Raw materials topics in Horizon 2020 Work Programme 2016

Horizon 2020 Societal Challenge 5
Information Day
Lisbon

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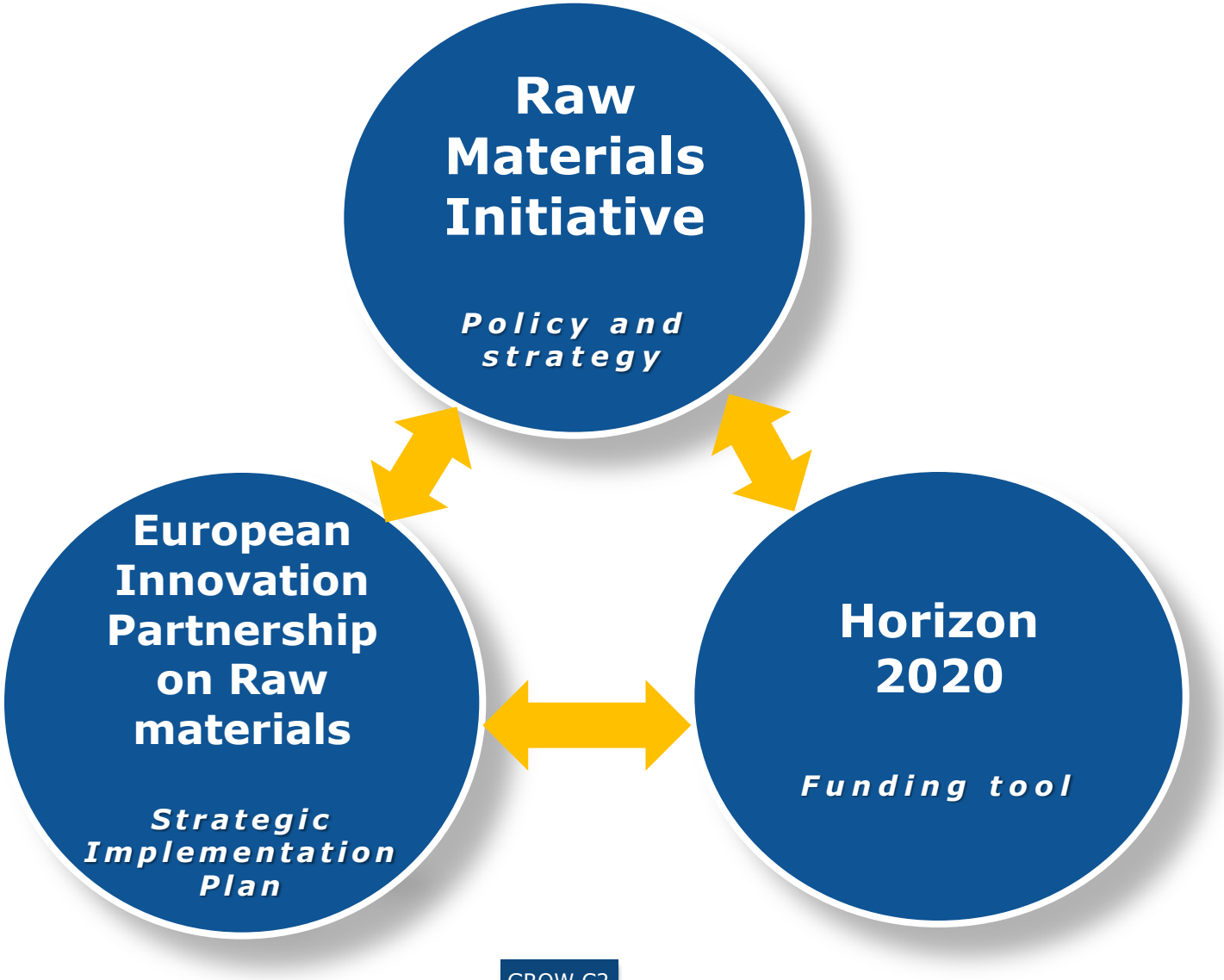
Unit C2 - «Resource Efficiency and Raw Materials»

