European Innovation Partnership on Raw Materials

Application for a Raw Materials Commitment

**Optimising quality of information in RAw MAterials data collection across EUrope**

**Acronym:** ORAMA

**Abstract / executive summary:**

The problems of data availability, accessibility and sharing are common to various levels of industry and public authorities. Several projects have already tried to address the access and use of interoperable spatial data and services at various levels. The adopted INSPIRE Directive is at the beginning of its implementation and the objective of a European wide harmonized Knowledge Base (KB) remains a challenge. First steps on integrating mineral raw materials data have been made with projects based on INSPIRE compliant data models (e.g., EURare, Minerals4EU and ProSUM). However, this is far from complete regarding the geographical coverage and data depth and the thematic coverage as well. Thus, three necessary actions are identified:

1a) Improving the spatial coverage of Minerals4EU (M4EU) project while ensuring INSPIRE compatibility, and 1b) better implementing the INSPIRE MR data model on mineral raw materials data and improving both their quality and their completeness.

2) The Minerals4EU Knowledge Data Platform (KDP) can serve data related to occurrences/deposits, exploration, extraction and related economic considerations, but required additional data on environmental and social aspects, and on the industrial ecology approach. The M4EU/ProSUM team of this Consortium is creating new data models for products, stocks and flows & composition for WEEE, ELVs and batteries (INSPIRE compatible), in order to build Sankey diagrams on top of the Diffusion Database, which will need further integration.

3) A survey will identify the status of these data and make recommendations to improve their public availability In the absence of existing 'harvestable' databases (DBs), providers will be assisted in creating portrayals harvestable through WFS/FTP.

**Links to the Strategic Implementation Plan:**

- II. Non-Technology Pillar
  - II.C Priority Area: Knowledge
    - Action area n° II.8: EU Raw Materials Knowledge Base
      - 1) Appropriate conditions for the development of the EU Raw Materials Knowledge Base (EURMKB)
      - 2) Data input and EU / global standards for interoperability with national
databases and other relevant databases

- 3) Raw materials intelligence - methods, tools and analysis
- 4) Public data reporting and related expertise and skills
- 6) Improvement of data collection

Coverage of the Action Areas referred to above:

ORAMA is built on the experience gained from Minerals4EU project which has strong links to past and ongoing EU-funded projects dealing with minerals intelligence such as ProMine, EURare, EuroGeoSource, ProSUM, FAME, MINATURA2020 and MICA. ORAMA covers and contributes especially to the EIP on Raw Materials action area concerning the building of the European Union Raw Materials Knowledge Base (the EURMKB, Action area n° II.8) whose aim is to provide EU-level data and information on raw materials (RM) from different European sources in a harmonized and standardized way. ORAMA will contribute to solving still pending problems related to the availability, exhaustiveness, reliability and quality of data that former actions like Minerals4EU -despite the substantial progress made- do not have totally settled. It is important to note that the action area on the Knowledge Base (KB) is a foundation for both the technology and non-technology pillars as well as fundamental for the international cooperation pillar. Thus, ORAMA initiative will eventually contribute to all three EIP pillars and several action areas. Beyond the improvement of the Minerals4EU approach, i.e., the extension of the spatial coverage and a full implementation of the INSPIRE Mineral Resources (MR) data model, ORAMA will strive for adding new European data sources both at national and regional levels, including from non-proactive organisations/institutes, helping them to serve their data. The ambition is also to contribute to pilot actions under the technology pillar, maintaining and making their results available in a seamless way using the Knowledge Data Platforms, while regulatory framework for primary and secondary raw materials (non-technology pillar) will contribute to- and use data and information from the Knowledge Base.

Objectives of the commitment:

ORAMA is a natural follow-up of Minerals4EU project as well as the EuroGeoSurveys EUMINET RM Commitment, as it will build on the experience gained developing the EU-MKDP which is one of the first brick of the future EURMKB and of the EU Geological Data Infrastructure (EGDI). The main objectives are:
1) To develop a clear strategy for extending and deepening the RM data from all Member States in the EU;
2) To make available different types of data (incl. social, environmental, economic, technical, exploration and extraction, primary and secondary raw materials) to end users; 3) To provide a systematic collection methodology and recommendations for the improvement of datasets and EU-level harmonization; 4) To assist and support data providers in creating portrayals harvestable through Web services (WFS) or other pertinent technical solution in the absence of existing 'harvestable' DBs.

