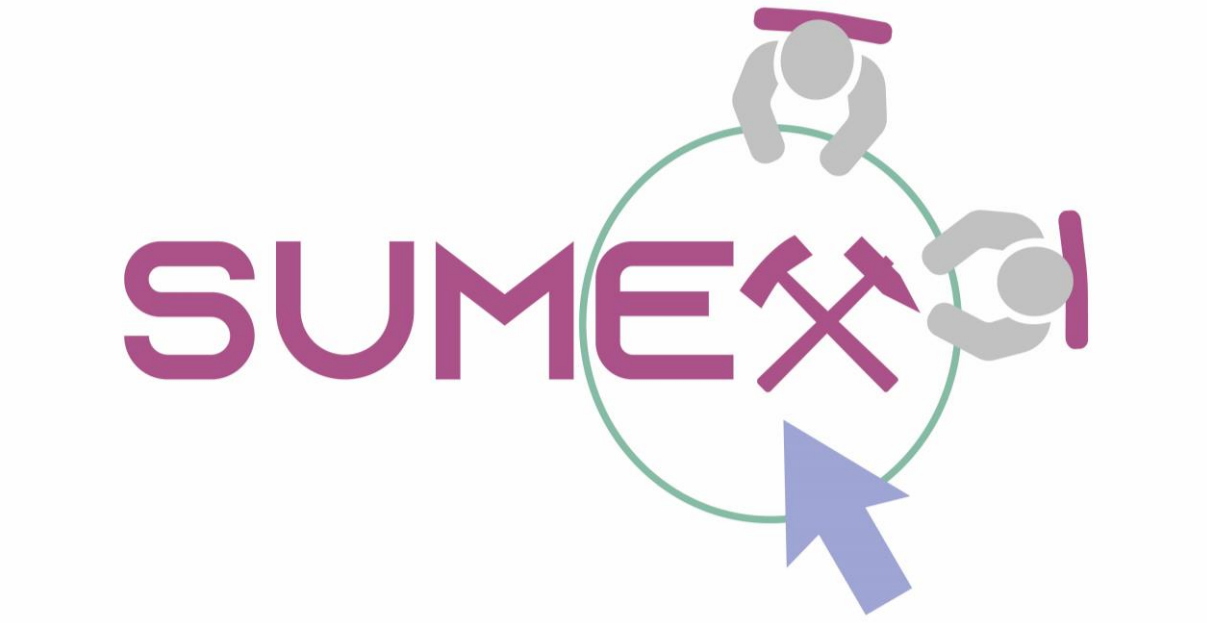

SUMEX DELIVERABLE D1.1

EUROPEAN SUSTAINABLE DEVELOPMENT FRAMEWORK

Summary:

This document deals with a) sustainability definitions; b) the set-up of a European sustainability framework and c) corresponding implications for the extractive industry in Europe. In a first stage the initial priorities and attributes for sustainable development have been defined. The current status will be taken as base for a stakeholder consultation process in the coming months.

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1 EXECUTIVE SUMMARY

SUMEX supports the set-up of a European sustainability framework for the extractive industry. In this report we look at the definitions of sustainability and sustainable development (SD) and how they relate to sustainable management in the extractive industry. After reviewing 31 international and EU SD policies and frameworks, the United Nations' Sustainable Development Goals, the European Union's (EU) Green Deal and the draft EU Principles for Sustainable Raw Materials are considered to be the most relevant for defining a set of priorities and attributes.

We identified the following priorities:

Reinventing the economy (i.e. considering the Green Deal)

- Understanding of the role and indicators for extractives in an inclusive Green Economy that exists within Planetary Boundaries
- Valuing natural and social capital
- Defining what Benefit Sharing (or Shared Value) means (beyond taxes and jobs)
- Accountability (i.e., life-cycle considerations, various capitals, reporting)
- Extractives' role in closing cycles, both biological and technological (beyond recycling, focus on reduction/dematerialisation, multiple use and redesign of products)
- Planning beyond the mine life

Social and societal responsibility

- Developing value together with society, i.e. communities
- Taking responsibility for goods and services needed in a Green Economy
- Sustainable learning (systems thinking, distinguish between fact, opinion and supposition, and the ability to learn from mistakes)
- Share knowledge and information transparently
- Improving workers' well-being (zero harm, improved skills)

Environmental sustainability

- Integrated water management
- Efficient energy consumption, based on renewable energy and zero greenhouse gas emissions
- Multiple, co-operative land use and net positive impact on ecosystem services and biodiversity
- Enlightened waste management that considers secondary resources from traditional waste by-products

These are accompanied by a set of attributes that reflect the aforementioned priorities for sustainable exploration and development, operations and closure/post closure.

The priorities and attributes proposed are preliminary at this stage to set the scene for an in-depth discussion with stakeholders and actors from extractive industries, civil society and public administration, to further advance and operationalise them in the coming months.

2 INTRODUCTION

The Horizon 2020 project SUMEX (**Su**stainable **M**anagement in **Ex**tractive industries; for more detailed information check the project background section at the end of this document or the project webpage: www.sumexproject.eu) supports the set-up of a European sustainability framework for the extractive industry. In this report we describe the key principles of this framework and the process how we derived them.

The starting point was a look at definitions of sustainability and sustainable development (SD). This was followed by a review of existing SD policies and frameworks. The results of the desktop research formed the base for the SUMEX launch event at the Raw Materials Week 2020. During this workshop the results from the desktop research were complemented by the more applied perspective from practitioners and experts. Together, they build the foundation for the set of priorities and attributes that we propose within the framework for SD in the extractive industry in the European Union.

This report, however, should only be seen as an interim result. It will serve as the input for the next step in the project: Over the coming months, SUMEX will invite interested parties across Europe to provide input and feedback on the operationalisation of these principles (to be described in a following report). This SUMEX report will form the reference for the identification of good management practises in the extractive industry across Europe and one of its key outputs, the toolkit of good practises.

3 SUSTAINABILITY VS. SUSTAINABLE DEVELOPMENT

The definition of sustainability and sustainable development is not as simple as it may appear, as there are plenty of different definitions, as well as operationalisations of these definitions in the form of models, frameworks, policies, etc. The discussion below is therefore by no means an all-inclusive picture but only presents parts of the discussion the authors consider as most relevant for SUMEX.

The authors of this report acknowledge that the discourse on the operationalisation or conceptualisation of sustainable development goes back for more than 30 years in both the world of practitioners as well as academia.

