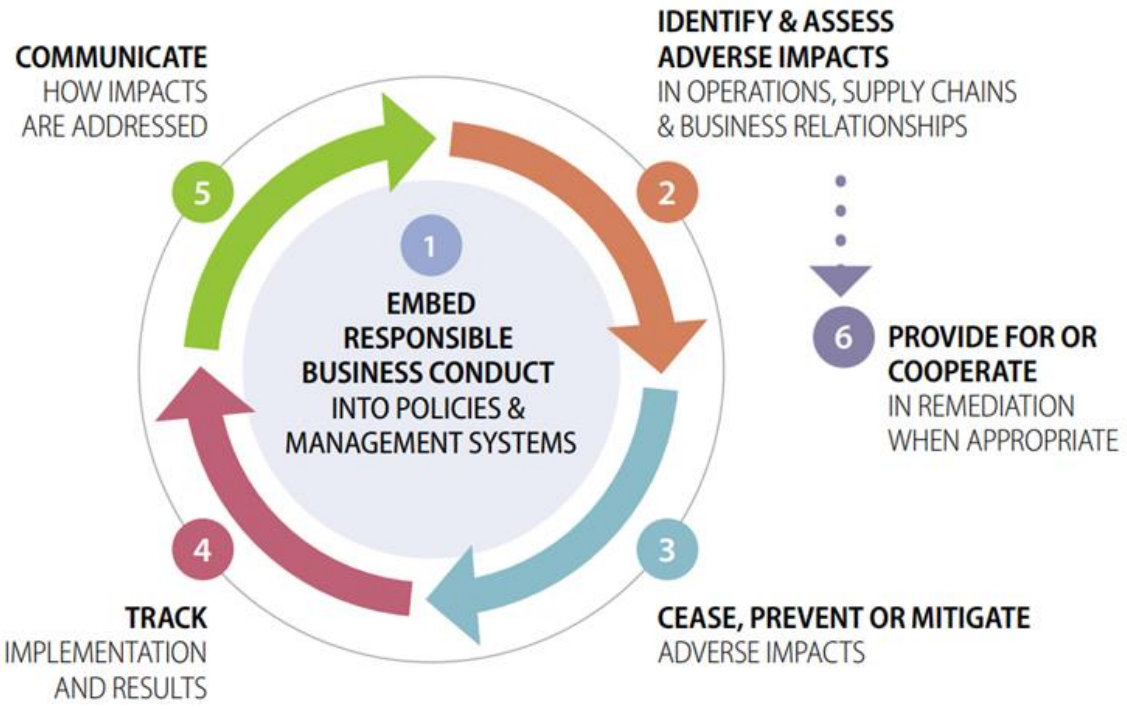
Chapter 1: Introduction

Chapter 2: Understanding environmental risks and impacts

Chapter 3: Step-by-step advice based on the 6-step framework of OECD RBC

Chapter 4: Other considerations when doing due diligence

Annexes: Glossary, helpful resources, relevant legislation, factors influencing impact severity, granting rights to nature, ASM ecological impacts



4

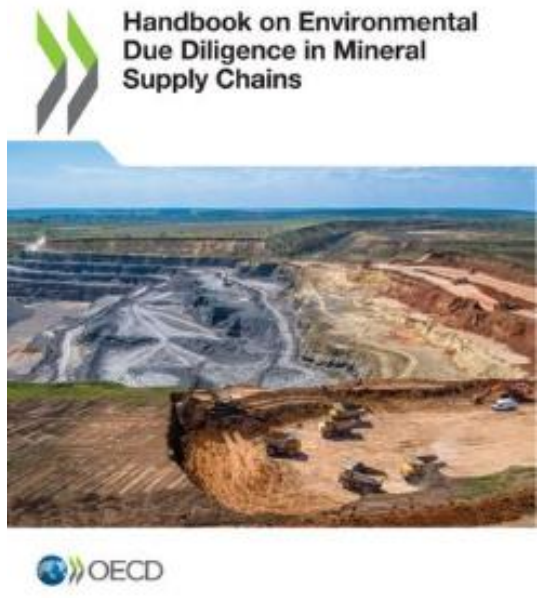
Thank you

Louis Maréchal – louis.marechal@oecd.org

http://www.oecd.org/corporate/mne/mining.htm

https://www.duediligenceguidance.org/

https://www.oecd-ilibrary.org/finance-and-investment/handbook-on-environmental-due-diligence-in-mineral-supply-chains_cef843bf-en



Supply Chain Management

Supply Chain Disruptions (2020)

Supply Chain Crisis (2021)

Supply Chain Disasters (2022)

Austrian Success Stories in Supply Chain Responsibility

André Martinuzzi, Mariana Kovacic-Lukic, Luis Nacken

?

Institute for Managing Sustainability WU

Austrian Success Stories in Supply Chain Responsibility

André Martinuzzi, Mariana Kovacic-Lukic, Luis Nacken

Bundesministerium
Arbeit und Wirtschaft

Agenda

01 Welcome

02 Context, Objectives & Method

03 Case Studies

04 Success factors & policy conclusions

02. Context

- Corporate Social Responsibility
- UN Sustainable Development Goals
- OECD Guidelines for Multinational Enterprises
- Sustainability Reporting following GRI and CSRD
- Greenhouse Gas Protocol (Scope-3 emissions)
- Responsible Sourcing and Due Dilligence
- Resilience of supply chains
- **EU Corporate Sustainability Due Diligence Directive**

Success factors & business case?

02. Objectives

1. provide insights into the **business case** for supply chain responsibility
2. create **case studies** with high public attention, representativeness, and replicability
3. draw **conclusions** for other companies and economic policymakers

02. Method – key questions

1. Activities
2. Motives & Exspektation
3. Implementation
4. Obstacles
5. Success factors

02. Method – comparative case analysis

greiner	plastic and foam solutions
infineon	Semiconductor manufacturing
SAINT-GOBAIN	Construction materials
ZKW	Lighting systems for automotive
STO	Glass packaging
RHOMBERG	Construction services
RHI MAGNESITA	refractory solutions
SEMPERIT	industrial rubber and plastic products
Kelly's	savoury snacks
NESPRESSO	coffee and coffee machines
FAHNEN GÄRTNER	flags and banners
EVVA access to security	access control systems

02. Method – comparative case analysis

RHI MAGNESITA	refractory solutions	Turning Customers into Suppliers
SEMPERIT	industrial rubber and plastic products	Together for Sutainability
Kelly's	savoury snacks	Honest Cashew Initiative
NESPRESSO	coffee and coffee machines	Blockchain for Transparency
FAHNEN GÄRTNER	flags and banners	Responsibility in an SME
EVVA access to security	access control systems	Strengthening the European Economy

RHI Magnesita– The Company

The driving force of the refractory industry

33
Main production sites
(incl. raw material sites)

+100
Countries shipped
to worldwide

5
R&D hubs
and centres

13,500
Employees

€ 3.3bn
2022 revenue

+1,500
Active patents

€ 77m
Investment in R&D and
Technical Marketing
including low-CO_2 emission
products

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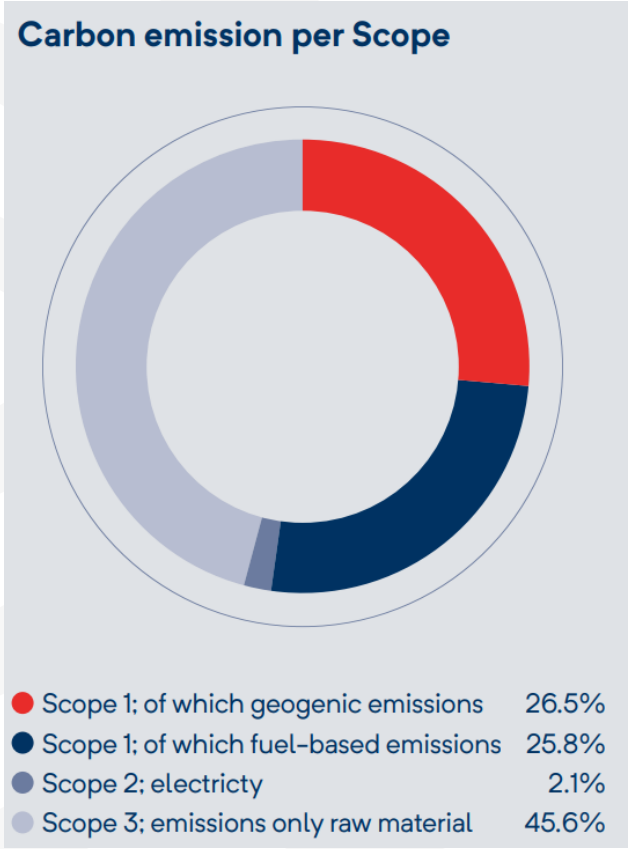
RHI MAGNESITA

RHI Magnesita– Turning Customers into Suppliers

- **Half of our greenhouse gas emissions stem from Scope 3**
  Indirect emissions resulting from activities like extracting and processing raw materials and transporting them to manufacturing sites.
- **Using circular raw materials** reduces emissions and cuts costs
- Goal until 2025 to reach a **15% recycling rate**
- Retrieving used products from our customers, processing them, and incorporating them into the production of new products
- Ensuring quality remains uncompromised
- Transforming our customers into suppliers fosters responsibility across the entire supply chain



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RHI MAGNESITA

RHI Magnesita – The Success Story

- **Exchange and Trust in the Supply Network**
  Through open communication within the supply network and intensive interaction, a foundation of trust is established along the supply chain, fostering opportunities for technological innovations.
- **Partnerships for Innovation**
  Collaboration facilitates the sharing of technical know-how and business contacts, driving innovation.
- **Resilience and Risk Mitigation Across the Supply Chain**
  Incorporating sustainability aspects into supplier evaluation and decision-making enhances reliability and availability throughout the supply chain, mitigating risks.
- **Proactively Addressing Future Challenges**
  Exerting influence on sustainability and responsibility right at the beginning of the supply chain helps proactively address future challenges.

Semperit – The Company

Solid balance-sheet structure

60.6%

Equity ratio

Revenue 1-6/2023:

374.2 MEUR

EBITDA 1-6/2023:

43.7 MEUR

International group

which develops, produces and sells highly specialised products made of rubber in the Industrial Sector

Two Divisions as of 1 July 2023

INDUSTRIAL APPLICATIONS

Focus on industrial applications with highly efficient manufacturing and cost leadership; this includes **hydraulic** and **industrial hoses** as well as **profiles**

ENGINEERED APPLICATIONS

Focus on customised technical solutions. **Handrails for escalators, conveyor belts, cable car rings, other engineered elastomer pruducts,** as well as the **Rico Group**

Over **30** locations worldwide

Listed on Vienna Stock Exchange since

1890

~ 5,000 employees

Leading market position

with strong brands in the Industrial Sector for nearly

200 years

Financial and employee figures differ to those presented in the study.
Semperit Group divested the Sempermed Segment end of 2022 and acquired RICO Group in mid 2023.

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Semperit – Together for Sustainability (TfS)

- TfS is a joint initiative of leading companies in chemical industry
- The purpose of this initiative is to improve the environmental and social conditions along the supply chain of the chemical industry
- TfS members are representing a global annual turnover of over €600 billion* and a global spend of more than €400 billion* in the chemical industry

AdvanSix, AkzoNobel, allnex, Archroma, Arkema, azelis, BASF, Bayer, Brenntag, CABB, Chemours, Clariant, Corteva agriscience, covestro, Croda, Dow, DSM, Eastman, Evonik, Givaudan, Henkel, ICL, iff, IMCD, Kraton, Lanxess, Lenzing, Lonza, lyondellbasell, Merck, Mitsui, OMV, Semperit, Sennics, Sika, Solvay, syngenta, UPM, Wacker, Wanhua

> €600 billion (global turnover)

> €400 billion (global spend)

Semperit 2022:
€1,1 billion turnover
€650 million spend

*Status February 2023

Semperit – Together for Sustainability (TfS)

Institute for Managing Sustainability WU

What is TfS doing?

- TfS supports and coordinates the measurements of sustainability performance of chemical companies and their suppliers by

all results and data are shared with all TfS members

Ecovadis Assessments (off-site audits)

- ✓ 15879 valid assessments (<3 years ago) in TfS-network
- ✓ 7445 assessment in 2023 YTD in TfS-network

TfS-Audits (on-site audits)

- ✓ 893 valid TfS audits (<3 years ago) in TfS-network
- ✓ 293 in 2023 YTD in TfS-network

TfS-Academy

- ✓ 340 courses in 10 languages about ESG topics

Calculation and Exchange of Scope 3 GHG Emission Data

- ✓ Guideline for calculating the carbon footprint in a harmonized way
- ✓ Platform for exchange of product carbon footprint (PCF) data

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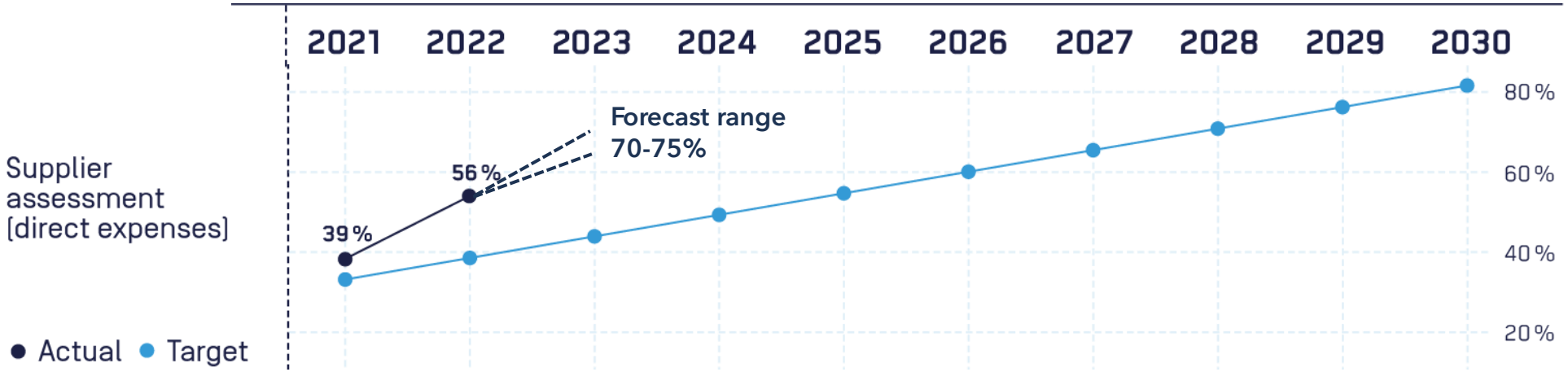
SEMPERIT

Semperit – The Success Study

Institute for Managing Sustainability WU

<u>Why is joining TfS a success story for Semperit?</u>

- Development of Semperit‘s ESG-rated spend coverage by Ecovadis



- Improvement of Semperit‘s Ecovadis Assessment

- ALC-Award in category Sustainability for Semperit (2022)

ALC
Austria's Lea

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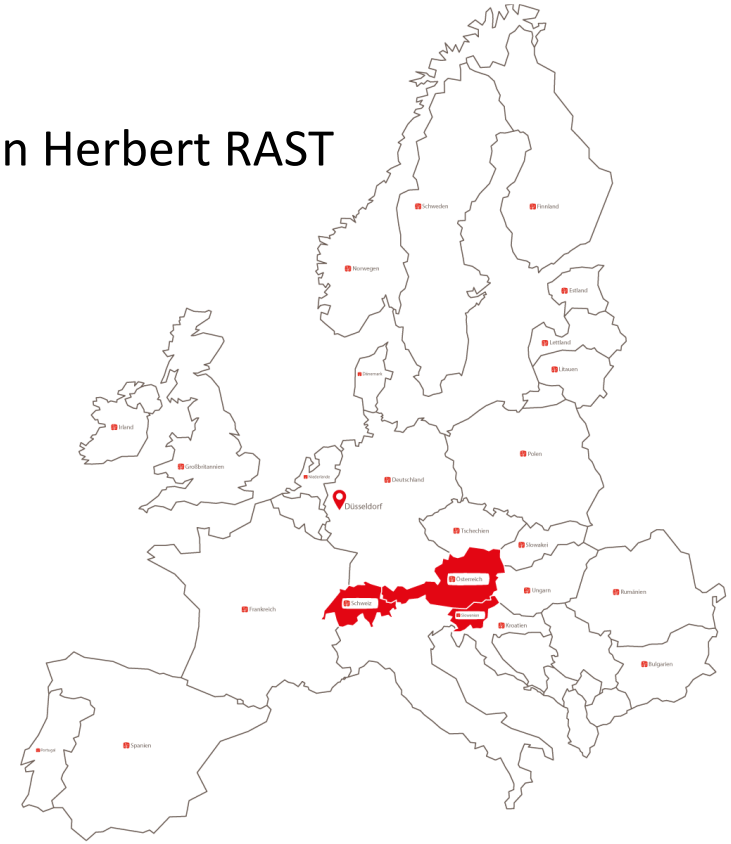
Arbeit und Wirtschaft

SEMPERIT

Kelly Snacks – the company

- Founded in 1955 by the American Howard Morse KELLY and the Austrian Herbert RAST
- Part of the Intersnack Group since 2008
- Responsible as a management unit for the countries **AUSTRIA - SWITZERLAND – SLOVENIA**
- 407 employees in Austria



Our brands:

Kelly's Soletti funny-frisch Chio ültje Tyrrells hand-cooked English crisps

2 production locations

Factory Vienna

Our factory in the 22nd district of Vienna covers 12,000 m2. We produce chips, extruded snacks, popcorn and pellet products on several production lines. The total annual production is around 12,000 tons.

Factory Feldbach

Our factory is located in the heart of the city of Feldbach. We produce pretzel sticks, pretzels, crackers and popped snacks on five baking lines. In total we produce 56 million consumer packs every year which is around 13,000 tons of snacks.

Kelly Snacks – The Company

- Kelly Snacks is an Austrian company specialized in the production and distribution of savoury snacks. Founded in 1955, the company employs approximately 400 people. Since 2008, Kelly Snacks has been part of the Intersnack Group, a German family owned company with around 14,000 employees, 42 production facilities worldwide, and an annual turnover of approximately 3.7 billion euros.
- In 2014, Intersnack introduced a Responsible Sourcing Policy that obligates suppliers to adhere to fair labour conditions and international standards throughout the entire supply chain.
- Under the Honest Cashew Initiative, Intersnack and Kelly voluntarily assume social responsibility and contribute to improving health and fair working conditions in developing countries.

Kelly Snacks – Honest Cashew Initiative

- In cashew nut harvesting and processing workers face health risks and typically work in precarious employment conditions. Improving these conditions was a difficult challenge due to the lack of transparency in the supply chain and its challenges to directly influence on-site conditions.
- Since 2016 the Intersnack Cashew Company (ICC) acquired three factories in Vietnam and two in India in order to gain direct influence over working conditions at the factories and in the countries of origin.
- Local presence created a communication base and provided insights into processing operations. Consequently, technical innovations were introduced which significantly reduced manual labour while reducing health risks, shortening work hours, and enhancing factory productivity.

Kelly Snacks – The Success Story

- **Trust and Strong Communication.** The company ensures transparency, trust, quality, and a strong communication base throughout the supply chain.
- **Enhancing Resilience Through Transparency.** The Honest Cashew Initiative allowed the company to innovate its cashew nut processing methods and enhance its ability to respond during crises.
- **Social Responsibility as the Foundation for Network Improvements**. The company takes responsibility and lays the foundation for quality standards and sustainability across the entire supply network.
- **Continuous Improvements for Long-Term Success.** The company establishes a trustworthy communication basis within the supply network, and gains knowledge and expertise for its own operations.

Nespresso – The Company

- Nespresso was founded in 1986 and employs more than 14,000 employees in 83 countries. Coffee capsules are produced in three facilities in Switzerland and sold worldwide through boutiques and distribution locations.
- In 2003, Nespresso established the 'AAA Sustainable Quality™' program in collaboration with the Rainforest Alliance. It emphasizes quality, efficiency, and responsibility in the supply chain and supports coffee farmers in implementing sustainable and environmentally friendly cultivation practices, securing higher incomes, and improving the quality of coffee. The program currently supports over 150,000 coffee farms in 18 countries.
- With enhancing transparency in the coffee supply chain through technical innovations Nespresso takes on social responsibility in developing countries while ensuring the high quality of its products.

Nespresso – Blockchain for Transparency

- To enable transparency and traceability, Nespresso leverages digital innovations, provides a comprehensive overview of the supply chain and delivers secure information about the coffee bean processing steps.
- Nespresso has pioneered the use of blockchain technology to store and verify information about processing steps in the supply chain. This involves the decentralized recording of information, which, once recorded, cannot be deleted.
- By employing blockchain technology, all stakeholders involved in the supply chain can access shared information in real-time, minimizing delays, errors, and fraud. Additionally, customers are educated about responsible supply chains and can make informed purchasing decisions.

Nespresso – The Success Story

- **Innovation and Technology.** Customers are informed about the conditions in the supply chain and actively involved in the coffee processing process.
- **Ensuring Quality and Exclusivity.** Transparency in the cultivation of raw materials and throughout the supply chain leads to better control over the quality of Nespresso's beans and coffee. The close collaboration with farmers allows the company to ensure specific quality requirements and characteristics of the harvested beans, guaranteeing high-quality coffee.
- **Creating Change at the Source.** Supporting farmers and having a local presence enables Nespresso to ensure sustainability and social responsibility. Nespresso establishes a foundation of trust for effective collaboration with farmers, enhances transparency and accountability in the supply chain, and guarantees fair working conditions.

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Full Transparency across the value Chain

1 **CHERRIES RECEIVED**
at various collection points

2 **CHERRIES WASHED AND PROCESSED**
at various washing stations

3 **CHERRIES MILLED**
at the warehouse

4 **GREEN COFFEE REPACKED FOR SHIPPING**
at a different warehouse

OPEN

OPEN

VERIFY low-carbon and sustainable food production at source.

BACKED BY

WWF | BCG Digital Ventures | BCG | HUMANITY UNITED

OpenSC is a Certified B Corporation

This company meets the highest standards of social and environmental impact

NESPRESSO

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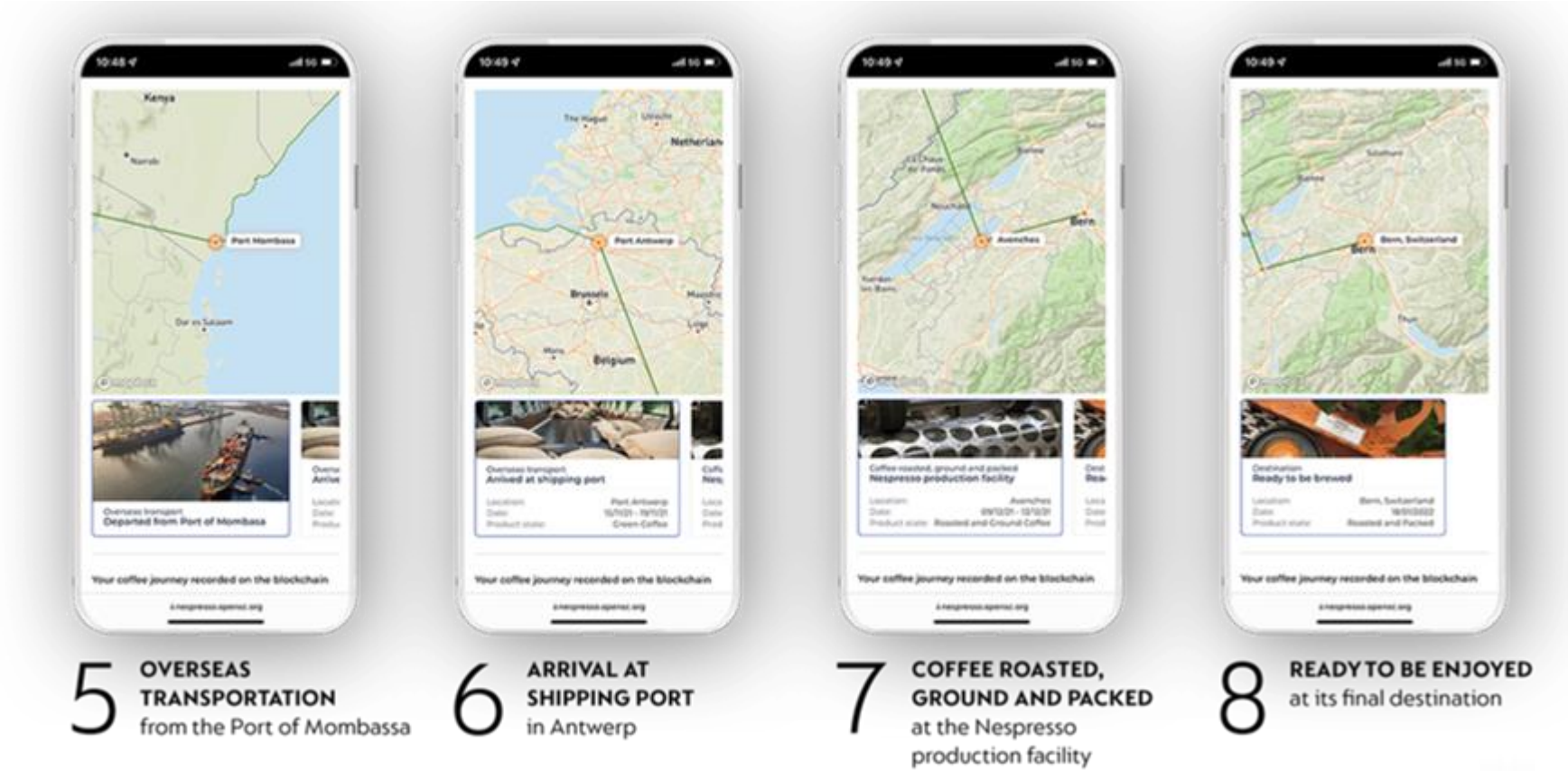
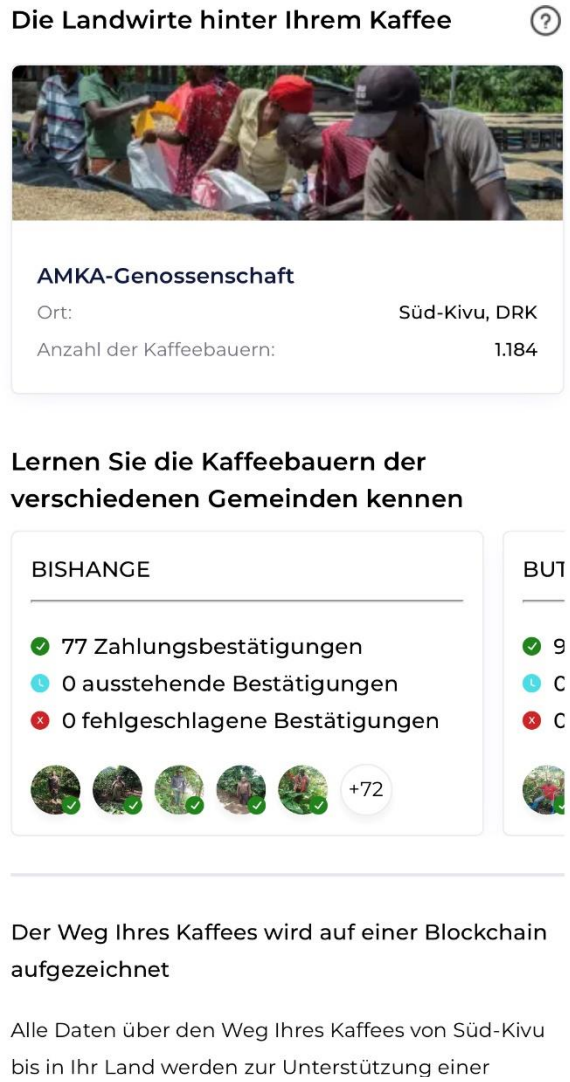
Including Payment Confirmation





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Fahnen Gärtner – The Company

- As a family-owned company founded in Austria in 1945 with approximately 100 employees FAHNEN GÄRTNER manufactures and distributes customized textile promotional items, flags, and flag technology
- FAHNEN GÄRTNER has set itself the goal of manufacturing its main products exclusively at the company site. This makes FAHNEN GÄRTNER one of the few companies in the textile industry that rely on the advantages of local production.
- Despite being relatively small, the company places a strong emphasis on sustainability and responsibility throughout its entire supply chain.
- The company generates 50 percent of its annual energy through photovoltaics and heat recovery, uses recycled materials in production, and places great importance on supply chain responsibility.

