

Deliverable D2.1

Stakeholder Report: identification & analysis

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PURPOSE

Deliverable D2.1 of the *Minerals Capacity Intelligence Analysis* (MICA) project documents the systematic identification & analysis of stakeholders related to raw material intelligence. This Stakeholder Report refers to Task 2.2 of the MICA project. The main purpose is to provide a comprehensive inventory of relevant stakeholders to prepare for a systematic appraisal of stakeholder needs and to inform other Work Packages of the MICA project.

EXECUTIVE SUMMARY

Deliverable D2.1 of the *Minerals Capacity Intelligence Analysis* (MICA) project documents the stakeholder landscape related to raw material intelligence. The main purpose is to provide a comprehensive inventory of relevant stakeholders to prepare for a systematic appraisal of stakeholder needs and to inform other Work Packages of the MICA project. The aim and ambition of the MICA project is to contribute to the emerging raw materials knowledge infrastructure in Europe (section 1). Stakeholder groups with stakes in raw material intelligence are identified, defined and classified according to a tailored methodology (section 2). The classification of stakeholder groups has the character of a synthesis (section 3), while the definition of stakeholder groups can be used as a stakeholder group manual (section 4), and the context of identification (section 5) provides stakeholder relations around certain raw material intelligence domains. This Stakeholder Report documents the most comprehensive stakeholder mapping in relation to raw material intelligence to support the systematic appraisal of stakeholder needs (Task 2.3) and to inform other Work Packages of the MICA project (section 6).

Methodology

Stakeholders in raw material intelligence are identified, defined and classified by means of a tailored methodology.

The identification of stakeholder groups is based on eight different approaches:

- The approaches 1 ‘*Research and Innovation (R&I) calls on raw materials*’, 2 ‘*Public consultations on raw material policy / legislation*’ and 5 ‘*Expert conferences on raw materials*’ yield broad arrays of stakeholder groups that are involved in prominent raw material discourses.
- The approaches 3 ‘*Private sector organizations*’ and 4 ‘*Civil society organizations*’ map organizations identified through repositories and web-searches.
- The approach 6 ‘*Country studies*’ provides an intuitive cross-cutting perspective on stakeholders from four national geological surveys.
- The approaches 7 ‘*World Café*’ and 8 ‘*Foresight and brainstorming*’ widen the stakeholder perspective.

This systematic methodological approach to stakeholder identification and analysis is pursued to limit arbitrary choices and to be open for discoveries of unexpected stakeholders.

A total of 90 principal stakeholder groups in raw material intelligence are defined. Four-digit codes express the hierarchical relationship of stakeholder groups as a pragmatic way to present the 90 stakeholder groups in some logical order. The concrete entries within each stakeholder group cover various themes, organisation forms and geographical levels; illustrative examples with

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particular relevance to raw material intelligence are singled out. For each stakeholder group, the context of their identification is indicated.

The 90 stakeholder groups are classified according to a typology of seven stakeholder types formed by the presence of power, legitimacy and/or urgency (Mitchell et al. 1997) in relation to the MICA project (Figure 1). Stakeholders' salience is the highest for definitive stakeholders combining all three attributes power, legitimacy and urgency. Among the expectant stakeholder category are dominant stakeholders (power and legitimacy without urgency), dependent stakeholders (legitimacy and urgency without power) and dangerous stakeholders (power and urgency without legitimacy). Among the latent stakeholder category are dormant stakeholders (power only), discretionary stakeholders (legitimacy only) and demanding stakeholders (urgency only). If no attribute is present, an actor group can be considered a non-stakeholder.

Results

The stakeholder classification does not **relate stakeholder groups** to an abstract raw material system, but **to the MICA project** with its concrete funding conditions, beneficiaries and aims. The classification must not be misinterpreted as a valorization or devalorisation of stakeholder groups, or that stakeholder groups are completely homogeneous. Its purpose is to guide the focusing on the appraisal of raw material information needs of certain stakeholder groups as transparent as possible and to support other MICA Work Packages.

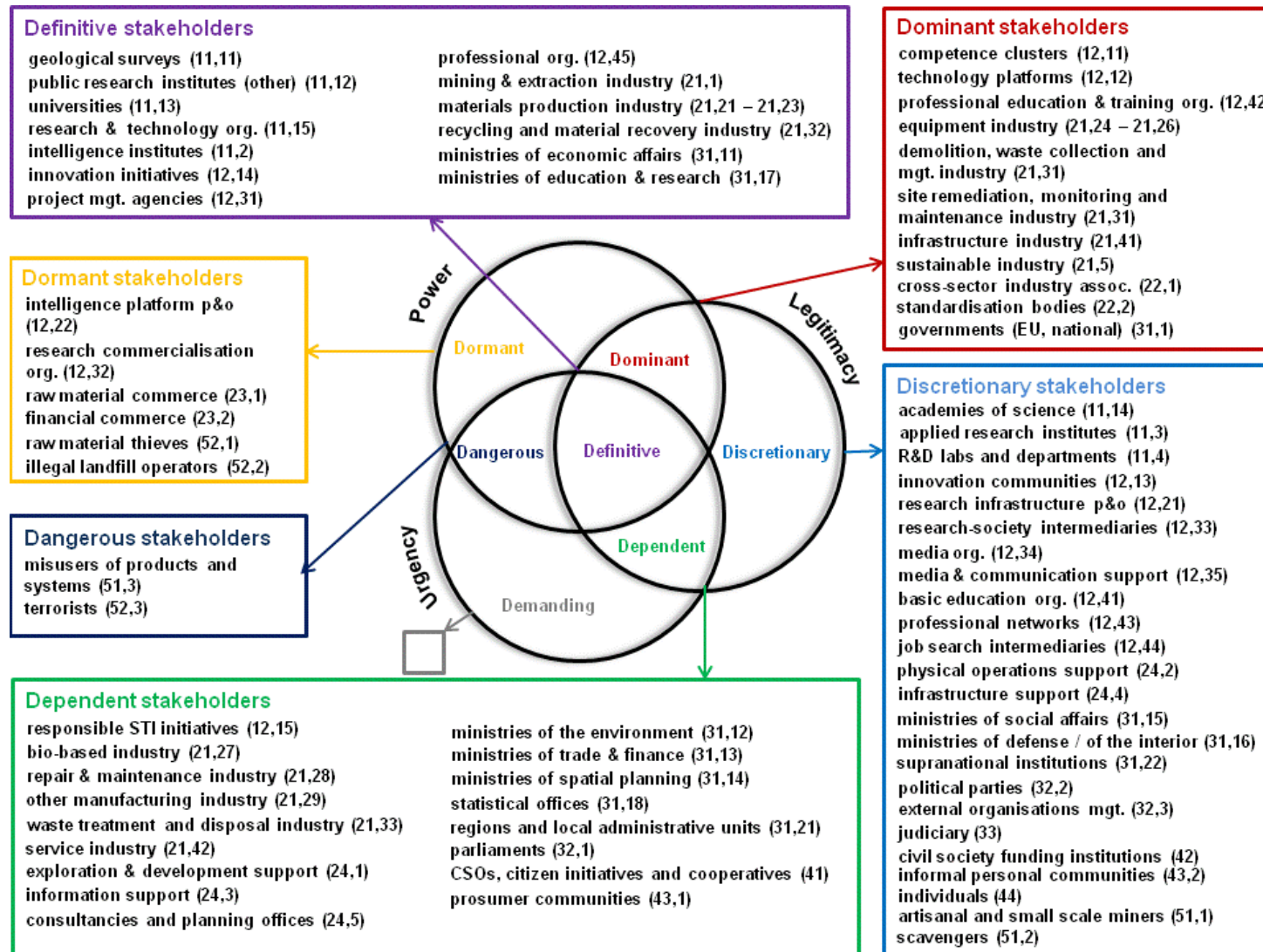


Figure 1: Assignment of 90 MICA stakeholder groups to 6 stakeholder types. For demanding stakeholders, no concrete stakeholder group is identified. The code numbers refer to the definition of stakeholder groups presented in section 4. Please note that this is a MICA perspective on stakeholder groups, explanations for the allocation of particular stakeholder groups are provided in the main text. CSO – civil society organisation, mgt. – management, org. – organisations, p&o – promoters and operators, R&D – research and development, STI – science, technology and innovation. Source: MICA.

Stakeholder groups have been identified in different contexts allowing for a basic assessment of their roles in raw material intelligence.

Funding of **research and innovation (R&I)** on raw materials in Europe is provided mainly by a wide range of ministries and agencies at national and EU level and by the private sector, the latter usually not disclosing details on raw material knowledge needs. All kinds of organizations (from the knowledge system, to the economic system and political system to civil society) may do R&I on raw material related issues or influence the course of R&I projects on raw materials, for example via advisory boards. Professional associations exist for geologists and mining engineers, while urban mine explorers and recycling engineers are not supported by equivalent professional organisations at EU and global level.

Raw material related R&I advance of the state of knowledge through scientific excellence, laying the foundations for the commercialization of new products, systems and services and for the solution of concrete problems contributing, for example, to resource efficiency and wellbeing. A number of R&I activities have led to intelligence platforms that are still operated, among them raw material, environment and land use platforms and open data repositories, all available for further R&I and knowledge-based decision-making.

The inviting bodies to **consultations on raw material policy-making / legislation** in Europe not only include diverse ministries and agencies, but also parliaments, geological surveys and industry associations. As in the case of R&I calls, stakeholder groups from the knowledge system, economic system, political system and civil society are responding to such consultations. Stakeholder consultations on raw material policy / legislations yield synopsis of stakeholder positions, suggestions for refinements, and stakeholder sensitization and activation effects. Recent key consultation fields with relevance to the raw material domain are R&I programming; eco-innovation policy, chemicals regulation and materials policy; nature conservation, ocean governance; circular economy action and legislation, waste management legislation; raw material strategies and responsible sourcing policies.

The **private sector** comprises all enterprises and their industry associations. Enterprises, encompassing also enterprise groups, enterprise units and joint ventures of several enterprises, are tied together both horizontally at the same level of the value chain (for example, certain raw material associations lobby together for conditions beneficial to their sector) and vertically through the input-output relations of the economic activities across all sectors and levels of the value chain.

The mapping of 90 industry associations (and specification of their members) mainly at EU level yields a broad sketch of the entire economy. While the mining sector is represented by a few major industry associations (e.g. Euromines), the materials industry is split up into construction materials, e.g. the European Aggregates Association (UEPG), metals, e.g. Eurometaux, industrial minerals, e.g. the Industrial Minerals Association (IMA) Europe, and chemicals, e.g. the European Chemical Industry Council (CEFIC). The manufacturing and infrastructure industry using such materials then branches out into a large variety of industry associations. For the re-manufacturing part of the economy (demolition, waste collection and management, recycling and material recovery) again, a small set of industry associations represents the interests of its members, e.g. the European Demolition Association (EDA), the European Federation of Waste Management and Environmental Services (FEAD) and the European Recycling Industries' Confederation (EuRIC). Cross-sector industry associations such as Business Europe complete the picture.

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The in-depth analysis for aluminum from cradle to grave at national, EU and global level has brought to the fore that there is an abundance of industry associations and players in aluminium globally and that single companies and industry associations cover different parts of the value chain often impeding an unambiguous assignment to a definite stakeholder group.

Civil society is the aggregated set of non-governmental organizations and institutions that manifest interests and will of citizens. The level of organization ranges from informal contacts, to citizen initiatives to civil society organisations (CSOs) representing civil society interests. In relation to raw materials, civil society has been mapped only fragmentary to date.

The more than 50 CSOs included in our analysis of positions are heterogeneous in terms of their size and structure. Besides a rather small number of big CSOs, e. g. Greenpeace, Human Rights Watch or Amnesty International, many organizations are relatively small, some being only temporary initiatives. A number of umbrella organizations aggregate the interests of national CSOs at European-level.

Seven subgroups are considered most relevant with regard to claims in raw material intelligence:

- **Transparency and democracy NGOs:** There are a number of CSOs focusing on the general accountability of governments and enterprises to society. Most prominent activities on transparency and representation of interests in mining projects are multi-stakeholder initiatives. A comprehensive inventory of civil society claims in mining issues is provided by the Initiative for Responsible Mining Assurance (IRMA Draft 2.0, April 2016). It covers 2 business integrity requirements, 13 social responsibility requirements, 10 environmental responsibility requirements and 2 positive legal requirements.
- **Development aid and relief CSOs:** Among the development aid and relief organizations, only a small number makes raw material related statements towards European institutions. The umbrella organization CONCORD and its member Action Aid have been relatively active in the last three years.
- **Social welfare CSOs:** Organizations advocating social welfare can be found, for example, in the fields of health, land rights and minority rights. Of those referring to raw materials, most are not represented by umbrella organizations; and many overlaps with other thematic categories exist.
- **Environmental NGOs:** Some environmental NGOs have developed into global brands, such as Greenpeace and the World Wildlife Fund for Nature (WWF). Organisations such as the European Environmental Bureau (EEB) and the International Union for the Conservation of Nature (IUCN) have developed significant capacity and capability to influence raw material policy-making.
- **Consumer organizations:** A big part of the consumer organizations does not focus on mining, but rather on later stages of the value chain. Consumer organizations expressing raw material related claims mostly concentrate on health and environmental impacts.
- **Trade unions:** Organizations representing the interests of workers at the European level are sectoral trade unions, for example in the mining industry, and cross-sectoral trade union confederations (e.g. IndustriAll).
- **Human rights NGOs:** Among human rights NGOs, statements relating to raw materials are dominated by Amnesty International and Human Rights Watch.

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All in all the breadth of CSOs relevant to raw material intelligence is mapped in MICA for the first time, however far from being complete.

Expert communities in the field of raw materials come together at **conferences on geology / mining and industrial ecology / recycling**. The organisers of scientific or investor conferences comprise in particular professional organizations and consultancies, but also ministries and multi-actor initiatives. Some conferences have a secretariat, such as the World Resources Forum and the MINEX Europe Forum. While the attendees cover a broad array of stakeholder groups from the four major domains (knowledge system, economic system, political system, civil society), the exhibitors often represent stakeholder groups with a clear economic interest.

Scientific conferences on raw materials provide synopsis of the state of knowledge, suggest actions and facilitate networking, while investor conferences aim at matching miners and investors. Key topics debated recently are investment risk, resource management intelligence, supply chain analysis and risk, mining standards, mining and climate change, advancement of industrial symbiosis, industrial ecology for urban planning, recycling process solutions and business cases, and sustainable lifestyle research and action.

While the stakeholder groups in EU raw material policy-making have been mapped extensively (e.g. Tiess 2011), such information on the national and subnational level is scattered and difficult to access. This **country-level perspective** on stakeholders in MICA accounts for the national and subnational level in the raw material knowledge domain.

The four countries explored, Hungary, Poland, Portugal and Sweden, share some most important stakeholder groups, namely geological surveys, universities, mining & extraction industry, ministries of economic affairs, ministries of the environment and regions and local administrative units. Only in this country perspective, the significance of the regions and local administrative units comes clearly to the fore. The four countries differ in the names and competences of the respective regional and local administrative units.

Countries follow very different raw material strategies which may imply different raw material information needs. For example, Denmark pursues a raw material plan with a clear focus on its own waters. Germany has acquired offshore mining rights and raw material diplomacy has enabled access to raw materials in Kazakhstan and Mongolia, both partners willing to reduce dependency on China.

In addition, **hidden actors** have been identified through analysis of foresight studies and brainstorming sessions. Hidden actors are often ignored by the incumbent raw material regime as their interventions either as informal actors (artisanal and small-scale miners, scavengers and misusers of products and systems) or as criminal actors (raw material thieves, illegal landfill operators, terrorists) are not desired.

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Conclusion

Identification, definition and classification of stakeholders assist the systematic appraisal of stakeholder needs and support other MICA work packages in their research.

In order to set foci for the empirical appraisal of stakeholder needs, we distinguish four tiers of stakeholders in the MICA project:

Tier 1: *Definitive stakeholders* are formally involved in the MICA project. They represent these stakeholder groups:

- geological surveys
- public research institutes (other)
- universities
- research & technology organisations
- intelligence institutes
- professional organisations
- mining & extraction industry
- material production industry
- recycling and material recovery industry
- innovation initiatives
- project management agencies
- ministries of economic affairs
- ministries of education & research

Tier 2: *Dominant stakeholders* and *dependent stakeholders* should be considered in the comprehensive survey of raw material information needs (see: upcoming Task 2.3). *Dominant stakeholders* are important because they have legitimacy and power in the raw material intelligence discourse. *Dependent stakeholders* with less power but equal legitimacy need to be accounted for urgently to put them at a comparative level of consideration compared to dominant stakeholders. Among the *dominant stakeholders* are in particular the manufacturing industry as a user of materials and the re-manufacturing industry as a key node to mobilize material in stock for the purposes of recycling and material recovery. Governments formulating raw material policies also count among the dominant stakeholders.

Dependent stakeholders include in particular industry sectors potentially affected by minerals raw material intelligence (e.g. the bio-based industry, tourism industry) and civil society organizations (e.g. environmental NGOs and human rights NGOs).

Tier 3: *Discretionary stakeholders* are not in focus of the MICA project, but they can be considered upon their request.

Tier 4: *Dormant stakeholders* and *dangerous stakeholders* have limited legitimacy to benefit from MICA. Both stakeholder groups might have to be dealt with to ensure that MICA services will be exploited in the intended ways.

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Demanding stakeholders have not appeared in the identification process.

Deliverable D2.1, the Stakeholder Report, provides a comprehensive inventory of relevant stakeholders to inform other Work Packages of the MICA project.

The topics identified in this report (section 5) support WP 3 *Data* and WP 4 *Methods* in searching and selecting adequate data and methods respectively. They inform WP6 *Platform* about topics for consideration in the services of the MICA platform.

The definition of stakeholder groups (section 4) assists WP 5 *Policy* to identify elements and to construct relations in raw material policy-making. The stakeholder groups defined may also be seen as an ontology that could contribute to the ontology built in WP6 *Platform*.

WP 1 *Project Management* and WP 7 *Dissemination* may build upon the stakeholder classification (section 3) in combination with the definition of stakeholder groups (section 4) to establish relationships with certain stakeholder groups of interest.

The comprehensive stakeholder mapping in relation to raw material intelligence is the first of its kind. It has been developed mainly through desk research and informal communication with stakeholders, while a systematic and comprehensive appraisal of stakeholder needs is covered by the upcoming Task 2.3.

DELIVERABLE REPORT

I. Introduction

Deliverable D2.1 of the *Minerals Capacity Intelligence Analysis* (MICA) project documents the inventory of stakeholders in raw material intelligence.¹

The aim and ambition of the MICA project is to contribute to the emerging raw materials knowledge infrastructure in Europe. To do so, the project team conducts a careful analysis of stakeholder needs and undertakes a review of existing data, methods and tools that provide intelligence on raw materials. The outcome of this analysis and review will be integrated into a powerful, user-friendly decision-support platform that provides different stakeholders (e.g. policy and decision makers, industry, investors, economic analysts, researchers and others) with answers to their raw materials-related questions and proposes options available for addressing associated problems.

The objective of WP2 *Needs: Stakeholder identification, appraisal and mapping of stakeholder requirements* is

- to provide a comprehensive inventory of relevant stakeholders, and
- to explore current stakes (interests/questions) in raw material intelligence.

Task 2.2 identifies and classifies stakeholders systematically, to provide a sound basis for a broad and deep appraisal of stakeholder needs in Task 2.3. Task 2.1 has mapped the pre-existing knowledge of the WP2 participants about the stakeholder landscape and stakeholder needs to achieve a shared understanding of key raw material intelligence issues at an early stage of the MICA project.

Deliverable 2.1 provides a snapshot of the stakeholder identification and classification.² This Stakeholder Report documents Task 2.2 only. It is complemented by a separate Appendix for internal use.

- Section 2 describes the methodology developed and applied to stakeholder identification, definition and classification of stakeholder groups.
- Section 3 presents the results of the classification of stakeholder groups
- Section 4 defines a large number of stakeholder groups
- Section 5 illustrates the contexts of identification and aggregates topics of interest for stakeholder groups

Sections 3, 4 and 5 are interlinked with increasing level of detail. Section 3 has the character of a synthesis, section 4 can be used as a stakeholder group manual and section 5 provides stakeholder assemblages and needs elicited in their context of identification. The MICA-internal Appendix contains a large amount of basic data which has been synthesized in this public report.

¹ according to the specifications of Task 2.2 of the Description of Work.

² A stakeholder mapping is principally an endless endeavour. We cut off at this point having employed a large variety of approaches to stakeholder identification and have yielded a useful classification of stakeholder groups.

2. Methodology

In this section, first, the state of research in identification and analysis of stakeholders is briefly summarized and, second, a synopsis of relevant stakeholder mappings in the raw material domain is given. Then, the MICA approach to stakeholder identification and analysis is developed.

2.1 State of research

The definition of a stakeholder proposed by Freeman (1984, p. 46) as “any group or individual who can affect or is affected by the achievement of the organisation’s objectives” is widely adopted in academic and practice-oriented (e.g. management) literature. Several approaches to operationalise this definition and to distinguish different types of stakeholders have been made.

Mitchell and colleagues (1997) point out the following main stakeholder attributes:

- **Power:** A stakeholder may have (actual or potential) power to the extent it can impose its will in a relationship, e.g. by access to coercive, utilitarian or normative means.
- **Legitimacy:** A stakeholder may have legitimacy by pursuit of a desirable social stake that is negotiated at different levels of social organisation and broadly shared.
- **Urgency:** A stakeholder may be attributed urgency in case there is both, time sensitivity and claims or relationships that are perceived as highly important.

Depending on whether one, two or three of these attributes are present, Mitchell and colleagues (1997) distinguish seven types of stakeholders (Figure 2).³ Stakeholders need not necessarily be conscious of possessing these attributes and may or may not choose to act on their claims or influence.

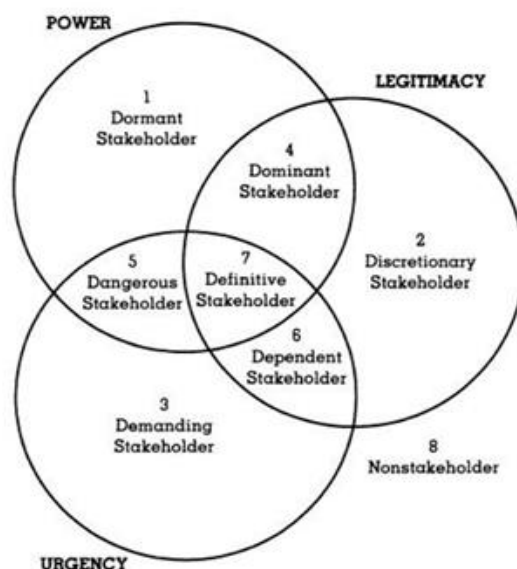


Figure 2: Stakeholder types. Source: Mitchell and colleagues (1997)

³ If none of these attributes is present, it is dealt with as 'non-stakeholders'.

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Among the latent stakeholder category are *dormant stakeholders* (power only), *discretionary stakeholders* (legitimacy only) and *demanding stakeholders* (urgency only). Among the expectant stakeholder category are *dominant stakeholders* (power and legitimacy without urgency), *dependent stakeholders* (legitimacy and urgency without power) and *dangerous stakeholders* (power and urgency without legitimacy). Stakeholders' salience is highest for *definitive stakeholders* combining all three attributes power, legitimacy and urgency. If no attribute is present, an actor group can be considered a *non-stakeholder*.

The process of stakeholder identification is emphasised to be a crucial part of stakeholder analysis (Varvasovszky & Brugha 2000; Elias et al. 2002, Bryson 2004), however, this process has been rarely explicitly addressed in literature. An example is Achterkamp and Vos (2007, p. 3) based on the concept of “boundary critique” as a part of critical systems thinking (Ulrich 1983). According to this approach, stakeholder identification should rely on a so-called incremental “sweep-in process”, i.e. sweeping in ever more features of the problem context, that is “most ethical”, and therefore “most inclusive” (ibid.).

Identifying the latent stakeholders requires special measures to systematically open up and broaden the system boundaries. In particular because the notion of legitimacy is socially constructed, it is not possible to identify these groups analytically. Achterkamp and Vos (2007) propose to identify stakeholders in a brainstorming session by distinguishing four roles of stakeholder involvement (Achterkamp & Vos 2007, pp. 8-9): the “client”, the “decision maker” and the “designer” as actively involved stakeholders on the one hand, and the “passively involved / representatives” (the affected stakeholders) on the other hand.⁴

Some stakeholder mappings in the field of knowledge production (RIF 2012, VERA 2012) refer to the quadruple helix model of Carayannis & Campbell (2010), basically separating and relating to one another academia, industry, government and civil society as principal stakeholder domains.

2.2 Stakeholder mappings in the raw material domain

In this section it is sketched how stakeholders are dealt with in a number of raw material knowledge activities.

There are a few explicit stakeholder mappings in the raw material domain, namely G. Tiess (2011) has developed a raw material policy-making framework tailored to the perspective of the European Commission. There is also a stakeholder chart/organigram of a coherent EU mineral policy (Tiess 2011), that has been adapted to country level, e.g. in the case of Romania (Marinescu et al. 2013).

⁴ At first, participants “are asked to write down individually all of the possible parties involved (people, groups of people, organizations)”. Then the participants are “asked, as a group, to come up with all the parties who can, will or ought to fulfill the various roles in the project.” (Achterkamp & Vos 2007, pp. 8-9).

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A number of activities, many of them at EU level, have contributed to the current status of raw material intelligence. They have dealt with stakeholders by involving them as project beneficiaries, as panel members or as external stakeholders that were, for example, invited to workshops. We have analyzed 14 relevant activities plus two new projects (Appendix 1). All 14 listed activities have involved members of the MICA consortium. Most projects have been completed (e.g. CRM_InnoNet), a few activities are ongoing and have produced significant interim results (e.g. IRP WG Global Metal Flows) and others have just started (e.g. ProSUM). Here, we highlight those approaches that signal a systematic treatment of stakeholder involvement in the project process (see Abbreviations section for acronyms):

- The EGDI Scope project (2012-2014) distinguishes high level end users (policy-makers), system end users (public sector, private sector), data providers, and other stakeholders.
- The EIT KIC Raw Materials (2015-2022) addresses start-up-companies, SMEs, educational actors, job seekers and society at large.
- The EO-MINERS project (2010-2013) provides a multi-level (local, regional, national, international), multi-stakeholder (institution / internal / external / extended external) stakeholder map from the perspective of a mining company. A typology of relations between NGOs and companies distinguishes confrontation / collaboration / evaluation.
- EuroGeoSources' (2010-2013) user groups are classified into the current users / the potential users / the VIP users.
- INTRAW (2015-2018) is supported through three panels of experts: Research & Innovation, Education & Outreach and Industry & Trade.
- Minerals4EU (2013-2015) provides a hierarchical graph of stakeholder groups breaking down private companies, governmental institutions and non-governmental institutions into more detailed stakeholder groups.
- ProMine (2009-2013) classifies stakeholders into the Manufacturing community, Mineral community, R&D community, Employment and quality of life community

Certain activities gather raw material information needs, e.g. the raw material commitments under the umbrella of the European Innovation Partnership (EIP) Raw Materials, and the Minlex (2015-2016) and MINGUIDE (2016-2019) projects.

2.3 The MICA approach

In the case of MICA, the aim is to map the stakeholders in raw material intelligence systematically and in a “most inclusive” and “most ethical” manner in order to enable legitimate stakeholders to benefit from the raw material intelligence capacity generated by the project. Stakeholders having legitimate “stakes” in the issues but having no power and/or urgency are to be identified with the same diligence as stakeholders with power. A raw material intelligence capacity, that is expected to have medium- to long-term impacts, should also pay attention to latent stakeholders who in the future may exercise power or gain legitimate and/or urgent claims on raw materials (see Figure 2). The systematic approach to stakeholder identification and analysis is meant to limit arbitrary choices and to be open for the discovery of unexpected stakeholders.

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We employ Mitchell and colleagues' approach for stakeholder classification⁵, develop a tailored systematic stakeholder identification scheme and use Achterkamp and Vos' approach to identify latent stakeholders⁶:

- Definitive stakeholders are formally involved in MICA.
- Dominant and dependent stakeholders have the legitimacy to be involved in MICA. While dominant stakeholders may also be considered due to their power in raw material intelligence, dependent stakeholders could be unfavorably affected if not involved in MICA.
- Dormant and dangerous stakeholders have to be dealt with, but need not be involved in MICA, because their claims have limited legitimacy.
- Discretionary and demanding stakeholders need not be in focus at this early stage of the project. While discretionary stakeholders may, for example, be included in MICA's communication strategy, demanding stakeholders could be considered when they raise actively stakes in MICA.

In the MICA project, we pursue a hybrid approach which (1) maps certain stakeholder groups densely (in particular industry associations and CSOs at EU level), (2) searches for stakeholders related to domains of raw material knowledge needs (captured along the Kick-Off meeting)⁷ and (3) traverses the preset boundaries through systematic and intuitive searches for other stakeholders.

Stakeholder identification and elicitation of needs

Table I shows the **eight MICA approaches** to identify stakeholder groups and elicit stakeholder needs (section 5). The approaches 1 '*R&I calls on raw materials*', 2 '*Public consultations on raw material policy / legislation*' and 5 '*Expert conferences on raw materials*' yield broad arrays of stakeholder groups being involved in dominant raw material discourses. The approaches 3 '*Private sector organizations*' and 4 '*Civil society organizations*' map organizations bottom up. The approach 6 '*Country studies*' provides an intuitive cross-cutting perspective. The approaches 7 '*World Café*' and 8 '*Foresight and brainstorming*' widen the stakeholder perspective.⁸

⁵ adopted also for example in two projects on research and innovation (RIF 2012, VERA 2012)

⁶ adopted also for example in a project on Living Labs in a Green Economy (INNOLAB 2015).

⁷ primary resources; secondary resources; critical raw materials; raw material economics; industry structure; raw materials policy and legal framework; environmental considerations; geodata & services for mining and exploration; international reporting and social responsibility

⁸ Demanding stakeholders could have been identified via the open call to raise stakes via the MICA website, but no such stakeholder group without power or legitimacy showed up to date (27.07.2016).

Table 1: The MICA approaches to stakeholder identification and elicitation of needs

Approach	Description
1 R&I calls on raw materials	selection of R&I calls at EU and national level (Denmark and UK), elicitation of raw material information needs of R&I funding bodies; analysis of EIP OG Meetings, material provided by DG GROW and DG JRC; identification of beneficiaries in 16 raw-material related R&I activities
2 Public consultations on raw material policy/legislation	selection of public consultations at EU and national level (Denmark and UK), elicitation of raw material information needs of decision-making bodies
3 Private sector organisations	identification of industry associations at EU, global and national level from repositories, thereby identifying also their members; approach selected industry associations directly, thereby elicitation of raw material information needs (also empirically; therefore mapped in Task 2.3)
4 Civil society organisations	identification of CSOs at EU, global and national level through open, systematic web-search and analysis of repositories, elicitation of raw material information needs through analysis of position papers
5 Expert conferences on raw materials	selection of scientific and investor conferences at EU and global level, thereby identifying stakeholders and the major conference topics
6 Country Profiles	bottom-up mapping of the stakeholder landscape at national level; indication of raw material information needs (Hungary, Poland, Portugal, Sweden) ⁹
7 World Café	MICA partners involved in WP 2 developed a rough stakeholder inventory during the Inception Workshop in a World Café format
8 Foresight and Brainstorming	selection of foresight studies, extraction of emerging raw material topics fed into a brainstorming session to anticipate emerging stakeholders and stakeholders that might be affected from MICA

Source: MICA

The number of projects, initiatives and other activities at EU, national, supranational and subnational level is increasing, and there are various attempts to map and to cope with these activities such as the ‘Vision and Roadmap for European Raw Materials’ (VERAM) project with its focus on technology platforms. In the MICA project, we are interested in the identification and analysis mainly of **stakeholder groups**. For that purpose, we have designed a search and classification approach from various perspectives. We do not claim to have traced every relevant concrete stakeholder¹⁰ – that would be an endless effort to keep pace with a constantly changing and moving target. Being aware that any search for stakeholder groups is subjective, we are convinced that the systematic search from eight different perspectives expands the set of stakeholder groups under consideration and adds to the justification of choices.

The synthesis of supposed stakeholder needs from the perspective of WP2 participants during the Inception Workshop has shown that stakeholder questions may arise around different topics and take the form of different question types (e.g. how much? where? when? how? who? what? how many? etc.). In the elicitation of stakeholder needs, we refrained from formulating concrete questions because raw material information needs are expressed in a variety of formats, e.g. as questions, as statements in position papers, or they are derived from policy claims, and question types can rapidly develop over the course of thinking about a certain topic. Instead, we extracted the **topics and related dimensions** as a way to elicit stakeholders' needs pragmatically.

⁹ These four country snapshots add to the systematic analysis of raw material R&I calls and consultations in Denmark and the UK. Due to the coverage of such a large number of diverse countries with regard to raw materials, we did not conduct a formal country classification.

¹⁰ We gathered personal information only for people we invite to contribute to our empirical work (Task 2.3).

Deliverable D2.1

Definition of stakeholder groups

Stakeholder groups (e.g. the 'government') are frequently quoted in stakeholder mappings; but often it remains opaque, which stakeholders are exactly meant. A stakeholder group is composed of a concrete body of organizations that have something in common what other organizations do not have. We have designed a template to assist in sorting, classifying and refining of stakeholder groups (Figure 3).

Code	Stakeholder group			Parent level	Parent stakeholder domain		
Definition							
Units							
In focus							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming

Figure 3: Template for the definition of stakeholder groups. Source: MICA.

The different boxes in the template are systematically filled in for all stakeholder groups (see section 4 for details):

- **Head:** code and name of the stakeholder group and code and name of the stakeholder group at the next higher aggregation level
- **Definition:** defining the stakeholder group's aims, what the individual stakeholders have in common and how the stakeholder group is composed
- **Units:** examples for the spectrum of concrete stakeholders at different geographical levels, with different forms of organisation (e.g. enterprise, industry association) or related to different themes
- **In focus:** brief of a illustrative example that is relevant and/or stands for an often hidden aspect in the current raw material discourse
- **Context of identification:** labels the respective contexts of identification described in Table I

The templates have been populated by making use of stakeholder repositories such as lists of EC DGs, ECs executive agencies, the Transparency of Lobbying at EU level Register, the Register of Commission Expert Groups, the EU's Financial Transparency System including the recipients of EU funds, tenders and grants and the Directory of Geoscience Organizations of the World (Geological Survey of Japan 2016). The analysis of the economic system has been supported by the NACE code system (Eurostat 2008). Targeted web-searches added further examples to fill in gaps.

90 stakeholder groups are identified, put into hierarchical order and filled with entries. In addition, some aggregate levels are introduced, without receiving entries, to facilitate the characterisation of stakeholder groups at a higher level of aggregation.

Deliverable D2.1

Characterisation of stakeholder groups

The identified stakeholder groups have been characterized according to the three criteria of urgency, legitimacy and power (section 3). These characterizations were guided by three questions:

- Who has the power to provide, manipulate and use raw material intelligence to one's own benefit, in particular through MICA?
- Who has legitimate claims to benefit from raw material intelligence, in particular through MICA?
- Who must be urgently considered in raw material intelligence, in particular in MICA, to account for power/legitimacy imbalances?

The characterisation of the stakeholder groups yields a classification of the stakeholder groups according to Mitchell and colleagues' typology.

3. Classification of stakeholder groups from a MICA perspective

In this section, the stakeholder groups defined (section 4) and identified with their raw material information needs (section 5) are related to the MICA project in order to reflect their influences, claims and positions in the design of the MICA services.

The 90 stakeholder groups are assessed with regard to the three criteria power, legitimacy and urgency according to Mitchell's stakeholder theory (see section 2.3). Depending on the realisation of these three criteria, the stakeholder groups have been assigned to six stakeholder types.¹¹ These assignments are subjective, but they are based on stakeholder theory and argued for. The classification thus expresses the rationale of the MICA project, how it views the stakeholder groups explicitly (see Figure 4). Of course, such assignments are debatable.

The stakeholder classification does not **relate stakeholder groups** to an abstract raw material system, but **to the MICA project** with its concrete funding conditions, beneficiaries and aims. The classification must not be misinterpreted as a valorization or devalorisation of stakeholder groups, or that stakeholder groups are completely homogeneous. Its purpose is to guide the focusing on the appraisal of raw material information needs of certain stakeholder groups as transparent as possible and to support other MICA Work Packages.