The most common definition, based on the so called Brundtland Commission's report Our Common Future (WCED, 1987) is as follows:

> '*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*' (paragraph 1)

However, definitions or principles are too vague and generic to capture the essence of the concept of SD. Over decades several attempts have been made to conceptualise, concretise, and consequently measures SD: Hopwood et al. (2005) and Waas (2011) summarise the historical discourse and evolution of conceptualisations encompassing, some of the most common ones, the three pillar model (e.g. every decision should take into account not only economic, but also environmental and social impacts), the weak & strong sustainability concept, environmental or ecologically centred models such as the thermodynamic or biogeophysical sustainability model by Holdren (1995) (i.e. the preservation of biological and geophysical resources for the benefit of human well-being of current and future generations).

Since then and in particular after the first UN Conference on Environment and Development (UNCED) in 1992, the concept of SD has been subject to on-going political commitment and various ways of implementation measures (SD strategies and programmes) on all political-administrative levels as well

as academic discourse. The UN has since continued its efforts through a number of conferences, initiatives and agreements leading up to the Sustainable Development Goals (SDGs), described in more detail in chapter 3.2.1. However, since then efforts to put the concept into practice and the expected outcomes remained quite diverse (Gottenhuber and Mulholland, 2020; Mulholland, 2018).

Other institutions, including governments and non-governmental organisations, business and business associations, academia and scientific associations, have, at all levels ranging from global all the way to the individual, further advanced, adopted and updated our understanding of sustainability and SD. By no means is it the goal of this report to give an all-inclusive overview. The following paragraphs outline the approach taken by SUMEX for conceptualising SD in order to come up with the priorities proposed in section 4.

In their book Pursuing Sustainability, Matson, Clark and Andersson (2016) describe that there is a commonality between the majority of these uses:

> *'A realization that our ability to prosper now and in the future requires increased attention not just to economic and social progress, but also conserving Earth's life support systems: the fundamental environmental processes and natural resources on which our hopes for prosperity depend.'* (p. 2)

They also move away from a needs-based approach (focused on economic development) towards one where **the ultimate goal of sustainability is more generally, inclusive human development or flourishing** (often times coined as broader societal welfare or social well-being). Figure 1 shows the MCA Framework as one example of a framework for sustainability, describing the constituents (material needs being just one of them) and determinants of well-being.

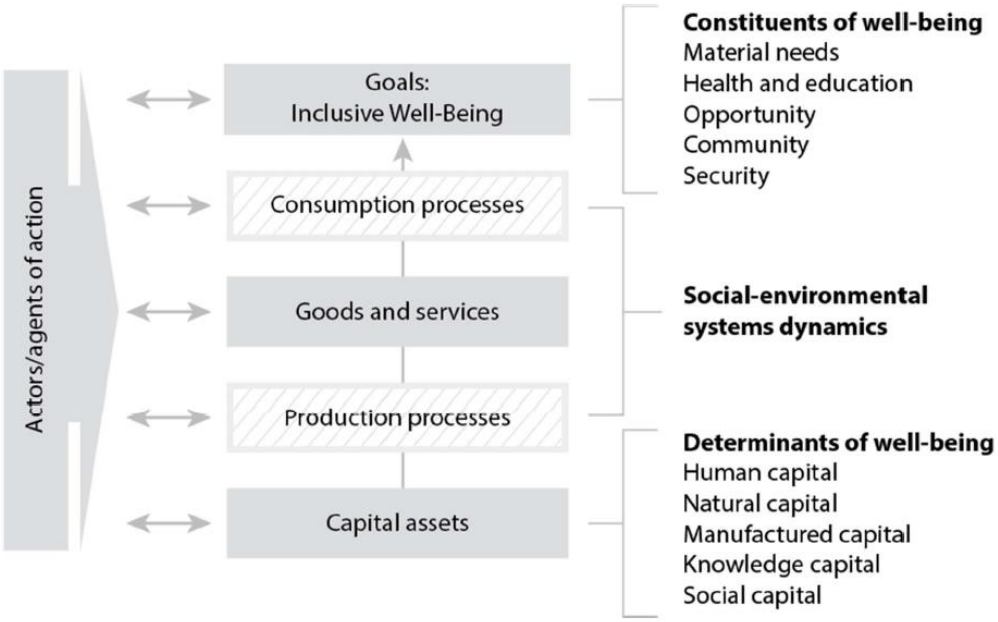

Figure 1: MCA Framework for Sustainability (Matson, Clark and Andersson, 2016)

The MCA Framework describes **5 sorts of asset stocks or capital** - **human, natural, manufactured, knowledge and social** – as the determinants of inclusive well-being; from these stocks and their dividends or flows (including ecosystem services, an important flow from natural capital), people now and in the future subsist and improve their lives. These determinants also make sustainability

"measurable": Sustainability, or sustainable development is achieved, when the overall stock of capital is grown, or at least sustained for future generations.
However, this also introduces another key aspect to the sustainability debate: the differentiation of **weak vs. strong sustainability**. Under weak sustainability each capital can substitute another ("substitutability paradigm"). Under strong sustainability, the build-up of capital is not completely interchangeable, but is limited by natural capital. This means there are environmental limits that have to be considered in order to ensure environmental sustainability ("non-substitutability paradigm").

Whilst science might not (yet) have an answer which of these two paradigms is correct, Neumayer (2003) argued that "*a combination of distinctive features of natural capital with the prevalence of risk, uncertainty and ignorance make a persuasive case for the preservation of certain forms of natural capital that provide basic life support functions*" (p. 4).

In 2009, a group of Earth system scientists, led by Will Steffen and Johan Rockström, published a concept called the Planetary Boundaries (Figure 2; Rockström et al., 2009; Steffen et al., 2015). This framework "*defines a safe operating space for humanity based on the intrinsic biophysical processes that regulate the stability of the Earth System*" as a precondition for SD and thus introducing concrete environmental limits for the preservation of certain forms of natural capital. Worth noting is also, that according to the authors, some of these boundaries, e.g. concerning biochemical flows, have already been breached.

