



Raw Materials in

HORIZON 2020

*European Raw Materials Information and Brokerage event
CRM_InnoNet*

London, 13 November 2013

Anne Auffret

*Directorate-General Enterprise and Industry
European Commission*

F3 - « Raw Materials, Metals, Minerals, and Forest-based industries »

Raw materials - Rationale



The European "Raw Materials Initiative" (launched in 2008)

- Ensure level playing field in access to resource in third countries
- Foster sustainable supply from European sources
- Boost resource efficiency and recycling



The European Innovation Partnership on Raw Materials (COM(2012) 82 final - 29 February 2012)

The overall objective of the EIP is to contribute to the 2020 objectives of the EU Industrial Policy to increase the share of industry on GDP to 20%, the Innovation Union flagship initiative, and the Resource Efficiency Policy by ensuring the sustainable supply of raw materials to European economy and society.

Specific:

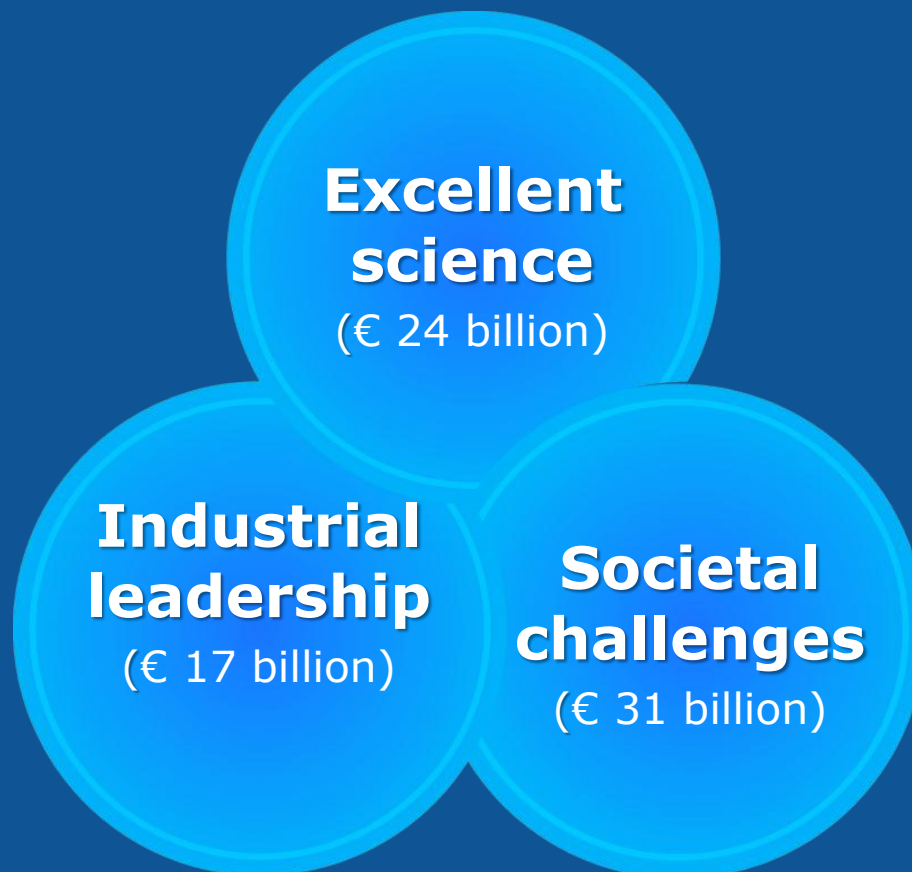
- Reduce import dependency
- Improve supply conditions from the EU and other sources
- Push Europe to the forefront in raw materials sectors
- Provide alternatives in supply
- Mitigate negative environmental and social impacts



- **EIP Strategic Implementation Plan adopted on 25 September 2013**



Horizon 2020



* the numbers are based on European Council conclusions, 8 February 2013 and are subject to the approval of the Multiannual Financial Framework Regulation by the European Parliament and the Council



