

## ERA-MIN RTDI projects to foster circular economy



RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY



Co-funded by the Horizon 2020 programme  
of the European Union

Ms. Leonor Gomez  
Ms. Dina Carrilho

*METS 2018 Conference  
Madrid, 10-12 April 2018*



RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY




Co-funded by the Horizon 2020 programme  
of the European Union


### ERA MIN 2. Introduction

ERA-MIN 2 (1<sup>st</sup> December 2016 – 30<sup>th</sup> November 2021) – **5 years**

- Title: *Implement a European-wide **coordination of research & innovation programs** on raw materials to strengthen the industry competitiveness and the shift to a circular economy*
- **Horizon 2020 ERA-NET Cofund** project under *Societal Challenge 5 - Climate Action, Environment, Resource Efficiency and Raw Materials*
- ERA-NET Cofund instrument is a **public-public partnership (P2P)**:
  - **Eligible participants** are research funding organisations ( national Ministries, regional authorities, national and regional funding agencies).
  - The **European Commission co-funds a single joint call for transnational proposals** (ERA-MIN Joint Call 2017). In addition, two joint calls without EU co-funding will be implemented.

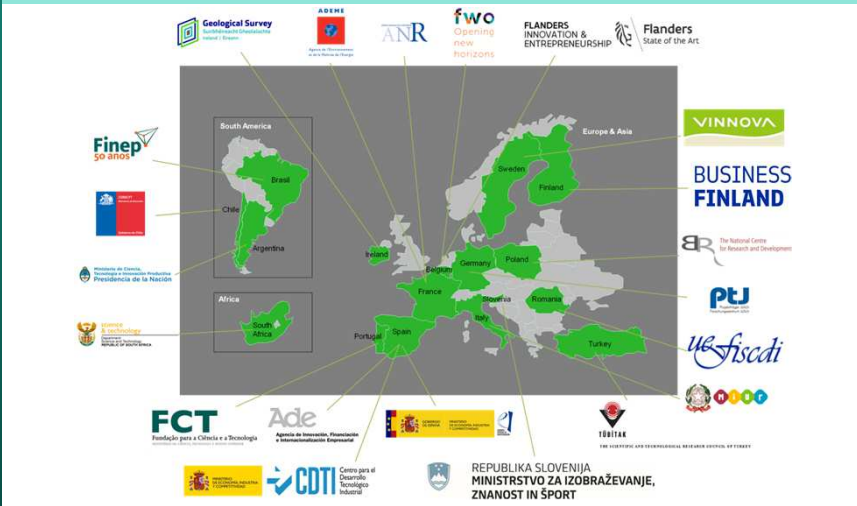
Participation of legal entities from **international countries and/or regions** is encouraged in the **2018 and 2019 Joint Calls**.



 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY



 Co-funded by the Horizon 2020 programme  
 of the European Union

## ERA-MIN 2. Consortium

Pan-European, innovative and flexible network of 21 public research and innovation funding organisations of 13 EU countries/regions and 4 non-EU countries






 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
 of the European Union

## ERA-MIN Joint Call 2017


### EU co-funded Call

- EU co-funding: ca. 5 M€
- Total call budget ca. 15 M€
- Launch: **1<sup>st</sup> February 2017**
- Funding decision: **Jan. 2018**
- Projects start: **1<sup>st</sup> May 2018**
- **Centralised peer-review** based on the H2020 evaluation criteria:
  - 1) Excellence, 2) Impact and 3) Implementation.
- Selection of projects following a **ranking list** recommended by the Scientific Evaluation Board.


 RESEARCH & INNOVATION PROGRAMME ON RAW MATERIALS TO FOSTER CIRCULAR ECONOMY
 
 Co-funded by the Horizon 2020 programme of the European Union

### Future objectives/activities

- 2018 and 2019 Joint Calls** for transnational proposals by pooling only national/regional funds, without EU co-funding
- OPEN** to participation of funding organisations from other countries and regions that are not partners of ERA-MIN 2
- As a result of 3 joint calls for transnational R&I proposals, ERA-MIN 2 aims to provide support to a total of **30 transnational R&I projects with 30 million Euros.**
- 2017-2021** – Follow-up of funded projects (including ERA-MIN projects); Organise mid-term and final Workshops; Mapping of research funding programmes for mutual learning; Organise/participate in joint workshops, matchmaking events with other Ministries and funding agencies
- By 2021**, ERA-MIN 2 aims to have **24 Associated partners/Observer organisations:**  
18 from European countries; 6 from non-European countries.


 RESEARCH & INNOVATION PROGRAMME ON RAW MATERIALS TO FOSTER CIRCULAR ECONOMY
 
 Co-funded by the Horizon 2020 programme of the European Union

### ERA-MIN Joint Call 2017 at a glance

**SCOPE:** demand-driven research and innovation on **primary and secondary resources of metallic, construction and industrial minerals** and **substitution of Critical Raw Materials** in a circular economy approach.



**Raw materials for the sustainable development and the circular economy**

The diagram illustrates the circular economy process for raw materials. It starts with **Primary resources** (Exploration of ores, construction and industrial minerals) leading to **Extraction** and **Processing**, which results in **Raw Materials**. From **Raw Materials**, the process moves to **Design**, **Production and manufacturing**, and **Use, re-use and repair**. **Residues (historical dumps and tailings)** are recycled back into **Secondary resources**, which are then used in **Recycling** to produce **Raw Materials** again. **Residual waste** is sent to **Landfill**. The diagram also highlights **Substitution of raw materials** and **Increase resource efficiency** as key goals of the circular economy approach.