The stakeholder types are presented in the following section one after another with the stakeholder groups contained. A brief rationale is given for assignments that are not so obvious. The code numbers refer to the definition of stakeholder groups presented in section 4.

¹¹ Non-stakeholders are excluded; demanding stakeholders yielded no entry.

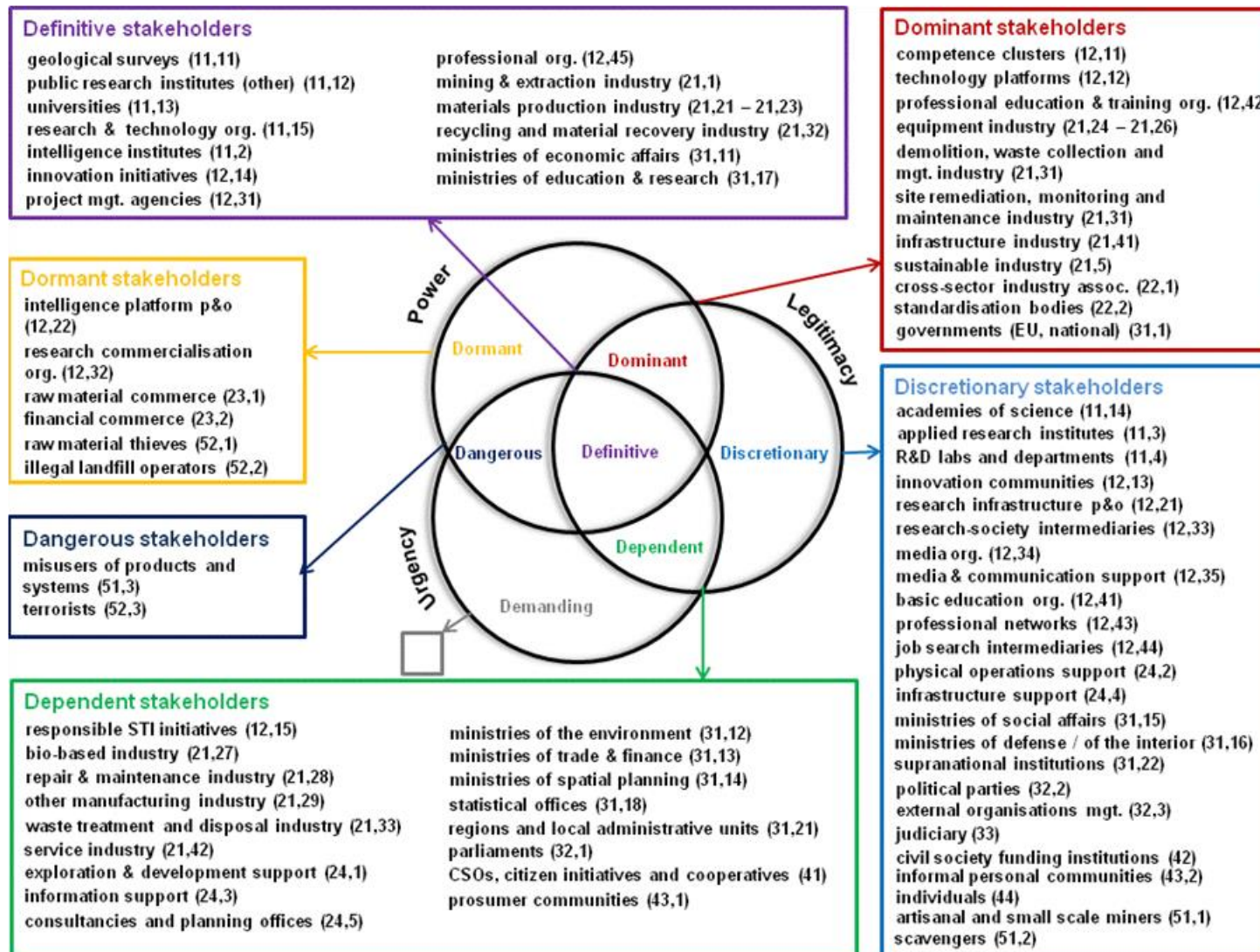


Figure 4: Assignment of 90 MICA stakeholder groups to 6 stakeholder types. For demanding stakeholders, no concrete stakeholder group is identified. The code numbers refer to the definition of stakeholder groups presented in section 4. Please note that this is a MICA perspective on stakeholder groups, explanations for the allocation of particular stakeholder groups are provided in the main text. CSO – civil society organisation, mgt. – management, org. – organisations, p&o – promoters and operators, R&D – research and development, STI – science, technology and innovation. Source: MICA.

Definitive stakeholders (power, legitimacy, urgency)

Definitive stakeholders include all stakeholder groups directly involved in the MICA project as beneficiaries, linked third parties (LTPs) and advisory board members (in particular most relevant industry sectors):

- geological surveys (11,11): EuroGeoSurveys and its members, national geological surveys as beneficiaries and LTPs – European and national level
- (other) public research institutes (11,12): Directorate General Joint Research Center (DG JRC)
- universities (11,13): University of Leiden, University Joseph Fourier of Grenoble, Norwegian University of Science and Technology, University College London
- research & technology organizations (11,15): Fraunhofer Society
- intelligence institutes (11,2): MinPol, La Palma Research Centre for Future Studies¹²
- professional organizations (12,45): European Federation of Geologists (EFG)

It includes the stakeholder groups represented in the advisory board:

- mining & extraction industry (21,1): Euromines, IMA Europe
- materials production industry – construction materials (21,21), metals (21,22), industrial minerals and chemicals (21,23): IMA Europe
- recycling and material recovery industry (21,32): Umicore
- innovation initiatives (12,14): European Institute of Technology, Knowledge and Innovation Community (EIT KIC) Raw Materials
- geological surveys (11,11): United States Geological Survey (USGS) – international level

The research initiating and funding bodies and intermediaries facilitating the MICA project also count among the definitive stakeholders:

- project management agencies (12,31): the Executive Agency for Small and Medium-sized Enterprises (EASME)
- ministries of economic affairs (31,11): Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW)
- ministries of education & research (31,17): Directorate-General for Research and Innovation (DG RTD)¹³

All stakeholder groups are listed in plural, even though only one representative body may be part of MICA. It is assumed that they represent the interest in raw material intelligence for their entire stakeholder group. MICA services could have repercussions in science, education and training by changing quality standards and information asymmetries, e.g. of teachers and students or authors and reviewers of research articles.

At the same time, the parties involved in MICA pursue their own stakes. Other organizations of the respective stakeholder groups, which are not involved in MICA, might either benefit from MICA's intelligence or have disadvantages because their data, methods and tools are not sufficiently covered and disseminated through the MICA services.

¹² They are SMEs, but their main function is to provide intelligence.

¹³ Has a key role in programming of Horizon 2020 calls.

Deliverable D2.1

Dominant stakeholders (power, legitimacy)

Dominant stakeholders include all stakeholder groups that shape the mindsets of the MICA project partners with regard to raw material intelligence without being directly involved in MICA. There is no particular urgency to involve them directly, although their explicit views can be of great value to MICA:

- competence clusters (12,11): e.g. the ERAMIN network on the Industrial Handling of Raw Materials for European Industries, or the ERA-NET on Applied Geosciences
- technology platforms (12,12): e.g. the European Technology Platform on Sustainable Minerals Resources (ETP-SMR)
- equipment manufacturing industry (21,24-21,26):¹⁴ e.g. the European Car Manufacturers Association (ACEA), Digital Europe, the European Engineering Industries Association (ORGALIME)
- infrastructure industry (21,41):¹⁵ e.g. the European Construction Industry Federation (FIEC)
- demolition, waste collection & management industry (21,31): e.g. the European Demolition Association (EDA)
- sustainable industry (21,5): e.g. the World Business Council for Sustainable Development (WBSCD)
- cross-sector industry associations (22,1): e.g. BusinessEurope
- standardization bodies (22,2): e.g. the Pan-European Reserves & Resources Reporting Committee (PERC)
- governments (31,1): e.g. the European Commission

Dependent stakeholders (legitimacy, urgency)

Dependent stakeholders include all stakeholder groups that have not much power in the current raw material intelligence discourse, but they are considered to have the legitimacy to be involved in raw material intelligence, in particular in MICA:

- responsible science, technology & innovation initiatives (12,15):¹⁶ e.g. the European Network of Scientists for Social and Environmental Responsibility (ENSSER)
- bio-based industry (21,27):¹⁷ e.g. FoodDrink Europe, the European Biomass Industry Association
- repair & maintenance industry (21,28):¹⁸ e.g. Siemens Repair Center Erlangen

¹⁴ These high-tech industry sectors are key stakeholders with regard to raw material demand for well-known emerging technologies, in particular requiring critical raw materials.

¹⁵ These sectors account for the largest share of raw material consumption with regard to mass.

¹⁶ These initiatives could assist the assessment, to which extent MICA represents legitimate claims.

¹⁷ This sector, including agriculture, forestry and fishing, could be overlooked, although it has a significant demand for industrial minerals (e.g. fertilizers) and some metals (e.g. cobalt catalyst for biomass-to-liquid conversion). At the same time the bio-based sector competes with the minerals sector on land use and as providers of raw materials.

¹⁸ This sector prolongs the useful life of products and systems, thereby reducing the demand for primary raw materials and the current availability of secondary raw material. Recycling at a higher level of the value chain (in particular re-use and non-destructive recycling) has been demonstrated to be superior to material-level recycling with regard to long-term carbon emission reduction targets (Allwood 2010).

Deliverable D2.1

- other manufacturing industry (21,29):¹⁹ e.g. EOS (additive manufacturing),²⁰ SpaceX (space technology),²¹ SmartMarine® Enterprise (maritime technology),²² International Association of Dredging Companies (IADC) (other geoengineering technology)²³
- waste treatment & disposal industry (21,33):²⁴ e.g. the Confederation of European Waste-to-Energy Plants (CEWEP)
- service industry (21,42):²⁵ e.g. Nordic Visitor
- exploration & development support (24,1), information support (24,3), consultancies and planning offices (24,5):²⁶ e.g. SRK Consulting
- ministries of the environment (31,12), ministries of trade & finance (31,13), ministries of spatial planning (31,14), statistical offices (31,18), regional and local administrative units (31,21):²⁷ e.g. Directorate-General for Environment
- parliaments (32,1):²⁸ e.g. European Parliament
- civil society engagement groups (41): e.g. Stop Mad Mining!
- prosumer communities (43,1):²⁹ e.g. European Maker Week

Dangerous stakeholders (power, urgency)

Dangerous stakeholders include two stakeholder groups that might have sufficient power to abuse MICA without having the legitimacy to do so. Therefore, precautionary action might be considered to prevent the MICA online platform from misuse/ abuse:

- misusers of products and systems:³⁰ e.g. hackers
- terrorists:³¹ e.g. so called 'Islamic State'

¹⁹ Supposedly, some emerging technologies are not on the radar of changing demand for raw materials (DERA/ISI 2016), although they might have disruptive impact on raw material supply patterns.

²⁰ Additive manufacturing is a potential game changer for manufacturing and consumption of raw materials (DERA/ISI 2016).

²¹ In 2013 DG ENTR called for a FRAMEWORK CONTRACT - STUDIES IN THE AREAS OF EUROPEAN COMPETITIVENESS that included a case scenario on "Manufacturing, assembly and extraction in space", as conditions such as lower gravity are beneficial to some manufacturing activities (ENTR/300/PP/2013/FC). Such an endeavor might feedback on material development and related raw material demand to be met in space or on earth.

²² The marine raw material regime with its economic and political actors differs to a large extent from the terrestrial raw material regime.

²³ Geoengineering, e.g. to expand land surface or combat climate change, may move masses that outclass the current raw material flows.

²⁴ This sector needs waste with exergy, e.g. containing aluminum, to maximize energy production and often aims at inertisation of residues for final disposal.

²⁵ Tourism, housing in coastal areas, other service industries (and fishing: see bio-based sector) may be affected from offshore mining.

²⁶ These three subgroups supply and use raw material intelligence in their daily work.

²⁷ These ministries and offices are not directly involved in MICA, but have legitimate claims in the MICA services.

²⁸ Policy and law making often originate from parliamentary initiatives. Parliamentarians represent their populations, thus having legitimate claims in MICA. Compared to DG GROW which directly supports the MICA project, for example the European Parliament has less power to influence the course of the MICA project.

²⁹ In the raw material intelligence discourse, civil society engagement is hardly noticeable, although they have claims that are legitimate in a European Union that strives to become more attractive to its citizens.

³⁰ The MICA platform may be hacked to generate, manipulate, use or destroy information for purposes not intended by MICA.

Deliverable D2.1

Dormant stakeholders (power)

Dormant stakeholders include all stakeholder groups that have power in the current raw material intelligence discourse but no legitimate claims in an exclusive commercial appropriation of MICA, because MICA is a publicly funded project.³² We refrain from indicating concrete examples for this stakeholder group because it is beyond the scope of the stakeholder mapping to identify and assess individual actor strategies.

Commercialisation through knowledge actors:

- intelligence platform promoters and operators (12,22)³³
- research commercialization organizations (12,32)

Commercialisation through commercial actors:

- raw material commerce (23,1)
- financial commerce (23,2)

Commercialisation through criminal actors:

- raw material thieves (52,1)³⁴
- illegal landfill operators (52,2)

Discretionary stakeholders (legitimacy)

Discretionary stakeholders include all stakeholder groups that have legitimate claims in MICA, but they neither have significant power in the raw material intelligence discourse, nor is there any urgency to involve them in MICA. All in all, the discretionary actors are kind of a container category comprising a large variety of stakeholders; therefore, we do not indicate a typical example:

- academies of science (11,14)
- applied research institutes (non-governmental) (11,3)
- R&D labs and departments of enterprises (11,4)
- innovation communities (12,13)
- research infrastructure promoters & operators (12,21)
- research–society intermediaries (12,33), media organizations (12,34), media & communication support (12,35)
- basic education organizations, professional education & training organizations, professional networks, job search intermediaries (12,41-12,44)

³¹ If no precautionary action is undertaken, terrorists may benefit e.g. from unintended guidance through MICA to find easily accessible spatial information that could be relevant to the planning of their operations.

³² This does not mean that dormant stakeholders have no legitimacy to benefit from MICA, but an exclusive commercial exploitation of MICA could be not intended by MICA.

³³ MICA may benefit from the services of other intelligence services and vice versa. In case of smart exploitation of MICA services, other commercial services might become obsolete. A commercial exploitation of the MICA capabilities is not visibly intended, but could be an option for other intelligence services.

³⁴ Raw material thieves could also be considered as dangerous stakeholders. Compared, for example, to terrorists the urgency to consider them appears to be less severe, although that does not mean they are not important.

Deliverable D2.1

- physical operations support (24,2), infrastructure support (24,4)
- ministries of social affairs (31,15), ministries of defense and of the interior (31,16)³⁵
- supranational institutions (31,22)
- political parties (32,2)
- external organisations management (32,3)
- judiciary (33)
- civil society funding institutions (42)
- informal personal communities (43,2), individuals (44)
- artisanal and small-scale miners (51,1), scavengers (51,2)

Demanding stakeholders (urgency)

No stakeholder group identified.

Based on these classifications, a strategy for the treatment of stakeholder types is suggested (Table 2).

Table 2: Suggestion for the treatment of stakeholder types in MICA

Stakeholder type	Implications for MICA
Definitive stakeholders (power, legitimacy, urgency)	Tier 1 stakeholders: Concrete organizations are involved in MICA. The raw material information needs of other non-involved organisations in the same stakeholder group can be relevant, too.
Dominant stakeholders (power, legitimacy)	Tier 2 stakeholders: These stakeholder groups should be considered in any comprehensive survey of raw material information needs.
Dependent stakeholders (legitimacy, urgency)	Tier 2 stakeholders: These stakeholder groups should be considered in any comprehensive survey of raw material information needs to put them at a comparative level of consideration to dominant stakeholders.
Discretionary stakeholders (legitimacy)	Tier 3 stakeholders: These stakeholder groups can be considered whenever they actively engage in the MICA project.
Dangerous stakeholders (power, urgency)	Tier 4 stakeholders: These stakeholder groups should be taken into account to ensure that MICA services are not misused or abused.
Dormant stakeholders (power)	Tier 4 stakeholders: These stakeholder groups should be taken into account to ensure that MICA services will be exploited in the intended ways.

Source: MICA.

4. Definition of stakeholder groups

The stakeholder groups have been defined and grouped bottom up. Concrete stakeholder groups at the lowest level 4 are grouped to more general ones at level 3. Level 3 stakeholder groups are assigned to more general domains at level 2 that fulfill different functions in the five major domains (level 1): knowledge system, economic system, political system, civil society and hidden actors.

³⁵ At EU level there is no “DG Defense” or common foreign and security policy asking for a secure raw material supply particularly for military purposes.

Deliverable D2.1

The 90 stakeholder groups identified are assigned according to their core function in their major reference system. At the center of Figure 5, the economic system, political system and civil society represent the classical three sectors of society. The knowledge system is singled out to emphasize knowledge-focused stakeholder groups in the light of raw material intelligence. The hidden actors are separated to stress actors not desired by the incumbent raw material regime.

There is no analytical solution to the development of such a hierarchy because organizations fulfill multiple roles in different systems. Of course, other groupings and assignments are possible. The four-digit codes, expressing the hierarchical relationship of stakeholder groups, are a pragmatic way to present the 90 stakeholder groups in some logical order allowing more intuitive orientation of the reader than a mere alphabetical or random listing.

1	knowledge system	2	economic system	
11	research institutes	21	industry (enterprises, associations)	
11,1	public sector research institutes	21,1	mining & extraction industry	
11,2	intelligence institutes	21,2	manufacturing industry	
11,3	applied research institutes (non-governmental)	21,4	other industry (infrastructure, service)	
11,4	R&D labs and departments of enterprises	21,3	re-manufacturing industry	
12	hybrid knowledge institutions	21,5	sustainable industry	
12,1	multi-actor STI institutions	22	industry umbrella organisations	
12,2	knowledge infrastructures	22,1	cross-sector industry associations	
12,3	knowledge intermediaries	22,2	standardisation bodies	
12,4	education, training & professional organisations	23	commerce	
		23,1	raw material commerce	
		23,2	financial commerce	
		24	technical support (mining / urban mining)	
		24,1	exploration & development support	
		24,2	physical operations support	
		24,3	information support	
		24,4	infrastructure support	
		24,5	consultancies and planning offices	
		3	political system	
		31	executive	
		31,1	governments (EU, national)	
		31,2	governments (subnational, supranational)	
		32	legislative	
		32,1	parliaments	
		32,2	political parties	
		32,3	external organisations management	
		33	judiciary	
		4	civil society	
		41	civil society engagement	
		41,1	civil society organisations	
		41,2	citizen initiatives	
		41,3	cooperatives	
		42	civil society funding institutions	
		42,1	foundations	
		42,2	crowdfunding	
		43	communities	
		43,1	prosumer communities	
		43,2	informal personal communities	
		44	individuals	
		5	hidden actors	
		51	informal actors	
		51,1	artisanal and small-scale miners	
		51,2	scavengers	
		51,3	misusers of products and systems	
		52	criminal actors	
		52,1	raw material thieves	
		52,2	illegal landfill operators	
		52,3	terrorists	

Figure 5: Hierarchy of stakeholder groups. The stakeholder groups are aggregated from the lowest level 4 stepwise to the highest level 1. For reasons of clarity only the levels 1, 2 and 3 are displayed in this figure. Source: MICA.

Two-letter country codes in square brackets allow for an assignment of country-bound organizations to a concrete country. The entries of organizations in a stakeholder group are not cited and referenced beyond the context of identification for readability reasons, as web-searches with their '<name>' in combination with 'homepage' easily lead to the respective website.

Deliverable D2.1

4.1 Knowledge system

A **knowledge system** is a system of creation, circulation and exploitation of knowledge (RIF 2013). With regard to MICA, it comprises all knowledge concerning raw materials. The development of the Raw Material Intelligence Capacity Platform (RMICP) itself is a research and innovation (R&I) activity. The knowledge system comprises funding organisations³⁶, research institutes (11), multi-actor Science, Technology & Innovation (STI) institutions (12,1), knowledge infrastructures (12,2), knowledge intermediaries (12,3) as well as education, training and professional organisations (12,4).

Code	Stakeholder group	Parent level	Parent stakeholder domain				
11,11	geological surveys	11,1	public sector research institutes				
Definition Geological surveys are public sector institutions carrying out operations and research in the field of geosciences (EuroGeoSurveys 2016). Most countries and some regions have an own geological survey or a functional equivalent responding to their needs. In some countries, state-level geological surveys gather their own data. Geological surveys particularly identify and assess primary raw material deposits. Some geological surveys extend their research to critical minerals and materials including secondary sources of raw materials (e.g. mining waste).							
Units A number of geological surveys and a European association of geological surveys are involved in MICA: <ul style="list-style-type: none">national level (see: Abbreviations section): GEUS [DK], NERC-BGS [GB], BRGM [FR], BGR [DE], GTK [FI], GeoZs [SI]; NGU [NO], PGI [PL], LNEG [PT], GIR [RO], SGU [SE], SWISSTOPO [CH], MFGI [HU], AGS [AL], GSB [BE], HGI-CGS [HR], IGME [GR], GSD [CY], GSI [IE], IGME [ES], ISPRA [IT]European level: EuroGeoSurveys Non-European geological surveys and their associations include: <ul style="list-style-type: none">national & regional level: Geoscience Australia & state-level geological surveys [AU], Geological Survey of Canada & state-level geological surveys [CA], United States Geological Survey (USGS) & state-level geological surveys [US], South African Council for Geosciences [ZA], Servicio Geológico Mexicano [MX], Geological Survey of Japan [JP], Mineral Resources Authority of Mongolia [MN], Kazgeology [KZ]; China Geological Survey & regional departments [CN], Geological Survey of India & of its regions [IN]supranational organisations: Association of Ibero-American Geological and Mining Surveys, Organisation of African Geological Surveys, UNECE Africa Minerals Resources Development Centre, Southern and Eastern African Mineral Center, Coordinating Committee for Geosciences Programmes in East and Southeast Asia, South Asia Geological Congress, SOPAC Geoscience Division - Secretariat of the Pacific Community							
In focus EuroGeoSurveys is representing 37 National Geological Surveys and some regional Geological Surveys in Europe. In some countries such as Germany, the state-level geological surveys play an important role as owners of data. EuroGeoSurveys provides the European institutions with pan-European advice and information. It is active in marine geology; earth observation – geo hazards; geochemistry; geoenergy; water resources; mineral resources; climate change, carbon capture & storage; spatial information (INSPIRE); soil resources – superficial deposits; cities and geoheritage; international cooperation and development.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X	X	X	

³⁶ This includes industry funding (21), government funding (31) and civil society funding (42); for the research and development (R&D) expenditure of mining & quarrying / recycling, see: EUNOMIA (2015, p. 189ff/198ff).

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
11,12	government research institutes (without geological surveys)	11,1	public sector research institutes				
Definition Government research institutes usually provide direct R&D support to business firms and public authorities (The Innovation Policy Platform 2016). Many operate at European, national or regional level; some of them doing research on the global commons. Geological surveys (11,11) also count among the government research institutes; here it is referred to other government research institutes in basic sciences and applied sciences of public interest. Research and Technology Organisations (RTOs) with diverse sponsorship models are treated separately (11,15).							
Units Government research institutes cover a wide range of research domains of public interest (non-exhaustive list): <ul style="list-style-type: none">geosciences: Geological and Geophysical Institute of Hungary [HU], The Greenland Institute of Natural Resources [DK]oceanology: Alfred Wegener Institute for Polar and Marine Research [DE], National Institute of Oceanography [IN], French Research Institute for Exploitation of the Sea (IFREMER) [FR], All-Russian Research Institute of Geology and Mineral Resources of the World Ocean [RU]space: German Aerospace Center (DLR) [DE], National Observatory of Athens [GR], Centre National d'Etudes Spatiales (CNES) [FR], European Space Agency (ESA) [EU]technology & engineering: Slovenian National Building and Civil Engineering Institute ZAG [SI], New Energy and Industrial Technology Development Organization (NEDO) [JP]environment: Swedish Environmental Research Institute (IVL) [SE], Clausthal Institute of Environmental Technology (CUTEC) [DE]International Study Groups on base metals: International Lead and Zinc Study Group (ILZSG), International Nickel Study Group (INSG), International Copper Study Group (ICSG)research in general: European Intergovernmental Research Organisations Forum (EIRO) [EU], DG Joint Research Center (JRC) [EU]							
In focus <i>DG Joint Research Centre (JRC)</i> is the European Commission's in-house science service that conducts a variety of raw material support activities. JRC ISPRA engages in the Raw Materials Information System (RMIS), Life Cycle Assessment (LCA) data, Critical Raw Materials (CRM) assessment and INSPIRE; JRC Petten engages in the Materials Information System (SETIS) and CRM for the energy sector/technologies; JRC Sevilla engages in construction and demolition (C&D) waste. Other activities of JRC include the Better Regulation for Circular Economy (BRACE-RMP) project, support to Raw Materials Scoreboard Development, and engagement in projects such as Minerals4EU and MICA. The main role of the <i>International Lead and Zinc Study Group (ILZSG)</i> , formed by the United Nations in 1959, is to ensure transparency in the markets for lead and zinc worldwide. To this end, ILZSG provides information on supply and demand developments in lead and zinc through publication of statistics, market research and economic studies.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X	X	X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
11,13	universities	11,1	public sector research institutes
Definition A university (also college) is an institution that offers courses leading to a degree (such as a bachelor's, master's, or doctoral degree) and where research is done (Merriam-Webster 2016a). Universities employ professors, external teachers, research staff and management. Students receive higher education (see also 12,41). Some universities pursue also particular regional missions or sustainability. Many universities offer education and research in geology and some in industrial ecology. Most universities are public sector institutes, the share of private universities growing.			

Deliverable D2.1

Units A large variety of universities with different thematic foci engage in higher education and research: <ul style="list-style-type: none">universities involved in MICA: Universiteit Leiden – Institute of Environmental Sciences (UL-CML), Université Joseph Fourier Grenoble (UJF), Norwegian University of Science and Technology (NTNU), University College London (UCL)other universities in Europe: A large number of universities engage in the EIT KIC Raw Materials, among them many technical universities (e.g. Luleå University of Technology, Delft University of Technology) and others universities (e.g. Université Nancy-Lorraine, Lund University).international universities: United Nations Universityuniversity associations: League of European Research Universities (LERU), European Centre for Strategic Management of Universities, European University Association (EUA), Federation of European Mineral Programs (FEMP)							
In focus <i>FEMP (Federation of European Mineral Programs)</i> is the organisation that organizes and co-ordinates the European Mining, Minerals and Environmental Program (EMMEP) for students in resource engineering, mining and geotechnical engineering, mineral processing, recycling and related academic studies. FEMP coordinates the cooperation with supporting companies, manages the financial aspects of the program and maintains the contact with the alumni.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X	X	X	

Code 11,14	Stakeholder group academies of science	Parent level 11,1	Parent stakeholder domain public sector research institutes				
Definition Academies of science are national or state-level science organizations or other learned societies dedicated to sciences (Wikipedia 2016a). They have different science sections or institutes (e.g. earth sciences, social sciences & humanities, etc.). Members are usually academic individuals. Research societies are similar but may have another organisational status, e.g. closer to a professional organization (12,45). Science unions pursue similar goals, although often at a more global level. Some academies of science host prize committees, for example for the Nobel Prize.							
Units Academies of science represent mostly academic science domains taught and researched at universities and public research institutes. <ul style="list-style-type: none">national level: The Royal Swedish Academy of Sciences [SE]: International Geosphere-Biosphere Programme and Nobel Prize Committee, Académie des Sciences [FR], Chinese Academy of Sciences [CN]European level: European Materials Research Society (E-MRS), European Network of Geoscience Associations, European Academy of Sciences (EURASC)international level: The International Council for Science (ICSU), The Society for Environmental Toxicology and Chemistry (SETAC)							
In focus The <i>International Council for Science (ICSU)</i> is a NGO with a global membership of national scientific bodies (122 Members, representing 142 countries) and International Scientific Unions (31 Members). Scientific unions include: the International Cartographic Association (ICA), the International Geographical Union (IGU), the International Union of Geodesy and Geophysics (IUGG), the International Union of Geological Sciences (IUGS), the International Union of Materials Research Societies (IUMRS) and the International Union of Soil Sciences (IUSS).							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X		X	

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
11,15	research & technology organisations	11,1	public sector research institutes				
Definition Research and Technology Organisations (RTOs) are organizations with the aim to harness science and technology in the service of innovation, to improve quality of life and build economic competitiveness (EARTO 2016). RTOs are nodes within innovation systems bringing together key players across the whole innovation chain, from fundamental to technological research, from product and process development to prototyping and demonstration and on to the full-scale implementation in the public and private sectors. Some governments provide basic funding to its RTOs needing to acquire additional funds, in particular from industry. Swerea AB is owned jointly by the Swedish state and Swedish industry. SINTEF, fostering cooperation between NTNU (11,13) and industry, is a foundation.							
Units Most RTOs are active in material and technology development, many of them engaged in the EIT KIC Raw Materials. <ul style="list-style-type: none">RTO involved in MICA: Fraunhofer Gesellschaft [DE]national level: French Alternative Energies and Atomic Energy Commission (CEA) [FR], C-Tech Innovation [GB], d'Appalonia [IT], SINTEF Foundation [NO], Swerea AB [SE], Technical Research Institute of Sweden [SE], Tecnalia [ES], Netherlands Organisation for Applied Scientific Research (TNO) [NL], Technical Research Centre of Finland (VTT) [FI]European level: European Association of Research and Technology Organisations (EARTO)							
In focus The <i>European Association of Research and Technology Organisations (EARTO)</i> represents the interests of about 350 RTOs from across the European Union and associated countries (91 direct members, some of which are associations regrouping several RTOs). EARTO has a number of policy-oriented (e.g. Horizon 2020; structural funds; European Innovation Council) and technology-oriented working groups (e.g. European Data Space).							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X		X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
11,2	intelligence institutes	11	research institutes
Definition Intelligence institutes are defined as a stakeholder group comprising intelligence agencies, foresight institutes, think tanks and global knowledge fora. An intelligence agency is a governmental/parliamentary agency responsible for the collection, analysis and exploitation of information and intelligence in support of law enforcement, national security, military and foreign policy objectives (Wikipedia 2016b). Foresight institutes are institutes thinking, debating and shaping the future (Cordis 2010). A think tank (or policy institute) is an organization performing research and advocacy concerning topics such as social policy, political strategy, economics, military, technology and culture (Wikipedia 2016c). A number of global knowledge fora aim to identify and analyse emerging issues and to provide the strategies to deal with them. Intelligence institutes rather track and anticipate change than rigorously doing science. Consultancies & planning offices (24,5) also provide intelligence, rather tailored to concrete business needs.			
Units <ul style="list-style-type: none"> intelligence agencies: Central Intelligence Agency CIA [US], European Strategy and Policy Analysis System (ESPAS) [EU] foresight institutes in MICA: MinPol, La Palma Research Centre for Future Studies (LPRC) think tanks: Center for Global Dialogue and Cooperation, Practical Action Consulting global knowledge fora: World Economic Forum, World Materials Forum, Worls Resources Forum 			

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In focus The <i>European Strategy and Policy Analysis System (ESPAS)</i> provides a framework for cooperation and consultation at administrative level, on a voluntary basis, between the European Parliament, the European Commission, the Council of the European Union, and the European External Action Service, with the Committee of the Regions and the European Economic and Social Committee as observers, to work together on medium- and long-term trends facing or relating to the European Union. The <i>World Resources Forum (WRF)</i> is an independent non-profit international organization that serves as a platform connecting and fostering knowledge exchange on resources management amongst business leaders, policy-makers, NGOs, scientists and the public.							
ID R&I calls	ID consultation	ID industry	ID civil societ	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X						X	

Code 11,3	Stakeholder group applied research institutes (non-governmental)	Parent level 11	Parent stakeholder domain research institutes				
Definition Applied research institutes are organisations where original investigation is undertaken in order to acquire new knowledge (OECD 2002). They attempt to identify and exploit the potential of scientific discoveries or improvements in technology such as new materials, devices, methods and processes. Applied research institutes of the private and civil society sectors have to acquire most of their revenues on their own opposed to the government-funded research institutes mostly conducting basic science and applied science in the public interest (11,12).							
Units Private applied research institutes cover a large variety of organization, for example in the realms of geology/raw materials, environment/sustainability, materials/technology: <ul style="list-style-type: none">geology/raw materials: Institute of Materials, Minerals and Mining (IoM3) [GB]environment/sustainability: Oakedene Hollins [GB], Wuppertal Institute [DE], World Resources Institute [US]materials/technology: Centre Européen de Développement Rapide de Produit (CIRTES SRC) carrying out contract R&I [FR], Institute of Non-Ferrous Metals (INM) [PL]							
In focus The <i>Institute of Materials, Minerals and Mining (IoM3)</i> is a UK based engineering institution whose activities encompass the whole materials cycle, from exploration and extraction, through characterisation, processing, forming, finishing and application, to product recycling and land reuse. It applies aspects of materials science and engineering, geology, mining and associated technologies, mineral and petroleum engineering and extraction metallurgy. The <i>World Resources Institute (WRI)</i> is a global research organization that spans more than 50 countries, with offices in the United States, China, India, Brazil, Indonesia and more. More than 450 experts and staff work on action to sustain natural resources. They have a regular publication of the US material flows, including metals, according to MFA methodology. The analyses highlight metals related to environmental impacts (lead, cadmium and mercury) rather than to criticality.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X	X	X	

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
11,4	R&D labs and departments of enterprises	11	research institutes				
Definition Research and development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this knowledge to devise new applications (OECD 2012). Most enterprises have an own R&D laboratory or department although some innovate without carrying out own R&D. More than half of the total expenditure on R&D in the EU is spent by enterprises. Living Labs are a particular kind of R&D labs. They are a real-life test and experimentation environments where users and producers co-create innovations (ENoLL 2016). For instance, there are Living Labs for mining technology and regional living labs in areas that include mining sites.							
Units R&D labs and departments of enterprises are paramount. Often, they do not appear as publicly visible entities. R&D labs and departments exist, for example, on mining, materials, waste treatment and recycling. <ul style="list-style-type: none">• mining: VSH Hagerbach Test Gallery [DE]• materials: KGHM Cuprum R&D Centre [PL], ERAMET Research [FR], ArcelorMittal Maizières Research [FR]• waste treatment and recycling: Ecological Services – Chemical laboratory and R&D department [SE]							
In focus The <i>VSH Hagerbach Test Gallery</i> is a subterranean Living Lab. The galleries, caverns, testing areas, laboratories and training rooms provide particular real-world conditions for research, development, testing and 1:1-scale experiments. This environment is used as a training ground and research laboratory. Own developments and operations on behalf of and in cooperation with companies, associations and research institutes are carried out.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X						X	X

Code	Stakeholder group	Parent level	Parent stakeholder domain
12,11	competence clusters	12,1	multi-actor STI institutions
Definition Competence clusters are defined as a stakeholder group that comprises competence networks, centres of excellence and science parks. This stakeholder group is characterized by a combination of competences that contribute to excellent science, either arranged through a virtual network, a regional cluster or in a single place such as a campus or building. There are a number of competence clusters dedicated to raw materials.			
Units Relevant examples of competence clusters in the realm of raw materials at different levels include: <ul style="list-style-type: none"> • regional level: Cambridge Science Park [GB], Science Park Berlin Adlershof – Innovation cluster for microsystem technology and materials [DE] • national level: Finish Metals and Engineering Competence Cluster [FI], European Center of Excellence for Water Technology [NL], Geokompetenzzentrum Freiberg [DE] • European level: European Rare Earth Competency Network (ERECON), ERA-NET on Applied Geosciences, ERAMIN Network on the Industrial Handling of Raw Materials for European Industries, EU funded Flexible and Mobile Economic Processing Technologies consortium (FAME), Critical Raw Materials (CRM) Alliance 			
In focus The cross-thematic <i>ERA-NET on Applied Geosciences</i> addresses non-energy non-agricultural raw materials and minerals. It shall, through intelligence networking and coordination, enhance and maintain the pan-EU mineral deposits inventory/database, in line with and building on existing activities in the framework of the EIP on Raw Materials. It shall provide economic geology maps of construction materials and industrial and metallic minerals across the 28 Member States of the EU in a free publicly accessible Internet/web-portal form. The ERA-NET shall also deliver a pilot study			

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identifying targets for general exploration, using innovative technologies and challenging a better understanding of ore genesis and direct exploration at deeper, unexploited levels of the Earth's crust.

ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X			

Code	Stakeholder group	Parent level	Parent stakeholder domain
12,12	technology platforms	12,1	multi-actor STI institutions

Definition

Technology platforms aim to define research priorities and action plans in strategic technological areas for regions and countries and to coordinate research efforts in these areas. Technology platforms are usually tailored towards a specific technology or sector. They may also aim at technology transfer. There are efforts to overcome fragmentation of technology platforms in the VERAM-project developing a raw materials roadmap towards 2050.

Units

Technology platforms are established at the regional, national and European level. Often, these levels are intertwined.

- regional level: Limousin Building Rehabilitation Technology Platform [FR]
- national level: Technology Platform Vehicles for Sustainable Transport (CZ), 29 Polish Technology Platforms correlated to European Technology Platforms [PL]
- European level: European Technology Platform (ETP) for Sustainable Chemistry (SusChem), ETP for Advanced Engineering Materials (EuMaT), ETP on Sustainable Mineral Resources, Manufuture, Zero Emissions Platform, Nanofutures, Industrial Safety

In focus

European Technology Platforms (ETPs) are industry-led stakeholder fora recognised by the European Commission as key actors in driving innovation, knowledge transfer and European competitiveness. There are ETPs on bio-based economy, energy, environment, ICT, production and processes, transport and cross-cutting ETP initiatives.

The *European Technology Platform on Sustainable Mineral Resources (ETP-SMR)* covers a wide scale (coal, metal ores, industrial minerals, ornamental stones, aggregates, smelters as well as technology suppliers and engineering companies) in different sectors along the value chain, from exploration to extraction, processing and recycling.

ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X				X			

Code	Stakeholder group	Parent level	Parent stakeholder domain
12,13	innovation communities	12,1	multi-actor STI institutions

Definition

An innovation community is a community of actors, often from different enterprises and institutions, who gather on a certain innovation project (see also 12,14). Frugal innovation communities and communities of practice are particular innovation communities. A frugal innovation community aims to discover new business models, reconfigures value chains and redesigns products to serve users who face extreme affordability and/or resource constraints, in a scalable and sustainable manner (Bhatti 2011). Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.

Units

- innovation communities: OLED Initiative Germany [DE], Scottish Institute for Remanufacture [GB]
- frugal innovation communities: Mitticool Refrigerator (Mansukhbhai Prajapati) [IN], Low cost sanitary napkin (A. Muruganantham) [IN]
- communities of practice: Federal Buildings Initiative's Community of Practice [CA]

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In focus The <i>Scottish Institute for Remanufacture (SIR)</i> brings together a group of leading Scottish, UK and multi-national companies comprising Original Equipment Manufacturers (OEMs), re-manufacturers, SMEs, academics, trade associations and public sector organizations for cross-sector sharing and collaboration. It is funded by Zero Waste Scotland and the Scottish Funding Council.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X							X

Code 12,14	Stakeholder group innovation initiatives	Parent level 12,1	Parent stakeholder domain multi-actor STI institutions				
Definition Innovation initiatives are defined as a strategic stakeholder group that comprises innovation partnerships and innovation institutes composed of different stakeholder groups in innovation. Under such innovation initiatives, a number of innovation communities may operate (see 12,13). At a high strategic level, a European Innovation Council (EIC) is envisaged. Some particular innovation initiatives focus on raw materials.							
Units There is an abundance of innovation initiatives at regional, national and European level. From a raw material perspective, two innovation initiatives at EU level stand out: <ul style="list-style-type: none">European Innovation Partnership (EIP) on Raw MaterialsEuropean Institute of Technology (EIT) Knowledge and Innovation Community (KIC) Raw Materials Other innovation initiatives in the realm of raw materials include Mineral Processing and Extractive Metallurgy For Mining And Recycling Innovation Association (PROMETIA).							
In focus The <i>European Innovation Partnership (EIP) on Raw Materials</i> is a stakeholder platform that brings together representatives from industry, public services, academia and NGOs. Its mission is to provide high-level guidance to the EU, its Members States and private actors on innovative approaches to the challenges related to raw materials. Among its main targets are 100 innovative pilots, substitutes for at least 3 applications, regulatory framework for primary and secondary raw materials, a raw material knowledge base (RMKB) with raw material flows and trends, raw material network of research, education and training centers, and a proactive international cooperation strategy. It is implemented through Strategic Implementation Plans (SIPs), Operational Group (OG) meetings and Raw Material Commitments. Raw Materials Commitments are meant to increase the success of funding (Horizon 2020, structural funds). For certain topics such as 'Robotics in Mining', there is a specific EIP group. The <i>European Institute of Technology (EIT) Knowledge and Innovation Community (KIC) Raw Materials</i> has the mission to boost the competitiveness, growth and attractiveness of the European raw materials sector via radical innovation and entrepreneurship. This KIC integrates multiple disciplines, and diversity and complementarity along the three sides of the knowledge triangle (business, education and research). It aims to pay particular attention to systemic thinking and action thereby considering different parts of the value chain holistically. Novel service offerings aim at boosting start-ups, SMEs, radical innovation and education.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X		X	

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Code 12,15	Stakeholder group responsible science, technology & innovation initiatives	Parent level 12,1	Parent stakeholder domain multi-actor STI institutions				
Definition Responsible science, technology and innovation (STI) initiatives act in favour of transparent processes that take (ethical) acceptability, sustainability and societal desirability of the STI development process into account. Societal actors shall work together to ensure that the process and its outcomes are better aligned with the values, needs and expectations of the European society.							
Units <ul style="list-style-type: none">national level: Fondation Sciences Citoyennes [FR]European level: European Network for Scientists for Social and Environmental Responsibility (ENSSER)global level: Scientists for Global Responsibility, International Network of Engineers and Scientists for Global Responsibility							
In focus The <i>European Network of Scientists for Social and Environmental Responsibility (ENSSER)</i> brings together independent scientific expertise to develop public-good knowledge for the critical assessment of existing and emerging technologies. ENSSER claims to promote critical thinking to help reshaping current models towards more democratic and participatory agenda-setting processes through creating spaces for scientific information independent from economic and political influence and through the identification, use and quality assessment of scientific, lay, local, traditional and other knowledge sources.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X						X

Code	Stakeholder group	Parent level	Parent stakeholder domain
12,21	research infrastructure promoters & operators	12,2	knowledge infrastructures
Definition Research infrastructures are facilities, resources and related services used by the scientific community to conduct top-level research in their respective fields (European Commission 2015a). Examples include large-scale research installations, integrated arrays of small research installations, collections, databases, high-capacity/high speed communication networks, highly distributed capacity and capability computing facilities, networks of computing facilities, data infrastructure, research vessels, satellite and aircraft observation facilities, coastal observatories, as well as infrastructural centres of competence which provide a service for the wider research community based on an assembly of techniques and know-how. Intelligence platforms are a particular kind of infrastructure that may be used for research and a broad range of other purposes.			
Units Pan-European Research Infrastructures (ERICs) include: <ul style="list-style-type: none"> European Social Survey (ESS) Euro-Argo – Global ocean observing infrastructure CERIC-ERIC – Materials science facilities of Central Europe In addition, there are various national research infrastructures in almost every country.			
In focus <i>CERIC-ERIC</i> is an integrated multidisciplinary and multiprobe research infrastructure open for external basic and applied users in the fields of materials, biomaterials and nanotechnology. It allows using facilities in 7 European			

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Countries. Free access is by international peer review selection and open publication, industrial and/or proprietary use is at market costs.

ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming X
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Code 12,22	Stakeholder group intelligence platform promoters & operators	Parent level 12,2	Parent stakeholder domain knowledge infrastructures
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Definition

Intelligence platforms can be seen as a particular infrastructure that addresses the knowledge needs of its users. Typically, intelligence platforms build upon data, information and knowledge being arranged in a smart way conducive to responding to users' needs. In contrast to the research infrastructure (12,21), intelligence platforms are not only used for research but for a variety of purposes such as policy-making, writing of an article and management decisions.

Units

MICA itself is developing an intelligence platform, while there are intelligence platforms on a range of other issues:

- raw materials (institutions): EU Raw Material Knowledge base (EURMKB) supported by EUROSTAT – 11th Date Center on Raw Materials, European Environmental Agency (EEA) and DG GROW C2; Knowledge Base Architecture (KBA), Raw Material Information System (RMIS) of the JRC, OneGeology
- raw materials (projects): MICA, CRM_InnoNet Innovation Network, European Geological Data Infrastructure (EGDI), Integrated Knowledge Management System (IKMS) for EU REE Resources, International Observatory for Raw Materials, EU Minerals Intelligence Network (Minerals4EU), European Minerals Knowledge Data Platform (EU-MKDP), Minventory data portal, ProMine database, ProSUM database, SmartGround – data collection and integration platform (see Abbreviations section)
- environment & land use (institutions): Shared Environmental Information System (SEIS), GIO land (on land cover and land cover change), Urban Atlas (land use and land cover data for Large Urban Zones with more than 100.000 inhabitants) and the European Nature Information System (EUNIS) – Habitat classification (ecosystem types of Europe).
- open data repositories: Open Data Platform (ODP)

In focus

Information on primary and secondary sources of raw materials, together with expertise, will form the three main blocks of the *European Union Raw Materials Knowledge Base (EURMKB)*: data collection (EUROSTAT, JRC, geological surveys, etc.), maintenance (standards, update, public access, etc.) and expertise (MFA for metals, INSPIRE compliant spatial data, 3D when appropriate, etc.). The objective of the *Knowledge Base Architecture (KBA)* project is to provide technical analysis of different components of the EURMKB.

ID R&I calls X	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café X	ID foresight & brainstorming X
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Code 12,31	Stakeholder group project management agencies	Parent level 12,3	Parent stakeholder domain knowledge intermediaries (research–government)
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Definition

Project management agencies are organisations (or their departments) which organise and administer projects, in particular research and innovation projects, also in the realm of raw materials. They are commissioned by the EU, national- or state-level ministries, by private or public foundations. They have excellent insights in the research and innovation landscape and on the status of research. They may also apply for funds as research performing

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organisations. A project/programme officer's (or advisor's) tasks at an EU executive agency may include general programme management, support of calls for tender and proposal, evaluation, monitoring and negotiation of projects, financial evaluation of projects and programmes (European Personnel Selection Office 2013).

Units <ul style="list-style-type: none"> regional level: Projektträger Bayern [DE] national level: Project Management Jülich [DE] European level: The Executive Agency for Small and Medium-sized Enterprises (EASME), European Association of Research Managers and Administrators (EARMA) 							
In focus <i>The Executive Agency for Small and Medium-sized Enterprises (EASME)</i> has been set up by the European Commission to manage on its behalf several EU programmes. It covers part of Horizon 2020, the EU Framework Programme for Research and Innovation, in particular: Part II 'Industrial leadership' and Part III 'Societal challenges' as well as part of the EU programme for the Environment and Climate Action (LIFE) and part of the European Maritime and Fisheries Fund (EMFF).							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X				X			

Code 12,32	Stakeholder group research commercialisation organisations	Parent level 12,3	Parent stakeholder domain knowledge intermediaries (research–industry)				
Definition Organisations promoting the commercialisation of research results are defined as a stakeholder group that comprises liaison offices in research institutes and universities, incubators as well as Intellectual Property Rights (IPR) management services, including patent brokers and patent offices. Such organisations may play a role related to commercialisation of EIT KIC Raw Materials results (12,14).							
Units <ul style="list-style-type: none">• liason offices: Czech Liason office for research, development and innovation [CZ], Edinburgh Research and Innovation – the University's commercial liaison unit [GB]• incubators: EBN innovation network – European Business and Innovation Centres (BICs)• IPR management: European Patent Office, Deutsches Patent- und Markenamt (DPMA) [DE]							
In focus The <i>EBN innovation network</i> is a network of 160+ quality-certified EU BICs (business and innovation centres, incubators, accelerators and other support organisations) and 100 associate members that support the development and growth of innovative entrepreneurs, start-ups and SMEs.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
							X

Code 12,33	Stakeholder group research–society intermediaries	Parent level 12,3	Parent stakeholder domain knowledge intermediaries (research–society)
Definition Research – society intermediaries are defined as a stakeholder group that comprises science shops, science museums libraries (universities, municipal, parliamentary, etc.) and historical sites such as abandoned mines (NACE 91).			

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Units <ul style="list-style-type: none"> science shops: Science Shop Bonn [DE] science & technology museums: Science Museum London [GB], Deutsches Museum [DE], Universeum [SE], Milos Mining Museum [GR], National Mining Museum Scotland [GB] libraries: Danish Royal Library [DK], OneMine (Online Mining and Minerals Library) historical sites: Peak District Lead Mining Museum [GB], Stiftung Zollverein (Zeche Zollverein) [DE] 							
In focus <p>OneMine is a collaborative effort among multiple societies to place the world's most comprehensive collection of mining and minerals based research in one place. This aggregate includes technical documents, conference papers, articles, pre-prints and late papers. The goal is to collect the most relevant and reliable aggregation of technical papers associated with mining and minerals in one, easy to navigate location. Anyone can search OneMine.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	X

Code 12,34	Stakeholder group media organisations		Parent level 12,3	Parent stakeholder domain knowledge intermediaries (all)			
Definition Media organisations communicate science to professionals, to the public and to special target groups such as politicians. Editorial staff (journalists, lectors, etc.) and publishers as well as manuscripts portals, professional authors and reviewers act as media organisations directly or indirectly. Media organisations comprise popular media, education & training media, professional media (incl. open access) and social media (incl. self-publishing). Commercial media provide intelligence to clients in the raw material domain.							
Units Media organisations can be classified into three major domains: <ul style="list-style-type: none">popular media: National Geographic (magazine), Discovery Channel (TV), El Pais (newspaper)professional media: Industrial Minerals (magazine), SNL Metals & Mining (platform), Metal Pages (portal), Infomine (portal, news market data), Journal of Industrial Ecology, Ore and Metals (publisher), Tradelink Publications (publisher), International Association of Scientific, Technical & Medical Publishers (publisher association)social media: ScienceBlogs TM							
In focus Tradelink Publications is an independent publisher of magazines and guides for the global mining industry.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
				X		X	

Code 12,35	Stakeholder group media & communication support	Parent level 12,3	Parent stakeholder domain knowledge intermediaries (all)
Definition Media support is defined as a stakeholder group that comprises public relations enterprises and advertising agencies. They support communication strategies and its implementation (e.g. event management, websites, advertisement) also for stakeholders in the raw material domain. Advertising agencies (NACE 73.11), public relations and communication activities (NACE 70.21) and organizers of conventions and trade shows (NACE 82.3) are domains of the official economic statistics.			

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Units <ul style="list-style-type: none"> event management: ARTS [FR], GOPA-Catermill [BE], ADvantix [GB] communication events: university days, Ted Talks, Google Science Fair (science); EU Minerals Day, Mining4Life event (minerals promotion days) conference and fair secretariats,: MINEX Europe Forum, Gordon Research Conferences, Ecobalance Secretariat, LCM conference series Organising Committee, Expo Mongolia education material: e.g. provided by the UN, Rio Tinto Secondary Education portal 							
In focus <p><i>Expo Mongolia</i> is an international mining and multi-sector trade fair that took place from 23–25 May 2016 in Ulaanbaatar. It targeted exporters from around the world to network with the local industry and expand business relations in Mongolia. The show profile includes industrial sectors like construction, mining, infrastructure, engineering, agriculture, logistics, medical health care and information technology.</p> <p><i>MINEX Europe Forum</i> is a pan-European technical and investment conference.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X				X		X	

Code 12,4I	Stakeholder group basic education organisations		Parent level 12,4	Parent stakeholder domain education, training and professional organisations			
Definition Organisations providing basic education are defined as a stakeholder group that comprises (pre-)primary, secondary and tertiary education (European Commission 2014b). Primary education provides students with fundamental skills in reading, writing and mathematics and establishes a solid foundation for learning and understanding core areas of knowledge, personal and social development. Secondary education builds on the learning from primary education and prepares for tertiary education or provides skills relevant to employment or both. Tertiary (or higher) education is provided by universities (see: 11,13), colleges of technology and other institutions of post-secondary education, whatever their source of finance or legal status (OECD 2002). It includes research institutes, experimental stations and clinics operating under the direct control of or administered by or associated with higher education institutions. All three stages are referred to when knowledge about mineral raw materials and recycling is part of education.							
Units <ul style="list-style-type: none">primary and secondary education: USGS Educational Resources for Secondary Grades [US], Bee Mine Secondary School (ZW), Wilhelm-Ostwald-Gymnasium [DE]tertiary education: Western Australian School of Mines (WASM) [AU], Camborne School of Mines [GB], ENAG-BRGM School with Higher education diploma courses in geoscience [FR], UCL MSc on Sustainable Resources [GB], Curtin Graduate School of Business [AU]							
In focus The Centre for Exploration Targeting of the <i>Curtin Graduate School of Business</i> offers a Master of Ore Deposit Geology (MODG) providing education in the geology and evaluation of ore deposits. It is designed for geologists with different levels of professional experience and offers education from international and Australian experts; provides an opportunity to improve geological, computing, exploration and management skills and includes hands-on practical experience, field excursions and research.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café X	ID foresight & brainstorming

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
12,42	professional education & training organisations	12,4	education, training and professional organisations				
Definition Organisations providing professional education & training are typically specialists in vocational training delivering a range of industry-leading professional qualifications, professional apprenticeships, professional development programmes and learning media. In the raw material domain, important fields of professional education and training are tailored towards the professions material & product designers (ecodesign, reconstruction), mining engineers & surveyors, and environmental engineers.							
Units <ul style="list-style-type: none">national level: TECHNIFUTUR [BE], BPP Professional Education [GB], Continuing Professional Development (CPD) [GB]European level: European Industrial Research Management Association (EIRMA) project Higher Education and Enterprises: Knowledge Alliances for the Training of Entrepreneurs (HEKATE)international level: EduMine							
In focus EduMine offers over 273 online courses, short courses and live webcasts on mining and geoscience.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X						X	

Code	Stakeholder group	Parent level	Parent stakeholder domain				
12,43	professional networks	12,4	education, training and professional organisations				
Definition A professional network is a connected community of people with the purpose to foster each other’s career development (Work Coach Café 2016). It brings together investors and professionals who want to grow their business, find a job or meet like-minded people. Professional networks showcase the abilities of professionals, also in the field of raw materials (see 12,44).							
Units <ul style="list-style-type: none">platforms: LinkedIn, Xing, Academia.edu, ResearchGate, etc.direct communication: informal exchange among professional colleagues							
In focus Mining Industry professionals is the LinkedIn group for mining engineers and mining professionals working in the mining industry. Individuals who become a part of this group network and build relationships. Executive search specialists who are a member of the Mining HR & Recruitment Specialists Association (MHRRSA) are explicitly invited.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
							X

Deliverable D2.1

Code 12,44	Stakeholder group job search intermediaries	Parent level 12,4	Parent stakeholder domain education, training and professional organisations				
Definition Job search intermediaries are organisations providing information about job opportunities thereby connecting jobseekers and employers (ASPE 2000). They may be geographically restricted or focus on specific professional groups. Professional networks (12,43) or professional media organisations (12,34) may also serve this function.							
Units <ul style="list-style-type: none">• mining-specific: CareerMine• general: Indeed, Stepstone, Jobstreet							
In focus CareerMine is a division of InfoMine (see 12,34) and provides the largest dedicated job board to the mining industry worldwide. The platform assists job seekers to find employment opportunities and interact with companies and recruiters who are hiring. Companies in the mining industry can showcase their employment opportunities, company profiles and career paths for both graduates and those already working in the industry.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming X

Code	Stakeholder group	Parent level	Parent stakeholder domain				
12,45	professional organisations	12,4	education, training and professional organisations				
Definition A professional organization (also called a professional body, professional association or professional society) is usually a non-profit organization seeking to further a particular profession, the interests of individuals engaged in that profession and the public interest (Wikipedia 2016d). Professional associations exist, for example, for geologists and mining engineers. The equivalent to urban mine explorers and recycling engineers is much rarer.							
Units <ul style="list-style-type: none">national level: Spanish Official Professional Association of Geologists (ICOG) [ES], Ordre des Architectes & Ingénieurs [LU], Chartered Institute of Waste Management (CIWM) [GB], Chartered Institute of Water and Environment (CIWEM) [GB], Institute of Civil Engineering [GB], Bundesverband Deutscher Geowissenschaftler (BDG) [DE], Geological Society [GB]European level: European Federation of Geologists (EFG), Architects' Council of Europe (ACE), European Council of Civil Engineers (ECCE)international level: International Society for Industrial Ecology (ISIE)							
In focus The <i>European Federation of Geologists (EFG)</i> includes 24 national association members. It disposes currently of nine panels of experts: CO ₂ geological storage, education, geological heritage, geothermal energy, hydrogeology, natural hazards, minerals, soil protection, and oil & gas. The <i>International Society for Industrial Ecology (ISIE)</i> connects individuals and student members from 45 countries in six major subject sections: Industrial Symbiosis and Eco-industrial Development, Socio-Economic Metabolism, Sustainable Urban Systems, Organizing Sustainable Consumption and Production, Environmental Extended Input Output (EEIO), and Life Cycle Sustainability Assessment.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X		X	

Deliverable D2.1

4.2 Economic system

An **economic system** is a system of production, resource allocation, exchange and distribution of goods and services in a society or a given geographic area (Wikipedia 2016e). With regard to MICA, it comprises all economic actors relevant for the stocks and flows of raw materials through the economy, namely the mining & extraction industry (21,1), the manufacturing industry (21,2) and the re-manufacturing industry (21,3) as well as industry umbrella organisations (22), commerce (23) and technical support (24). Sustainable industry (21,5) is treated separately. Each primary raw material that is fed into the economic system from the environmental system migrates through the economic system until it enters again the environmental system as waste or an emission to air, water and soil.³⁷ The classification of stakeholder groups makes use of the NACE code system whenever considered adequate. The collection of concrete entries makes use of an in-depth analysis across the entire life cycle of aluminum which is singled out on appropriate occasions.

Code	Stakeholder group	Parent level	Parent stakeholder domain
21,1	mining & extraction industry	21	industry (enterprises, associations)
Definition The mining and extraction industry covers <i>quarrying of stone, sand and clay</i> (NACE 08.1), <i>mining of metal ores</i> (NACE 07) and <i>mining and quarrying of industrial minerals</i> (NACE 08.9). Mining companies and contract mining companies range from small-scale mining to national mining companies to transnational corporations. Their operations include extraction, milling, washing, grinding, concentration, beneficiation and sometimes on-site smelting and refining of extracted material. Mining ventures must get permission of mining authorities and hold the mining rights thereby clarifying land ownership. Exploration & development firms support the mining & extraction industry in planning of their activities. Such <i>support activities for other mining and quarrying</i> (NACE 09.9) are treated separately (see 24,1). Stakeholders from a mining company perspective (EO-MINERS 2013) include shareholders of mining companies, employees, management, sub-contractors, suppliers, banks, customers; NGOs (relationship: confrontation, co-operation, evaluation). Contract mining (e.g. CMIC Group) and Joint Ventures (e.g. Morobe Mining Joint Ventures of Harmony Gold Mining and Newcrest Mining) are particular organisational forms of mining.			
Units <ul style="list-style-type: none"> industry associations: EUROMINES, the Industrial Minerals Association (IMA) – Europe, Slovenian Surface Mining Association (DTV PO) [SI], Hungarian Mining Association [HU], Mineral Products Association [GB], SveMin Swedish Association of Mines, Mineral and Metal Producers [SE] enterprises (diverse): LKAB, Boliden Mineral AB, Sandvik, KGHM Cuprum, Anglo American, MEAB Metallextraktion, Greenland Minerals and Energy Ltd., AGS Minas de Portugal, Hellas Gold, Calduran Kalkzandsteen, BHP Billiton, Agnico-Eagle, Vale, Rio Tinto, Cobre Las Cruces SA, Danish Raw Materials (Danske Råstoffer), BG Stone A / S, KPMC (ore beneficiation) bauxite enterprises: Norsk Hydro ASA, Votorantim Metais, Maaden Saudi Arabian Mining Company, Misubishi Corporation, UC Rusal, Alumina Limited, Hindalco, South32, Rio Tinto Alcan, EGA Dubai, Emal 			

³⁷ The entry of a material into the economic system goes hand in hand with an economic valorization, the re-entry of a material into the environment is associated with its economic devaluation and with environmental impacts.

Deliverable D2.1

In focus <p><i>Rio Tinto</i> is a global mining group that focuses on finding, mining and processing mineral resources. Its businesses include open pit and underground mines, mills, refineries, smelters and power stations – including a significant hydropower portfolio – as well as a number of research and service facilities. It also owns and operates infrastructure that takes its products to its customers, including railways, ports and ships. Major products are aluminium, copper, diamonds, gold, borates, titanium dioxide and salt, iron ore, thermal and metallurgical coal and uranium.</p> <p><i>BG Stone A / S</i> is the largest Danish privately owned operator in the extraction and sale of raw materials. It is a nationwide provider with delivery points centrally in Denmark.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X	X	X	X	X	X	

Code	Stakeholder group	Parent level	Parent stakeholder domain				
21,21	construction material industry	21	manufacturing industry				
Definition							
The construction material industry sector covers <i>manufacture of clay building materials (NACE 23.3), manufacture of other porcelain and ceramic products (NACE 23.4), manufacture of cement, lime and plaster (NACE 23.5), manufacture of articles of concrete, cement and plaster (NACE 23.6), cutting, shaping and finishing of stone (NACE 23.7), manufacture of structural metal products (NACE 25.1), building completion and finishing (NACE 43.3) and other specialised construction activities (NACE 43.9).</i>							
Units							
<ul style="list-style-type: none">industry associations: European Aggregates Association (UEPG), The European Cement Association (CEMBUREAU), Construction Products Europe, Assimagra [PT], British Aggregates Association [GB]enterprises: LafargeHolcim, Knauf, Euroaszfalt Ltd.							
In focus							
LafargeHolcim operates in the building materials industry. It is present in 90 countries and claims to have innovative cement, concrete and aggregates solutions.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X	X		X		X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
21,22	metals industry	21	manufacturing industry
Definition <p>The metals industry sector covers <i>manufacture of basic iron and steel and of ferro-alloys (NACE 24.1), manufacture of tubes, pipes, hollow profiles and related fittings, of steel (NACE 24.2), manufacture of other products of first processing of steel (NACE 24.3), manufacture of basic precious and other non-ferrous metals (NACE 24.4 / {24.46}), casting of metals (NACE 24.5), manufacture of tanks, reservoirs and containers of metal (NACE 25.2), manufacture of steam generators, except central heating hot water boilers (NACE 25.3), forging, pressing, stamping and roll-forming of metal; powder metallurgy (NACE 25.5), treatment and coating of metals; machining (NACE 25.6), and manufacture of other fabricated metal products (NACE 25.9).</i></p>			
Units <ul style="list-style-type: none"> industry associations (diverse): EUROMETAUX, EUROALLIAGES, European Confederation of Iron and Steel Industries (EUROFER), European Precious Metals Federation (EPMF), METALS FOR BUILDINGS [EU], The European Foundry Association (CAEF), European General Galvanizers Association, Jernkontoret – The Swedish Steel Producers Association [SE], International Tin Research Institute (ITRI), Tantalum-Niobium International Study Center, Minor Metals Trade Association (MMTA) 			

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<ul style="list-style-type: none"> aluminium industry associations: European Aluminium Association (EAA), European Aluminium Foil Association e.V., The Aluminum Association [US], Aluminum Association of Canada (AAC) [CA], Brazilian Aluminium Association (ABAL), Gulf Aluminum Council, IGORA – Association for Aluminium Recycling [CH], Council for Aluminum in Buildings (CAB), International Aluminium Institute (IAI) enterprises (diverse): Höganäs (metal powders), KGHM Ecoren (rhenium metal and ammonium rerrhenate producer), Freeport-McMoRan, Atlantic Copper, Less Common Metals Ltd. (REE alloys), ZANARDI Fonderie, Neorem Magnets OY, ERAMET, Wolfram Bergbau und Hütten AG, Vaccumschmelze, Outotec aluminium enterprises: Aughinish Alumina, Aluinvent, Aluminium SA (bauxite, alumina, aluminum), Votorantim Metais, Maaden Saudi Arabian Mining Company, Mitsubishi Corporation, UC Rusal, Chalco, Norsk Hydro ASA, Alumina Limited, Hindalco, Glencore, Aluar, Press Metal, NLM Nippon Light Metal Ltd., Trimet, AMAG Austria Metal, Sohar Aluminium, Raffineria Metall Capra, Norton Aluminium, Tandom Metalurgical Group Ltd., Aluminio La Estrella, South32, Rio Tinto Alcan, EGA Dubal and Emal, Century Aluminium, Umicore, Alcoa, China Power Investment Corp., Shandong Xinfu Aluminum & Electricity Group Ltd., East Hope Group, China Hongqiao Group Ltd., Tomago Aluminium Company Pty. Ltd., Alba (Aluminium Bahrain), Aluminij d.d. Mostar, Ma'aden Aluminium, Hillside Aluminium, Aluminerie Alouette Inc., Mozal (Mozambique Aluminium Smelter), Companhia Brasileira de Aluminio (CBA), Qatalum (Qatar Aluminium Co), Inalum 							
In focus Aurubis is an integrated copper group and the world's largest copper recycler. Its core business is the production of marketable copper cathodes from copper concentrates, copper scrap and recycling raw materials.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X	X	X	X	X	X	

Code 21,23	Stakeholder group industrial minerals and chemicals industry	Parent level 21	Parent stakeholder domain manufacturing industry
Definition The industrial minerals and chemicals industry sector covers <i>manufacture of coke and refined petroleum products (NACE 19), manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms (NACE 20.1), manufacture of pesticides and other agrochemical products (NACE 20.2), manufacture of paints, varnishes and similar coatings, printing ink and mastics (NACE 20.3), manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations (NACE 20.4), manufacture of other chemical products (NACE 20.5), manufacture of man-made fibres (NACE 20.6), manufacture of rubber and plastic products (NACE 22), manufacture of glass and glass products (NACE 23.1), manufacture of refractory products (NACE 23.2), manufacture of abrasive products and non-metallic mineral products n.e.c. (NACE 23.9), processing of nuclear fuel (NACE 24.46), and manufacture of magnetic and optical media (NACE 26.8).</i>			
Units <ul style="list-style-type: none"> industry associations: The European Chemical Industry Council (CEFIC), Plastics Europe, European Tyre & Rubber Manufacturers' Association (ETRMA), European Composites Industry Association (EuCIA), Nanotechnology Industries Association (NIA), the Industrial Minerals Association (IMA) Europe, European Lime Association, Eurogypsum, European Carbon and Graphite Association, Cerame-Unie, The European Refractories Producers Association (PRE), Glass Alliance Europe, Mineral Products Association [GB], Antwerp World Diamond Centre, Global Phosphate Forum enterprises: Magnesitas Navarras, Grecian Magnesite, Johnson Matthey (Speciality Chemicals), BASF, KWH-Mirka, Imerys, Sibelco 			
In focus BASF offers a wide range of basic chemicals and chemical products – from bulk to specialty chemicals – for agriculture, automotive & transportation, construction, electronics & electric, energy & resources, furniture & wood, home care			

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and cleaning, nutrition, packaging & print, paints & coatings, personal care & hygiene, pharmaceuticals, plastics & rubber, pulp & paper, textile, leather & footwear.

Imerys transforms a large variety of minerals into high value specialty products considered essential for its customers' products or manufacturing processes.

ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X	X	X	X		X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
21,24	mechanical equipment industry	21	manufacturing industry

Definition

The mechanical equipment industry sector covers *manufacture of general-purpose machinery (NACE 28.1), manufacture of other general-purpose machinery (NACE 28.2 / {28.32}), manufacture of agricultural and forestry machinery (NACE 28.3), manufacture of metal forming machinery and machine tools (NACE 28.4), manufacture of other special-purpose machinery (NACE 28.9)*. We also include *manufacture of cutlery, tools and general hardware (NACE 25.7)*.

Units

- industry associations: The European engineering industries association (ORGALIME), European Materials Handling Federation (FEM), Agricultural Machinery in Europe (CEMA), European Plastics and Rubber Machinery, The European Association of Machine Tool Industries (CECIMO), Verband Deutscher Maschinen- und Anlagenbau (VDMA) [DE]
- enterprises (diverse): Siemens, Kempe Engineering, AP Technology, Dickinson Group, Novelis, Aleris, Liebherr
- enterprises for aluminum processing: Mitsubishi Corporation, NLM Nippon Light Metal Ltd.

In focus

Dickinson Group is a provider of furnace & industrial services to the metals smelting, mineral processing, power generation and petrochemical industries.

ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X		X		X			

Code	Stakeholder group	Parent level	Parent stakeholder domain
21,25	electric & electronic equipment (EEE) industry	21	manufacturing industry

Definition

The electric and electronic equipment industry sector covers *manufacture of computer, electronic and optical products (NACE 26 / {26.8}), manufacture of electrical equipment (NACE 27), manufacture of office machinery and equipment (except computers and peripheral equipment) (NACE 28.23), manufacture of medical and dental instruments and supplies (NACE 32.5), installation of industrial machinery and equipment (NACE 33.2) and electrical, plumbing and other construction installation activities (NACE 43.2)*. We also include *reproduction of recorded media (NACE 18.2) and sound recording and music publishing activities (NACE 59.2)*. ICT and automation are cross-cutting industries pervading all industry sectors (e.g. ZVEI 2010). The WEEE forum is allocated to sustainable industry (21,5).

