METHODOLOGY FOR ESTABLISHING THE EU LIST OF CRITICAL RAW MATERIALS

IRTC Round Table on “How Methodology determines what is critical”
Resources for Future Generations Conference
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First action of the EU raw materials policy action plan in 2008 to “Define critical raw materials for the EU”

- EU methodology was developed in 2010
- Based on 2014 assessment recommendations was revised in 2016
- Revision of the list every 3 years, last in 2017, next in 2020
Scope and principles

- Raw materials used for industrial applications at the EU level
- 78 minerals, metals/chemical elements, wood and natural rubber screened in 2017 (42 in 2011)
- Based on data, no predictions
- Thresholds, but no ranking order
- Comparability between exercises

### Individual abiotic materials

<table>
<thead>
<tr>
<th>Aggregates</th>
<th>Hafnium</th>
<th>Rhenium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium</td>
<td>Helium</td>
<td>Scandium</td>
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<tr>
<td>Antimony</td>
<td>Indium</td>
<td>Selenium</td>
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<tr>
<td>Baryte</td>
<td>Iron Ore</td>
<td>Sulphur</td>
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<tr>
<td>Bauxite</td>
<td>Lead</td>
<td>Potash</td>
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<tr>
<td>Bentonite</td>
<td>Limestone</td>
<td>Silica Sand</td>
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<tr>
<td>Beryllium</td>
<td>Gold</td>
<td>Silicon Metal</td>
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<tr>
<td>Bismuth</td>
<td>Gypsum</td>
<td>Silver</td>
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<tr>
<td>Boron (Borates)</td>
<td>Lithium</td>
<td>Talc</td>
</tr>
<tr>
<td>Chromium</td>
<td>Magnesite</td>
<td>Tantalum</td>
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<tr>
<td>Kaolin clay</td>
<td>Magnesium</td>
<td>Tellurium</td>
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<tr>
<td>Cobalt</td>
<td>Manganese</td>
<td>Tin</td>
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<tr>
<td>Coking coal</td>
<td>Molybdenum</td>
<td>Titanium</td>
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<tr>
<td>Copper</td>
<td>Natural Graphite</td>
<td>Tungsten</td>
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<td>Diatomite</td>
<td>Nickel</td>
<td>Vanadium</td>
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<tr>
<td>Feldspar</td>
<td>Niobium</td>
<td>Zinc</td>
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<td>Flouorspar</td>
<td>Perlite</td>
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<tr>
<td>Gallium</td>
<td>Phosphorus</td>
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<tr>
<td>Germanium</td>
<td>Phosphate rock</td>
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<tr>
<td>Platinum group metals (PGMs)</td>
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<tr>
<td>Iridium</td>
<td>Platinum</td>
<td>Ruthenium</td>
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<tr>
<td>Palladium</td>
<td>Rhodium</td>
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<tr>
<td>Rare earth elements (REEs)</td>
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<tr>
<td>Light rare earth elements (LREEs)</td>
<td>Heavy rare earth elements (HREEs)</td>
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<tr>
<td>Cerium</td>
<td>Dysprosium</td>
<td>Lutetium</td>
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<tr>
<td>Lanthanum</td>
<td>Erbium</td>
<td>Terbium</td>
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<td>Neodymium</td>
<td>Europium</td>
<td>Thulium</td>
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<td>Praseodymium</td>
<td>Gadolinium</td>
<td>Ytterbium</td>
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<tr>
<td>Samarium</td>
<td>Holmium</td>
<td>Yttrium</td>
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<tr>
<td>Biotic materials</td>
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<tr>
<td>Natural Rubber</td>
<td>Natural cork</td>
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<tr>
<td>Sapele wood</td>
<td>Natural Teak wood</td>
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**Legend:**
- Green boxes = Materials covered in 2014 but not in the 2011 assessments
- Orange boxes = New materials covered in the 2017 assessment
**EU methodology**

**Economic importance**
- Importance of a raw material per economic sector (NACE-2) & importance of the sector in the EU economy (value added)
- Substitution (technical and cost performance)

**Supply risk**
- Global supply and EU sourcing
- Market concentration (HHI)
- Governance performance (WGI)
- Import reliance
- Trade agreements and restrictions
- Substitution (production, criticality, co/by-production)
- End-of-Life Recycling Input Rate
Economic importance

Raw Materials Initiative
EU Critical Raw Materials
CRM assessment 2017

1. allocation of RM uses to EU CPA products at 6-digit level
2. NACE-2 at 2-digit level
3. RM-specific substitution performance index

\[ EI = \sum_S (A_s \times Q_s) \times SI_{EI} \]
Supply risk

\[ SR = \left[ \left( HHI_{WGI,t} \right)_{GS} \cdot \frac{IR}{2} + \left( HHI_{WGI,t} \right)_{EUSourcing} \left( 1 - \frac{IR}{2} \right) \right] \cdot (1 - EoL_{RIR}) \cdot SI_{SR} \]

- Supply concentr. (HHI)
- Governance (WGI)
- Global vs EU
- Import dependency
- Trade
- Supply chain

Raw Materials Initiative
EU Critical Raw Materials
CRM assessment 2017
Unique features

- Developed and driven by governmental departments
- Combines Global vs EU-specific information on risk
- Incorporates specific influences of trade restrictions vs mitigation of certain trade agreements
- Supply risk checked at extraction and refining stages
- Priority of data sources data
- Average of the data over the last 5 years
- Both thresholds on EI and SR must be reached
### Results and implications

**2017 CRMs (27)**

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HREEs=heavy rare earth elements, LREEs=light rare earth elements, PGMs=platinum group metals

- Contributes to the implementation of the EU industrial policy
- Incentivises the EU production of CRMs
- Helps prioritise needs and actions (R&D, investment, circular economy)
- Helps negotiating trade agreements, drafting legislation, challenging trade distortion measures
- Useful for EU and national policy measures
- Builds into the EU Knowledge base - RMIS
Overall, improved methodology fulfils its objectives well and results make sense in the EU context.

There are some difficulties with:

- data availability, in particular on recycling (EOL-RIR), specialty metals (e.g. scandium, gallium)
- data quality and priority (EU, intl., private)
- raw materials market shares / allocation of end-uses to sectors (e.g. in case of multiple allocation) - combining data from different sources
- combining trade and production data with reference to a single commodity (e.g. REEs) and/or stage in the supply chain
Outlook

✓ A new list in 2020
✓ Major work in 2019
✓ Streamlined approach
✓ Launch at the CRM event on 12 November 2018
Raw Materials Week 2018

12 - 16 November 2018 in Brussels, Belgium
eurawmaterialsweek.eu

- 6th annual High Level Conference of EIP on raw materials “Raw materials for low carbon and circular economy” on 14 November
- Critical Raw Materials in our everyday life
- The EU Raw Materials Knowledge Base event
- EIT RawMaterials event
- EU-Canada Raw Materials Stakeholders Forum
- Horizon 2020 Infoday & brokerage event
- Responsible supply of raw materials
- Raw Materials Industries and Natura 2000 / Biodiversity
- Forests for the future
- Copernicus for raw materials

Methodology for establishing the EU list of critical raw materials: https://publications.europa.eu/en/publication-detail/-/publication/2d43b7e2-66ac-11e7-b2f2-01aa75ed71a1/language-en/format-PDF/source-32064602


EIT Raw materials: www.eitrawmaterials.eu