



**UNIVERSITY OF
CAMBRIDGE**
INSTITUTE FOR
SUSTAINABILITY LEADERSHIP

**CLG
Europe**

Materials & Products Taskforce

Enhancing circular economy in the use of critical raw materials in the EU

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Agenda

1. Introduction: CISL & CLG Europe's Materials & Products Taskforce
2. Scene setting & policy context
3. The EU's Critical Raw Materials Act and the Net Zero Industry Act
4. A business view: "Embracing circularity: A pathway for strengthening the Critical Raw Materials Act"
5. Future outlook & challenges
6. Open discussion

About CISL & CLG Europe's Materials & Products Taskforce



The University of Cambridge Institute for Sustainability Leadership (CISL) partners with business and governments to develop leadership and solutions for a sustainable economy. We aim to achieve net zero, protect and restore nature, and build inclusive and resilient societies. For over three decades we have built the leadership capacity and capabilities of individuals and organisations, and created industry-leading collaborations, to catalyse change and accelerate the path to a sustainable economy.



CLG Europe develops credible, ambitious positions amongst its membership and deploys effective strategic communications to engage with the highest levels of policy audiences. CLG Europe is diverse in its membership and representative of Europe in both geography and sector, welcoming the innovative talent of SMEs as well as leading established companies.

Materials & Products Taskforce

The Taskforce for climate neutral and circular materials and products was created in September 2021, with the aim of driving forward policy action on sustainable materials by bringing together a group of progressive businesses across sectors and value chains. The group brings together companies that are actively committed to producing and using climate neutral and sustainable materials, and who want to work together to promote and support EU-wide measures to decarbonise material production and use.

Growing demand for critical raw materials

- The availability of critical raw materials is increasingly under pressure.
- Demand for critical raw materials is rapidly increasing. E.g. for lithium and graphite, it can ramp up to 500% by 2050 ([World Bank, 2020](#))
 - Critical raw materials are essential for the EU economy as a whole and especially for the green transition.
- Commodity markets have been very volatile.
- Global supply and demand patterns have changed, due to emerging markets and new technologies.
- The challenges related to commodities are interlinked and affect policies in the areas of social issues, financial markets, development, trade, industry and foreign affairs.
- Various political instruments are needed in order to address these challenges.

Overview of EU policies related to critical raw materials

- The EU has **specific CRM relevant strategies and legislation**:
 - EU CRM action plan (2020),
 - Conflicts Minerals Regulation (2021),
 - EU CRMA (2023) and EU CRM assessment lists (2011 - 2023)
- Furthermore, **a large number of other EU policies have an impact on the green transformation.**
- Many of these policies, especially for the circular economy, also have implications on the **demand for critical raw materials.**

Green Deal Industrial Plan

The European Commission **launched the Green Deal Industrial Plan in January 2023** with the aim to:

- “enhance the competitiveness of Europe's net-zero industry and support the fast transition to climate neutrality.”
- “provide a more supportive environment for the scaling up of the EU's manufacturing capacity for the net-zero technologies and products required to meet Europe's ambitious climate targets.” ([European Commission, 2023](#))
- **Two key legislations under the GDIP are:**
 - The Net-Zero Industry Act
 - Critical Raw Materials Act

The Net-Zero Industry Act (NZIA)

- It's **part of the GDIP** “for a predictable and simplified regulatory environment.” ([European Commission, 2023](#))
- The NZIA is intended to be a **game-changer legislation** to reshore cleantech production in Europe.
- The Act aims to:
 - “increase the competitiveness and resilience of the EU’s net-zero technology industrial base.”
 - “to reduce the risk of replacing our reliance on Russian fossil fuels with other strategic dependencies” ([European Commission, 2023](#))
- **The file focuses on** products, components and equipment that are needed for manufacturing net-zero technologies.
- **Latest policy update:**
 - On 6 February, the European Parliament and the Council, in the third trilogue, reached a provisional deal on the Net-Zero industry Act (NZIA)
 - The deal is now to be formally approved by the Parliament (plenary vote scheduled for 22 April) and by the Council.