1. Health, demographic change and wellbeing	7 472
2. Food security, sustainable agriculture, marine and maritime research & the Bioeconomy	3 851
3. Secure, clean and efficient energy *	5 931
4. Smart, green and integrated transport	6 339
5. Climate action, resource efficiency and raw materials	3 081
6. Inclusive and reflective societies	1 309
7. Secure societies	1 695
<i>Science with and for society</i>	<i>462</i>
<i>Spreading excellence and widening participation</i>	<i>816</i>

* Additional funding for nuclear safety and security from the Euratom Treaty activities (2014-2018)

All funding figures (€ million, 2014-2020) in this presentation are subject to the pending Multiannual Financial Framework Regulation by the EP and the Council



Budget: € 3 081 million

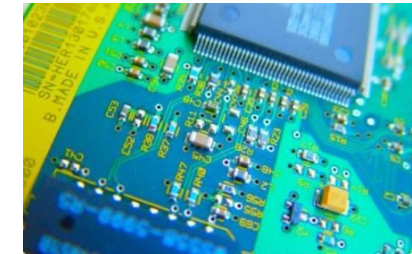
Objective: *"to achieve a resource – and water – efficient and climate change resilient economy and society, the protection and sustainable management of natural resources and ecosystems, and a **sustainable supply and use of raw materials**, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources and eco-systems."*

1. Fighting and adapting to climate change
2. Sustainably managing natural resources and ecosystems
- 3. Sustainable supply of non-energy and non-agricultural raw materials**
4. Transition towards a green economy through eco-innovation
5. Global environmental observation and information systems
6. Cultural heritage



"Ensuring The Sustainable Supply Of Non-energy And Non-agricultural Raw Materials"

- New solutions for sustainable **production of raw materials**
- Innovative and sustainable solutions leading to **substitution of raw materials**
- **Coordinating and supporting** raw materials research and innovation



"Waste: A resource to recycle, reuse and recover raw materials"

- **Recycling of raw materials** from products and buildings
- Towards near-zero waste at European and global level - **Secondary raw materials inventory**





New solutions for sustainable production of raw materials: Mining of small deposits and alternative mining

Challenge/Scope

- Europe has been actively mined over many centuries resulting in exhausting the easy-to-access mineral deposits
- Developing innovative sustainable concepts and technological solutions (TRL 4-6), including alternative approaches, for
- Mining of small or difficult to access mineral deposits, including abandoned mining sites
- Addressing the challenges of accessibility, industrial viability and environmental impacts.
- Industrially-driven multidisciplinary consortia
- Participation of SMEs as far as possible.



New solutions for sustainable production of raw materials: Mining of small deposits and alternative mining

Impact

- Pushing the EU to the forefront in the areas of sustainable mining
- Improved competitiveness and creation of added value and new jobs in materials producing and downstream industries.
- Unlocking a substantial volume of various raw materials within the EU.
- Enabling the better efficiency of exploitation of raw materials' resources and increasing the range and yields of recovered raw materials.
- Improving economic viability and investment security of mining operations.
- Increased process efficiency (including water and energy consumption) and reduced environmental footprint.
- Contribution to the EIP on Raw Materials.

Appropriate EU contribution: EUR 2-8 million

Type of action: Research and Innovation actions



New solutions for sustainable production of raw materials: Flexible processing technologies

Challenge/Scope

- Developing new integrated sustainable processing concepts and systems (TRL 4-6) with
- Higher technical, economic, energy, health, safety and environmental performance and flexibility, versatility, and where appropriate mobility and modularity, for
- Processing and refining of different raw materials from low grade and/or complex feeds with changing composition and logistically distributed material sources along all processing steps to refining.
- Feeds containing ores, industrial and construction minerals, and wood-based fibres, if justified also with secondary materials feeds.
- Industrially-driven multidisciplinary consortia,



New solutions for sustainable production of raw materials: Flexible processing technologies

Impact

- Pushing the EU to the forefront in the areas of sustainable processing
- Improved competitiveness and creation of added value and new jobs in materials producing and downstream industries.
- Unlocking a substantial volume of various raw materials within the EU.
- Enabling the better efficiency of exploitation of raw materials' resources and increasing the range and yields of recovered raw materials.
- Improving economic viability and investment security of processing operations.
- Increased process efficiency (including water and energy consumption) and reduced environmental footprint.
- Contribution to the EIP on Raw Materials.