Fahnen Gärtner – Responsibility in an SME

- FAHNEN GÄRTNER prefers regional and local sourcing over cheaper procurement on other continents, thereby guaranteeing its customers transparency, sustainability, and responsibility in the supply chain.
- By primarily using regional and national suppliers, FAHNEN GÄRTNER establishes a continuous communication basis and develops and supports smaller, regional suppliers that often provide specialized products. This ensures fair working conditions and a transparent supply chain.
- By considering the product life cycle, the company can extend its responsibility beyond the point of sale.
- The company uses recycled materials in its own production and offers its customers the restoration of purchased flags.

Fahnen Gärtner – The Success Story

- **Promoting Transparency Through Regional Sourcing.** Prioritizing regional supply chains allows FAHNENGÄRTNER to guarantee long-term collaboration and foster awareness of sustainability.
- **Long-Term Partnerships.** The long-term collaboration within the supply network enable FAHNENGÄRTNER to respond flexibly, promptly, and extensively to individual customer requirements.
- **Innovation.** Through supplier partnerships, receives valuable input for the development of its own business.
- **Company Size as Competitive Advantage.** Through its product offering and quality, FAHNENGÄRTNER can ask for a higher price, secure a competitive advantage, and provide its customers with customized products.

EVVA – The Company

- Founded in Austria in 1919 and headquartered in Vienna, EVVA employs over 790 employees across 10 locations throughout Europe. EVVA specializes in developing and manufacturing mechanical and electronic access control systems.
- Modern electronic and mechanical security systems require highly precise and specialized components. For door systems, specific fittings are made of brass and copper, which are usually only available through distributors in Asia. The extraction of zinc and copper often occurs under environmentally damaging conditions and unsafe working conditions.
- EVVA commits to responsible supply chain management by strengthening the European economy in the fittings industry and enhancing production through secondary raw materials

EVVA – Strengthening the European Economy

- In the early 2000s, the labour intensive fittings industry migrated to China and many European manufacturers transitioned into distributors and shifted their manufacturing to the distribution of fittings.
- EVVA, in partnership with one of its European suppliers in the fittings industry, rebuilt a former fittings production facility in Lithuania. The collaboration of the two companies allowed them to pool resources and expertise, reviving a European production site.
- Existing machinery was further developed, new technologies were made available at the site, and additional expertise was obtained through cooperation with industry specialists.

EVVA – The Success Story

- **Long-Term Partnerships.** EVVA gains insights from its suppliers and enhances transparency within the supply network through close partnerships.
- Collaborative Development and Innovations. EVVA supports its suppliers and collaboratively advances their production capabilities, which expands EVVA's sphere of influence while providing greater insight into its own supply chain.
- **Resilience Thanks to European Supply Chains.** Reestablishing fittings manufacturing in Europe allows EVVA to source and deliver materials more efficiently and respond more flexibly to customer demands.
- **Competitive Advantage Through Product Quality**. Short transportation routes, close collaboration with suppliers, and a continuous communication basis provides the company with a reliable supply.

4. Success Factors

Upstream

- Improved Communication, Information, and Trust
- Improved Bargaining Power
- Collaborative Improvements, Development, and Innovation

Company

- Optimized Production and Corporate Processes
- Capability to Act and Autonomy
- Positive External Perception of the Company and the Industry

Downstream

- Greater Resilience and Improved Risk Assessment
- Improved Supply Capability
- Better Products and Quality

4. Successful companies …

1. Prioritize **critical areas**, such as products, raw materials and strategic suppliers
2. Think in **partnerships** rather than transactions
3. Think in networks and systems by searching for **strategic partners**
4. Assess the **full risk** including supply disruptions, image risks, social conditions at supplier side,
5. Think beyond their industry or region and see themselves as part of a **larger system**
6. Engage with **current topics at supplier side**, this can lead to innovation and optimization
7. Take **new perspectives** on existing processes and partnerships
8. Join **sector initiatives** and learn from experiences of others
9. Consider not only suppliers but also **customers and competitors** into their supply chain responsibility
10. Act **proactively** and think **long-term**

4. Policy recommendations

- **Standardization**
- Networking
- Technical Solutions
- Circular Economy

- terms and definitions, evidence, verification, and reporting obligations
- avoid ambiguity and excessive interpretation
- international agreements and regimes that contribute to the global application of the same minimum standards
- regulations in these countries would secure minimum standards and an even playing field

4. Policy recommendations

- Standardization
- **Networking**
- Technical Solutions
- Circular Economy

- further networking within their industries and across industry-spanning supply chains.
- supply chain responsibility as a shared task, not limited to the bilateral cooperation of two companies but rather the establishment of joint initiatives and platforms.
- Binding agreements are occasionally seen as problematic, as they could contradict competition law

4. Policy recommendations

- Standardization
- Networking
- **Technical Solutions**
- Circular Economy

- automatic information exchange, quality assurance, and decision support
- small companies need data exchange with manageable effort
- gaps in documentation could be closed through industry- or matter-specific approximations.
- data on value chains should be made as accessible as possible to the public

4. Policy recommendations

- Standardization
- Networking
- Technical Solutions
- **Circular Economy**

- supply chain responsibility as part of a broader commitment to sustainable development and the circular economy
- financial incentives for circular economy, and taxation of environmentally harmful or poorly produced products.
- resource conservation and the circular economy should play a greater role in public debate

Outlook, conclusions & next steps

-
-
-
-
-
-
-

Austrian Success Stories in Supply Chain Responsibility

André Martinuzzi, Mariana Kovacic-Lukic, Luis Nacken

www.sustainability.eu

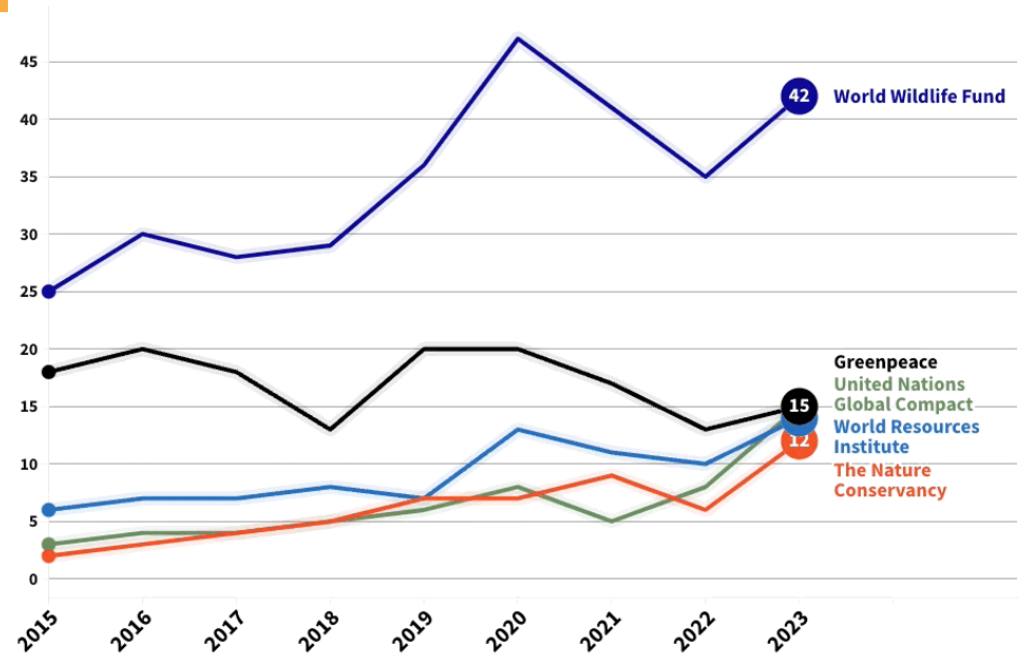
2023

WWF Risk Filter Suite

Why World Wide Fund for Nature

WWF Continues to Be Recognized as the NGO Leader in Sustainable Development

% of Experts, Total Mentions, 2015–2023



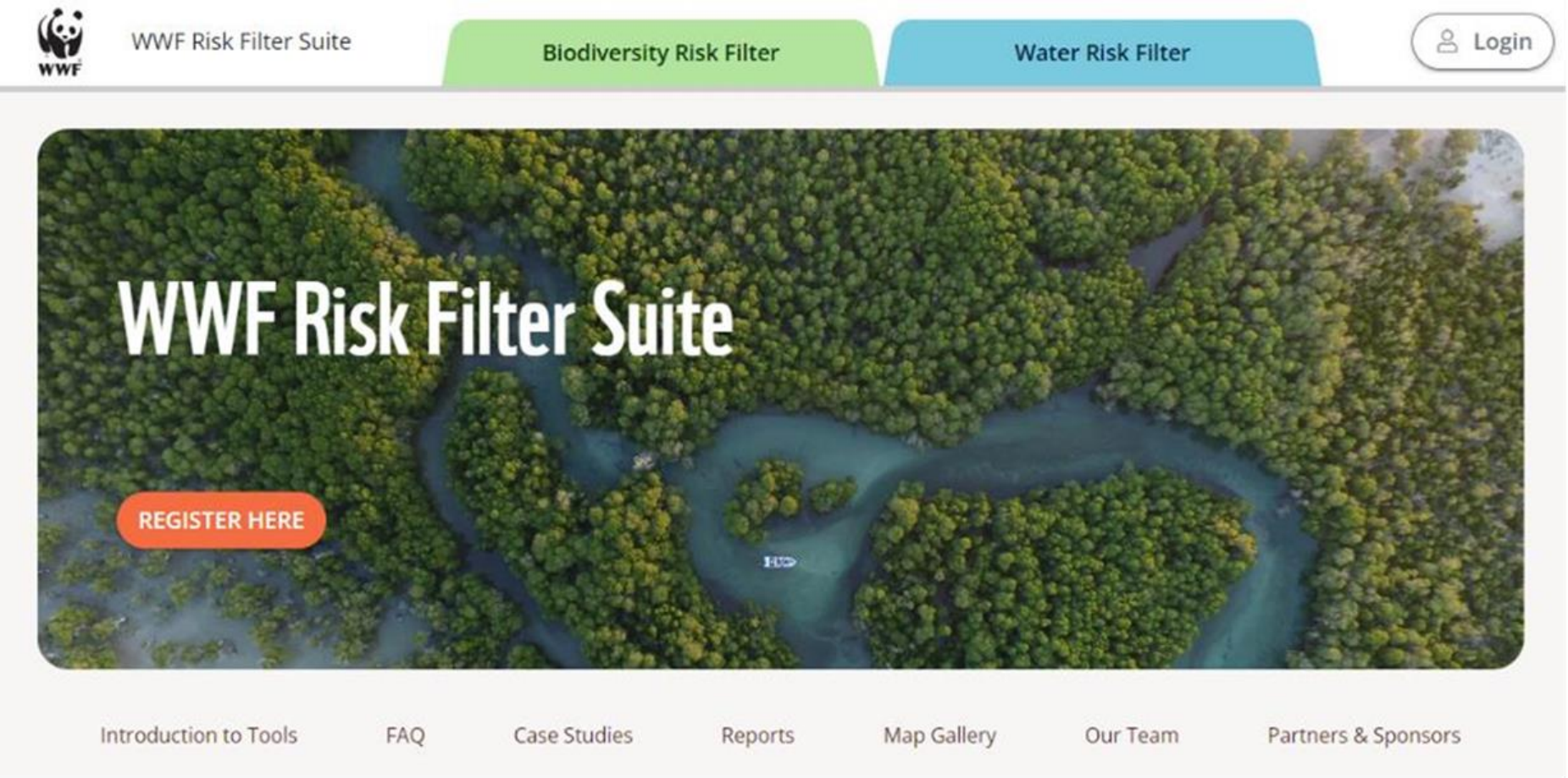
Source: GlobeScan/SustainAbility Survey of 520 experts representing business, government, NGOs, and academia across 63 countries from March – May 2023)

Globe Scan

Global experts:

- Capacity to engage stakeholders (local trust)
- Advocacy at national & global scale
- Innovation & science-based approaches

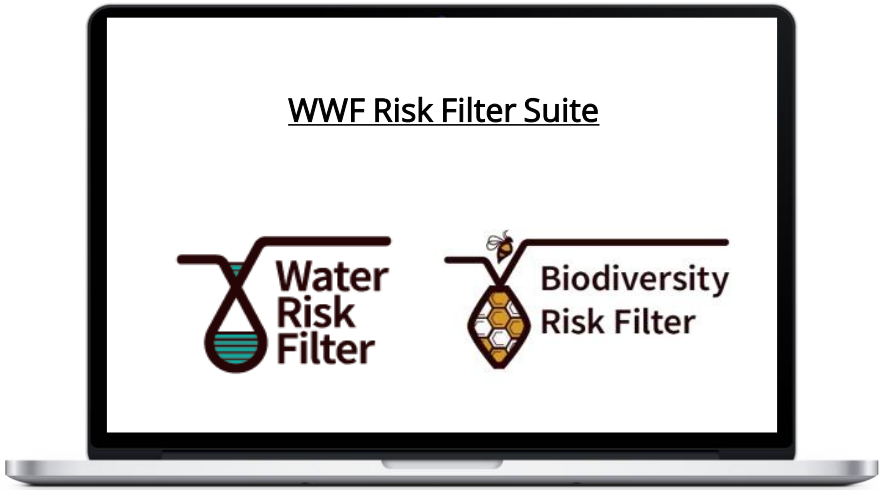
WWF Risk Filter Suite



https://riskfilter.org/

British International Investment · TESCO · KFW DEG Impulse · ABInBev · H&M Group · EDEKA

Biodiversity & Water Stewardship Roadmap



https://riskfilter.org/

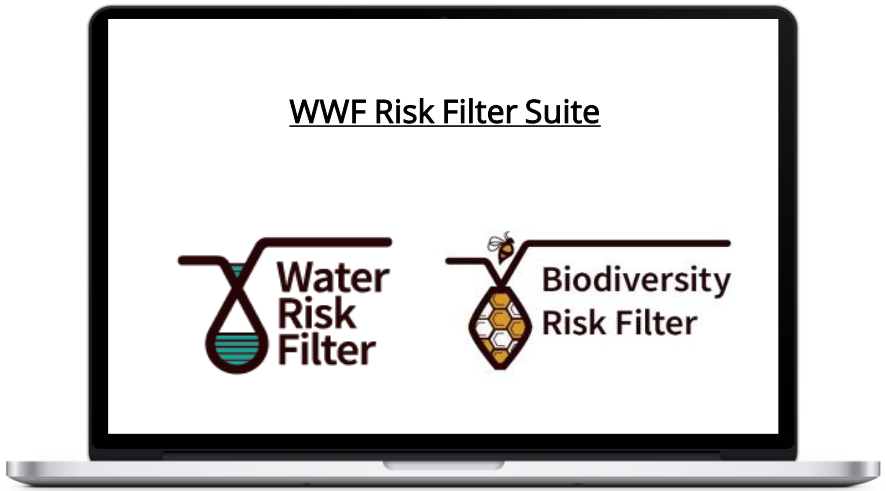
Awareness Building → Knowledge of Impact → Internal Action → Collective Action → Influence Governance





WWF Risk Filter Suite

The WWF Risk Filter Suite compiles free, online and spatially-explicit tools.



https://riskfilter.org/

The tools are designed to be **corporate and portfolio-level screening and prioritization tools** to help companies and investors identify risks hotspots and opportunities across their direct operations, value chain and investments.

This in turn helps companies to better **prioritize where and on what to focus** their corporate actions and inform business strategy and investment decision-making process.

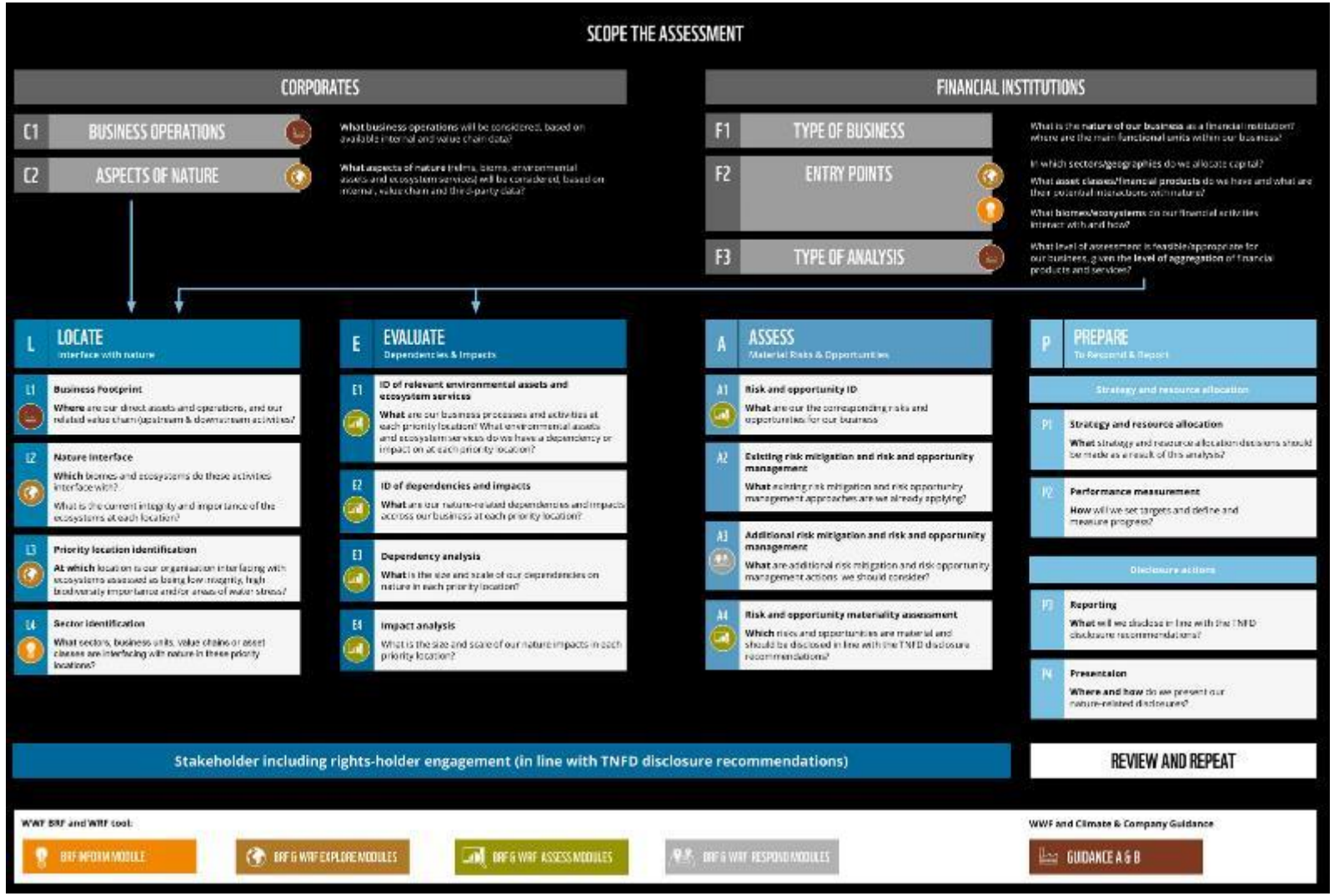
IMPORTANT: The tools are not designed for detailed local level risk assessment or to be used at singular site-level.

Stakeholder and regulatory expectations are increasing

Corporates will need to comply with many new standards on biodiversity and water

- Science-Based Targets for Nature
- CDP
- Global Reporting Initiative
- Climate Disclosure Standards Board
- Task Force for Nature-related Financial Disclosures
- EU Sustainable Finance Disclosure Regulation
- EU Corporate Sustainability Reporting Directive
- Post 2020 Global Biodiversity Framework (CBD)

Alignment with TNFD (LEAP Approach)



Suggested outputs of LOCATE phase:

- **Geospatial map** of the operational locations, and upstream and downstream value chain locations, overlaid on geospatial biodiversity data
- A list of the organisation's **priority locations** (direct, upstream and downstream)

Suggested outputs of EVALUATE phase:

- A list of the **relevant environmental assets and ecosystem services** at each priority location;
- A list of relevant **nature-related dependencies and nature impacts**, according to the selected scope;

Suggested outputs of ASSESS phase:

- A 'long list' of **relevant nature-related risks and opportunities** the organisation should act on
- A **matrix of material risks** consistent with the enterprise management framework of the organisation (e.g. significance by sector, business line, location, value chain, etc).

Alignment with other Initiatives

DRAFT EUROPEAN SUSTAINABILITY REPORTING STANDARDS

SCIENCE BASED TARGETS NETWORK
GLOBAL COMMONS ALLIANCE

SBTN 5-step approach:

1	ASSESS	• Conduct a full value chain and materiality assessment, supported by digital tools	WWF BRF/WRF provides support
2	INTERPRET & PRIORITIZE	• Refresh your prioritization of locations and value chain partners for action • Align issue areas and ambition levels with needs of global and local stakeholders	WWF BRF/WRF provides support
3	MEASURE, SET & DISCLOSE	• Complete baseline measurement and SBT setting for all nature-related issue areas	WWF BRF/WRF tools are not target setting tools
4	ACT	• Develop and implement synergistic and science-based action plans for nature that can deliver on multiple objectives, e.g. for climate and land, biodiversity and water availability	WWF BRF/WRF Respond Module will provide support in the future
5	TRACK	• Monitor progress across your value chain • Upload data on your progress to a shared interface that tracks the targets and progress of your collaborators and peers	

Building on and aligning with existing solutions

ENCORE

IBAT

RepRisk
Due diligence on ESG and business conduct

What the Risk Filter Suite Is (and Is Not)

What this is

A user-oriented tool of **nature-related risks to business,** supporting companies and financial institutions in identifying financially material issues

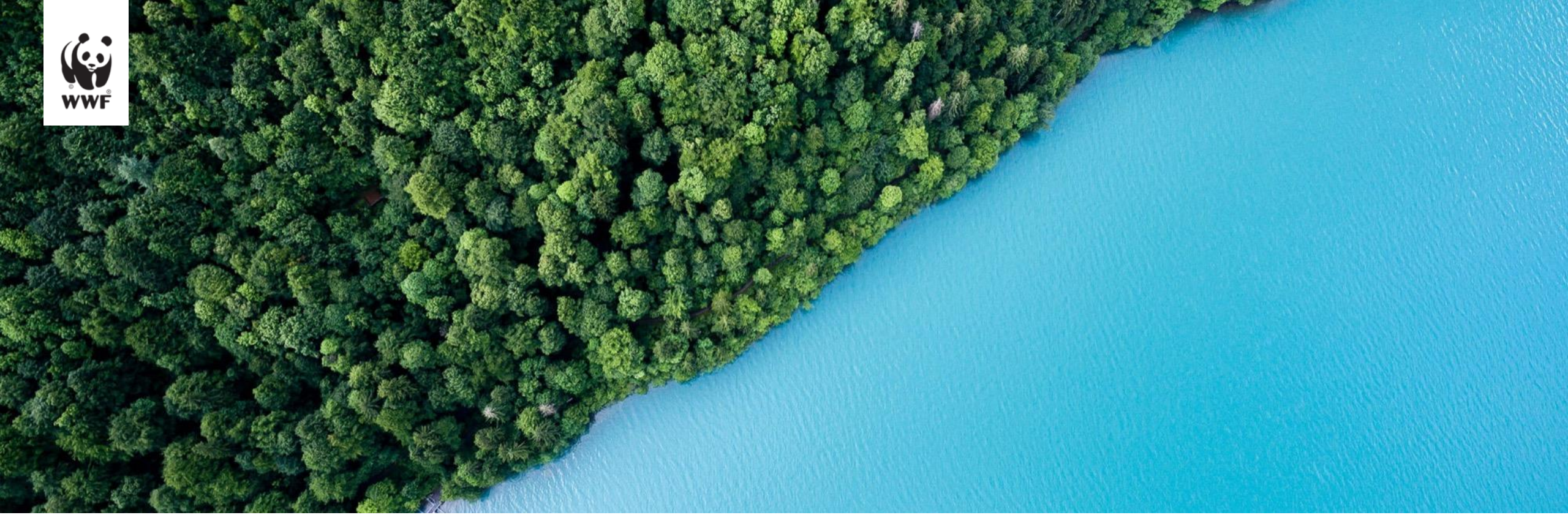
A **corporate and portfolio-level screening and prioritization tool,** helping companies and financial institutions prioritize where to focus action and investments

What this is not

A comprehensive model of **nature-related risks to nature & people** that captures nature in all its facets

A **footprint assessment tool** that provides biodiversity & water impact scores across corporate spheres of influence

A **site-level assessment tool** that provides highly granular or near-real time information at local scale



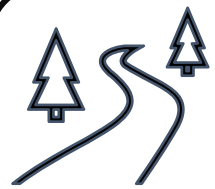
Introduction to the WWF Risk Filter Suite: Tools & Frameworks

Risk Framework

Industry Sector Dependencies & Impacts

*Different approaches in WRF & BRF

- % weighting by industry in WRF + operational risk (optional)
- 1-5 rating by industry in BRF based on ENCORE



State of Freshwater & Biodiversity

- 32 global datasets in WRF
- 50+ global datasets in BRF

Company Input Data
In Risk Filter
Portfolio Manager

Location & Industry of
Company sites to be assessed

Basin/Scape risk score across all company sites:

- Water basin risk in WRF
- Biodiversity scape risk BRF

Risk Framework: Three Corporate Risk Types

PHYSICAL RISK

REGULATORY RISK

REPUTATIONAL RISK

	PHYSICAL RISK	REGULATORY RISK	REPUTATIONAL RISK
Water Risk Filter	✓	✓	✓
Biodiversity Risk Filter	✓	*In Development*	✓

Data & Indicators – Water Physical, Regulatory, Reputation Risks

Total of 32 indicators

	Category	Indicators	
Physical	Water Scarcity	Aridity, Water depletion, Baseline water stress, Blue water scarcity, Available water remaining (AWARE), Drought frequency probability & Project change in droughts occurrence	13 indicators
	Flooding	Estimated flood occurrence & Projected change in flood occurrence	
	Water Quality	Surface water quality index	
	Ecosystem Service Status	Fragmentation status of rivers, Catchment ecosystem services degradation level & Projected impacts on freshwater biodiversity	
Regulatory	Enabling Environment	Freshwater policy status, Freshwater law status & Implementation status of water management plans	12 indicators
	Institutions & Governance	Corruption perceptions index, Freedom in the world index & Business participation in water management	
	Management Instruments	Management instruments for water management, Groundwater monitoring data availability and management & Density of runoff monitoring stations	
	Infrastructure & Finance	Access to safe drinking water, Access to sanitation & Financing for water resource development and management	
Reputational	Cultural Importance	Cultural diversity	7 indicators
	Biodiversity Importance	Freshwater endemism & Freshwater biodiversity richness	
	Media Scrutiny	National media coverage & Global media coverage	
	Conflict	Conflict news events (RepRisk) & Hydro-political risk	

