Figure: Raw materials covered by the EU study

Aluminium	Antimony	Barytes	Bauxite	Bentonite
Beryllium	Borates	Chromium	Clay (Kaolin and kaolinitic clay)	Cobalt (Cobaltum)
Coking coal	Copper	Diatomite	Feldspar	Fluorspar
Gallium	Germanium	Gold	Gypsum	Hafnium
Indium	Iron ore	Limestone	Lithium	Magnesite
Magnesium	Manganese	Molybdenum	Natural graphite	Nickel
Niobium	Perlite	Phosphate rock	Platinum group metals	Potash
Rare earth ele-ments (Light and Heavy)	Rhenium	Scandium	Selenium	Silica sand
Silicon metal	Silver	Talc	Tantalum	Tellurium
Tin	Titanium	Tungsten	Vanadium	Zinc (Zincum)

Source: European Commission (2014): Report on critical raw materials for the EU.

Development of policy options

Based on the work outlined above, options for an ecological raw materials and resources policy at national, European and international level will be derived and specified. This will be based on two complementary approaches to reducing pressures on the environment:

1. Enhancing the environmental compatibility of raw materials extraction;
2. Focusing resource efficiency measures on raw materials that are environmentally relevant.

Target group-specific communication of results

The main project outcomes will be presented and summarised in a way specific to each target group. In particular, information will be addressed to policymakers, users and industry stakeholders.

Öko-Institut e.V.
Schicklerstr. 5-7, 10179 Berlin, Germany
Phone: 0049 30 / 405085 0
Contact: Günter Dehoust
Email: G.Dehoust@oeko.de
www.oeko.de

Project partners

ifeu – Institut für Energie- und Umweltforschung Heidelberg GmbH

Projekt-Consult GmbH

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Contact person: Jan Kosmol
Email: jan.kosmol@uba.de

Internet: www.umweltbundesamt.de
/umweltbundesamt.de
/umweltbundesamt

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ÖkoRess II
Further development of policy options for an ecological raw materials policy

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

Umwelt Bundesamt

Project background

The German government and German industry are increasingly exploring the question of how the supply of raw materials for Germany can be rendered sustainable in the long term. Scientific studies and media articles periodically report about manifold environmental impacts related to mining activities and the processing of raw materials. Examples include dam collapses with dramatic consequences for the environment, as happened at an iron ore mine in Brazil (Samarco mine in Mariana) in November 2015 or in Kolontár (Hungary) in 2010 where a reservoir containing toxic red mud burst. In addition to the impacts of such accidents, there are long-term environmental pressures through mercury and cyanide emissions in gold mining, radioactive pollution in rare earth mining, and the destruction of high-value ecosystems in the development of new mining sites worldwide.

While the global economy will have to rely on the primary extraction of a whole range of abiotic raw materials for the foreseeable future, taking effective measures to make mining sustainable is hampered by the following circumstances:

- Many of the raw materials Germany needs are extracted elsewhere – and often outside the EU as well – with the result that many raw material supplies escape governance by German environmental legislation.
- Simply the diversity of the raw materials that Germany needs dictates that measures be focused on and primarily applied to streams that are particularly environmentally relevant. Yet, a comprehensive environmental assessment of the mining of abiotic raw materials, which could support a sound prioritization, does not currently exist.

The ÖkoRess II project seeks to contribute to tackling these challenges. It builds on the results of the precursor projects ÖkoRess, UmSoRess and RohPolRess, complements them and feeds their findings into scientific, political and societal debates on this issue.

The project is given expert support by a Project Advisory Group on Environmental Issues of Raw Materials Policy, which was set up at the end of 2013. The group is composed of representatives of federal ministries, authorities, companies, industry associations, research institutions and civil-society groups. This ensures broad integration of expertise and social interests.

Photo: Small-scale gold mining in Madre de Dios, Peru / © Projekt-Consult GmbH

Project aims

The aim of the project is to enrich the debate ongoing in Germany, Europe and internationally on the subject of sustainable resource management by contributing scientific findings on relevant environmental impacts and socioeconomic contexts, and to formulate concrete policy options.

To that end, the methodology for assessment of the ecological availability of raw materials that was developed in the precursor project ÖkoRess will be applied to 51 abiotic raw materials and tested in this way. The results are hoped to allow a first sound prioritization to be made and to introduce to the criticality debate a focus on raw materials that are particularly critical in environmental terms.

Approach

The work on the project will proceed along the following steps:

Case studies on environmental impacts and socioeconomic contexts of raw materials extraction
Ten raw material/country case studies will be done to expand the knowledge base on environmental impacts and risks and on socioeconomic context factors. The analysis will focus in particular on examples that are particularly relevant to the German economy, either because of their major importance for raw material supply or the environmental and socioeconomic context of raw material extraction.

Comparative analysis of the case studies
The results of the above case studies will be compared with those from the 13 studies done in the UmSoRess project and evaluated in a cross-case analysis, which will allow conclusions to be drawn as to typical problem constellations and possible strategic approaches. The findings from this will also be used inter alia to review the conclusions from UmSoRess, and where necessary, to modify the assessment methodology developed in ÖkoRess, in order to thus produce country- and raw material-specific analyses.

Assessment of the ecological availability of raw materials
The assessment methodology developed in ÖkoRess will be applied to 51 abiotic raw materials. Their selection is based on an EU study on critical raw materials from 2014. This is meant to ensure connectivity of the project to the threads of the debate conducted in the EU and internationally. The aim of this work package is to present for the first time a reliable assessment of the environmental impacts and risks of abiotic raw materials.