

Critical Raw Materials for Ireland for a Resource-Efficient Circular Economy (CIRCLE)

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Identifying pressures

The Critical Raw Materials for Ireland for a Resource-Efficient Circular Economy (CIRCLE) project addressed the challenge of ensuring the availability and security of critical raw materials (CRMs) in Ireland, which is vital for industrial growth and competitiveness. Global raw material supply is becoming increasingly complex and uncertain, exacerbated by resource scarcity and supply chain vulnerabilities. Ireland lacked a criticality assessment methodology tailored to its unique economic and resource landscape. To address this gap, the CIRCLE project developed a customised methodology for assessing the criticality of raw materials specific to Ireland. This robust framework for evaluating raw materials' criticality supported evidence-based decision-making, crucial for developing strategic policies to ensure resource security and reduce dependency on imports. By identifying CRMs and their supply risks, the project aimed to secure jobs, promote innovation and sustain economic growth. In addition, it emphasised sustainable resource management practices to enhance resource efficiency, reduce waste and drive the circular economy. Thus, the CIRCLE project significantly contributed to Ireland's understanding and management of CRMs, supporting both economic resilience and environmental sustainability.

Informing policy

The CIRCLE project holds significant policy, societal and commercial relevance. The assessment methodology and resulting CRM lists can assist stakeholders in identifying essential materials for various industrial sectors, providing insights into potential supply risks and economic impacts. The CRM lists will support evidence-based decision-making for policymakers by offering a robust framework to evaluate the criticality of raw materials, which is crucial for developing strategic policies that ensure resource security. This is aligned with Ireland's goals for sustainable development and climate change mitigation. By identifying CRMs, the project can help ensure the availability of essential resources for key industries such as the electrical and electronics industry, medical device industry and the manufacturing industry. The focus on sustainable resource management practices can contribute to environmental conservation, benefiting society at large. CIRCLE project outcomes can aid industries in understanding their raw material dependencies and supply risks, which is vital for maintaining competitiveness and fostering resilience against supply chain disruptions.

Developing solutions

The CIRCLE project implemented a CRM methodology tailored to Ireland's economic and resource landscape, characterised by customised CRM assessments and multiple evaluation methods. Three methods were developed for assessing raw material criticality:

- Method I. Identify CRMs when both economic importance (EI) and supply risk (SR) values surpass a threshold.
- Method II. Categorise materials into low, elevated and high criticality based on EI and SR thresholds.
- Method III. Rank materials by the sum of EI and SR values, from most to least critical.

The CIRCLE project recommends the establishment of a national database comprising three vital components:

- CRM data to facilitate strategic decision-making and reduced import reliance;
- circular material use rate data to track progress towards greenhouse gas reduction, waste reduction targets and climate goals;
- material flow analysis to provide insights into material flows and resource consumption in Ireland.

In addition, a knowledge base similar to the EU Raw Materials Knowledge Base is recommended to support data dissemination and partnerships, enhancing resource security and economic resilience.