Appropriate EU contribution: EUR 2-8 million

Type of action: Research and Innovation actions



Innovative and sustainable solutions leading to substitution of raw materials: Materials for electronic devices

Challenge/Scope

- Developing innovative and sustainable solutions (TRL 3-5) for
- Appropriate substitution of critical and scarce raw materials in electronic devices (e.g. In transparent conductive layers, CRMs in light sources)
- Targeting appropriately materials and applications that are difficult to recycle and where there are limited prospects to increase primary supply within the EU.
- Actively involve end users from a variety of concerned sectors such as touch screen, flexible electronics, solar energy, lighting and the built environment (smart windows).
- Synergies with existing relevant initiatives should be ensured, in particular, with the Future & Emerging Technologies (FET) Flagship on graphene and the possible Photonics Public Private Partnership.



Innovative and sustainable solutions leading to substitution of raw materials: Materials for electronic devices

Impact

- Pushing the EU to the forefront in the area of sustainable raw materials substitution.
- Improved competitiveness and creation of new jobs in materials producing and downstream industries.
- Significant contribution to reduced dependency on CRMs in the medium term.
- Contribution to the large scale adoption of the new cost-effective technology in the EU, measured by quantitative and qualitative indicators.
- Availability of new materials for electronic devices.
- Contribution to the EIP on Raw Materials.

Appropriate EU contribution: EUR 2-8 million

Type of action: Research and Innovation actions



Coordinating and supporting raw materials R&I: Mineral deposits of public importance

Challenge/Scope

- Mineral policies, crucial for supply of raw materials, are sometimes not clear, too dispersed in their implementation or insufficiently linked to other related policies (e.g. land-use planning) to be fully effective.
- Developing a concept and methodology for defining and protecting the mineral deposits of public importance with an adequate regulatory (including permitting) or guidance framework similar to NATURA 2000
- Ensuring the best use of the mineral deposits of public importance in the future.
- covering all minerals with stress on the occurrence of critical minerals and
- defining deposits of local, regional, national or EU interest and importance and their safeguarding.
- Engage all relevant actors across the EU from local, regional, national to EU levels, including civil society, relevant representatives of public administration and experts on mineral deposits, land use and development planning, mining and related legislation (particularly permitting), and the relevant industries.



Coordinating and supporting raw materials R&I: Mineral deposits of public importance

Impact

- Improved conditions for sustainable access and supply of raw materials in the EU.
- Facilitated decision-making at EU, national, regional and local levels and in the minerals industry.
- Safeguarding of mineral wealth for future generations by defining mineral deposits of public importance.
- Promotion of good governance and facilitation of public acceptance in the EU.
- Increased transparency of EU raw materials policies and legislation.
- Contribution to the EIP on Raw Materials.

Appropriate EU contribution: EUR 1-2 million

Type of action: 1 Coordination and support action



Coordinating and supporting raw materials R&I: Strategic international dialogues and cooperation on raw materials with technologically advanced countries

Challenge/Scope

- The EU's strategy for international cooperation in research and innovation + raw materials
- promoting the cooperation with technologically advanced countries to facilitate discussion in multilateral fora (such as OECD, UNEP, G20, G8) and strategic international dialogues and cooperation with technologically advanced countries (such as Australia, Canada, Japan, South Africa, US and others).
- Mapping and addressing the cooperation opportunities in terms of the synergies in research and innovation, joint educational and skills programmes, raw materials trade aspects, and exchange of best practices in exploration, extraction, processing and recycling of raw materials essential for industry, and in management and substitution of Critical Raw Materials.



Coordinating and supporting raw materials R&I: Strategic international dialogues and cooperation on raw materials with technologically advanced countries

Impact

- Establishing and maintaining strong and sustainable relationships with the countries concerned.
- Greater EU influence in multilateral processes and better support to implementation of international commitments.
- Enhanced impact of research and innovation activities through synergies with international research and innovation programmes.
- Facilitated decision-making at EU, national, regional and local levels and in the minerals industry.
- Contribution to the EIP on Raw Materials.