[See the Water Risk Filter Methodology]

Data & Indicators – Biodiversity Physical and Reputation Risks

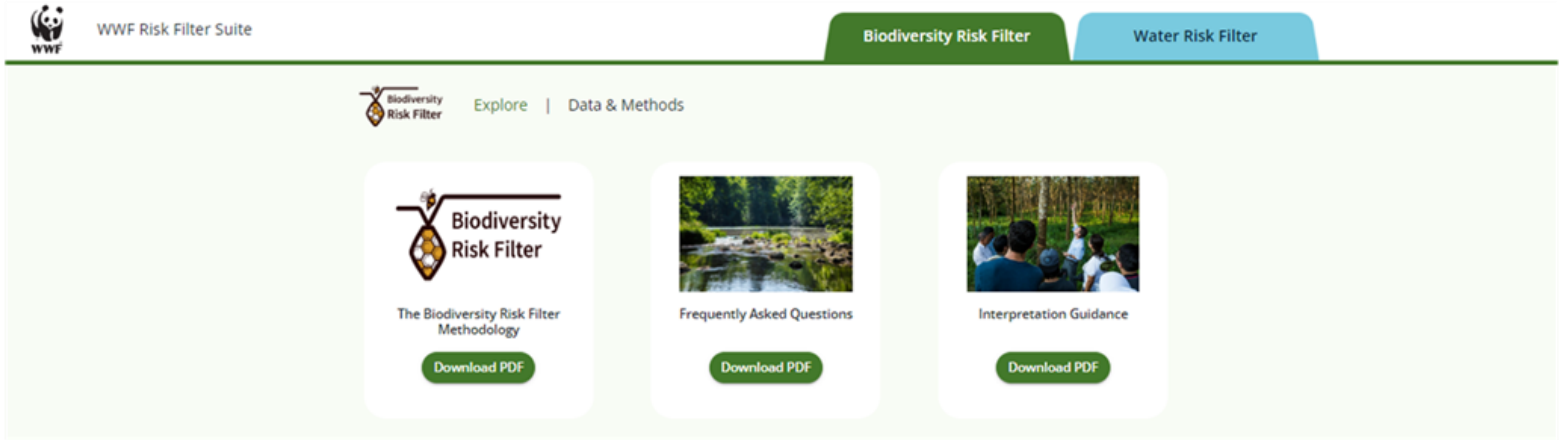
Total of 33 indicators

	Category	Indicators	
Physical	Provisioning Services	Water Scarcity, Forest Productivity and Distance to Markets, Limited Wild Flora & Fauna Availability, Limited Marine Fish Availability	20 indicators
	Regulating & Supporting Services - Enabling	Soil Condition, Water Condition, Air Condition, Ecosystem Condition, Pollination	
	Regulating Services - Mitigating	Landslides, Fire Hazard , Plant/Forest/Aquatic Pests and Diseases, Herbicide Resistance, Extreme Heat, Tropical Cyclones	
	Cultural Services	Tourism Attractiveness	
	Pressures on Biodiversity	Land, Freshwater and Sea Use Change, Tree Cover Loss, Invasives, Pollution,	
Reputational	Environmental Factors	Protected/Conserved Areas, Key Biodiversity Areas, Other Important Delineated Areas, Ecosystem Condition, Range Rarity	13 indicators
	Socioeconomic Factors	Indigenous Peoples (IPs); Local Communities (LCs) Lands and Territories, Resource Scarcity: Food - Water – Air, Labor/Human Rights, , Financial Inequality	
	Additional Reputational Factors	Media Scrutiny , Political Situation, Sites of International Interest, Risk Preparation	

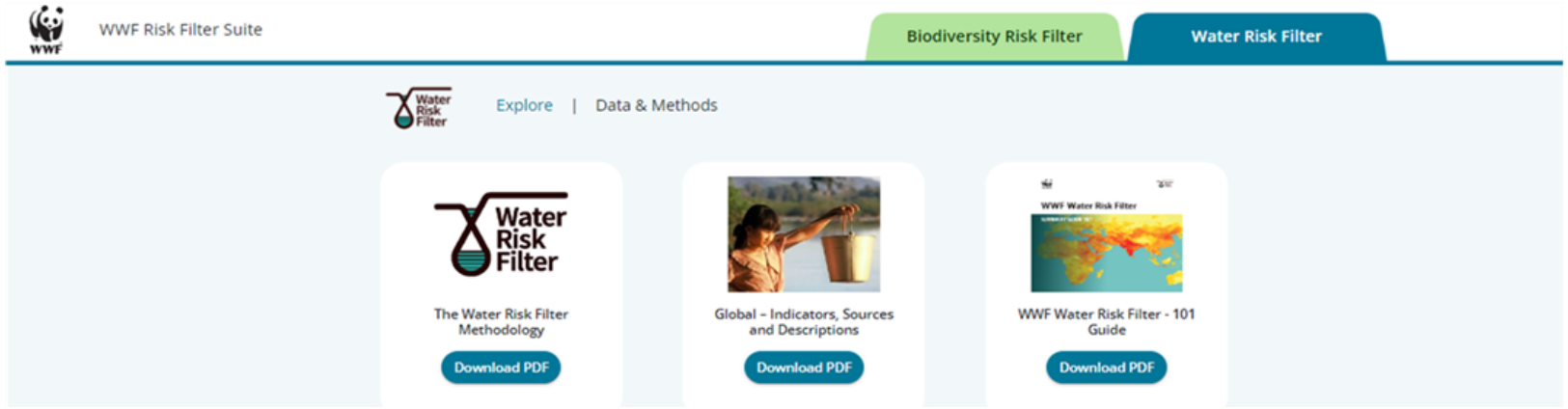
See the Biodiversity Risk Filter Methodology

Data & Methods

Data & Methods Biodiversity Risk Filter: https://riskfilter.org/biodiversity/explore/data-and-methods



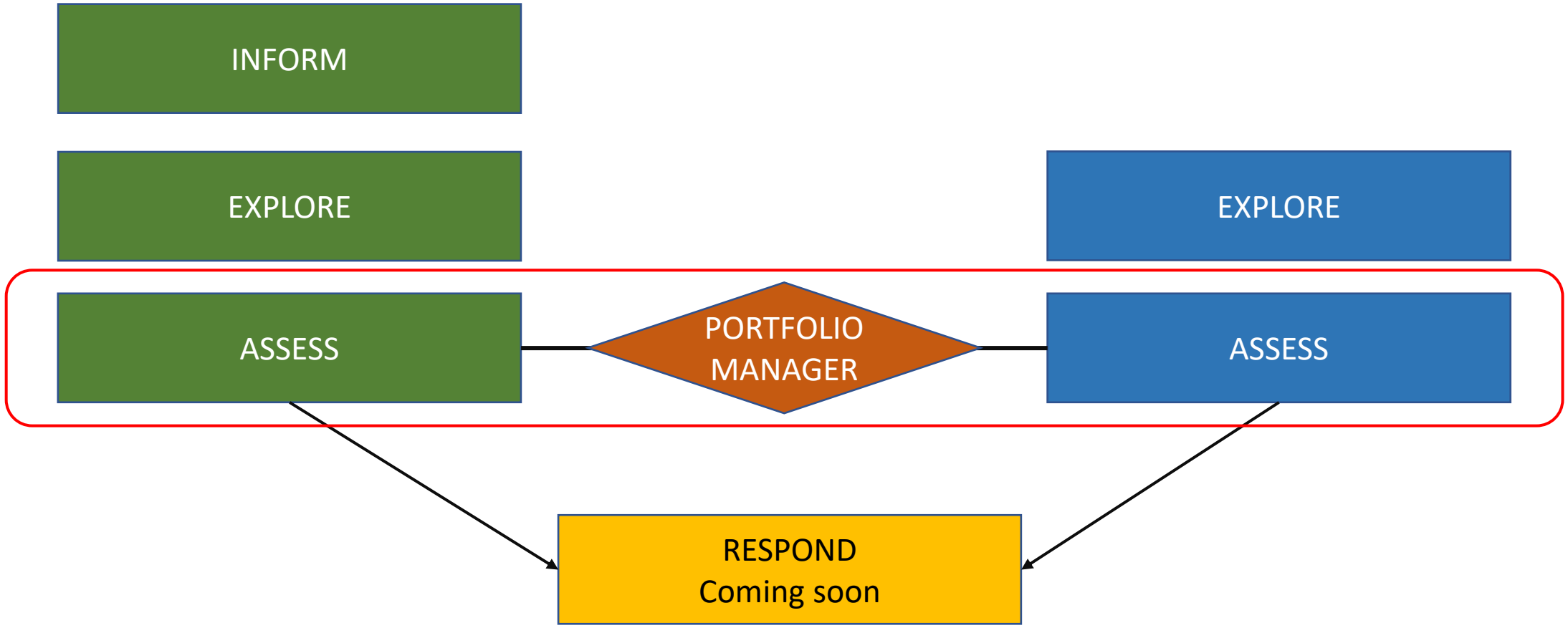
Data & Methods Water Risk Filter: https://riskfilter.org/water/explore/data-and-methods



WWF Risk Filter Tools & Modules

Biodiversity Risk Filter

Water Risk Filter



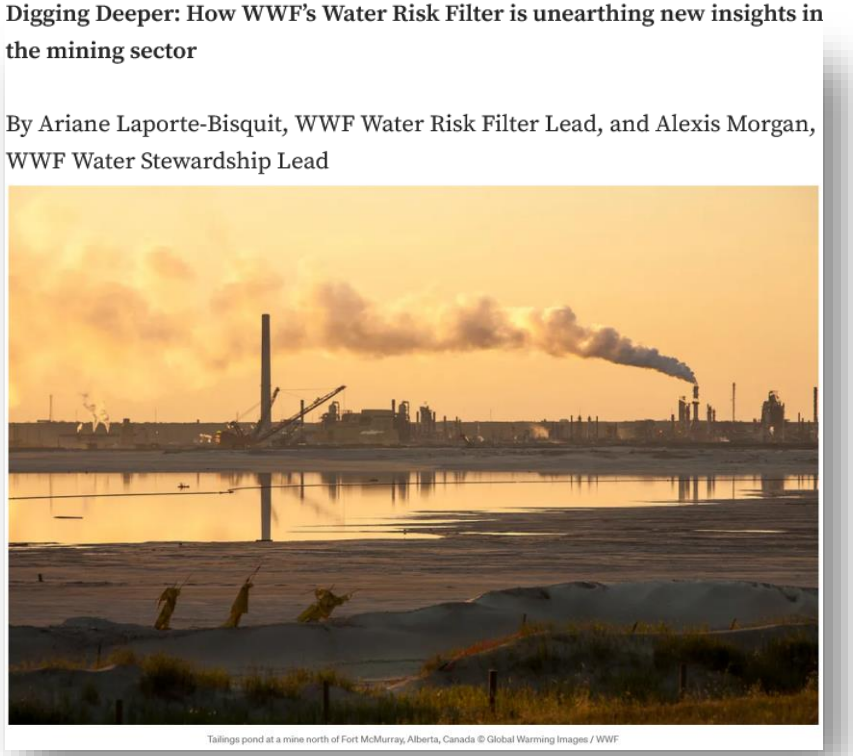
Risk Assessments for Mining sector

Mining companies and commodities face significant water risks, warns WWF report

Posted on 05 February 2020

With water crises worsening across the world, a new WWF report highlights the range of water risks facing the mining industry – and calls on companies and investors to urgently assess and respond to the growing water risks to their businesses and assets.

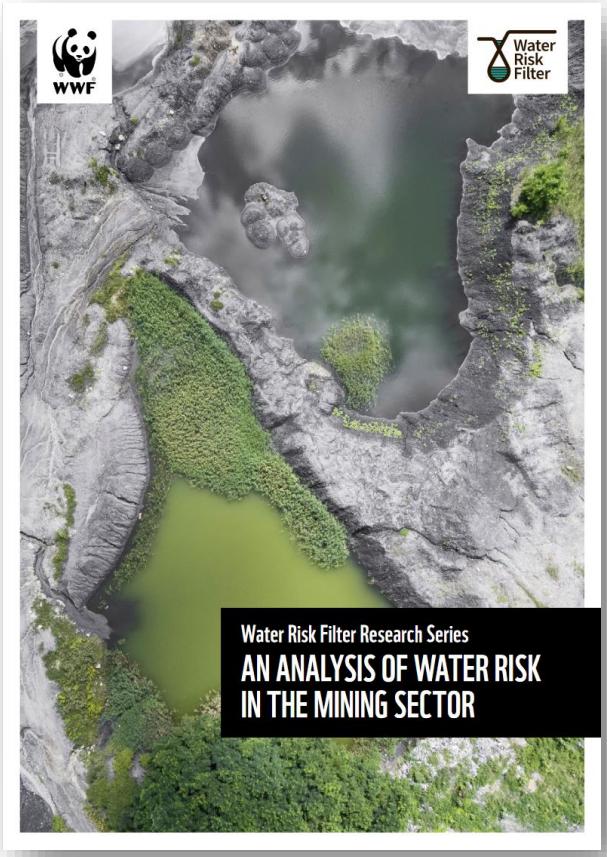
WWF report highlights water risks to mining sector



Digging Deeper: How WWF's Water Risk Filter is unearthing new insights in the mining sector

By Ariane Laporte-Bisquit, WWF Water Risk Filter Lead, and Alexis Morgan, WWF Water Stewardship Lead

Tailings pond at a mine north of Fort McMurray, Alberta, Canada © Global Warming Images / WWF



Link to web stories:

- Mining companies and commodities face significant water risks, warns WWF report
- Digging Deeper: How WWF's Water Risk Filter is unearthing new insights in the mining sector

Link to report:

- Water Risk Filter Research Series - AN ANALYSIS OF WATER RISK IN THE MINING SECTOR

Risk Assessments for WWF Corporate Partners

Resources

- How to Video Tutorial: https://www.youtube.com/playlist?list=PLMvtA1H1MyPv9v450eP8O4mpY-O-H8hGd
- PDF Tutorial to Assess Water and Biodiversity Risk: https://panda.maps.arcgis.com/sharing/rest/content/items/bffb9342f19449e7b148801ebfecf62f/data
- WWF Risk Reports: https://riskfilter.org/risk-reports
- User Case Studies: https://riskfilter.org/case-studies
- Data & Methods Biodiversity Risk Filter: https://riskfilter.org/biodiversity/explore/data-and-methods
- Data & Methods Water Risk Filter: https://riskfilter.org/water/explore/data-and-methods

Number of users of the WWF Risk Filter Suite: over 8,000 registered users having assessed over 900,000 sites

Example of water risk assessments delivered by Risk Filter team for WWF corporate partners

British International Investment, IKEA, H&M Group, KFW DEG, EDEKA, Google, Tchibo, alpro, Carlsberg, mondi

WWF Risk Filter Team can provide a range of different services for bespoke water risk assessment & recommendations.

Get in touch: riskfilter@wwf.de

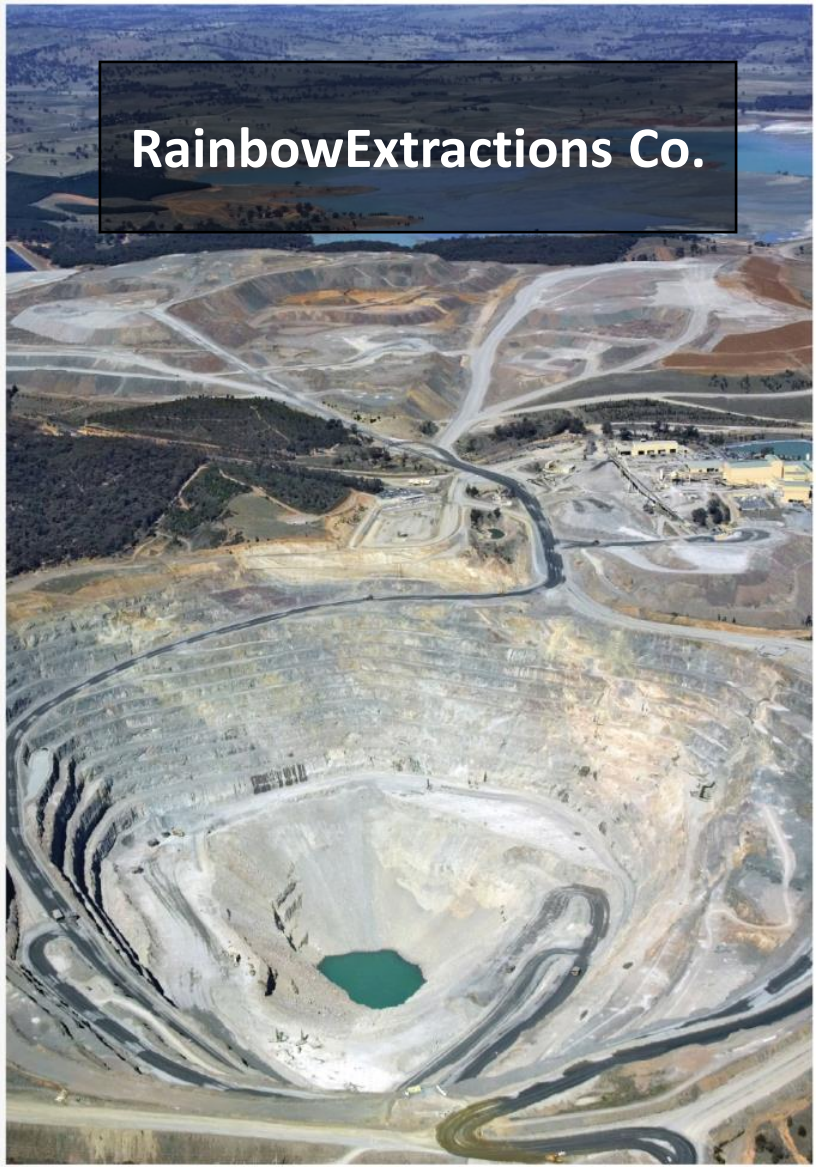
Case study

The company “RainbowExtractions Co.“ is a global mining enterprise that specializes in extracting coal, copper, iron, aluminum and other metals.

With operations spanning **multiple countries and continents**, its expansive supply chain starts from site planning and extraction to refining and distribution.

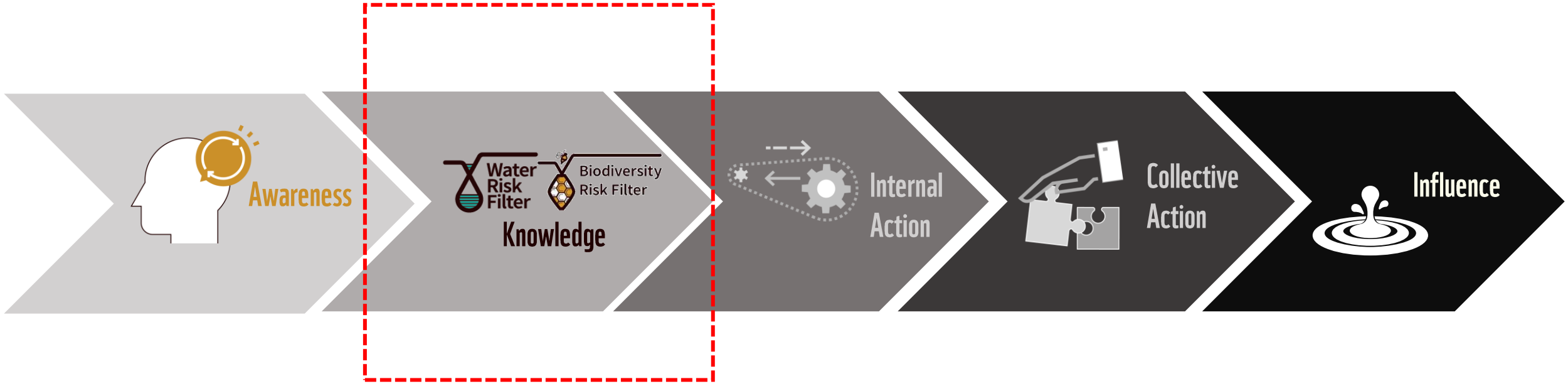
Recently, a consortium of stakeholders, including international environmental NGOs and institutional investors, have highlighted the importance of **responsible sourcing**.

Prompted by growing environmental regulations, increased stakeholder concerns, and an intrinsic commitment to responsible operations, RainbowExtractions recognized the urgent need to assess potential **biodiversity and water risks in its supply chain** and start the **stewardship journey**.



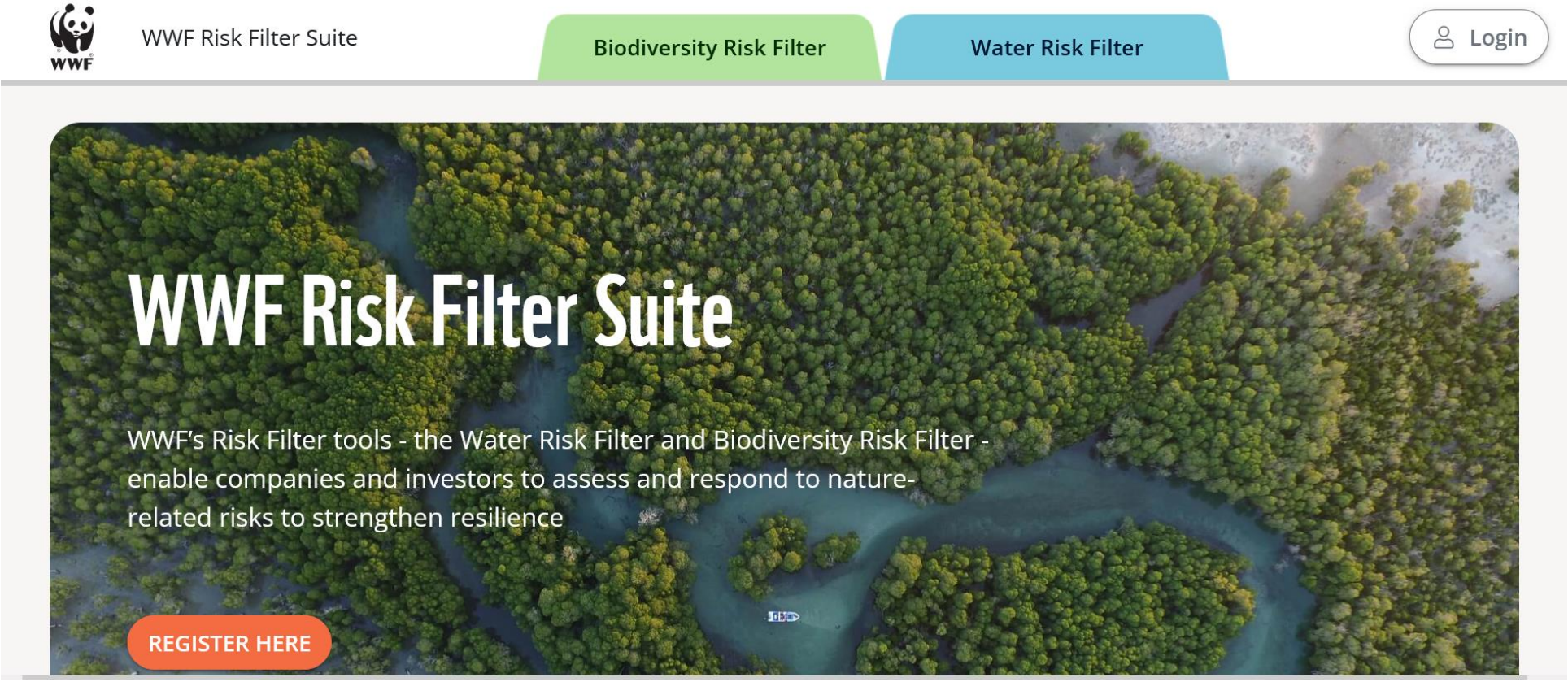
Disclaimer: This case is based on a fictitious company.

Biodiversity & Water Stewardship Roadmap



Let's work on the tool

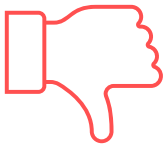
https://riskfilter.org/



DATA UPLOAD: Do's and Don'ts

The Do's

1. Add the name of company(ies) (and group(s)) before adding sites
2. Site names should be unique across your companies
3. Provide latitude and longitude as WGS84 decimal degrees and in this format [latitude, longitude]
4. Paste the data as values in the excel templates
5. Perform a visual check of the data before uploading
6. Click on the question marks (?) or the help tab to get additional guidance



The Don'ts

1. Upload more than 5,000 in one company or group
2. Change the excel template file structure
3. Provide incomplete addresses
4. Change the sites IDs in the excel

re-sourcing

RE-SOURCING CLOSING CONFERENCE

Ensuring responsible sourcing through the application of the United Nations Framework Classification for Resources (UNFC) as a holistic classification scheme

Co-organized by EIT Raw Materials and UNECE

eit RawMaterials

UNECE

Day 2 – 22 September 2023

WELCOME & HOUSEKEEPING

EIT Raw Materials & UNECE

Dr. Patrick Nadoll
EIT RawMaterials
Senior Advisor

Ghadi Sabra, MSc
Politecnico di Torino
PhD candidate

Dr. Ulrich Kral
Environment Agency Austria
Waste Expert

Dr. Slavko Solar
UNECE
Economic Affairs Officer

EIT Raw Materials & UNECE

Europe	48
Asia	5
South America	4
Africa	2
Australia	1
Grand Total	**60**

Industry	21
Academia	15
Policymaker	9
NGO	7
Industry | NGO	3
Academia | Policymaker	2
Industry | Policymaker	1
Academia | NGO	1
Industry | Academia	1
Grand Total	**60**

EIT Raw Materials & UNECE

1. UNFC basics
2. Primary raw materials
3. Secondary raw materials
4. UNFC in mineral inventories
5. State of play
6. ERMA investment funnel and EIT RawMaterials perspective
7. VECTOR GIS platform example
8. Discussion and Q&A

UNECE

The United Nations Framework Classification for Resource (UNFC)
Basics

RE-SOURCING Conference | EIT Raw Materials and UNECE Workshop | Vienna, Austria | 22 September 2023

The United Nations Economic Commission for Europe (UNECE)

The United Nations Economic Commission for Europe (UNECE) was set up in 1947 by **ECOSOC.**

It is one of five regional commissions of the UN, including:

- Economic Commission for Africa (ECA),
- Economic and Social Commission for Asia and the Pacific (ESCAP),
- Economic Commission for Latin America and the Caribbean (ECLAC),
- Economic and Social Commission for Western Asia (ESCWA).

- **UNECE** aims to promote **pan-European economic integration, within** its **56 Member States** in Europe, North America, and Asia – Yet, all **interested UN Member States** may participate in the work of UNECE.
- **Over 70 International professional organizations** and other **non-governmental organizations** take part in UNECE

The area of expertise of the UNECE includes several sectors, such as:

- Economic cooperation and integration
- **Energy (including Sustainable Resource Management)**
- Environment
- Housing and land management
- Gender, population
- Statistics
- Timber
- Trade
- Transport

https://unece.org/sustainable-energy/sustainable-resource-management

The Expert Group on Resource Management (EGRM)

- **EGRM** has over **300 active members** representing international organizations, professional associations, governments, academia, industry, and civil society.
- Working groups and task forces work continuously to advise EGRM's parent inter-governmental body, the UNECE Committee on Sustainable Energy.
- Membership in EGRM is open to anyone interested in the sustainable management of resources.