Against this background of ecological boundaries, Folke et al. (2010) merged this view on environmental system together with a social systems perspective in a way that society should "*seriously consider ways to foster resilience of smaller, more manageable Social-Ecological Systems that contribute to Earth System resilience, and to explore options for deliberate transformation of these Social-Ecological Systems that threaten Earth System resilience*" (p. 20). In this regard, Folke et al. (2006) not only highlighted the inter-connectedness of ecological and social systems but moreover, that social systems very much depend on other regions ecological capacity to sustain them (i.e. "*that patterns of production, consumption and wellbeing develop not only from economic and social relations within and between regions but also depend on the capacity of other regions' ecosystems to sustain them.*" (p. 1).

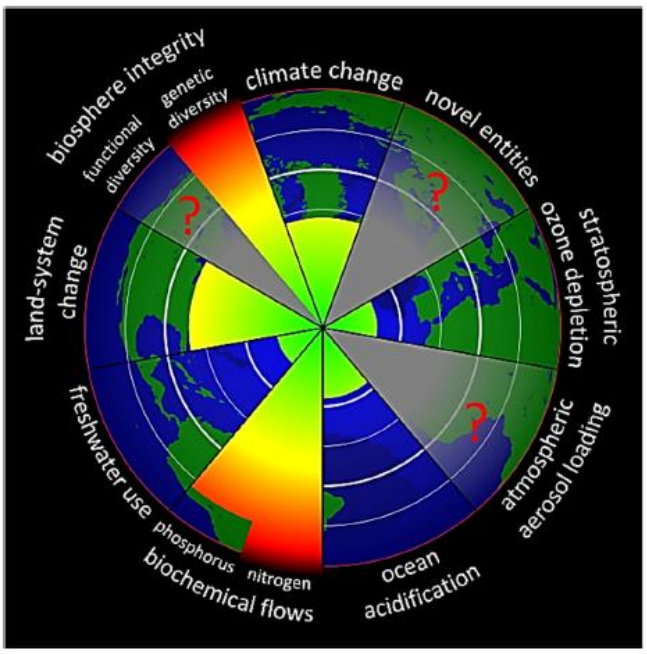

Figure 2: The Planetary Boundaries (acc. to Steffen et al., 2015)

Also building on the Planetary Boundaries, British economist Kate Raworth in 2012 argued that a safe and just operating space for humanity was needed and added 12 social foundations (Figure 4), including e.g. food security, income, water and sanitation, health care or education, resulting in an economic model she called the Doughnut Economy (Raworth, 2012, 2017).

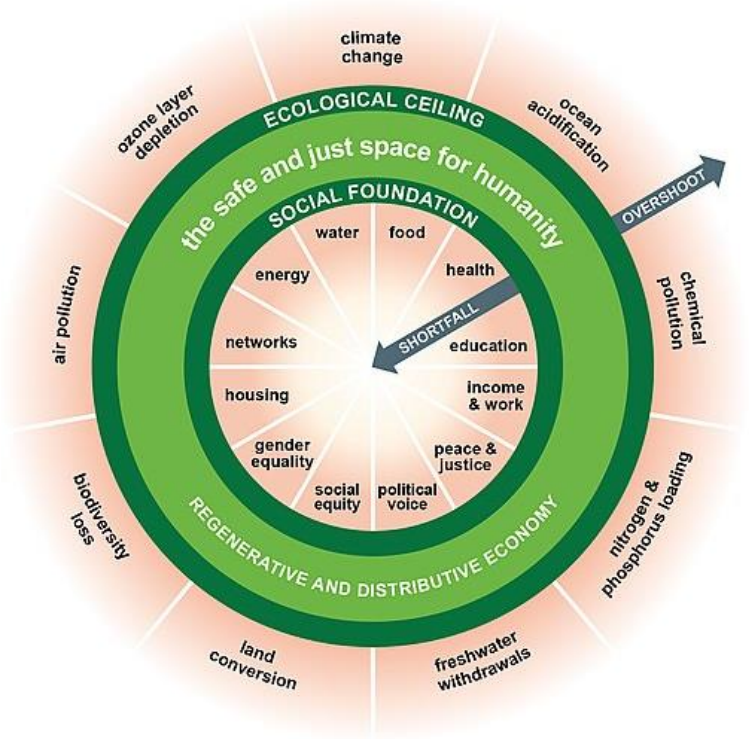

Figure 3: Doughnut economic model (Source: Wikimedia Commons)

SUMEX follows Neumayer (2003) and takes a hybrid position between weak and strong sustainability: Given that the project`s mandate is sustainable management in extractive industries (the ability of a society to convert natural capital for the purpose of enhancing wellbeing) , we consider the extraction of raw materials as substitutable (e.g. to turn natural capital like a copper orebody into manufactured capital like an electric motor) but consider natural capital affecting the Planetary Boundaries as non-substitutable. However, an absolute crucial question needs to be addressed: Where are the trade-offs and imbalances between capital substitution and to what extent can we draw on the non-substitutable natural capital (i.e. staying within Planetary Boundaries or not decreasing natural capital beyond its regenerative capacity should be avoided). In how far this global scale discourse on natural capital considerations can be further operationalised in the context of sustainable development "measures" or other forms of operationalisation in general and, in particular, in the extractive sector will be investigated in the upcoming months in the SUMEX project.

For that purpose, we use the Planetary Boundaries and Doughnut Economy model as a starting point for our approach regarding sustainability, which will be further developed during the project inception phase.

3.1 SUSTAINABLE MANAGEMENT IN THE EXTRACTIVE INDUSTRY

The debate surrounding SD in the extractive industry is as protracted as the generic SD debate and has also been the subject of much scholarly debate over the past decades. Following the Brundtland definition and a needs-based, weak sustainability approach, the discourse has been centred around minimising negative environmental, social and economic impacts while simultaneously ensuring economic prosperity and contributing to SD as the primary goal (IIED, 2002). In the case of extractives, the environmental and social impacts resulting from exploration and development, operations, closure and post-closure are well known, particularly because the industry attracts considerable public attention and its ongoing need to obtain and comply with planning and operating permissions and regulations.

To contribute to SD, a mineral operation must minimise negative environmental and social impacts throughout its lifecycle. From an environmental perspective, this is best accomplished through effective environmental management. During exploration and development, effort must be made to avoid negatively impacting the biophysical integrity of the land. During operations, more environmentally-friendly extractive technologies (as defined as emitting less waste, treatment of effluent streams) need to be implemented through substitution or process modification. New concepts such as 'temporary nature' or biodiversity management plans should be developed and applied. During the closure and post-closure phases, technological measures must ensure air quality, that surface and groundwater resources are protected and that ecological production/alternate land use is accommodated. Restoration or the use of the extraction area for different purposes can take place progressively during the life-time of the extraction site. Economic sustainability involves creating economic value out of whatever decision is being acted upon and that decisions are made in the most equitable and fiscally sound manner while considering the other aspects of sustainability. In the extractive sector, economic sustainability generally applies to the notion of 'shared value', 'economic equity' or an equitable share of the economic benefits arising from the development. This may present as revenue sharing, job and business opportunity creation or local procurement of goods and services that the development would require. The economic connection to the communities of interest might be negotiated and secured under contract in the form of impacts and benefits agreements (Hitch, 2006).