Appropriate EU contribution: EUR 1-2 million

Type of action: 1 Coordination and support action



Recycling of raw materials from products and buildings

Challenge/Scope

- Complex products and buildings contain many valuable raw materials minerals and metals, wood-fibre based materials, etc.
- Industrially-driven multidisciplinary consortia
- Developing innovative technological solutions and prove the concept and feasibility (TRL 5-6) for
- Sustainable recycling and recovery of raw materials from:
 - complex end-of-life products;
 - construction and demolition (C&D) waste, particularly from the most promising objects, such as deconstruction of non-residential buildings.



Recycling of raw materials from products and buildings

Impact

- Unlocking a significant volume of various raw materials within EU28
- Measurable increase in the efficiency of exploitation of secondary raw materials' deposits ('urban mines')
- Increased range and yields of recovered materials and energy efficiency.
- Reduced environmental footprint
- Contribution to the EIP on Raw Materials.

Appropriate EU contribution: EUR 6-8 million

Type of action: Research and Innovation actions



Towards near-zero waste at European and global level: Secondary raw materials inventory

Challenge/Scope

- Creating an EU network of relevant institutions (such as environmental agencies, research organisations, etc.)
- Developing an inventory component of an EU knowledge base with data and information on secondary raw materials + their flows, maps and evaluation of European stocks.
- Different types of waste (such as mining waste, wood-based, industrial, municipal waste, waste electrical and electronic equipment (WEEE) and others)
- National and regional level in the EU and Associated Countries
- Compatibility with relevant EU or global standards and interoperability with national and other relevant databases



Towards near-zero waste at European and global level: Secondary raw materials inventory

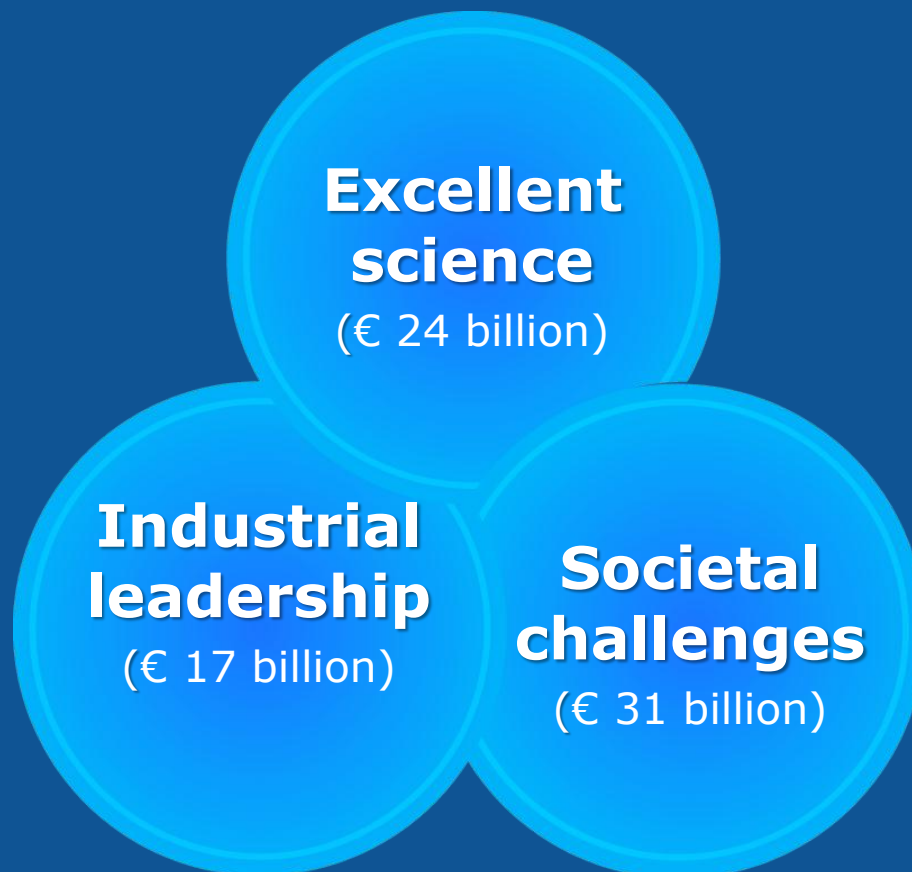
Impact

- Better-informed decision-making at EU and national level as well as by industry
- Increased EU raw materials knowledge and transparency of EU raw materials information
- Boosting the raw material sector through an interdisciplinary and transnational cooperation
- Improving availability of key raw materials, while creating greater added value to the economy and more jobs.
- Contributing to the EIP on Raw Materials.