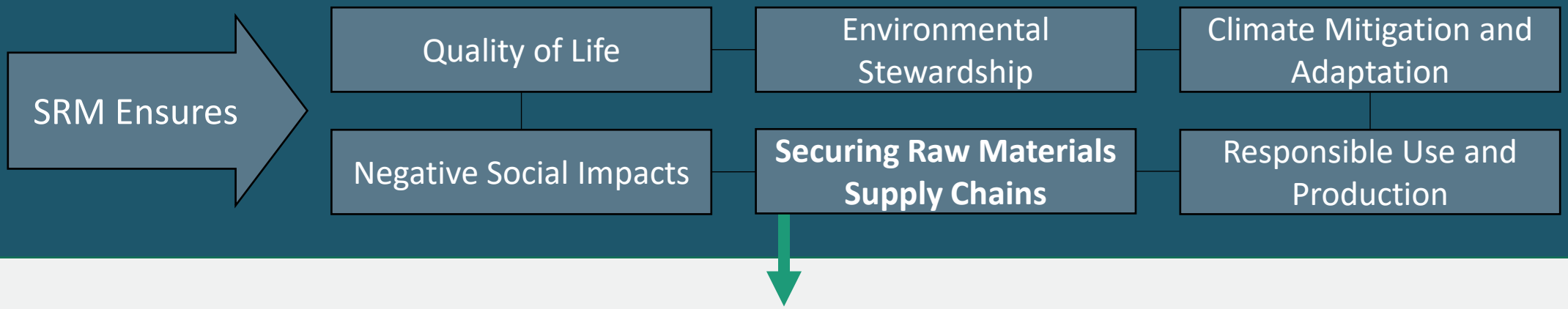
UNFC & UNRMS were developed by **EGRM** at **UNECE** for Global Application

The UN Policy Brief – May 2021

15. **Implement a shared principles-based, integrated, sustainable resource management framework** using tools such as the existing United Nations Framework Classification for Resources (UNFC) and the United Nations Resource Management System (UNRMS) under development.

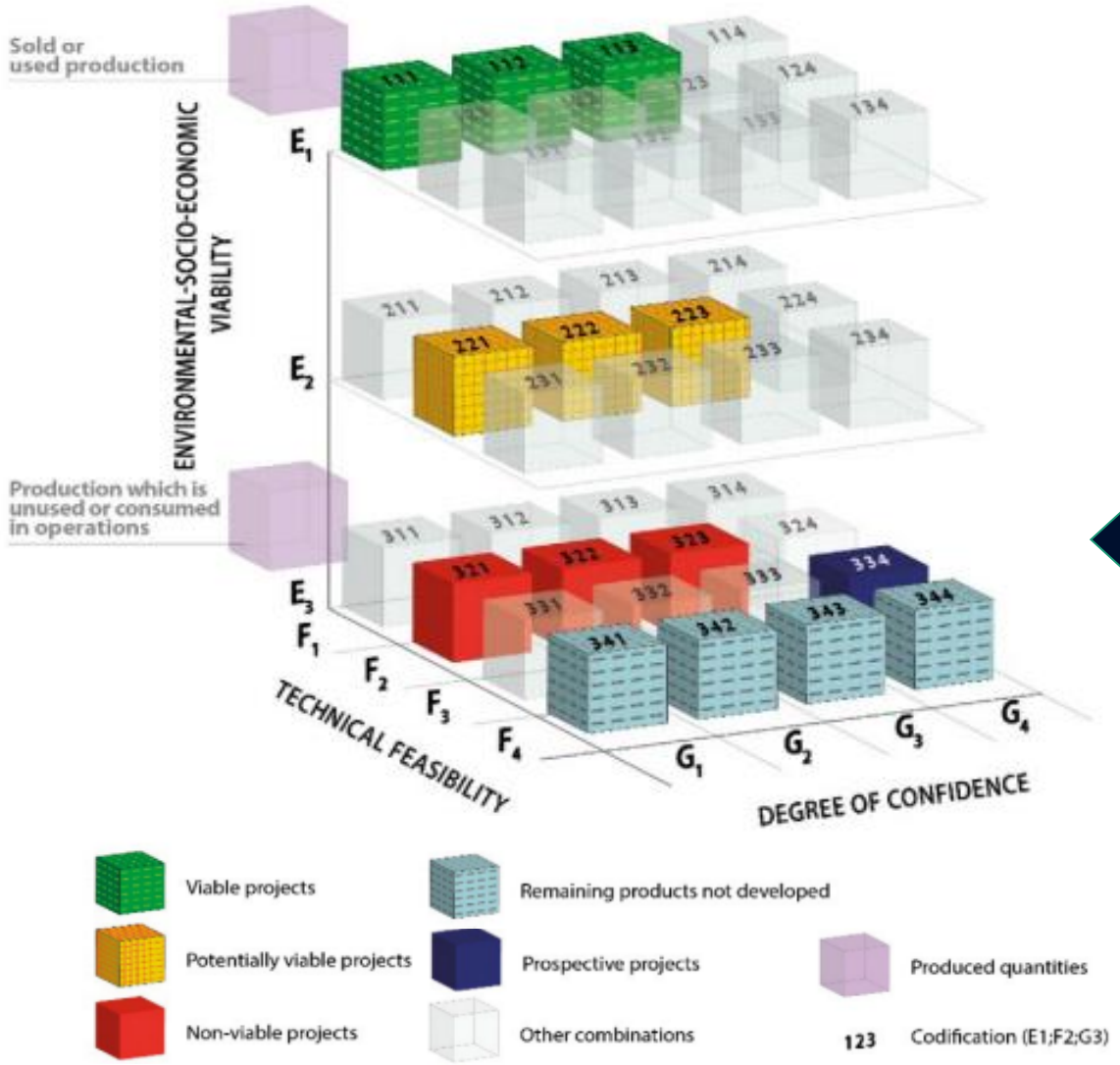
Why do we need UNFC?

- **Sustainable Resource Management (SRM)** is critical to deliver the UN Agenda 2030 and its Sustainable Development Goals

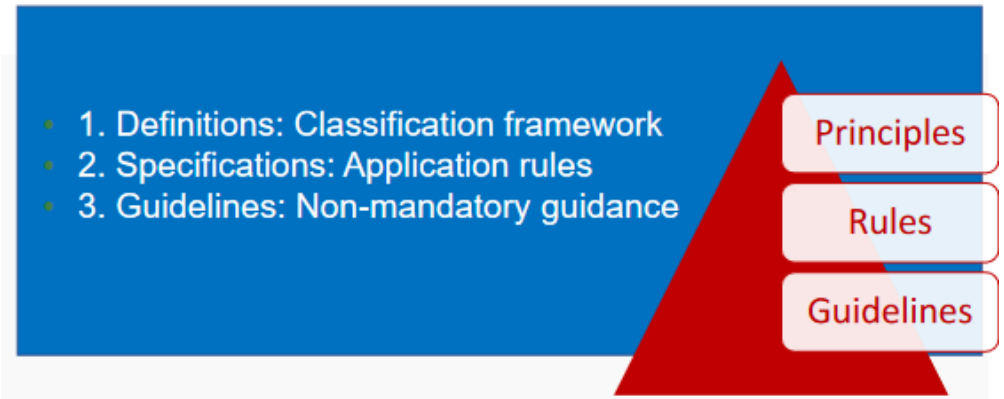


begins with mapping and classifying the mineral deposits
based on
relevant, consistent, transparent and comparable raw material information

What is UNFC?

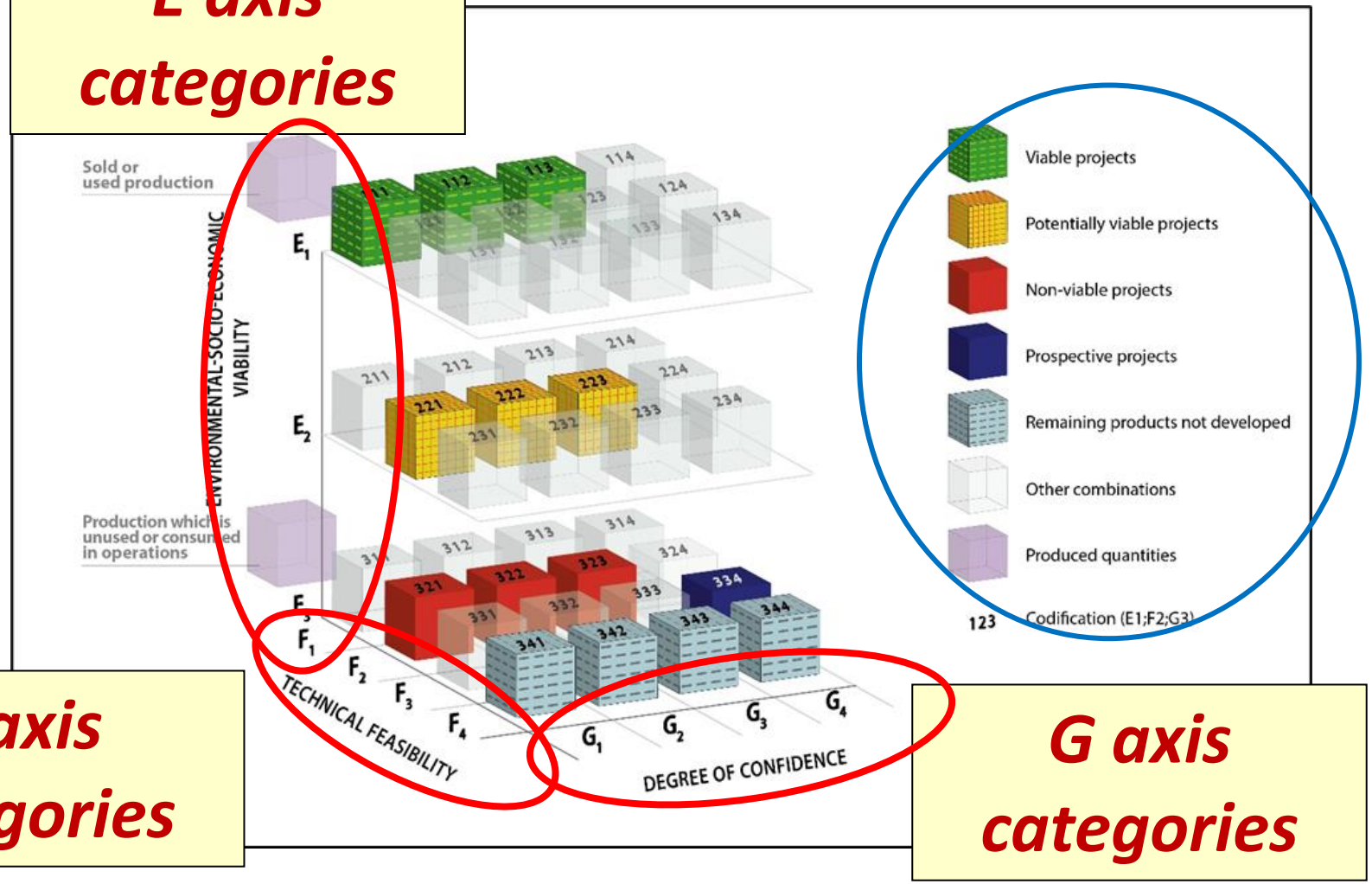


- **UNFC** is an international scheme for the classification, management and reporting of energy and raw material resources
- **UNFC** is based on 3 fundamental criteria
  - **E axis**: Environmental-socio-economic viability
  - **F axis**: Technical Feasibility
  - **G axis**: Degree of Confidence



UNFC
Categories and Classes

E axis categories



Classes

F axis categories

G axis categories

UNFC Categories Definition
E axis

- **Degree of favourability of environmental social and economic conditions in establishing the viability of the project**
- **Includes consideration of market prices and relevant legal, regulatory, social, environmental and contractual conditions**
- **E1, E2 and E3 categories**
- **E1 is "best"**
- **Definitions should always be read in conjunction with supporting explanation**

Category	Definition
E1	Development and operation are confirmed to be environmentally-socially-economically viable.
E2	Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.
E3	Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.

UNFC Categories Definition

F axis

- Maturity of technology, studies and commitments necessary to implement the project
- These projects range from early conceptual studies through to a fully developed project that is producing
- F1, F2 and F3 and F4 categories
- F1 is “best”
- Definitions should always be read in conjunction with supporting explanation

Category	Definition
F1	Technical feasibility of a development project has been confirmed.
F2	Technical feasibility of a development project is subject to further evaluation.
F3	Technical feasibility of a development project cannot be evaluated due to limited technical data.
F4	No development project has been identified.

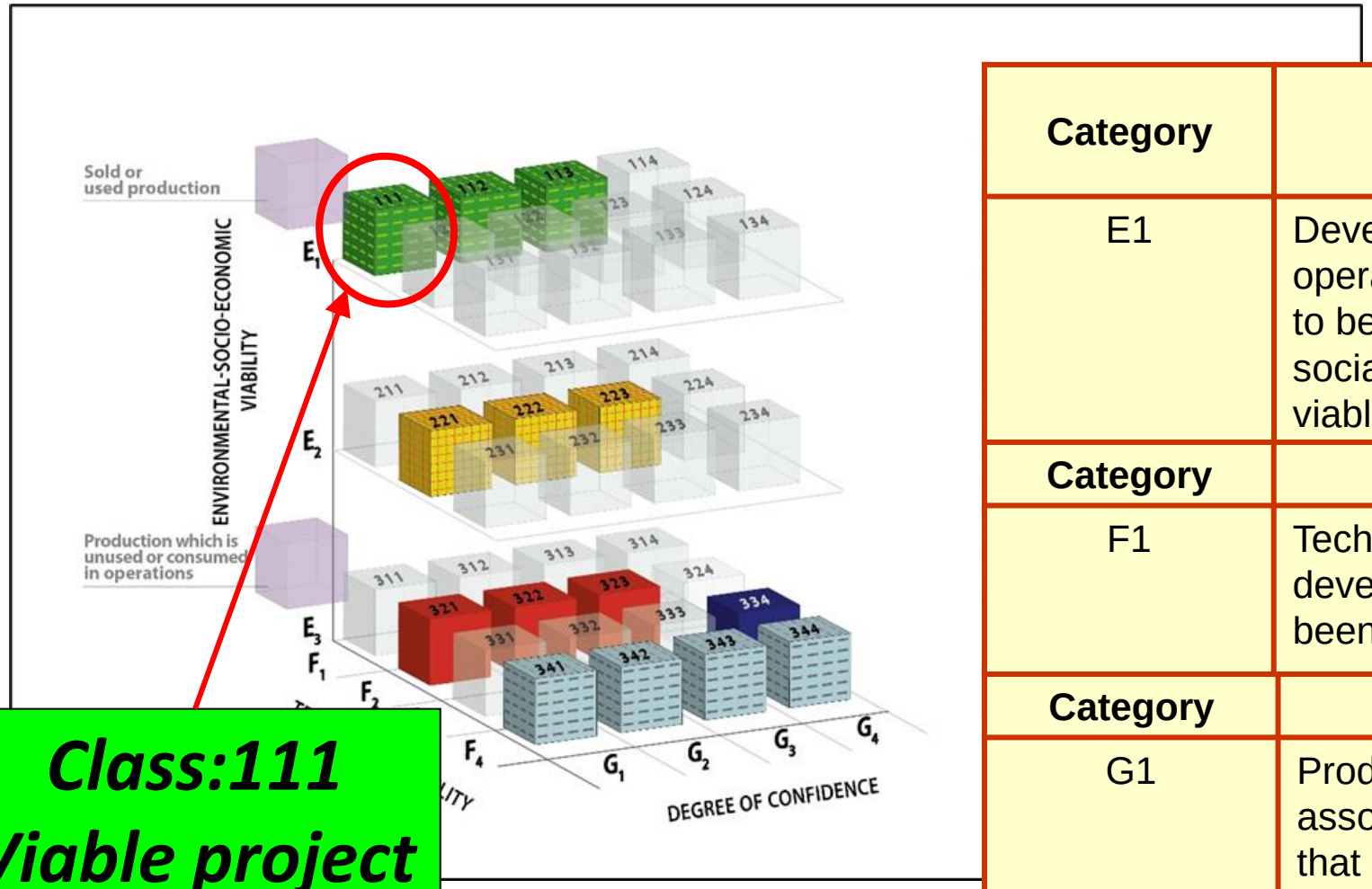
UNFC Categories Definition

G axis

- Degree of confidence in the estimate of the quantities of products from the project
- Generally defined as discrete increments for solids (G1, G2, G3), but often defined as scenarios for fluids (G1, G1+G2, G1+G2+G3)
- G1, G2, G3 and G4 categories
- G1 is “highest confidence”
- Definitions should always be read in conjunction with supporting explanation

Category	Definition
G1	Product quantity associated with a project that can be estimated with a high level of confidence.
G2	Product quantity associated with a project that can be estimated with a moderate level of confidence.
G3	Product quantity associated with a project that can be estimated with a low level of confidence.
G4	Product quantity associated with a Prospective Project, estimated primarily on indirect evidence.

UNFC
How it works



Class:111
Viable project

Category	Definition
E1	Development and operation are confirmed to be environmentally-socially-economically viable.
Category	**Definition**
F1	Technical feasibility of a development project has been confirmed.
Category	**Definition**
G1	Product quantity associated with a project that can be estimated with a high level of confidence.

Resource Classification Stakeholders

What are the benefits of UNFC?

UNFC allows
consistent comparison within and across multiple commodities

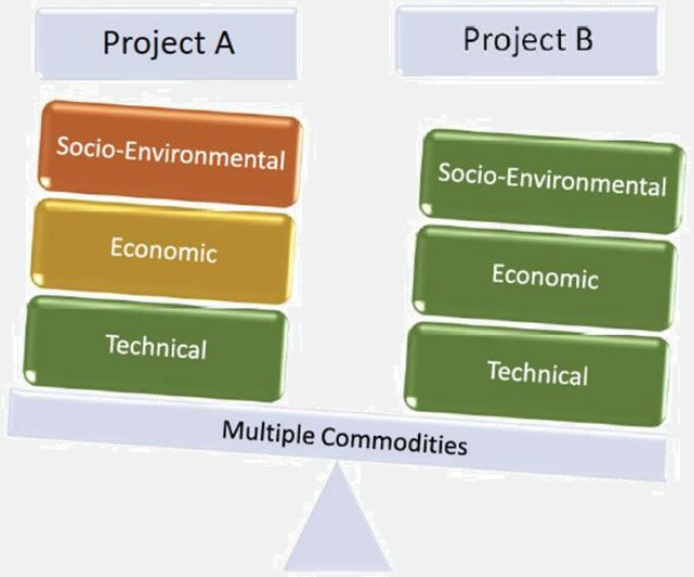
Globally deployed and endorsed
by the UN ECOSOC for application

Simple to use
3 categories (E, F, G) lead to 3 basic classes (viable, potentially viable, non-viable).

Combines all resources such as **energy, minerals and ground water** into one global classification system

Informs on **environmental, social** and **governmental issues** at **local, regional,** and **national level**

UNFC improves financial resilience through business process innovation
UNFC derives necessary social, environmental, and economic outcomes



UNFC speeds up decision-making, rendering it more rational, efficient, predictable, and safe. It makes information processing simpler as it integrates a resource management approach

ESG Considerations in UNFC

UNFC E Axis – Environmental-Socio-Economic Viability ⟶

Cate-gory	Definition	Supporting Explanation
E1	Development and operation confirmed to be environmentally-socially-economically viable.	Development and operation are environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions. All necessary conditions have been met (including relevant permitting and contracts) or there are reasonable expectations that all necessary conditions will be met within a reasonable timeframe and there are no impediments to the delivery of the product to the user or market. Environmental-socio-economic viability is not affected by short-term adverse conditions provided that longer-term forecasts remain positive.
	ESG Score ↕	
E2	Development and operation expected to become environmentally-socially-economically viable in the foreseeable future.	Development and operation are not yet confirmed to be environmentally-socially-economically viable but, on the basis of realistic assumptions of future conditions, there are reasonable prospects for environmental-socio-economic viability in the foreseeable future.
	ESG Score ↕	
E3	Development and operation not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine viability.	On the basis of realistic assumptions of future conditions, it is currently considered that there are not reasonable prospects for environmental-socio-economic viability in the foreseeable future; or, environmental-socio-economic viability cannot yet be determined due to insufficient information. Also included are estimates associated with projects that are forecast to be developed, but which will be unused or consumed in operations.

UNFC/ UNRMS

Social Resource Contract (SLO+)

-- Governance, transparency, stakeholder engagement

Balanced, integrated resource management (nexus/eco-system model)
Assured, safe, affordable access to "critical needs" resources

-- Mitigate / Eliminate Moral Hazard & Negative Externalities

Zero waste – includes pre-approved End of Lifecyle management plan for issuance of operating permit
Zero harm

-- Reliability of Key Data

Capability, credibility and Independence of Experts

Circularity

From commodity to resources as a service and Public Good
Continuous whole lifecycle resource management

Provenance, traceability and trackability of resources funds

Secure supply chains for critical materials and stressed resources
Innovation – transformative technologies and business models
Blockchain (all resources tokenized)
Smart Contracts
End avoidable wastes and leakages and prevent illicit fund flows

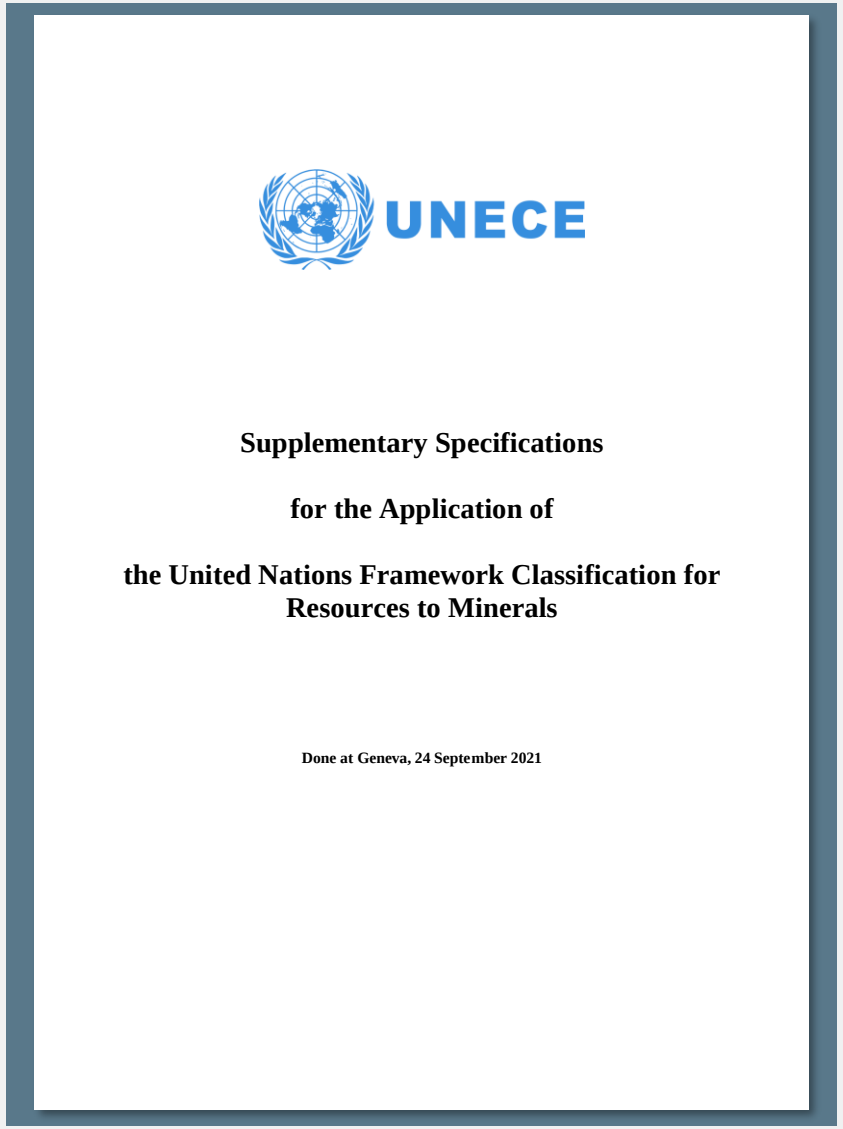
ESG Scores

SDG Compliance and Reporting
Climate Action – Carbon Tariffs
Energy and Source
Water Use Efficiency and Source
Resource Use Efficiency
Adaptability and Resilience of Operator

UNECE

UNFC
To
Primary Raw Materials
- Minerals -

UNFC Minerals Specifications


UNECE

Supplementary Specifications

for the Application of

the United Nations Framework Classification for Resources to Minerals

Done at Geneva, 24 September 2021

These minerals specifications are intended to support the attainment of the Sustainable Development Goals as relevant to the minerals industry: The use of UNFC as a system for the sustainable management of all minerals sources

This document is intended for:

1. Policymakers
2. Government resource management
3. Company internal resource management
4. Financial reporting

UNFC Classes and Sub-classes
Defined by Sub-Categories

UNFC Classes Defined by Categories and Sub-categories

				Categories		
		Class	Sub-Class	E	F	G
Total Products	Produced	Sold or used production				
		Production which is unused or consumed in operations				
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

Key aspects of Supplemental Specifications for Mineral Projects

- Mineral project plan and definition
- Mineral project lifetime
- Mineral project evaluation
- Project classification
- Project reporting

UNFC Supplemental Specifications for Mineral Projects

Mineral project plan and definition

- Prospecting/Exploration
- Mining
- Beneficiation / Processing
- Decommissioning
- Remediation

Mineral Project Lifetime

- Project Lifetime is the remaining period of time that a project is expected to operate, constrained by technical, economic, regulatory or other permit/license cut-offs.
- Mineral project lifetime is normally constrained by the period for which prospecting, exploration or mining license may apply for the project.
- Mining license may include beneficiation, processing, decommissioning and remediation stages of the mineral lifecycle.

UNFC
Supplemental Specifications for Mineral Projects

Mineral project evaluation

Mineral projects may adopt various methodologies in the various stages of the mineral lifecycle including in the estimation of quantities as appropriate to the project. The basis for any estimations shall be appropriately referenced in the evaluation. This includes not only third-party data but also methodologies or procedures that have been used by the evaluating entity to generate in-house data.

UNFC
Supplemental Specifications for Mineral Projects

Project Classification

Classification of projects based on the level of maturity

Where it is considered appropriate or helpful to sub-classify mineral projects to reflect different levels of project maturity, based on the current status of the project, optional sub-classes may be adopted.

Distinction between Environmental-Socio-Economic assumptions

The environmental-socio-economic axis categories encompass the non-technical issues that directly impact the viability of a project, including product prices, costs, legal/fiscal framework, environmental regulations and known environmental or social impediments, barriers or benefits

Distinction between potentially produced quantities and undeveloped quantities

Quantities of products associated with projects are categorized as F1 to F3 as potentially developable using existing technology or technology currently under development or operation. There may be remaining quantities with no development project. The product quantity associated with these are categorized as F4. These are quantities which, if produced, could be bought, sold or used.