Units

- industry associations: European Committee of Electrical Installation Equipment Manufacturers (CECED), European Committee of Domestic Equipment Manufacturers (CEMED), Electrical and Electronic Manufacturing Association (eema), European Committee of Manufacturers of Electrical Machines and Power Electronics (CEMEP), European Electronic Components Manufacturers Association (ECMA), European

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<p>Photonics Industry Consortium, Digital Europe, Association of European Automotive and Industrial Battery Manufacturers (EUROBAT), Union of the Electricity Industry (EURELECTRIC)</p> <ul style="list-style-type: none"> enterprises: Siemens AG, ABB, Endress + Hauser, Rittal, Weidmüller, Phoenix Contact, Hach-Lange, Pepperl+Fuchs, Eaton, Elektrolux Group 							
<p>In focus</p> <p><i>Electrolux</i> produces home appliances based on consumer insight and developed in collaboration with professional users. They offer solutions for households and businesses with products such as refrigerators, dishwashers, washing machines, cookers, vacuum cleaners, air conditioners and small domestic appliances, thereby using a large variety of raw materials.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X	X	X	X	X		X

Code 21,26	Stakeholder group transport equipment industry	Parent level 21	Parent stakeholder domain manufacturing industry				
Definition The transport industry sector covers <i>manufacture of motor vehicles, trailers and semi-trailers (NACE 29), building of ships and boats (NACE 30.1), manufacture of railway locomotives and rolling stock (NACE 30.2), manufacture of air and spacecraft and related machinery (NACE 30.3), manufacture of transport equipment n.e.c. (NACE 30.9).</i>							
Units industry associations <ul style="list-style-type: none">vehicles: The European Car Manufacturers Association (ACEA), European Association of Automotive Suppliers (CLEPA)railway locomotives and rolling stock: The European Rail Industry (UNIFE)ships and boats: Association of European Shipbuilders (AWES), Community of European Shipyards Associations (CESA)air and space craft: Aerospace and Defence Industries Association in Europe (ASD) enterprises <ul style="list-style-type: none">vehicles: Renault, Peugeot-Citroën, Volkswagen-Audi, Seat, BMW Group, Jaguar Land Rover, Audi, Skoda, Tata, Mercedes-Benzrailway locomotives and rolling stock: Bombardier, Alstomships and boats: Multinational Engineering, Royal IHCair and space craft: EADS, Boeing, Airbus							
In focus <i>Renault SA</i> is divided into 2 operational sectors in over 120 countries: Automotive, including the design, production and distribution of products through a sales network and Services, including sales financing, rental, maintenance and service contracts. <i>Multinational Engineering</i> builds Valemax, the world's largest ore carrier with 2.3 times more capacity than its predecessors to cater the Brazil–China shipping route (Arndt et al. 2015).							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X	X		X	X	X	X

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
21,27	bio-based industry	21	manufacturing industry				
Definition The bio-based industry sector covers <i>crop and animal production, hunting and related service activities (NACE 01), forestry and logging (NACE 02), fishing and aquaculture (NACE 03), manufacture of food products (NACE 10), manufacture of beverages (NACE 11), manufacture of tobacco products (NACE 12), manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (NACE 16), manufacture of paper and paper products (NACE 17), and printing and service activities related to printing (NACE 18.1).</i> We also include <i>manufacture of basic pharmaceutical products and pharmaceutical preparations (NACE 21).</i>							
Units industry associations: <ul style="list-style-type: none">• The Confederation of Food and Drink Industries in the EU (FoodDrinkEurope), Primary Food Processors (PFP) [EU], European Manufacturers of Feed Minerals, Association Union of European Beverages Associations (UNESDA), Confederation of European Community Cigarette Manufacturers• Danish Fishery Association (Danmarks Fiskeriforening) [DK]• European Confederation of Woodworking Industries (CEI Bois), Confederation of European Paper Industries, European Pulp and Paper Chemicals Group• European Biomass Industry Association• European Association of Euro-Pharmaceutical Companies (EAECF), The European Federation of Pharmaceutical Industries and Associations enterprises: <ul style="list-style-type: none">• Nestlé, Nordzucker							
In focus <i>Primary Food Professors (PFP)</i> is the association of the European primary food processing industry. The primary food processing industry uses around 220 million tons of agricultural raw commodities (cereals, sugar beet, rape-seeds, soy beans, sunflower seeds, crude vegetable oil, starch potatoes, cocoa beans...) a year, thereby using large amounts of industrial minerals, e.g. for filtering.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
	X	X					X

Code	Stakeholder group	Parent level	Parent stakeholder domain
21,28	repair & maintenance industry	21,2	manufacturing industry
Definition The repair & maintenance industry sector covers <i>repair of fabricated metal products, machinery and equipment (NACE 33.1), maintenance and repair of motor vehicles (NACE 45.2), sale, maintenance and repair of motorcycles and related parts and accessories (NACE 45.4 / {sale}), and repair of computers and personal and household goods (NACE 95).</i> The repair & maintenance industry prolongs the useful life of products, thereby reducing the demand for primary raw materials and delaying the date when products can be exploited for material recycling.			
Units industry associations: <ul style="list-style-type: none"> The Repair Association [US], The Automotive Maintenance & Repair Association (AMRA) [US], The Restoration Industry Association (RIA) [US], Fachverband für Smartphone Reparaturbetriebe (SRQM) [DE] enterprises: <ul style="list-style-type: none"> Marangoni Retreading (tyres), Huneke Kanalsanierung (canals), Carglass, ATU Autoteile Unger, Pitstop, Siemens Repair Center Erlangen 			

Deliverable D2.1

In focus <i>Pitstop</i> is a car repair and maintenance enterprise with 330 branches in 230 cities in Germany. Pitstop has developed into a complete vehicle service workshop chain.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X							X

Code 21,29	Stakeholder group other manufacturing industry	Parent level 21,2	Parent stakeholder domain manufacturing industry				
Definition Other manufacturing industry includes <i>manufacture of textiles</i> (NACE 13), <i>manufacture of wearing apparel</i> (NACE 14), <i>manufacture of leather and related products</i> (NACE 15), <i>manufacture of furniture</i> (NACE 31), and <i>other manufacturing</i> (NACE 32 / {32.5}). We include <i>manufacture of weapons and ammunition</i> (NACE 25.4) and <i>manufacture of military fighting vehicles</i> (NACE 30.4). In a broader sense, we include maritime technology (WBGU 2013), space technology, geoengineering technology (e.g. for minimal invasive extraction of raw material in sensitive environments, or in extreme environments) and other emerging technologies (DERA/ISI 2016) which may have to be considered in raw material supply synopsis (e.g. USGS 2016) in the near future.							
Units industry associations: <ul style="list-style-type: none">furniture: European Furniture Industries Confederation (EFIC)textiles: The European Textile and Apparel Organisation (EURATEX) enterprises: <ul style="list-style-type: none">packaging cans: Ball Corporation, Crown, Can-Pack UK, Coca Cola Enterprises, Lavit, Nespresso, Constantia, Rexamdefense: Lockheed Martin, Krauss Maffei, Heckler & Kochadditive manufacturing: EOSspace technology: SpaceXmaritime technology: Earth Ocean Farms (aquaculture), SmartMarine® Enterprise (marine engineering), Planktos Inc (ocean fertilization), International Association of Dredging Companies (IADC) (artificial islands)							
In focus SmartMarine Enterprise provides flexible design, fabrication, assembly, and life-cycle management capabilities to yards and contractors within a single integrated environment. It provides marine and engineering companies with decision-support capabilities to facilitate global design, construction, and life-cycle optimization.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
		X					X

Code 21,31	Stakeholder group demolition, waste collection and management industry	Parent level 21,3	Parent stakeholder domain re-manufacturing industry
Definition The demolition, waste collection and management industry sector covers <i>waste collection</i> (NACE 38.1), and <i>demolition and site preparation</i> (NACE 43.1). We include decommissioning of products and infrastructure. This industry removes material from the use phase to process it further, e.g. to secondary material (21,32) or final waste (21,33).			

Deliverable D2.1

Units industry associations: <ul style="list-style-type: none">European Demolition Association (EDA)The European Federation of Waste Management and Environmental Services (FEAD) enterprises: <ul style="list-style-type: none">general: Recifemetal Espana (an Ambigroup Group enterprise), SUEZ - SITA Northern Europe Waste Services, Advanced Disposal, Berliner Stadtreinigungsbetriebe, Controlled Demolition, Inc., Keltbrayaddressing aluminum: Shanks Waste Management, WMR Recycling GmbH, Waste Management Inc., Swedish Waste Management and Recycling, Danish Waste Association, Sims Metal Management							
In focus Keltbray Group is a UK based business offering engineering, construction, demolition, decommissioning, remediation, rail and environmental services. It provides pre-construction advice and services in sensitive, highly regulated and constrained environments on projects ranging from city centre developments, rail infrastructure to nuclear sites.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X		X				X	

Code 21,32	Stakeholder group recycling and material recovery industry	Parent level 21,3	Parent stakeholder domain re-manufacturing industry				
Definition The recycling and material recovery industry sector covers <i>materials recovery</i> (NACE 38.3), more specifically <i>dismantling of wrecks</i> (NACE 38.31) and <i>recovery of sorted materials</i> (NACE 38.32). This industry overlaps for example with the metals industry (21,22) processing both primary and secondary raw materials in the same physical devices.							
Units industry associations: <ul style="list-style-type: none">The European Recycling Industries' Confederation (EuRIC), European Electronics Recyclers Association (EERA), European Federation of Glass Recyclers (FERVER), Plastic Recyclers Europe, European Tyre Recycling Association (ETRA), European Metal Trade and Recycling Federation (EUMETREC), European Ferrous Recovery and Recycling Federation (EFR) enterprises: <ul style="list-style-type: none">diverse: H.C. Starck, Recylex, UMICORE, Hareus, Johnson Matthey Recycling, Kötés Ltd., Solvay-Rhodia, Aurubis, Recyclex, Norsk Hydro ASAaluminum: Norton Aluminium, Tandom Metalurgical Group Ltd., Norsk Hydro ASA, Befesa, Trimet, Raffineria Metalli Capra, Stena Aluminium, Tomra (reverse vending machines for bottle and can return)							
In focus H.C. Starck provides recycling and metal processing services for tungsten, molybdenum, tantalum, niobium and rhenium, high-precision and CNC-controlled machines for customer-specific long forging, rolling and extruding of pure and alloyed materials.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X	X				X	

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Code 21,33	Stakeholder group waste treatment and disposal industry	Parent level 21,3	Parent stakeholder domain re-manufacturing industry				
Definition The waste treatment and disposal industry covers <i>waste treatment and disposal</i> (NACE 38.2), both of hazardous and non-hazardous waste. We include the recycling of slags, ashes and dusts as well as landfill mining (ZVEI 2015).							
Units industry associations: <ul style="list-style-type: none">Confederation of European Waste-to-Energy Plants (CEWEP), Syndicat national du traitement et de valorisation des déchets urbains et assimilés [FR] enterprises: <ul style="list-style-type: none">Berliner Stadtreinigungsbetriebe – Müllheizkraftwerk Ruhleben [DE], Müllverbrennung Kiel GmbH & Co. KG [DE], Shenzhen East Waste-to-Energy Plant [CN], Hoovers (treatment) [US], Plessis-Gassot landfill [FR]							
In focus The <i>Shenzhen East Waste-to-Energy Plant</i> is designed to incinerate 5,000 tons of waste per day. That's a third of the waste produced by the city of Shenzhen in a year.							
ID R&I calls	ID consultations X	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming X

Code 21,34	Stakeholder group site remediation, monitoring and maintenance industry	Parent level 21,3	Parent stakeholder domain re-manufacturing industry				
Definition The site remediation, monitoring and maintenance industry is covered by <i>remediation activities and other waste management services</i> (NACE 39). Sites include quarries, mines and industrial facilities.							
Units industry associations: <ul style="list-style-type: none">• Site Remediation Industry Network SRIN [US], NICOLE [EU] enterprises: <ul style="list-style-type: none">• Empresa de Desenvolvimento Mineiro, SA (EDM) [PT], National Uranium Company site [RO] (long-term stewards of mining legacies), RMA Ross Mitchell & Associates Group [AU], WISUTEC [DE]							
In focus <i>NICOLE</i> is a forum on contaminated land management in Europe, promoting co-operation between industry, academia and service providers on the development and application of sustainable technologies. The objective is to pro-actively enable European industry to identify, assess and manage industrially contaminated land efficiently, cost-effectively, and within a framework of sustainability. <i>RMA Ross Mitchell & Associates Group</i> offers the remediation of contaminated sites and waste management contracting services to public and private sectors throughout Australia. RMA is focused on waste minimisation to landfill sites by the treatment of material for re-use on-site or recycling. Major remediation projects have been undertaken at gasworks, mining facilities, petrochemical sites, government facilities, hazardous waste sites and landfills, metal and chemical manufacturing industries and other industrial manufacturing sites.							
ID R&I calls X	ID consultations X	ID industry	ID civil society	ID conferences X	ID country studies	ID World Café X	ID foresight & brainstorming

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Code	Stakeholder group	Parent level	Parent stakeholder domain				
21,41	infrastructure industry	21,4	other industry				
Definition The infrastructure industry covers <i>electricity, gas, steam and air conditioning supply (NACE 35), water collection, treatment and supply (NACE 36), sewerage (NACE 37), construction of buildings (NACE 41), construction of roads and railways (NACE 42.1), construction of utility projects (NACE 42.2), construction of water projects (NACE 43.91), construction of other civil engineering projects n.e.c. (NACE 43.99)</i> . Infrastructure is an important raw material end-use sector. Transportation services are covered through the stakeholder group raw material trade (23,2).							
Units industry associations: <ul style="list-style-type: none">energy: EURELECTRICwater/sewerage: Danish Water and Sewage Association (DANVA) [DK], EurEau [EU]construction/civil engineering: European Construction Industry Federation [FIEC] enterprises: <ul style="list-style-type: none">energy: E.ON [DE], EDF [FR], ENGIE [FR], Vattenfall [SE],water/sewerage: Veolia [FR], Wasserwerke Karlsruhe [DE]construction/ civil engineering: BOUYGUES GROUP [FR], Royal BAM Group [GB]							
In focus <i>EurEau</i> is the association of Europe’s drinking water and waste water service operators using large amounts of industrial minerals. Its members provide water services to more than 400 million people and reflect the diverse private and public water service industry across Europe. EurEau brings together national associations representing water supply and waste water services in 28 EU and EFTA countries.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X		X				X	X

Code	Stakeholder group	Parent level	Parent stakeholder domain
21,42	service industry	21,4	other industry
Definition The service industry covers – among others – <i>wholesale and retail trade of motor vehicles and motorcycles (NACE 45 / {45.2, 45.4 maintenance and repair of motorcycles and related parts and accessories}), wholesale trade, except of motor vehicles and motorcycles (NACE 46), retail trade, except of motor vehicles and motorcycles (NACE 47), and cleaning activities (NACE 81.2)</i> . We include the tourism industry, in particular covering parts of <i>accommodation (NACE 55), food and beverage service activities (NACE 56), and travel agency, tour operator reservation service and related activities (NACE 79)</i> .			
Units industry associations <ul style="list-style-type: none"> retail: Independent Retail Europe, Dansk Handel og Service [DK] tourism: European Tourism Association [ETOA], HOTREC – the Voice of Hotels, Restaurants, Cafés and similar establishments in Europe other: Association of Residential Cleaning Services International enterprises <ul style="list-style-type: none"> retail: Migros [CH], Decathlon [FR], Tesco [GB], EDEKA [DE] tourism: Nordic Visitor (IL), TUI [DE] other: Gegenbauer Gebäudeservice GmbH [DE] 			

Deliverable D2.1

In focus <p>The assessment of effects of the proposed iron sand seabed mining by the TTR company in the south, <i>Taranaki Bight (New Zealand)</i> on recreation and tourism concludes that direct effects are relatively minor with little impact on specific recreation and tourism activities along the southern Taranaki coast study area. Implications of unintended outcomes (such as ship collisions and oil spills) would have an impact on recreation and tourism in the area (m.e environment 2014).</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
							X

Code 21,5	Stakeholder group sustainable industry	Parent level 21	Parent stakeholder domain industry (enterprises, associations)				
Definition Sustainable industry is an umbrella term for enterprises that integrate sustainability into its operations as part of their CSR strategies, specific value-driven enterprises (Stoner 2011) dedicated to sustainability, and industry initiatives to foster sustainability. Many enterprises and industry associations listed above (21,1-21,4) may be considered sustainable. Sustainable industry is singled out here to shed light on private sector organisations and initiatives whose major purpose is to promote sustainability rather than to generate profit.							
Units <ul style="list-style-type: none">sustainability initiatives: WEEE Forum, World Business Council for Sustainable Development (WBSCD), Finnish Network for Sustainable Mining, Aluminium Stewardship Initiative, World Green Building Council, International Council on Mining and Metals (ICMM)value-driven business: The Crown Estate [GB], Mondragon Corporation [ES]							
In focus The <i>Crown Estate</i> is a value-driven business investing in and managing some of the UK's most important assets, ensuring they are sustainably worked, developed and used to deliver value over the long term. The <i>WBSCD World Business Council for Sustainable Development</i> is a CEO-led organization of forward-thinking companies that aims to create a sustainable future for business, society and the environment. The WBSCD aims to be the leading voice of business that supports companies in scaling up value-added business solutions and in creating the conditions where more sustainable companies will succeed and be recognized. The <i>International Council on Mining and Metals (ICMM)</i> is an international organisation dedicated to improving the social and environmental performance of the mining and metals industry. Bringing together 23 mining and metals companies and 34 regional and commodities associations, it sees itself as an agent for change towards a safer and more sustainable industry.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
	X						

Code 22,1	Stakeholder group cross-sector industry associations	Parent level 22	Parent stakeholder domain industry umbrella organisations
Definition Cross-sector industry associations cover industry federations at global, European and national level, employer associations (BPB 2013) and chambers of commerce. Their main purpose is to serve all industries and to speak with one industry voice in policy-making.			

Deliverable D2.1

Units <ul style="list-style-type: none"> chamber of commerce: International Chamber of Commerce (ICC), General Council of the Catalan Chambers of Commerce [ES], British Chambers of Commerce (BCC) [GB], Aussenhandelskammer (AHK) [DE] employers association: The European employers' organisation (CEEMET) industry federations: Business Europe, Bundesverband der Deutschen Industrie (BDI) [DE], Confederation of British Industry [GB], Business Fédération Luxembourg (FEDIL)[LU], Confederation of the Danish Industry [DK] 							
In focus <p><i>CEEMET</i> is the European employers' organisation representing the interests of the metal, engineering and technology-based industries with a particular focus on labour market policy and industrial relations issues. Members are national employers' organisations and federations representing 200,000 member companies across Europe.</p> <p>The <i>British Chambers of Commerce (BCC)</i> is an independent business network with accredited chambers in every nation and region of the UK and in key markets around the world. It provides practical advice and support to British companies trading around the world.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
	X	X					

Code 22,2	Stakeholder group standardisation bodies	Parent level 22	Parent stakeholder domain industry umbrella organisations				
Definition Standardisation bodies include established standardization organisations and temporary committees with a specific purpose as well as quality control and certification organisations verifying compliance with standards.							
Units <ul style="list-style-type: none">• general standardization bodies: CEN, ISO, DIN [DE], International Electrotechnical Commission [IEC]• standardization committees: Pan-European Reserves & Resources Reporting Committee (PERC), the Committee For Mineral Reserves International Reporting Standards (CRIRSCO), INfrastructure for SPatial InfoRmation in Europe (INSPIRE), The Commission for the Management and Application of Geoscience Information (IUGS-CGI), Global Earth Observation System of Systems development (GEOSS), Extractive Industries Transparency Initiative (EITI), Expert Group on Resource Classification (EGRC) of UNECE• quality control/certification: Limestone and Brickwork Association (Kalk- og Teglværksforeningen) [DK], European Quality Association for Recycling e.V.							
In focus <p>The <i>Pan-European Reserves & Resources Reporting Committee (PERC)</i> is the organisation responsible for setting standards for public reporting of exploration results, mineral resources, and mineral reserves by companies listed on markets in Europe.</p> <p>The <i>Extractive Industries Transparency Initiative (EITI)</i> is a global standard to promote the open and accountable management of natural resources. It seeks to address the key governance issues of the oil, gas and mining sectors. It requires information along the extractive industry value chain from the point of extraction to how the revenue makes its way through the government to how it benefits the public. This includes how licenses and contracts are allocated and registered, who the beneficial owners of those operations are, what the fiscal and legal arrangements are, how much is produced, how much is paid, where those revenues are allocated and what the contribution to the economy, including employment is.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X							

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
23,11	raw material market places	23	raw material commerce				
Definition Enterprises pursue different strategies to procure raw materials ranging from spot contracts at raw material exchanges to supply contracts over years to shares in supply companies (KfW 2011). Raw material procurement has become a strategic mid-to long-term issue for many companies. Raw material market places refer to the matching of supply and demand and related financial transactions including raw material exchanges, brokerage intermediaries trading raw materials and directly contracting parties.							
Units <ul style="list-style-type: none">raw material exchange: LME London Metal Exchangebrokerage intermediaries / trading companies: Istanbul Mineral Exporters' Association (minerals), AMC Group (metals), The Robert Gibbs (contracting) Company Limited (scrap), Romet, Schweizerische Metallhandels AG (physical investment in raw materials)contracting parties: ThyssenKrupp directly investing in a copper mining venture and receiving the by-product molybdenum in turn.							
In focus The <i>LME London Metal Exchange</i> is a global centre for industrial metals trading. The prices built through three trading platforms are used as the global reference price and both the metal and investment communities use the LME to transfer or take on risk. Traded commodities include aluminium, aluminium alloys, North American Special Aluminium Alloy Contract (NASAAC), copper, lead, nickel, tin, zinc, cobalt, molybdenum, steel billet.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	X

Code	Stakeholder group	Parent level	Parent stakeholder domain
23,12	raw material trade	23	raw material commerce
Definition Raw material trade refers to the physical activities involved in the exchange of raw materials, namely logistics, warehousing and transportation at various scales. The international shipping industry enables the shipment of 90% of global trade volume (ICS 2015). Dry bulk commodities, namely iron ore, coal, grain, bauxite and alumina, phosphate rock and minor bulks accounted for nearly half of the total 52,572 estimated billion ton-miles performed in 2014 (UNCTAD 2015). Arriving at ports, raw materials are then distributed via the trans-European transport network. Aggregates for construction are usually traded only regionally and locally (mainly railways, inland waterways, road transport). Shipments are registered through authorities of the ministries of the economy (31,11) and trade & finance (31,13).			
Units <ul style="list-style-type: none"> logistics and warehousing (incl. stockpiling): GEINVEST Ltd., Japan Oil, Gas and Metals National Corporation (JOGMEC) international shipping: China Cosco Shipping, International Chambers of Shipping (ICS), Intercargo World Shipping Council continental transport: trans-European transport network (T-ETN) regional and local transport: BG Stone [DK] 			
In focus <i>Intercargo (international Association of Dry Cargo Shipowners)</i> represents shipowners, managers and operators of dry cargo vessels. It deals with fair treatment of seafarers (& criminalisation), piracy, places of refuge, MARPOL Annex VI, Greenhouse Gas Emissions from ships, reception facilities, ballast water management and corruption. The <i>World Shipping Council</i> represents liner shipping which is the service of transporting goods by means of high-			

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capacity, ocean-going ships that transit regular routes on fixed schedules. There are approximately 400 liner services in operation today, most of them sailing weekly. Liner vessels, primarily in the form of containerhips and roll-on/roll-off ships, carry about 60 % of the goods by value moved internationally by sea each year.							
ID R&I calls	ID consultations X	ID industry	ID civil society	ID conferences X	ID country studies	ID World Café X	ID foresight & brainstorming

Code	Stakeholder group	Parent level	Parent stakeholder domain				
23,21	stock exchanges	23	financial commerce				
Definition Stock exchanges are financial market places at which sellers and buyers trade shares and other financial products. Stock exchanges play a vital role for investments in raw materials, e.g. as fund management (pension funds, hedge funds, private equity funds) may affect entire economies (and its raw material supply and demand) and as shares of companies from the raw material domains are issued and traded, thereby financing, for example, mining ventures. Investors may aim, for example, at asset development or venture capital provision.							
Units <ul style="list-style-type: none">• general funds: Knight Vinke, Government Pension Fund Japan [JP], European Investment Fund (EIF) [EU], European Fund for Strategic Investments (EFSI) [EU]• exchange traded commodity funds (ETF): BOOST ISSUER SILV.ZT13/62 exchange-traded commodity, Dow Jones UBC commodity index• investors: United Minerals Group (UMG) INVEST, George Soros (retired individual, see 44)							
In focus <i>United Minerals Group (UMG) INVEST</i> is a company focused on asset management in the commodity sector, industrial production and sales. It was founded in 2006 by System Capital Management. The company's portfolio includes products such as ball clay, limestone, ash and slag products, rare and technical gases, grains and oilseeds and mineral fertilizers.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
				X		X	

Code 23,22	Stakeholder group financial institutions	Parent level 23	Parent stakeholder domain financial commerce
Definition Financial services are provided by a broad spectrum of institutions (NACE 64-66), comprising public and private banks, insurance companies, fund management companies, real estate companies (NACE 68), rating agencies and royalty companies. Royalty companies provide upfront capital to developing mining, and receive a royalty on future production.			
Units All units listed, but the royalty companies, are not specific to the raw materials domain: <ul style="list-style-type: none"> public banks: EIB European Investment Bank, EBRD European Bank for Reconstruction and Development, Worldbank, KfW Bankengruppe [DE] private banks: BB&T Capital Markets, Lincoln International, Goldman Sachs, ABN AMRO, Nordic Investment Bank, ING Group, Mirea Asset, Zet Capital Partners insurance companies: Lloyds Insurance fund management: M2 Capital Partners International, Z Capital Partners L.L.C. real estate companies (agents, brokers, investors): Residential Capital Management [US], URC United Real 			

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<p>Estate Company [MENA]</p> <ul style="list-style-type: none"> rating agencies: Standard & Poors, Fitch, Moody royalty companies: Franco Nevada <p>Financial markets and stock exchanges are monitored and controlled through authorities of the ministries of the economy (31,11) and trade & finance (31,13).</p>							
<p>In focus</p> <p>The <i>European Bank for Reconstruction and Development (EBRD)</i> is owned by 65 countries from five continents as well as the European Union and the European Investment Bank. Each shareholder is represented on the Board of Governors, which has overall authority over the EBRD. EBRD's financing for private sector projects generally ranges from \$5 million to \$250 million in the form of loans or equity. To address the transition challenges in the natural resources sector, the EBRD focuses on improving environmental, social, corporate governance and transparency standards as well as enhancing energy efficiency and energy security. It supports local governments or private operators in the delivery of urban services, notably in water and wastewater, public transport, urban roads and lighting, solid waste management, district heating and energy efficiency.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
		X		X		X	

Code 24,1	Stakeholder group exploration & development support	Parent level 24	Parent stakeholder domain technical support (mining/urban mining)				
Definition The exploration & development support stakeholder group refers to both geological deposits and anthropogenic stocks. It includes the prospection and exploration of geological deposits, siting, and mine development (designing, construction) (NACE 09.9, 71.12). The exploration firm may sell the project on to a mining firm if it does not develop the mine project by itself. Exploration refers to Greenfield exploration applied to unexplored areas and to Brownfield exploration, i.e. the re-exploration of projects developed (partially) in the past. There is no such concrete equivalent to urban mining, but it can be constructed analogue.							
Units <ul style="list-style-type: none">offshore deposits: Aross Marine Consulting Aps [DK]: Service provider of marine surveying, inspections and claims handling.onshore deposits: VA Erzberg GmbH, Swick Drilling Portugal, SRK Exploration Services, Joy Global, Fugro Austria GmbHanthropogenic stocks: e.g. utility companies, land registry offices, remote-sensing companies							
In focus SRK Exploration Services delivers field and consultancy services for exploration projects worldwide. It specialises in the exploration for all metal and industrial mineral commodities, elevating projects from the earliest stage of exploration through to resource drilling.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
	X			X			

Code	Stakeholder group	Parent level	Parent stakeholder domain
24,2	physical operations support	24	technical support (mining/urban mining)
<p>Definition</p> <p>The physical operations support stakeholder group refers to both mining and recycling. It includes the supply of consumables (e.g. explosives, drilling oil), machinery and equipment (e.g. excavators, conveyer belts), systems and</p>			

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processes (e.g. sieve classification, metallurgical solutions) and automation (e.g. filed sensors, manufacturing execution systems). For recycling, the physical operations support seems to be more integrated, e.g. in the field of material identification and separation (ZVEI 2015).

Units mining: <ul style="list-style-type: none"> consumables: BASF, Arkema, Tecnicas Reunidas, WOLA Chemisch-Technische Erzeugnisse, Orica machinery and equipment: Caterpillar, Atlas Copco (MEYCO acquisition), Gonar-Bis Sp. z o.o. , IHC Mining B.V. , Weir Minerals Europe Ltd, Royal IHC systems and processes: Metso Minerals, Sandvik Mining and Construction GmbH, TOMRA Sorting Solutions, Draeger Safety, STEINERT Elektromagnetbau GmbH, APPROPRIATE PROCESS TECHNOLOGIES PTY LTD, automation: ABB AB, Computer Control Technology (SK), Institute for Systems and Computer Engineering of Porto INESC TEC, Resources Computing International Ltd. (RCI) Mathematics Consulting, Endress*Hauser, Krohne, Pepperl+Fuchs, Phoenix Contact, Rittal, Siemens, Weidmüller recycling: <ul style="list-style-type: none"> machinery and equipment: SMS Siemag systems and processes: Tomra, Eldan Recycling A/S, ZB Group, MTB Recycling S.A., MMH Recycling Systems Ltd, Redoma Recycling AB, WENDT CORPORATION automation: ABB, Bayer Technology Services, Evonik Industries, Endress*Hauser, Krohne, Pepperl+Fuchs, Phoenix Contact, Rittal, Samson, Siemens, Weidmüller

In focus <p><i>Royal IHC</i> designs, builds and maintains equipment and vessels, working from sea level to ocean floor, for maritime service providers in the offshore, dredging and mining industries.</p> <p><i>Sandvik Mining and Construction GmbH</i> is a provider of equipment and solutions for mineral exploration, underground mining in hard and soft formations, surface mining and bulk materials handling and specific areas of the construction industry such as quarrying, tunneling, demolition and recycling and other civil engineering applications.</p> <p><i>Siebertechnik GmbH</i> is an enterprise in the special-machine and plant construction branch with a product range for the treatment of mineral bulk solids as well as for solid-liquid separation in the chemicals and foodstuffs industries.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X				X			

Code 24,3	Stakeholder group information support	Parent level 24	Parent stakeholder domain technical support (mining/urban mining)
Definition <p>The information support stakeholder group refers to both mining and recycling. It covers two main branches: data, computation and modelling, telecommunications as well as testing and analysis. A more recent development is information support provided through Big Data (e.g. through IBM).</p>			
Units <ul style="list-style-type: none"> data, computation and modelling, telecommunications: Granta Design, Gemcom Software, DFKI, ATOS France, Fugro Austria GmbH, Robertson Geologging Ltd., Geodan Software Development & Technology, GeoSpatiumLab, Geodata Ziviltechnikergesellschaft testing and analysis: ALS Minerals Geochemistry, OCAS (chemical analysis of castings and coated products) 			
In focus <p><i>Robertson Geologging Ltd</i> is a company in the design, manufacture and supply of slim-hole, digital wireline logging systems for mining/mineral surveys, geotechnical engineering studies, shallow oil/gas operations and unconventional resources.</p>			

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ALS Geochemistry is a provider of analytical data services to the mining and exploration sectors, in particular for the estimation of mineral resources. They have over 60 locations around the world. Its analytical laboratories are certified and registered in each region with global application of standard procedures and audits.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
				X			X

Code 24,4	Stakeholder group infrastructure support	Parent level 24	Parent stakeholder domain technical support (mining/urban mining)				
Definition Infrastructures are shared basic support structures of operations (Frischmann 2012). The stakeholder group infrastructure support here relates to infrastructure that makes a mining or recycling activity work, while the building and operation of infrastructures is an important raw material end-use sector (cf. 21,41). Operation sites need energy supply, water supply/sewage, transportation and other infrastructure services (e.g. safety systems). It covers on-site solutions and connections to the public infrastructure.							
Units <ul style="list-style-type: none">energy supply: Siemens, Rio Tinto's own hydropower generating facilitieswater supply/sewage: Veolia Water Technologies South Africatransportation: Ferrit Global Mining Solutions (transport systems at mines), Trade association for Danish commercial ports (Danske Havne), Danish Shipowners Association (Danmarks Rederiforening), The Voice of European Railways (CER)other infrastructure services: PBE Mining Solutions							
In focus <i>Veolia Water Technologies South Africa</i> builds mine water treatment systems to match the specific requirements of mining applications, e.g. mining for gold, nickel and copper mining to uranium, coal or other minerals. It offers modular water and wastewater treatment plants, e.g. for managing the water requirements of populations living in remote locations. <i>PBE Mining Solutions</i> designs, engineers and manufactures integrated solutions for safety, communications, monitoring and control systems for mines around the world. It is supported and serviced by its network of global offices and distribution partners.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
	X			X			X

Code	Stakeholder group	Parent level	Parent stakeholder domain
24,5	consultancies and planning offices	24	technical support (mining/urban mining)
Definition This stakeholder group integrates consultancies and planning offices as the latter also provides specific consultancy services. A consultancy is a company that gives professional advice to other companies for a fee (Merriam-Webster 2016b). It comprises <i>architectural and engineering activities and related technical consultancy</i> (NACE 71.12). This stakeholder group includes spatial & urban planning offices, offices/architecture bureaus, engineering consulting/engineering office, research & innovation consulting/design offices, geology/mining/raw materials consulting, environment consulting, business and other management consultancy activities, law firms. These actors also carry out research services thereby providing concrete intelligence to private sector companies.			

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Units <ul style="list-style-type: none"> spatial & urban planning offices/ architecture bureaus: ISKRIVA, Institute for Spatial Planning of the Koprivnica-Krizevi County, Architekten von Gerkan, Marg & Partner engineering consulting/ engineering office: BMT Group, Raw Materials Group (consulting and data on mining and smelting), G.E.O.S. Freiberg Ingenieurgesellschaft, Integrated Resources Management Malta, DMT GmbH, SUEZ Environment, SOPREMA, ENCO S.r.l., Tec3i, INNOVATECH, TWI Limited, GeMMe Génie Minéral, Matériaux & Environnement research & innovation consulting/ design offices: PNO Europe, CEINNMAT, KTN, Spinverse, Sirris geology/mining/raw materials consulting: Roskill Information Services, GWP Consultants LLP, SRK Consulting, Micin International environment consulting: Milieu Ltd, BIPRO GmbH, Bio Intelligence Service, COWI A/S, Industrial Ecology Consultants, Deloitte, Kemakta Konsult AB, AEA Technology, LRS Consultancy, Environmental Resources Management (ERM) business and other management consultancy activities (economic analysis, accounting, bookkeeping and auditing firms; tax consultancy): PwC PriceWaterhouseCorporation, Ernst & Young, SNL Metals and Mining law firms: Hayes Law Firm, Norton Rose Fulbright [CA] 							
In focus <p><i>Micon</i> is a mining consultancy providing professional advice to mining companies and to their providers of capital, law firms and government agencies.</p> <p><i>Environmental Resources Management (ERM)</i> is a provider of environmental, health & safety (EHS), social and sustainability consulting services.</p> <p><i>BMT Group [GB]</i> is an engineering, science and technology consultancy, operating mainly in the maritime industries.</p> <p><i>Norton Rose Fulbright [CA]</i> advises on all aspects of mining transactions and project development for domestic and global clients with mining interests. Its coverage of comprehensive law firm services is illustrated by diverse awards from different institutions, including Global Mining Law Firm of the Year (Who's Who Legal Awards 2013), Energy and Natural Resources Law Firm of the Year (IFN Awards Law Poll 2012) and Lawyers of the Year for Aboriginal, Securities and Corporate Law (Best Lawyers 2013).</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X	X	X	X

4.3 Political system

A **political system** is a system of politics and government (Wikipedia 2016g). The focus in MICA is on raw material related politics and governance. The political system in democracies is generally made up of an executive (31), legislative (32) and judiciary (33).

Code 31,1	Stakeholder group governments (EU, national)	Parent level 31	Parent stakeholder domain executive
Definition <p>A government sets and administers public policy and exercises executive, political and sovereign power through customs, institutions and laws applicable to a territory and/or groups of people (Business Dictionary 2016a). Forms of governments include democracy, republic, monarchy, aristocracy and dictatorship. Cabinets and committees (e.g. Environment and Planningscommittee of the Danish Government) assist to coordinate the different institutions of a government. Government domains include executive and legislative organs, financial and fiscal affairs, external affairs and international development, basic research, and transfers of a general character between different levels of government. Specific public issues are treated by government ministries, agencies and administrative authorities (OECD 2011). A ministry is headed by a minister.</p>			

Deliverable D2.1

Governments have been classified into resource privatism, resource nationalism, producer country resource nationalism, consumer country resource nationalism and investment target country resource nationalism (Ward 2009). Raw material interests in a foreign country may involve diplomacy and embassies (e.g. Embassy of Canada to Hungary, Slovenia and Bosnia and Herzegovina). Most national and some regional governments have a ministry, department or an office for geology and/or mining. They are attached to different ministry types (e.g. mines, economy, industry, ecology and natural resources, land, education and science) reflecting the diverse approaches to the tailoring of powers. The geology/mining body's remit ranges from geological science to territorial planning and mining permissions to mineral policy development. Agencies and administrative authorities for special purposes are usually assigned to the respective ministries or directly to the government.

Units

Governments operate at supranational, national and subnational level.

- subnational level: Wales [GB], Scotland [GB], Cataluña [ES], Alpes-Maritime [FR]
- national level: USA, South Korea, Germany (industrialized countries), Brazil, Russia, India, China, South Africa (BRICS, emerging countries), Bolivia, Mongolia, Zimbabwe (developing countries); Embassy of Canada to Hungary, Slovenia and Bosnia and Herzegovina [CA]
- supranational level: European Union, ASEAN, OECD, UN General Assembly, UN High-level Political Forum on Sustainable Development, G7 Summit

At the time of writing, the voters in the UK have voted – on average – for an exit from the EU; however, the implementation is unclear. While England and Wales were – on average – in favour of leaving, Scotland and Northern Ireland were – on average – in favour of remaining in the EU. One cannot rule out the possibility that parts of the UK will leave the UK and stay within the EU. Such an exit of the UK from the EU might detach the UK (or parts) from the EU's R&I funding or structural funds in the future.

In focus

The *European Union* is governed mainly through the European Commission and the European Council. There are different horizontal (e.g. the committee of the regions) and vertical (e.g. multi-level governance between EC and national ministries) co-ordination mechanisms. Policy initiatives such as the NATURA2000 refit or Circular Economy Action Package involve the horizontal and vertical coordination of many government units.