Appropriate EU contribution:

Type of action: 1 Coordination and Support action

Horizon 2020



* the numbers are based on European Council conclusions, 8 February 2013 and are subject to the approval of the Multiannual Financial Framework Regulation by the European Parliament and the Council



<p><i>Leadership in enabling and industrial technologies (LEITs)</i> (ICT, nanotechnologies, materials, biotechnology, manufacturing, space)</p>	13 557
<p><i>Access to risk finance</i> Leveraging private finance and venture capital for research and innovation</p>	2 842
<p><i>Innovation in SMEs</i> Fostering all forms of innovation in all types of SMEs</p>	616 + complemented by expected 20% of budget of societal challenges + LEITs and <i>'Access to risk finance'</i> with strong SME focus

* All funding figures (€ million, 2014-2020) in this presentation are subject to the pending Multiannual Financial Framework Regulation by the EP and the Council

Role of the EIT and JRC in Horizon 2020



	<i>Proposed funding (€ million, 2014-2020)</i>
<i>European Institute of Innovation & Technology (EIT)</i> Combining research, innovation & training in knowledge and Innovation Communities (possible KIC on Raw materials)	2 711
<i>Joint Research Centre (JRC)*</i> Providing a robust, evidence base for EU policies	1 903

* Additional funding for the JRC for Euratom Treaty activities

3. Horizon 2020: Timetable



Process:

- Political decisions on Horizon 2020: Autumn
- Consultation of Member States on the 2014-2015 work programme:
 - SC5 expert group meetings: 6 Sept, 8 October, 11 November
- Publication of first calls for proposals: 11 December 2013

Events:

- SC5 Info-Day: 12 November
- National launch events: November 2013 to January 2014
- National NCP SC5 events: end 2013-2014

Confirmed H2020 launch events



- - 3/4 October Romania
- 11 October Finland
- 18 October Czech Republic
- 29 October Denmark
- 11 November Spain
- 12 November Netherlands
- 14 November Belgium
- 26/27 November Hungary
- 29 November Slovenia
- 10 December Ireland
- 13 December Portugal
- 16 December France
- 10 January Greece
- 14 January Luxembourg
- 21 January Austria and Slovakia
- 28 January Germany
- 31 January UK
- 7 February Malta

and Iceland (22 November), Norway (6 December), Switzerland (14 January)



- EU raw materials webpage:

http://ec.europa.eu/enterprise/non_energy_extractive_industries/raw_materials.htm

- European Innovation Partnership on Raw Materials:

http://ec.europa.eu/enterprise/policies/raw-materials/innovation-partnership/index_en.htm

- Horizon 2020:

<http://ec.europa.eu/research/horizon2020/>

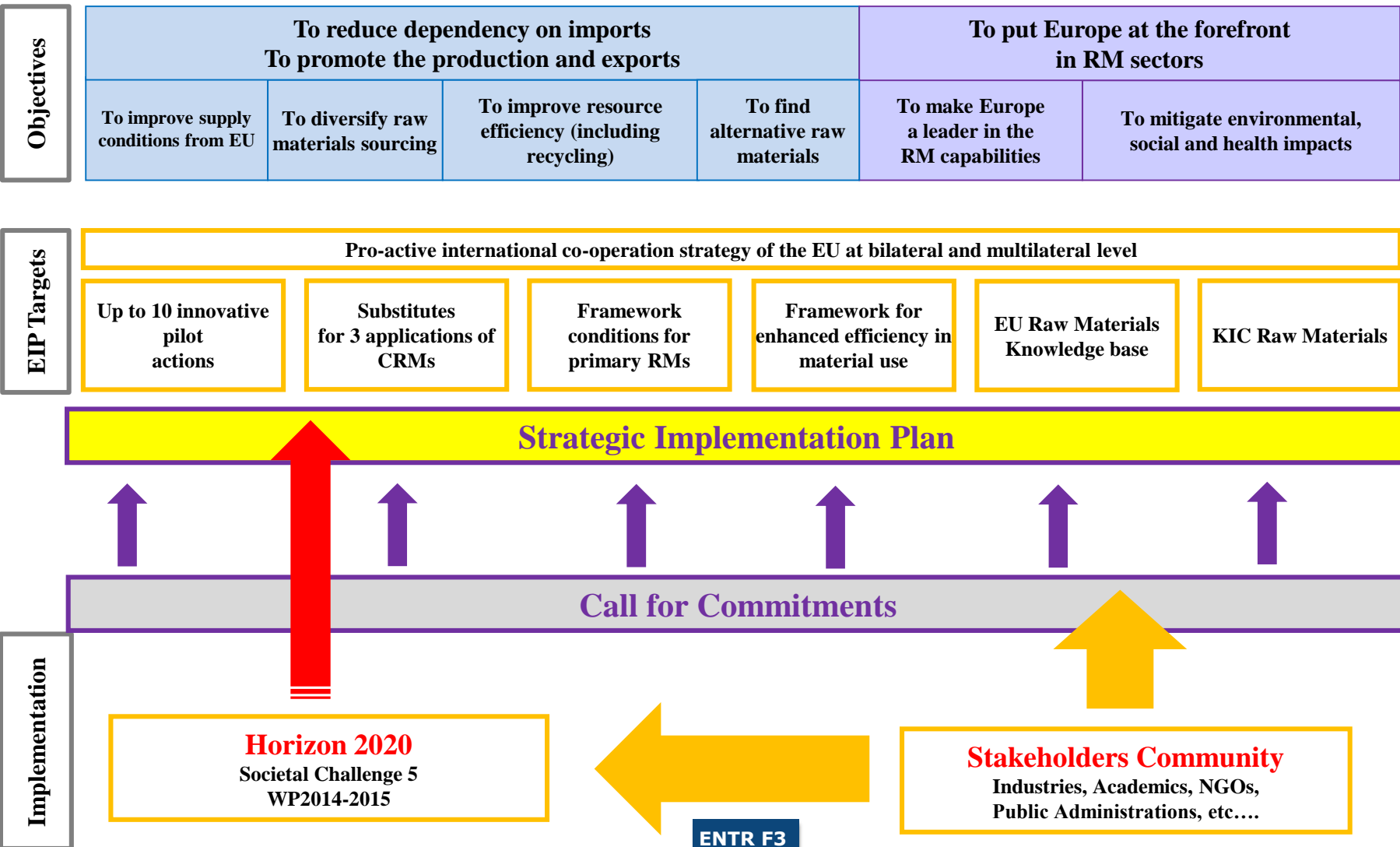
THANK YOU!

Back up slides

Technology readiness levels (TRL)



- General annex G of the Workprogramme 2014-2015,
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)