The European Commission's proposal for The EU's Critical Raw Materials Act (CRMA)

The regulation sets clear benchmarks for domestic capacities along the strategic raw material supply chain and aims to diversify EU supply by 2030



At least **10%** of the EU's annual consumption to be covered by domestic **extraction** capacity



At least **40%** of the EU's annual consumption to be covered by domestic **processing** capacity



At least **15%** of the EU's annual consumption to be covered by domestic **recycling** capacity



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

- There has been a provisional political agreement reached in November 2023 and in December the European Parliament gave green light to the text. The Council reading is awaiting.
- **Compared to the European Commission's proposal, the agreed text:**
 - adds another CRM (aluminium) to the list of strategic raw materials (therefore, 34 critical raw materials and 17 strategic raw materials)
 - Further to natural graphite, synthetic graphite is added to the list of strategic raw materials for an initial period of 3 years until the list is revised by the European Commission.
 - The benchmarks of 10% for extraction of raw materials and 40% for processing are kept however the recycling target has been increased to 25% from 15%.

Build-up of raw material extraction capacities

- Possibilities vary greatly for the different raw materials:
 - **Lithium** → Possible to a limited extent, the best deposits are outside the EU.
 - **REE** → Possible, REE are widespread and also available in the EU, but extraction is more expensive than from other sources and HREE are only contained to a small extent in EU deposits.
 - **Aluminium/Bauxite** → There are no relevant deposits in the EU.

Build-up of raw material processing capacities

- Challenges due to **high electricity prices**:
 - **Aluminium** → Processing exists, but currently cost problems.
- **Desirably high but more cost-intensive, environmental and labour standards in EU.**
- **Higher transport costs** of usually larger quantities of raw materials compared with the smaller quantities of products.
- Nevertheless, **higher costs can lead to innovation of processes such as energy savings.**

Recycling

- According to the provisional agreement, the CRMA sets a circular target of **25% recycled content by 2030**.
- For some raw materials this target* has already been achieved:
 - Bauxite/aluminium,
 - Copper,
 - ...
- For others it is unclear of how to achieve the goal*:
 - REE,
 - Lithium,
 - ...

* originally proposed 15% recycled content target by 2030

Diversification of supply

- Often possible and sometimes practiced:
 - Possible for REE and lithium.
 - Practiced in the case of aluminium.
- Depends on **existing deposits**.
- Risks of **higher costs** and the **displacement of environmental and social impacts**.

Overall assessment

“While these have been positive developments, the EU’s approach to industrial policy remains relatively narrow in its aims, lacks new resources and is not yet sufficiently connected to the EU’s other wider approaches, such as its economic security strategy and wider approach to sustainable development.” ([CLG Europe, 2023](#))

Circular economy (CE) practices provide an important and alternative opportunity for greater strategic autonomy, improved security of supply of CRMs, and, as a result, a more sustainable European industry.



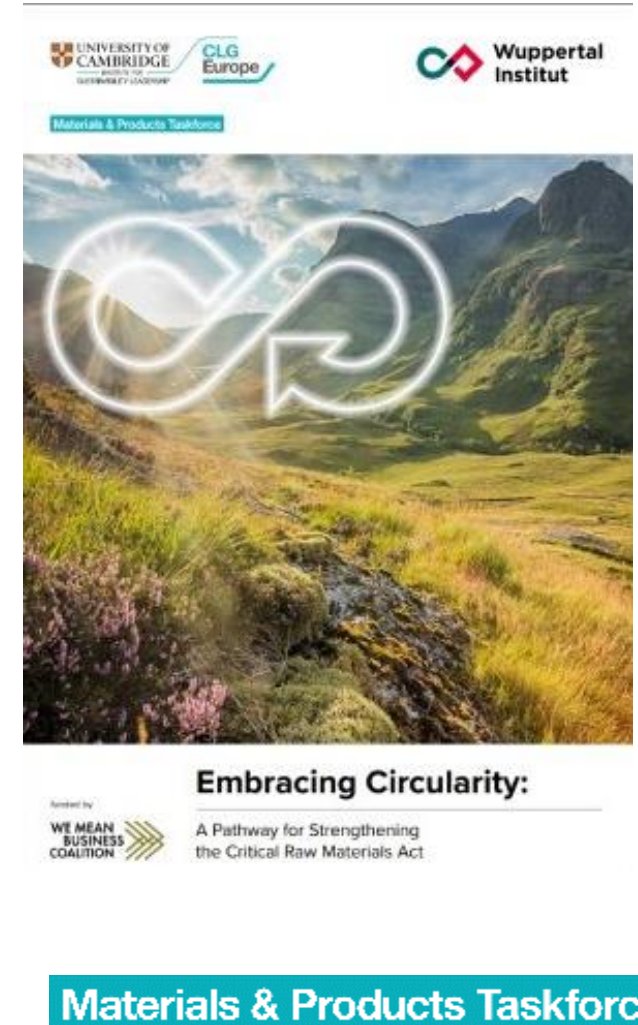
#EmbracingCircularity:
A pathway for
strengthening the Critical
Raw Materials Act