The *EU's Raw Material Initiative* aims at securing the sustainable supply of raw materials (non-energy, non-agricultural) through 3 pillars – (1) ensuring level playing fields in access to resources in third countries (trade strategy, raw material diplomacy, developing countries), (2) fostering the sustainable supply from European sources (good practices, EU knowledge base, research and skills), (3) boosting the resource efficiency and promotion of recycling (waste legislation, waste shipment regulation); cross-cutting issues are sector specific criticality analyses, markets and stockpiling, research, ERECON (see 12,11) and the EIP on Raw Materials (see 12,14). The EIP High-Level Steering Group Members include the EU Commissioner for Environment, Maritime Affairs and Fisheries; the EU Commissioner for Research, Science and Innovation; the EU Commissioner for Internal Market, Industry, Entrepreneurship and SMEs as well as the French Minister of Industrial Renewal; the Swedish Minister of Environment; the Austrian Minister of Economy; the Greek Deputy Minister of Environment, Energy and Climate Change; the German Federal Minister for Economic Affairs and Energy; the Polish Deputy-Prime Minister and Minister of Economy; the Ministry of Environment of the Slovak Republic, and the Spanish Secretary of State for Science, Technology and Innovation.

The *Dansih Raw Material Plan 2016* (Råstofplanen) (Naturstyrelsen 2014) outlines the principles of raw material planning at different government levels. Planning is to be based on the mapping of raw materials (p. 2). It is to focus on (a) raw material volume and quality, and (b) on environmental protection, interests regarding water supply, values pertaining to landscape, geological and scientific as well as earth- and forest-related interests (§3). The region shall plan the digging areas for raw materials to such an extent that raw material demand for the raw material plan period (of 12 years) can be accommodated (p. 2). The raw material plan should respect existing infrastructural installations and reservations for areas for future infrastructural installations such as wind turbines, transmission cables, roads or rail tracks shown in the municipal plans pursuant to sectoral laws, and design- and installation laws (p. 3).

ID R&I calls	XID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X				X	X	

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
31,11	ministries of economic affairs	31,1	governments				
Definition Ministries of economic affairs have a large variety of remits including general economic, commercial and labor affairs; coverage of industry sectors (in particular mining, manufacturing and construction); raw material diplomacy. In some countries, the ministries of economic affairs have a mining directorate, in other countries there is a separate ministry of mining. Mining ventures must submit information based on environmental and social impact assessments in order to be eligible for an evaluation to receive a permission of mining authorities. The responsibilities for offshore mining ventures may involve other ministries (e.g. ministries of the environment). Agencies and authorities for energy, raw materials, development and investment and finance may assist the ministries of economic affairs (see 31,13).							
Units ministries: <ul style="list-style-type: none">sub-national level: Greenlandic Department for Business and Labour Market [DK], Department of Enterprise Trade and Investment (Northern Ireland, [GB])national level: Ministry of Economy, Energy and Tourism [BG], Ministry of Economic Affairs of Herzegbosnian Canton [BA], Finnish Ministry of Employment and the Economy [FI], Ministry of Industry, Labour and Trade [DK], Federal Ministry for Economic Affairs und Energy (BMWi) [DE], Department for Business Innoovation and Skills [GB], The Ministry of Mineral Resources [DK]EU level: Directorate-General Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), Directorate-General International Cooperation and Development (DG DEVCO)international level: UN Economic and Social Council, UN Department of Economic and Social Affairs agencies and authorities: <ul style="list-style-type: none">sub-national level: local Mineral Planing Authorities [DK]national level: The Mining Inspectorate of Sweden [SE], Mineral License and Safety Authority [DK], Danish Energy Agency [DK], Deutsche Rohstoffagentur (German raw material agency, DERA) [DE], Investment and Development Agency of Latvia (LIAA) (LT), Department for Transport [GB], Coal Authority [GB], GIZ (international development consulting) [DE]EU level: Innovation & Networks Executive Agency (INEA), European Economic and Social Committee, European Chemicals Agency, Trans-European Transport Network Executive Agency (TEN-T EA)international level: International Atomic Energy Agency (IAEA), UN International Labor Organisation (ILO), International Seabed Authority (ISA), International Maritime Organisation (IMO), United Nations Industrial Development Organisation (UNIDO), United Nations World Tourism Organisation (UNWTO), United Nations Development Programme (UNDP)							
In focus The <i>Greenlandic Department for Business and Labour Market Issues</i> contracts out certification requirements to applicants to become suppliers to the raw material sector and coordinates the development of related competences. The <i>International Seabed Authority (ISA)</i> is an autonomous international organization established under the 1982 United Nations Convention on the Law of the Sea and the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea. The Authority is the organization through which States Parties to the Convention shall organize and control activities in the Area, particularly with a view to administering the resources of the Area, in accordance with the regime for the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction (the Area) established in Part XI and the Agreement.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X		X	

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
31,12	ministries of the environment	31,1	governments				
Definition Ministries of the environment deal with emission, transmission and immission of substances, ecosystem protection, green economy, circular economy, resource efficiency, material stocks and flows, sustainable production and consumption, waste programmes (e.g. Waste and Resources Action Programme in the UK); their remit may also cover public health, nuclear power, nature conservation and so on. In some countries, natural resources are governed through the ministries of economic affairs. In particular, environmental ministries and their respective agencies/authorities deal with the environmental impacts of mining and recycling. Treatment of environmental issues of offshore mining may involve international bodies.							
Units ministries: <ul style="list-style-type: none">sub-national level: Department of the Environment (Northern Ireland) [GB]national level: Danish Ministry for Environment and Food [DK], Danish Ministry for Energy, Supply and Climate [DK], Department for Environment, Food and Rural Affairs (DEFRA) [GB], Department for Energy and Climate [GB], Ministère de l'Environnement, de l'Energie et de la Mer (MEEM) [FR]EU level: Directorate-General Environment, e.g. Unit A.2 Waste management and recycling agencies and authorities: <ul style="list-style-type: none">sub-national level: Natural England, Scottish Natural Heritage, Natural Resources Wales, Scottish Environment Protection Agency, Environmental Agency (England), Commissioner for Heritage's Office (Hongkong)national level: Environment Agency for Mineral Resources Activities (EAMRA) [DK], Danish Environmental Agency [DK], Environmental Agency [GB]EU level: European Environment Agency (EEA)international level: Intergovernmental Panel on Climate Change (IPCC), United Nations Environmental Programme (UNEP)							
In focus The <i>European Environment Agency</i> (EEA) provides independent information on the environment for those involved in developing, adopting, implementing and evaluating environmental policy and also for the general public. The EEA gathers data and produces assessments on a wide range of topics related to the environment. Thereby it collaborates with the European Environmental Information and Observation Network and its 33 EEA member countries.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X	X	X	X

Code	Stakeholder group	Parent level	Parent stakeholder domain
31,13	ministries of trade & finance	31,1	governments
Definition Ministries of trade and finance deal with the provision of the economy with money, trade relations, customs, trade taxes and so on. The supporting agencies include the authorities that control customs (e.g. at ports, airports and terrestrial border crossings), stock exchanges and financial markets. Ministries of trade and finance provide framework conditions and control financial and physical transactions of raw materials.			
Units ministries: <ul style="list-style-type: none"> sub-national level: Börsenaufsicht Frankfurt a.M. of Hessisches Ministerium für Wirtschaft, Energie, Verkehr und Landesentwicklung [DE] national level: Secrétariat d'État chargé du commerce, de l'artisanat, de la consommation et de l'économie 			

Deliverable D2.1

<p>sociale et solidaire [FR]</p> <ul style="list-style-type: none"> EU level: Directorate-General Trade, Directorate-General Economic and Financial Affairs (DG ECFIN) <p>agencies and authorities:</p> <ul style="list-style-type: none"> sub-national level: Port of Rotterdam Authority [NL] national level: Italian Competition Authority [IT] EU level: The European Securities and Markets Authority (ESMA) international level: World Trade Organisation (WTO), International Monetary Fund (IMF), United Nations Conference on Trade and Development (UNCTAD), World Bank Group, e.g. International Bank for Reconstruction and Development (IBRD) 							
<p>In focus</p> <p><i>The European Securities and Markets Authority (ESMA) is an independent EU Authority that contributes to safeguarding the stability of the European Union's financial system by enhancing the protection of investors and promoting stable and orderly financial markets.</i></p> <p><i>The objective of the Port of Rotterdam Authority is to enhance the port of Rotterdam's position as a logistics hub and industrial complex. It manages, operates and develops the port and industrial area of Rotterdam. The Port Authority is responsible for maintaining the safe and smooth handling of all shipping. It invests in the development of the existing port area, in new port sites, public infrastructure and in handling shipping. Shareholders of the Port of Rotterdam Authority are the Municipality of Rotterdam (ca. 70 %) and the Dutch government (ca. 30 %).</i></p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X					X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
31,14	ministries of spatial planning	31,1	governments
<p>Definition</p> <p>Ministries of spatial planning are usually equipped with broad framework planning competences. Competencies for spatial planning may be located mainly at sub-national level, mainly at national level or shared between subnational and national levels (Silva & Achemping 2015). The division of labour may involve strong vertical and horizontal coordination, mainly vertical coordination, mainly horizontal coordination or weak vertical and horizontal coordination. Some countries use strategic environmental assessment (SEA) and/or environmental impact assessment (EIA) in spatial planning, others not. Key topics are land use, infrastructure planning and regional economic development. Area development companies are often state-owned.</p>			
<p>Units</p> <p>ministries:</p> <ul style="list-style-type: none"> sub-national level: Senate Department for Urban Development and the Environment Berlin [DE] national level: Department for Communities and Local Government [GB] EU level: Directorate-General Regional and Urban Policy (DG REGIO), Directorate-General Agriculture and Rural Development (DG AGRI), Structural funds <p>agencies and authorities:</p> <ul style="list-style-type: none"> sub-national level: London Old Oak and Park Royal Development Corporation [GB], Shanghai Lingang Economic Development (Group) Co., Ltd [CN] national level: The Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) Swedish Agency for Marine and Water Management [SE] EU level: European Commission Conference on maritime spatial planning (MSP), Committee of the Regions international level: United Nations Human Settlements Programme (HABITAT); United Nations regional commissions for Africa (UNECA), Europe (UNECE), Latin America (UNECLAC), Asia and the Pacific (UNESCAP), Western Asia (UNESCWA) 			

Deliverable D2.1

In focus							
In China, there are currently 8 major state-owned developers delivering projects ranging from infrastructure investment and construction to properties development. <i>Shanghai Lingang Economic Development (Group) Co., Ltd</i> develops industrial parks in the Heavy Equipment Manufacturing Zone and Logistics Zone.							
The <i>Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR)</i> within the <i>Federal Office for Building and Regional Planning (BBR)</i> in Germany is a departmental research institution under the portfolio of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). It advises the Federal Government with sectoral scientific consultation in the political fields of spatial planning, urban development, housing and building.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X						

Code	Stakeholder group	Parent level	Parent stakeholder domain				
31,15	ministries of social affairs	31,1	governments				
Definition							
The remit of ministries of social affairs ranges from social protection, recreation, culture and religion to health to housing and public amenities. In some countries, education is a task of the ministries of social affairs; in other countries, it is the task of the ministries of research and innovation. It also includes the protection of cultural heritage. Labor conditions and workers rights in the mining industry are among the key issues of ministries of social affairs.							
Units							
ministries:							
<ul style="list-style-type: none">sub-national level: Ministerium für Arbeit, Integration und Soziales des Landes Nordrhein-Westfalen [DE]national level: Ministry of Social Affairs and Employment [NL], Department for Work and Pensions [GB]EU level: Directorate-General Employment, Social Affairs and Inclusion (DG EMPL), Directorate-General Migration and Home Affairs (DG HOME)international level: UN Department of Economic and Social Affairs, UN Office for the Coordination of Humanitarian Affairs (OCHA)							
agencies and authorities:							
<ul style="list-style-type: none">sub-national level: Regional Secretary for Social Solidarity (Azores) [PT]national level: Federal Employment Agency [DE]EU level: European Agency for Safety and Health at Work, European Centre for Disease Prevention and Control, Executive Agency for Health and Consumersinternational level: UN Inter-Agency Task Force on Social and Solidarity Economy (TFSSE), World Health Organisation (WHO), United Nations Children's Fund (UNICEF), UN Social Development Commission, UN Permanent Forum on Indigenous Issues							
In focus							
Cornwall and West Devon Mining Landscape is among the <i>UNESCO</i> world heritage sites. Its underground mines, engine houses, foundries, new towns, smallholdings, ports and harbours and their ancillary industries together reflect prolific innovation which, in the early 19th century, enabled the region to produce two-thirds of the world's supply of copper. The substantial remains are a testimony to the contribution of Cornwall and West Devon to the Industrial Revolution in the rest of Britain and to the fundamental influence the area had on the mining world at large.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	X

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
31,16	ministries of defense and of the interior	31,1	governments				
Definition Ministries of the interior are responsible for the public order in a territory, including police and fire-protection services. Operations of the ministries of defense may transgress the borders of the respective territory. Defence refers to military defence and civil defence. Criminal action related to raw materials (see 52) may be prosecuted under the auspices of the ministries of the interior; raw material conflicts between nations may involve the ministries of defense. Both ministries cooperate and build upon intelligence provided to the government (see 11,2, 31).							
Units ministries: <ul style="list-style-type: none">national level: Ministry of Defence [GB], Ministère de la Défense [FR], Bundesinnenministerium [DE], United States Department of Defense (DoD) [US]EU level: DG European Civil Protection and Humanitarian Aid Operations (ECHO)international level: UN Security Council, UN Department of Peacekeeping Operations, UN Department of Safety and Security, United Nations Office for Disarmament Affairs (UNODA) agencies and authorities: <ul style="list-style-type: none">national level: Scotland YardEU level: European Police Office (EUROPOL), European Defence Agency (EDA), European Union Institute for Security Studiesinternational level: UN counter-terrorism committees, UN peacekeeping operations and political missions, UN Commission on Crime Prevention and Criminal Justice							
In focus The <i>US Department of Defense</i> regularly publishes a Strategic and Critical Materials Report on Stockpile Requirements. The primary purpose of the National Defense Stockpile (NDS) Program is to decrease the risk of dependence on foreign suppliers or single suppliers on supply chains of strategic and critical materials used in defense, essential civilian, and essential industry applications. The NDS Program allows for decreasing risk by maintaining a domestically held inventory of necessary materials.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X						X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
31,17	ministries of education & research	31,1	governments
Definition Ministries of education and research are among the research funding bodies formulating policies and programmes in order to tackle certain issues requiring knowledge, such as primary and secondary raw material supply. Some governments act through research councils or public research funding societies. Research councils are (usually public) bodies that provide research funding in the form of research grants or scholarships (Wikipedia 2016h).			
Units ministries: <ul style="list-style-type: none"> sub-national level: Ministerium für Wissenschaft, Forschung und Kunst Baden-Württemberg [DE] national level: Government Office for Science [GB], Innovate UK [GB], Federal Ministry of Education and Research (BMBF) [DE] EU level: Directorate-General Research and Innovation (DG RTD), Directorate-General Education and Culture (DG EAC), Directorate-General Joint Research Center (DG JRC) 			

Deliverable D2.1

agencies and authorities: <ul style="list-style-type: none"> sub-national level: Innovationsagentur Medien- und Kreativwirtschaft Baden-Württemberg (MFG) [DE] national level: Engineering and Physical Sciences Research Council (EPSRC) [GB], Natural Environment Research Council [GB], Research Councils [GB], Acedemy of Finland [FI], Die Österreichische Forschungsförderungsgesellschaft [AT], French National Research Agency (ANR)[FR], The Netherlands Organisation for Scientific Research (NWO)[NL] EU level: European Research Council, Research Executive Agency, European Intergovernmental Research Organisations Forum (EIRO) international level: United Nations Educational, Scientific and Cultural Organisation (UNESCO) 							
In focus The <i>European Intergovernmental Research Organisations Forum (EIRO)</i> has extensive expertise in the areas of basic research and the management of large, international infrastructures, facilities and research programmes.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X			X		X	

Code 31,18	Stakeholder group statistical offices	Parent level 31,1	Parent stakeholder domain governments				
Definition Statistical offices collect, analyse and provide macroeconomic data on a wide range of issues for policy-making, ranging from production statistics to macroeconomic environmental accounting to empirical polls of the population.							
Units <ul style="list-style-type: none">sub-national level: Statistische Landesämter [DE]national level: Statistisches Bundesamt [DE]EU level: Directorate-General Eurostat (DG ESTAT)international level: OECD's Statistical Information System, UN Statistics Commission, UN COMTRADE							
In focus Eurostat's <i>Environmental Data Centre on Natural Resources (EDCNR)</i> is an online repository for a broad range of data on natural resources in Europe covering data sets on raw materials, energy resources, air, water resources, soil, spatial resources and biodiversity. It provides information on resource efficiency indicators as well as basic statistics, indicators and assessments on natural resources. The aim is to improve the understanding of the relationship between economic growth (consumption and production patterns), resource use and environmental impacts. The <i>UN COMTRADE</i> Database provides free access to detailed global trade data. It is a repository of official trade statistics and relevant analytical tables.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X						X	

Code 31,21	Stakeholder group regions and local administrative units	Parent level 31,2	Parent stakeholder domain governments (subnational, supranational)
Definition Each EU Member State is divided into so-called NUTS 1 regions which in turn are subdivided into NUTS 2 regions and then divided further into NUTS 3 regions (Eurostat 2015). There are leading regions in and outside Europe with prosperity, high-quality of life and innovation potential, and there are regions in the doldrums of interest (rural areas, remote villages). Potential mining ventures may be located in such different types of regions, thereby meeting different			

Deliverable D2.1

<p>interests. Districts and municipalities constitute a more detailed level than NUTS 3. These are called 'Local Administrative Units' existing at two levels (LAU 1 and LAU 2) (Eurostat 2015). At LAU level, there may be spatial/land use planning and development units, inter-municipal bodies, theme-specific bodies (e.g. water utility) and bodies referring to ecosystems (e.g. river-basin organisations).</p>							
<p>Units</p> <ul style="list-style-type: none"> sub-national level: City of Pforzheim [DE], City of Shanghai, Shanghai Municipal Bureau of Planning and Land Resources [CN], City of Amsterdam [NL], Emilia Romagna [IT], Scotland [GB] associations at national level: Deutscher Städtetag [DE] associations at EU level: EUROCITIES associations at international level: International Council for Local Environmental Initiatives - Local Governments for Sustainability (ICLEI), 100 Resilient Cities 							
<p>In focus</p> <p><i>International Council for Local Environmental Initiatives - Local Governments for Sustainability (ICLEI)</i> is the leading global network of more than 1,500 cities, towns and regions committed to building a sustainable future. By helping the ICLEI Network to become sustainable, low-carbon, resilient, ecomobile, biodiverse, resource-efficient and productive, healthy and happy with a green economy and smart infrastructure, it aims to impact over 20% of the world's urban population.</p> <p><i>EUROCITIES</i> is the network of major European cities. Its members are the elected local and municipal governments of major European cities. Today, it brings together the local governments of over 130 of Europe's largest cities and 40 partner cities that govern 130 million citizens across 35 countries. EUROCITIES' objective is to reinforce the role that local governments should play in a multi-level governance structure.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X						X	

Code	Stakeholder group	Parent level	Parent stakeholder domain				
31,22	supranational institutions	31,2	governments (subnational, supranational)				
Definition							
Supranational institutions comprise supranational organisations (already mapped under 31,1) and international, multinational and bilateral agreements (e.g. NAFTA in the GATT) (Rodrigo et al. 2009). Other multi-actor supranational institutions (e.g. World Economic Forum) have been classified under intelligence institutions (11,2).							
Units							
<ul style="list-style-type: none">• bilateral Raw Material Partnerships of Germany with partner countries• EU-Japan-US trilateral diplomacy dialogue on Critical Raw Materials• Organisations as secretariats of International Conventions (e.g. MARPOL, Basel, Helsinki, OSPARCOM, Aarhus, ...)							
In focus							
Germany has established bilateral <i>Raw Material Partnerships</i> with countries such as Mongolia, Kazakhstan and Chile. Article 2 of the contract with Kazakhstan states: "The parties shall promote economic co-operation between the two countries with the aim of fully exploiting and developing the potential of raw materials in the Republic of Kazakhstan via investment, innovation and supply contracts and the transfer of technology to the Republic of Kazakhstan. The parties shall support cooperation between companies from both countries in connection with the exploration, extraction, processing and use of mineral raw materials, with the aim of achieving a secure and sustainable supply and use of raw materials along with the transfer of technology and innovation."							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain
32,1	parliaments	32	political representation (legislative)
Definition Parliaments are built through elections of parliament members. Most parliaments have far-reaching legislative competences and control rights of the government (European Union 2016). Committees may support the legislative processes through technical and strategic expertise. Parliaments may initiate raw material policy initiatives.			
Units <ul style="list-style-type: none"> sub-national level: Sami Parliament [FI], Landtag Baden-Württemberg [DE] national level: Assemblée Nationale [FR], UK Parliament [GB] EU level: European Parliament 			
In focus The <i>European Parliament</i> is directly elected by EU voters every 5 years. It has a legislative (together with the EU Council), supervisory and budgetary role. Raw material policies may have its origin in the European Parliament. The European Minerals Day 2011 was officially launched at the European Parliament (12,35).			
ID R&I calls	ID consultations	ID industry	ID civil society
	X		
ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
		X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
32,2	political parties	32	political representation (parties)
Definition Political parties are organised groups of people with similar political aims and opinions, seeking to influence public policy (ACE 2012). Politicians are usually part of a political party. Besides the moderate parties dominating the mainstream discourse, two party types are particularly relevant to raw material policy: far-right populist parties and Green parties. Far-right populist parties have succeeded in the elections to the European Parliament 2014 and at recent national/state-level elections. Typically, far-right parties combine nationalism, xenophobia, law and order and welfare chauvinism. Their programmes exhibit statements on STI and R&I policy hardly noticed in public. Green parties often advocate on environmental issues aiming to prevent or mitigate the impacts of primary raw material supply and at the same time to promote the circular economy and restrictive chemicals regulation.			
Units <ul style="list-style-type: none"> Green parties: The Green Party [DE], The Greens - European Free Alliance Fra-right parties: e.g. UK Independence Party [GB], Front Nationale [FR], Freiheitlichen Partei Österreichs (FPÖ) [AT], Alternnative für Deutschland (AFD) [DE], Lega Nord per l'indipendenza della Padania [IT], Partij voor de Vrijheid (PVV) [NE], Prawo i Sprawiedliwość (PIS) [PL], Jobbik [HU] 			
In focus The European Parliament is currently composed of these <i>groups representing the political parties</i> : Group of the European People's Party (PPE); Group of the Progressive Alliance of Socialists & Democrats (S&D); The Alliance of Liberals and Democrats for Europe (ALDE); The European Free Alliance Greens (Verts/ALE); The European Conservatives and Reformists (ECR); European United Nordic Green Left (GUE/NGL); Non-Attached Members; Europe of Freedom and Democracy (EFD). Every MEP either belongs to a group or is registered as "non-attached". The <i>UK Independent Party</i> is a party that considers technology, mathematics and science as important fields to foster the development and growth of Great Britain. They want to secure the survival and expansion of coal industry in the form of deep, opencast and drift mining – in their opinion wind and solar power is no alternative.			
ID R&I calls	ID consultations	ID industry	ID civil society
ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
		X	

Deliverable D2.1

Code	Stakeholder group	Parent level	Parent stakeholder domain				
32,3	external organisations management	32	political representation (external)				
Definition Political entities manage their relations with external organisations to ensure transparency on policy-making and to contribute to the traceability and credibility of external influence. Main types of interaction with external organizations are expert groups, lobbies and civil society nodes. Expert groups (also expert fora, expert panels or advisory bodies) are a consultative entities set up by the government or parliament for the purpose of providing them with advice and expertise (European Commission 2010). Lobbying covers all interest representation activities carried out with the objective of influencing the policy-making and decision-making processes (EU Parliament 2015). Civil society nodes enable CSOs to have access to policy-making in defined formats. All three modes of external organizations management are relevant to raw material policy-making.							
Units <ul style="list-style-type: none">expert groups: Raw Materials Supply Group [EU], German Advisory Council on Global Change (WBGU) [DE], The German Advisory Council on the Environment (SRU) [DE], Enquete Commissions of the German Parliament [DE]lobby groups: Business Europe, Greenpeacecivils society represented via contact group: The European Trade Union Confederation (ETUC), Bureau Européen des Unions de Consommateurs (BEUC)							
In focus <i>Expert groups</i> are a consultative entity set up by the Commission or its services for the purpose of providing them with advice and expertise, which comprises at least six members and is foreseen to meet more than once. At EU level 12 expert group organization types are enumerated: Association, NGO, International Organisation, Third country, Corporate, Candidate country, Trade union, Research institute, Academia, EU body, EU agency, Financial institution. In addition, individuals are listed with their expertise. The EU operates a <i>Transparency Register</i> . EU level lobbies include: Professional consultancies/law firms/self-employed consultants; In-house lobbyists/corporate lobby 'in-house representatives' and trade/business/professional associations; Non-governmental organisations; Think tanks, research and academic institutions; Organisations representing churches and religious communities; Organisations representing local, regional and municipal authorities, other public or mixed entities, etc. or trade associations. The <i>EU Civil Society Contact Group</i> is organized into 8 sectoral groups (Environment, Health, Social Policy, Development, Human Rights, Women's rights, Culture, Education), each with a specialization and comprising a number of associations (10 for the Environmental sector, 100+ for the public sector). The Civil Society Group is an information-sharing group. The Membership of the Civil Society Contact Group is primarily made up of European umbrella groups rather than particular NGOs (besides WWF or Greenpeace).							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
							X

Code	Stakeholder group	Parent level	Parent stakeholder domain
33	judiciary	3	political system
Definition The judiciary is composed of a system of courts, judges and lawyers negotiating the cases of conflicting parties in relation to existing law. A court is an institution with the duty to discover the true facts about a case like crimes or disagreements and makes a decision according to the law. A lawyer is a person certified as trained in law and licensed to give legal advice and to represent others in litigation within a particular jurisdiction. Lawyers may be employed in law firms (see: 24,5) or work independently. A judge is a person who is in charge of a trial in a court and decides how a person who is guilty of a crime should be punished, or who makes decisions on legal matters. With regard to mining, courts conduct trials of conflicting parties in particular on land use conflicts (McCarthy Tétrault 2015).			

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Units <ul style="list-style-type: none"> subnational level: Landgericht Sachsen [DE] national level: Warden's Court [AU], Ontario superior court of justice [CA], Supreme Court of Yukon [CA] EU level: The European Court of Human Rights, The EU Court of Justice interprets EU law to make sure it is applied in the same way in all EU countries and settles legal disputes between national governments and EU institutions. international level: International Center for Settlement of Investment Disputes (ICSID) 							
In focus <i>The International Center for Settlement of Investment Disputes (ICSID)</i> is an international arbitration institution devoted to investor-state dispute settlement. Following Canada's ratification of ICSID, Canadian mining companies now have access to this mechanism, as long as their investment is protected by an instrument in which they have agreed to ICSID arbitration, and the host state has also ratified the ICSID Convention.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	X

4.4 Civil society

Civil society is dynamic, vibrant and influential but is also selectively restricted (WEF 2013). It is defined as the aggregated set of non-governmental organizations and institutions that manifest interests and will of citizens. Civil society can be classified by types of organisations, by degrees of formality and institutionalisation, by functions, by client group and by aggregate political strength (Cameron 2008).

Here, it is focused on the citizens' perspective on raw materials. The social licence to operate (SLO) refers to the level of acceptance or approval by local communities and stakeholders of mining companies and their operations (Mining Facts 2016). It engages in the public through CSOs (41,1),³⁸ citizen initiatives (41,2) and cooperatives (41,3) and has specific funding mechanisms (42). Civil society is also made of communities (43) and individuals (44).

Code	Stakeholder group	Parent level	Parent stakeholder domain
41,11	transparency and democracy NGOs	41,1	civil society organisations
Definition Transparency and democracy NGOs are movements striving to strengthen direct or indirect democracy, citizen participation and transparency in order to prevent legal violations like corruption (Transparency International 2016, Transparency Accountability Initiative 2016, Democracy International 2010). Even if they deal with transparency and democracy, they often focus on one of them and emphasize the importance of accountability. Transparency and democracy NGOs act for example on the operations of mining companies and revenue fluxes of mineral extraction.			
Units <ul style="list-style-type: none"> national level: PowerShift [DE] European level: Corporate Europe Observatory (CEO), European Partnership for Democracy (EPD) international level: Transparency International, Initiative for Responsible Mining Assurance (IRMA) 			
In focus <i>The Initiative for Responsible Mining Assurance (IRMA)</i> is a coalition of NGOs, businesses purchasing minerals and metals for resale in other products, affected communities, mining companies and trade unions. It is seeking to improve the			

³⁸ Sometimes the term NGO is used whenever it is more common.

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environmental and social performance of mining operations through the multi-stakeholder development of a set of best practice standards as well as a system to independently verify the implementation of those standards. It is designing a responsible mining assurance system with six integrated elements: best practice standards, third party mechanism to verify, a subscriber program, communication tools, an organizational structure and business model and mechanisms for resolving disputes.

ID R&I calls	ID consultations	ID industry	ID civil society X	ID conferences	ID country studies	ID World Café X	ID foresight & brainstorming
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Code 41,12	Stakeholder group development aid and relief CSOs	Parent level 41,1	Parent stakeholder domain civil society organisations
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Definition

Development aid and relief CSOs are non-profit associations (some of them with religious affiliation) seeking to support disadvantaged or discriminated groups of people in developing countries or in situations of crisis (GlobalCorps 2016). They usually focus on direct basic assistance concerning food, health as well as infrastructure.

Units

- national level: Kehys (the Finnish national platform of Concord) [FI], Verband Entwicklungspolitik und Humanitäre Hilfe deutscher Nichtregierungsorganisationen (VENRO) [DE], The International Development Network (BOND) [GB]
- European level: CONCORD – European NGO Confederation for relief and development, CARE international (member of CONCORD), SOLIDAR (European network of NGOs), STOP Mad Mining
- international level: ActionAid, CIDSE – Together for Global Justice, Christian Solidarity Worldwide, International Christian Development Organization (CBM), Islamic Relief Worldwide, Buddhist Global Relief, Oxfam International

In focus

The *Stop Mad Mining* campaign, run in 2015 within the framework of the European Year of Development 2015, aims at creating the link between (over-)consumption of raw materials in Europe on the one hand and poverty, human right violations and environmental destruction in resource rich countries on the other hand.

Oxfam international is an international confederation of 18 organisations working together with partners and local communities in more than 90 countries. Its purpose is to help create lasting solutions to poverty. Oxfam deals with issues like active citizenship, gender justice, inequality and essential services, natural resources, saving lives and sustainable food.

ID R&I calls X	ID consultations	ID industry	ID civil society X	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
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Code 41,13	Stakeholder group social welfare CSOs	Parent level 41,1	Parent stakeholder domain civil society organisations
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Definition

Social welfare CSOs are charity groups created to pursue philanthropic rather than pecuniary purposes. Their purpose is to benefit society (e.g. health, inclusion) or a specific group of people (e.g. homosexuals, handicapped people) and employs all of its resources to those charitable activities. Its motives may be educational, humanitarian or religious (The Free Dictionary 2016, Business Directory 2016b).

Units

- national level: Arbeiterwohlfahrt e.V. (AWO), Deutscher Caritasverband e.V. (DC), Diakonisches Werk der Evangelischen Kirche in Deutschland e.V. (DW), Deutscher Paritätischer Wohlfahrtsverband e.V. (DPWV),

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<p>Deutsches Rotes Kreuz e.V. (DRK), Zentralwohlfahrtsstelle der Juden in Deutschland e.V. (ZWSt).</p> <ul style="list-style-type: none"> European level: Platform of European Social NGOs, Caritas Europe, Culture Action Europe international level: Mines and Communities (MAC), Indigenous Environmental Network (IEN) Minority Rights Group International, Survival International, Unrepresented Nations and Peoples Organization (UNPO) 							
<p>In focus</p> <p>The <i>Platform of European Social NGOs</i> (Social Platform) is the alliance of representative European federations and networks of non-governmental organisations active in the social sector. Full Members Associate Members are: AGE Platform Europe, Autism Europe, Caritas Europa, Housing Europe - The European Federation of Public, Cooperative Social Housing, CECOP-CICOPA Europe – European Confederation of Workers' Co-operatives, Social Cooperatives and Participative Enterprises, COFACE – Confederation of Family Organisations in the EU, EAPN – European Anti-Poverty Network, EASPD – European Association of Service Providers for Persons with Disabilities, ECDN – European Consumer Debt Network, EDF – European Disability Forum, ENAR – European Network Against Racism, ENSIE (European Network of Social Integration Enterprises), EPA – European Parents' Association, EPHA – European Public Health Alliance, EPR – European Platform for Rehabilitation, ESAN – European Social Action Network, EURAG – European Federation of Older Persons, EUROCHILD, EURODIACONIA – European Federation for Diaconia, EURORDIS – European Organisation for Rare Diseases, EWL – European Women's Lobby, FEANTSA – European Federation of National Organisations working with the Homeless, FEFAF – European Federation of Parents and Carers at Home, ICSW – International Council on Social Welfare Europe, IFSW – International Federation of Social Workers Europe, ILGA Europe – The European Region of the International Lesbian, Gay, Bisexual, Trans and Intersex Association, INCLUSION EUROPE – The European Association of Societies of Persons with Intellectual Disability and their Families, IUT – International Union of Tenants, MHE – Mental Health Europe, PICUM – Platform for International Cooperation on Undocumented Migrants, SOLIDAR, TGEU – Transgender Europe, VOLONTEUROPE, WAGGGS – World Association of Girl Guides and Girl Scouts Europe Region, YFJ – European Youth Forum</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
			X			X	

Code 41,14	Stakeholder group environmental NGOs	Parent level 41,1	Parent stakeholder domain civil society organisations
<p>Definition</p> <p>An environmental NGO is an organization originating from the conservation or environmental movements, concerned with the depletion of natural resources, global warming and other environmental issues (International Relations 2016). They deal with a wide range of issues many of them being also involved in development and human rights issues.</p>			
<p>Units</p> <ul style="list-style-type: none"> sun-national level: Project Underground [US], Avataq Greenland [DK] national level: Sierra Club [US], Earthworks [US], Mining Watch Canada [CA], Mineral Policy Institute [AU], Landsforeningen Levende Hav [DK] European level: European Environmental Bureau (EEB), European Partners for the Environment international level: International Union for Conservation of Nature (IUCN), Friends of the Earth International, Greenpeace, World Wildlife Fund for Nature 			
<p>In focus</p> <p>The <i>European Environmental Bureau (EEB)</i> represents more than 150 environmental NGOs from 30 European countries in particular in European policy-making. EEB tries to be on top of EU policy formulation and to influence its direction. Energy and climate, REACH, the CAP but also TTIP, green economy, circular economy are among its recent subjects. In their Action Plan for 2016, there is a brief section on circular economy and resource conservation stating mostly that EEB will closely follow developments. In 2016, they plan to be especially active in the Waste Framework Directive with the aim of making the economy more circular. On the topic of resource conservation, they aim to address it via product policies and a guideline for eco-design. Product Environmental Footprint and the Raw Materials Initiative are</p>			

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referred to.							
<p>The <i>International Union for Conservation of Nature (IUCN)</i> is active in many areas related to nature protection. They are the advisory body for the global World Heritage Sites concerning nature. IUCN engage with industry to protect nature. The extractive industry, with their large footprint and resource intensive nature, is one of their key target sectors. The IUCN has extensive information on mining, among others a database of mining conflicts in South America and reports on the impacts of mining. The ICMM Good Practice Guidance for Mining and Biodiversity (21,5), which has become a benchmark within the mining industry, was developed jointly with IUCN. IUCN has started a research program on the impacts of deep sea mining.</p> <p><i>Greenpeace</i> is an independent global campaigning organisation that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace. Greenpeace has several publications on mining, many on coal mines but also some on metal mining. They mostly focus on deep sea mining or mining projects affecting coastal seas, stating deep sea mining has detrimental effects. Their point of view is also that the Antarctica should not be mined. In their publication <i>Corporate Crimes</i>, they describe cases where companies have violated the Bhopal rules, including several mining companies.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X	X		X			X	

Code	Stakeholder group	Parent level	Parent stakeholder domain				
41,15	consumer organisations	41,1	civil society organisations				
Definition Consumer organisations are (often voluntary) groups of people who work for a cause of protecting and empowering consumers. Most inform consumers about their rights or campaign for a fair deal (Consumer Council 2016). Raw material related issues are tackled in particular through promotion of sustainable consumption behaviour.							
Units <ul style="list-style-type: none">• subnational level: Verbraucherzentrale Nordrhein-Westfalen [DE], Foreningen '16. August' (Greenland) [DK]• national level: Stiftung Warentest [DE], Die Verbraucherinitiative [DE], Consumers Union [US], Friluftsrådet [DK]• European level: Bureau Européen des Unions de Consommateurs (BEUC), European Association for the Coordination of Consumer Representation in Standardization (ANEC)• international level: Fair-Trade International, Consumers International (CI)							
In focus <i>The Bureau Européen des Unions de Consommateurs (BEUC) investigates EU decisions and developments likely to affect consumers, with a special focus on five areas identified as priorities by our members: Financial Services, Food, Digital Rights, Consumer Rights & Enforcement and Sustainability. Members now include 42 independent national consumer organisations from 31 European countries.</i>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
	X		X			X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
41,16	trade unions	41,1	civil society organisations
Definition Trade unions are associations of workers and are formed to primarily maintain or improve the conditions of employment of its members and to protect their economic, political and social interests. Workers's associations may be formed on plant basis, industry basis, firm basis, regional basis or national basis (YourArticleLibrary 2015). Trade unions play a major role in communication and improvement of labor conditions in the mining industry.			