EU Raw Materials Framework

Building blocks



European Commission

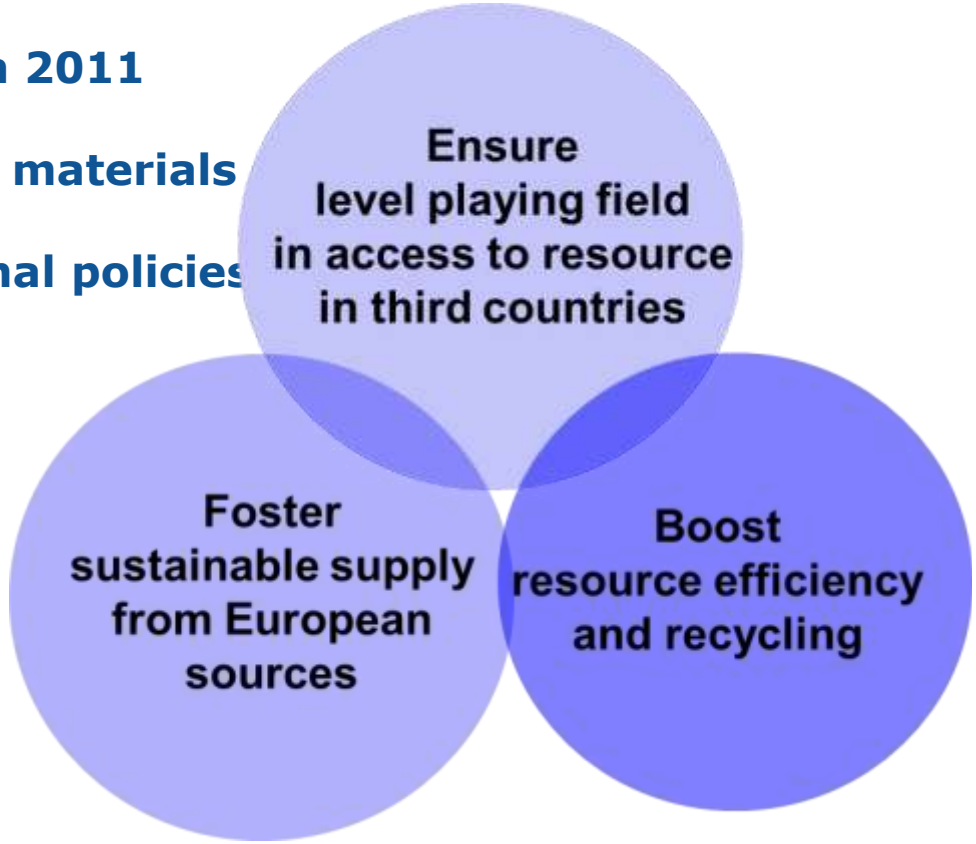
1. Raw Materials Initiative

EU Raw materials policy

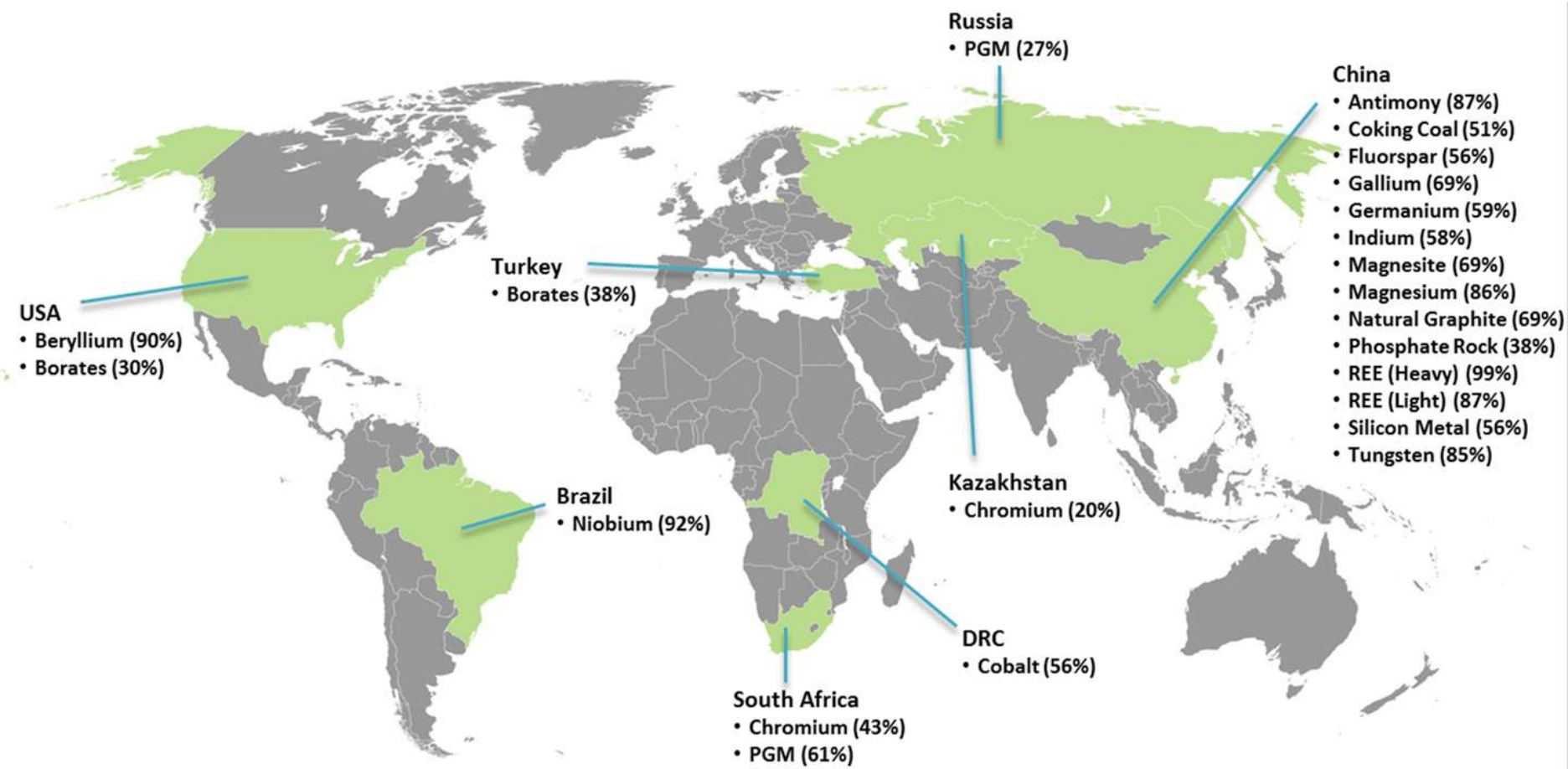
European Commission

EU "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**



Critical Raw Materials*



* Communication on the review of the list of critical raw materials for the EU and the implementation of the Raw Materials Initiative - COM(2014) 297, 26.5.2014

European Commission

2. European Innovation Partnership on Raw Materials

Policy implementation

European Commission

European Innovation Partnership on Raw Materials

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'

EIP targets:

- Up to 10 innovative pilot actions
- Substitutes for at least 3 applications of CRMs
- Regulatory framework for primary and secondary RM
- EU RM Knowledge base
- International cooperation strategy…

➢ **Strategic Implementation Plan (SIP) adopted on 25 September 2013**

Strategic Implementation Plan

European Commission

European Innovation Partnership on Raw Materials

I. Technology Pillar

- I.A Raw materials research and innovation coordination
- I.B Technologies for primary and secondary raw materials' production
- I.C Substitution of raw materials

II. Non-Technology Policy Pillar

- II.A Improving Europe's raw materials framework conditions
- II.B Improving Europe's waste management framework conditions and excellence
- II.C Knowledge, skills and raw materials flows

III. International Cooperation Pillar

- III.1 Technology
- III.2 Global Raw Materials Governance and Dialogues
- III.3 Health, Safety and Environment
- III.4 Skills, Education and Knowledge
- III.5 Investment activities