UNFC
Supplemental Specifications for Mineral Projects

G-Axis Considerations

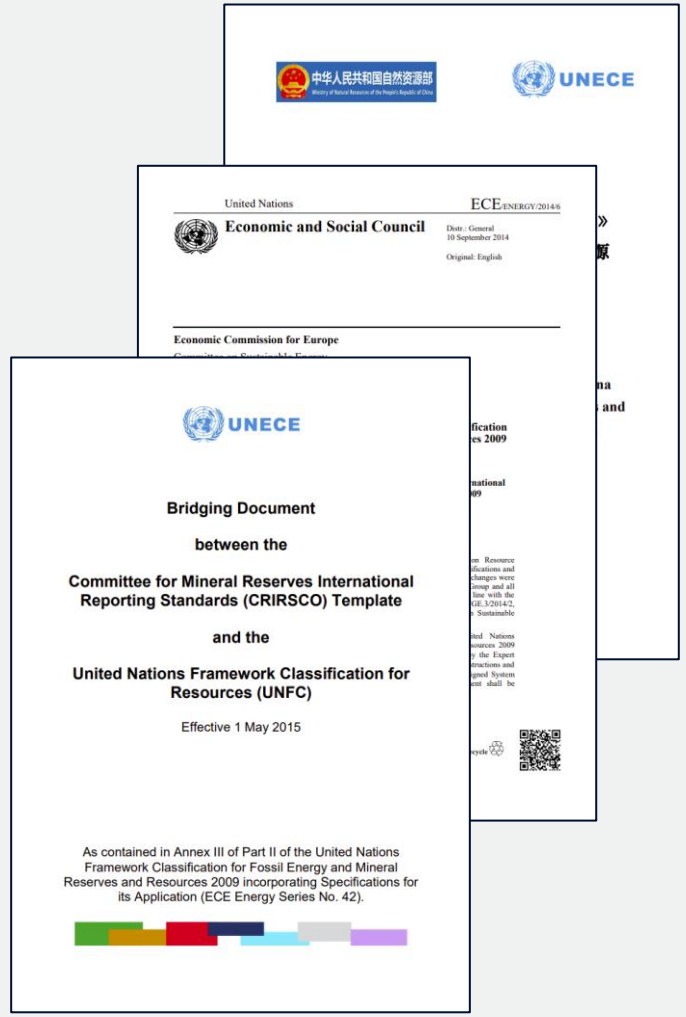
- Product quantity estimates may be categorized discretely as G1, G2 and/or G3 (along with the appropriate E and F Categories), based on the degree of confidence in the estimates (high, moderate and low confidence, respectively) based on direct evidence. Additional Comments

- The G axis in minerals and mining conditions primarily reflect **geologic uncertainty** impacting the estimate forecast for the project. Uncertainties include **availability and resolution of direct data** such as drill hole density in relation to the mineralization and or deposit type. In addition, indirect data such as geophysical data might be included, which should be measured against redundancy of methods (e.g. geophysical measurements calibrated against drill core evaluation, drill hole logs. Calibrated methods provide higher certainty than uncalibrated methods.) The accuracy of measurements controls the level of the category (lab assay, rock mechanics, mineralogical phase assessment).

UNFC
Bridging Documents

- Aligned System - A classification system that has been aligned with **UNFC** as demonstrated by the existence of a **Bridging Document**
- A bridging document explains **the relationship between UNFC and another classification system**, including instructions and guidelines on how to classify estimates generated by application of that system using the UNFC Numerical Codes.

- For **mineral resources**, UNFC has been bridged to
  - National Classification Systems
  - CRIRSCO-template
  - Soviet-based system (KGZ based)
  - The Chinese classification system
  - NEA/IAEA
  - INSPIRE Code



GB/T 17766-1999		UNFC		
		级	亚级	
经济意义	1	E1	E1.1	经济和社会活力
			E1.2	
	2M	E2		
	2S			
	3			
		E3	E3.1	
			E3.2	
			E3.3	
可行性评价阶段	1	F1		项目状态和技术可行性
	2	F2		
	3	F3		

UNFC-2009 Classification					CRIRSCO Template		NEA/IAEA Classification	
UNFC Classes and Sub-classes		UNFC Categories			CRIRSCO Classes and Sub-classes			
Class	Sub-Class	E	F	G	Class	Sub-Class	IAEA-NEA Categories	Status
Commercial Projects	On Production	1	1.1	1	Mineral Reserves	Proved	Reasonably Assured Resources (RAR)	Existing
				2		Probable		
	Approved for Development	1	1.2	1		Proved		Committed
				2		Probable		
	Justified for Development	1	1.3	1		Proved		Planned
				2		Probable		
Potentially Commercial Projects	Development Pending	2	2.1	1	Mineral Resources	Measured	Identified Resources	RAR
				2		Indicated		
				3		Inferred		IR*
	Development	2	2.2	1		Measured		RAR
				2		Indicated		

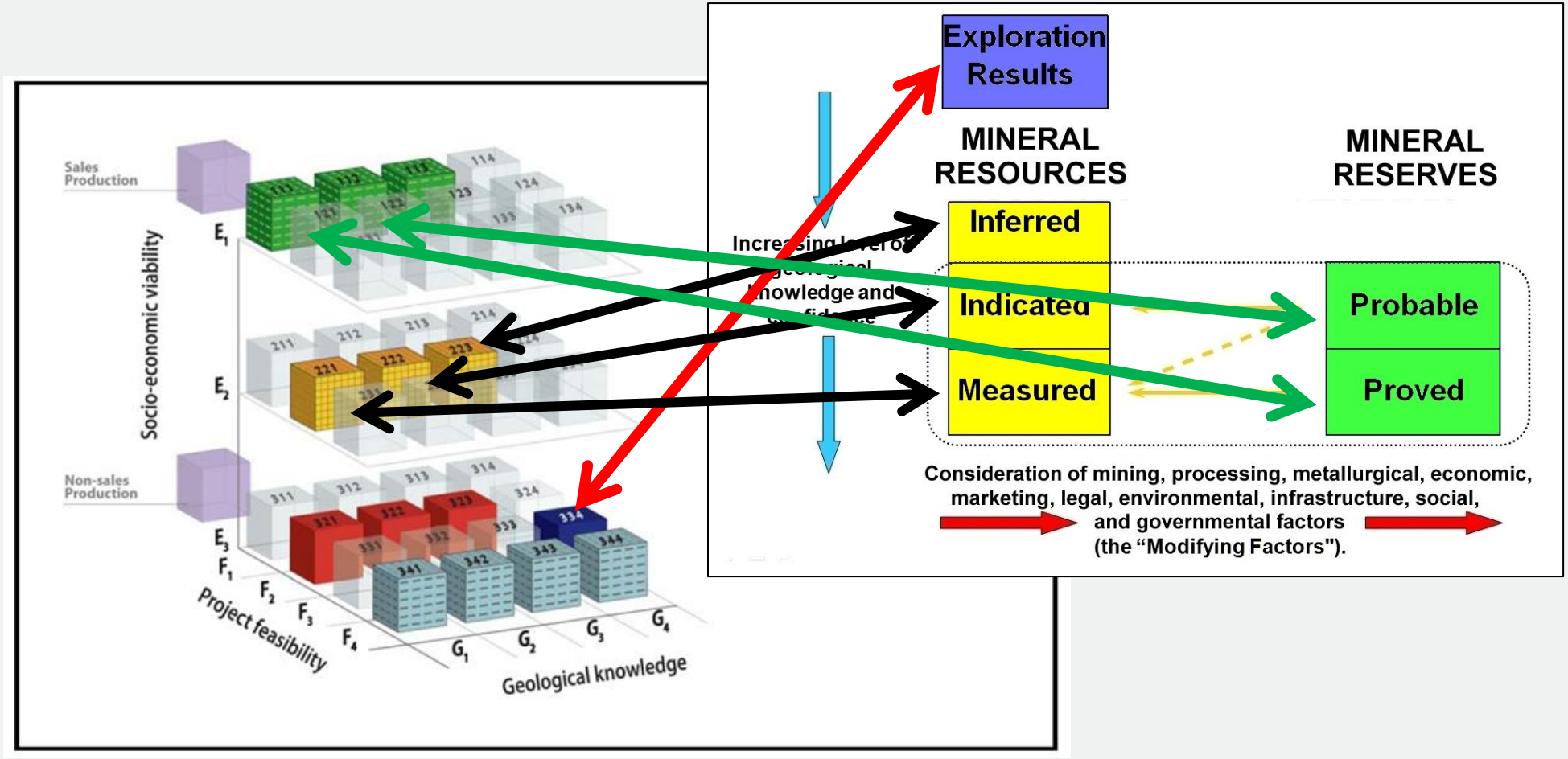
Law (2015) and Proposed New Book of Regulations for Solid Mineral Raw Materials	Results of Geological Exploration	Mineral Resources			Miner Reser	
		Inferred	Indicated	Measured	Probable	Proved
Official Book of Regulations for Solid Mineral Raw Materials (1979)	Mineral Reserves					
	Potential	Potential	Established (*in situ* – Geological: *Out-of-Balance and Balance*)		Exploitation (*inclusive of dilutions and losses during mining*)	
	D_2, D_1	C_2	C_1	B,A	C_1	B,A
UNFC			Mineral Resources		Mineral Reserves	
	334	223	222	221	112	111

CRIRSCO Template		UNFC-2009 "minimum" Categories			UNFC-2009 Class
Mineral Reserve	Proved	E1	F1	G1	Commercial Projects
	Probable			G2	
Mineral Resource	Measured	E2	F2	G1	Potentially Commercial Projects
	Indicated			G2	
	Inferred			G3	
Exploration Results		E3	F3	G4	Exploration Projects

Examples

Minerals Classification

UNFC – CRIRSCO Default Mappings



The GeoERA Project

- 19 UNFC pilots produced, and analyzed through the project to showcase the potential and possibility of UNFC implementation, in order to harmonize the classification of mineral projects of different types.
- The outcome demonstrates that it is feasible for the classification results to be aggregated across countries

N: National,aggregated (8) | n: National,site (3) | R: Regional,aggregated (3) | r: Regional,site (4) | S: Site,site (1)

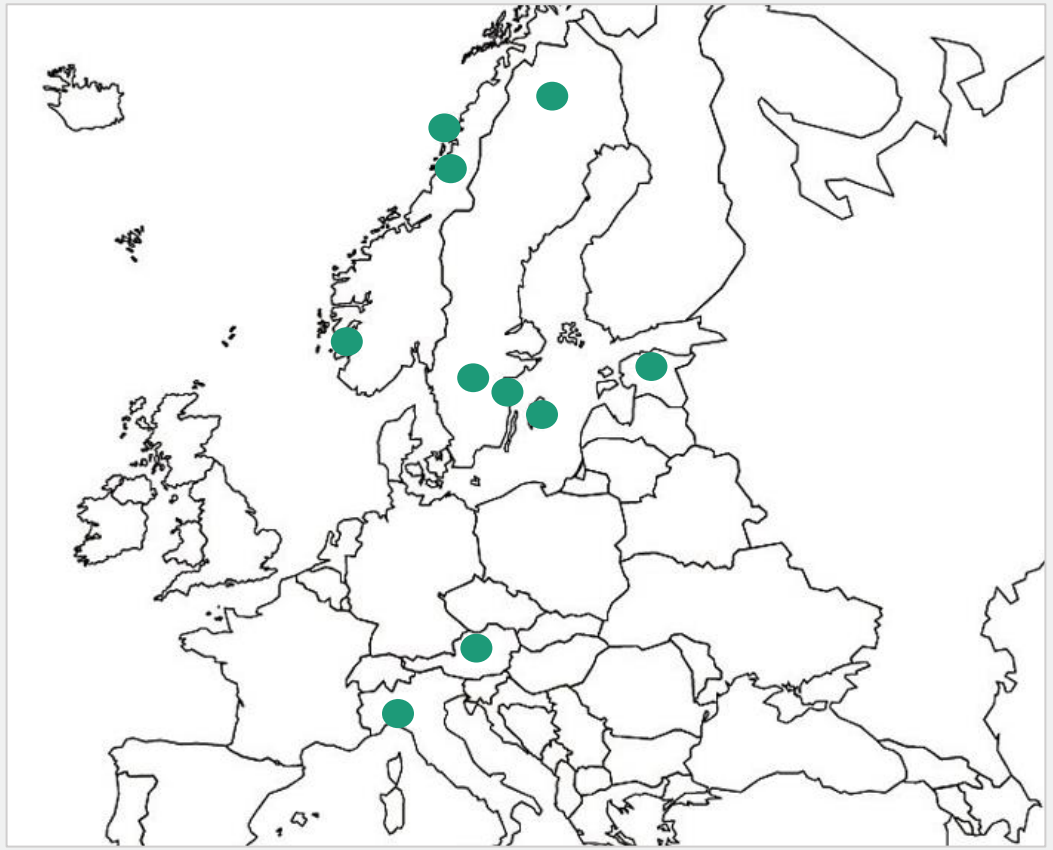
Country	Gold	Copper	Cobalt	Manganese	REE	Phosphate	Carbonates	Graphite	Aggregates	Natural stone	Peat	Gypsum	Perlite	#
Austria									R					1
Belgium						n								1
Croatia									R					1
Denmark							N		N					2
Finland	N	N	N					N			R			5
Hungary				[S]								[r]	[r]	3
Norway						n		r	r	r				4
Slovenia									N					1
Sweden					r									1
#	1	1	1	1	1	2	1	2	5	1	1	1	1	19

- UNFC Challenges in **GeoERA**:
  - Capacity Building
  - Establishing functional systems
  - Further UNFC method development
  - Data quality and interoperable datasets

UNFC Minerals Classification Case Studies

- Many UNFC Case Studies have been done in Europe to different minerals.
- These Case studies help tailor UNFC to local requirements, and improve UNFC principles, specifications and guidelines

- A GUIDANCE FOR THE APPLICATION OF THE UNFC-2009 FOR MINERAL RESOURCES IN FINLAND, NORWAY AND SWEDEN – 2017
- UNFC Case Studies from Finland/Estland, Sweden and Norway – Nordkalk limestone and Forsand sand and gravel mines – 2020
- UNFC Case Study from Austria - Sand and Gravel Resources in Greenfield Areas – 2022
- UNFC Case Study: Rare Earth Elements, Exploration Prospects and Secondary Resources in Sweden – 2022
- UNFC – A Case Study on Graphite - 2022



- UNFC Case Studies on mineral resources in EU

UNFC GUIDANCE EUROPE

UNFC Guidance Europe is a document to assist regional and national authorities in establishing and maintaining a **project-based inventory of primary and secondary raw material projects** in **Europe** using **UNFC**

UNFC Guidance Europe is for:

Users include national governments, regional authorities, geological surveys, corporations and academics who are needing to make resource management decisions including ensuring that the best information is available for making those decisions

Qualified experts and resource estimate preparers in Europe to classify primary and secondary raw material projects

UNFC GUIDANCE EUROPE IS ONE OF THE FIRST STEPS ON THE PATH TO FULL IMPLEMENTATION OF UNFC IN EUROPE

UNFC GUIDANCE EUROPE

Why UNFC for Raw Material Inventories?

UNFC is **the tool to provide stakeholders** with **widespread information** on **technical feasibility, socio-environmental concerns,** and **the commercial potential** of **raw material projects**.

UNFC is applicable to all raw material projects, meaning that the inventory will cover projects that recover mineral raw materials from geological occurrences and from anthropogenic resources such as tailings, stockpiles, and waste rocks.

A UNFC-based Inventory is important for:

Public-sector decision-making ranging from onsite, municipality, regional, country, European and the UN level on aspects of the resource life cycle

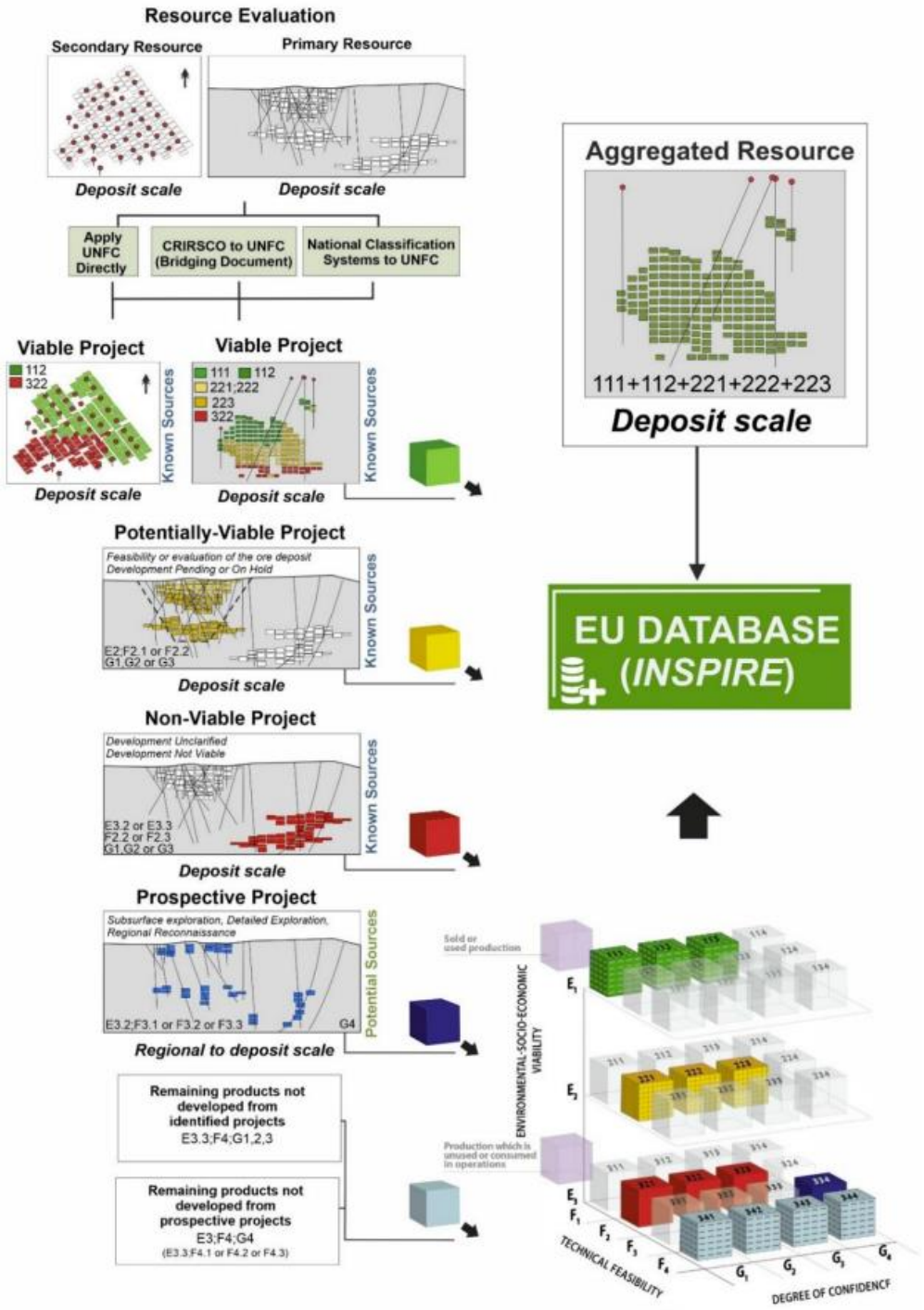
Economic management for planning, organization, and leading activities of management at all corporate levels

Finance investment decision making considering economic, environmental, and social aspects of raw material projects

In expertise, knowledge, and education

UNFC GUIDANCE EUROPE

Graphical Abstract



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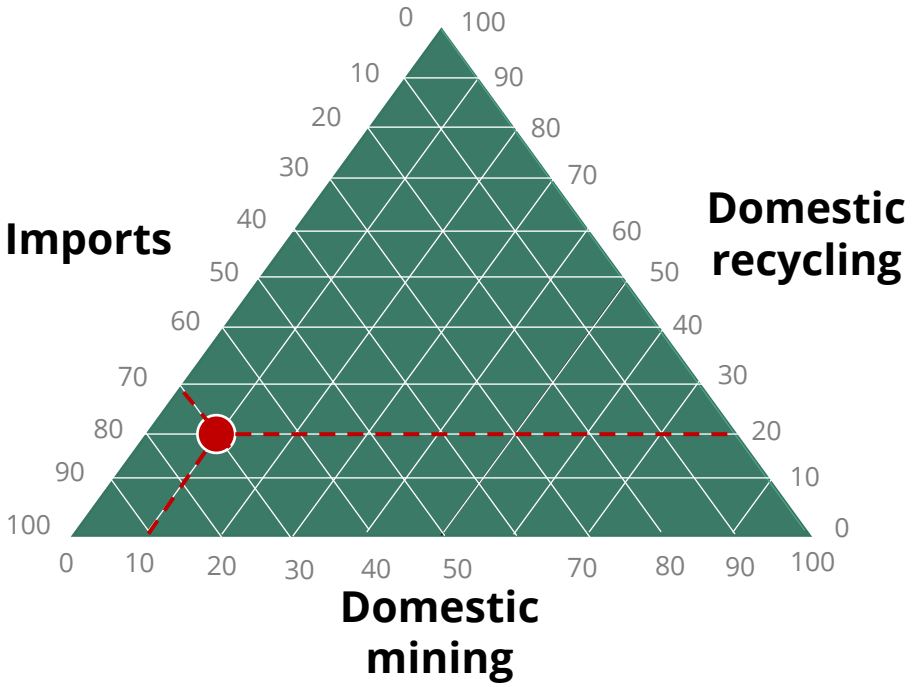
UNFC
To
Secondary Raw Materials
- Anthropogenic Resources -

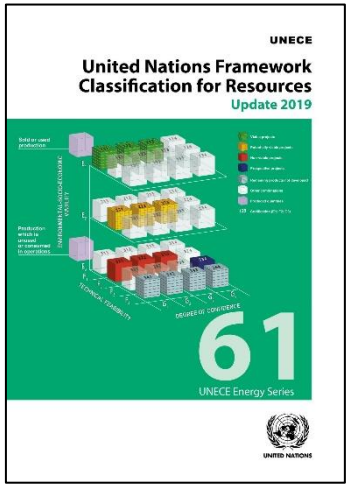
Context



- Raw materials can by sourced either from mining or recycling projects.
- Primary raw materials dominate the supply, but secondary raw materials are getting more and more attention.
- The UNFC allows to compare mining and recycling projects on a common playing field.

UNFC documents

Generic
Terminology & principles



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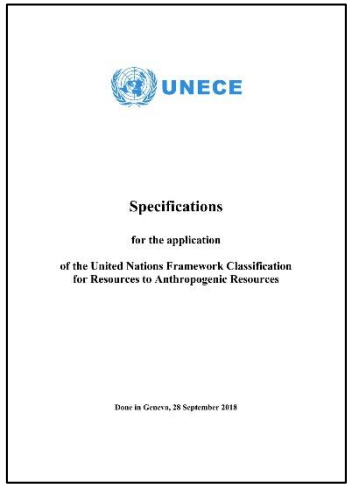
Specifications
Anthropogenic Resources



https://doi.org/10.5281/zenodo.3759026

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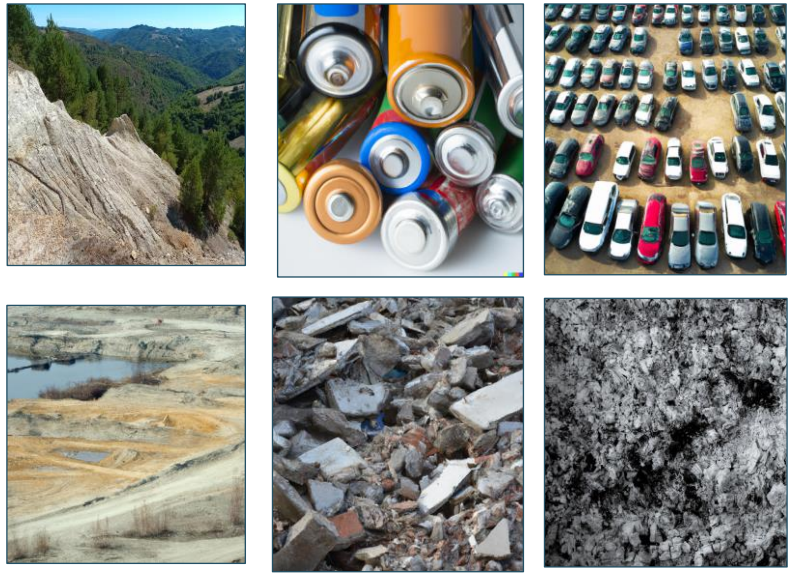
Guidelines

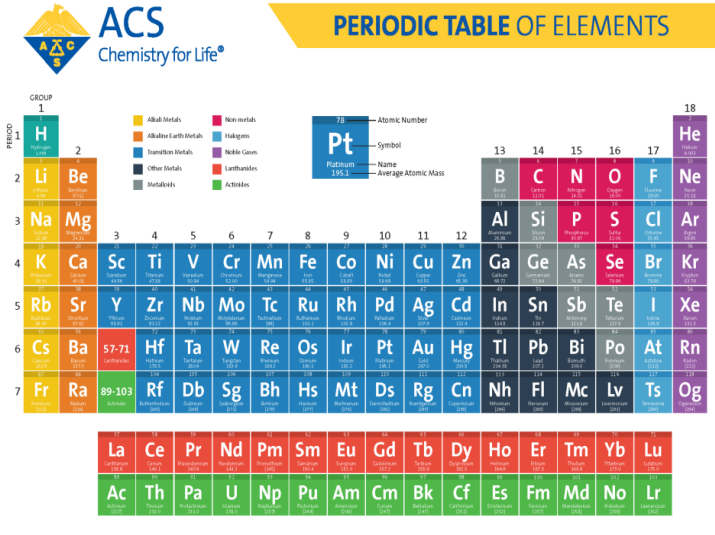
Application of UNFC to anthropogenic resources