The condition of social sustainability and how mineral resource development is reflected, can be expressed in terms of 'resilience' (or sustaining the regenerative capacity of the natural system affected by mining operations) and is subject to many factors from both of the other two spheres of SD (i.e., economic and environmental). From the perspective of economic influence on social sustainability, such factors as economic market trends and the longevity of the resource being extracted affects how social sustainability persists (Black, 2005). How the various stakeholders perceive the environmental degradation or change influences their ability to accept extractive activity. Health concerns and other impacts on the community, occupational health and safety, loss of aesthetic, competing land use and inappropriate post-mining land use deeply affect social sustainability (Hitch, 2006) or, in other terms, an operation's social license to operate. The social resilience of the economic impacts of mineral development can distort local and regional economies with the loss of traditional economic drivers, local or artisanal ways of life, etc. The societal benefits of mining operations in terms of economic gains (e.g. company profit, royalties, community benefits, raw materials security of supply), play a role for not only a Social Licence to Operate perspective but more broadly speaking for society as a whole.

SUMEX will add to this debate elements of strong sustainability, i.e. what the limitations on natural capital (expressed through Planetary Boundaries) and inclusive well-being (expressed through the Doughnut Economy) mean for the extractive industry. This implies that in addition to the perspective stated above, a spatial aspect will be central. This entails that we do not focus on extractive companies, but take a systems perspective. The question is thus how a mine or quarry needs to be operated in order

to balance economic, social, and environmental interests in the allocation of the different forms of capital impacted. This focus on capital implies that we focus on the (wider) area that is impacted by the extractive project. We will therefore also make explicit the interests of stakeholders and trying to balance the frictions, tensions, and dilemmas behind these interests that are part of SD.

3.2 CONCEPTUALISING SUSTAINABLE DEVELOPMENT – POLICIES, IMPLEMENTATION FRAMEWORKS AND INSTRUMENTS

A review of the multidisciplinary literature on SD policies, standards, tools and frameworks reveals a lack of a comprehensive tool for understanding SD and its complexities and brought up a large number of policies and frameworks. Table 1 lists examples of such frameworks we considered as potentially relevant for SUMEX.

Table 1: Example of frameworks relevant for the extractive sector that cover elements of a sustainable development approach

Category	Frameworks	Reference
International frameworks	OECD Guidelines for Multinational Enterprises	OECD, 2011
	UN Global Compact	United Nations, 2015
	UN Sustainable Development Goals	United Nations, 2021
	Voluntary Principles on Security and Human Rights	Voluntary Principles, 2021
Industry Sustainability Initiatives	GMI – Global Mining Initiative	IIED, 2002
	Extractive Industries Transparency Initiative	EITI, 2019
	Guidelines of Social Responsibility in Outbound Mining Investment	CCCMC, 2014
	ICMM Sustainable Development Framework	ICMM, 2003
	IRMA – Initiative for Responsible Mining Assurance	IRMA, 2018
	MAC Towards Sustainable Mining	MAC, 2021
	Responsible Mining Index (RMI)	RMF, 2019
Management System Standards	ISO 45001	ISO, 2018
	ISO 14001: Environmental Management System Standard	ISO, 2019
EU Sustainability Approaches	European Green Deal	European Commission, 2019
	RMSG Draft - EU Principles for Sustainable Raw Materials	European Commission, 2021
	Taxonomy Regulation – Sustainable Finance	European Commission, 2020
Reporting, Disclosure and Transparency Standards	AA1000	AccountAbility, 2018
	Accounting Directive	European Commission, 2013
	Carbon Disclosure Project	CDP, 2021
	Carbon Pricing Leadership Coalition	World Bank, 2020
	Global Reporting Initiative (GRI)	GRI, 2021
	Water Disclosure Project	CDP, 2021a
Financing Standards	IDB's Environmental and Social Safeguards	Huppi, Scholl & Liebenthal, 2013
	IFC Social and Environmental Performance Standards	IFC, 2012
Socially Responsible Investing Indices	Dow Jones Sustainability Index	S&P Global, 2021
	Jantzi Social Index	Sustainalytics, 2016
Commodity Specific Standards	ICA – Coppermark	Coppermark, 2021
	Kimberley Process	Kimberley Process, 2002
	International Cyanide Code	ICMI, 2016
	Responsible Gold Mining Principles	World Gold Council, 2019
	Responsible Jewellery Council	RJC, 2019

Guided by Planetary Boundaries and Doughnut Economy, together with the results of the SUMEX launch meeting (see next chapter below and the submitted report of the kick-off workshop), conversations within the project team and with the Advisory Board, the United Nations' Sustainable Development Goals, the EU Green Deal and the draft EU principles for sustainable raw materials were considered to be the most relevant to SUMEX for defining the SD priorities described below. Other standards, i.e. IRMA and RMI or GRI (for the operationalisation of the SD principles) and Copper Mark (for the battery materials use case) will be revisited in the coming months as the next project step.

3.2.1 UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

The United Nations (UN) adopted a new set of goals in September 2015 (see 'The 17 Goals') to guide global policy towards SD – the Sustainable Development Goals or 'SDGs'. The SDGs replaced the earlier Millennium Development Goals, which the UN used from 2000 to 2015. There are 17 specific goals, each split further into sub-goals, which can be broadly grouped into three areas (United Nations, 2021):

- *Human development* – tackling income poverty, hunger, lack of access to basic services (health, education, water and sanitation) and gender inequality (i.e. SDGs 1-6);
- *Economic development* – enabling conditions for poverty eradication, providing access to energy, providing economic growth, decent jobs, infrastructure and industry, declining inequality, housing and peaceful societies (i.e. SDGs 7-11 and 16-17); and
- *Environment* – ensuring that the agenda of poverty eradication (and by implication, of economic growth) is protected against ecological threats (i.e. SDGs 12-15).