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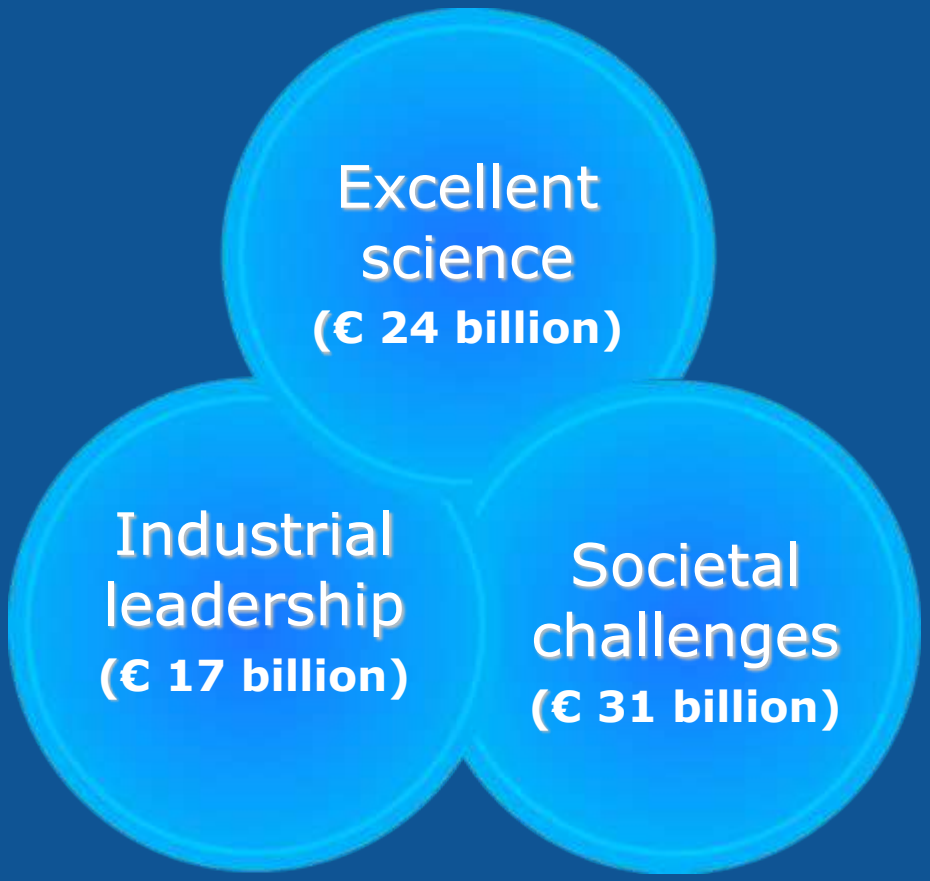
3. Raw Materials in Horizon 2020

Horizon 2020
Context and overview



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Programming stakeholders

- **Formal Groups**
  - **Programme Committees** - nominated Member States' representatives (delegates + experts) by 28 Member States + associated countries
  - **National Contact Points** - Your first contacts! Organising specific events in the Member State
  - **Advisory Group** - experts giving a advice for a strategic orientation

- **External stakeholders**
  - **European Technology Platforms (ETP SMR)**
  - **European Innovation Partnerships (EIP RM)**
  - **Joint Programming Initiatives**
  - **scientific panels**
  - **FP projects (ERA-MIN, I2Mine, Promine, EURARE…)**
  - **+ 28 new Horizon projects**

EIT KIC
Raw materials

Establishing a pan-European network of excellence

RawMaterials

Well-balanced consortium with 116 partners

Partners in 22 EU countries with special focus on ESEE

Aughinish Alumina
Trinity College Dublin
University of Limerick

Full coverage of value chains and commodities (especially CRMs)

Business partners represent
>700,000 jobs
>200 billion € turnover

Partners` roles in EIP RM commitments:
>75% participation
40% coordination

Raw materials in SC5

European Commission

SC5 Call 'Greening the economy'

Raw materials

- New solutions for sustainable production of raw materials (RIA)
- Raw materials Innovation actions (IA)
- Raw materials policy support actions (CSA)
- Raw materials international co-operation (CSA)
- ERA-NET Cofund on Raw materials (CSA)

Budget

- 2016: €64 million

Deadlines:

- 8 Mar 2016 (RIA, CSA, and First stage of IA)
- 6 Sep 2016 (Second stage of IA)

Technology readiness levels (TRL) – RIA, IA

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General annex G of the Work programme 2016-2017,

Where a topic description refers to a TRL, the following definitions apply:

- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept
- TRL 4 – technology validated in lab
- TRL 5 – technology validated in relevant environment (industrial environment in the case of key enabling technologies)
- TRL 6 – technology demonstrated in relevant environment (industrial environment in the case of key enabling technologies)
- TRL 7 – system prototype demonstration in operational environment
- TRL 8 – system complete and qualified
- TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Raw materials in SC5 - RIA

European Commission

SC5-13-2016-2017: New solutions for sustainable production of raw materials

RIA – €26 million in 2016

- **Sustainable selective low impact mining (2016)**
- **New technologies for the enhanced recovery of by-products (2016)**
- New sensitive exploration technologies (2017)

SC5-13-2016-2017: New solutions for sustainable production of raw materials

- develop sustainable **systemic solutions through industrially- and user-driven multidisciplinary consortia covering the relevant value chain of non-energy non-agricultural raw materials**.
- Assessment of the related **environmental and safety risks and a plan to communicate** the added value of the proposal **to the local communities and society** for improving public acceptance and trust should be addressed
- **Participation of civil society** from the start of exploration until after-mining activities in a process of co-design, co-development and co-implementation is strongly encouraged.
- **cluster with other projects financed under this topic and – if possible – with other relevant projects** in the field funded by Horizon 2020, in support of the EIP on Raw Materials.
- **international co-operation is encouraged**.