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Units <ul style="list-style-type: none"> subnational level: Industriegewerkschaft Metall Baden Württemberg [DE] national level: Danish Trade Union Office [DE], Swedish Trade Union Confederation [SE] European level: European Trade Union Confederation (ETUC), IndustriAll, European Confederation of Independent Trade Unions (CESI) international level: International Trade Union Confederation (ITUC) 							
In focus <p>The <i>European Trade Union Confederation (ETUC)</i> is an umbrella organization. It comprises 89 national trade union confederations in 39 countries and 10 European trade union federations. The 10 federations represent workers in different industrial sectors ranging from journalism and manufacturing to public services and the police. Trade union federations are responsible for European social dialogue at sectoral level, including mining.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
			X			X	

Code	Stakeholder group	Parent level	Parent stakeholder domain				
41,17	human rights NGOs	41,1	civil society organisations				
Definition							
Human rights NGOs are associations devoted to the promotion and protection of human rights. They deal with different aspects, but their core activity is about dignity, justice, choice and opportunity. Indigenous people are a particular target group (Wiseberg 1991).							
Units							
<ul style="list-style-type: none">• subnational level: Cultural Survival [SE]• national level: Finnwatch [FI], Human Rights League of France [FR], Netherlands Centre for Indigenous Peoples (NCIV) [NL]• European level: Human Rights Democracy Network (HRDN), European Association for the Defense of Human Rights (AEDH)• international level: Human Rights Watch, Amnesty International, International Federation for Human Rights (FIDH), Coalition for the International Criminal Court, Human Rights Without Frontiers (HRWF), International Centre for Transitional Justice (ICTJ)							
In focus							
Human Rights Watch has the mission to defend people's rights worldwide. Mining is something they often refer to in connection with human right abuses, especially child labour and health effects. In their opinion industries, companies and governments are in charge to prevent child labour. They consider publicly available information about environmental or health impacts as very important.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
			X			X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
41,18	world view organisations	41,1	civil society organisations
Definition A world view can include natural philosophy, fundamental, existential and normative postulates or themes, values, emotions and ethics (Wikipedia 2016i). The world view organisations churches and religious communities are fellowships of religious groups (Berger 2003). This stakeholder group also includes philosophical and non-confessional organisations as they also advocate in the name of a certain world view perspective.			

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Units <ul style="list-style-type: none"> national level: British Humanist Association [GB], Bahá'í Deutschland [DE], Anglican Church [GB] European level: Conference of European Churches (CEC), Ecumenical Youth Council in Europe international level: Catholic Church, Soka Gakkai International – Buddhism in Action for Peace, Atheist Alliance International, the Freemasons 							
In focus <p>In March 2013, the <i>Catholic Church</i> appointed a new Pope, 'Francis' from Argentina. His encyclical 'Laudato Si' deals with environmental protection as a duty of all people in the world. He considers that the duty of every government to preserve its country's resources is inalienable. Among the major changes compared to his predecessors, is the emphasis that Catholics should 'go into the streets' and realize changes that mitigate poverty and climate change, eradicate human dignity violations and bring children to school (Remotti & Erdmann 2016).</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	

Code 41,19	Stakeholder group other special interest groups	Parent level 41,1	Parent stakeholder domain civil society organisations				
Definition The range of special interest groups is very broad. In some cases, relationships with the raw material domain can be drawn. A few more organisation types are listed without claiming exhaustiveness because the civil society domain has received comparatively little attention in the discourse on raw materials.							
Units <ul style="list-style-type: none">clubs: music clubs, traditions clubs, sports clubs, outdoor clubs, alpine clubs, debate clubseconomic interest associations: Bund der Steuerzahler (association of taxpayers) [DE]peace NGOs: Nonviolent Peaceforce, The European Peacebuilding Liaison Office (EPLO)							
In focus The <i>European Peacebuilding Liaison Office (EPLO)</i> is the independent civil society platform of European NGOs, networks of NGOs and think tanks (11,2) which are committed to peacebuilding and the prevention of violent conflict. It deals with mining in the heart of rural zones, recommending stakeholders to better identify the needs and expectations of communities, better plan and coordinate their activities and engage more constructively with local communities. It aims to help strengthen the legal framework of the extractives sector in the Democratic Republic of Congo on those issues that directly affect community development, i.e. (1) free, prior and informed consent of communities impacted by mining projects; (2) the development of regulations on expropriation, relocation and compensation of directly affected communities; (3) the establishment and management of community development funds; and (4) the use of implementation agreements ('cahier des charges') between communities and companies.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	X

Code	Stakeholder group	Parent level	Parent stakeholder domain
41,2	citizen initiatives	41	civil society engagement
Definition A citizen initiative is a temporary, loose interest grouping of citizens that refers to an actual, concrete occasion. It is a form of citizen participation in vivid democracies. It deals with a wide range of topics, including the threatening of living places or insufficient medical care (BPD 2016c).			

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Units <ul style="list-style-type: none"> subnational level: Avon & Hills Mining Awareness Group Inc. (AHMAG) [AU], Swedish Sami Association (Sami protest against a British iron ore mining company) [SE], Bristol Bay Forever citizens initiative [US], Bürgerinitiative Christophstal (Freudenstadt) [DE] EU level: 'Stop Plastic in the Sea' citizen initiative international: International Indigenous People's movement for Self-determination and Liberation (IPMSDL) 							
In focus <p>The <i>International Indigenous Peoples Movement for Self-determination and Liberation (IPMSDL)</i> is a movement of grassroots-based indigenous peoples' organizations, communities and advocates. It defends the rights of indigenous peoples against: the displacement from ancestral lands and territories; destructive development projects that deprive them of or degrade their resources, cultures and environment; discrimination, marginalization and disenfranchisement and the violation of their right to decide on matters affecting their lives and their development; oppression and repression by the State and its instrumentalities; colonization and subjugation by imperialist globalization.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
			X			X	

Code 41,3	Stakeholder group cooperatives			Parent level 41	Parent stakeholder domain civil society engagement		
Definition A cooperative (also known as co-op, co-operative or coop) is an autonomous association of people united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled business. Here, cooperatives refer to citizen-directed economic initiatives. They exist for example in the fields of mining, energy transition and recycling.							
Units <ul style="list-style-type: none">mining: Bolivian mining cooperatives Morococala, Santa Fe, Machacamarca, Poopo, and Huanuni [BO]energy transition: renewable energy cooperatives [DE], Middelgrunden Wind Turbine Cooperative [DK]recycling: Asociacion Cooperativa de Ríciadores de Bogotá [CO], Recycling Cooperative COOPAMARE [BR]							
In focus When the closure of COMIBOL mines in Bolivia became irreversible, the Centre for Research and Popular Service (CISEP) [BO] worked to consolidate and strengthen mining cooperatives to improve production processes and thus raise the income for mining families. It worked with the <i>Mining Cooperatives Morococala, Santa Fe, Machacamarca, Poopo, and Huanuni</i> .							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming X

Code 42,1	Stakeholder group foundations	Parent level 42	Parent stakeholder domain civil society funding institutions
Definition A foundation is an organization established from donated funds for the purpose of donating grants to others (Businessdictionary 2016). Most foundations pursue philanthropic purposes, fund research and innovation or issue prizes. Research foundations are foundations that provide grants to researchers, researcher groups or research performing organisations. Often, they also pursue philanthropic aims such as knowledge as a cultural good or solutions for problems that are not sufficiently tackled by the public sector and/or private sector research.			

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Units <ul style="list-style-type: none"> funding research & innovation: Volkswagen-Stiftung [DE], Vinnova [SE], National Science Foundation (NSF) [US], European Science Foundation (ESF), Melinda & Bill Gates Foundation funding philanthropic action: Zero Waste Scotland [GB], Stiftung Denkmalschutz (protection of cultural heritage) [DE] issuing prizes: Right Livelihood Award Foundation 							
In focus <p><i>The Right Livelihood Award</i> is an international award to "honour and support those offering practical and exemplary answers to the most urgent challenges facing us today". The prize was established in 1980 by German-Swedish philanthropist Jakob von Uexkull. An international jury, invited by the five regular Right Livelihood Award board members, decides the awards in such fields as environmental protection, human rights, sustainable development, health, education, and peace.</p> <p><i>Zero Waste Scotland</i> is a registered charity based on a circular economy investment fund.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
X				X		X	

Code 42,2	Stakeholder group crowdfunding platforms	Parent level 42	Parent stakeholder domain civil society funding institutions				
Definition Crowdfunding platforms are web-based finance marketplaces. They bring together both halves of the market - funders and recipients for that projects with a certain purpose and ideas can be realized. They focus on different target groups like platforms for start-ups and/or on different topics like platforms for sustainable ideas (Crowdsurfer Ltd & Ernst & Young LLP 2015).							
Units <ul style="list-style-type: none">• general: Kickstarter• related to raw materials, eco-design & recycling: EcoCrowd, Oneplanetcrowd, Science Starter, Degussa-crowdfunding, Bürgerzins, Green Rocket, Green Crowding							
In focus <i>EcoCrowd</i> is a newly launched crowdfunding platform which looks to specifically support sustainable start-ups as well as projects supported by the Deutsche Umweltstiftung (German Environmental Foundation).							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	

Code	Stakeholder group	Parent level	Parent stakeholder domain
43,I	prosumer communities	43	communities
Definition Prosumption (production/consumption) refers to the creation of products and services by the same people who will ultimately use them. Three major prosumer community types can be distinguished: citizen science creating user knowledge, the creation of digital goods (e.g. open software) and the creation of physical goods (e.g. open hardware, repair-café, fab labs, open workshops, etc.). Prosumption also stands for the democratization of science, technology and innovation. New demands on raw material supply may be raised by prosumers from a citizen perspective.			

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Units <ul style="list-style-type: none"> citizen science: European Citizen Science Association, Citizens' Science Alliance creation and manipulation of digital goods: Minecraft Community creation and manipulation of physical goods: VOW e.V. [Association of Open Workshops] [DE], betahaus Berlin [DE] related to raw materials, eco-design, recycling: Scanergy (a scalable and modular system for energy trading between prosumers) cross-cutting: Prosumers international, European Maker Week 							
In focus <i>betahaus Berlin</i> aims to meet the requirements that independent, creative professionals have for their work station. It offers spaces and rooms designed to flexibly serve multiple purposes. There are coworking spaces, a community space, team rooms, meeting rooms and event spaces in various sizes, a hardware lab, a wood workshop, and a café.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	X

Code 43,2	Stakeholder group informal personal communities	Parent level 43	Parent stakeholder domain communities				
Definition The informal personal community is characterized by the informal expression of interests and needs. In addition to pure informal communication, there are social networks used for serious lobbying. These networks start informally, but once the movements grow proto-institutions with significant influence may emerge. In relation to raw materials, the local community affected by mining and/or recycling is of particular importance (e.g. of indigenous people).							
Units <ul style="list-style-type: none">informal communication: family, neighbourhood, peerssocial networks: Avaaz – Community Petitions platform							
In focus <i>Community Petitions</i> is a new web platform that gives people around the world the power to start and win campaigns at the local, national, and international level. Community Petitions is a crowd-sourced part of Avaaz, the largest-ever global web movement bringing people-powered politics to decision-making everywhere. The Avaaz model of internet organising allows thousands of individual efforts, however small, to be rapidly combined into a powerful collective force.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	

Code 44	Stakeholder group individuals	Parent level 4	Parent stakeholder domain civil society
Definition Besides their association in groups, communities and organizations individuals act as single entities. The myriads of micro-actions may be captured by the terms of individual roles, values and lifestyles. A role is described as a set of behaviours expected of individuals, coordinated with the behaviour of other people. (Bosančić 2007). Individuals take an abundance of roles in modern life individual. Specific individuals have significant impact on society's attitude towards minerals. For example, Iain Simpson Stewart has been described as geology's "rock star" (Alok et al. 2008), being also known to the public as the presenter of a number of science programmes for the BBC. Values are considered to be collectively shared assumptions and beliefs about what is desirable or undesirable in a society (BusinessDirectory			

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<p>2016d). They give sense and influence a person's behaviour. Lifestyles (classes, milieus) describe a way of living of individuals, families or societies (BusinessDirectory 2016e). It is a composite of motivations, needs and wants and is influenced by factors such as culture, family, reference groups and social class. Individuals are classified and aggregated according to socio-demographic characteristics (e.g. age, gender, education, income).</p>							
<p>Units</p> <ul style="list-style-type: none"> • roles: voter, tax payer, consumer, employee, donator, citizen scientist, maker, energy producer, waste producer, online trader, social entrepreneur, professional, promotor, family member, etc. • values: trust in institutions, attitude towards human rights, etc. • lifestyles: the growing middle classes, the super rich, the poor, lifestyle on health and sustainability (LOHAS) 							
<p>In focus</p> <p>The <i>Lifestyle of Health and Sustainability (LOHAS)</i> has been defined a lifestyle with certain socio-demographic characteristics in order to define a certain market segment for environmentally sound and healthy products. Its size is estimated typically between 10-30 % of the population in countries such as the USA, Japan and Germany.</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café X	ID foresight & brainstorming

4.5 Hidden actors

Hidden actors are rarely addressed as stakeholders. In MICA, it is accounted for informal actors (51) and criminal actors (52) in relation to primary and secondary raw materials.

Code 51,I	Stakeholder group artisanal and small-scale miners	Parent level 51	Parent stakeholder domain informal actors				
Definition Artisanal and small scale miners are individuals, groups or communities practicing manual, very labour intensive mining with minimal or no mechanization often informally and/or illegally (Mining Facts 2016b, POLINARES 2012). It takes place all over the world but is mostly widespread in developing countries. Artisanal and small scale miners could also have a need to exchange practices in mining; however their informality impedes reliable judgement.							
Units <ul style="list-style-type: none">regions where artisanal & small-scale mining takes places: San Simón (organized themselves under the name San Simón de Mategua Mining Company) [BO], Ozizwenzi Kwa Zulu Natal [ZA], Geita [TZ]artisanal & small-scale mining initiatives: Communities And Small-Scale Mining (CASM)							
In focus Small scale miners in <i>Geita</i> [TZ] use mercury for extracting gold.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café X	ID foresight & brainstorming

Code	Stakeholder group	Parent level	Parent stakeholder domain
51,2	scavengers	51	informal actors
<p>Definition</p> <p>Scavengers are – often itinerant – waste pickers who perceive waste as a resource for income generation (Ezeah et al. 2013). They are especially represented in developing countries where controlled waste disposal is not widespread. Their activities include artisanal dismantling, collection & recycling of material (small scale, informal), for example of e-</p>			

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waste and landfills. Scavengers may have a – still to be proven – need to exchange practices in scavenging. Scavengers for discarded food from supermarkets are emerging although with little impact on the mineral raw materials domain. In some cases, the boundaries between scavengers and raw material thieves are blurring.							
Units							
<ul style="list-style-type: none"> regions where scavenging takes places: Kumasi [GH], Jakarta [ID], South Kalimantan [ID] scavenging initiatives: step – solving the e-waste-problem 							
In focus							
A research study (Mahjudin et al. 2015) aimed to analyze the amount of waste that can be reduced by scavengers at Basirih landfill Banjarmasin Indonesia, and show the importance of determining landfill management options based on the composition of the waste in the landfill. Inorganic waste in Basirih landfill amounted to $\pm 40\%$, 26,02% of inorganic waste can still be used, while 13.98% of waste can not be utilized by the scavengers. The amount of waste that can be reduced by scavengers is 414 tons per month. 3.45% inorganic waste is reduced by scavengers- compared to the total waste, and 8.5% compared to total inorganic waste, with the highest recovery rate is PET plastic and the highest types of waste can be obtained by scavengers are white and coloured plastic bags.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café X	ID foresight & brainstorming

Code 51,3	Stakeholder group misusers of products and systems			Parent level 51	Parent stakeholder domain informal actors		
Definition							
Unintended use generally means the use of a something (e.g. a product or a database) which was not aimed at the time it was designed and implemented. This way, the intention of the product or system can go into reverse. Facets of misuse include hacking and littering. A hacker is a person who has an advanced understanding of computers, networking, programming or hardware (Computer Hope 2016) and uses this understanding to break into computer systems by surreptitious means. Littering occurs when products or waste are not fed into a defined collection, management and disposal system but diffused into unsuitable places such as parks and the ocean.							
Units							
<ul style="list-style-type: none">hacking: Goldcorp Inc. hackinglittering: plastic littering of the world oceans (e.g. containing metal compound stabilizers)							
In focus							
A computer <i>attack on Goldcorp Inc.</i> has resulted in a data breach, which underlines the growing propensity of hackers to target confidential corporate information (McGugan 2016). The breach was reported by The Daily Dot website. It said hackers appeared to have dumped a mountain of Goldcorp’s confidential corporate and employee information online. The sample data spanned a wide variety of information, including employees’ performance, contract agreements with other companies and budget information for 2016. Goldcorp operates mines in Canada, Mexico, and Central and South America.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
							X

Code 52,1	Stakeholder group raw material thieves	Parent level 52	Parent stakeholder domain criminal actors
Definition Metal theft has become a crime problem in many areas, in particular in times of high commodity prices. Therefore, some countries have introduced legislation to regulate scrap-metal recycling yards. Raw material thieves are organized			

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gangs who steal, for example, copper railway tracks, pipes and cables from construction sites, public and private infrastructure (fencing, cladding, roofing, decorative ornaments, etc.), plaques from gravestones, arts or remove metal scrap from the public collection system and sell it to private sector scrap merchants (EUROPOL 2016). Some operate across national borders (all over Europe). They cause a loss of raw material value in the established regime, thereby diminishing legitimate private or public assets. A European Coalition of infrastructure operator industry associations (e.g. EURELECTRIC, CER) issued a 'Joint Call For Actions Against Metal Theft At European Level' (Brussels, 26 May 2015) emphasizing the risk of disrupted continuity of services.

Units							
<ul style="list-style-type: none"> removal from the public collection system: metal theft from scrap yards removal from applications in-use: metal theft from railway lines 							
In focus							
A recent study (Ashby & Bowers 2015) sought to test if the presence of a market for stolen property could drive thefts in a local area. <i>Metal thefts</i> from railway lines in England were shown to be significantly more common in areas with more scrap-metal yards, high road accessibility and high population density.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
						X	

Code 52,2	Stakeholder group illegal landfill operators	Parent level 52	Parent stakeholder domain criminal actors				
Definition Illegal landfill operators are persons who run a waste disposal site for the deposit of waste onto or into land for which a conditioning plan has not been submitted (Golder Associates 2005). They provide a sink for the material contained in the waste and may cause severe environment, health and safety problems.							
Units Offenders can include: <ul style="list-style-type: none">• construction, demolition, remodeling, roofing or landscaping contractors• waste management companies or general hauling contractors• operators of transfer stations or junkyards• automobile repair or tire shops• scrap collectors• local residents and “do-it-yourselfers”							
In focus The European Commission is referring Greece to the Court of Justice of the EU over poor waste management on the Greek island of Corfu. The Commission's concerns relate to the Temploni <i>landfill</i> which has been operating in breach of EU waste and landfill legislation (Directive 2008/98/EC of the European Parliament and of the Council, and Council Directive 1999/31/EC) since at least 2007, and represents a serious risk for human health and the environment.							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café X	ID foresight & brainstorming

Code 52,3	Stakeholder group terrorists	Parent level 52	Parent stakeholder domain criminal actors
Definition Terrorists are persons who want to advance their political or individual world view aims by using terror (The Free Dictionary 2016b). They are usually organized with other terrorists in small cells. They do not recognize borders and			

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<p>affect states and civilians irrespective of their geographical location. They may attack or sabotage critical infrastructures such as data centres, skyscrapers and dams, and thereby directly influence the raw material and knowledge stocks and flows. However, the indirect impact on economy and society may affect the raw material domain much more severely. Terrorists may stem from a wide range of backgrounds. It needs to be discussed to which extent the intelligence developed by the EU funded MICA project can be abused by terrorists.</p>							
<p>Units</p> <ul style="list-style-type: none"> • religiously motivated: so called "Islamic State", Al Quaida • politically motivated: activist sabotage of infrastructure projects (e.g. mining) • individually motivated: diffuse and unclear targets • 'environmentally' motivated: ecologists/Brittany nationalists lobby groups 							
<p>In focus</p> <p>The prospection enterprise Variscan Mines à Orléans [FR] was attacked by using a bomb. It has encountered strong local opposition in <i>Bretagne (Brittany)</i>. A group named ni hon-unan (NHU) claimed the bombing (France Bleu 2016).</p>							
ID R&I calls	ID consultations	ID industry	ID civil society	ID conferences	ID country studies	ID World Café	ID foresight & brainstorming
							X

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5. Stakeholder assemblages

The following subsection presents the stakeholder groups identified and the elicited raw material information needs at an aggregate level. Basic information can be retrieved from the MICA-internal Appendix. We have focused on sources from the last to years to today.

5.1 R&I calls on raw materials

Organisations fund R&I to get the raw material information they need. Three major modes of R&I funding can be distinguished: call for proposals, call for tenders and direct awards.

- Calls for proposals are based on R&I programmes often coordinated by government organisations. Expert groups, stakeholder consultations, closed meetings, certain fora and informal lobbies contribute to R&I programming (Erdmann & Schirrmeister 2016). Government organisations often delegate the implementation of R&I programmes to project management agencies which are intermediary organisations between research performing organisations and funding bodies (Rip 2000). Project/programme officers are engaged in R&I programming, the management of proposals/projects and their evaluation.
- Calls for tender reflect more specific R&I needs of organisations, in particular of government organisations. R&I projects responding to calls for tender are often smaller in scope, duration and funding, more targeted and more service oriented than those responding to calls for proposals. Government organisations contract research performing organisations directly rather than employing a project management agency.
- Organisations, in particular industry, entrust research performing organisations actively and directly with R&I projects. The supply and demand of R&I services is then often negotiated bilaterally.

Foundations and philanthropists may employ all three modes of R&I funding; however, their share in funding of R&I projects at EU level is minor (1 %) compared to industry and government (RIF 2012).

Research performing organisations include academia, industry, government and other societal organizations at large. In addition, project leads issue subcontracts to other research performing organisations to provide specific services.

R&I calls on raw materials are identified and analysed from three perspectives (see MICA-internal Appendix I for details). First, we have looked for calls for proposals and calls for tenders issued by various EU institutions and national level institutions (Denmark and UK) and identified a number of relevant stakeholder groups involved in the supply and management of R&I calls. Thereby, the knowledge interests of the calls have been collected. Second, 16 particularly relevant activities to MICA were identified and the beneficiaries have been extracted. They have been assembled to subgroups representing research performing organizations in the realm of raw materials. Third, we complemented the stakeholder groups by material provided by DG GROW and DG JRC and from the EIP Operational Group Meeting in April 2016.

Figure 6 presents the assemblage of stakeholder groups around R&I synthesizing all three perspectives:

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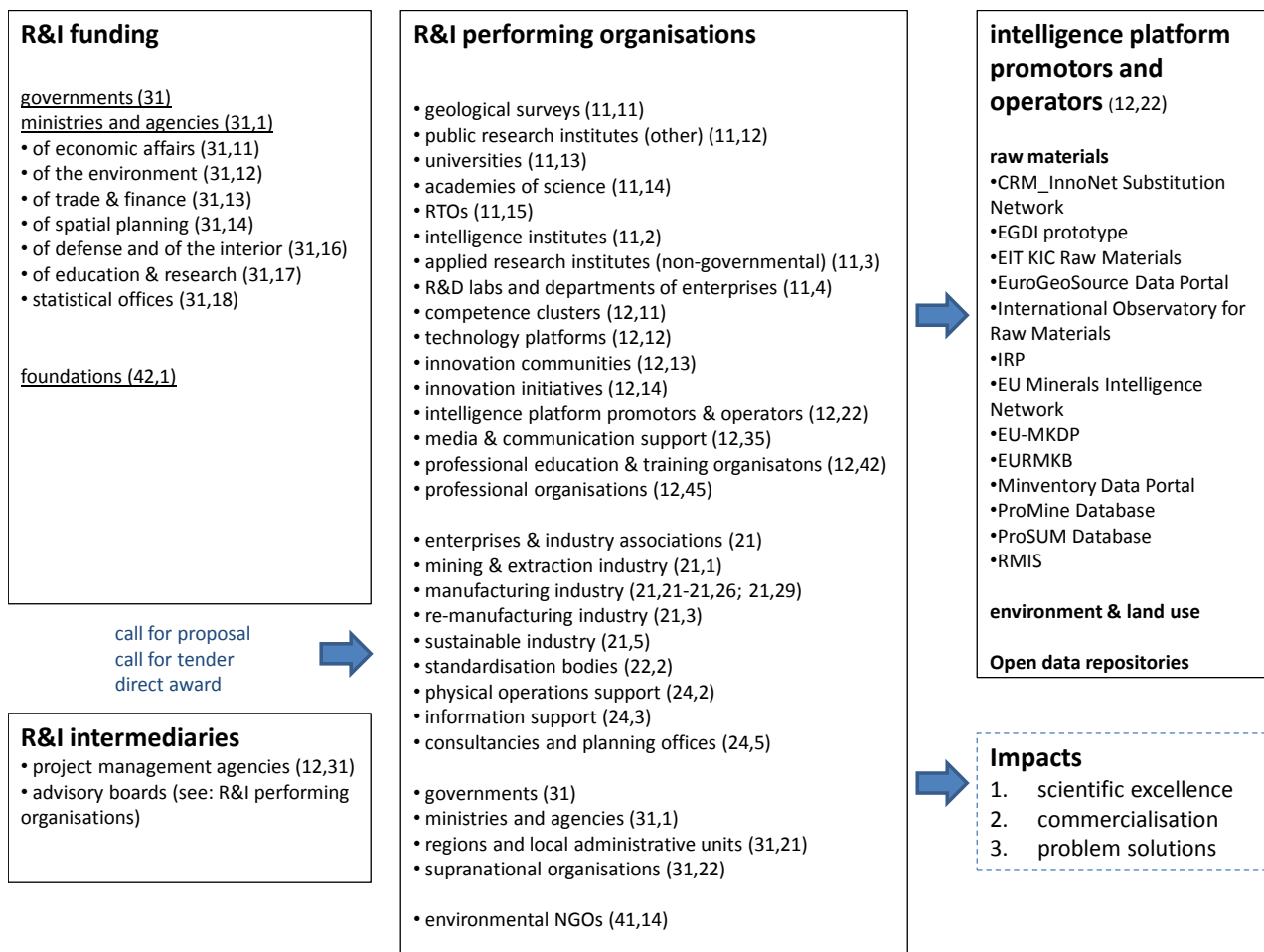


Figure 6: Stakeholder assemblage around R&I on raw materials. Source: MICA based on R&I calls at national (DK, GB) and EU level, 16 raw material activities and material provided by DG GROW and DG JRC and from the EIP Operational Group Meeting in April 2016 (see: Appendix I for details).

Funding of R&I on raw materials is provided mainly by a wide range of ministries & agencies at national and EU level, while private sector R&I funding on raw materials is not detected by this approach although it accounts for large shares, both on primary and secondary raw materials (EUNOMIA 2015). Research performing organizations on raw materials cover all domains: from the knowledge system to the economic system and the political system to civil society. All these stakeholder groups may also be represented in advisory boards.

Raw material related R&I aims to advance the state of knowledge through scientific excellence laying the foundations for the commercialization of new products, systems and services and providing solutions to concrete problems contributing, for example, to resource efficiency and wellbeing. More precisely, a number of R&I activities have led to intelligence platforms that are still operated, among them raw-material and environment & land use platforms as well as open data repositories, all available for further R&I and knowledge-based decision-making.

The following raw material information needs expressed in R&I calls have been collected for the national level (Table 3) and the EU level (Table 4):

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Table 3: Knowledge interests addressed through R&I calls at national level (Denmark and UK)

	ministries of economic affairs (31,11)	ministries of the environment (31,12)	ministries of education & research (31,17)	Other (3)	foundations (42,1)
Raw material intelligence (risk tool, materials brokerage service, technical & legal support)	X				X
Mapping of raw materials (marine, terrestrial)		X			
Extraction and processing of raw materials (marine/terrestrial, business analysis, impacts/conflicts in Africa, international policies, rent-capture)	X	X			
Methods (evaluation & application of Footprinting, Environmental Impact Assessment, MFA for waste)	X	X			
Security of raw material supply (mineral resources, critical raw materials, competitiveness & supply-chain linkages in steel sector)	X		X		
Resource efficiency (waste minimization, SME support, lifestyles)	X				X
Waste prevention (durability, consumer behavior, re-use & repair activities, public procurement criteria)		X			X
Waste characterization and treatment (WEEE, packaging; composition, quality, quantity; waste treatment options)		X			
Circular Economy (economics of recycling, performance, business model; incentives & barriers to collection & material recovery, consumer tracking, public procurement criteria)	X	X	X	X	X
Eco-Innovation (design for circular economy, risks and cost of new materials, Life Cycle Costing, improve assets)		X	X		X
Impact dimensions (EHS risks from material recovery of wastes, mine water discharge into the sea, impact of deep mining on marine ecosystems, ...)	X		X		

Source: MICA based on Danish Ministry for Environment and Food / Danish Environment Agency [DK], Department for Environment, Food and Rural Affairs (DEFRA) [GB], Department for Business Innovation and Skills [GB], Department for International Development [GB], Environment Agency England [GB], Waste and Resources Action Programme (WRAP) (including WRAP Cymru, WRAP Northern Ireland, WRAP England) [GB], Zero Waste Scotland [GB], Engineering and Physical Sciences Research Council (EPSRC) [GB], Natural Environment Research Council [GB], Coal Authority [GB], (see: Appendix I for details).

Table 4: Knowledge interests addressed through R&I calls at EU level

	H2020 (31,1)	DG GROW (31,11)	DG ENV (31,12)	DG REGIO (31,14)	DG JRC (31,17)	DG ESTAT (31,18)
Raw material intelligence (Network of mining & metallurgy; ERA-NET applied geosciences; dialogues in the area of climate action, environment, resource efficiency)	X	X				

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and raw materials; strategic international dialogues and cooperation on raw materials; guide to relevant EU and MSs' legislation and mineral policy; mapping of national activities & network of H2020 NCPs; monitoring system and forum to debate developments and needs, identify gaps and opportunities, establish priorities to create knowledge base of materials science and engineering; new geomodels of mining deposits; coordinating European Observation Networks to reinforce the knowledge base for climate, natural resources and raw materials					
Mapping of raw materials (deposits of public importance; definition, protection)	X				
Extraction and processing of raw materials (new sustainable concepts & solutions for mining small /complex / difficult access mineral deposits, automated deep mining, integrated system for metals processing or refining)	X				
Methods (resource efficiency self-assessment tool; measure co-innovation; procedures for environmental statistics & accounts; environmental footprinting; cross-sectoral sustainability assessment of energy and resource efficient solutions in the process industry; methods and tools for providing high quality expertise for different stakeholders (raw materials))	X		X		x
Security of raw material supply (availability, access to CRMs, cost of inputs, CRM substitution, support SMEs)	X	X			X
Resource efficiency (buildings; excellence in materials and processes; energy and resource management systems for improved efficiency in the process industries, integrated approach to process optimisation for raw material resources efficiency; new adaptable catalytic reactor methodologies for process intensification)	X	X	X	X	
Waste prevention (pre-fabricated elements through the reuse and recycling of construction materials and structures)	X				
Waste characterization and treatment (improved downstream processing of mixtures in process industries, flexible processing)	X				
Circular Economy (C&D waste, ship recycling, WEEE; recovery technologies for metals and other minerals, measures for transition, assessment of standardisation needs and ways to overcome regulatory bottlenecks in the process industry in the area of recovery of valuable materials, metals and minerals from waste, waste markets: understanding & enhancing the functioning, SE Europe, validation of waste statistics, EU waste legislation: implementation, further development)	X		X		X
Eco-innovation (pilots, market replacement, SME support; substitution of CRM in permanent magnets & LED, WEEE, extreme environments, electric power; excellence in materials & processes, nano-materials (risk&safety, characterization&classification), new/advanced materials (Eco-design, Eco-innovation, Product LCM, high performance, costs))	X	X	X	X	X
Impact dimensions (nano-risk/safety, environment-friendly agriculture, eutrophication prevention, relation of resource efficiency to climate change and land use; economic policy analysis; unspecific)	X		X		
Financial instruments (natural capital financing facility, impacts of environmental fiscal reform, fiduciary duties of investors)		X	X		
New production and consumption systems (business models for flexible and delocalised approaches for intensified processing, new supply chains for sustainable customer-driven small series production)					

Source: MICA based on EIP on Raw Materials (supported by DG GROW), DG GROW, DG Environment, DG Regio, DG JRC, DG ESTAT, EC Horizon 2020 (see: Appendix I for details).

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The ongoing R&I activities MINGUIDE (2016-2019) and Minlex (2015-2016) aim for mapping further raw material related needs mainly of national ministries and the legislative landscape at European, national and subnational level respectively.³⁹

5.2 Public consultations on raw material policy/legislation

Governmental organisations such as ministries and parliaments launch stakeholder consultations to collect their positions on certain topics. Organisations responding to consultations include lobbying groups of all kinds: industry, research performing organisations, civil society organisations but also government organisations and the wider society. Stakeholder consultations thus constitute an important element of raw material policy-making.

We have looked for calls for stakeholder consultations issued by various EU institutions and national level institutions (Denmark and Great Britain) and mapped the respective stakeholder groups (see MICA-internal Appendix 2 for details). Figure 7 provides a synthesis of the results.

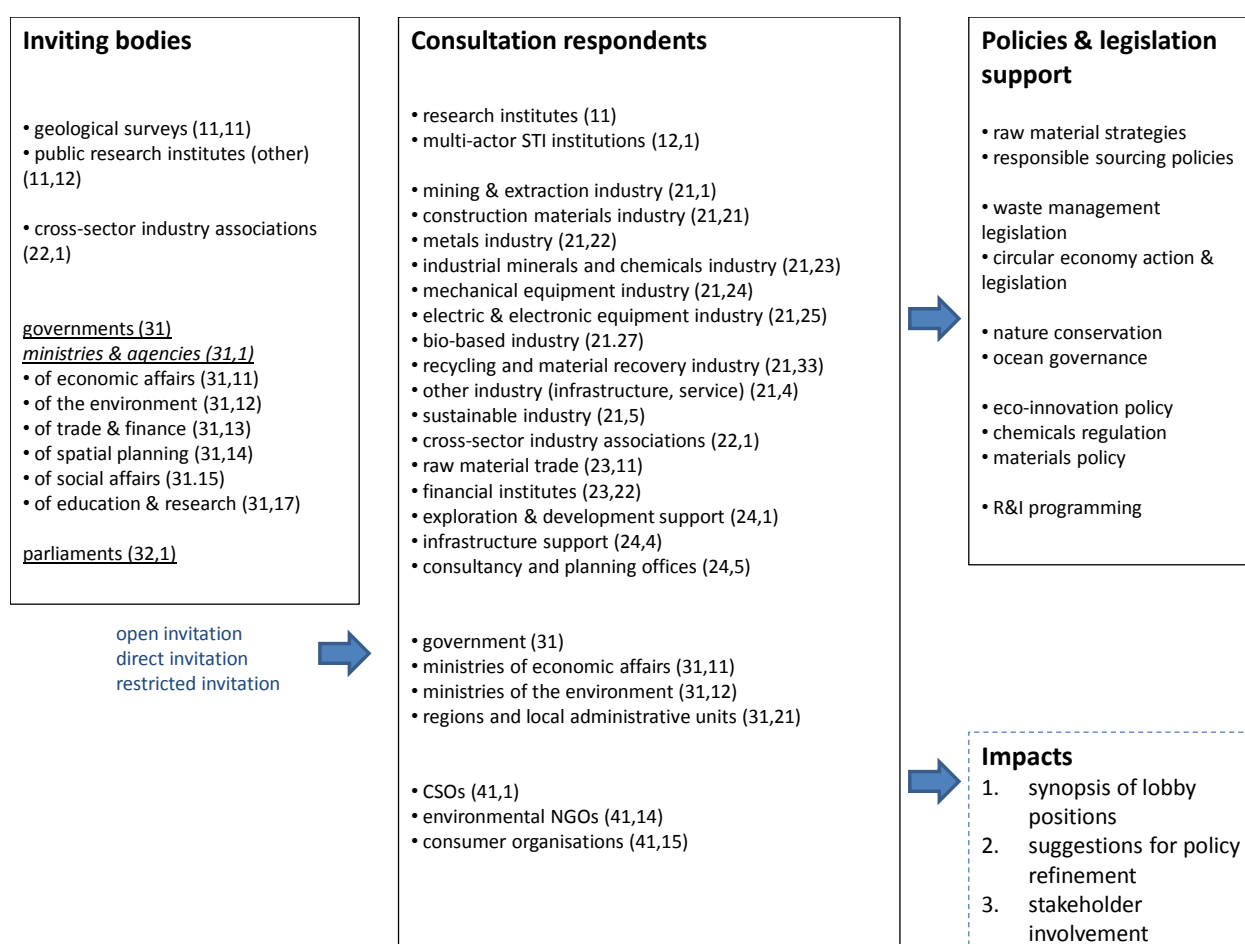


Figure 7: Stakeholder assemblage around public consultations on raw materials. Source: MICA based on stakeholder consultations at national (DK, GB) and EU level (see: Appendix 2 for details).