In essence, the SDGs take a very reductionist approach to human development and aim towards improving equity and sustainability (e.g. Gottenhuber and Mulholland, 2019; Mulholland, 2018; Pisano et al., 2016). Unlike the Millennium Development Goals, however, which struggled to gain widespread adoption, the SDGs have been widely and rapidly embraced by governments, industry and civil society alike.

Goal 12, dealing with sustainable consumption and production patterns includes the target to "achieve the sustainable management and efficient use of natural resources". It takes a deeper assessment to realise that in addition there are many other aspects to work through. First there are metals and minerals required for numerous renewable energy technologies (e.g., solar photovoltaics, solar thermal, wind, geothermal), energy storage systems (e.g., lithium-ion batteries), specialty alloys for infrastructure, medical technology, electronics and communications technology, and electric vehicles (EVs), and those metals and minerals required for agriculture.

Secondly, extraction sites and companies can make a meaningful contribution to helping a local area make substantial progress on most (if not all) of the SDGs, such as gender equality, economic activity and the revenue flows which support communities and host governments, environmental protection, education, water and so on. The Columbia Centre on Sustainable Investment (2016) demonstrated that extractive activity can contribute to advancing all of the SDGs (see Figure 4 above). Leading global extractive company AngloAmerican Ltd (AngloAmerican, 2018), believes that extraction interacts with all of the SDGs, with their framing of these relationships also shown in Figure 4 below.

Figure 4: Potential relationships between extraction and the UN SDGs as demonstrated by (above) Columbia Centre on Sustainable Investment (2016) and (below) AngloAmerican (2018)

Thirdly, in parallel, international agencies are assessing the role that extraction can play in providing the raw materials needed to meet the SDGs, such as the World Bank study on metals and minerals for low-carbon-emissions technologies (i.e., renewable energy; Drexhage et al., 2017) or the International Energy Agencies scenarios on the future of energy (IEA, 2018) or electric vehicles and the metals required for them (IEA, 2019).

There is an expectation of rapid growth in demand for some metals lithium (Li) and cobalt (Co) in particular (even allowing for evolving changes in battery chemistry such as reduced cobalt content). While there will be an increasing demand for other metals in EVs and renewable energy (e.g., copper, nickel, manganese), the effect of the growth of these technologies on metal demand is less pronounced given the continuing strong role of these metals in other uses (e.g., infrastructure, alloys).

Fourthly, sustainable consumption (SDG 12) implies responsibility in the supply, use and disposal or recycling of metals and minerals. At present, although some metals are widely recycled (e.g., lead, iron, aluminium, copper), most still have poor to negligible recycling rates (e.g., lithium, rare earths, indium) (Paat et al., 2020). As part of the agenda for sustainable consumption, a key conceptual framework is that of industrial ecology – working to achieve closed loops for our materials use or what we know as 'circular economy'.

3.2.2 EUROPEAN GREEN DEAL

The European Green Deal will be considered in terms of climate and sustainability targets already set within the European Commission. With the European Green Deal, climate change and environmental degradation will be counteracted through a new growth strategy. At the same time, the economy is to be transformed towards becoming modern, resource-efficient and competitive. Moreover, by 2050, zero net greenhouse gas emissions are to be released, economic growth is to be detached from resource use, as well as all people and all regions are to be supported in an inclusive way. Through the action plan of the European Green Deal, the efficient use of resources is promoted by shifting from a linear economy to a clean and circular one. Restoring biodiversity and combating pollution are also included in this action plan. (European Commission, 2021a)

Looking at the European Green Deal from a raw materials perspective, it pursues access to resources of strategic importance that contribute to the achievement of the goals that have been set. This covers both primary and secondary raw materials which are to be sustainably extracted. (European Commission, 2019)

3.2.3 DRAFT EU PRINCIPLES FOR SUSTAINABLE RAW MATERIALS

Furthermore, the draft EU principles for sustainable raw materials, developed by the Raw Materials Supply Group of the European Union, were considered. These principles address the sustainable extraction and processing of raw materials in Europe from the exploration, extraction and treatment of non-energy mineral resources to post-closure. Although the principles build upon main elements of existing EU legislation on sustainability and refer to internationally agreed initiatives on sustainable raw material extraction and processing, they do not impose any obligations for member states or industry.

Like the United Nations SDGs, the EU principles for sustainable raw materials include aspects of social, economic and environmental performance. Human rights, engagement with communities of interest, employment, as well as health and safety are issues addressed by the social principles for sustainable raw materials. Economic sustainability and governance principles deal with business integrity, transparency and wider economic contribution. The environmental principles for sustainable raw

materials focus on environmental management and mitigation of environmental impacts caused by extractive activities.

The aim of the EU sustainability principles for raw materials is to align and improve the understanding of sustainable extraction and processing within the European Union towards the SDGs. (European Commission, 2021)

4 THE SUMEX SUSTAINABLE MANAGEMENT PRIORITIES AND ATTRIBUTES

During the launch event of the SUMEX project on 17 November 2020, participants were asked to submit what they believed to be the salient attributes or characteristics of SD in the extractive sector in Europe. The submissions were illustrated as a 'word cloud' as presented below (Figure 5).