 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
 of the European Union

## ERA-MIN Joint Call 2017 – thematic areas

Five main topics:


1. **Supply of raw materials from exploration and mining**
2. **Design**
3. **Processing, Production and Remanufacturing**
4. **Recycling of End-of-Life Products**
5. **Cross-cutting topics:**
  - 5.1. **New business models**
  - 5.2. **Improvement of methods or data for environmental impact assessment**
  - 5.3. **Social acceptance and trust/public perception of raw materials**



 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
 of the European Union

## ERA-MIN Joint Call 2017 – main topics and sub-topics

1. **Supply of raw materials from exploration and mining**
  - 1.1. Exploration
  - 1.2. Mining operations
  - 1.3. Mine closure & reclamation
2. **Design**
  - 2.1. Product design for increased raw material efficiency
  - 2.2. Product design for reuse or extended durability of product
  - 2.3. Product design to promote recycling
  - 2.4. Product design for critical material substitution


 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
 of the European Union

## ERA-MIN Joint Call 2017 – main topics and sub-topics

### 3. Processing, Production and Remanufacturing

- 3.1. Increase resource efficiency in resource intensive production processes
- 3.2. Increase resource efficiency through recycling of residues or manufacturing
- 3.3. Increase resource efficiency using information & communication technologies (ICT)

### 4. Recycling of End-of-life products

- 4.1. End-of-life products collection and logistic
- 4.2. End-of-life products pre-processing
- 4.3. Recovery of raw materials from End-of-life products
- 4.4. Increase recycling of End-of –Life products information & communications technologies (ICT)


 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
 of the European Union

## ERA-MIN Joint Call 2017

Joint application & evaluation but **national/regional funding**

- **National/regional funding priorities, rules and regulations** apply:
  - **Call topics (and sub-topics)** eligible for funding
  - **Eligible organisations** from academia, industry, SMEs, NGOs, public authorities from the participating countries/regions
  - **Eligible type of research:** fundamental and applied research (Technology Readiness Level TRL 1-9)

 RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY

 Co-funded by the Horizon 2020 programme  
of the European Union

### Partner search tool

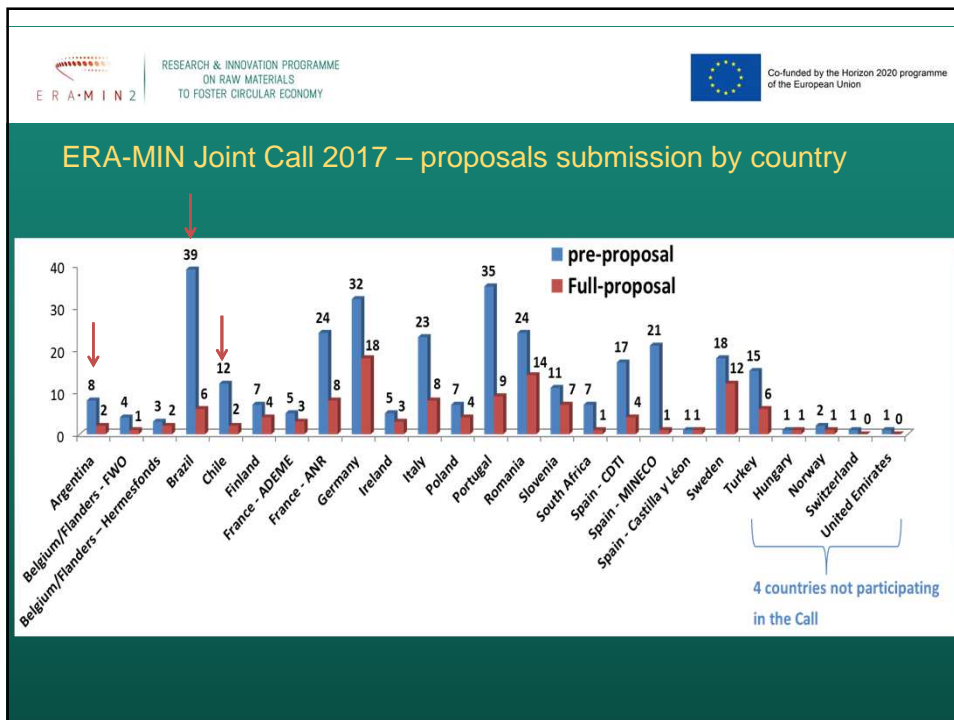
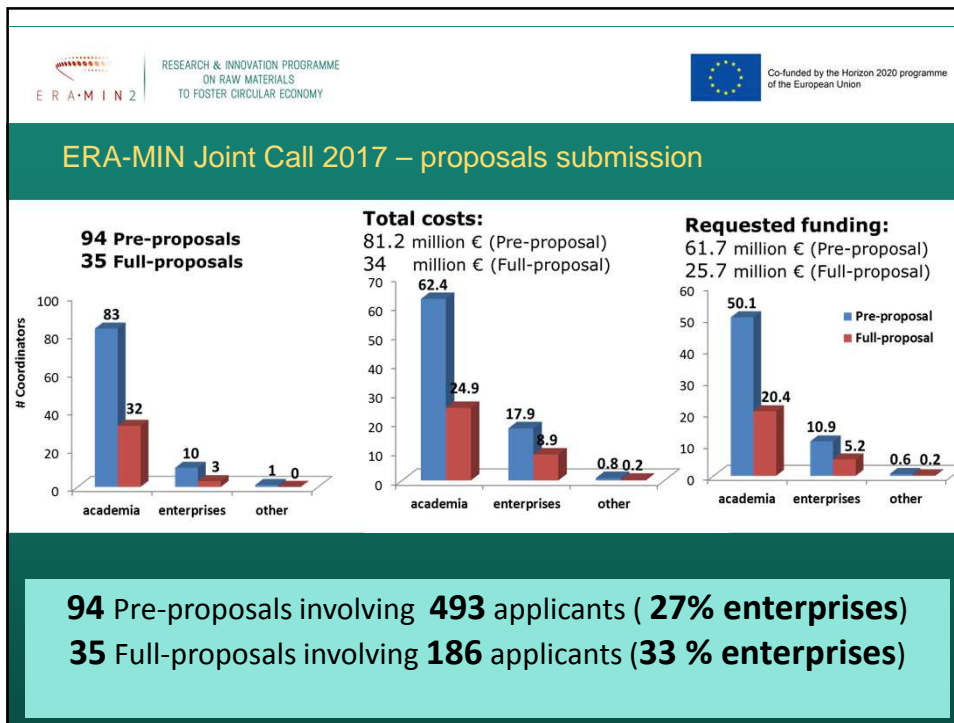
Searching for partners and build consortia? Please refer to the online tool available on the **NCPs-CaRE website** (<http://partnersearch.ncps-care.eu/>).

