Research and innovation in raw materials in Horizon 2020

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INTMET Clustering Conference
“Fostering Innovation in the Iberian Pyrite Belt”

Seville, January 23 2019
EU Policy - “Raw Materials Initiative”

- Aim: securing sustainable supplies of raw materials
- Launched in 2008, consolidated in 2011
- Non-energy, non-agricultural raw materials
- Connecting EU external and internal policies
- Integrated strategy (3 pillars)
- Introduced list of 14 Critical Raw Materials (CRM) in 2010, updated 20 CRMs in 2014, updated 27 CRMs in 2017

Ensure level playing field in access to resources in third countries

Foster sustainable supply from European sources

Boost resource efficiency and recycling
• **European Innovation Partnership on Raw Materials**
  - COM(2012) 82 final - 29 February 2012

• **Overall objective:**
  - Contribute to the 2020 objectives of the EU Industrial Policy (to increase the share of industry in GDP to 20%), the Innovation Union and the Resource Efficiency 'flagships'

• **Specific objectives:**
  - Reduce import dependency
  - Improve supply conditions from European and other sources
  - Push Europe to the forefront in raw materials sectors
  - Provide alternatives in supply
  - Mitigate negative environmental and social impacts

• **Strategic Implementation Plan**
  - adopted on 25 September 2013
EU Raw Materials Strategy and Commission priorities

Commission priorities 2015-19

1. Jobs, Growth and Investment
   - circular economy and green growth

3. Energy Union
   - transition to a low-carbon economy
     (renewables, electricity market, transport...)

4. Internal Market
   - unlock the full potential of the single market
     - a renewed EU Industrial Policy Strategy

6. Trade policy to harness globalisation
   - economic diplomacy
     - raw materials chapters in FTAs

9. A stronger global actor
   - international cooperation
     and development

Raw Materials Initiative = EU policy
EIP on Raw Materials Strategic Implementation Plan
✓ CRM list
✓ H2020 funding

Sustainable Development Goals
Climate Paris agreement

Transition to a low carbon and circular economy

Raw Materials
Critical Raw Materials

Legend:
- Red dots: Critical raw materials
- Blue dots: Non-critical raw materials

Graph showing the relationship between Supply Risk and Economic Importance for various critical raw materials.
Research and Innovation funding

Evolution of investment in EU R&I (billion € current prices)

<table>
<thead>
<tr>
<th>Period</th>
<th>FP1</th>
<th>FP2</th>
<th>FP3</th>
<th>FP4</th>
<th>FP5</th>
<th>FP6</th>
<th>FP7</th>
<th>H2020</th>
<th>HEU</th>
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</thead>
<tbody>
<tr>
<td>1984-1987</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>13</td>
<td>15</td>
<td>19</td>
<td>56</td>
<td>77</td>
<td>100</td>
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<td>1990-1994</td>
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<td>1994-1998</td>
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<td>1998-2002</td>
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<td>2002-2006</td>
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<td>2007-2013</td>
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<td>2014-2020</td>
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<td>2021-2027</td>
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</tbody>
</table>
Raw Materials projects within the Circular Economy

- Exploration
- Design & production
- Processing
- Extraction

Secondary raw materials

Substitution

-primary raw materials

Reduce reuse recycle
Raw Materials actions

66 actions

365 M€

More on the SC5 data hub: https://sc5.easme-web.eu/?theme=green (filter "raw materials")
66 PROJECTS*

*including ongoing GAPs
Funding

365 M€*

ERANET; 5,000,000 €
CSA; 40,666,692 €
SUBSTITUTION; 18,677,201 €
EXPLORATION; 46,963,587 €
EXTRACTION; 82,745,526 €
PROCESSING; 139,249,237 €
RRR; 31,674,914 €

*including ongoing GAPs
666 PARTICIPANTS*

- Private for-profit entities: 54%
- Higher or Secondary Education Establishments: 16%
- Research Organisations: 13%
- Other: 9%
- Public bodies: 8%

*including ongoing GAPs
Funding

666 PARTICIPANTS*

Private for-profit entities 46%
Research Organisations 23%
Higher or Secondary Education Establishments 25%
Public bodies 2%
Other 4%