Description of the activities:

Implementation of the ORAMA will be based on the following 5 major areas of action:
1. Inventory and analysis of data collection and sources
   In a first instance, an investigation-based inventory of all potential data providers including governmental bodies, institutes and academic bodies, and professional/industry organizations able to contribute, will be realized and then analyzed. Data sources dealing with social, environmental, economic and technical data on exploration, resource potential and extraction with respect to primary & secondary Raw Materials will be surveyed in all MS. Precise assessments will be made on the content of these DBs, the perimeter covered and the granularity, the format of the data and the
compliance with the INSPIRE MR and data models currently being developed for products, stocks & flows, in order to define the best harvesting procedure to implement.

2. Recommendations for data harmonization

At the end of the survey, recommendations for the implementation of data gathering methods, the improvement of existing ones and the inclusion of new datasets in the existing KB will be made, thus contributing to achieve harmonization and improved standardization of raw materials data across the EU, taking into account the INSPIRE Directive legal obligations. Close interactions will be made with the JRC in order to ensure there is no duplication between the EURMKB and the EC’s Raw Materials Information System (RMIS), notably regarding land use, economy data and life cycle analysis.

3. Demonstration of applicability of recommended methodologies

The efficacy of the recommendations on both primary and secondary materials will be tested and demonstrated at MS level with three major actions:

- Demonstrating the improvement of spatial coverage with the recommended system over that of Minerals4EU, and
- Improving the implementation of the INSPIRE MR data model which has not been completed for a number of elements, because of its complexity, with in some cases, entire parts of the model missing or imperfectly mapped (e.g., mining wastes).
- Testing the efficiency of newly developed services -in synergy with ProSUM- to generate on the fly Sankey Diagrams, directly from the data of Diffusion DB of the EU-RMKB/EURMKB.

4. Clustering with other RMC’s, projects and initiatives

Strong synergies will be naturally established with ongoing projects such as EURare, ProSUM, MICA, the ORAMA team being also the team working within these projects. Existing links with the JRC teams from H06 and H08 Units will be solicited in order to ensure a harmonious development of both the EURMKB and the RMIS. Furthermore, the Minerals4EU Foundation, established in Brussels, will be an important forum for ORAMA as its main aim is to assist in the long-term delivery of Minerals4EU services and to provide a one-stop-shop through which stakeholders can easily access its products and the underlying expertise.

5. Outreach and communication actions

Foreseen actions such as workshops, stakeholder meetings, website, social media, videos, educative materials will assist in the delivery of the benefits of ORAMA to the RM community. A workshop at the outset will be organized, the aim of which being to widely inform that a large and exhaustive survey at the EU-scale will be launched for identifying all the public data related to RM, covering the whole value-chain, from exploration to recycling including economy aspects. Another one, at the end of the project will present the results of the exercise, the best practices, and how to get access and use them.

**Description of the expected impacts:**

ORAMA will deliver a range of outputs that will have significant impacts and benefits for the EU. It will contribute (i) to refine the policy related to the collection and dissemination of raw materials data, (ii) to encourage networking between key institutions in the EU and (iii) to improve the EURMKB through the identification of new data sources which will deliver harmonized raw materials data across Europe. In addition to achieving the objectives of the EIP on Raw Materials, expected impacts will also include:

- Improving quality, assurance, homogeneity and accessibility to primary and secondary mineral raw materials data, all along the whole value chain in the EU28;
- Improving data collection systems from regional to national and then EU level and subsequent achievement of harmonized data;
- Favoring evidence-based decision-making for raw materials policy at EU and Member State levels;
- Facilitating investment decisions by industry with the development of dedicated applications or
services on top of the Central Knowledge Base;
• Increasing EU raw materials knowledge for stakeholders;
• Facilitating collaboration and negotiations with the rest of the world on raw materials matters.

Having easily accessible, well-organized, extensive, homogeneous and reliable data will trigger the development of new, attractive services on top of the Knowledge Base, allowing each end user (i) to extract the data he needs, (ii) to get the necessary information on the best available method to use for solving a problem (through the MICA ontology-based DDG Expert System), and finally (iii) to process the data online in a seamless way and in a comfortable professional environment. The ambition of ORAMA is to make the necessary step from GATHERING to EXPLOITATION of data.