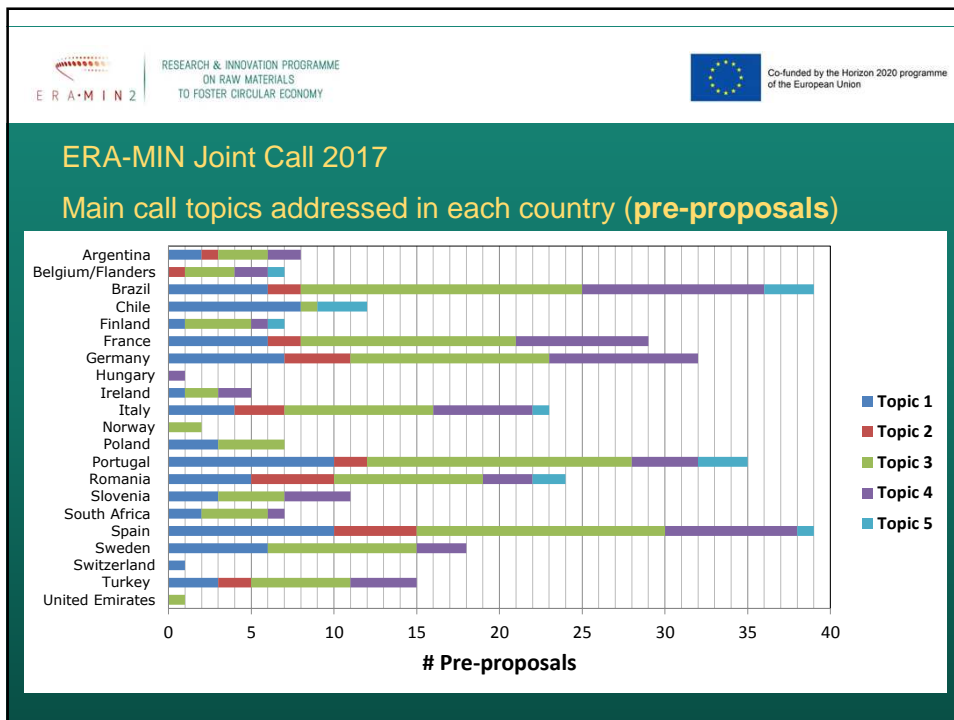
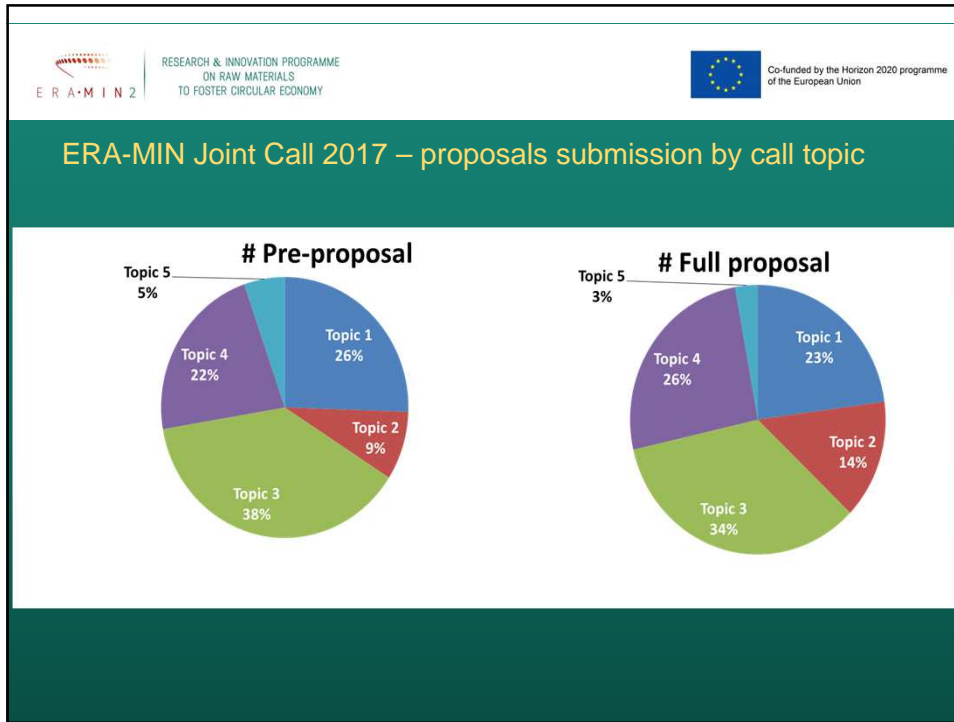
More details on the ERA-MIN Joint Call 2017 **Webinar on 30<sup>th</sup> March at 12:00 CEST** available at ERA-MIN 2 website

 RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY

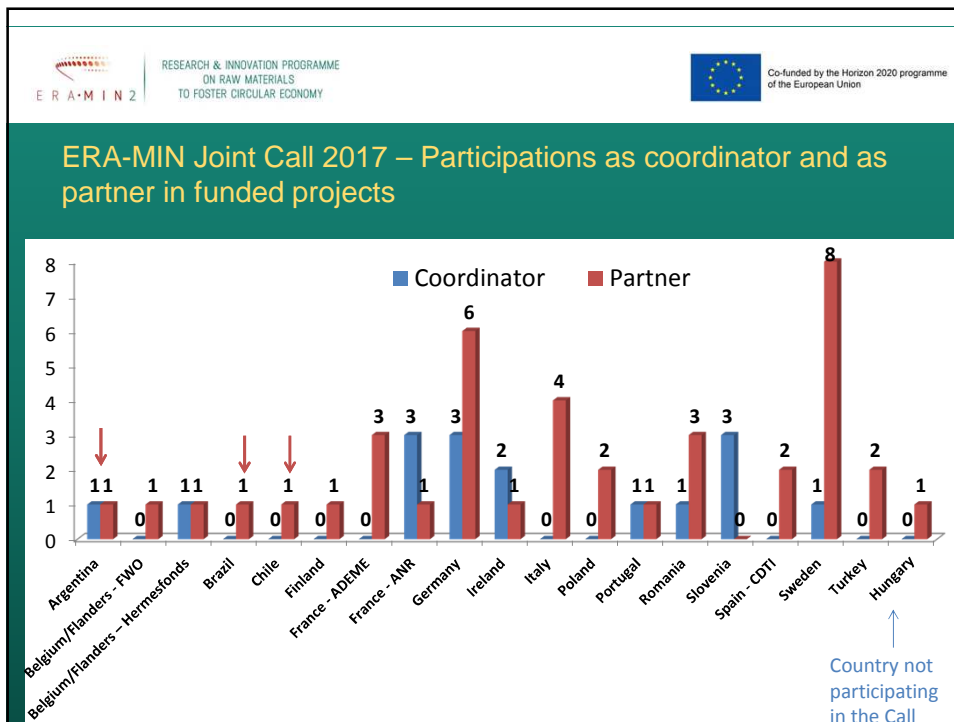
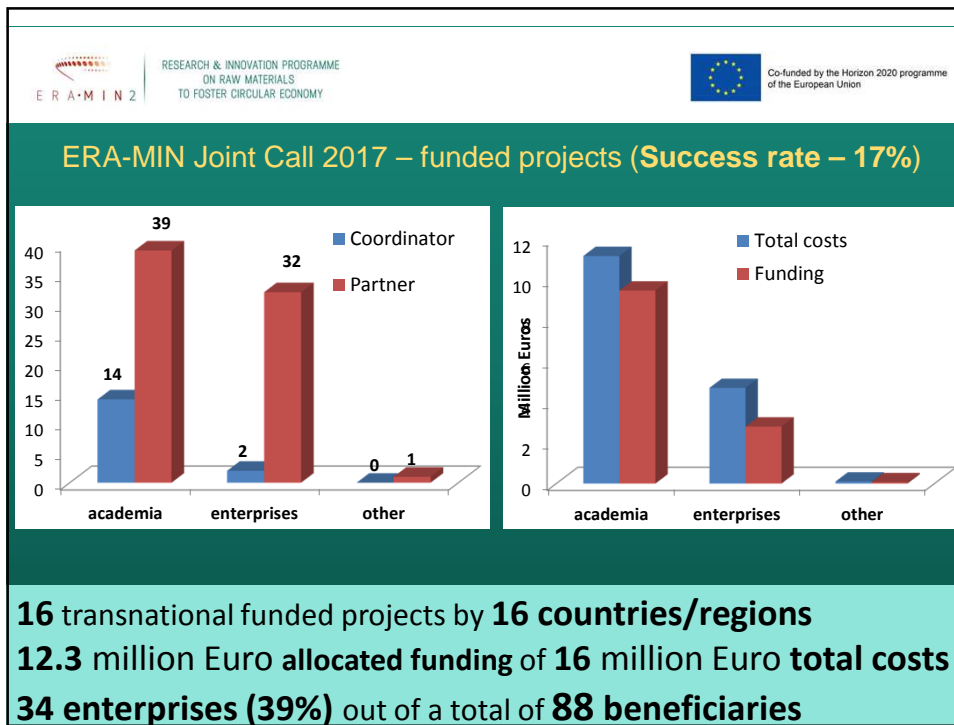
 Co-funded by the Horizon 2020 programme  
of the European Union