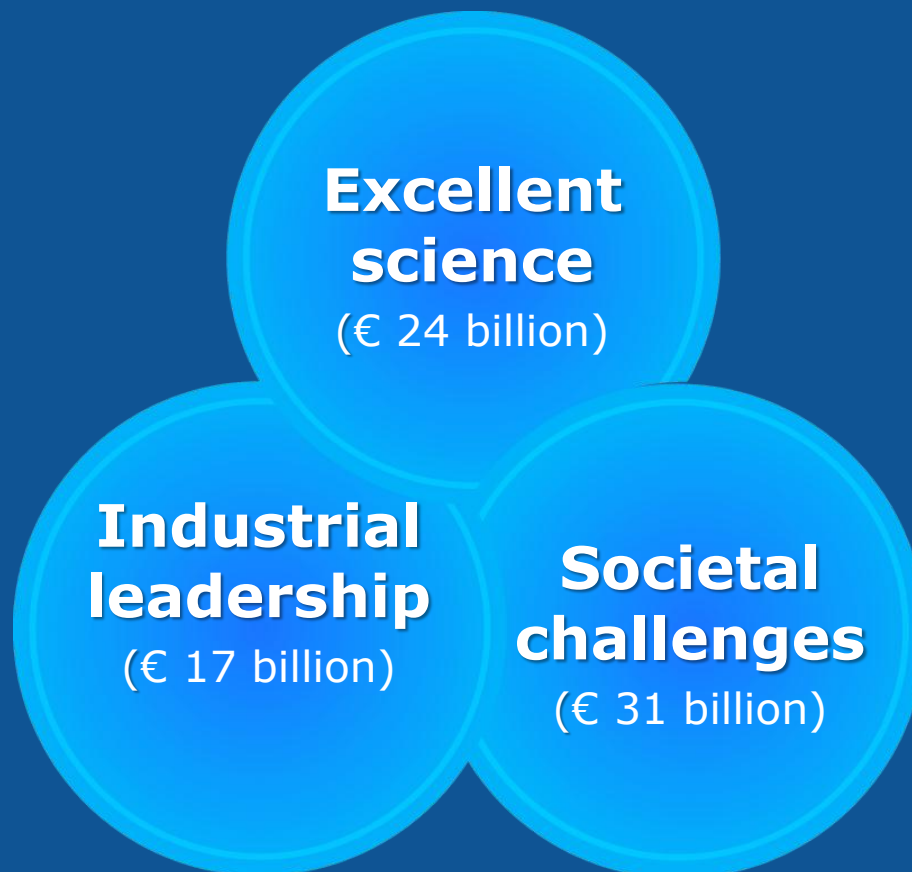




- 1. Horizon 2020: Context and overview**
- 2. Horizon 2020: Programming**
- 3. Horizon 2020: Societal Challenge 5 (SC5)**
- 4. Horizon 2020/SC5: Timetable**

1. Horizon 2020: Context and overview

Horizon 2020



* the numbers are based on European Council conclusions, 8 February 2013 and are subject to the approval of the Multiannual Financial Framework Regulation by the European Parliament and the Council



<i>European Research Council (ERC)</i> Frontier research by the best individual teams	13 095
<i>Future and Emerging Technologies</i> Collaborative research to open new fields of innovation	2 696
<i>Marie Skłodowska-Curie actions (MSCA)</i> Opportunities for training and career development	6 162
<i>Research infrastructures (including e-infrastructure)</i> Ensuring access to world-class facilities	2 488

* All funding figures (€ million, 2014-2020) in this presentation are subject to the pending Multiannual Financial Framework Regulation by the EP and the Council



<p><i>Leadership in enabling and industrial technologies (LEITs)</i> (ICT, nanotechnologies, materials, biotechnology, manufacturing, space)</p>	13 557
<p><i>Access to risk finance</i> Leveraging private finance and venture capital for research and innovation</p>	2 842
<p><i>Innovation in SMEs</i> Fostering all forms of innovation in all types of SMEs</p>	616 + complemented by expected 20% of budget of societal challenges + LEITs and <i>'Access to risk finance'</i> with strong SME focus

* All funding figures (€ million, 2014-2020) in this presentation are subject to the pending Multiannual Financial Framework Regulation by the EP and the Council



1. Health, demographic change and wellbeing	7 472
2. Food security, sustainable agriculture, marine and maritime research & the Bioeconomy	3 851
3. Secure, clean and efficient energy *	5 931
4. Smart, green and integrated transport	6 339
5. Climate action, resource efficiency and raw materials	3 081
6. Inclusive and reflective societies	1 309
7. Secure societies	1 695
<i>Science with and for society</i>	<i>462</i>
<i>Spreading excellence and widening participation</i>	<i>816</i>

* Additional funding for nuclear safety and security from the Euratom Treaty activities (2014-2018)

All funding figures (€ million, 2014-2020) in this presentation are subject to the pending Multiannual Financial Framework Regulation by the EP and the Council

Role of the EIT and JRC in Horizon 2020



	<i>Proposed funding (€ million, 2014-2020)</i>
<i>European Institute of Innovation & Technology (EIT)</i> Combining research, innovation & training in knowledge and Innovation Communities (possible KIC on Raw materials)	2 711
<i>Joint Research Centre (JRC)*</i> Providing a robust, evidence base for EU policies	1 903

