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COMMISSION STAFF WORKING PAPER
Accompanying the document

**Communication from the Commission to the European Parliament, the Council, the
European Economic and Social committee and the Committee of the Regions**

**Making Raw Materials available for Europe's future well-being - proposal for a
European Innovation Partnership on Raw materials**

{COM(2012) 82 final}

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1. COHERENCE WITH CONDITIONS FOR SUCCESS¹ AND EU VALUE ADDED

1.1. Focus on a specific societal challenge:

The European Union needs to make a significant step by 2020 if it is to improve the security of supply and achieve efficient and sustainable management of non-energy, non-agricultural raw materials in the EU. These include many and diversified materials such as aggregates, industrial minerals and wood, but also metals used in high technology industries such as cobalt, platinum, rare earths, and titanium.

The objectives of this Partnership are clear: the European Union has to extract more efficiently and safely, to re-use and recycle more, to find alternatives/substitutes for critical raw materials and to be more resource efficient by decoupling resource use from economic growth.

There are clear positive impacts on competitiveness, with about 30 million EU jobs depending on the availability of raw materials. The development of EU's high tech manufacturing industry including eco-technologies is at stake. The proposal aims at reducing the risk of undermining the EU capacity to produce strategic products for its society. From this perspective, it is also a necessary basis for the success of other relevant Innovation Partnerships.

1.2. Major policy instruments

The policy measures used are both on the **supply** and on the **demand**-side. On the supply-side, companies should be the main drivers of efficiency improvements, but national and EU level research and innovation funding can be mobilised to fund development of the new technologies and processes. In this context, research and innovation are crucial because new and more sustainable extraction, more resource efficient use and recycling **technologies**, as well as new substitutes for currently used materials cannot be developed without significant efforts involving new research activities as well as new Development and Innovation projects.

On the demand side, **standardisation** and **certification** schemes are needed in many instances, in order to complement the market. Examples of such needs include:

¹ As outlined in the Innovation Union Flagship Communication COM(2010) 546

- interoperable software and data management packages, allowing faster integration of data for cross-country exploration and survey including 3D geological mapping;
- common terminology related to mineral and metals classification and production statistics, harmonised geological resources classification e.g. according to the UNFC² guidelines;
- new eco-design standards and requirements to promote the use of recycled materials, to increase the durability and recyclability of products and to ensure an efficient use of materials (e.g. metals scrap, paper for recycling)

Special attention will be given to promote a full implementation of existing legislation and increased **exchange of best practices** related to the implementation of Environmental and Minerals Policies in Member States, particularly in the field of land use and in mining waste, as well as in the sustainable management of resources, including harvesting and mobilisation of wood.

Public procurement plays also an important role in steering innovation in general and sustainable trends in particular. Indeed, in being first or early, smart and responsible purchasers, public procurers can be powerful actors to create incentives for recycled materials and related services to steer the materials flow efficiently by all means. Public procurement policies on a national, regional or local level that support the uptake and diffusion of new substitutes, and recycling technologies and sufficient collecting schemes for raw materials will be developed with all stakeholders from demand and supply side. Public procurement can stimulate best practice examples, promote the use of recycled, durable and recyclable products and can help to set benchmarks for economical feasible and environmental sound solutions.

1.3. EU added value of this Partnership

The Partnership will **create critical mass** towards the single objective of ensuring sustainable access to raw materials by creating synergies between different policy instruments (technological, regulatory and standardisation), reinforcing co-ordination with Member States where their contribution is crucial and ensuring the development of integrated value chains.

The lack, in the past, of clear EU instruments aiming at promoting innovation has contributed to a gradual loss of skills and knowledge in the EU (e.g. of mining and related engineering). At the same time, the insufficient implementation of the EU waste legislation has hampered the full exploitation of EU's potential (e.g. recycling). The Partnership aims at changing this situation.

There is an **insufficient co-operation between Member States** in different domains. National geological surveys use different nomenclature and different definitions which limits pan-EU assessments and references. Some countries apply strict conditions in public procurement, notably to promote the recycling markets, but there is scope for an extension of this practice.