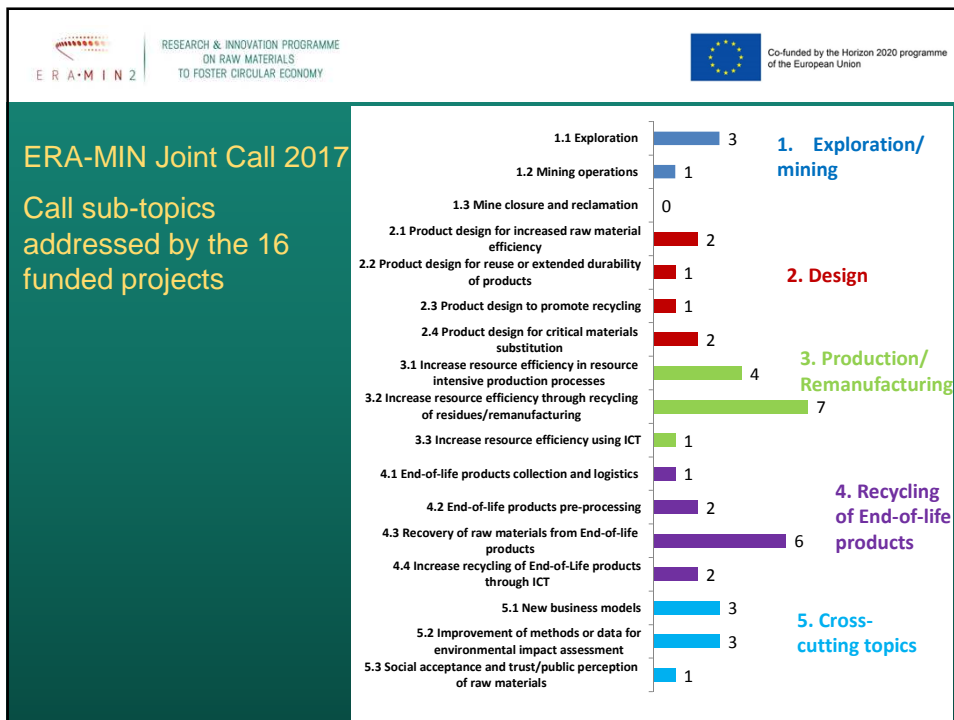
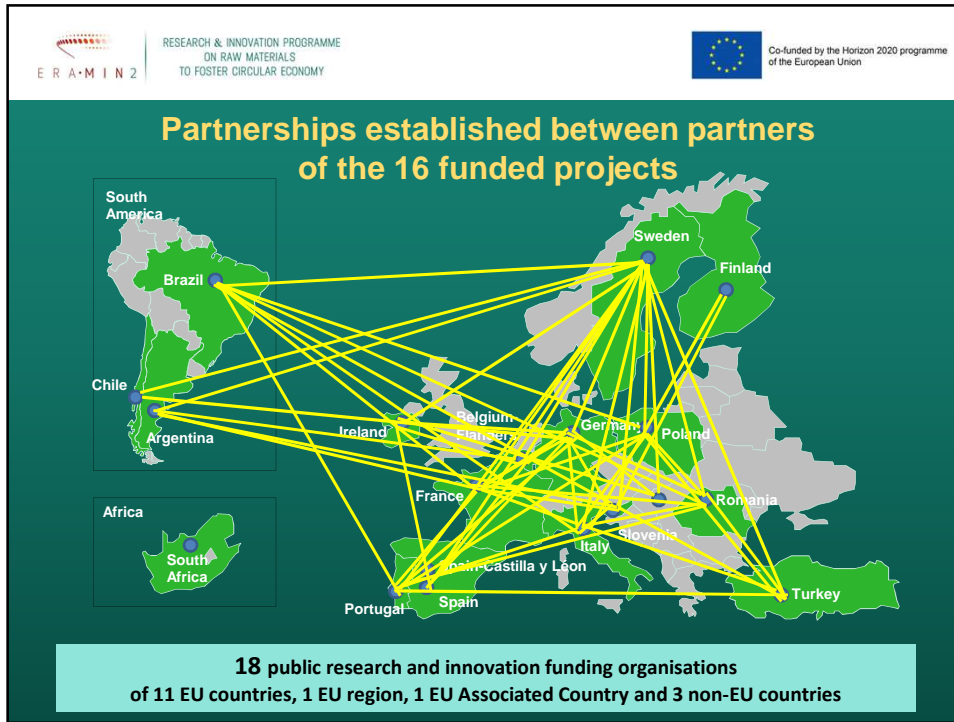
## ERA-MIN Joint Call 2017 Call statistics