**Expected innovation outcomes:**
New processes
New services
New technologies
Societal innovation

**Comments:**
One of the strengths of the Consortium is the strong management capability, its experience in international and mutual cooperation, and its competence in geoscientific research. Collectively, National Geological Survey Organisations (NGSOs) of this Consortium have participated in over 180 EU research projects. They are key public holders of thematic, geology related data, information, and expertise and knowledge providers to a wide range of stakeholders including local, regional, and national / authorities, economists and civil society stakeholders. Having developed the first INSPIRE compliant pan-EU distributed architecture, the ORAMA team has probably the best vision and understanding of what the RM policy support action SC5-15c-2017 'Optimizing collection of raw materials data in Member States' represents and the ORAMA commitment marks its willpower to take up the challenge.

**Name of the coordinating organisation:**
Geologian tutkimuskeskus - GTK
**Country:**
Finland
**Entity profile:**
Governmental/public body

**Role within the commitment:**
GTK is a leading European centre in assessment, research and sustainable use of geological resources. GTK coordinated both ProMine and Minerals4EU. Commitment leader. Coordination. Outreach actions. Clustering with other projects. GTK will also contribute to the following tasks: Inventory and analysis of data collection and sources, Recommendations for data harmonization; Demonstration of applicability of recommended methodologies.

**Other partners:**

**Name of partner:**
EuroGeoSurveys
**Country:**
Europe
**Entity profile:**
Other
Non-profit making organisation

**Role within the commitment:**
EGS is the organisation of the Geological Surveys of Europe. EGS was part of the INSPIRE work carried out in the M4EU project, and is involved in MICA and ProSUM projects, working on communicating the projects’ benefits to its stakeholders. The commitment will benefit from EGS’s experience in establishing an effective dialogues among different stakeholders from all over Europe, and in communicating science in the frame of large EC projects.

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**Name of partner:**
European Platform on Sustainable Mineral Resources (ETP SMR)

**Country:**
Europe

**Entity profile:**
Other

**Other:**
Technology platform

**Role within the commitment:**
Provide eventually data from research within the platform members.

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**Name of partner:**
Euromines

**Country:**
Europe

**Entity profile:**
Other

**Other:**
Industry Association

**Role within the commitment:**
Provide data particularly on economic, environmental and social aspects as well as mass flow data where available.

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**Name of partner:**
Minerals4EU Foundation

**Country:**
Europe

**Entity profile:**
Other

**Other:**
non-profit making organization / not-for-profit foundation

**Role within the commitment:**
The purposes of M4EU Foundation are mainly to maintain and update the outputs of the Minerals4EU Project beyond the project’s lifetime and to provide a one-stop-shop contact point through which stakeholders can easily and transparently access its products and the underlying expertise, and to act as a focal point for the leading European Minerals Intelligence Network. ORAMA is a natural follow-up of the Minerals4EU project.
**Name of partner:**
Bureau de Recherches Géologiques et Minières (BRGM)

**Country:**
France

**Entity profile:**
Governmental/public body

**Role within the commitment:**
BRGM is a main contributor of the pan-EU Geological Data Infrastructure (EGDI). BRGM was WP Leader of Minerals4EU (developing the Minerals Knowledge Data Platform [KDP]), a key-partner of EURARE (developing the REE Integrated Knowledge Management System), WP Leader of ProSUM and MICA (developing respectively the Urban Mining KDP and the MR DDG Expert Syst.). BRGM will bring all its experience for harvesting new data and feeding the future EURMKB.

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**Name of partner:**
Natural Environment Research Council (British Geological Survey - BGS)

**Country:**
United Kingdom

**Entity profile:**
Governmental/public body

**Role within the commitment:**
BGS is a world leader in mineral statistical information & analysis, with one of the largest databases in the world on the production and trade of minerals. BGS will play a key role in the following areas: Compilation & analysis of raw materials; Development of harmonization procedures for statistical data; Improving spatial coverage of M4EU; Assisting with the compilation of other data; Assisting development of raw material flows information.