SC5-13 a) Sustainable selective low impact mining [2016]

- develop new sustai**nable selective low impact technological solutions for mining of small mineral deposits** (including those with chemically complex ore-forming phases) on the land.

- clearly show **integration of mining solutions with the processing and/or metallurgy steps** in order to justify economic viability of the overall process.

- include the **participation of technology oriented SMEs**, as far as possible.

- Indicative size of proposals: EUR 3 to 7 million
- Expected TRL: 4-5

SC5-13 b) New technologies for the enhanced recovery of by-products [2016]

- **evaluate the potential by-products** existing in primary or secondary raw materials (usually accompanying the major constituents at low concentrations) and
- **develop energy-, material- and cost-efficient new mineral processing and/or metallurgical technologies and processes** to
- **increase the selectivity and the recovery rates** of valuable by-products, **particularly Critical Raw Materials**.
- The **importance of the targeted sources of by-products for the EU economy** has to be duly demonstrated in the proposal.

- Indicative size of proposals: EUR 3 to 7 million
- Expected TRL: 4-5

Raw materials in SC5 - IA

European Commission

SC5-14-2016-2017: Raw materials Innovation actions IA – €28 million in 2016

- **Intelligent mining on land (2016)**
- Processing of lower grade and/or complex primary and/or secondary raw materials in the most sustainable ways (2017)
- Sustainable metallurgical processes (2017)

- to develop **innovative pilots demonstrating clean and sustainable production** of non-energy non-agricultural **raw materials in the EU** from primary and/or secondary sources.

- **justify relevance of selected pilot demonstrations**, **finishing at Technology Readiness Levels (TRL) 6-8**, in d**ifferent locations within the EU** (if justified also outside);

- **facilitate the market uptake of solutions** developed through **industrially- and user-driven multidisciplinary consortia covering the relevant value chain**;

- outline the **initial exploitation and business plans** (with indicated CAPEX, OPEX, IRR and NPV) with clarified management of IPR, and commitment to the first exploitation;

- consider **standardisation aspects** when relevant;

- **assess health, safety and environmental risks and their management**

SC5-14 Innovation Actions

European Commission

- **include a plan to communicate the added value of the proposal to the local communities and society** for improving public acceptance and trust should be addressed by all the proposals.
- **Participation of civil society** from the start of exploration until after-closure activities in a process of co-design, co-development and co-implementation is strongly encouraged.
- **seek synergies, including possibilities for funding, with relevant national/regional research and innovation programmes…**
- **cluster with other projects** financed under this topic and – if possible – with other relevant projects in the field funded by Horizon 2020, in support of the EIP on Raw Materials
- **international cooperation is encouraged.**

SC5-14 a) Intelligent mining on land [2016]

- **develop and demonstrate new intelligent mining systems**
- to **avoid exposure of workers in dangerous operations**,
- to **increase efficiency and profitability**, and
- to **minimise environmental impacts** of the mining operations.
- Any of the **metallic, industrials and/or construction minerals** could be targeted.
- The **importance of the targeted raw materials for the EU economy** has to be duly demonstrated in the proposal.

- Indicative size of proposals: EUR 8-13 million
- Expected TRL: 6-8

Raw materials in SC5 - CSA

European Commission

SC5-15-2016-2017: Raw materials policy support actions - CSA

- **Expert network on Critical Raw Materials (2016)**
- Good practice in waste collection systems (2017)
- Optimising collection of raw materials data in Member States (2017)
- Linking land use planning policies to national mineral policies (2017)
- EU network of mining and metallurgy regions (2017)
- EU network of regions on sustainable wood mobilisation (wood supply) (2017)

SC5-15 a) Expert network on Critical Raw Materials [2016]