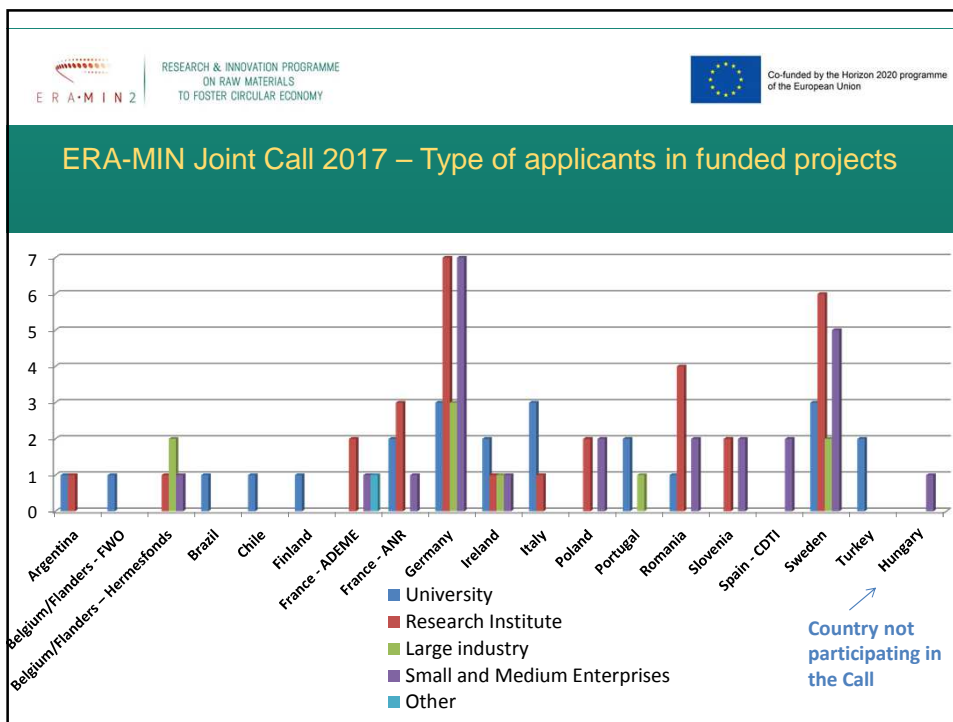














Call sub-topics	Project Keywords	Countries /regions	Project acronym/title
1.1: Exploration	<b>Li-deposit exploration</b> , drone, SWIR, LIBS, integrated software solutions	<b>France</b> , Portugal, Germany	LIGHTS Lightweight Integrated Ground and Airborne Hyperspectral Topological Solution
1.1: Exploration	Exploration, magnetics, airborne, FTMG/3D-VM/OPM, high resolution	<b>Germany</b> , Sweden, Spain	AMTEG Advanced Magnetic full Tensor Gradiometer instrument
1.2: Mining operations	Sensor fusion, LIBS, multi energy X-ray, mining, geological modelling	<b>Germany</b> , Chile, Sweden	REWO-SORT Reduction of Energy and Water consumption of mining Operations by fusion of sorting technologies LIBS and ME-XRT
1.1: Exploration	Innovative, <b>gold</b> , targeting, 3D modelling, microanalysis	<b>Ireland</b> , Sweden	Gold_Insight Tracing Gold-Copper-Zinc with advanced microanalysis

Call sub-topics	Project identifier	Countries /regions	Project acronym/title
<p><b>2.1:</b> Product design for increased raw material efficiency</p> <p><b>2.4:</b> Product design for critical materials substitution</p>	<p><b>Monazite, rare earth oxides, doped zirconia, thermal barrier coatings, sintered zirconia</b></p>	<p><b>Romania, Italy, France</b></p>	<p><b>MONAMIX</b></p> <p>New concepts for efficient extraction of mixed rare earths oxides from monazite concentrates and their potential use as dopant in high temperature coatings and sintered materials</p>


Call sub-topics	Project identifier	Countries /regions	Project acronym/title
<p><b>2.4:</b> Product design for critical materials substitution; <b>3.2:</b> Increase resource efficiency through recycling of residues or remanufacturing</p>	<p><b>Phosphorus recycling, P from manure ash, P-concentration, P-sustainability, Zero waste</b></p>	<p><b>Portugal, Brazil, Italy, Poland, Romania, Sweden, Turkey, France</b></p>	<p><b>Deasphor</b></p> <p>Design of a product for <b>SUBSTITUTION of phosphate rocks</b></p>
<p><b>3.1:</b> Increase resource efficiency in resource intensive production processes</p>	<p><b>Lithium, membrane electrolysis, water recovery, life cycle analysis, magnesium</b></p>	<p><b>Argentina, Belgium/ Flanders, Sweden</b></p>	<p><b>Li-Water</b></p> <p>Membrane electrolysis for resource-efficient lithium and water recovery from brines</p>
<p><b>3.2:</b> Increase resource efficiency through recycling of residues or remanufacturing</p>	<p><b>Waste recycling, slag, fibers, alkali activated foams</b></p>	<p><b>Slovenia, Finland, Italy</b></p>	<p><b>FLOW</b></p> <p>Lightweight alkali activated composite foams based on secondary raw materials</p>
<p><b>3.1:</b> Increase resource efficiency in resource intensive production processes; <b>3.2:</b> Increase resource efficiency through recycling of residues or remanufacturing</p>	<p>Mining wastes, mineral processing, hydrometallurgy, <b>base and precious metals</b>, economic and environmental assessment</p>	<p><b>France, Romania, Turkey, Poland</b></p>	<p><b>MINTECO</b></p> <p>Integrated eco-technology for a <b>selective recovery of base and precious metals in Cu and Pb mining by-products</b></p>



 RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
of the European Union

### ERA-MIN Joint Call 2017 – 7 funded projects address **Topic 3. Processing, Production and Remanufacturing**

Call sub-topics	Project keywords	Countries/ regions	Project acronym/ title
<b>2.1:</b> Product design for increased raw material efficiency, <b>2.2:</b> Product design for reuse or extended durability of products, <b>2.3:</b> Product design to promote recycling , <b>3.2:</b> Increase resource efficiency through recycling of residues or remanufacturing, <b>3.3:</b> Increase resource efficiency using information and communication technologies (ICT), <b>4.1:</b> End-of-life products collection and logistics , <b>4.2:</b> End-of-life products pre-processing: pre-treatment, dismantling, sorting, characterisation, <b>4.3:</b> Recovery of raw materials from End-of-life products, <b>4.4:</b> Increase recycling of End-of-Life products through information and communication technologies (ICT), <b>5.1:</b> New business models, <b>5.2:</b> Improvement of methods or data for environmental impact assessment	Circular economy, <b>magnet recycling,</b> NdFeB magnets, end-of-life magnets, Eco-labelling	<b>Slovenia,</b> Germany, Sweden	MaXcycle A novel circular economy for sustainable RE-based magnets


 RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
of the European Union

### ERA-MIN Joint Call 2017 – 7 funded projects address **Topic 3. Processing, Production and Remanufacturing**

Call sub-topics	Project keywords	Countries/ regions	Project acronym/ title
<b>3.1:</b> Increase resource efficiency in resource intensive production processes, <b>3.2:</b> Increase resource efficiency through recycling of residues or remanufacturing, <b>5.2:</b> Improvement of methods or data for environmental impact assessment	<b>Bottom Ash, Metal Recovery, Construction Minerals, Recycling, Waste Minimization</b>	<b>Germany,</b> Italy, Sweden	BASH-TREAT Optimization of bottom ash treatment for an improved recovery of valuable fractions
<b>3.2:</b> Increase resource efficiency through recycling of residues or remanufacturing, <b>4.3:</b> Recovery of raw materials from End-of-life products	<b>Rare earth elements, recycling,</b> magnetic nanomaterials, e-waste, selectivity	<b>Slovenia,</b> Sweden, Argentina, France	MetRecycle Recycling of metals using functionalized magnetic nanoparticles (FMNP)

Call sub-topics	Project keywords	Countries /regions	Project acronym/title
<p><b>3.1:</b> Increase resource efficiency in resource intensive production processes,<b>3.2:</b> Increase resource efficiency through recycling of residues or remanufacturing,<b>4.3:</b> Recovery of raw materials from End-of-life products,<b>5.1:</b> New business models,<b>5.2:</b> Improvement of methods or data for environmental impact assessment ,<b>5.3:</b> Social acceptance and trust/public perception of raw materials</p>	<p>Critical Raw Materials, biometallurgi, sulfate reduction, <b>bauxite residue, fly ash</b></p>	<p><b>Sweden,</b> Germany, Ireland, Hungary</p>	<p>BIOMIMIC Innovative biotechnological methods for effective mining of secondary material</p>
<p><b>4.3:</b> Recovery of raw materials from End-of-life products</p>	<p><b>Precious metals recovery,</b> supercritical CO2, complexing surface-active polymers, spent catalysts, secondary resources</p>	<p><b>France,</b> Romania, Germany</p>	<p>SUPERMET Recovery of Precious Metals from Spent Catalysts by Supercritical CO2 Extraction Assisted by Polymers</p>

Call sub-topics	Project keywords	Countries /regions	Project acronym/title
<p><b>4.2:</b> End-of-life products pre-processing: pre-treatment, dismantling, sorting, characterisation, <b>4.3:</b> Recovery of raw materials from End-of-life products, <b>4.4:</b> Increase recycling of End-of-Life products through information and communication technologies (ICT)</p>	<p><b>Bottom ash,</b> sensor-based characterisation, sensor-based sorting, process model, optimization</p>	<p><b>Belgium /Flanders,</b> Germany</p>	<p>INSTANT / INNOVATIVE SENSOR TECHNOLOGY FOR OPTIMIZED MATERIAL RECOVERY FROM BOTTOM ASH TREATMENT</p>
<p><b>4.3:</b> Recovery of raw materials from End-of-life products, <b>5.1:</b> New business models</p>	<p>PCB, ASR, <b>battery,</b> critical metals, economic assessment full scale plant</p>	<p><b>Ireland,</b> Belgium /Flanders, Germany, Spain</p>	<p>ReCEOL Recycling of End-of-Life Products (PCB, ASR, LCD)</p>



RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY



Co-funded by the Horizon 2020 programme  
of the European Union

More information on the 16 **ERA-MIN 2 funded projects**  
and the 17 ERA-MIN funded projects are available at  
<https://www.era-min.eu/results>