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**Name of partner:**
Federal Institute for Geosciences and Natural Resources (BGR)

**Country:**
Germany

**Entity profile:**
Governmental/public body

**Role within the commitment:**
BGR has a strong expertise on global raw material markets and maintains long-term databases on raw material production. BGR continuously observes and analyses the global situation and regional aspects of raw material production and has a strong record of detailed analysis of resource availability. BGR also was and is partner of several EU-funded projects (MICA, Minerals4EU, Polinares).

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**Name of partner:**
Czech Geological Survey (CGS)

**Country:**
Czech Republic

**Entity profile:**
Governmental/public body

**Role within the commitment:**
CGS is the state organization that compiles, stores, interprets and provides objective expert geological information for the state administration, the private sector and the public. CGS participates in: Demonstration of applicability of recommended methodologies for harmonization; Recommendations for data harmonization; Clustering with other RMC’s, projects and initiatives; Analysis of data collection and sources

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**Name of partner:**
Geological Survey of Denmark and Greenland

**Country:**
Denmark

**Entity profile:**
Governmental/public body

**Role within the commitment:**
GEUS is partner in the projects Minerals4EU, EURare, Prosum and MICA. GEUS’ role has been specification of the data models and to support the NGSO’s in mapping of data to the data models and setting up services to make it available externally. GEUS can is therefore contribute to ‘Analysis of data collection and sources’, ‘Recommendations for data harmonization’ and ‘Demonstration of applicability of recommended methodologies for harmonization’

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**Name of partner:**
SRDE “Geoinform of Ukraine”

**Country:**
Ukraine

**Entity profile:**
Governmental/public body

**Role within the commitment:**
SRDE "GeoInform of Ukraine" (GIU) collects, stores, analyzes and provides information received from overall geological study and use of subsurface in Ukraine. GIU is intended to contribute to the strategy for collecting raw materials data, it is going to make available various types of data, to implement collection methodology for the improvement of datasets and EU level harmonization, and to create portrayals harvestable through WFS/FTP

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**Name of partner:**
MINISTRY OF AGRICULTURE, RURAL DEVELOPMENT AND ENVIRONMENT OF CYPRUS, Geological Survey Department of the Republic of Cyprus (GSD)

**Country:**
Cyprus

**Entity profile:**
Governmental/public body

**Role within the commitment:**
The Cyprus Geological Survey will set up a methodology to put together all relevant data furnished by other Authorities. These data include statistical information on raw materials, primary and secondary and environmental aspects of quarries and mines including restoration
of extractive sites and mine waste deposits. The GSD could contribute by analyzing the completeness of available data and information.

**Name of partner:**
Hrvatski geološki institut-Croatian Geological Survey (HGI-CGS)

**Country:**
Croatia

**Entity profile:**
Governmental/public body

**Role within the commitment:**
HGI-CGS is the principal public research institute in Croatia in the field of geosciences and the authority for collecting, storing and distributing data related to exploration of mineral resources. HGI can contribute to the improvement of spatial coverage of available mineral data, annual production and reserves can be made available on aggregated data on territorial basis. HGI-CGS contributed to 8 EU related minerals projects.

**Name of partner:**
INSTITUTE OF GEOLOGY AND MINERAL EXPLORATION - IGME GR

**Country:**
Greece

**Entity profile:**
Governmental/public body

**Role within the commitment:**
IGME is intended to contribute in all phases. It has the knowledge and experience to provide input in all the activities as described in the commitment’s relevant section since it is a major geo-related data collector, provider and evaluator and at the same time holds strong links with industry associations, mining companies, the Ministry of Environment and Energy (supervising authority of IGME), local and regional authorities and academia.

**Name of partner:**
IGME – Geological Survey of Spain

**Country:**
Spain

**Entity profile:**
Governmental/public body

**Role within the commitment:**
IGME’s Mining Panorama includes Spanish statistics on mineral raw materials production, exploration and trade made by a department exclusively dedicated to mineral resources and the environmental aspects of mineral extraction (mine waste, reclamation, etc). IGME will work in the analysis of data collection sources, recommendations for data harmonization and any outreach action to deliver the benefits of ORAMA to the raw materials stakeholders.

**Name of partner:**
ISPRA - Geological Survey of Italy

**Country:**
Italy
Entity profile:
Governmental/public body
Role within the commitment:
ISPRA together with ISTAT are currently setting up a methodology to harmonize the different regional databases and then these data with other national databases. These process includes analysis of statistical information, environmental impacts and socio-cultural aspects of both active and ceased sites. ISPRA endorses the theme Analysis of data collection and sources, to whom could contribute developing methods for defining the data reliability.