- The proposed action should **develop** primarily an **EU expert network or structure of networks covering all CRMs** and where possible, include the stakeholders **covering as much of the value chains** as possible. Proposals should build on the experience such as the ERECON a network on Rare Earth Elements, and CRM_InnoNet.
- Projects should cover all the following points:
- **Map, comprehensively assess and quantify estimated amounts of existing primary and secondary sources of and alternatives** to the different CRMs. ;
- **Estimate** the expected **EU demand of various CRMs** in the future and identify major trends;
- **Provide policy and technology recommendations** for actions improving the production of the various primary and secondary CRMs and actions for their potential substitution;
- **Provide a plan for transparent consultation with relevant external stakeholders** and effective communication of the findings to the professional and general public across the EU;
- In the case of secondary CRMs, the mapping information on **Waste Electrical and Electronic Equipment (WEEE) and waste batteries and other relevant end-of-life products** within the EU is crucial, as well as the need to contribute to the further development of European standards for the treatment of WEEE in order to optimise the recovery of CRMs.

- Indicative size of proposals: EUR 3 million
- Up to one project shall be funded

Raw materials in SC5 - CSA

European Commission

SC5-16-2016-2017: Raw materials international cooperation - CSA

- **Demand-supply forecast and raw materials flows at global level (2016)**
- **Advancing the idea of a World Forum on Raw Materials (2016)**
- International network of raw materials training centres (2017)

SC5-16 a) Demand-supply forecast and raw materials flows at global level [2016]

- develop a **common methodology to mineral raw materials flows at global level** which could be agreed and used at international level. As a pilot case, focus should be on **critical raw materials** and in particular the ones used in **low-carbon technologies**. The methodology should incorporate models on demand-supply **forecast** in order to allow for dynamic analysis of global materials flows. Proposals should provide **recommendations and feed into future policy** developments.
- In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), **international co-operation is <u>required</u> with the US and Japan in the field of Materials Flow Analysis**. Where appropriate, **synergies with the relevant EU Member States initiatives** are to be explored and fostered.
- Proposals should **build on the outcomes** of the Study on Data Inventory for a Raw Material System Analysis and on related studies performed by the International Resource Panel.

- Indicative size of proposals: up to EUR 1 million

SC5-16 b) Advancing the idea of a World Forum on Raw Materials [2016]

- **Develop an EU-based platform** of international key experts and stakeholders that would advance the idea of a World Forum on Raw Materials and **enhance the international cooperation among G20 Member countries as well as the other third countries** active in the mining and other raw materials sectors.
- **Foster sharing of experience** with a view to increasing understanding of all aspects of trade in raw materials and strategies to leverage natural resources for wider growth and development in close co-operation with the OECD to contribute to the OECD policy dialogue.
- Where appropriate explore and foster synergies with the relevant EU Member States initiatives;
- **Identify common needs and threats, and develop and promote on international fora recommendations** on possible actions to consolidate the efforts of the countries involved towards a more joint and coherent approach towards raw materials policy and investment;
- **Involve relevant organisations**, in particular OECD, International Study Groups, CONNEX, the Intergovernmental Forum on Mining, UNEP Resource Panel, in the planned activities.
- **International co-operation is required**, in particular with G20 Member countries as well as the other third countries active in the mining and other raw materials sectors, and international organisations.

- Indicative size of proposals: up to EUR 1 million

Raw materials in SC5 - Cofund

European Commission

SC5-17-2016: ERA-NET Cofund on Raw materials

ERA-NET Cofund – € 5 million

SC5 17- ERA-NET Cofund on Raw materials [2016]

- strengthen **co-ordination of national and regional research programmes** in the field of non-energy non-agricultural raw materials, while
- building on the **experience of ERA-MIN ERA-NET**.
- This should be achieved in line with the integrated strategy proposed in the **EU Raw Materials Initiative (RMI) and the Strategic Implementation Plan of the European Innovation Partnership (EIP) on Raw Materials**.
- The ERA-NET should cover the **whole raw materials value chain** including exploration, extraction and processing technologies and recycling, as well as substitution.
- Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to **implementing a joint call for proposals** resulting in grants to third parties with EU co-funding in this area.
- Proposers are encouraged to include **other joint activities including additional joint calls without EU co-funding**.
- Participation of legal entities from **international partner countries and/or regions is encouraged in the joint call** as well as in other joint activities including additional joint calls without EU co-funding. Participants from countries which are not automatically eligible for funding may nonetheless request a Union contribution (on the basis of the ERA-NET unit cost) for the co-ordination costs of additional activities..