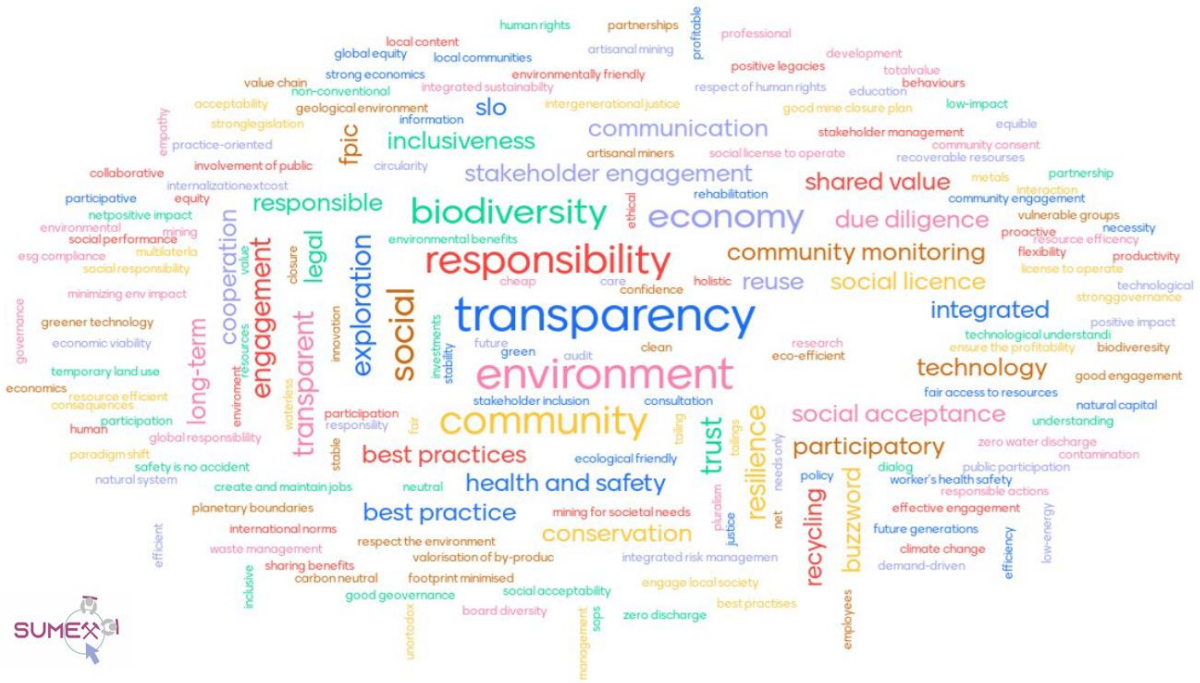

Figure 5: Sustainable Development in Word Cloud (Source: SUMEX Project Kick-Off Workshop)

The virtual event then turned to three parallel breakout groups that were tasked to focus on three main segments of the extractive value chain. These workshop groups should discuss improvements to actions and processes along the extractive value chain that could contribute to the sustainable development framework reflecting the European condition. The breakout group discussions are summarised in the report of the kick-off workshop, with Figure 6 to Figure 8 showing the key results:

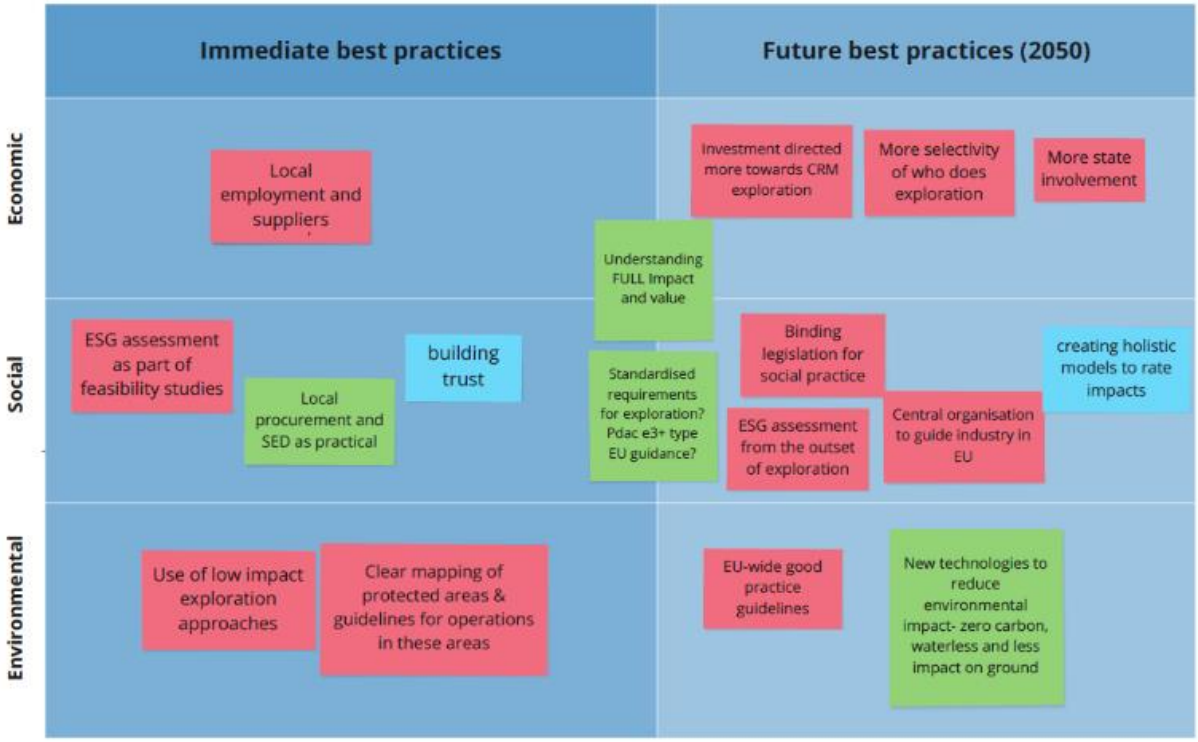

Figure 6: Attributes – Exploration and Development (Source: SUMEX Project Kick-Off Workshop)