Feedstock



Recycling project

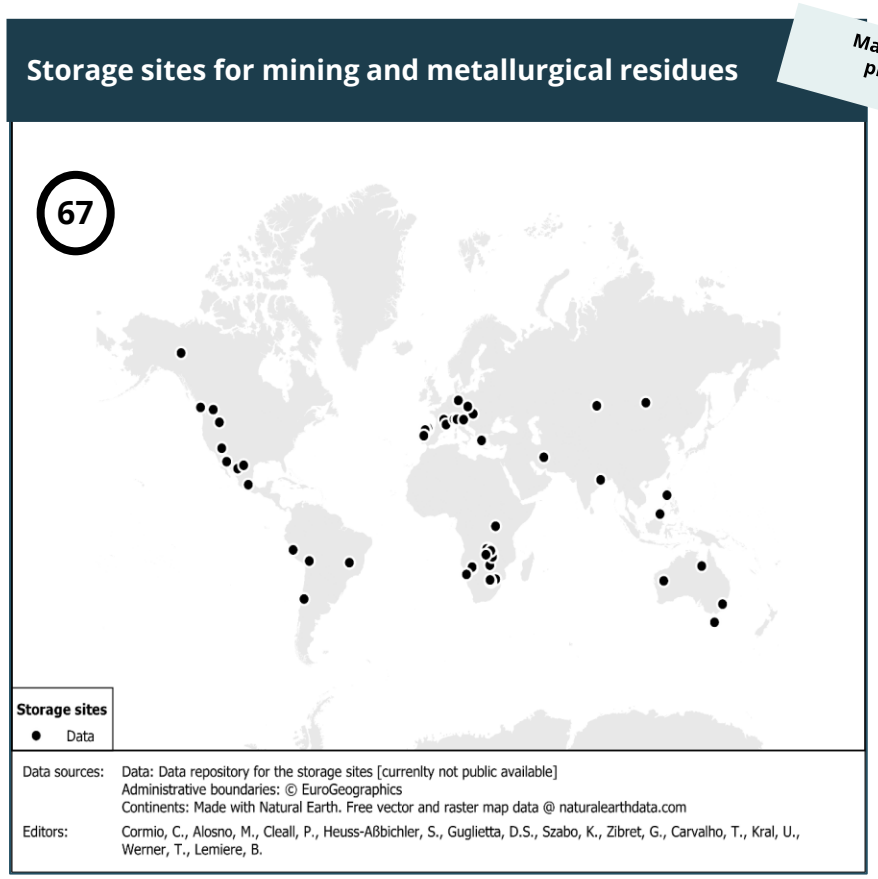
Raw Materials

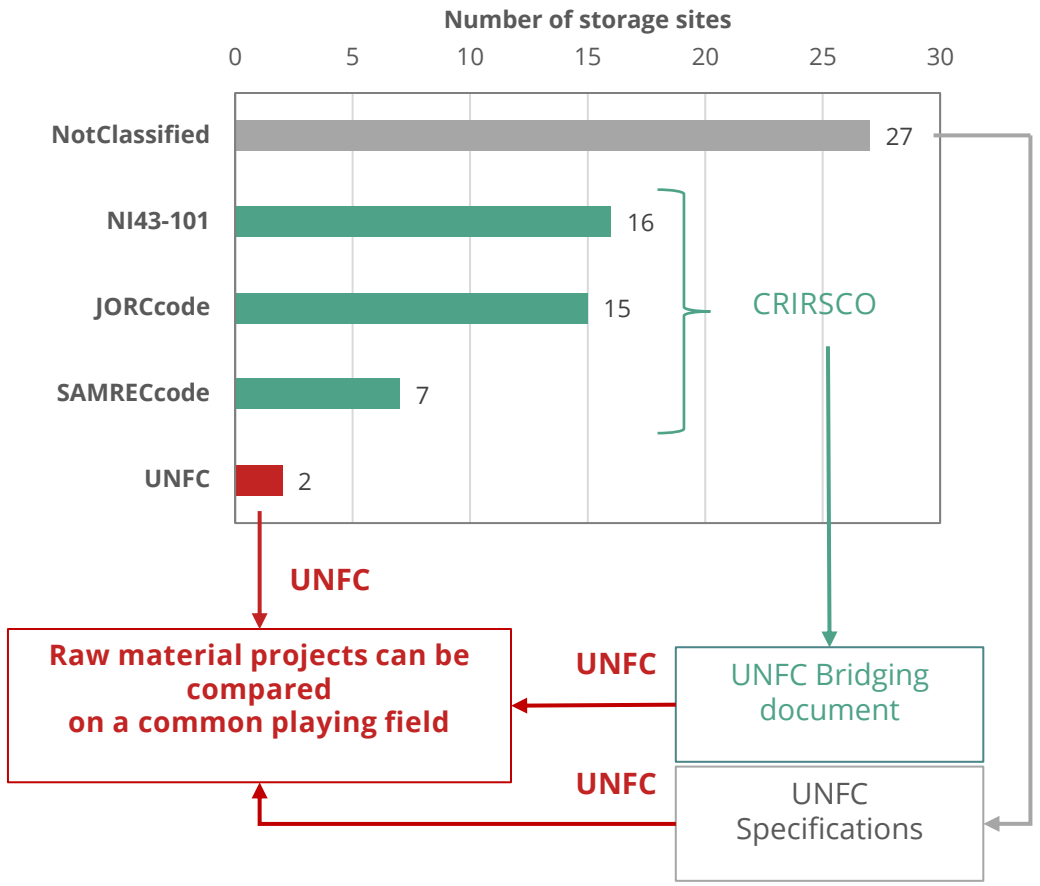


https://www.acs.org/education/whatischemistry/periodictable.html

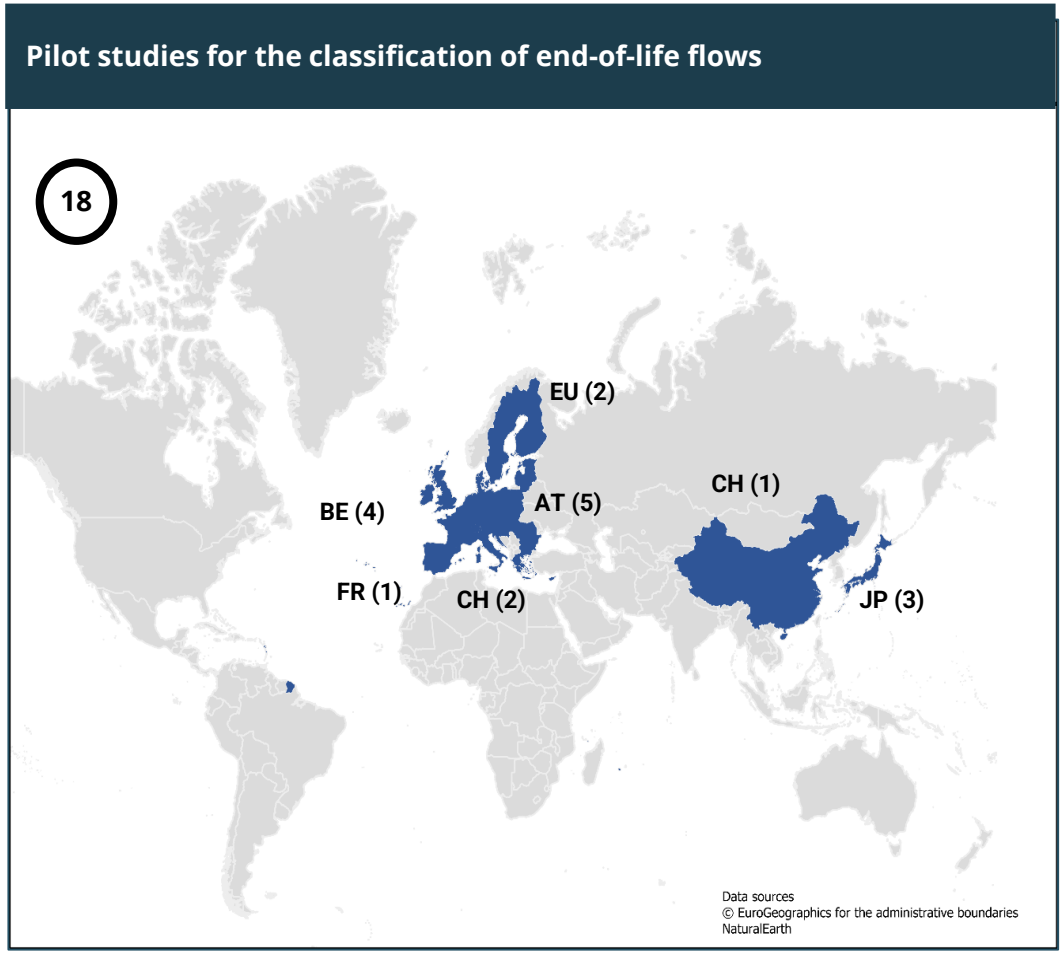
UNFC communicates
the viability of recycling projects
for the future production of secondary raw materials

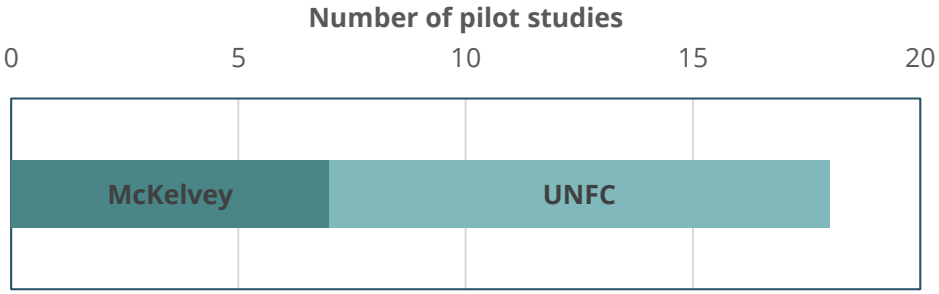
(Re)Mining: Mining and metallurgical residues

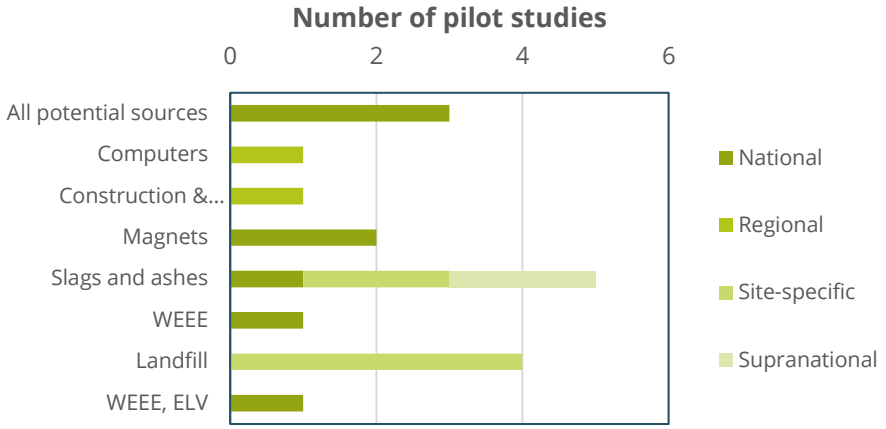




Recycling: End-of-Life flows



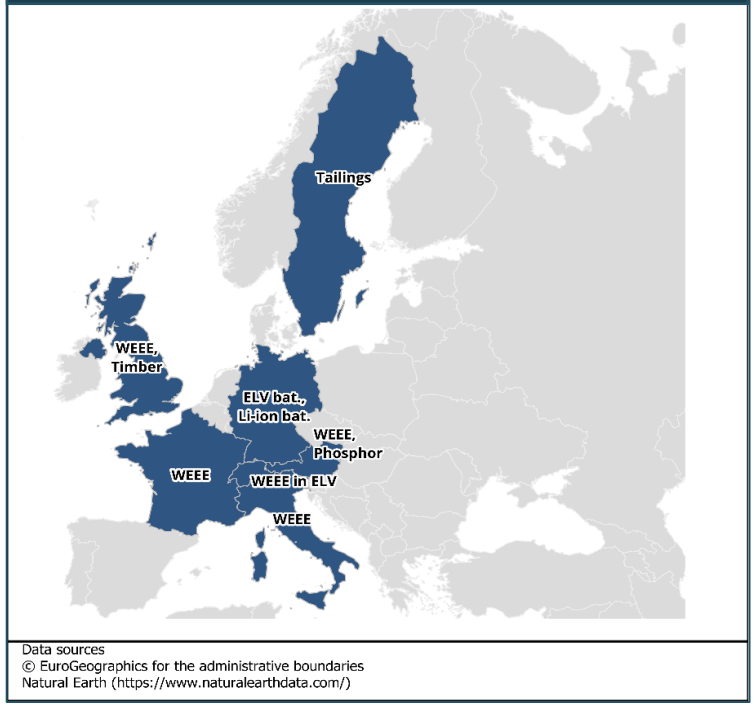




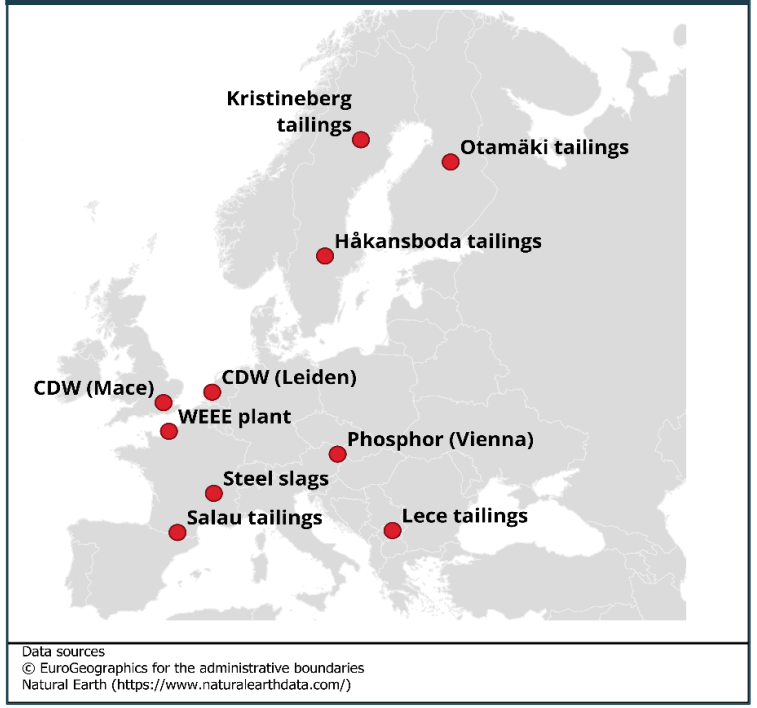
Future Availability of Secondary Raw Materials

EU PROJECT, 2022-2026, www.futuram.eu

National UNFC applications



Site-specific UNFC applications



Harmonized UNFC implementation

Reporting standard including UNFC

Take-home-messages

- The knowledge on the **viability of recycling and mining projects** is relevance for diversification of **raw material supply**.

- **UNFC is applicable to recycling projects**.

- The UNFC has been **successfully applied** to recycling projects. However, there is a short history on the classification of recycling projects (compared to mining projects). New UNFC case studies are under development.

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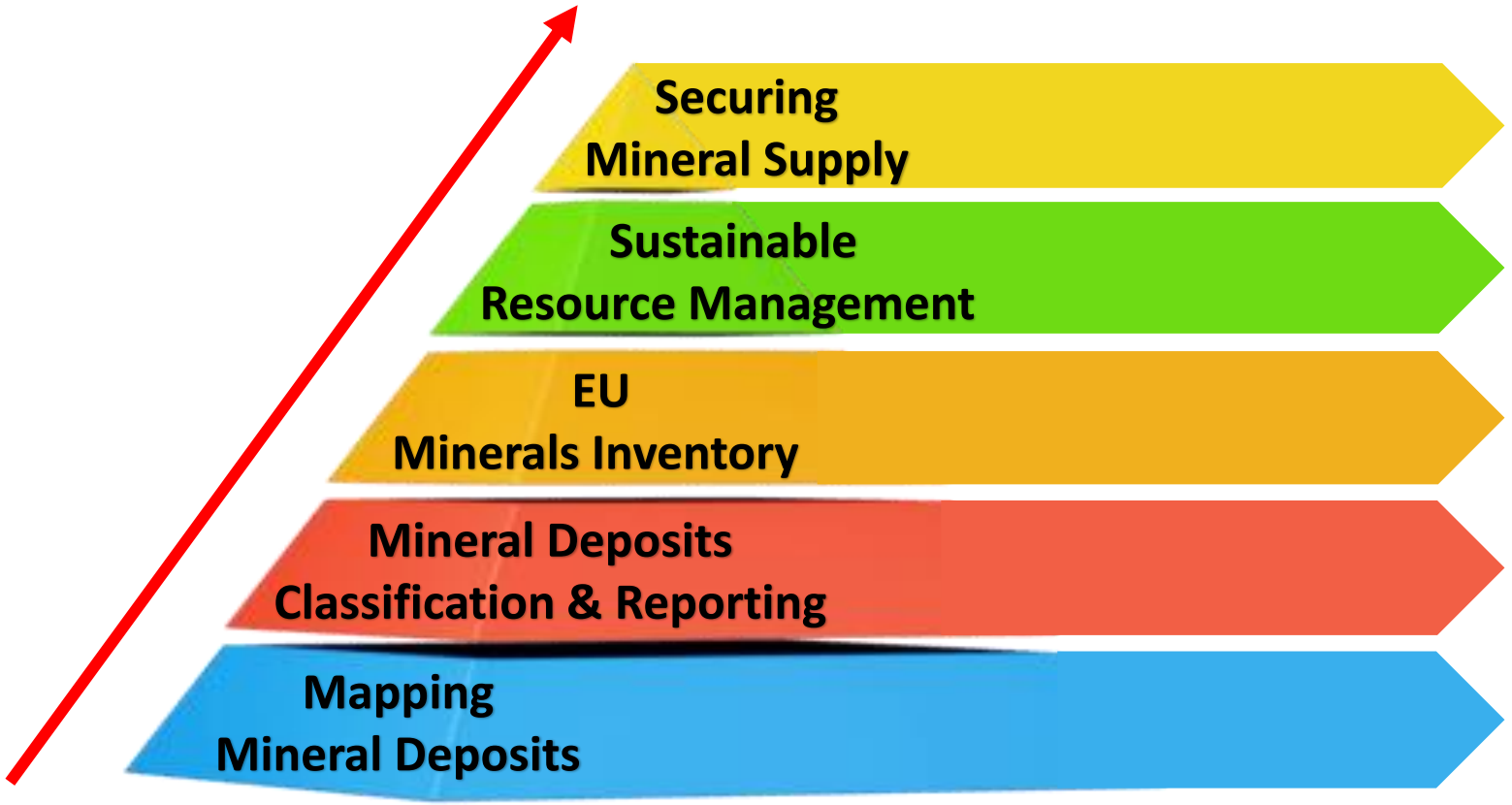
UNFC in Mineral Inventories
&
State of Play
Critical Raw Materials Act
Proposal

UNFC-Based Roadmap to Securing Mineral Supply in EU



Prosperous, Sustainable, Carbon-neutral
EU Economy

Informed Decision-making
Capital Allocation
Strategic Projects

Consistent and Coherent Data

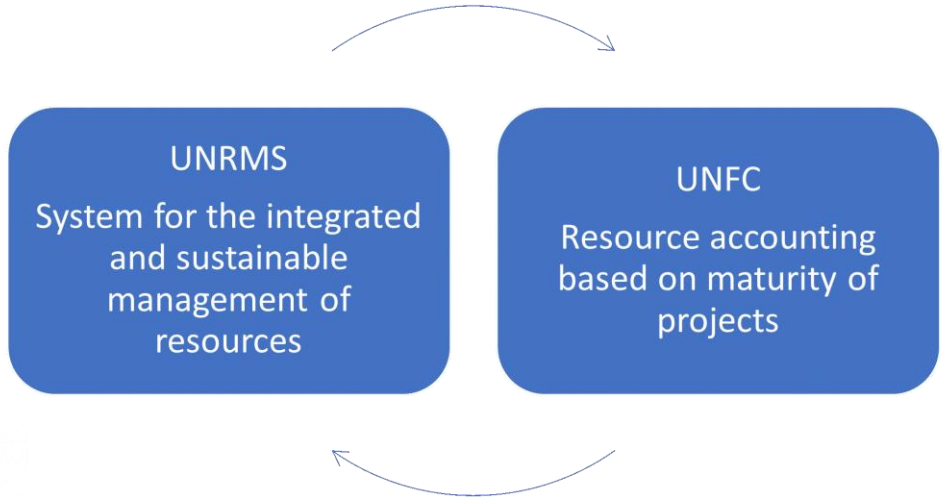
Environmental, socio-economic factors
Geologic knowledge
Technical Feasibility

Reliable Information and Transparency

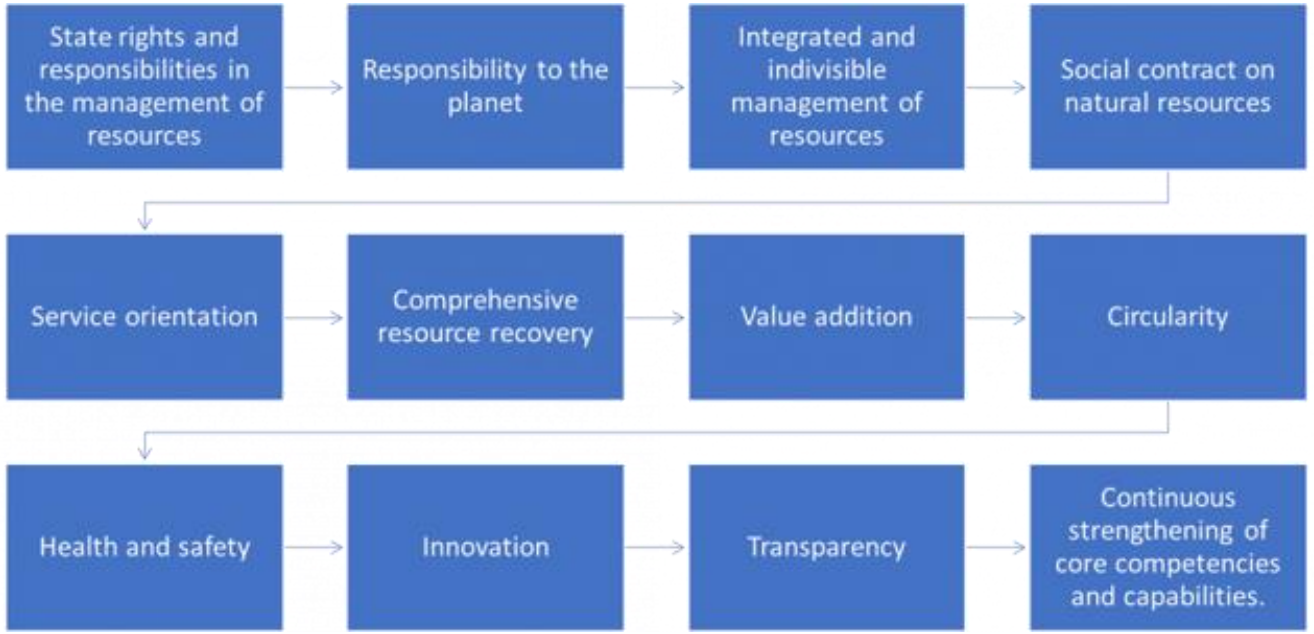
- UNFC enables stakeholders to assess the potential of resources, plan their exploration and development, ensure sustainable management practices, and ultimately eliminate supply risks

The United Nations Resource Management System
UNRMS

- **UNRMS** is the toolkit to tackle sustainability and technology challenges. It includes high-impact technologies that encourage efficient discovery and modelling of in-place resources and allow higher precision during recovery and processing.



UN Resource Management System (UNRMS) - Principles



UNRMS Tool Kit Concepts:

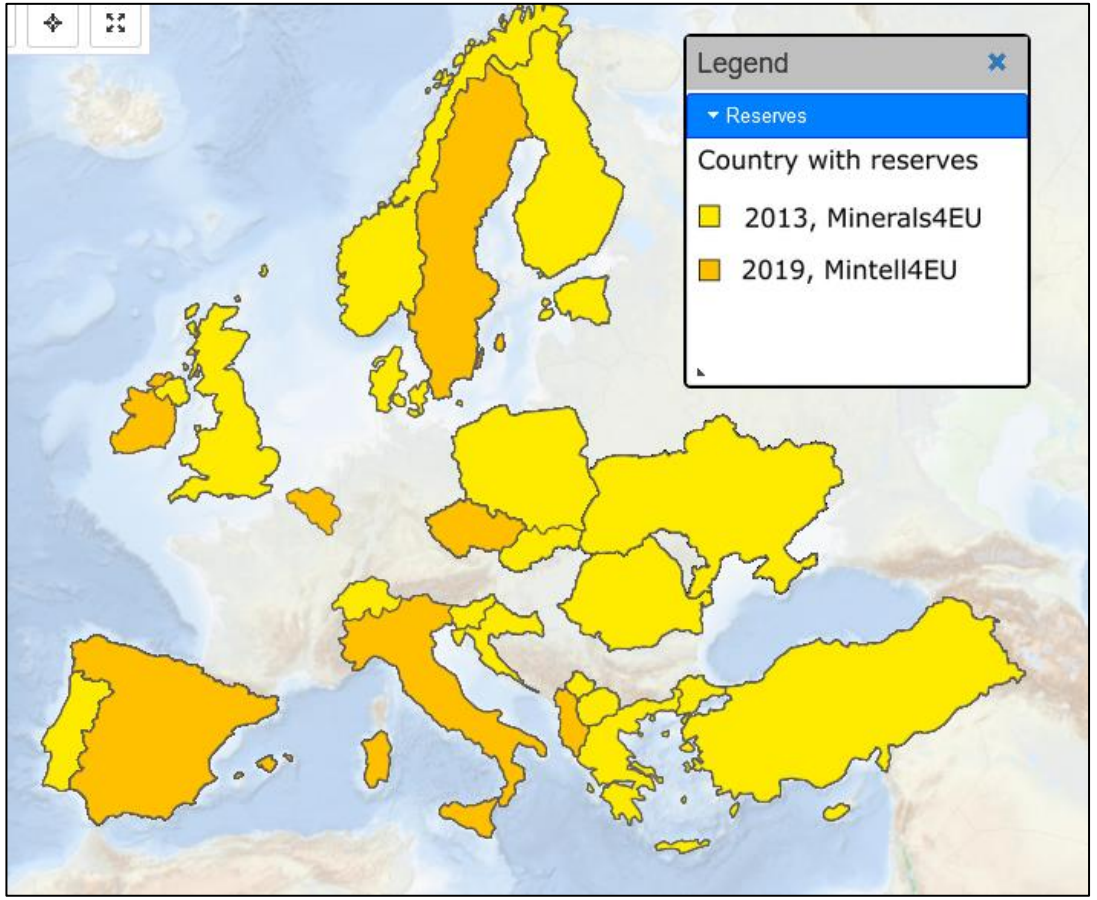
- Clean Energy Index
- Service orientation in the use and reuse of resources
- Resource supply system
- Blockchain and machine learning/artificial intelligence model for resource management
- Critical raw materials dashboard

Current Situation in EU for Minerals Classification

- **EU has currently no unified** classification system for mineral resources neither aggregated commodity figures with the same classification system
- **EU Member States** have adopted **different** mineral resources classification and reporting systems
- The most common ones are UNFC-Based National Classification Systems, Soviet-Based, and CRIRSCO International Reporting Template
- **Data collection** across EU Member States can be divided into 5 groups:
  - **Central collation of information** based on **national reporting system** (KGZ based)
  - **Central collation of information** based on **international reporting systems**
  - **Central collation of information** based on **national system** (UNFC-based)
  - **Central collation of information** based on **own national system**
  - **Incoherent data collection** based on **national system or without system specification**

Current Situation on National Raw Materials Inventories in EU

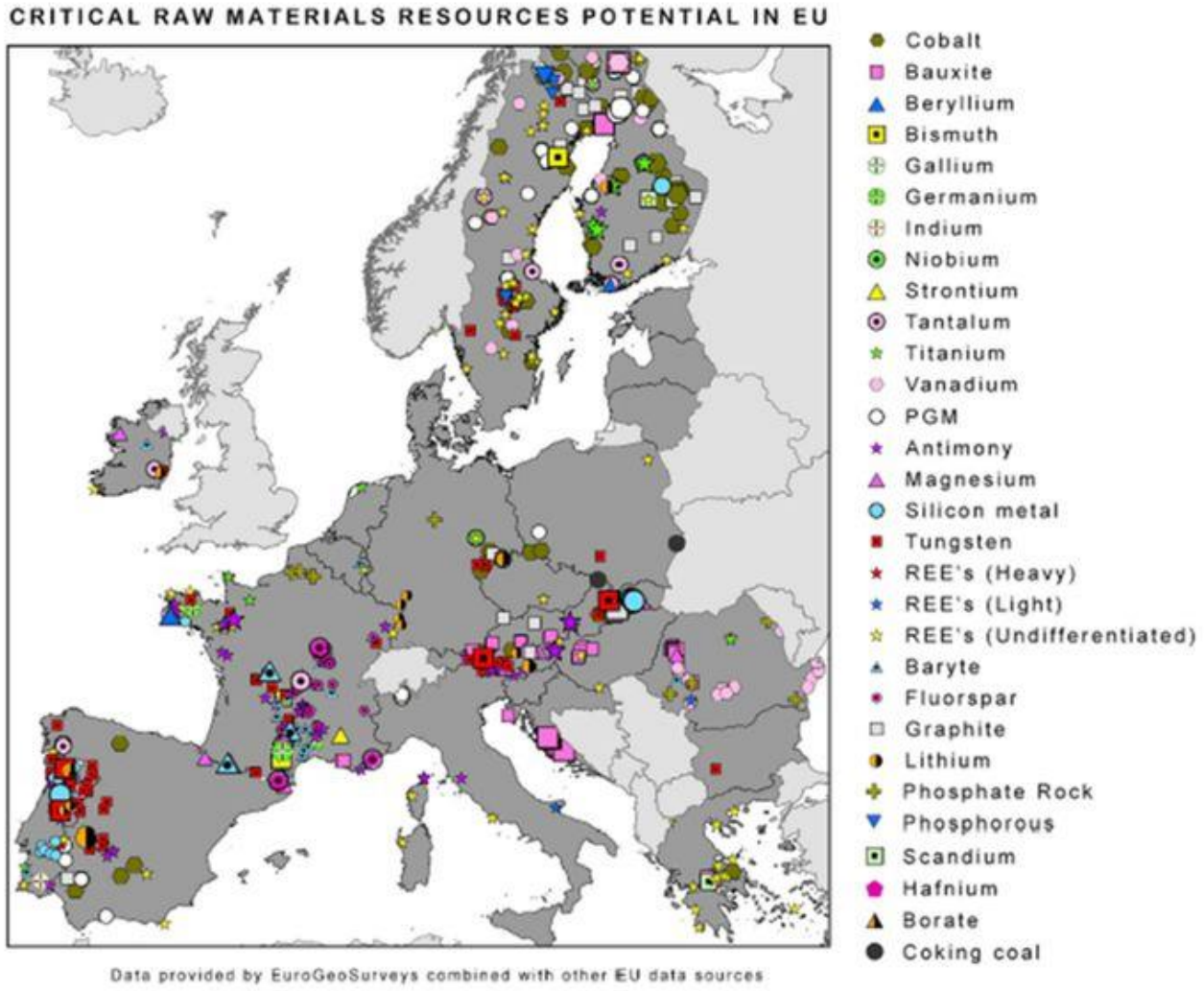
- Only a few European Countries have a National Raw Materials Inventory.
- These EU countries, that also have strong regional administrations, may have regional data collection on reserves and resources.
- National raw material inventories require country-level specifications that comply with governmental and social standards and requirements.
- The inventory specifications are also conveyed to regional inventories but on a more general basis.