Name of partner: Laboratório Nacional de Energia e Geologia, I.P. (LNEG)
Country: Portugal
Entity profile: Governmental/public body
Role within the commitment:
LNEG has one of the most extensive libraries of mineral exploration and one of its core missions is translating this raw information into products easily used by the public in general as well as government organisations. LNEG has been in many projects that are the precursors to ORAMA: ProMine, EuroGeoSource and Minerals4EU. LNEG is actively working as third party partners in Prosum and Mica and is partner in FAME and a stakeholder in MINATURA2020.

Name of partner: Geological and Geophysical Institute of Hungary
Country: Hungary
Entity profile: Governmental/public body
Role within the commitment:
Preparation datasets & information for INSPIRE compliant dataservice. Support harvesting for mineral resources data; Participation in establishment of the concept on data collection and management & service harmonized by global standards; Participation in analysis of current data collection method; Preparation of recommendations for the improvement of data gathering methods; Demonstration of data harmonization applications for selected countries.

Name of partner: GEOLOGICAL SURVEY OF NORWAY
Country: Norway
Entity profile: Governmental/public body
Role within the commitment:
NGU has mandate from Norwegian Government to establish & run spatial databases on mineral resources, and is currently developing inspire compliant services. NGU does also have good cooperation with most other data owners, such as the Mining Directorate and the Directorate of
Environment. Our contribution will predominantly be in area 1, 3 and 4, and NGU may contribute with demonstration activities.

**Name of partner:**
Polish Geological Institute-National Research Institute

**Country:**
Poland

**Entity profile:**
Governmental/public body

**Role within the commitment:**
PGI collects and manages complex geological and statistical data: on mineral resources, mining output, mineral deposits and geological exploration projects, drillings, mining licences, water resources quality and intakes, natural hazards, mining wastes as well as environmental and spatial-planning conditions of current and future mining activity, geosites and geoparks. PGI will contribute to Analysis of data collection and sources.

**Name of partner:**
Sveriges Geologiska Undersökning (SGU)

**Country:**
Sweden

**Entity profile:**
Governmental/public body

**Role within the commitment:**
SGU provides information from its mineral database and updates the Fennoscandian Ore Deposits Database using a common collection system developed with GTK and NGU. SGU is involved in EURARE and ProSUM projects to establish systems to collect and store REE mineral deposit and mine waste data, respectively. In the Commitment SGU will contribute to development of an optimal collection system of raw materials data to be applied by all member states.

**Name of partner:**
State Geological Institute of Dionyz Stur (SGIDS)

**Country:**
Slovakia

**Entity profile:**
Governmental/public body

**Role within the commitment:**
SGIDS will contribute in nearly all activities. SGIDS has the knowledge and experience to gather, process and provide information on primary and secondary raw materials from Slovak Republic. Based on its long experience with Minerals Yearbook we can contribute in improvement of data gathering methods and recommendations for harmonization of data gathering methods with testing it in national level.

**Name of partner:**
WEEE Forum i.v.z.w.

**Country:**
Europe

**Entity profile:**
Other

**Other:**
International not-for-profit association

**Role within the commitment:**
In the RMC, the WEEE Forum, co-ordinator of the H2020 ProSUM project and speaking for thirty-two producer responsibility organisations annually collecting 1.7 Mt of WEEE, will provide a proportion of the data (secondary raw materials) and share its expertise in the field of WEEE.

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**Name of partner:**
Geological Survey of Ireland (GSI)

**Country:**
Ireland

**Entity profile:**
Governmental/public body

**Role within the commitment:**
In addition to providing data and metadata on Ireland’s minerals production GSI will contribute to action areas 4 & 5. GSI will link activities of ORAMA to Minerals4EU Foundation which has just been set up to collect minerals intelligence information. GSI will also participate in outreach, data gathering and research activities seeking to identify how best to collect minerals intelligence information and how best to standardize this information.

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**Existing EU contribution:**
Yes

**Source:**
FP 7
Horizon 2020

**Period to implement the commitment:**
Tuesday, 15 March, 2016 to Saturday, 1 February, 2020