* Additional funding for the JRC for Euratom Treaty activities

3. Horizon 2020: Programming - overall approach

Proposed Programme Cycle



2014	2015	2016	2017	2018	2019	2020
Strategic Programme						
Work Programme 1 (plus tentative information for 2016)		Strategic Programme				
		Work Programme 2 (plus tentative information for 2018)		Strategic Programme		
				Work Programme 3 (plus tentative information for 2020)		
						Work Programme 4

12 Focus Areas



- Personalising health and care
- Sustainable food security
- Blue growth: unlocking the potential of the oceans
- Smart cities and communities
- Competitive low-carbon energy
- Energy efficiency
- Mobility for growth
- **Waste: a resource to recycle, reuse and recover raw materials**
- Water innovation: boosting its value for Europe
- Overcoming the crisis: new ideas, strategies and governance structures for Europe
- Disaster-resilience: safeguarding society and adapting to climate change
- Digital security

Horizon 2020 approach



- Full respect of the **Horizon 2020 legislative acts**
- **Strategic programme (12 Focus Areas)** guide the Work programme preparation
- A strong **challenge-based approach**, freedom to come up with innovative solutions
- **Simplified list of possible types of action** (e.g. research and innovation: 100%; innovation actions: 70%,...)
- **Less prescription**, broader topics, strong emphasis on expected impact
- **Cross-cutting issues** mainstreamed (e.g. social sciences, gender, international...)

Work programme:

- **One single work programme***, including all parts of the H2020;
- In principle, **two-years approach**, respond to the request for predictability
- **Mirroring the Strategic Programme**; tentative information for the third year;
- A **specific call for each Focus area**
- **Web tools** to enhance the user-experience;

* With the exception of the ERC and the actions by the JRC and the EIT.

Simplification: Rules for Participation



- **A single set of rules:**
 - Adapted for the whole research and innovation cycle
 - Covering all research programmes and funding bodies
 - Aligned to the Financial Regulation, coherent with other new EU Programmes
- **One project – one funding rate**
 - Maximum of 100% of the total eligible costs (except for innovation actions, where a 70% maximum will apply for profit making entities)
 - Indirect eligible costs: a flat rate of 25% of direct eligible costs
- **Simple evaluation criteria**
 - Excellence – Impact – Implementation (Excellence only, for the ERC)
- **New forms of funding aimed at innovation**
 - pre-commercial procurement, inducement prizes, dedicated loan and equity instruments
- **International participation**
 - facilitated but better protecting EU interests



- International cooperation is crucial to address many Horizon 2020 objectives
- Principle of general openness: the programme will remain to be the most open funding programme in the world
- Horizon 2020 shall be open to the association of: acceding countries, candidate countries and potential candidates and selected international partner countries that fulfil the relevant criteria (capacity, track record, close economic and geographical links to the Union, etc.)
- Targeted actions to be implemented taking a strategic approach to international cooperation (dedicated measures in the 'Inclusive, innovative and secure societies' challenge)



- Member States' expert group for SC5
 - Nominated MS representatives in the future Programme Committees (Delegates + Experts) by 28 MS + Norway, Iceland, Liechtenstein
 - meetings: 4 September, 8 October, 11 November
- National Contact Points
 - Information contact person(s) for the Societal Challenge 5
 - Organising specific events for SC5 in their MS
- Advisory Group
 - 31 experts giving a advise for a strategic orientation of SC5
 - meetings: 4 October...

Horizon 2020: Old slides

5.3 Raw materials



- New solutions for sustainable production of raw materials
 - New exploration technologies and geomodels
 - Mining of small deposits and alternative mining
 - Deep mining on continent and in sea-bed
 - **Flexible processing technologies**
 - **New metallurgical systems**
 - Recycling of raw materials from products and buildings
- Innovative and sustainable solutions leading to substitution of raw materials
- Towards near-zero waste at European and global level

5.3 Raw materials



- Coordinating and supporting raw materials research and innovation
 - Innovation friendly minerals policy framework
 - Mineral deposits of public importance
 - Raw materials intelligence capacity
 - Raw materials research and innovation coordination
 - Strategic international dialogues and co-operation on raw materials
- Cross-challenge topics
 - Boosting the potential of small businesses for eco-innovation and a sustainable supply of raw materials (SME Instrument)