EU countries with reporting on mineral reserves inserted in the European Geological Data Infrastructure (EGDI).

Critical Raw Materials Potential in Europe

- Europe has significant CRMs deposits across the continent
- However, their **accessibility** and **economic viability** depend on various factors (geology, regulations, social and environmental concerns, market, etc.)
- Recent years have seen spikes in **mineral exploration** and **mining** in different EU countries
- The EU is working towards **sustainable** and **secure mineral supply chains**



Securing Supply From EU Mineral Deposits

- UNFC can assist the EU to achieve the **European Green Deal Objectives** and the **Sustainable Development Goals** through:
    - **Securing EU Mineral Deposits supply** is critical for Europe's successful transition towards a more sustainable, low-carbon economy
    - Coherent and consistent data
    - Reliable information and transparency
    - Comprehensive and Sustainable information on Mineral Deposits
    - A comprehensive and standardized approach for managing mineral deposits at the beginning of the value chain

EUROPEAN CRITICAL RAW MATERIALS ACT

The EU is aiming to ensure a secure and sustainable supply of critical raw materials for Europe's industry

WHY?

Critical raw materials are needed for the **green and digital transitions** as well as for defence and space

To enhance our **long-term competitiveness**

To maintain our **open strategic autonomy** in a fast-changing and increasingly challenging geopolitical environment

European Commission

EUROPEAN CRITICAL RAW MATERIALS ACT

Setting 2030 Benchmarks for Strategic Raw Materials

EU EXTRACTION

At least **10%** of the EU's annual consumption for extraction

EU PROCESSING

At least **40%** of the EU's annual consumption for processing

EU RECYCLING

At least **15%** of the EU's annual consumption for recycling

EXTERNAL SOURCES

Not more than **65%** of the EU's annual consumption of **each strategic raw material at any relevant stage of processing** from a single third country

STRATEGIC PROJECTS

Criteria for recognition of Strategic Projects

Contribution

the project would make a meaningful contribution to the security of the EU's supply of strategic raw materials;

Feasibility

the project is or will become technically feasible within a reasonable timeframe; production volume can be estimated

ESG

the project would be implemented sustainably;
prevention and minimisation of environmental impacts, use of socially responsible practices, use of transparent business practices with adequate compliance policies

Shared benefits

EU: cross-border benefits beyond the Member State
Non-EU: mutual benefits for the EU and the third country, adding value in the third country;

Benefits of selected Strategic Projects

- Support for access to finance
- Shorter permitting timeframes

Applications require the use of UNFC

CRM ACT: LEGISLATIVE PROCEDURE [1, 2, 3]

Act proposal

The European Commission drafts and proposes the Critical Raw Materials Act and related legislation

16 March 2023

National, EESC, CoR opinion(s)

Review and feedback from EU Member States, Committee of Regions, and Economic Committee.

Draft report

Review and feedback from EU Member States, Committee of Regions, and Economic Committee.

7 Sept 2023

Committee vote

Review and feedback from EU Member States, Committee of Regions, and Economic Committee.

2 Oct 2023

Plenary vote

European Parliamentary vote, with support of the Council and Commission

Trilogue

Informal trilateral meeting between representatives of the Parliament, the Council and the Commission

Plenary approval

Adoption

1) https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2023/0079(COD)&l=en
2) https://epthinktank.eu/tag/eu-legislation-in-progress
3) https://www.consilium.europa.eu/media/56627/presidencies-until-2030.pdf

Figure adopted from PLUTONIC RAW MATERIALS ADVISORY

UNFC in CRM-Act Proposal: Time to Act

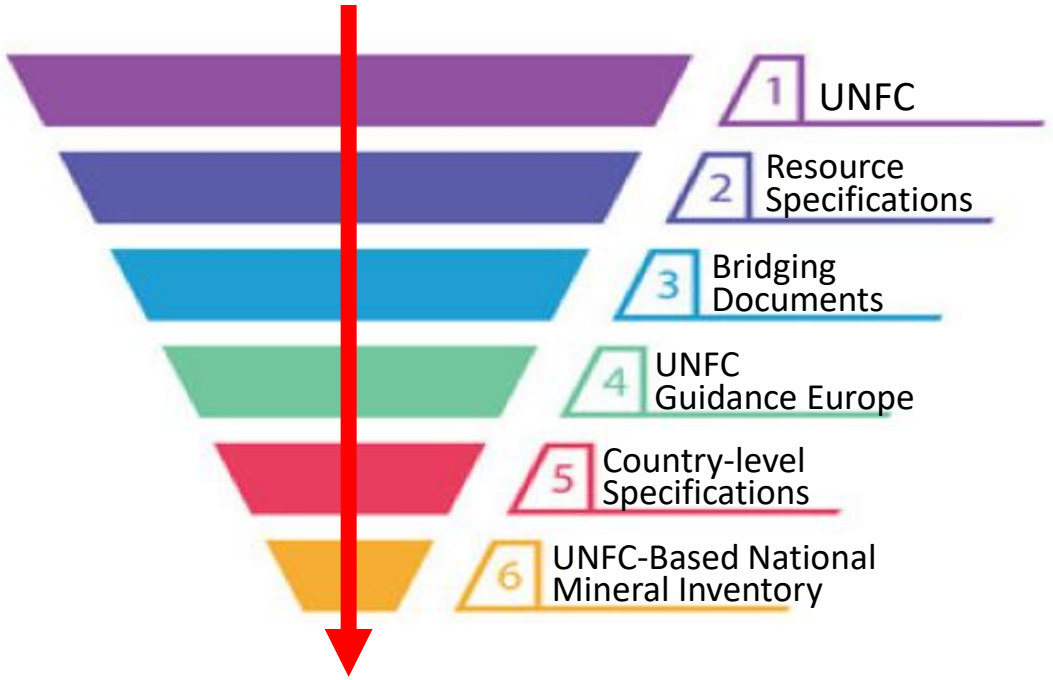
- UNFC was mentioned in the **CRM-Act proposal** in:
  - **Strategic Projects**
  - **National Exploration Projects**
  - **Risk Monitoring**
  - **Extractive Wastes**
- If the CRM-Act is enacted, Member States will be mandated to use UNFC to report:
  - UNFC is key in the recognition of Strategic Projects – **Project promoters** are required to classify their projects in **UNFC** for the **Strategic Project Application to the Commission**.
  - Member States will have to intensify their National Exploration Programs – **Exploration results are required to be reported in UNFC**
  - New and existing projects are to be reported by the Member States to the Commission – **UNFC is obligatory for monitoring new projects.**
  - As part of National measures on circularity, CRM recovery from extractive wastes is encouraged – **UNFC is required when reporting on extractive waste facilities**.

Why UNFC for CRM-Act Proposal?

- The implementation of UNFC in Europe **supports the objectives of the EU CRM-Act**
- UNFC's role as a **harmonizing classification system** mobilizes sustainable investments in raw material projects and promotes **cross-border trading** of minerals
- UNFC is applicable to a **wide range of resources.** This enables data aggregation, interoperability, and comparability, making it a more comprehensive classification system, which can better serve policy making at EU level.
- UNFC is applicable to Secondary Raw Materials, even **end-of-life products**, which are strongly targeted in the Act, along with other **CRM-bearing waste streams**.
- UNFC is simple to use, facilitating classification for **National Authorities** at EU levels while allowing **National Reporting Standards to remain at country levels**.
- UNFC has been **tested extensively on EU grounds** and has shown **positive indications** on the possibility to **harmonize and solidify data** on CRMs for decision-making and policy formulation within the EU.

UNFC Application to EU CRMs

- **UNFC** can facilitate meaningful comparisons between deposits, areas, regions, and countries, aiding decision-making at National and EU levels
- **UNFC** provides a clear framework for assessing the environmental, socio-economic viability of a mineral project, enabling sustainable decisions by policymakers and stakeholders
- UNFC application to CRMs and mineral deposits enables harmony in the EU, and ultimately sustainable resource management
- Following the correct sequence of UNFC documents, from generic to national-levels, facilitates the application of UNFC by stakeholders



Action Plan: UNFC in CRM-Act Proposal

1. **UNFC Thematic Template with Strategic, Exploration, Monitoring, and Recycling modules**
2. **Workshops and Trainings – Capacity Building**
3. **National Guidance / Recommendations**

→ Consistent use across Europe

- UNFC Guidance on national level based on UNFC Guidance Europe
- National level Guidance
- Comparable between primary and secondary raw materials
- Simple procedures / evidence-based classification

→ Countries

- with national reporting - bridging
- without national reporting – template/form

→ Building on the experience:

- EU CRM database
- ERMA
- UNFC documents (UNFC2019, Specifications, Guidance …)
- Bridging documents, national systems
- Promotion and capacity building

→ Coordination: DG GROW, UNECE, GSEU and Futuram

→ UNECE is Coordinating the UNFC activities on behalf of DG GROW

EIT Raw Materials

ERMA
Investment Case Classification
and
EIT RawMaterials' Perspective

INVESTMENT CHANNEL FOR RAW MATERIALS PROJECTS

EIT RawMaterials has set up an agile and fast process to bring raw materials projects into an investment channel, review and approve them to secure the most suitable financing options

Secure primary and secondary raw materials supply for European industrial ecosystems

INVESTMENT PROPOSAL PROCESS

Example for investment cases

1. Rare earth magnets and motors
2. Materials for energy storage and conversion

SUBMISSION

Company description

Please describe your company in 1 000 character(s) maximum

Contact details

Name | Role

Name | Role

E-mail | Phone

E-mail | Phone number

Partners

Co-investors | Industrial

Co-investors | Industrial partners

Investment case / Project description

Please describe your investment / project in 1000 character(s) maximum

Services requested from ERMA

Please describe what kind of services and activities are required to advance the project in 1000 character(s) maximum

Relevance of the project for the EU

Please explain relevancy of your project for the EU in 1000 character(s) maximum

Project location

Project location

Value chain step

ex. mining, processing, recycling, ...

Why is the investment needed?

1000 character(s) maximum

Investment type (M€)

Public | Private | Own contribution

Amount in € | Amount in € | Amount in €

Total investment needed (M€)

2021 | 2022 | 2023 | 2024 | 2025

in € | in € | in € | in € | in €

2026 | 2027 | 2028 | 2029 | 2030

in € | in € | in € | in € | in €

Financial Indicators and time period

ROI | Discount rate | NPV

ROI | Discount rate | NPV

Process input sources / materials

Volume (t) | Value (M€)

Volume in tons | Value in M€

Process outputs sources / materials

Volume (t) | Value (M€)

Volume in tons | Value in M€

Target market

Industry | Value (M€)

Type of industry | Value in M€

Lead time to production

1000 character(s) maxim

Jobs to be created

1000 character(s) maxim

Revenue model

1000 character(s) maxim

Existing demand (volume / value)

Ex. pre-sales orders, ...

Impacts

Social Impacts

1000 character(s) maxim

Environmental Impacts

1000 character(s) maxim

Project risks

1000 character(s) maxim

Other comments

1000 character(s) maxim

Send

submit your propsal
on www.erma.eu

EUROPEAN RAW MATERIALS ALLIANCE | ERMA

eit RawMaterials
Connecting matters

Co-funded by the European Union

STAGE 1 EVALUATION

- Project assessment according to the fixed criteria
- Dedicated assessment team
- Decision

UNFC SCORE

STAGE 1 EVALUATION

- Project assessment according to the fixed criteria
- Dedicated assessment team
- Decision

STAGE 2 PITCH

- Project presentation by the Company in front of the evaluation committee (EIT Raw Materials/ ERMA, Independent External Evaluators)
- Q&A Session after the presentation
- Final decision by the Management Board

VECTOR

Social Vectors: We will assess perceptions, values and attitudes towards the sourcing of critical raw materials for the green transition.

We will integrate our social and geoscience vectors to produce an easy-to-understand interface that allows all of our results to be accessed in one place, by anyone.

Geoscience Vectors: We will use minimally disruptive technologies to investigate mineral deposits under the Earth's subsurface.

Grant number #101058483

Co-funded by the European Union

UK Research and Innovation

Roundtable Discussion
Q&A
Closure

re-sourcing

RE-SOURCING CLOSING CONFERENCE

THANK YOU FOR PARTICIPATING!

EIT Raw Materials and UNECE Workshop

eit RawMaterials

UNECE

Day 2 – 22 September 2023

MADITRACE

re-sourcing

CRM traceability: the Lithium supply chain case

Re-sourcing 2023, Vienna

MORADELL-CASELLAS Alban

BRGM

09/22/2023

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Maditrace develops methods

- Artificial fingerprints
- Digital fingerprints

} Investigated for all project's CMR (Co, Nd, nautral graphite)

- **Natural physico/chemical fingerprints** → Different for each considered CMR

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Lithium tracing and natural tracers

- Is it possible to distinguish **lithium deposits** from each other ?

- If Yes, does it work **throughout the entire production chain** ?

→ Which analytical techniques to use **on site** and **in lab** ?

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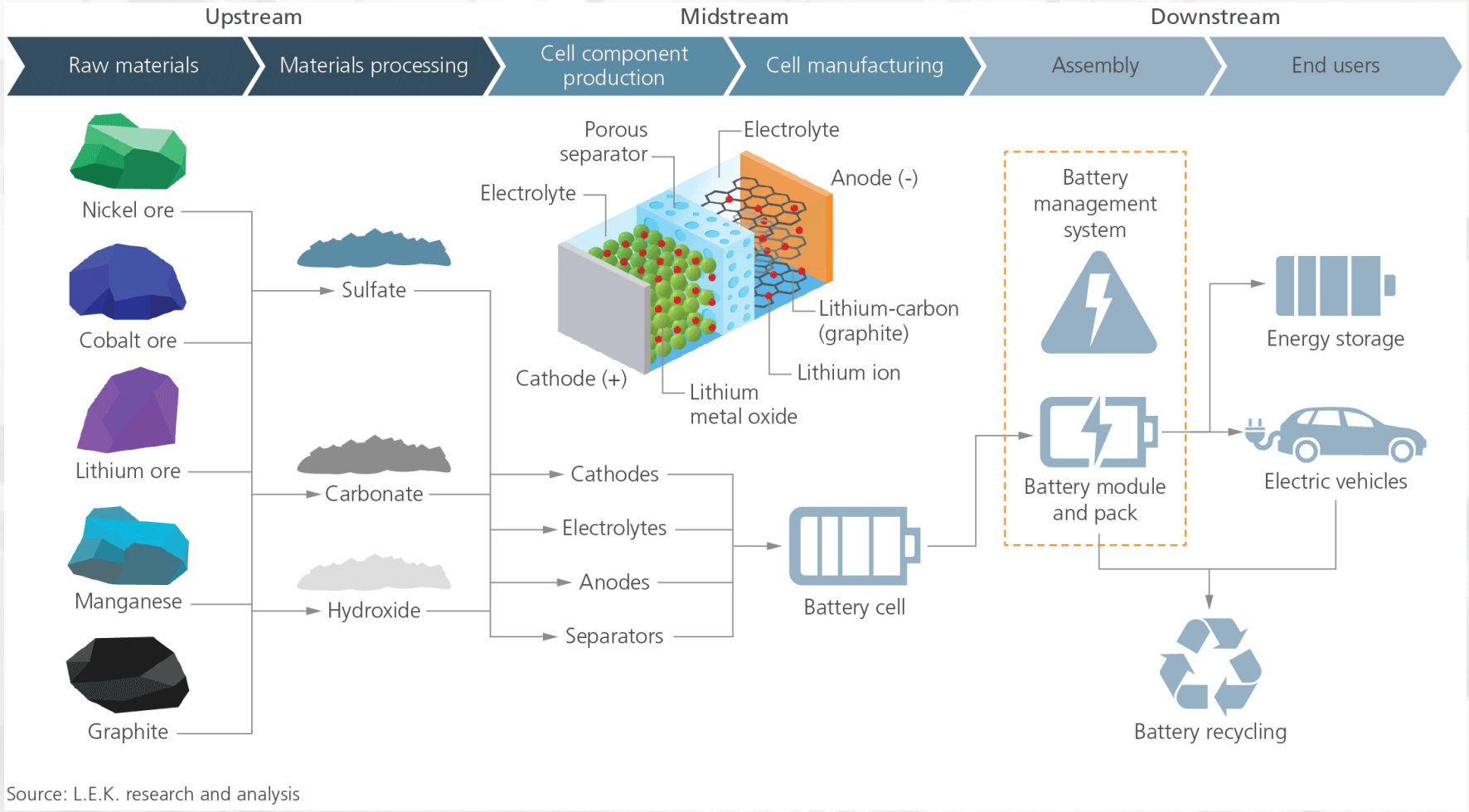
Lithium deposits and supply chain

- Hard rock deposits
- Brines deposits
- Geothermal deposits
- Unconventional clay deposits



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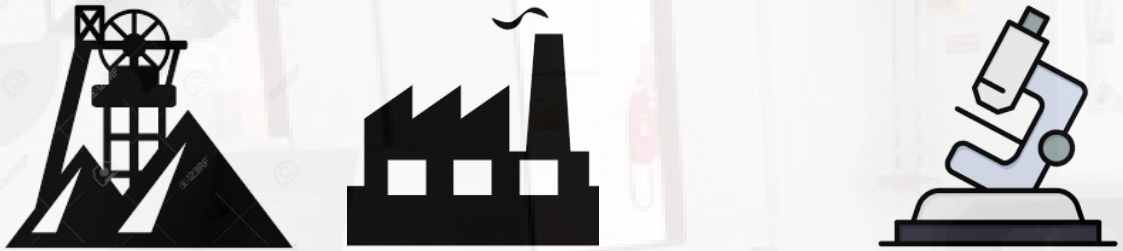
Analytical techniques and long term approach



On site instruments =/= Laboratory instruments

- Project approach : develop laboratory methods and **adapt** on-site certification techniques

- Certification schemes : use these techniques **to check/audit the declared sources**

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Analytical Techniques

- **Mineralogical composition**

XRD Bruker
D8 advance

Pegmatite outcrops, Sankt Radegund bei Graz, Graz-Umgebung District, Styria, Austria, *MINDAT*

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Analytical Techniques

- Mineralogical composition
- **Major elements composition**

XRF Malvern Panalytical *Zetium*

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Analytical Techniques

- Mineralogical composition
- Major elements composition
- **Minor elements composition**

LA+QQQ-ICP-MS Teledyne CETAC® *Analyte Excite +* Agilent *8900*

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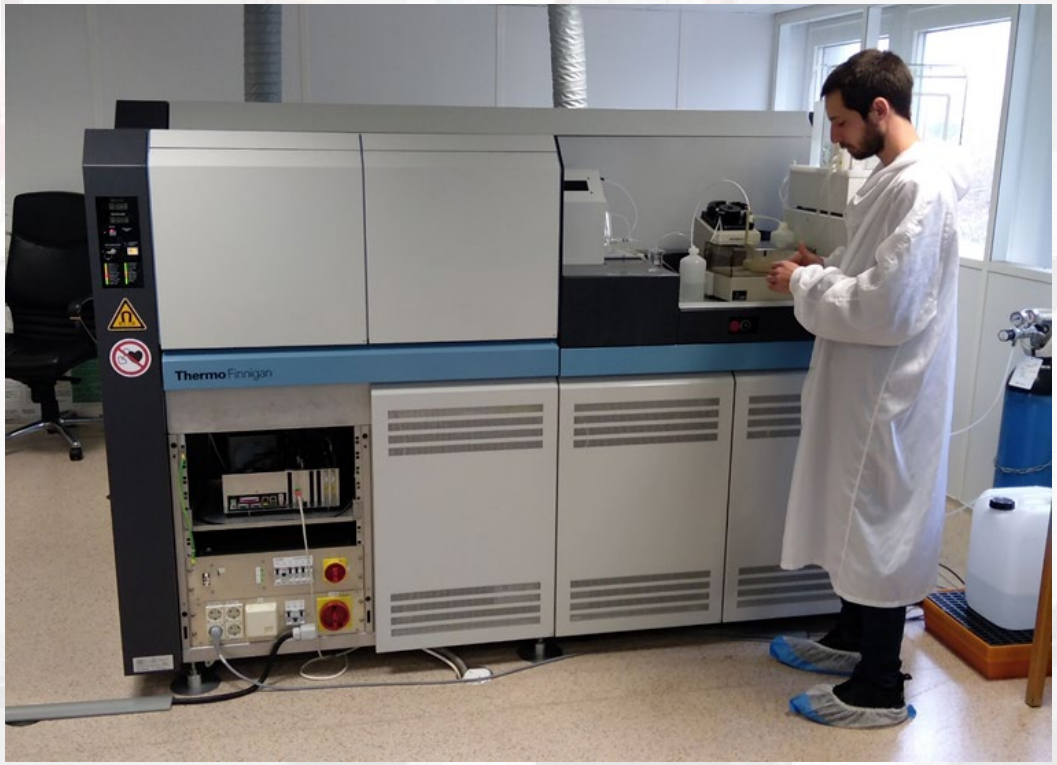
Analytical Techniques

- Mineralogical composition
- Major elements composition
- Minor elements composition
- **Isotopic signature**



MC-ICP-MS ThermoScientific *Neptune plus*

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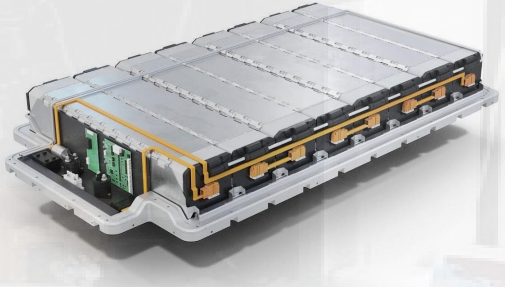
Analytical Protocol

Spodumene concentrate

Li salts

Active materials

Battery cathodes



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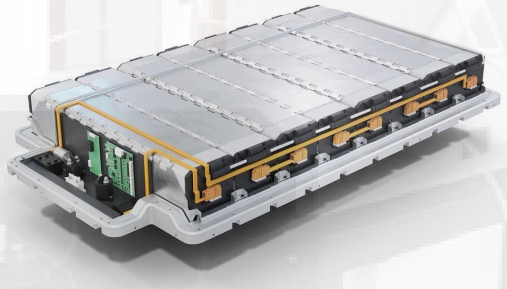
Analytical Protocol



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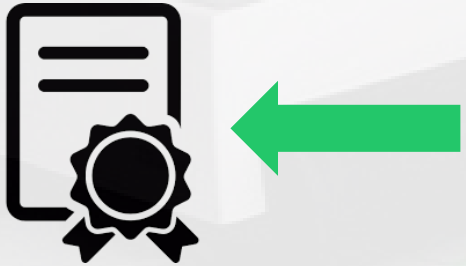


On-site analysis

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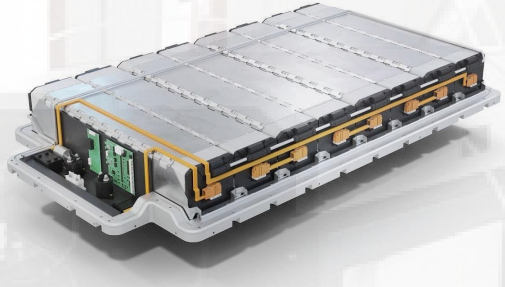
Analytical Protocol



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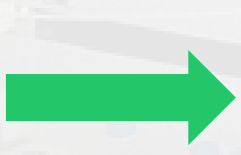


In-lab analysis

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Litterature

- In the case of Lithium, **deposits types can be distinguished** using isotopic signature
- The signature **may be altered** by some processes
- It is possible to make the link between **a battery and the lithium salts** (LiOH and Li_2CO_3)

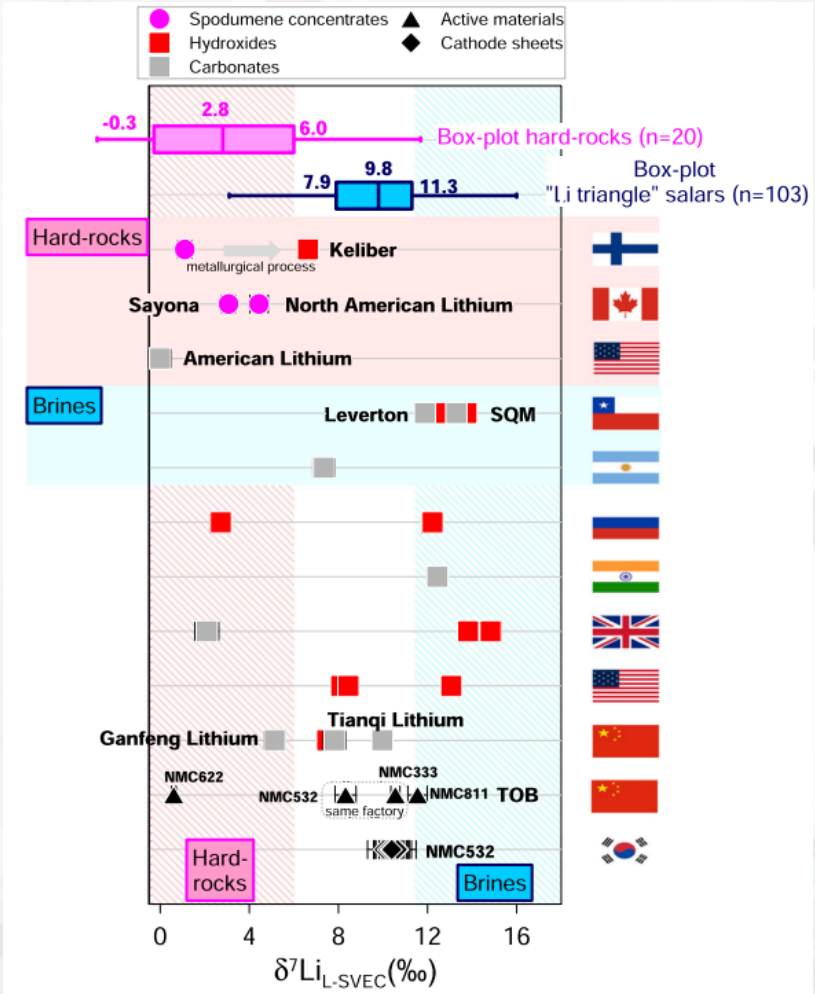

Fig. 4 Lithium isotope compositions of various battery precursors and components produced around the world (Finland, Canada, USA, Chile, Argentina, Russia, India, UK, China, and South Korea). Spodumene

