

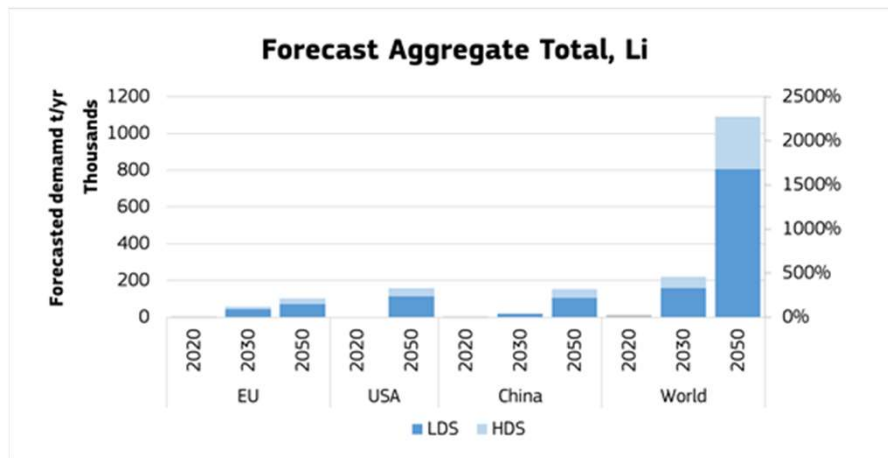


Maximising the potential of circularity for Critical Raw Materials in the EU

*DG Environment
Directorate Circular Economy
Unit B3: From Waste to Resources*

Critical raw materials and the EU economy

- Driven by the twin transition and defence needs, significant **growth in CRM demand**, with risk of global supply/demand imbalance



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**.

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

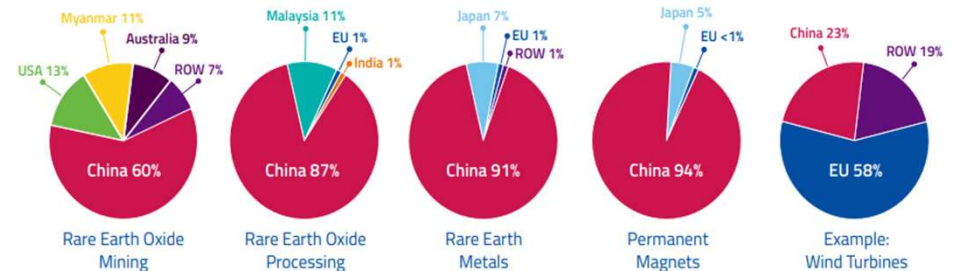


Fig. 3: From rare earths mining to wind turbine manufacturing: estimated market shares in 2019. Sources: Team analysis and Roskill 2018; Adamas Intelligence 2019; Petevs 2017; Carrara et al. 2020; IEA 2021; USGS 2021.

Source: European Raw Materials Alliance (ERMA)

Recycling's potential

- Recycled raw materials offer the potential for domestic, reliable, sustainable supply of critical raw materials
- Current recycling rates are low for most CRMs
- Recycling will not solve our short- and medium-term supply shortages, more primary production and imports are needed
- But it has the potential to cover a large part of future EU demand beyond 2030