**ERA-MIN Research Agenda** is available for download at:  
<https://www.era-min.eu/publications>





RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY

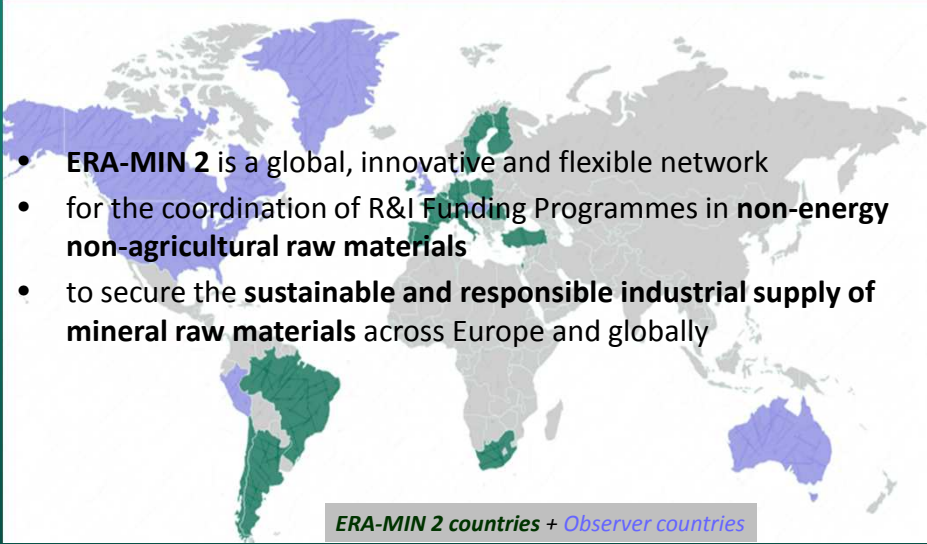


Co-funded by the Horizon 2020 programme  
of the European Union

**ERA-MIN Joint Call 2018**  
**Participating countries**  
**Call calendar**


 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
 of the European Union



- **ERA-MIN 2** is a global, innovative and flexible network
- for the coordination of R&I Funding Programmes in **non-energy non-agricultural raw materials**
- to secure the **sustainable and responsible industrial supply of mineral raw materials** across Europe and globally

ERA-MIN 2 countries + Observer countries


 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY



 Co-funded by the Horizon 2020 programme  
 of the European Union




- Funds **demand driven research** transnational projects
- Supports partnerships between academia, **industry and SMEs**
- Provides access to **leading knowledge** and **new markets** across **Europe and world-wide**

ERA-MIN 2 countries + Observer countries






 RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
of the European Union

## ERA-MIN Joint Call 2018

Scope / Call thematic areas	Similar to Call 2017
15 Participating countries/regions <i>(to be updated in September 2018)</i>	<u><b>Latin American Countries:</b></u> Argentina, Brazil and Chile <u><b>EU countries/regions:</b></u> Belgium-Flanders; Finland; France; Ireland; Poland; Portugal; Romania; Slovenia; Spain - Castilla y León; Sweden; <u><b>Non-EU countries:</b></u> South Africa; Turkey;
Call provisional budget <i>(to be updated later)</i>	7.2 million Euros


 RESEARCH & INNOVATION PROGRAMME  
ON RAW MATERIALS  
TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
of the European Union

## ERA-MIN Joint Call 2018

Submission procedure	One-stage submission procedure (only <b>full proposals</b> )
Call pre-announcement	September 2018
<b>Call opens</b>	<b>31<sup>st</sup> October 2018</b>
Full-proposal submission <b>deadline</b>	<b>31<sup>st</sup> January 2019</b>
Feedback to applicants	Mid May 2019
Earliest start date of projects	June 2019


 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
 of the European Union

## HOW CAN YOU GET INVOLVED?

**If you are a researcher from academia, SME, industry, NGO or public authority**

- Apply, as coordinator or partner, in a transnational consortium to 2018 and 2019 ERA-MIN Joint Calls
- Apply as reviewer for the scientific peer-review of international R&D projects

**If you are a Research Funding Organisation (Ministry or Agency) from European or non-European country or region**

- Join the **2018/2019 joint calls** for transnational R& projects to support the internationalization of the researchers from your country or region

**If you represent a raw materials initiative, Horizon 2020 project, industrial association or an international body**

- Liaison with ERA-MIN 2 activities to ensure complementarity and avoid duplication of efforts


 RESEARCH & INNOVATION PROGRAMME  
 ON RAW MATERIALS  
 TO FOSTER CIRCULAR ECONOMY


 Co-funded by the Horizon 2020 programme  
 of the European Union


**Our project ERA-MIN 2  
 was made possible  
 thanks to #H2020 funding**

**€30 billion** is still  
 available in the 2018-20  
 Work Programme!


 European  
 Commission


 #InvestEUresearch

**Coordination: FCT- Fundação para a Ciência e a Tecnologia – Portugal**  
[eramin@fct.pt](mailto:eramin@fct.pt)


**FCT**  
 Fundação para a Ciência e a Tecnologia  
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO

**Follow us: Website: [www.era-min.eu](http://www.era-min.eu)**  

**@eranetmin2**  

**[www.linkedin.com/in/era-min-joint-calls-102ba271](https://www.linkedin.com/in/era-min-joint-calls-102ba271)**