About the report

In July 2023, the Wuppertal Institute and CLG Europe's Materials & Products Taskforce launched its joint publication "[Embracing circularity: A pathway for strengthening the Critical Raw Materials Act](#)"

The report aims to:

- Improve the understanding of businesses and policymakers about the current and future demand for CRMs and strategic raw materials in Europe, and how greater circular practices could support the green transition, bolster geopolitical autonomy and enable business innovation.
- Improve the understanding of businesses and policymakers about the key barriers to greater circularity concerning CRMs.
- Set out what policies and investments are required to make a more circular approach work in practice, and what preconditions would be needed to facilitate and incentivise their effective use



Research methodology



Sectors covered in the report include **aluminium, construction, lighting, automotive, IT, energy storage, material technology, packaging and recycling.**



Company representatives who participated in the research included:

- **CLG Europe's Taskforce** for climate neutral and circular materials and products.
- **Other identified business stakeholders** across sectors and value chains.



Extensive literature review including review of policy evolution leading to the CRMA.



Qualitative primary research including one interactive stakeholder workshop, several interviews with company representatives and collected company case studies.

Business perspectives



- In a workshop and several interviews we discussed opportunities and challenges when implementing circular economy practices with **company representatives** from:
 - **CLG Europe's Taskforce** for climate neutral and circular materials and products and
 - other identified **business stakeholders** along the value chains of aluminium, REE and lithium.
- The report features **several case studies** from industries concerning CE practices in CRM use.

Benefits and opportunities of CE practices



Opportunities:

- ✓ **Aluminium** → avoid alloy mixes to enable higher recycling quality
- ✓ **REE** → reduction of the quantities used, lifetime expansion, usage of waste streams
- ✓ **Lithium** → substitution, lifetime expansion, recycling

Examples of business case studies

Volvo Cars' holistic approach to circularity

Volvo Cars is committed to becoming a circular business by 2040. To achieve this, Volvo Cars is implementing a holistic approach towards circularity, targeting both operations and vehicle design.

The company is trying to cluster CRM-containing components and thereby make them easier to dismantle, and wherever possible designing components from a single material.

Another key part of Volvo Cars' circular strategy is to identify partners that are leading the way in the recycling of CRMs.

Replacing CRMs: Vianode's synthetic graphite

Synthetic graphite is today the most common anode material.

Vianode has developed a revolutionary technology for the graphitisation process.

By combining a closed and cleaner processing method with the use of renewable electricity from hydropower, this innovative technology helps to reduce CO₂ emissions by more than 90 per cent compared with conventional production.

Regulatory barriers for implementing CE practices



- Waste leakage to outside the EU.
- Lack of policy signals to shift preference from virgin to recycled materials.
- Policy misalignment.

Technical challenges and limits of recycling



- Dynamically changing material composition.
- Strongly increasing use of substances.
- **Need for** an effective collection of separate, clean waste streams and a more local recycling infrastructure.
 - Aluminium → Material uniformity.
 - Lithium → Wide range of inputs.
 - REE → Very demanding and costly separation process.

Challenges for business adoption



- Change in **business models**.
- Having a clear **business case**.
- **Economic viability**.
- **Volume requirements** to be competitive.
- Lack of **value chain collaboration** and lack of **information**.
- Protection of **business knowledge**.
- **Logistical** challenges.

Conclusions and recommendations 1/2



Implement a more comprehensive circular approach within the CRMA, rather than focusing only on recycling.



Set a flexible approach towards circularity within the CRMA that recognises the need for a case-by-case approach.



Deploy forward-looking infrastructure to enable a systems-wide circular economy.

Conclusions and recommendations 2/2



Set a clear overall vision on a **European Industrial Strategy** that combines circularity, carbon neutrality and further sustainability aspects.



Create more **environmentally and socially sustainable supply chains** by diversifying supply chains and promoting responsible mining practices.



Implement **financial incentives and support schemes** to ensure faster the commercial viability of a shift towards green technologies.

Future outlook



Business models: Circular economy practices often require significant changes to existing business models. While the implementation of these practices can be challenging, it can also create new opportunities for businesses to build up more resilient business models, reduce costs and improve ESG performance.



Upcoming European institutional change: How will the legacy of the European Green Deal and related policies be featured in the next EU agenda? What will be the priorities of the next institutions?



International dimension: There is increasing international competition to access critical raw materials. How will the international landscape change in light of increasing geopolitical tensions?

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