³⁹ These and other relevant recent and ongoing activities are listed in Appendix 1.

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The inviting bodies to consultations on raw material policy-making/legislation not only include diverse ministries & agencies but also parliaments, geological surveys and industry associations. Stakeholder groups from the four major domains knowledge system, economic system, political system and civil society are responding.

Stakeholder consultations on raw material policy / legislations yield synopsis of stakeholder positions, suggestions for refinements, and stakeholder sensitization and activation effects.

The following key raw material information needs expressed in consultations have been collected for the national level (Table 5) and the EU level (Table 6).

Table 5: Stakeholder interests leveraged through consultations at national level (Denmark and UK)

	geological surveys (11,11)	Industry associations (21)	ministries of the economy (31,11)	ministries of the environment (31,12)	ministries of spatial planning (31,14)	parliaments (32,1)
Raw material intelligence (development of innovation framework)			X			
Mapping of raw materials (minerals potential, deposits of public importance, exploration)	X		X			
Extraction and processing of raw materials (licensing, information for small scale mining)				X		
Security of raw material supply (marketing of raw material, for innovative technologies, secure supply, assess demand)		X	X			
Circular Economy (product-responsibility, recycling and raw materials)						X
Impact dimensions (social impact issues related to mining activities, environmental issues related to mining, revision of legislation)			X	X		
Infrastructure planning (strategy for financing a railway network infrastructure, Involving communities in the siting of disposal facilities)			X			
land use planning (rural planning, urban planning, flood protection, changes in national planning policy, general notifications, general notifications on changes in law and on the area)					X	X

Source: MICA based on The Danish Environment- and Planningscommittee [DK] (associated to the Danish parliament), Confederation of the Danish Industry [DK], The Ministry of Mineral Resources [DK], Mineral License and Safety Authority [DK], Environment Agency for Mineral Resources Activities (EAMRA) [DK], Ministry of Industry, Labour and Trade [DK], Greenland Institute of Natural Resources (GINRN) [DK], Danish Center for Environment and Energy (DCE) [DK], Geological Survey of Denmark and Greenland (GEUS) [DK], Department for Environment, Food and Rural Affairs (DEFRA) [GB], Department for Communities and Local Government [GB], Department for Business Innovation and Skills [GB], Department of Energy and Climate Change [GB], Department for International Development [GB], Department for Transport [GB], Deutsche Rohstoffagentur (DERA) [DE], Bundesverband der Deutschen Industrie (BDI) [DE], Deutscher Bundestag [DE](see: Appendix 2 for details).

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Table 6: Stakeholder interests leveraged through consultations at EU level

	Horizon 2020	DG GROW, DG DEVCO (31,11)	DG ENV (31.12)	DG TRADE (31,13)	DG REGIO (31.14)	DG JUSTICE (31,15)	DG RTD (31.17)	European Parliament (32,1)
Raw material intelligence (EU actions in relation to global coordination of Earth observations; food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy, Horizon 2020 3rd programming consultation)	X						X	
Waste characterization and treatment (amendment of the mining waste directive; amount of mining waste, mining and waste management techniques; functioning of waste markets in the EU; implementation of the Directive on end-of life vehicles; unknown whereabouts)			X					X
Circular economy (financing, legal barriers)		X	X					
Security of raw material supply (responsible sourcing of minerals originating from conflict-affected and high-risk areas, critical raw materials, EIP, 'Commitments' in the area of raw materials, dumping in trade defence investigations concerning the People's Republic of China)	X				X			
Development paradigms (revising the European consensus on development, sustainable investment)	X					X		
Legal aspects (impacts of legislation on sectors, construction sector, functioning of the legislative framework for chemicals (excl. REACH), Fitness Check of the EU nature legislation (Birds and Habitats Directives), establishment of a European Pollutant Release and Transfer Register (E-PRTR), Streamlining monitoring and reporting obligations in environment policy, International Ocean Governance)	X		X					
Evaluation of funding schemes (mid-term evaluation of the LIFE funding programme, Ev. of European Regional Development Fund and Cohesion Fund, Public consultation on Horizon 2020 'Science with and for Society' Work Programme 2018-2020)			X		X		X	

Source: MICA based on EC Horizon 2020, DG GROW, DG DEVCO, DG Trade, DG REGIO, DG Environment, DG Justice, DG RTD, European Parliament (see: Appendix 2 for details).

The stakeholder consultation of the EC on Climate Action, Environment, Resource Efficiency and Raw Materials – Work Programme 2018-2020 preparation (SC 5, Horizon 2020) held until 8 April 2016 (DG RTD 2016) has broadly raised additional stakes.

5.3 Private sector organisations

The private sector comprises all enterprises and their industry associations. They are tied together:

- horizontally at the same level of the value chain: for example, certain raw material associations lobby together for beneficial conditions to their sector,
- vertically through the input-output relations of all economic activities across all sectors and levels of the value chain.

The term enterprise encompasses also enterprise groups, enterprise units and joint ventures of several enterprises. Industry associations generally lobby for the members they represent, which

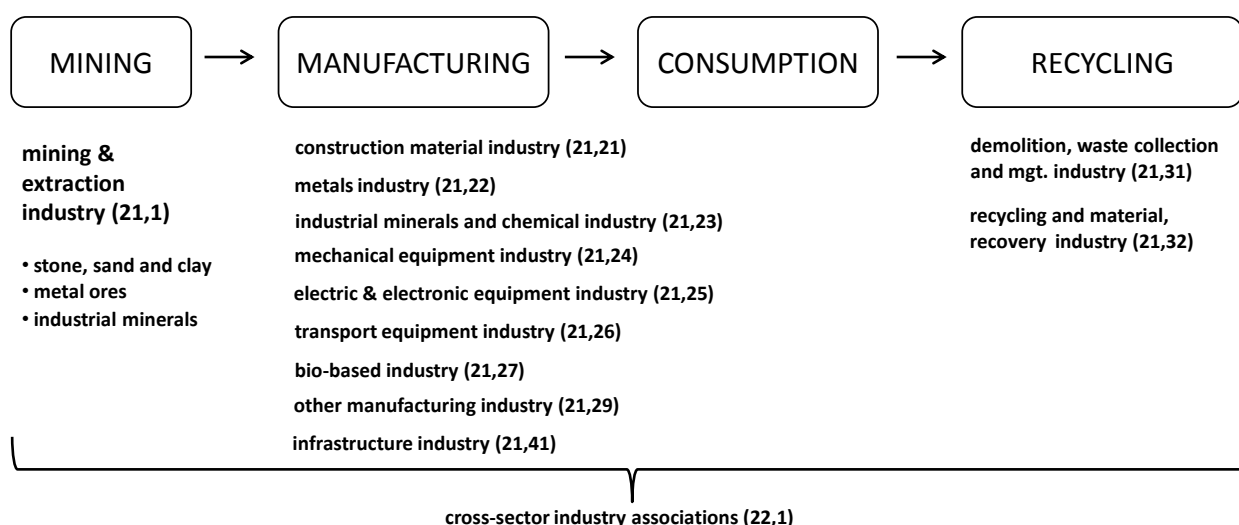
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are enterprises in that sense. They may be organized as civil society organisations, but their main remit is to support private sector activities. Likewise, employers' associations are classified under the private sector because they represent primarily the interests of the executive organs of enterprises. Professional organizations are assigned to the knowledge system (12,45).

We have searched and mapped industry associations at European level and – if not available at global and/or national level – to cover raw material supply and raw material demand of the entire economy in breadth (cf. megasector concept DG ENTR 2014, modified for the MICA purposes). Particular attention is paid to raw material demand for emerging technologies (DERA/ISI 2016), and accordingly, industry associations were researched. We made use of the EU's Transparency Register and of web-searches to identify concrete organizations.

Most relevant industry association types are shown in Figure 8 (upper part). 90 concrete organizations are listed in the internal Appendix 3. In addition, we have mapped enterprises and industry associations for aluminium across the entire life cycle from cradle to grave, including technical support and finance in depth across all spatial levels (see Figure 8 lower part).

Industry associations in breadth at EU-level



Enterprises and industry associations in depth for aluminum at all levels

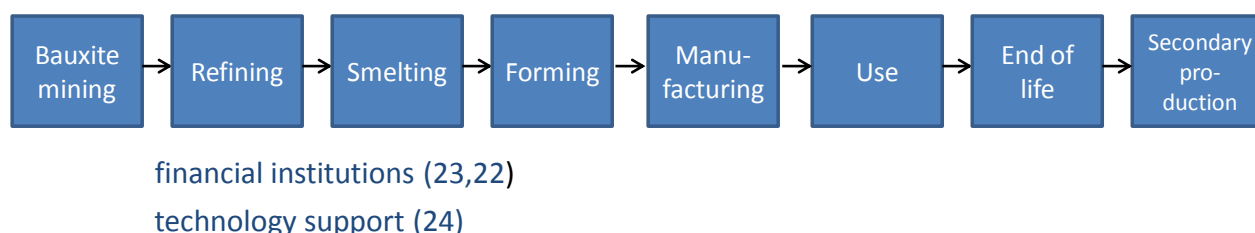


Figure 8: Stakeholder assemblage of private sector organizations. Source: MICA.

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The mapping of 90 industry associations (and their members) mainly at EU level yields a broad sketch of the entire economy. While the mining sector is represented by a few major industry associations (e.g. Euromines), the materials industry is split up into construction materials (e.g. UEPG European Aggregates Association), metals (e.g. Eurometaux), industrial minerals (e.g. IMA Industrial Minerals Association Europe) and chemicals (e.g. CEFIC European Chemical Industry Council). The manufacturing and infrastructure industry using these materials then branches out into a large diversity of industry associations. For the re-manufacturing part of the economy again, a small set of industry associations represents the interests of its members (e.g. EDA European Demolition Association, EuRIC European Recycling Industries' Confederation, FEAD European Federation of Waste Management and Environmental Services). Cross-sector industry associations such as Business Europe complete the picture.

The in-depth analysis for aluminium has brought two major insights to the fore. First, companies and industry associations often cover different parts of the value chain, and second, there is a global abundance of industry associations and players in aluminium.

We have depicted the stakeholder interests of industry from the foci of their websites, both for the breadth of materials transformed in a wide range of sectors of the European economy represented through 23 European industry associations (Table 7) and for aluminium in depth represented through aluminium enterprises and industry associations at EU, global and national level (Table 8). The aluminium life cycle is presented in higher resolution.

All industry associations are active in the field of promoting their industry's interest in the realms of industrial policy, trade policy and legislation. Many industry associations provide information services to their members and support R&D, collaboration and communication. Besides these general activities, they have certain foci with regard to raw material and environmental issues.

Table 7: Raw material interests of 23 European industry associations

	materials industry	manufacturing industry	re-manufacturing industry
Primary raw material supply (policy, initiative, access to non-EU sources, exploration, reporting of resources & reserves, mining waste, biodiversity, NATURA2000)	X		
Resource efficiency, no net loss	X		
Circular economy (supply chain, specific waste streams, recycling rates calculation, recycling incentives and barriers, markets, waste framework directive, waste shipment regulation, waste lists, landfill directive, biodiversity)	X	X	X
Ecodesign (MEErP methodology, evaluation of directive)		X	
Critical raw materials	X		
Sustainability & EHS (policy, SDS goals, SCP, impact assessment, ecolabel, audit, certification, industrial emissions directive, safety and health at work directive, physical agents: noise, vibrations)	X	X	X
Energy & climate (energy efficiency, ETS, CO ₂ regulation, carbon footprint, taxation)	X	X	

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Materials & substances (REACH, raw materials, CLP packaging)	X	X
Emerging technologies (alternatives, R&I, nanotechnology)	X	X
Trade (international, TTIP, responsible sourcing)	X	X
Lifestyles (promote healthy lifestyles)		X
Responsible business	X	X
Other (machinery directive)	X	X

Source: MICA based on CEFIC, Construction Products Europe, CRM Alliance, ECP, EPMF, EUROALLIAGES, EUROFER, EUROMETEAUX, EUROMINES, IMA Europe, MMTA, PRE, UEPG (materials industry); ACEA, CESA, CLEPA, ECCA, FoodDrink Europe, Metals for Buildings, ORGALIME (manufacturing industry); EDA, EuRIC, FEAD (re-manufacturing industry) (see: Appendix 3 for details).

Table 8: Raw material interests of enterprises and industry associations covering the life cycle of aluminium (primary production comprises smelting, refining and forming, secondary production recycling and material recovery)

	Mining	primary production	manufacturing & use	End of Life	secondary production	technical support	Finance	industry associations
Bauxite mining business (trends, opening of new mines, overhaul of technologies, suppliers, pricing)	X	X				X		
Al smelters (capacities, ongoing and new projects, upgrading, projections for new installations, new Al production places, energy pricing)		X				X		
Primary Al markets – primary (bauxite/alumina/aluminum, global industry, competition, relocation, prospective prices for refined Al, projected local demands and expansion possibilities)	X	X	X				X	X
Secondary Al markets – secondary (availability, scrap markets, material compositions, alloys, output from recycling)		X		X	X			X
Projections of primary Al supply (availability, only one supplier in South America)		X	X			X	X	X
Projections of secondary Al supply in use stock with related outflow times into the recycling system by region (availability, volumes by end-use type, speciality companions, industry scrap, local resolution, where new recycling facilities will come up, planning of plant capacities)			X	X	X	X	X	X
Projections of Al demand by end-use sector (packaging cans, building & construction, transportation, machinery & equipment, other; geographical resolution)		X	X			X		X
Al products (product trends, new material standards for potential Al applications, new application fields, new production lines, new alloys, competing material solutions)		X	X			X		X
Commodity pricing (pricing strategies in markets)	X	X	X	X	X	X	X	X
Responsible aluminum (sourcing, supply chain, certification)								X

Source: MICA based on websites of enterprises, industry associations and financial institutions (see: Appendix 3 for details).

EUNOMIA (2015) authored a comprehensive report on mining and recycling stating additional raw material information needs.

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5.4 Civil society organisations

Civil society is the aggregated set of non-governmental organizations and institutions that manifest interests and will of citizens. The level of organization ranges from informal contacts to citizen initiatives to non-governmental organisations (NGOs) representing civil society interests. Such civil society organisations (CSOs) are often organized around a certain issue such as human rights or the environment. In relation to raw materials, civil society has only been fragmentarily mapped to date. A number of NGOs are not classified under civil society. For example, industry associations and employers' associations rather represent a part of the economic system and professional organisations of the knowledge system than of civil society.

For pragmatic reasons, we focused on organisations who have a minimum degree of institutionalisation, i.e. they have at least an own website and/or they are officially registered, because the effort to identify them is lower than for those which are hardly institutionalized. We have searched and mapped CSOs at European and global level for a wide range of issues. From the entirety of CSOs, we chose the ones that are either organized at the European level or articulating their interests towards one or several European institutions. Only those CSOs making any statements relating to raw materials were finally included in the analysis. To identify these statements, a keyword-based search was applied on the CSOs' websites comprising the keywords 'raw material', 'mining', 'mine', 'mines', 'mineral' and 'recycling'.

The more than 50 CSOs included in our analysis are heterogeneous in terms of their size and structure. Besides a rather small number of big CSOs, e.g. Greenpeace, Human Rights Watch or Amnesty International, a higher number of organizations are relatively small, some being only temporary initiatives. A number of umbrella organizations aggregate the interests of national CSOs at the European level. Eight subgroups are considered most relevant with regard to claims in raw material intelligence:⁴⁰

- **Transparency and democracy NGOs:** There are a number of CSOs focusing on the general accountability of governments and enterprises to society. Most prominent activities on transparency and representation of interests in mining projects are multi-stakeholder initiatives. A comprehensive inventory of civil society claims in mining issues is provided by the Initiative for Responsible Mining Assurance (IRMA Draft 2.0, April 2016). It covers 2 business integrity requirements, 13 social responsibility requirements, 10 environmental responsibility requirements and 2 positive legal requirements.
- **Development aid and relief CSOs:** Among the development aid and relief organizations, only a small number makes raw material related statements towards European institutions. The umbrella organization CONCORD and its member Action Aid have been relatively active in the last three years.
- **Social welfare CSOs:** Organizations advocating social welfare can be found, for example, in the fields of health, land rights and minority rights. Of those referring to raw materials, most are not represented by umbrella organizations; and many overlaps with other thematic categories exist.

⁴⁰ We consider all these organizations as CSOs, but sometimes stick to more familiar names, e.g. environmental NGO.

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- **Environmental NGOs:** Some environmental NGOs have developed into global brands, such as Greenpeace and the World Wildlife Fund for Nature (WWF). Organisations such as the European Environmental Bureau (EEB) and the International Union for the Conservation of Nature (IUCN) have developed significant capacity and capability to influence raw material policy-making.
- **Consumer organizations:** A big part of the consumer organizations does not focus on mining, but rather on later stages of the value chain. Consumer organizations expressing raw material related claims mostly concentrate on health and environmental impacts.
- **Trade unions:** Organizations representing the interests of workers at the European level are sectoral trade unions, for example in the mining industry, and cross-sectoral trade union confederations (e.g. IndustriAll).
- **Human rights NGOs:** Among human rights NGOs, statements relating to raw materials are dominated by Amnesty International and Human Rights Watch.

We have elicited their raw material information needs through analysis of their position papers and political statements, i.e. they are derived and often not stated explicitly as such (see Appendix 4 for details). Figure 9 contains an illustrative classification of the thematic CSO types along the value chain.

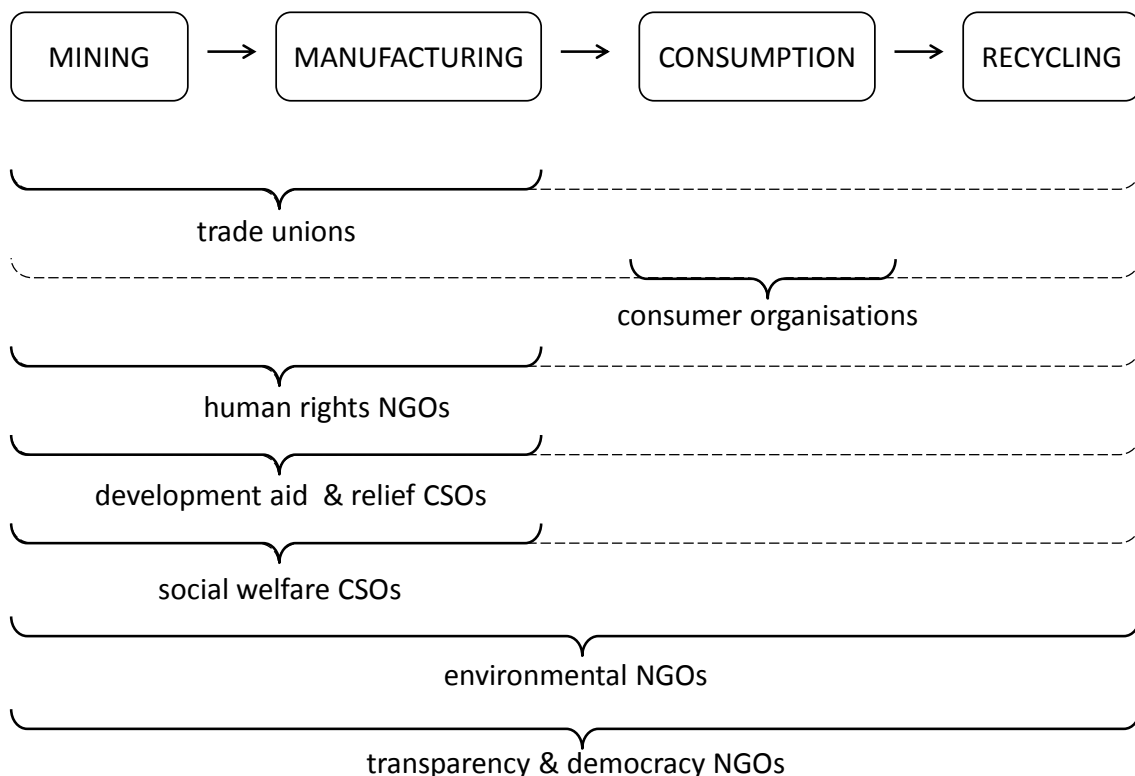


Figure 9: Stakeholder assemblage of civil society organizations. Source: MICA based on web analyses of CSOs homepages, position papers and political statements (see Appendix 4 for details).

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Some CSOs clearly cover the entire value chain such as transparency & democracy NGOs and environmental NGOs, whereas, for example, trade unions and social welfare CSOs rather focus on the mining and manufacturing stages. Consumer organizations have their focus on consumption but extend their remit to the entire value chain. All in all, the breadth of CSOs in relation to raw materials is mapped for the first time, however far from being complete (see section 4, in particular codes 41,18-41,19).

Key raw material information needs can be derived from civil society positions in the domains indicated in Table 9:

Table 9: Raw material related interests of CSOs

	Human Rights NGOs	Trade Unions	Development & relief CSOs	Social welfare CSOs	Consumer organizations	Environmental NGOs	Transparency & democracy CSOs
Balance of trade relations	x		x				
Conflict minerals / Supply chain due diligence according to OECD standards	x		x			x	
Further standards for Corporate Social Responsibility			x				
Free, prior and informed consent to ensure extractive industry transparency				x			
Safe and health working conditions, e. g. hazardous substances	x	x		x	x		
Land rights / forced displacement of local people	x		x	x			
Minority rights				x			
Monitoring of artisanal and small-scale mining activities	x				x		
Intimidation, violence, and killing of / against human rights defenders	x						
Child labour	x		x				
Country-by-country-reporting, e. g. for taxes		x	x				
Raw materials as driving force for relocations (from Europe)		x					
Circular economy / urban mining		x	x		x	x	
Environmental impacts of mining (local and global): planetary boundaries, hazardous substances, emissions, energy efficiency	x			x	x	x	
Environmental impacts of products, e. g. eco-design, implications for mining					x	x	
Corruption in the mining sector							x

Source: MICA based on web analyses of CSOs homepages, position papers and political statements (see Appendix 4 for details).

A comprehensive inventory of civil society claims in mining issues is provided by the Initiative for Responsible Mining Assurance (IRMA Draft 2.0, April 2016). It covers 2 business integrity requirements, 13 social responsibility requirements, 10 environmental responsibility requirements and 2 positive legal requirements.

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5.5 Expert conferences on raw materials

Expert communities in the field of raw materials come together at conferences. Conferences serve to gather and discuss the state of knowledge on a certain issue. A number of different actor groups assemble around conferences:

- The organizers and sponsors make for the practical realization and a broad outreach of the conference. Exhibitors and media may be involved, too.
- The organizers often set up programme committees that negotiate and decide on the various tracks and contributions of conferences.
- The contributors to the state of knowledge on a certain issue include the individual speakers, panelists, participants and rapporteurs of sessions.

There are scientific conferences and well known specific international conferences organised to match investors and miners or junior mining companies (e.g. Mines and Money, MiningIndaba or Prospectors and Developers Association of Canada conferences). We have selected major conferences on geology/mining and on industrial ecology/recycling to identify and assign actors to stakeholder groups which are displayed in Figure 10. Appendix 5 provides detailed information.

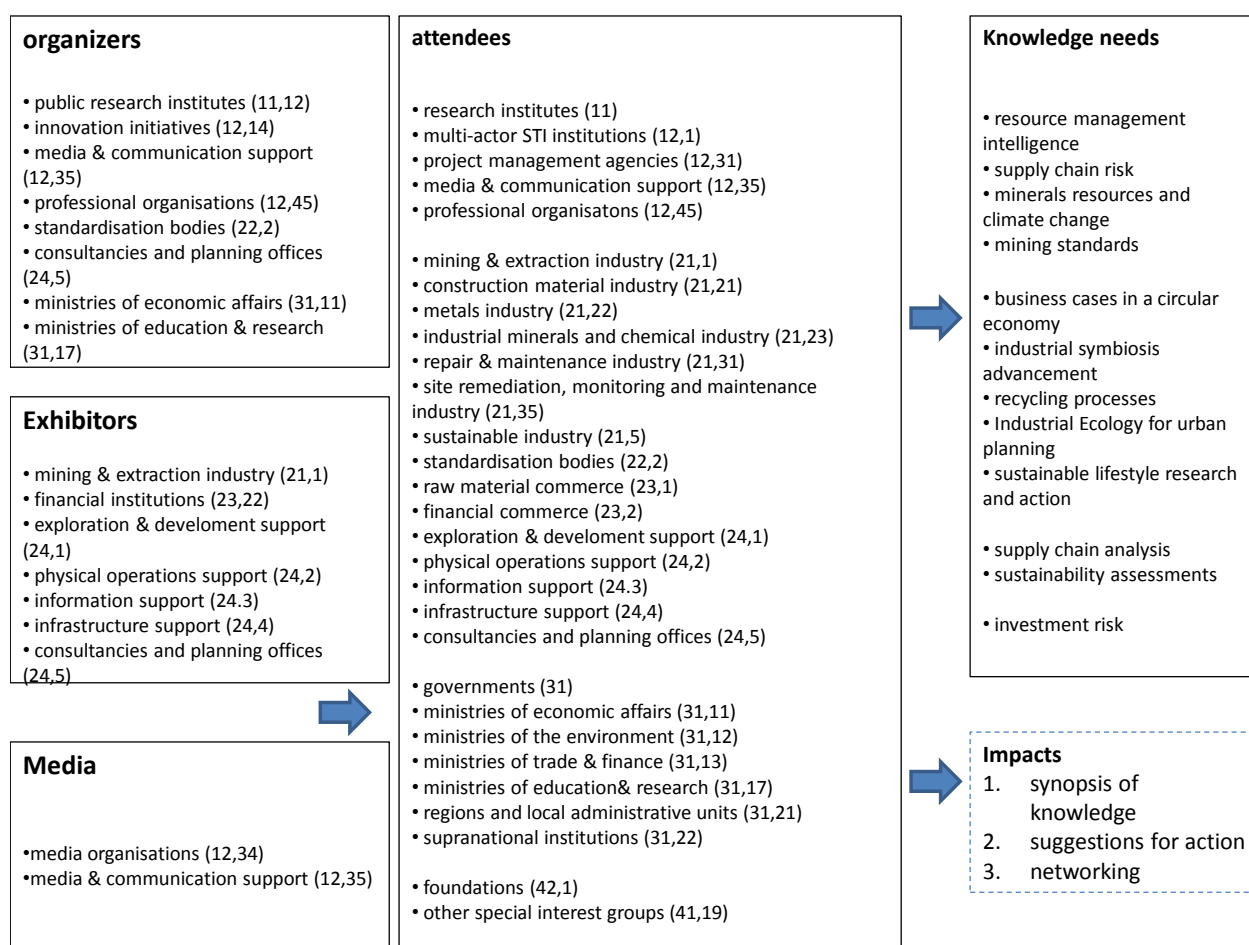


Figure 10: Stakeholder assemblage around scientific conferences. Source: MICA based on recent conferences on geology/mining and industrial ecology/recycling (see Appendix 5 for details).

Deliverable D2.1

The following key raw material information needs have been collected for geology/mining conferences (Table 10) and industrial ecology/recycling conferences (Table 11), respectively. They were collected at the level of conference session topics. A few conferences cover both theme clusters, as the two communities increasingly interact:

Table 10: Key raw material information needs articulated through geology and mining conferences

	Annual High Level Conference of the European Innovation Partnership (EIP) on Raw Materials	MIN WIN-WIN: Mines & Money	EU-US-Japan Trilateral Conference on Critical Materials	ERA MIN	ERA-MIN Stakeholder meeting	MINEX EUROPE für Europa
National economic policies and governance structures	x					
Reliable and consistent minerals data for stock exchanges, commodity markets and financial systems	x					
Public data and reporting requirements across the EU: The PERC reporting standard, CRIRSCO, and the UNFC classification	x					
Responsible mining in Europe: costs vs. profits; roles and responsibilities of geoscientists in minerals reporting	x					x
Mapping and networking the European non-energy mineral raw materials research community				x		
Critical materials: find substitutes, in particular for critical raw materials in high-value technology applications; rare earth substitution from a steel industry perspective; rare earth substitution and related needs in research and education; improve use efficiency			x	x	x	
International research cooperation: nano-scale design of substitute materials, new environmentally friendly extraction and separation technologies			x	x	x	
International research cooperation:			x			
Roadmapping research priorities/research, development and education needs to meet the future supply from primary resources in Europe				x	x	
Economic viability/potential for the expansion of the European mineral base						x
Cross-border initiatives to encourage mining in Europe						x
Mining efficiency in times of low commodity prices; improving the extraction of critical materials			x			x

Source: MICA based on EIP Raw Materials, Mines and Money Conference, EU-US-Japan trilateral conference on Critical Materials, ERA-MIN, MINEX Europe (see Appendix 5 for details).

Deliverable D2.1

Table 11: Key raw material information needs articulated through industrial ecology and recycling conferences

	Annual High Level Conference of the European Innovation Partnership (EIP) on Raw Materials	EU-US-Japan Trilateral Conference on Critical Materials	ERA-MIN Stakeholder meeting	World Resources Forum	International Conference of the International Society for Industrial Ecology	Gordon Conference on Industrial Ecology	EcoBalance	LCA	LCM Conference Series
Business challenges and opportunities in the circular economy	x			x					
Recycling practices / processes (in the field of rare earth, related needs in research and education, nanotechnology applications for recycling; improved and more precise manufacturing)		x	x						
Technologies and Assessments for recovering materials from Urban Mining		x					x		
Tailoring the science of Industrial Ecology to the needs of the urban planning and design process					x	x			
Reliable and comprehensive indicators and benchmarks to set policy goals in resource management				x					
Role of sustainable lifestyles in the circular economy				x					
Contribution of the use of non-energetic resources to climate change (impact, mitigation)				x					
Supply chain risk management , in particular material resource supply risks for renewable energy technologies				x			x		
Code of practices and standards for mines; Fairtrade and Fairmined standard				x					
Theories, Models and Mechanisms of Symbiotic Systems and Eco-Industrial Development					x				
Method and database development in EEIO					x				
Rebound Effects in the field of recycling					x				
Improving the analytical capacity to analyze global supply chains of energy and material						x			
LCA Methodology and Life Cycle Scenario Modelling Techniques		x			x		x	x	
Life Cycle Management (LCM)									x

Source: MICA based on EIP Raw Materials, EU-US-Japan trilateral conference on Critical Materials, ERA-MIN, World Resource Forum, International Society for Industrial Ecology, Gordon Conference on Industrial Ecology, EcoBalance, LCA and LCM conference series (see Appendix 5 for details).

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The organizers of conferences on geosciences comprise in particular professional organizations and consultancies but also ministries and multi-actor initiatives. Some conferences have a secretariat, such as the World Resources Forum and the MINEX Europe Forum. While the attendees cover a broad array of stakeholder groups from all four major domains (knowledge system, economic system, political system, civil society), the exhibitors mainly represent stakeholder groups with a clear economic interest. Scientific conferences on raw materials provide the synopsis of the state of knowledge, suggest actions and facilitate networking, while investor conferences aim at matching miners and investors.

In addition, the MINEX (2015) survey elicits a broad spectrum of raw material related needs at the national level of 24 European countries.⁴¹

5.6 Country profiles

Stakeholders in raw material policy gather at the national level, which is linked to supra- and subnational levels. While the stakeholder groups in EU raw material policy-making have been mapped extensively (e.g. Tiess 2011), such information on the national and subnational level is scattered and difficult to access. This country-level perspective shall account for the national and subnational levels.

Four geological surveys (MFGI of Hungary, PGI of Poland, LNEG of Portugal and SGU of Sweden) identified and mapped the stakeholder landscape in their respective countries, considering who is most important in raw material policy-making.

The compilation of stakeholders and of their needs has mostly been done through quick interviews at different meetings attended, in connection with missions in the respective countries and with colleagues at different departments and divisions within the geological survey. Some inquiries have been done by telephone and e-mail contacts.

The four country perspectives showing which stakeholder groups matter in the current raw material discourse of a certain country yield the following pattern (Table 12).

All of the four countries share the stakeholder groups: geological surveys, universities, mining & extraction industry, ministries of economic affairs, ministries of the environment, and regions and local administrative units. Only in this country perspective, the significance of the regions and local administrative units comes clearly to the fore. The four countries differ in the names of the respective regional and local administrative units. In Poland, the linkages of the metals industry with downstream manufacturing industry can be traced, while in Hungary, Portugal and Sweden the construction materials industry is most prominent. The recycling and material recovery industry seems to play a major role in all countries, to a lesser degree in Portugal. Exploration &

⁴¹ Key factors affecting mining business in Europe in 2015, with large country variety, include: 1 mining legislation and regulation, 2 accessibility of information, 3 attitude towards mining operations, 4 geological prospectivity, 5 availability of land for exploration, 6 corruption, 7 cost of labour, 8 infrastructure, 9 language and 10 workforce (MINEX 2015).

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mining support, consultancies and planning offices, statistical offices and environmental NGOs are relevant players in at least three of the four countries.

Table 12: Stakeholder groups identified bottom-up in a country perspective

code	stakeholder group	Hungary	Portugal	Poland	Sweden
11,11	geological surveys				
11,12	public research institutes (other)				
11,13	universities				
11,14	academies of science				
11,3	applied research institutes (non-governmental)				
12,22	intelligence platform promoters & operators				
12,45	professional organisations				
21,1	mining & extraction industry				
21,2	manufacturing industry				
21,21	construction material industry				
21,22	metals industry				
21,23	industrial minerals and chemicals industry				
21,25	electric & electronic equipment industry				
21,26	transport equipment industry				
21,27	bio-based industry				
21,29	other manufacturing industry				
21,31	demolition, waste collection and management industry				
21,32	recycling and material recovery industry				
21,41	infrastructure industry				
21,5	sustainable industry				
22,2	standardisation bodies				
24,1	exploration & development support				
24,2	physical support				
24,5	consultancies and planning offices				
31,11	ministries of economic affairs				
31,12	ministries of the environment				
31,13	ministries of trade & finance				
31,14	ministries of spatial planning				
31,15	ministries of social affairs				
31,18	statistical offices				
31,21	regions and local administrative units				
32,1	parliaments				
33	judiciary				
41,14	environmental NGOs				
41,19	other special interest groups				
42,1	foundations				

Source: MICA based on LNEG, MFGI, PGI and SGU (tacit knowledge and informal communication with stakeholders) (see Appendix 6 for details).