² United Nations Framework Classification (UNFC) for Fossil Energy and Mineral Resources provided by the UNECE Ad Hoc Group of Experts on the Harmonization of Fossil Energy and Mineral Resources Terminology

The mining, harvesting, substitution, resource efficiency and recycling research efforts inside the EU do not presently have the necessary critical mass. Developing **integrated 'value chains'** from extraction and process of raw material, product design and use to end of life can only be achieved by ensuring a dialogue between mining, harvesting, manufacturing, waste management and recycling industries. No national research programme in the EU can cover all aspects.

In addition, **co-operation between national research organisations** is very limited and contributes to a high fragmentation the European Research Area³. The research investments and risks are too large for many private companies. Efforts should be made to strengthen research initiatives both at EU and at international level with a view to address issues of common benefit at global level e.g. finding viable alternatives for primary and secondary raw materials.

Also, the EU should play a **geopolitical role** in ensuring access for EU companies to raw materials in the world while respecting as far as possible EU environmental standards. These standards, set at EU level and adopted world-wide, can ensure a level playing field and the competitiveness of EU players.

Similar to Large Scale Facility (LSF)-Programmes in natural science, the establishment of structured joint venture programmes in the addressed areas would strengthen national excellence and increase visibility, both within the EU and on the international stage. Whilst EU companies can participate in commercial deep-sea exploration and exploitation activities, they are excluded from the state-sponsored efforts that some non-EU countries, with the same concerns as the EU about raw materials, are now beginning to undertake.

1.4. Support from Member states and stakeholders

The Council has, on different occasions, asked for swift action. The Council Conclusions of 10th of March 2011 "INVITES the Commission to further promote innovation and research and development efforts in the raw materials value chain, to assess the case for launching a European Innovation Partnership (EIP) on raw materials and to come forward with proposals for this as appropriate". The Environmental Council of December 2010 calls on the Commission to develop integrated and sustainable material-based strategies.

Several EU Member States such as Finland, France, the Netherlands and Germany have already developed their national raw material strategies and also have been very supportive of EU initiatives in this field. Many indications show that Member States see a real added value for stronger EU-level co-operation.

A public consultation⁴, which ran from 15 April until 22 June 2011, yielded about 160 contributions from citizens, organisations (federations, companies active in mining, recycling and down-stream users), and public authorities, which supported the overall idea and objective of an Innovation Partnership, the suggested targets and possible work packages.

³ A project under ERA-NET on industrial handling will make an evaluation on the current shortages.

⁴ http://ec.europa.eu/enterprise/policies/raw-materials/public-consultation-ip/index_en.htm

2. WORK PACKAGES

2.1. WP 1 - Developing innovative technologies and solutions for sustainable and safe raw materials supply

Addressing innovative technologies along the entire value chain for cost-effective, safe and environmentally and socially sound raw materials production including:

- advanced exploration technologies, such as for sensing and 3D/4D mapping;
- innovative alternatives for extraction, including frontier technologies such as for the extraction of deep continental crust and marine raw materials resources that will build a new benchmark in mining of primary resources;
- technologies to reduce the use of hazardous substances, such as cyanide in mining processes, and creosote in wood treatment;, and technologies to improve the recovery from waste, including for example red mud and abandoned or closed mining waste facilities;
- advanced technologies for the pre-processing steps of minerals and secondary raw materials such as metals, glass, plastics, paper, wood, waste aggregates etc. via automated sorting systems, and clean and resource efficient processing of raw materials, such as (bio-) hydrometallurgy, closed loop processes for most polluting and most value-adding industrial production, including innovative technological solutions for water management, combined with energy consumption minimisation and recovery of by-products;
- turning wastes into valuable secondary raw materials by developing more efficient recycling/recovering processes (e.g. metals recycling from municipal waste, thermo-chemical phosphorous recovery from incinerated sludge, rare metals recovery from waste electric and electronic equipment, advanced recycling methods for the construction and demolition waste, multi-material cartons and paper waste etc.);
- the development of standardisation roadmaps for the above fields to ensure practical application of the research results and binding together the developed technologies to enable the most effective innovation impact, while avoiding unnecessary costs for business.