											H 0%																	He 1%
Li 0%		Be 0%																			B* 0.6%	C	N	O	F* 1%	Ne		
Na		Mg 13%																			Al 12%	Si* 0%	P* 17%	S 5%	Cl	Ar		
K* 0%		Ca	Sc 0%	Ti 19%	V 2%	Cr 21%	Mn 8%	Fe 31%	Co 22%	Ni 17%	Cu 17%	Zn 31%	Ga 0%	Ge 2%	As 0%	Se 1%	Br	Kr										
Rb		Sr 0%	Y 31%	Zr 12%	Nb 0%	Mo 30%	Tc	Ru 11%	Rh 28%	Pd 28%	Ag 19%	Cd 30%	In 0%	Sn 31%	Sb 28%	Te 1%	I	Xe										
Cs		Ba 1%	La-Lu ¹	Hf 0%	Ta 5%	W 42%	Re 50%	Os	Ir 14%	Pt 25%	Au 20%	Hg	Tl	Pb 75%	Bi 0%	Po	At	Rn										
Fr		Ra	Ac-Lr ²	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Uut	Fl	Uup	Lv	Uus	Uuo										
¹ Group of Lanthanide			La 1%	Ce 1%	Pr 10%	Nd 1%	Pm	Sm 1%	Eu 38%	Gd 1%	Tb 6%	Dy 0%	Ho 1%	Er 1%	Tm 1%	Yb 1%	Lu 1%											
² Group of Actinide		Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr												
Aggregates 8%	Bentonite 19%	Coaling Coal 0%	Diatomite 4%	Feldspar 8%	Gypsum 1%	Kaolin Clay 1%	Limestone 19%	Magnesite 2%	Natural Cork 8%	Natural Graphite 3%	Natural Rubber 1%	Natural Teak Wood 0%	Perlite 42%	Sapele wood 0%	Silica Sand 18%	Talc 16%												

* F = Fluorspar, P = Phosphate rock, K = Potash, Si = Silicon metal, B = Borates.

EC/JRC (2021): Raw Materials Scoreboard, third edition

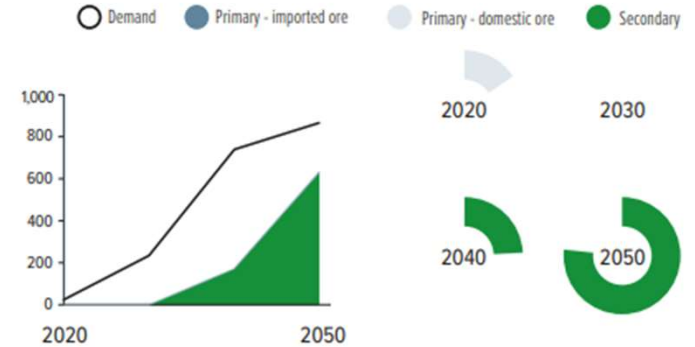


Figure 145. European lithium supply-demand balance, gap to be met by imports or more domestic supply (kt)

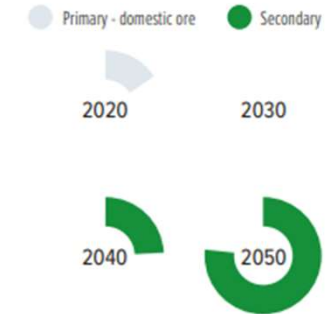


Figure 146. European lithium self-sufficiency evolution

European Critical Raw Materials Act

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

Sustainability

Benchmarks (2030)

- 10% extraction – 40% processing – **15% recycling in the EU**
- No more than 65% from any single third country

Raw Materials diplomacy

- CRM club
- Strategic Partnerships

Monitoring
and risk
preparedness

Strategic Projects

One-stop
shop
permitting

Financing
sub-group

Skills, research and
innovation

International engagement to
promote high ESG standards

Highest standards for Strategic
Projects

Environmental footprint
declaration for CRMs placed on
the EU market

European Critical Raw Materials Act

Increase the **circularity** and sustainability of the critical raw materials

Benchmark on
Recycling

MS programmes to increase
efficient use of CRM
according to waste
hierarchy

Information requirements on
recycled content & future
minimum shares of CRM in
permanent magnets

Circularity information
requirements for
products containing
permanent magnets
via label, passport and
data carrier

Focus on extractive waste

- Operators and MS to
analyse potential of CRM
recovery
- Public database of closed
waste facilities