- Indicative size of proposals: EUR 5 million

Raw materials in other parts of H2020

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Resource efficiency, recycling and reuse

- Resource and Energy Efficiency - SPIRE PPP
- Industry 2020 in the Circular Economy
- LEIT 5ii - Energy-efficient buildings

Substitution

- LEIT pillar, 5ii - Advanced materials and nanotechnologies

Bio-based materials

- Societal Challenge 2, JTI BBI

Raw Materials topics in other parts of Horizon 2020

European Commission

- **Resource and Energy Efficiency ➔ SPIRE**
  - SPIRE 07-2017: Integrated approach to process optimisation for raw material resources efficiency, excluding recovery technologies of waste streams. IA, TRL 5-7, 6-8 M€.

- **Products recycling, reuse and life cycle ➔ Industry 2020 in the Circular Economy**
  - CIRC-01-2016-2017: Systemic, eco-innovative approaches for the circular economy: large-scale demonstration projects.
    - a) Design for circular value and supply chains (2016). IA, TRL 5-7, 7-10 M€. 08 Mar 2016 (1st stage)
    - b) Systemic services for the circular economy (2017). IA, 4-7 M€.
  - CIRC-04-2016-2017: New models and economic incentives for circular economy business. RIA, 3 M€. **08 Mar 2016**

- **Construction materials recycling and reuse ➔ LEIT pillar, 5ii - Energy-efficient buildings**
  - EEB-04-2016: New technologies and strategies for the development of pre-fabricated elements through the reuse and recycling of construction materials and structures.

    RIA, TRL 4-6, 3-5 M€. **21 Jan 2016**

Raw Materials topics in other parts of Horizon 2020

European Commission

- **Substitution ➔ LEIT pillar, 5ii - Advanced materials and nanotechnologies**
  - NMBP 03-2016: Innovative and sustainable materials solutions for the substitution of critical raw materials in the electric power system.

    RIA, TRL 3-5, 3-5 M€. **08 Dec 2015 (first stage)**
- **Bio-based materials (wood-based and natural rubber)➔ S. Challenge 2**
  - BB-1-2016: Sustainability schemes for the bio-based economy. RIA, 5 M€. 17 Feb 2016 (First stage)
  - BB-2-2017: Towards a methodology for the collection of statistical data on bio-based industries and bio-based products. RIA, 6 M€.
  - BB-3-2017: Adaptive tree breeding strategies and tools for forest production systems resilient to climate change and natural disturbances. RIA, 6 M€.
  - BB-4-2016: Intelligent solutions and tools in forest production systems, fostering sustainable supply of quality wood for the growing bioeconomy. IA, 2 M€. 17 Feb 2016
  - RUR-05-2017: Novel public policies, business models and mechanisms for sustainable supply and payment of forest ecosystem services. IA, 4 M€.
  - Other: 2. Specific Grant Agreements (SGAs) for ERA-NET Cofund actions supporting Joint Actions towards Public-Public Partnerships in the Bioeconomy: B. Innovative forest-based bioeconomy

Register as an expert

in the Horizon 2020 database

of independent experts for European research and innovation

http://ec.europa.eu/research/participants/portal/desktop/en/experts/index.html

3rd annual High Level Conference of EIP on Raw Materials on 9-10 December 2015 in Brussels

- **EU policy and economic trends in raw materials**
- Launching the **2nd call for the EIP "Raw Materials Commitments"** and presenting successful ones
- **Brokerage event on the 2016 Horizon 2020 calls** relevant to Raw Materials seek to provide networking opportunities for new initiatives and projects
- **Back-to-back to KIC Raw materials Event**

https://ec.europa.eu/eip/raw-materials/en/content/third-high-level-conference-european-innovation-partnership-eip-raw-materials-and-horizon

References

European Commission

EU raw materials webpage:

- http://ec.europa.eu/growth/sectors/raw-materials/index_en.htm

Check the EIP website for fresh news:

- https://ec.europa.eu/eip/raw-materials/en/meetings-listing

Horizon 2020 - Raw materials webpage:

- http://ec.europa.eu/programmes/horizon2020/en/area/raw-materials

Horizon 2020 – EXPERTS

- http://ec.europa.eu/research/participants/portal/desktop/en/experts/index.html

European Commission

Thank you for your attention!