*including ongoing GAPs
<table>
<thead>
<tr>
<th>Project Acronym</th>
<th>Topic Description</th>
<th>Project Title</th>
<th>EC Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAME</td>
<td>Flexible processing technologies</td>
<td>Flexible and Mobile Economic Processing Technologies</td>
<td>7,458,064.00</td>
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<tr>
<td>OptimOre</td>
<td>Flexible processing technologies</td>
<td>Increasing yield on Tungsten and Tantalum ore production by means of advanced and flexible control on crushing, milling and separation process</td>
<td>5,084,468.75</td>
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<tr>
<td>INTMET</td>
<td>New metallurgical systems</td>
<td>Integrated innovative metallurgical system to benefit efficiently polymetallic, complex and low grade ores and concentrates</td>
<td>7,834,976.25</td>
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<tr>
<td>METGROW PLUS</td>
<td>New metallurgical systems</td>
<td>Metal Recovery from Low Grade Ores and Wastes Plus</td>
<td>7,911,462.50</td>
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<tr>
<td>CHROMIC</td>
<td>New solutions for sustainable production of raw materials</td>
<td>effiCient mineral processing and Hydrometallurgical ReOvery of by-product Metals from low-grade metal contaIning seCondary raw materials</td>
<td>4,869,687.50</td>
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<tr>
<td>PLATIRUS</td>
<td>New solutions for sustainable production of raw materials</td>
<td>PLATInum group metals Recovery Using Secondary raw materials</td>
<td>6,994,210.00</td>
</tr>
<tr>
<td>SCALE</td>
<td>New solutions for sustainable production of raw materials</td>
<td>Production of Scandium compounds and Scandium Aluminum alloys from European metallurgical by-products</td>
<td>7,000,000.00</td>
</tr>
<tr>
<td>CROCODILE</td>
<td>Raw materials Innovation actions</td>
<td>first of a kind commercial Compact system for the efficient Recovery Of COBalt Designed with novel Integrated LEading technologies</td>
<td>11,625,289.01</td>
</tr>
<tr>
<td>RemovAL</td>
<td>Raw materials Innovation actions</td>
<td>Removing the waste streams from the primary Aluminium production and other metal sectors in Europe</td>
<td>11,481,599.13</td>
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<tr>
<td>SecREEEs</td>
<td>Raw materials Innovation actions</td>
<td>Secure European Critical Rare Earth Elements</td>
<td>12,880,031.87</td>
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<tr>
<td>AGRAL</td>
<td>Sustainable Industry Low Carbon II</td>
<td>Development of the optimum AGRAL cermet manufacturing process for aluminium inert anode application and fuel cell interconnect plates.</td>
<td>5,232,146.13</td>
</tr>
<tr>
<td>LoCO2Fe</td>
<td>Sustainable Industry Low Carbon II</td>
<td>Development of a Low CO2 Iron and Steelmaking Integrated Process Route for a Sustainable European Steel Industry</td>
<td>7,418,415.02</td>
</tr>
</tbody>
</table>
## 83 M€ in 2019


- **30M€**
- **a)** Sustainable processing and refining of primary and/or secondary raw materials
- **b)** Recycling of raw materials from end-of-life products
- **c)** Recycling of raw materials from buildings
- **d)** Advanced sorting systems for high-performance recycling of complex end-of-life products

### SC5-10-2019-2020 - Raw materials innovation actions

- **20M€**
- **a)** Integrated exploration solutions
- **b)** Services and products for the extractive industries life cycle

### SC5-09-2018-2019: Sustainable production of raw materials

- **30M€**
- **b)** Digital mine
- **c)** Recovery of metals and minerals from sea resources

### CE-SC5-08-2018-2019-2020: policy support actions

- **3M€**
- **c)** Responsible sourcing in global value chains
2018-2020 Work Programme – Raw Materials

2018

€60M


- Sustainable processing, reuse, recycling and recovery
- Processing, EoL products, buildings, sorting systems

2019

€83M

SC5-10-2019-2020 - Raw materials innovation actions

- Integrated exploration solutions
- Services and products for the extractive industries life cycle

2020 Indicative

- Mining pilots
- Substitution of CRM

CE-SC5-06-2018: Enhanced recovery of by-products

€15M

SC5-09-2018-2019: Sustainable production of raw materials

- Breakthrough concepts and solutions for sustainable exploration, mining and/or processing
- Digital mine
- Recovery of metals and minerals from sea resources

CE-SC5-08-2018-2019-2020: policy support actions

- Certification of treatment facilities for waste
- Responsible sourcing in global value chains
- Expert network on CRM
- Sustainable management in extractive industries
be an expert evaluator !!!

Participant Portal

The future

WP 2019 – deadline February 19, 2019

WP 2020 – June 2019

Information day: 16-17 September 2019

Horizon Europe, 2021 - 2027
Horizon Europe

Specific objectives of the Programme

- Support the creation and diffusion of high-quality knowledge
- Strengthen the impact of R&I in supporting EU policies
- Foster all forms of innovation and strengthen market deployment

Optimise the Programme’s delivery for impact in a strengthened ERA

Pillar 1
Open Science
- European Research Council
- Marie Skłodowska-Curie Actions
- Research Infrastructures

Pillar 2
Global Challenges and Industrial Competitiveness
- Clusters
  - Health
  - Inclusive and Secure Society
  - Digital and Industry
  - Climate, Energy and Mobility
  - Food and natural resources
- Joint Research Centre

Pillar 3
Open Innovation
- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

Strengthening the European Research Area
- Sharing excellence
- Reforming and Enhancing the European R&I system
Horizon Europe

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Overview of raw material actions

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