The following key raw material information needs at country level have been collected (Table 13), details being provided in Appendix 6:

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Table 13: Raw material information needs of stakeholders in four countries assigned to four principal actor domains

	Knowledge system	Economic system	Political system	Civil Society
Geological deposits (availability, mineral occurrences (quality, quantity), resources, prospection, research, geological/geochemical/geophysical maps & databases, drill core archives, basic research)	HU, PT, SE	PT, SE	HU, SE	
Urban mine (in stock, occurrences of waste & scrap, secondary raw materials, basic research)	SE	PL, PT; SE	SE	
Exploration & exploitation processes (trends, optimization, minerals rights, exploration & mining regulations and permits, promotion)	HU, PL, PT, SE	HU, PL, PT, SE	HU, PL, SE	
Land use (land use plans, urban planning, infrastructure plans from government to municipality level, area development information, involved municipalities, protected areas, indigenous people, regulation)		HU, SE	HU, PT, SE	
Global and national markets, prices, stocks (spatial and temporal distribution, major and companion materials, alloys)	PL	PL		
Critical raw materials	PL	PL		
Geographical information (exploration permits and exploitation concessions, protected areas (e.g. natural areas, cultural areas, recreational areas), mineral deposits, resources and reserves, mineral production (current and historical), secondary resources (e.g. minerals in tailings), exploration areas of interest, land use (nationally and locally)		HU, PL, PT, SE		
Statistics & SSH on raw materials (statistics: mineral resources (primary & secondary), mines, employment, raw material economics (use in end sectors), supply & demand projections; sociology, stakeholders)	PT, SE	PL, PT	HU, PT, SE	
Industry structure (producers, exporters, legal framework, development, international trade)	PL	PT, SE	PT, SE	
Environmental impact (mines, mining waste, nature conservation, assessments, minimization, foundations, regulation)	PT	PT, SE	HU, PL, PT, SE	PT, SE
Cultural heritage (mining patrimony)			PT	PT
Recycling (waste materials, use of wastes, secondary material recovery)	HU, SE	PL	PL	
Manufacturing & use (developments, resource efficiency, eco-design, material requirements)		HU, PL, SE		

Source: MICA based on LNEG, MFGI, PGI and SGU (tacit knowledge and informal communication with stakeholders) (see Appendix 6 for details).

Countries follow very different raw material strategies which may imply different raw material information needs. For example, Denmark pursues a raw material plan with a clear focus on its own waters. Germany has acquired offshore mining rights and raw material diplomacy has enabled access to raw materials in Kazakhstan and Mongolia, both partners willing to avoid a dependency on China.

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5.7 World Café

Task 2.1 of WP2 has mapped the pre-existing knowledge of the WP2 participants about the stakeholder landscape. The Inception Workshop in February 2016 in Copenhagen [DK] provided four broad categories (knowledge system, economic system, political system and socio-cultural system) to be filled in with stakeholder groups. Stakeholder groups have been amended by workshop participants in a World Café, four participant groups switching consecutively from table to table building upon the work of the group (s) previously at the respective table. This is documented in an internal milestone report (M1). The stakeholder groups identified are listed in Appendix 7. They have been incorporated in the definition of stakeholder groups (section 4).

5.8 Foresight and brainstorming

Some foresight studies point at future developments that are already noticeable in the present. Such foresight studies can be used to re-assess the position of stakeholder groups (section 3) under different assumptions and to identify further stakeholders.

We have analyzed the following sources to identify future topics:

- Strategic Foresight: Towards the 3rd Strategic Programme of Horizon 2020 (SAMI Consulting 2016)
- DG ENTR Call on Future EU manufacturing, assembly and extracting activities in space (DG ENTR 2013)
- World in Transition: Governing the Marine Heritage (WBGU 2013)
- Integrated Technology Roadmap – Automation 2020+ Megacities (ZVEI 2010)
- Raw Material Demand for Emerging Technologies (DERA/ISI 2016)
- BMBF Foresight Cycle 2: Social Trends (VDI TZ & Fraunhofer ISI 2015)

The analysis of these sources yielded three basic developments that may sharpen the position of stakeholders in raw material intelligence:

- the expansion of primary raw material supply (new frontiers for mining the lithosphere, e.g. offshore mining, lunar manufacturing, in-situ mining in protected areas)
- the expansion of secondary raw material supply (mining the anthroposphere in place of the lithosphere, e.g. local circular economy cooperatives, industrial ecology at district level)
- socio-technical transformation (changing modes of production and consumption, e.g. massive raw material movements through geoengineering altering our understanding of nature, changing production/consumption relations through additive manufacturing)

A joint brainstorming session involving three persons from the Fraunhofer ISI's Foresight unit and three persons from Fraunhofer ISI's Infrastructure and Sustainability unit identified and sharpened a number of stakeholder groups that are considered in the definition of stakeholder groups (section 4) and in the classification of stakeholder groups (section 3).

Finally, we have analyzed foresight studies in the realm of knowledge generation, circulation and exploitation to identify further stakeholder groups:

- Research and Innovation Futures (RIF 2013):
- Forward Visions on the European Research Area (VERA 2013)

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These stakeholder groups are again considered in the definition of stakeholder groups.

Appendix 8 provides a list of stakeholder groups identified through the brainstorming session based on emerging topics derived from foresight studies.

6. Conclusion

Eight approaches to identify stakeholder groups and to elicit stakeholder needs from different perspectives are designed and conducted. The stakeholder definition is applied to 90 principal stakeholder groups put into a hierarchical order. These 90 stakeholder groups have been classified according to a stakeholder typology distinguishing definitive, dominant, dependent, dormant, discretionary, demanding and dangerous stakeholders.

Deliverable D2.1, the Stakeholder Report, provides a comprehensive inventory of relevant stakeholders to inform other Work Packages of the MICA project.

The topics identified in this report (section 5) support WP 3 Data and WP 4 Methods in searching and selecting adequate data and methods respectively. They inform WP6 Platform about topics for consideration in the services of the MICA platform.

The definition of stakeholder groups (section 4) assists WP 5 Policy to identify elements and to construct relations in raw material policy-making. The stakeholder groups defined may also be seen as an ontology that could inspire also the ontology built in WP6 Platform.

WP 1 Project Management and WP 7 Dissemination may build upon the stakeholder classification (section 3) in combination with the definition of stakeholder groups (section 4) to establish relationships with certain stakeholder groups of interest.

The comprehensive stakeholder mapping in relation to raw material intelligence is the first of its kind. It has been developed mainly through desk research and informal communication with stakeholders, while a systematic and comprehensive appraisal of stakeholder needs is covered by the upcoming Task 2.3.

7. References

- ACE [The Electoral Knowledge Network] 2012: Parties and candidates. <http://aceproject.org/ace-en/topics/pc/pca/pca01/pca01a> (accessed 26 July 2016).
- Achterkamp, M.C. & Vos J.F.J. 2007: Critically identifying stakeholders. In: Systems Research and Behavioral Science, 25(1) 3-14.
- Allwood, J.M., Cullen, J.M. & Milford, R.L. 2010: Options for achieving a 50% cut in industrial carbon emissions by 2050. Environmental Science and Technology, 44(6) 1888-1894.
- Alok, J., Sample, I., Boase, N. & Duckworth, A. (2008). Science Weekly: Iain Stewart on climate change. Guardian. <https://www.theguardian.com/science/audio/2008/sep/08/science.weekly.podcast> (accessed 30 June 2013).
- Arndt, N., Kesler, S.E. & Ganino, C. 2015: Metals and Society. An Introduction to Economic Geology. 2nd edition. Springer: Cham.
- Ashby, M.P.J. & Bowers, K.J. 2015: Concentrations of railway metal theft and the locations of scrap-metal dealers. In: Applied Geography 63(2015) 283-291.
- ASPE [Office of the Assistant Secretary for Planning and Evaluation] 2000: The role of intermediaries in linking TANF recipients with jobs: the process of linking TANF recipients with jobs. <https://aspe.hhs.gov/legacy-page/role-intermediaries-linking-tanf-recipients-jobs-process-linking-tanf-recipients-jobs-152961> (accessed 26 July 2016).
- Berger, J. 2003: Religious Non-Governmental Organizations: An Exploratory Analysis. <http://www.global.ucsb.edu/orfaleacenter/luce/luce08/documents/Harvard%20Summary%20paper.pdf> (accessed 26 July 2016).
- Bhatti, Y. 2011: What is frugal innovation? Definition. <http://www.frugal-innovation.com/author/yasserbhatti/> (accessed: 25 July 2016).
- Bosančić, S. 2007: Werte, Normen und Rollen. Universität Augsburg. Grundkurs Soziologie. 28. November 2007.
- BPB [Bundeszentrale für politische Bildung] 2016a: Arbeitgeberverbände. <http://www.bpb.de/nachschlagen/lexika/lexikon-der-wirtschaft/18650/arbeitgeberverbaende> (accessed 26 July 2016).
- BPB [Bundeszentrale für politische Bildung] 2016b: Partei. <http://www.bpb.de/nachschlagen/lexika/politiklexikon/17992/partei> (accessed 26 July 2016).
- BPB [Bundeszentrale für politische Bildung] 2016c: Bürgerinitiativen. <http://www.bpb.de/nachschlagen/lexika/handwoerterbuch-politisches-system/201988/buergerinitiativen?p=all> (accessed 26 July 2016).
- Bryson, J.M. 2004: What to do when Stakeholders matter. In: Public Management Review, 6(1) 21-53.
- Business Dictionary 2016a: Government. <http://www.businessdictionary.com/definition/government.html#ixzz4C75riVvl> (accessed 26 July 2016).
- Business Dictionary 2016b: Charitable organization. <http://www.businessdictionary.com/definition/charitable-organization.html#ixzz4BdFjcHBB> (accessed 26 July 2016).
- Business Dictionary 2016c: Foundation. <http://www.businessdictionary.com/definition/foundation.html> (accessed 26 July 2016).
- Business Directory 2016d: Values. <http://www.businessdictionary.com/definition/values.html> (accessed 26 July 2016).
- Business Directory 2016e: Lifestyle. <http://www.businessdictionary.com/definition/lifestyle.html> (accessed 26 July 2016).
- Cameron, G. 2008: Background paper: How should we classify civil society? A review of mainstream and alternative approaches. International Conference: Whatever Happened to Civil Society? 3-5 December 2008, KDK Conference Centre, the Netherlands.

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- Carayannis, E.G. & Campbell, D.F.J. 2010: Triple Helix, Quadruple Helix and Quintuple Helix and How Do Knowledge, Innovation and the Environment Relate To Each Other? A Proposed Framework for a Trans-disciplinary Analysis of Sustainable Development and Social Ecology. *International Journal of Social Ecology and Sustainable Development* 1 (1) 41-69.
- Computer Hope 2016: Hacker. <http://www.computerhope.com/jargon/h/hacker.htm> (accessed 26 July 2016).
- Consumer Council 2016: Consumer Organisations. GCSE home economics – wiser buyer. Consumer Council Factsheet. http://www.consumercouncil.org.uk/filestore/documents/home_economics_a_level_and_gcse/gcse_wiser_buyer/Consumer_Organisations_Factsheet.pdf (accessed 26 July 2016).
- Cordis 2010: What is Foresight: Definition. <https://cordis.europa.eu/foresight/definition.htm> (accessed 25 July 2016).
- Crowdsurfer Ltd & Ernst & Young LLP 2015: Crowdfunding: Mapping EU markets and events study. On behalf of the European Commission. http://ec.europa.eu/finance/general-policy/docs/crowdfunding/20150930-crowdfunding-study_en.pdf (accessed 26 July 2016).
- Democracy International 2010: Mission Statement. 27 November 2010, Brussels. https://www.democracy-international.org/sites/default/files/PDF/2010-12-01%20Democracy_International_Mission_Statement_EN.pdf (accessed: 26 July 2016).
- DERA [German Raw Material Agency] 2016: Marscheider-Weidemann, F., Langkau, S.; Hummen, T.; Erdmann, L.; Tercro, L.T. (Fraunhofer ISI), Marwede, M. & Benecke, S. (Fraunhofer IZM): Rohstoffe für Zukunftstechnologien 2016. DERA Rohstoffinformationen 28. DERA: Berlin.
- DG ENTR 2013: CALL FOR TENDER No ENTR/300/PP/2013/FC. FRAMEWORK CONTRACT - STUDIES IN THE AREAS OF EUROPEAN COMPETITIVENESS.
- DG ENTR 2014: ANNEXES TO THE REPORT ON CRITICAL RAW MATERIALS FOR THE EU. REPORT OF THE AD HOC WORKING GROUP ON DEFINING CRITICAL RAW MATERIALS. Date: 25/05/2014.
- DG RTD 2016: Synthesis of the results of the 2016 stakeholder consultation for Horizon 2020 Societal Challenge 5 'Climate action, environment, resource efficiency and raw materials'. Date: 12/07/2016. <https://ec.europa.eu/programmes/horizon2020/en/climate-action-environment-resource-efficiency-and-raw-materials-work-programme-2018-2020> (accessed 26 July 2016).
- EARTO [European Association of Research and Technology Organisations] 2016: Who we are. <http://www.earto.eu/about-rtos.html> (accessed 25 July 2016).
- Elias, A.A., Cavana, R.Y. & Jackson, L.S. 2002: Stakeholder analysis for R&D project management. In: *R&D Management*, 32(4) 301-310.
- ENoLL [European Network of Living Labs] 2016: What is a Living Lab? <http://www.openlivinglabs.eu/aboutus> (accessed 25 July 2016).
- Erdmann, L. & Schirrmeister, E. 2016: Constructing Transformative Scenarios for Research and Innovation Futures. *Foresight*, 18(3) 238 – 252; <http://dx.doi.org/10.1108/FS-06-2014-0041>
- EUNOMIA 2015: Study on the Competitiveness of the EU Primary and Secondary Mineral Raw Materials Sectors. Final Report for DG Internal Market, Industry, Entrepreneurship and SMEs. Eunomia Research & Consulting Ltd: Bristol.
- EuroGeoSurveys 2016: About us. <http://www.eurogeosurveys.org/about-us/> (accessed 25 July 2016).
- European Commission 2010: Communication from the president to the Commission, Framework for Commission Expert Groups: Horizontal Rules and Public Register. SEC 2010 7649 final. 10 November 2010, Brussels.
- European Commission 2014a: The European Union explained. How the European Union works. Your guide to the EU institutions. Publications Office of the European Union : Luxembourg. Available at: <http://bookshop.europa.eu/en/how-the-european-union-works-pbNA0414810/?CatalogCategoryID=luYKABst3lwAAAEjxJEY4e5L> (accessed 26 July 2016).

Deliverable D2.1

- European Commission 2014b: The structure of the European education systems 2014/15: schematic diagrams. http://eacea.ec.europa.eu/education/eurydice/documents/facts_and_figures/education_structures_EN.pdf (accessed 26 July 2016).
- European Commission 2015a: What are RIs? http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=what (accessed 25 July 2016).
- European Commission 2015b: Waste management: Commission refers GREECE to the Court of Justice of the EU over illegal landfill. http://europa.eu/rapid/press-release_IP-15-6224_en.htm (accessed 25 July 2016).
- European Parliament 2015: Transparency of lobbying at EU level. Briefing. December 2015, European Union.
- European Personnel Selection Office 2013: Project / programme officers and advisers. http://europa.eu/epso/apply/jobs/cast/2015/projectmanagement/index_en.htm (accessed 25 July 2016).
- European Professionals Network (2016): Who are we? <http://www.epnetwork.eu/archives/69> (accessed 25 July 2016).
- European Union 2016: European Parliament. http://europa.eu/about-eu/institutions-bodies/european-parliament/index_en.htm (accessed 26 July 2016).
- EUROPOL 2016: 17 EU Member States in Coordinated Action against Metal Thieves. <https://www.europol.europa.eu/content/newsletter-17-eu-member-states-coordinated-action-against-metal-thieves> (accessed 26 July 2016).
- Eurostat 2008: NACE Rev. 2. Statistical classification of economic activities in the European Community. Eurostat Methodologies and Working Papers.
- Eurostat 2015: Regions in the European Union. Nomenclature of territorial units for statistics NUTS 2013/EU-28. Eurostats manuals and guidelines. Publications Office of the European Union: Luxembourg.
- Ezeah, C., Fazakerley, J.A. & Roberts, C.L. 2013: Emerging trends in informal sector recycling in developing and transition countries. *Waste Management* 33(2013) 2509–2519.
- Finn, C.B. 1996: Stakeholder Influence Mapping. In: C. Huxham (ed.), *Creating Collaborative Advantage*. Sage: Thousand Oaks, CA.
- France Bleu 2016: L'explosion à l'entreprise Variscan Mines d'Orléans revendiquée : les enquêteurs sur la piste bretonne. <https://www.francebleu.fr/infos/faits-divers-justice/un-engin-explosif-vise-l-entreprise-variscan-mines-orleans-l-action-signe-en-breton-1464104710> (accessed: 26 July 2016).
- Freeman, R.E. 1984: *Strategic Management: A Stakeholder Approach*. Pitman: Boston, MA.
- Frischmann, B.M. 2012: *Infrastructure – The Social Value of Shared Resources*. Oxford University Press: New York.
- Geological Survey of Japan 2016: Directory of Geoscience Organizations of the World. <https://www.gsj.jp/information/gsj-link/dir/a.pdf> (accessed 26 July 2016).
- GlobalCorps 2016: List of relief organizations. <http://www.globalcorps.com/jobs/ngolist.pdf> (accessed: 26 July 2016).
- Golder Associates Ltd 2005: REPORT ON IMPLEMENTATION OF THE LANDFILL DIRECTIVE IN THE 15 MEMBER STATES OF THE EUROPEAN UNION. http://ec.europa.eu/environment/waste/landfill/pdf/report_a2.pdf (accessed 26 July 2016).
- ICS [International Chamber of Shipping] 2015: Shipping facts. Information about the international shipping industry. <http://www.ics-shipping.org/shipping-facts/shipping-facts> (accessed 26 July 2016).
- INNOLAB 2015: Teufel, B. & Erdmann, L.: Akteurs- und Netzwerkanalyse. Working Paper in the INNOLAB Project [Living Labs in the Green Economy]. Fraunhofer-Institut für System- und Innovationsforschung ISI, Karlsruhe.
- International Relations 2016: Environmental NGOs. <https://internationalrelationsonline.com/ngo-careers/environmental-ngos/> (accessed 26 July 2016).

Deliverable D2.1

- IRMA [Initiative for Responsible Mining Assurance] 2016: IRMA Standard for Responsible Mining IRMA-STD-001 Draft v2.0 Publication Date: 05 April 2016. <http://www.responsiblemining.net/> (accessed 26 July 2016).
- KfW [Kreditanstalt für Wiederaufbau] 2011: Erdmann, L., Feil, M., & Behrendt, S.: Kritische Rohstoffe für Deutschland. Kreditanstalt für Wiederaufbau (KfW) Bankengruppe: Frankfurt am Main.
- Kiley, J. & Coetzee, M. 2007: Delivering learning programmes. In: Melinde Coetzee (ed.), Practising education, training and development in South African organisations, pp. 1964-2011. Juta: Cape Town.
- m.e environment 2014: Murray, C. & Fairgray, D.: ASSESSMENT OF EFFECTS ON RECREATION AND TOURISM FROM THE TRANS-TASMAN RESOURCES MARINE CONSENT APPLICATION. Final Version.
- Mahjudin, R.P., Hadi, S.P. & Purwanto 2015: Waste Reduction by Scavengers in Basirih Landfill Banjarmasin South Kalimantan Indonesia: Waste Composition Based Analysis. In: Journal of Applied Environmental and Biological Sciences 5(11) 118-126.
- Marinescu, M., Kriz, A. & Tiess, G. 2013: The necessity to elaborate minerals policies exemplified by Romania. In: Resources Policy 38(2013) 416–426.
- McCarthy Tétrault 2015: Mining in the Courts. Year in Review. Vol. 5 - March 2015. McCarthy Tétrault: Vancouver.
- McGugan, I. 2016: Goldcorp hack underlines rise in cyberattacks on corporations. The Globe and Mail. Published Thursday, Apr. 28, 2016. <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/goldcorp-says-computer-network-hit-by-hackers/article29785793/> (accessed 25 July 2016)
- Merriam-Webster 2016a: University. <http://www.merriam-webster.com/dictionary/university> (accessed 25 July 2016).
- Merriam-Webster 2016b: Consultancy. <http://www.merriam-webster.com/dictionary/consultancy> (accessed 26 July 2016).
- MINEX Europe 2015: Masterminding a mining revival in Eurpe. “Europe: open for mining?” survey organized by Advantix. 1st European Mining & Exploration Forum. 17-18 November 2015, Vienna.
- Mining Facts 2016a: What is the Social Licence to Operate (SLO)? <http://www.miningfacts.org/Communities/What-is-the-social-licence-to-operate/> (accessed 25 July 2016).
- Mining Facts 2016b: What is artisanal and small-scale mining? <http://www.miningfacts.org/communities/what-is-artisanal-and-small-scale-mining/> (accessed 25 July 2016).
- Mitchell, R., Agle, B. & Wood., D. 1997: Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. In: The Academy of Management Review, 22(4) 853-886.
- Myjobhelper 2016: About myjobhelper.co.uk. <http://myjobhelper.co.uk/aboutus> (accessed: 26 July 2016).
- Naturstyrelsen [Agency of the Danish Environmental Ministry] 2014: Råstofplan 2016 [Raw Material Plan 2016]. <http://naturstyrelsen.dk/media/135916/statslige-interesser-regionernes-raastofplan-2016-d-20042015.pdf>, retrieved on April 25, 2016
- OECD 2002: Frascati manual: Proposed standard practice surveys on research and experimental development, 6th edition. OECD Publishing: Paris. Available at: <http://www.oecd-ilibrary.org/docserver/download/9202081e.pdf?expires=1469447742&id=id&accname=guest&checksum=A3A0405966E2C7D00CEADFCA17A1DECC> (accessed 25 July 2016).
- OECD 2011: Classification of the functions of government (COFOG). In: Government at a glance 2011. OECD Publishing: Paris.
- OECD 2012: Main science and technology indicators. OECD Publishing: Paris. <http://dx.doi.org/10.1787/msti-v2012-2-en> (accessed 25 July 2016).
- POLINARES [EU Policy on Natural resources] 2012: Dorner, U., Franken, G., Liedtke, M. & Sievers, H.: Artisanal and Small-Scale Mining (ASM). POLINARES working paper n. 19. http://www.polinares.eu/docs/d2-1/polinares_wp2_chapter7.pdf (accessed 25 July 2016).

Deliverable D2.1

Remotti, L. & Erdmann, L. 2016: The Impact of Changing Value Systems on EU Research and Innovation Policies. Report to the European Commission DG RTD A6 (unpublished).

RIF [Research and Innovation Futures] 2012: Amanatidou, E., Cox, D. & Saritas, O.: Stakeholders in the STI System. RIF Deliverable 4.1. The University of Manchester: Manchester. Available at (30 April 2013): <http://www.rif2030.eu>

RIF [Research and Innovation Futures] 2013: Erdmann, L., Schirrmeister, E., Warnke, P. & Weber, M.: New ways of doing research: from explorative to transformative scenarios. RIF Deliverable 2.1. RIF report (Synthesis and Annex) available at: <http://www.rif2030.eu>. (accessed 25 February 2014).

Rip, A. 2000: Higher forms of nonsense. *European Review*, 8(4) 467-486.

Rodrigo, D., Allio, L. & Andres-Amo, P. 2009: Multi-Level Regulatory Governance: Policies, Institutions and Tools for Regulatory Quality and Policy Coherence. OECD Working Papers on Public Governance, No. 13, OECD Publishing. <http://dx.doi.org/10.1787/224074617147>

SAMI Consulting 2016: Duckworth, M., Lye, D.; Ravetz, J. & Ringland, G.: Strategic Foresight: Towards the 3rd Strategic Programme of Horizon 2020. Document prepared for the European Commission. Available at <https://ec.europa.eu/research/foresight/index.cfm> (accessed 26 July 2016).

Silva, E.A. & Acheampong, R.A. 2015: Developing an inventory and typology of land-use-planning systems and policy instruments in OECD countries. OECD Environment Working Papers, No. 94. OECD Publishing: Paris.

Stoner, J. L. 2011: Five ways to tell if an organization is really values-driven. <http://seapointcenter.com/values-driven-organizations/> (accessed 26 July 2016).

The Free Dictionary 2016b: Terrorist. <http://www.thefreedictionary.com/terrorist> (accessed 26 July 2016).

The Free Dictionary 2016a: Charitable societies and Institutions. <http://legal-dictionary.thefreedictionary.com/Charitable+organization> (accessed 26 July 2016).

The Innovation Policy Platform 2016: <https://www.innovationpolicyplatform.org/content/universities-and-public-research-institutes> (accessed 26 July 2016).

Tiess, G. 2011: General and International Mineral Policy. Springer: Wien.

Transparency Accountability Initiative 2016: About the T/A Initiative. <http://www.transparency-initiative.org/about> (accessed 26 July 2016).

Transparency International 2016: Mission, Vision and Values. https://www.transparency.org/whoweare/organisation/mission_vision_and_values/ (accessed 26 July 2016).

Ulrich, W. 1983: Critical Heuristics of Social Planning. A New Approach to Practical Philosophy. Bern: Haupt. Reprint edition (1994), Wiley: Chichester.

UNCTAD [United Nations Conference on Trade And Development] 2015: Review of Maritime Transport 2015. UN Publications: Geneva.

USGS 2016: Mineral Commodity Summaries 2016. U.S. Department of the Interior, U.S. Geological Survey. Reston, VA. <http://dx.doi.org/10.3133/70140094>

Varvasovszky, Z. & Brugha, R. 2000: A stakeholder analysis. In: *Health Policy and Planning*, 15(3) 338-345.

VDI TZ & Fraunhofer ISI 2015: Gesellschaftliche Veränderungen 2030. Ergebnisband I zur Suchphase von BMBF-Foresight Zyklus II. Available at: http://www.vditz.de/fileadmin/media/VDI_Band_100_C1.pdf

VERA [Forward Visions on the European Research Area] 2012: Haegeman, K., Pérez, S.E., Marinelli, E., Warnke, Ph., Teufel, B., Degelsegger, A. & Weiss, G.: Communication Strategy – Deliverable D6.2. Report of the VERA project. The VERA consortium: Seville / Karlsruhe / Vienna.

VERA [Forward Visions on the European Research Area] 2013: Teufel, B., Erdmann, L., Schirrmeister, E., Daimer, S., Laredo, P., Schoen, A., Robinson, D. & Loikkanen, T.: ERA Scenario Report, – Deliverable D3.1. Report of the VERA

Deliverable D2.1

project. The VERA consortium: Seville / Karlsruhe / Vienna. available at: <http://eravisions.eu/scenarios/> (accessed 25 February 2014).

Ward, H. 2009. Resource nationalism and sustainable development: A primer and key issues. Working Paper. The International Institute for Environment and Development (IIED): London.

WBGU [German Advisory Council on Global Change] 2013: World in Transition: Governing the Marine Heritage. Flagship Report. Available at: <http://www.wbgu.de/en/flagship-reports/>.

WEF [World Economic Forum] 2013: The Future Role of Civil Society. World Scenario Series. WEF (in collaboration with KPMG International): Geneva.

Wikipedia 2016a: Academy of sciences. https://en.wikipedia.org/wiki/Academy_of_sciences (accessed 25 July 2016).

Wikipedia 2016b: Intelligence Agency. https://en.wikipedia.org/wiki/Intelligence_agency (accessed 25 July 2016).

Wikipedia 2016c: Think tank. https://en.wikipedia.org/wiki/Think_tank (accessed 25 July 2016).

Wikipedia 2016d: Professional association. https://en.wikipedia.org/wiki/Professional_association (accessed 26 July 2016).

Wikipedia 2016e: Economic system. https://en.wikipedia.org/wiki/Economic_system (accessed 26 July 2016).

Wikipedia 2016f: Spatial planning. https://en.wikipedia.org/wiki/Spatial_planning (accessed 26 July 2016).

Wikipedia 2016g: Political system. https://en.wikipedia.org/wiki/Political_system (accessed 26 July 2016).

Wikipedia 2016h: Funding of science. https://en.wikipedia.org/wiki/Funding_of_science (accessed 26 July 2016).

Wikipedia 2016i: World View. https://en.wikipedia.org/wiki/World_view (accessed 26 July 2016).

Wiseberg, L.S. 1991: Protecting Human Rights Activists and NGOs: What More Can Be Done? Human Rights Quarterly 13(1991) 525-529.

Work Coach Café 2016: What is a professional network? <http://www.workcoachcafe.com/career-dictionary-definitions/what-is-a-professional-network/> (accessed 26 July 2016).

YourArticleLibrary 2015: Trade Union: It's meaning and definition. <http://www.yourarticlelibrary.com/trade-unions/trade-union-its-meaning-and-definition-trade-union/26118/> (accessed 26 July 2016).

Zins, J.E. 2000: Implementation of prevention. Vol. 11, No. 1, A special issue of the Journal of Educational and Psychological consultation.

ZVEI [German Electrical and Electronic Manufacturers' Association] 2010: Integrated Technology Roadmap – Automation 2020+ Megacities. ZVEI, Division Automation (eds.), Frankfurt am Main.

ZVEI [German Electrical and Electronic Manufacturers' Association] 2015: Integrated Technology Roadmap – Automation 2025+ Recycling als Rohstoffquelle. ZVEI, Division Automation (eds.), Frankfurt am Main.

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Glossary

Definitive stakeholders are characterized through power, legitimacy and urgency.

Dominant stakeholders are characterized through power and legitimacy but not urgency.

Dependent stakeholders are characterized through legitimacy and urgency but not power.

Dangerous stakeholders are characterized through power and urgency but not legitimacy.

Dormant stakeholders are characterized through power, but neither legitimacy nor urgency.

Discretionary stakeholders are characterized through legitimacy, but neither power nor urgency.

Demanding stakeholders are characterized through urgency but neither power nor legitimacy.

Stakeholder assemblage is the gathering of relevant stakeholders to a specific topic, problem, project etc. It makes sure that all necessary actors are involved (Finn 1996). By assembling different stakeholders, their roles, responsibilities, interests and influences regarding to the issue become clear. Stakeholder assemblages assist the understanding of a process (Zins 2000).

An **institute** is an organisational body created for a certain purpose.

The term "**institution**" applies to both informal institutions such as customs or behavior patterns important to a society, and to particular formal institutions created by entities such as the government and public services.

Abbreviations

3D	three dimensional
C&D	construction and demolition
CAP	Common Agricultural Policy
CEO	chief executive officer
CIRIRSCO	Committee for Mineral Reserves International Reporting Standards
CLP	Classification, Labelling and Packaging (regulation)
CNC	computerized numerical control
CRM	critical raw materials
CSO	civil society organisation
DG	Direction Générale
EC	European Commission
EFTA	European Free Trade Association
EHS	environment, health and safety
EIP	European Innovation Partnership
EIT	European Institute of Innovation and Technology
ETS	Emissions Trading Scheme
EU	European Union
H2020	Horizon 2020 Programme
HR	human resources
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
LAU	Local Administrative Unit
LCA	life cycle assessment
LCM	life cycle management
LTP	Linked Third Party
MEEerP	Methodology for the Ecodesign of Energy-related Products
MENA	Middle East and North Africa
MEP	member of European Parliament

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MFA	Material Flow Analysis
MS	member state
MICA	Minerals Capacity Analysis
NACE	The Statistical Classification of Economic Activities in the European Community
NCP	National Contact Point
n.e.c	not elsewhere classified
NUTS	The Nomenclature of Territorial Units for Statistics
NGO	non-governmental organization
OEM	Original Equipment Manufacturers
OG	operational group
PEF	Product Environmental Footprint
PERC	Pan European Reserves and Resources Reporting Committee
R&D	research and development
R&I	research and innovation
REACH	Registration, Evaluation, Authorisation of Chemicals (regulation)
REE	rare earth element
RMICP	Raw Material Intelligence Capacity Platform
RMIS	Raw Material Information System
RTO	Research and Technology Organisation
SCP	sustainable consumption and production
SDG	sustainable development goal
SE	Southern Europe
SME	small and medium-sized enterprise
SLO	social licence to operate
SSH	social sciences and humanities
STI	science, technology and innovation
TTIP	Transatlantic Trade and Investment Partnership
UN	United Nations
UNFC	United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources
UNECE	United Nations Economic Commission for Europe
VIP	very important person
WEEE	Waste Electrical and Electronic Equipment
WP	Work Package

Two digit country codes

Code	Country
AL	Albania
AT	Austria
AU	Australia
AW	Aruba
BA	Bosnia and Herzegovina
BE	Belgium
BG	Bulgaria
BO	Bolivia
BR	Brazil
CA	Canada
CH	Switzerland
CL	Chile
CN	China
CO	Colombia
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
ES	Spain
FI	Finland
FR	France
GB	United Kingdom (Great Britain)
GH	Ghana
GR	Greece
HR	Croatia
HU	Hungary
ID	Indonesia
IE	Ireland
IN	India

IT	Italy
JP	Japan
KE	Kenya
KG	Kyrgyzstan
KR	Korea, Republic of
KZ	Kazakhstan
LT	Lithuania
LU	Luxembourg
LV	Latvia
MN	Mongolia
MT	Malta
MX	Mexico
NL	Netherlands
NO	Norway
NZ	New Zealand
PL	Poland
PT	Portugal
RO	Romania
RU	Russian Federation
SE	Sweden
SI	Slovenia
SK	Slovakia
TR	Turkey
TZ	Tanzania, United Republic of
UA	Ukraine
US	United States of America
VN	Viet Nam
ZA	South Africa

MICA beneficiaries

BGR	Bundesanstalt für Geowissenschaften und Rohstoffe [DE]
BGS	Natural Environment Research Council - British Geological Survey [GB]
BRGM	Bureau de Recherches Géologiques et Minières [FR]
EFG	European Federation of Geologists
EGS	EuroGeoSurveys
Fraunhofer	Fraunhofer Institute for Systems and Innovation Research ISI [DE]
GEoZS	Geoloski Zavod Slovenije [SI]
GEUS	Geological Survey of Denmark and Greenland [DK]
GTK	Geologian tutkimuskeskus (Geological Survey of Finland)
JRC	Joint Research Centre [EC]
LPRC	La Palma Research Centre for Future Studies [ES]
MinPol	MinPol KG - Agency for International Minerals Policy [AT]
NTNU	Norwegian University of Science and Technology, Trondheim
UCL ISR	University College London; Institute for Sustainable Resources [GB]
UJF-LIG	Université Joseph Fourier Grenoble; Laboratoire d'informatique de Grenoble [FR]
UL-CML	Universiteit Leiden, Centrum voor Milieuwetenschappen Leiden [NL]

MICA linked third parties (LTPs)

AGS	Albanian Geological Survey
GIR	Geological Institute of Romania
GSB	Geological Survey of Belgium
GSD	Geological Survey Department [CY]
GSI	Geological Survey of Ireland
HGI-CGS	Croatian Geological Survey
IGME	National Center of Sustainable Development, Institute of Geology and Mineral
Exploration (EKBAA-IGME)	[GR]
IGME	Spanish Geological Survey
ISPRA	Geological Survey of Italy (hosted by ISPRA)
LNEG	Laboratório Nacional de Energia e Geologia (National Laboratory of Energy and
Geology)	[PT]
MFGI	Geological and Geophysical Institute of Hungary
NGU	Geological Survey of Norway
PGI	Polish Geological Institute
SGU	Sveriges Geologiska Undersökning (Geological Survey of Sweden)
SWISSTOPO	Federal Office of Topography [CH]

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Project acronyms

CRM_InnoNet – Substitution of Critical Raw Materials (EC, 2012-2015)

EGDI Scope – European Geological Data Infrastructure (EC, 2012-2014)

EIT KIC Raw Materials – European Institute of Innovation and Technology / Knowledge and Innovation Community Raw Materials (EC, 2014-2022)

EO-MINERS – Earth Observation for Monitoring and Observing Environmental and Societal Impacts of Mineral Resources Exploration and Exploitation (EC, 2010-2013)

EURare is a project funded by the European Commission for the 'Development of a sustainable exploitation scheme for Europe's Rare Earth ore deposits (EC, 2013-2018)

EuroGeoSource is a data portal (EC, 2010-2013)

i2Mine – Innovative Technologies and Concepts for the Intelligent Deep Mine of the Future (EC, 2011-2016)

INTRAW – International Raw Materials Observatory (EC, 2015-2018)

IRP WG on Global Metal Flows - International Resource Panel Working Group on Global Metal Flows (UN, since 2007)

Minatura2020 – Mineral deposits of public importance (EC, 2015-2018)

Minerals4EU – Minerals Intelligence Network for Europe (EC, 2013-2015)

MINGUIDE – Minerals Policy Guidance for Europe (EC, 2016-2019)

Minlex – Study- Legal framework for mineral extraction and permitting procedures for exploration and exploitation in the EU (EC, 2015-2016)

Minventory is a data portal (EC, 2013-2015)

ProMine was a project in the area of exploration and the efficient use of mineral resources within Europe. (EC, 2009-2013)

ProSUM – Prospecting Secondary raw materials from the Urban Mine and Mining waste (EC, 2015-2017)