2.2. WP 2 – Developing innovative and sustainable solutions for the appropriate substitution of critical and scarce raw materials

Achieving solutions to reduce the use including finding of substitutes of critical, scarce or hazardous materials including:

- First set of priority actions may be derived from identified critical raw materials for our economy and from the most economically vital and ecological sensitive applications where critical raw materials are used in large proportions or are the crucial components;
- Finding sustainable alternatives, for example, for rare earths in permanent or heat resistant magnets, LEDs and displays, or electrical drives and regenerative braking;

precious metals in catalysers, indium and gallium compounds in semi-conductors, telecommunication or lighting;

- Addressing technical solutions to increase resource efficient production technology (production processes and manufacturing equipments) in order to be competitive on the global market;
- Building upon the work of relevant European Technology Platforms, identify opportunities and develop new ideas for innovative materials and products with potential to be put in the market.

2.3. WP 3 - Improving EU's raw materials regulatory framework, knowledge and infrastructure base

Finding sustainable alternative solutions such as those related to:

- building an innovative knowledge base of EU resources, including exploration of primary and secondary raw materials (on land and in the marine environment) and estimations of the resource availability including urban mines (land fills and mining waste);
- make use of satellite based information systems such the Global Monitoring for Environment and Security;
- identification and exchange of best practices in defining a minerals policy in the Member States based on principles of sustainable development and on a strict enforcement of the existing legislation notably for what concerns the safety of mining waste facilities, the prevention of mining waste generation and the reduction of their impact on the environment;
- identification of best practices in terms of land-use planning for minerals in the Member States and to incorporate the consideration of minerals in marine spatial plans;
- identifying different instruments (such as one-stop-shop or parallel assessment) in order to facilitate the process for authorisation of minerals exploration and extraction in the Member States;
- improving environmental impact assessment methodologies and identifying good practices in their use to facilitate the access to and the smooth supply of primary and secondary raw materials;
- standardisation of geological data including by-products and coherence on the relevant terminology, such as common terminology related to mineral and metals classification and production statistics⁵;

⁵ E.g. Talc production in France can today not be differentiated between low and high grade Talc, while imported Talc will be a high quality grade commodity typically with a high whiteness and limited countries of supply (Pakistan, China, North Korea)

- promote the application of the existing Best Available Technique (BAT) documents for the extractive industry and pulp and paper industry inside and outside the EU;
- implementation of standardisation and/or certification schemes for mining operations;
- skills to promote technical excellence in line with the requirements of a high-tech mining industry and to maximise the added value of innovation;

2.4. WP 4 - Improving the regulatory framework conditions, notably by promoting excellence and prevention, preparation for re-use and recycling through public (e.g. procurement) and private initiatives

Pursue the following non-technological actions:

- finding appropriate tools for a timely assessment of the officially adopted targets in particular by taking advantage of the experience of the most advanced Member States;
- improve the profitability and reduce the cost of recycling by enhancing efficiency in the collection, sorting and recycling of waste, including by:
 - examining innovative economic models for incentivising consumers to return waste to collection points;
 - identifying and examining existing collection systems which combine competition, high recovery rates, environmental protection and low costs;
 - developing new economic instruments promoting the use of recycled materials and the further development of EU based recycling industry;
- identifying ways of tracking major flows of waste inside and outside the EU to eliminate illegal or substandard treatment of waste by a strict application of existing legislation;
- develop new product policies focused on primary and secondary raw materials efficiency (recyclability, durability, etc) through various type of EU instruments: green public procurement, ecodesign Directive, Ecolabels;
- propose and implement standardisation and/or certification schemes for example, for recycling facilities inside and outside the EU to avoid environmental leakage to assist and complement recycling companies activities, through interoperable authority-company systems for tracking waste to prevent illegal dumping/ trade for collecting processing hazardous waste electronic equipment.
- Develop incentives and innovative support schemes to optimise the added value that can be extracted from primary and secondary raw materials.