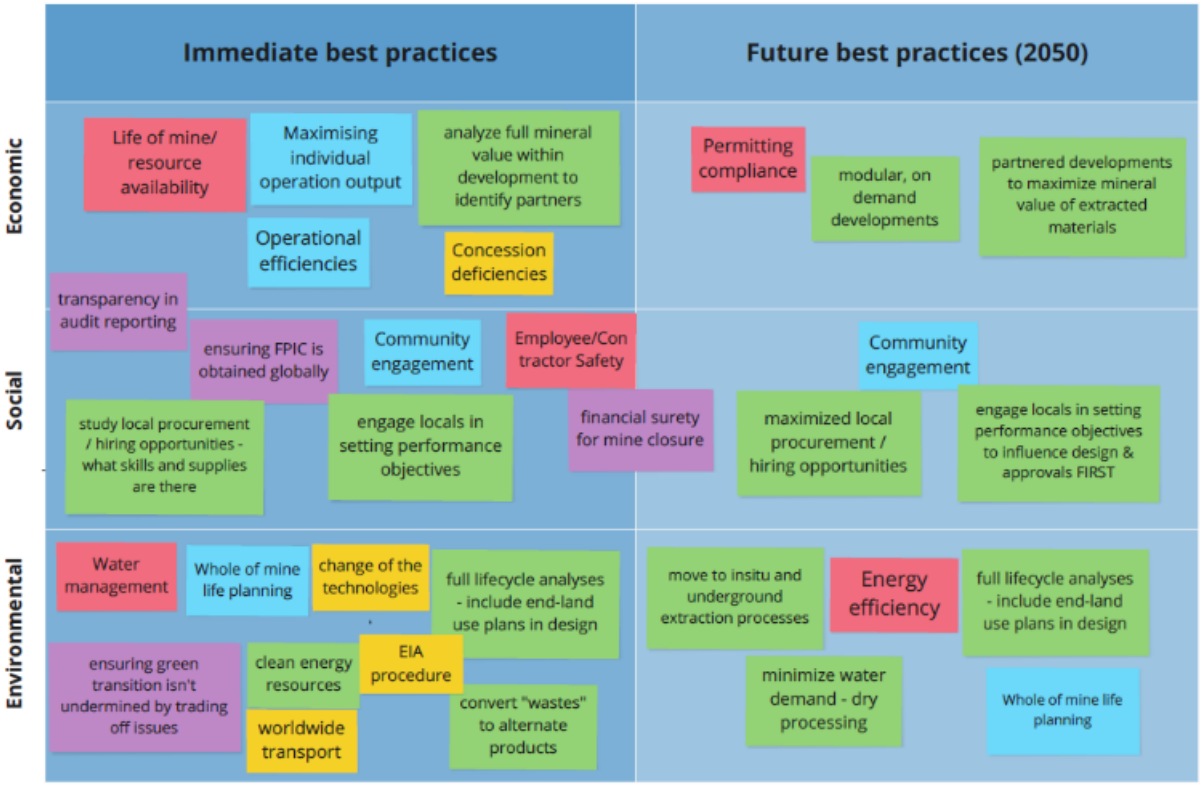

Figure 7: Attributes – Operations (Source: SUMEX Project Kick-Off Workshop)

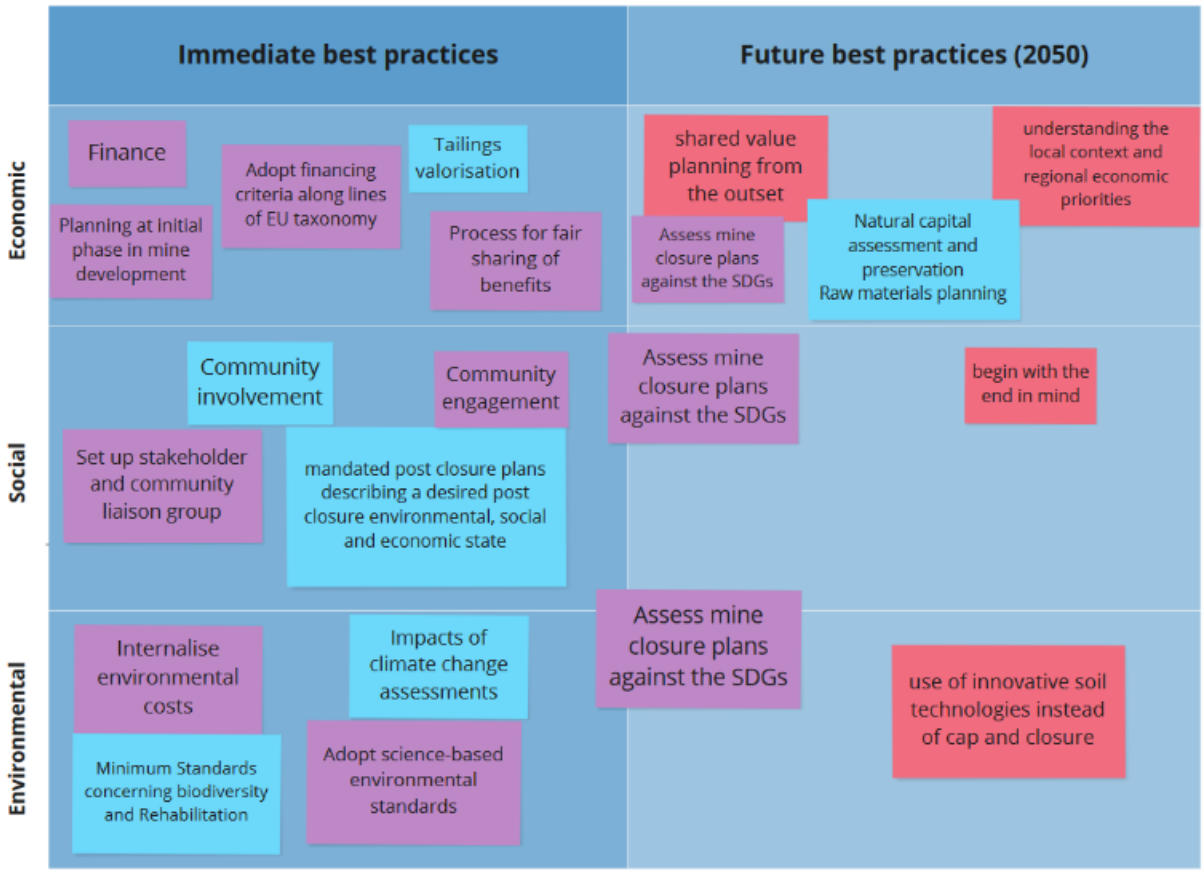

Figure 8: Attributes – Closure and Post-Closure (Source: SUMEX Project Kick-Off Workshop)

It is not surprising to see that almost all of the responses reflect aspirational goals as opposed to a concrete process. This is very reflective of the overall sustainable development discourse. In many cases, the process-driven attributes contribute to the attainment of the more goal-oriented or aspirational attributes or values.

4.1 SUSTAINABLE DEVELOPMENT PRIORITIES IN THE EXTRACTIVE INDUSTRY

Based on the processes described above, SUMEX suggests the following SD priorities for the extractive industry in Europe. These should be seen as future oriented, to some extend still aspirational and going beyond current legal requirements, which are without saying, a baseline requirement.