Desaulty et al. 2022

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Advancement

- **~50 samples** : Spodumene and lepidolite concentrates, Li carbonate and hydroxyde, NMCs, battery cathodes
- 16 lithium salts with **known deposits type** from knowledge or isotopic analysis
- **60 trace elements** analyzed on 40 samples ; 36 samples with Li isotopic signature
- Working on **sample preparation** for analysis (NMC, cathodes …) and trace elements **data treatments** (with the contribution of isotopic signatures)

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Databases and data treatments

- **Feed databases** with data from certified and "certifying" analyses
- Big data treatments (PCA, NeuralNetwork, clustering …)

→ **Discriminant tracers** for certification

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Needs for samples

- Necessity to have a representative number of samples from every sources :
  - To help **natural tracers developement**
  - To **feed databases** for discriminant tracers determination
  - To **assess production evolution** and new producing sites

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CERA 4in1 Certification System and Standards

Overview

Thania Nowaz

DMT GmbH & Co. KG

21.09.2023

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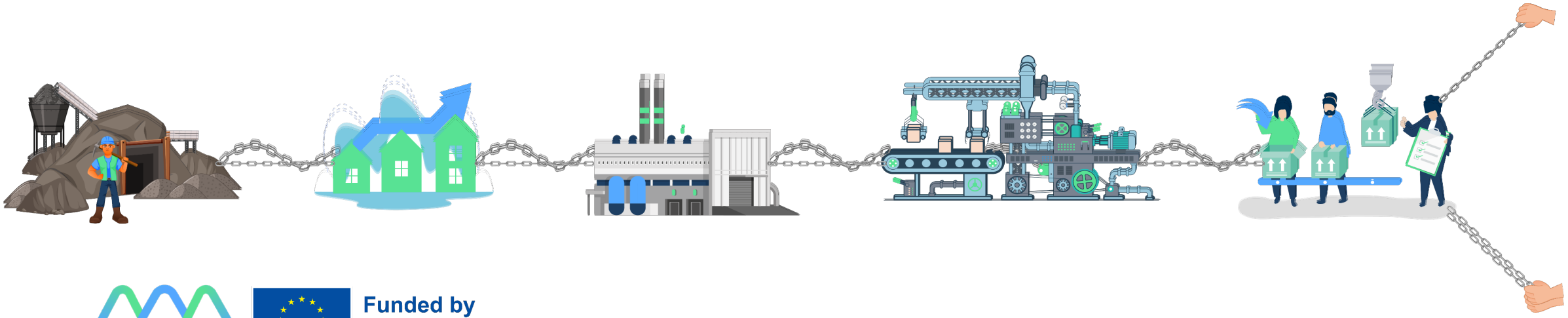
Why focus on supply chains



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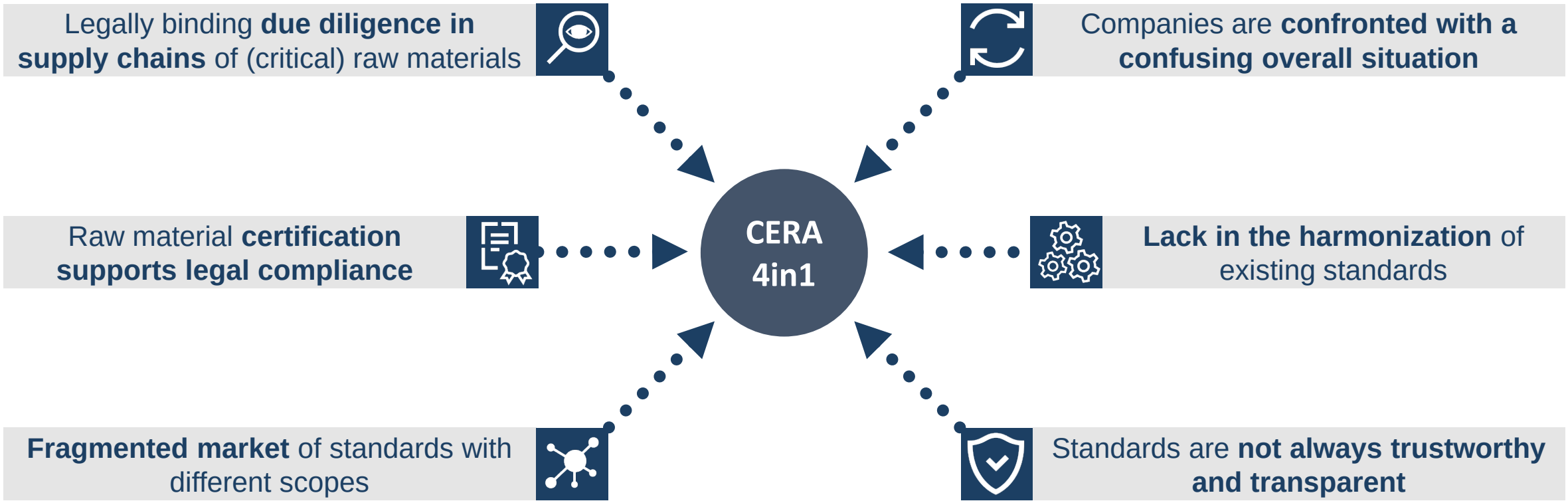
Sources: Russia's war on Ukraine. Russia-Ukraine War: What Happened on Day 39 of the War in Ukraine - The New York Times (nytimes.com)
DRC: Conflict Minerals | Ethical Consumer

Status quo



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What is the maturity level of CERA 4in1 standards?

Exploration and development	Extraction and processing	Supply chain	End-products
CERA Readiness Standard **CRS**	CERA4in1 Performance Standard **CPS**	CERA Chain of Custody Standard **CCS**	CERA4in1 Final Product Standard **CFS**
Time-to-market ~ Q2.2024	**`Upstream- Extraction until raw material'** **Market Entry** **as TNC In-house Standard** **Q4.2023**	Time-to-market ~ Q4.2025	Time-to-market ~ Q4.2025

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TÜV NORD CERA4in1

What is it?

The **first** and **so far only certification system** that **proves sustainable** development **along the entire mineral raw material value chain** – from **exploration**, through **extraction** and **processing**, **manufacturing** until **end-products**

What is it targeting?

Targeting **all kind of minerals**, **everywhere in the world** and is applicable to **any size of company**

How is it addressing the market concerns?

Streamline and simplify the methods through which **sustainability** is defined and validated **in the raw material sector**.

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Client´s Advantages applying CERA 4in1 to maintain ESG

- Reducing **supply chain risks**
- **Market advantages,** e.g. brand differentiation, consumer recognition for responsible products
- **Readiness** for and **compliance** with actual and upcoming **legislation**
- Reduction of **insurance** and **financing** risks resulting from **ESG performance**
- Compliance with **stakeholders expectations**: civil society, customers, banks, stock exchanges, …
- Improve or sustain **community involvement** and **consultation** to **obtain** and **maintain Social License to Operate**

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The CCS Development

Exploration and development	Extraction and processing and manufacturing	Supply chain	End-products
CERA Readiness Standard **CRS**	CERA4in1 Performance Standard **CPS**	CERA Chain of Custody Standard **CCS**	CERA4in1 Final Product Standard **CFS**
Time-to-market ~ Q2.2024	Downstream Time-to-market ~ Q4.2024	Time-to-market ~ Q4.2025	Time-to-market ~ Q4.2025

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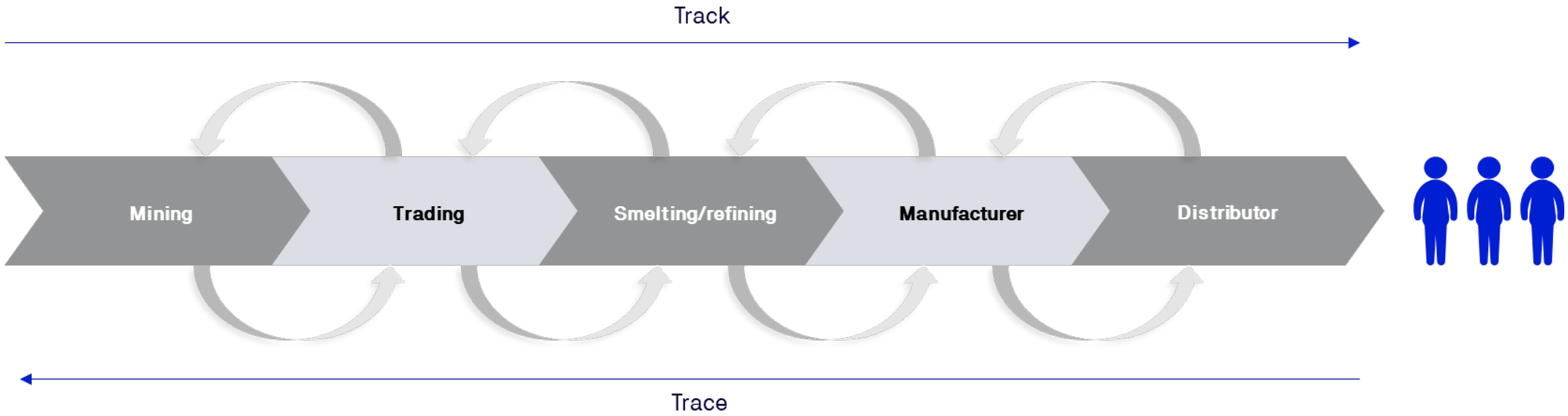
What is chain of custody

§`***The process by which inputs and outputs and associated information are transferred, monitored and controlled as they move through each step of the supply chain***‘ – ISO 22095

§`***The custodial sequence that occurs as ownership or control of the material supply is transferred from one custodian to another in the supply chain***‘- (Adapted from: WB: WWF Alliance for Forest Conservation and Sustainable Use, 2002)



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Chain of Custody Requirements

- Control of materials
- Transfer documents
- Evaluation

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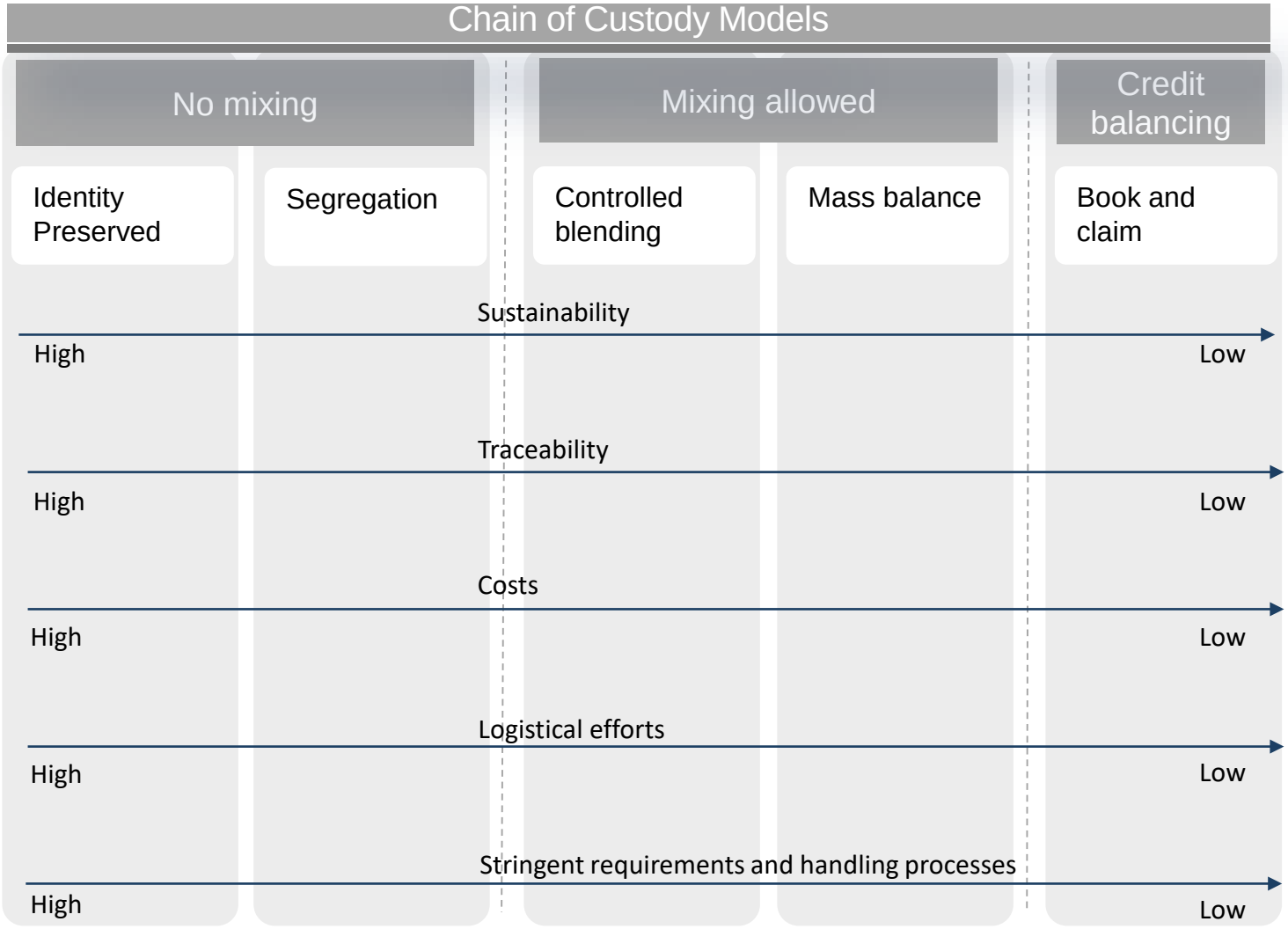
Chain of Custody Requirements

Control of materials

Transfer documents

Evaluation



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Chain of Custody Requirements

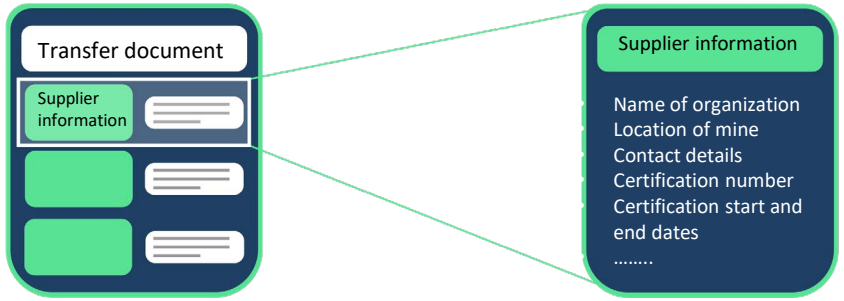
Control of materials

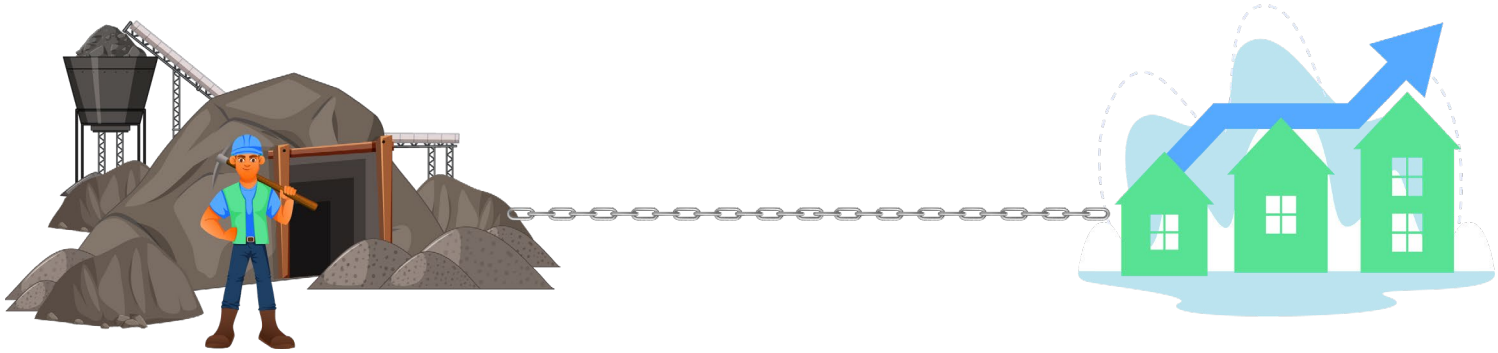
Transfer documents

Evaluation

Information that will be in transfer documents

- Supplier's information
- Input/output materials information
- Transporter or shipper details
- Processing information
- Sustainability information





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Chain of Custody Requirements

Control of materials

Transfer documents

Evaluation

Verification

- Evaluating conformance with the applicable requirements
- Frequency
- Type of audit in line with the risks identified
- Corrective actions in response to non-conformities

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Conclusion

Chain of custody schemes

- Commodity specific
- Lacking technical aspects
- Harmonization of structure and terminology
- Optional sustainability aspects

Flexible

Scalable

Adaptable

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re-sourcing

Material & Digital Traceability for CRM Certification

Daniel Monfort, BRGM

Re-Sourcing project workshop, Vienna 22-9-2023

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Agenda

- **General presentation of MaDiTraCe project.** Daniel Monfort (BRGM, French geological survey)
- **CERA 4in1 Certification System and Standards.** Tania Nowaz (company DMT)
- **CRM traceability: the Lithium supply chain case.** Alban Moradell Casellas (BRGM)
- **CRM traceability: the natural graphite case.** Valentina Dietrich & Robert Arato (Montanuniversität Leoben)
- **Questions**

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Bringing greater transparency, traceability & sustainability to raw material supply chains

Global commodity flows and regulatory frameworks pertaining to **critical raw materials (CRMs)** are high on the European economic and political agenda. Companies are also facing increased pressure to responsibly extract, process and source materials as initiatives such as the EU Battery regulation and the EU Directive on Corporate Sustainability Due Diligence come into force.This makes standardised certification schemes, transparent and secure traceability, and decentralised confidential data handling imperative.

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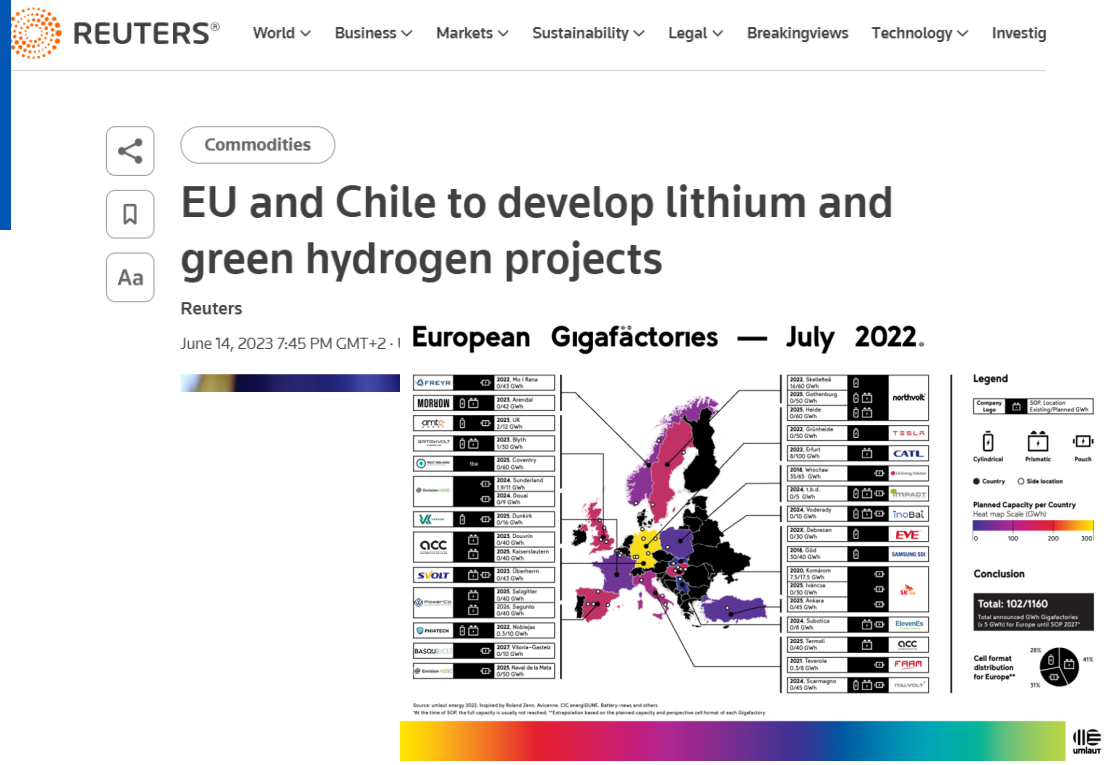
A project in a very particular context

Raw materials for battery, responsible sourcing and battery passport



Objective 1

Identify gaps in current due diligence practices and assess manufacturing industry needs in respect to compliance with sustainability standards and regulation.

Objective 2

Develop and test a portfolio of digital, mineralogical and geochemical technological solutions reinforcing the transparency and traceability of complex CRM supply chains.

Objective 3

Integrate this portfolio with a generic certification scheme for CRM supply chains from the mine to the manufactured and recycled products.

Objective 4

Integrate technological solutions into digital product passports, such as the battery passport, using a decentralised approach.

Objective 5

Facilitate the uptake, implementation and exploitation of the project's technologies and certification scheme by end-users and key stakeholders.

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For a sustainable energy transition

Material fingerprinting will be carried out for four key commodities found in battery and magnet supply chains for e-mobility and wind energy development.

Cobalt

Used to develop batteries, super alloys, catalysts and magnets.

Lithium

Used in battery, glass, ceramic, steel and aluminium production.

Natural graphite

Used in battery production as well as in refractories for steelmaking.

Rare earth elements

Key to the production of magnets for electric motors and batteries.

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The MaDiTraCe concept

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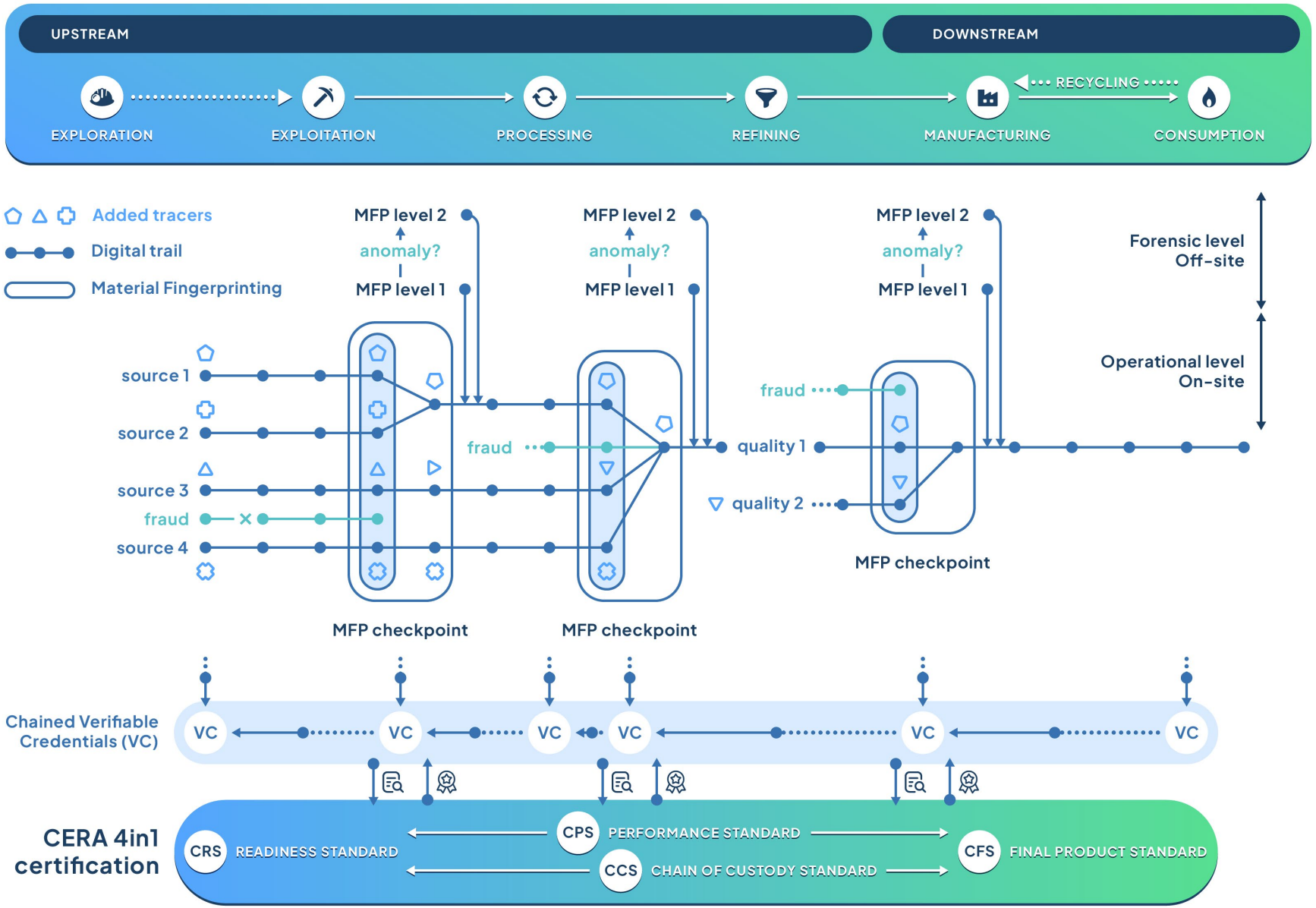
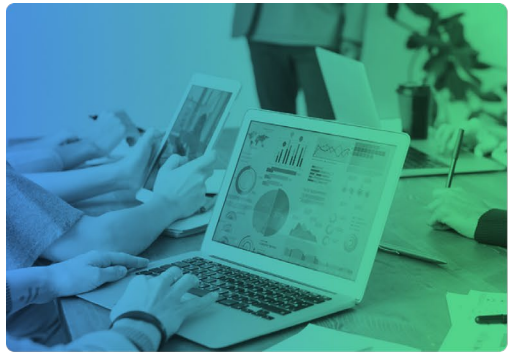


The MaDiTraCe concept more in detail

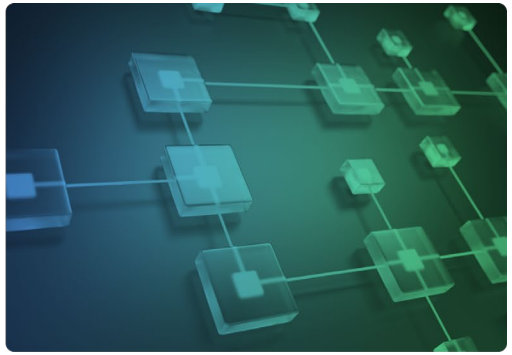
Expected impacts

The project expects to make significant impacts on complex CRM supply chains.



Improve supply chain data transparency & traceability

Identify & address gaps in due diligence



Set up technological solutions for tracking raw material flows

Develop comparable criteria, reporting & audit approaches

Enable sustainable sourcing of raw materials

Support the implementation of the EU Action Plan on CRMs

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And now?

- **Looking for engaged stakeholders**

- **Are you a battery raw material provider or manufacturer and you are interested in our project? Please, contact us** contact@maditrace.eu

Questionnaire

- **What are your main points of interest of this seminar?**

- **Which do you think is most significant challenge of adopting an ESG standard in the mining industry?**

- **Which option do you think will play a role in the increased adoption of a chain of custody standard in the mining industry?**

Thank you

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