2.5. WP 5 – International framework – horizontal approach

Promoting appropriate international co-operation, including with exporting or recycling developing countries. This co-operation may deal with different policy issues such as

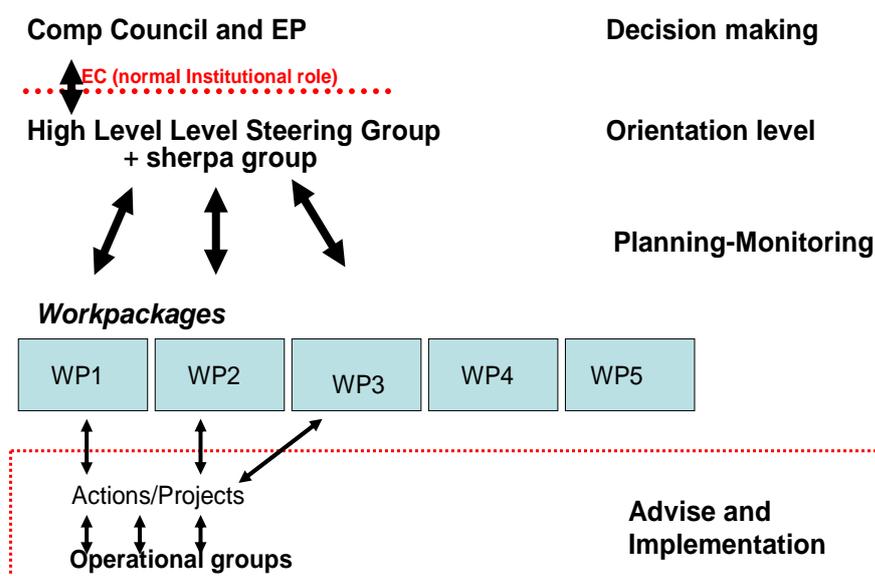
- geology and improving the geological knowledge base;
- research and innovation;
- trade and investment conditions;
- policy dialogue/co-operation with international organisations and fora such as the World Bank, African Union, Extractive Industries Transparency Initiative, OECD, G20 and International Resources Panel, as well as bilateral cooperation (e.g. Japan, the US, Australia).

3. GOVERNANCE STRUCTURE

The EIP will follow the usual EU institutional decision making processes to implement actions, such as in funding, regulation and standardisation. The Council will provide EU-level political guidance (launch and endorse the implementation plan, and adjust political targets). The Parliament will be kept informed.

The governance structure covers 4 different levels of action:

governance structure raw materials EIP



3.1. High level steering Group (HLSG)

The Steering Group will be the orientation level, because it will develop the strategic direction of this EIP.

Mandate:

Its mandate will have two parts. During the preparation phase (mid-2012-early 2013) the HLSG will compile the strategic implementation plan (facilitated by 'EC-secretariat'). During the implementation phase (mid-2013 – 2020), its tasks will be broadened to:

- Preparation: From mid-2012 to early 2013: Compile strategic implementation plan (facilitated by ‘EC-secretariat’);
- Implementation: mid-2013 – 2020:
 - Organise monitoring of progress made;
 - Updating strategic implementation plan (SIP); foreseen annually, but can be more frequent if necessary;
 - Ensure feedback-inputs from broader stakeholder communities;
 - Engage as EIP ‘champions/ambassadors’ with EU Institutions, Member States and stakeholder communities;
 - Designate leaders of each work package as appropriate;
 - Meeting once a year, or more often if needed.