Reinventing the economy (i.e. considering the Green Deal)

- Understanding of the role and indicators for extractives in an inclusive Green Economy that exists within Planetary Boundaries
- Valuing natural and social capital
- Defining what Benefit Sharing (or Shared Value) means (beyond taxes and jobs)
- Accountability (i.e., life-cycle considerations, various capitals, reporting)
- Extractives' role in closing cycles, both biological and technological (beyond recycling, focus on reduction/dematerialisation, multiple use and redesign of products)
- Planning beyond the mine life

Social and societal responsibility

- Developing value together with society, i.e. communities
- Taking responsibility for goods and services needed in a Green Economy
- Sustainable learning (systems thinking, distinguish between fact, opinion and supposition, and the ability to learn from mistakes)
- Share knowledge and information transparently
- Improving workers' well-being (zero harm, improved skills)

Environmental sustainability

- Integrated water management
- Efficient energy consumption, based on renewable energy and zero greenhouse gas emissions
- Multiple, co-operative land use and net positive impact on ecosystem services and biodiversity
- Enlightened waste management that considers secondary resources from traditional waste by-products

4.2 ATTRIBUTES FOR SUSTAINBLE DEVELOPMENT IN THE EXTRACTIVE SECTOR

The following are a set of proposed attributes that reflect the aforementioned priorities for sustainable exploration and development, operations and closure/post-closure. They might sound conventional and well known, but might still prove difficult to do and achieve in many ways in real life.

Planning

The needs of the environment, communities, and other stakeholders have to be addressed from the outset and for all stages of the life cycle of an extractive project. Since contributing to SD involves setting

goals for continuous improvement, corporate policies must be written to accurately identify an extractive company's short- and long-term environmental and socio-economic goals, aligned with those of society.

Management

Once the planning phase has been initiated, the focus must be placed on implementing standards, tools and technologies that lead to improved performance and efficiency. Many of these standards and tools are generic industrial applications but must be redesigned to address life stage specific problems of the extraction site.

Innovation and implementation of cleaner technology

Management measures and cleaner technologies go hand in hand because contributing to sustainable development involves first restructuring management practices to enable easy redesign of industrial operations, and then integrating the technologies that release fewer pollutants and decrease long-term environmental stresses. In view of the plethora of environmental problems that persist in the extractive industry, there is a need to implement cleaner technologies on a number of fronts, and a mine or quarry can pursue one of two strategies to achieve improvement. The first is a substitution strategy, which simply involves replacing one set of technologies with another set. Secondly, a replacement strategy should be considered, that is simply the upgrading of existing systems using more effective, modern methods.

Innovation and new technologies should also be considered to find new product solutions, in the context of a circular economy, for current waste materials such as waste rock or tailings.

Social acceptance (SLO)

A wide range of stakeholders are potentially affected throughout the life of an extractive project and, in combination with the high degree of public awareness of its impacts, processes need to be in place that address tensions and balance the needs of all stakeholders. This includes the acceptance that different views on sustainability exist, e.g. concerning competing land uses. By demonstrating a commitment to share benefits (or to create shared value), extractive projects will experience better social acceptance (or achieve SLO) and an increased ease with which to operate. Improved communications and trust are proving integral in enhancing such relations.

Governance and transparent reporting

Extractive companies adhere to ethical business practices maintaining the highest business integrity in all operations and to sound systems of governance (European Commission, 2021). They treat non-financial (ESG) data much the same way as financial and transparently report such data in a meaningful way, ideally in raw form and at an operation level, and engage with stakeholders as required.

Formation of sustainable partnerships

Cooperative approaches for engaging with the rest of society is a key to improved sustainable development in the extractive industry. This includes also a better understanding and integration of the extractive stage with following stages of the (circular) value chain. The formation of public-private partnerships with influential groups and organizations such as academic establishments, churches, research institutions, NGOs, non-profit organisations, governmental bodies, and voluntary associations are also part of this process.

5 NEXT STEPS IN SUMEX

The SUMEX framework of priorities and attributes proposed above is preliminary to set the scene for a consultation process with stakeholders in the coming months.

The goal of this process is to then come up with a final framework that is further operationalised and which will serve as a guide for the SUMEX project to identify good practise examples from other EU, national and regional projects, as well as from industry, focusing on the five focus areas (permitting, environmental and social impact assessments, land use, health & safety and reporting) of SUMEX. This framework will also undergo a practical test with our industrial partners, Boliden and UEPG.

The outcomes of this process will be described in a separate follow-up report.

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SUMEX PROJECT BACKGROUND

SUMEX is a 36-months project funded by the EC that started on 01.11.2020. The project supports the set-up of a European sustainability framework to improve the permitting procedure along the extractive value chain (prospecting, exploration, extraction, processing, closure, post closure activities), to guarantee timely decisions, a transparent governmental regulatory regime, appealing financial and administrative conditions and sustainable natural environmental and social conditions. The main mission of SUMEX is to assist policymakers and other stakeholders in seizing this opportunity.

To foster more, but sustainable mineral production in the EU, SUMEX (*SUstainable Management in EXtractive industries*) will establish a sustainability framework for the extractive industry in Europe. It does so by considering the Sustainable Development Goals, the European Green Deal, as well as EU Social License to Operate considerations and will involve stakeholders from industry, government, academia and civil society backgrounds from all across the EU.

This framework is then applied across the extractive value chain to analyse the mineral, as well as relevant economic, environmental and social policy frameworks of the EU, member states and selected regions along five focus areas – socio-economic and environmental impact assessments, land use planning, health and safety, reporting official statistics and permitting processes/policy integration-to find, or build, where needed, good practices or tools for an open access toolkit, which will be embedded in a broader Community of Practise (CoP) and which forms the basis for capacity building. This CoP will consider relevant stakeholder groups, with a focus on permitting authorities, across the EU, providing a digital platform and using a series of workshops and webinars. In SUMEX, the experience from other projects builds a powerful foundation for addressing the challenge of how best to implement sustainability considerations into the whole raw materials value chain.

Challenge: No common understanding of sustainable management in extractive industries

SUMEX supports the set-up of a European sustainability framework to improve the permitting procedure along the extractive value chain (prospecting, exploration, extraction, processing, closure, post closure activities), to guarantee timely decisions, a transparent governmental regulatory regime, appealing financial and administrative conditions and sustainable natural environmental and social conditions. The main mission of SUMEX is to assist policymakers and other stakeholders in seizing this opportunity.

Objectives of SUMEX

- Strengthen policy coordination and agenda setting along the mineral extraction value chain;
- Propose a uniform EU sustainable management in extractive industries context;
- Cluster with other projects to identify good practices and good practise principles;
- Identify good practises and principles for policy strategies and strategic approaches, coordination/integration and approaches and property rights regimes for different institutional systems;
- Build a toolkit with good practises, with a focus on access to land, permitting and policy coordination and integration;
- Identify stakeholder learning needs and requirements;
- Deploy an open access toolkit for capacity building across EU and with all stakeholders.

More info on https://www.sumexproject.eu/
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