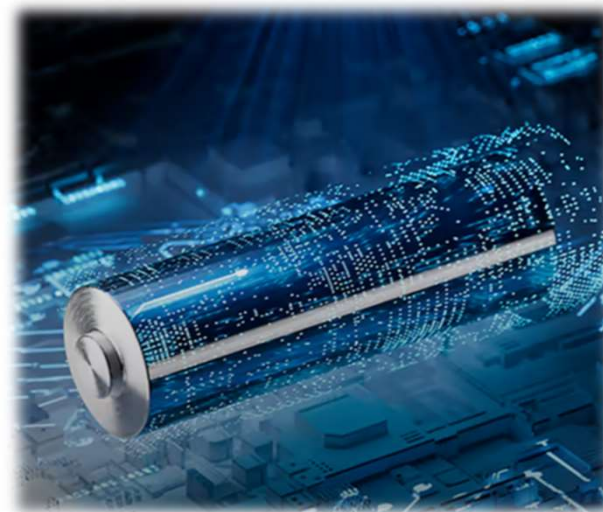
Forthcoming actions:

- End-of-life vehicles
- WEEE
- Specific waste treatment
- List of Waste
- ...

CRM in sectoral material streams

- **Batteries Regulation** introduces minimum recycled content in batteries for **cobalt**, lead, **lithium** and **nickel**.
- Ambitious waste management requirements including **recycling efficiency** (e.g. lithium-based batteries or nickel-cadmium batteries) and material recovery targets for **cobalt**, **copper**, lead, **lithium** and **nickel**.
- Promoting reuse, remanufacturing, repurposing
- Digital Battery Passport

...



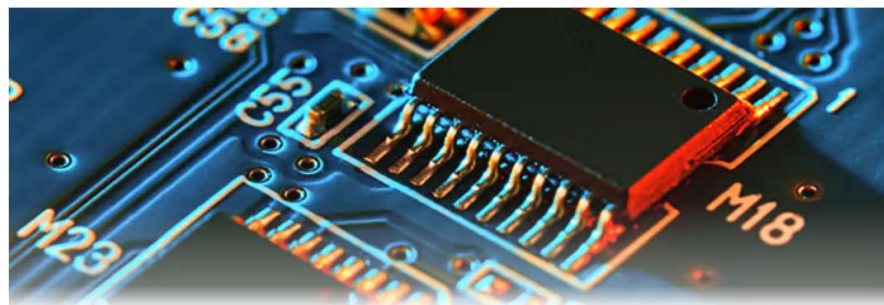
CRM in sectoral material streams

- Implementation of **ESPR**, including performance and information requirements in new products, which will promote the substitution of CRMs and make sure that they can be dismantled and recycled or re-used
- Material use in EU's automotive sector: **6% copper for automotive parts & 30% of permanent magnet REEs demand (2025)**
- Revision of the **ELV Directive**: Requirements for the design, tackling missing vehicles, end-of-life treatment of vehicles as well as information requirements on CRM rich components



CRM in WEEE

- **WEEE** contains precious and critical raw materials the recovery of which is significant for green and digital transition
- [Commission Recommendation](#) (6 October 2023) on targeting small and CRM-rich consumer electronics to improve the return and tack-back of used and waste mobile phones, tablets and laptops
 - Financial incentives (rewards, vouchers, discounts & DRS)
 - Means of calculating the buy-back value of EEE
 - The use of postal services (post-offices as collection points, prepaid labels and envelopes)
 - ...
- [WEEE Directive Review](#): SWD on the evaluation expected in Q3 2024, subsequently impact assessment and legislative proposal
- CRM relevant: identification, collection, recycling and recovery of CRM including potential EPR financing



CRM in Waste

- Revision of [European list of waste](#) – including waste codes for lithium-ion batteries and intermediate waste streams (‘back mass’)
- [Harmonise applicable waste management rules](#) for certain waste streams – such as wind turbines
- [Financial support to recycling projects](#): Mobilise up to 200 million euros to deploy ten additional [Hubs for Circularity](#) to substantially increase recovery and recycling of raw materials in the entire Union.
- CRM recycling technologies need to be supported through [Horizon Europe](#) and in synergy with Member States R&I programmes and scaled up from lab to commercialisation.

CRM international

- Regulatory cooperation and creating an integrated market for materials to be recycled
- Strategic partnerships or free trade agreements
- **Batteries Regulation:** towards a global level playing field for recycling
- Revision of **Waste Shipment Regulation:** Facilitating shipments of waste for recycling through digitalization and streamlined procedures