Composition:

- 6 Ministers in total (2 for each of the domains Industry/Economy, Environment and Research);
- 10 to 12 CEOs of major EU Industries (mining and materials producers including chemical, pulp and paper, wood-based industries, mechanical engineering and waste management industries);
- EIB and EIF high-level representative; NGO high-level representative (e.g. EEB, EITI);
- 6 high-level representatives of research organisations (e.g. ERA-NET, European geological surveys, European space agencies, and European Technology Platforms);
- Vice President and Commissioner for Industry and Entrepreneurship and Commissioner for the Environment and Commissioner for Research, Innovation and Science will be associated.

The above-mentioned figures are merely indicative of the type and proportionality of representation which will be taken into account.

Appointment procedure:

- EC appoints, from mid-2012 (to be confirmed) for 3-4 years.
- EC may re-appoint some members to ensure continuity, and will appoint replacements by person with similar expertise.

3.2. Sherpa Group

The objective of the Sherpa Group is to ensure a smooth running of the partnership including planning of major actions/events and preparing the meetings and follow-up of the High Level Steering Group.

Mandate:

Meeting once or twice between the meetings of the HLSG, and content-wise, it will provide the link between the orientation-level of the HLSG with the planning-implementation levels.

Composition:

The Sherpa Group should largely mirror the types of actors from the Members of the HLSG but may include some extra members, on a case by case basis, if considered appropriate. The Sherpas should be the 'personal confidente' of their respective Steering Group member and have the expertise of the subject.

3.3. Operational groups – implementation level and broad stakeholder involvement

Their main task is to provide advice to the HLSG, to convert the Strategic Implementation Plan (SIP) into tasks and actions, to organise and carry out the detailed planning of the actions of the SIP. Different operational groups may be convened in order to provide the necessary expertise according to the different subjects covered by the working packages.

Mandate:

They could be set up for specific actions, and dissolved upon successful delivery of action. These groups may work for various work packages and will be the operational glue on the shop floor level. They will also contribute to monitor the implementation of actions defined in the strategic implementation plan.

Composition:

Operational groups are made up of experts in the different areas covered by the work packages. They may include, where appropriate, representatives of local authorities and relevant bodies and initiatives, such as Public-Private Partnerships, Joint Programming Initiatives, Joint Technology Initiatives, and other funding initiatives. Participants should come from all relevant sources of expertise, including actors not directly represented in the HLSG.

3.4. Role of the European Commission

The Commissioner responsible for Industry and Entrepreneurship and the Commissioner responsible for Research, Innovation and Science will lead the EIP in association with the Commissioner responsible for Environment. Other Commissioners will be associated and invited on an ad hoc basis depending on the specific subject of discussion (e.g. Commissioner responsible for Trade).

The European Commission appoints the HLSG and the operational advisory groups. It will also facilitate/ assist the HLSG, stakeholder engagement, and provide logistical support (e.g. organisation of conferences, website, etc).

The European Commission offers the secretariat services in the start-up phase. Existing structures in the relevant areas, such as European Technology Platforms, will be used as appropriate. At the moment of the official creation of the Partnership, a secretariat will be ready to start operating to organise work under the five different work packages including the meetings of the expert groups and the annual meeting of the Steering Group.

In late 2014, and in view of the experience gathered in the initial two/three years, the European Commission will propose any appropriate adaptations to the basic governance structure presented above.

4. LINK WITH EXISTING INITIATIVES AND ACTIONS

4.1. General overview

Instrument/Initiatives	Names	Potential role in EIP
European Technology Platforms and Joint Technology Initiatives	Sustainable Mineral Resources (SMR), ENIAC (JTI on nanoelectronics), Artemis (JTI on embedded systems), Photonics21, Manufuture, SusChem, Forest-Based Industries, ECTP (Construction Platform), EUROP (Robotics) and EuMaT (Advanced Materials), Forest-based Sector Technology Platform	Existing networks of relevant industries with strong innovation needs and research organisation should contribute in the definition of the targets and the implementation of the defined roadmaps.
ERA-NET	Industrial handling of raw materials	Implementation of Member State R&D contributions
Joint Programming Initiative	Healthy and productive seas and oceans	Implementation of Member State R&D contributions
European Co-operation in Science and Technology (COST) networks	Not yet identified	Implementation of Member State R&D contributions
Space programmes	GMES (Global Monitoring for Environment and Security), GNSS (Global Navigation Satellite System), EGNOS (European Geostationary Navigation Overlay Service) and GALILEO	Collection of information about mineral resources

4.2. Link with EU funding programmes

FP7 themes and initiatives	Implementation of EU R&D contributions	Nanosciences, Nanotechnologies, Materials and new Production Technologies and Environment Factories of the Future PPP, Environmental Technologies
CIP	Implementation of EU level innovation contributions	Innovation support for SMEs and ICT
LIFE+	Contribution to sustainable management and environmental issues	Sustainable Management of Natural Resources

The new HORIZON 2020, among other instruments, is expected to support actions for this Partnership.

5. REACHING OUT AND REPORTING TO THE CIVIL SOCIETY AND INVOLVEMENT OF ALL MEMBER STATES

In order to ensure a regular consultation of other parties not directly present in the basic structure of the Partnership, two mechanisms are foreseen:

The Council of Ministers will be regularly informed about major developments in the area of Raw Materials in line with the recent Competitiveness Council Conclusions adopted on 9th March 2011 and those adopted by the ENV Council in December 2010. The Innovation Partnership could be a major topic of this regular exchange of views with the Council.

A broader Stakeholders' Forum will be held annually. This would be an occasion to take stock of the work done by the Partnership and to provide inputs for the continuation of the activities.

With ERA-NET in materials and ETP-SMR, the Sustainable Consumption and Production (SCP) and waste consultations groups the EU has already set up other fora to provide continuity among stakeholders.

Moreover, visibility actions and dissemination of information via an internet portal are envisaged.

6. ROADMAP WITH EXPECTED OUTCOMES AND CLEAR MILESTONES

The following milestones are envisaged:

- From mid-2012: nomination of HLSG by EC and start work on EIP, based on discussions with Member States, EP, and stakeholders;

- Early 2013: Strategic Implementation Plan finalised by HLSG, and which will be presented by the EC to the EP and Council (first semester of 2013);
- From mid-2013: implementation started and first annual conference held;

A number of preparatory actions and studies have been initiated in 2011 to underpin the work of this EIP, and will bring their first deliverables late 2011, and in the period 2012-2013, so that the EIP can show concrete progress from the very start.

Short term: (2012-2013)

- The key actors and infrastructure for feeding the raw materials knowledge base of Europe identified.
- First elements of the raw materials knowledge base are in place notably through the GMES initial operations and the GMES and Africa initiative.
- Study on Innovative Technologies and Possible Pilot Plants to be finalised
- Development of a reliable tool assessing environmental impacts of materials
- Launching dedicated FP7 research actions targeting basic concepts and technological elements for new production plants in extraction and processing and for collection, recycling of raw materials and actions for finding substitutes and viable alternatives for at least three to critical raw materials. Launching networking and co-ordination initiatives (FP7 CSAs and ERA-NETs) to create a suitable critical mass involving as appropriate public authorities, industry and the research community.

2014:

- Progress assessment (including the governance structure): to take into account new Multiannual Financial Framework and new Commission in place.

Medium - long term: (2014-2020)

- Complete raw materials knowledge base of Europe created and permanently updated including a deliverable of a **European 3-D map of the distribution of raw materials** resources, projection of future demand of raw materials according various scenarios, economic and environmental impacts of the scenarios.
- Up to **ten innovative pilot plants** for raw materials **extraction, processing, product design and recycling**.
- a Network of European Research, Education and Training Centres on Mineral resources and **Mining and Materials Management (M³)** is created.
- Industrially viable **alternatives for at least three substitutes** to critical raw materials (or groups thereof) addressed also via research projects.
- Initiatives including **legislation and standardisation** promoting the uptake of innovative solutions in place.

- Enhanced efficiency in **recycling of waste streams**