MinLand: Mineral resources in sustainable land-use planning

A H2020 Project

H2020 Grant Agreement: GA 776679

Topic: SC5-15d - Linking land use planning policies to national mineral policies

Deliverable 2.3: Safeguarding mineral resources in Europe: existing practice and possibilities

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EXECUTIVE SUMMARY

The European Commission is aware of the need to ensure a reliable and sustainable supply of mineral raw materials for its industry. For this reason, the Raw Materials Initiative highlights the importance of ensuring access to domestic sources of minerals. The MinLand project was built on this objective, for which the integration of mineral resource policies into land use planning policies is a key factor.

The WP2 of the MinLand project aims to create a structured and functional data repository of existing legislative practices on mineral resources and spatial planning across Europe to support the tasks to be developed in the other work packages.

The purpose of this D2.3 Delivery is to report on the main sources of information on legislative and land use practices specifically related to the safeguarding of minerals, complemented with the results obtained through a survey between MinLand partners and third parties.

The Minerals Safeguarding concept, as agreed upon by the MinLand Consortium is the act, process or procedure to ensure that areas containing, or potentially containing, mineral resources are not needlessly occupied by other uses that may prevent their future extraction, including the places for installing mining/quarrying infrastructures. This concept grounds on the assumption that a fair and equitable prior assessment of possible land uses is made.

From the existing sources of information regarding minerals and land use planning, the more relevant ones on the legislative practices for safeguarding are the MINLEX project (2015 – 2016), the MIN-GUIDE project (2016 – 2019), and the MINATURA2020 project (2015 – 2018).

A “Study - Legal framework for mineral extraction and permitting procedures for exploration and exploitation in the EU” was delivered by the MINLEX project in 2016 covering the 28 European member states. Several major findings can be found in this report, which are very relevant to understand the legal basis for the current safeguarding practices across Europe. It mainly addresses the permitting procedures, which are the ones where minerals and land use planning legislations directly touch each other.

The MIN-GUIDE is an ongoing project aiming at the development of a minerals policy guide for Europe. For that purpose, an online knowledge repository is being built, which is already the main source for data on minerals-related legislation.

The now completed MINATURA2020 project aimed to develop a concept and methodology for the definition and subsequent protection of “mineral deposits of public importance”. Data collected in this project on the existing regulatory practices among European countries, are quite relevant with regard to the minerals safeguarding issue. The MinLand Survey was partially built on the results of the MINATURA project, and data were collected to fill gaps in existing data coverage and secure new relevant data.

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From the MinLand survey it is concluded that the practice for safeguarding the access to mineral resources through **the existing legislative framework is effective, but not efficient**.

The practise is effective because, with some exceptions, mining easements (restrictions on land use resulting from the legalisation of exploration or extraction activities by administrative contract, concession or any other legal form) and areas with well-documented resources are considered in legislation for minerals safeguarding. It is inefficient because only a minor part of the known mineral resources may be safeguarded through the above procedures, and the safeguarding of hypothetical mineral resources is usually not addressed.

Most of the countries have spatial data repositories on land use planning, environmental protection areas and mineral resources, besides other land use planning topics. Only a few countries have spatial data repositories available through a single web-portal.

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1. Introduction

Over the last two decades, the European Commission has become more aware of the need to ensure a reliable and sustainable supply or mineral raw materials for sustaining its industrial base. In the lack of steady policies at EU level concerning mineral raw materials and land use planning, some progress has been made towards achieving that objective, especially after the announcement of the Communication from the Commission "Promoting sustainable development in the EU non-energy extractive industry"[1], which states that land use planning is one of the key factors for the competitiveness of the extractive industry. Subsequent support was given to several projects on research, innovation and policy actions, as well as to several initiatives aiming at fostering sustainable supply of raw materials to the EU industry.

The Raw Materials Initiative (RMI)[2], which has the European Innovation Partnership (EIP) on Raw Materials[3] as the major EU commitment for its implementation, highlights the importance of ensuring the access to domestic sources of mineral raw materials. The sustainability of European industry requires sustainable and environmentally friendly extractive activity in Europe, so that the EU industry does not depend entirely on foreign sources and, consequently, overcomes the risks of outsourcing. Yet, several competing land uses, such as urban sprawl, infrastructures development and nature conservation, amongst others, have a negative effect on the available area for exploration and exploitation of mineral deposits. Thus, as the supply of mineral raw materials from domestic sources to the European industry is at risk, there is a need to safeguard the access of the extractive industry to the places where mineral resources occur. To achieve this, the integration of the mineral resources policies into the land use planning policies is a key factor around which the MinLand project has been designed.

The main objective of WP2 of the MinLand project is to create a structured and functional data repository for the existing policies and practices across Europe on mineral resources and land use planning and associated spatial data. This repository intends to support the other WPs in:

- Non-energy Mineral Resources[4] and Land Use Planning policies, legislations and practices
- Available sources of spatial data covering the whole mineral land use value chain
- Existing measures for safeguarding mineral resources.

For this purpose, a plan for collecting data was outlined, which includes a three steps approach, as reported in Deliverable D2.2:

[1] COM (2000) 265 final - Communication from the Commission. Promoting sustainable development in the EU non-energy extractive industry.

[2] COM (2008) 699 - Communication from the Commission to the European Parliament and the Council: The Raw Materials Initiative - Meeting our critical needs for growth and jobs in Europe.

[3] COM (2012) 82 final - Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Commitee of the Regions: Making raw materials available for Europe's future wellbeing - Proposal for a European Innovation Partnership on Raw Materials

[4] In this document, non-energy mineral resources will simply be referred to as mineral resources.

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- Mapping and completing existing surveys from previous or on-going projects like MINATURA2020, MINLEX and MIN-GUIDE;
- Use of consortium partners' and third parties' expertise on national systems and policies;
- Reach out to national experts and complement/validate already compiled information.

Within this deliverable, D2.3, we provide the results and an analysis of the collected data on mineral and land use planning framework policies for further elaboration in WP4, WP5, and WP6. The focus is on the **existing legislative practice for safeguarding mineral resources in Europe, as well as on related spatial data**.

As a starting point for the analysis of the answers provided by the partners and third parties, as well as for the analysis of the results obtained in other projects, a brief discussion on the Minerals Safeguarding concept is firstly presented.

2. The concept of safeguarding mineral resources

Several decades ago it was realised (e.g. Nolan, 1955) that one of the problems facing modern civilization is that an expanding population is dependent on an economy based on continually available supplies of mineral raw materials, the total amount of which is fixed.

Technological advances in the exploration of mineral resources have continuously led to the discovery of new deposits, many actions have been taken to improve the efficiency of the minerals value chain, including recycling, and steps towards a more sustainable consumption of resources have been taken. Despite this, ensuring the supply of mineral raw materials to the society remains a contemporary problem **because only the technological issues** (substitution and recycling techniques, new exploration and extraction techniques, 3D and 4D deposit modelling, etc) **are being addressed**. The societal issues, in which can be included the **societal acceptance for the inclusion of minerals safeguarding areas in land use planning remains unresolved**. Indeed, since minerals can only be extracted where they occur, if Land Use Planning does not grant the extractive industry access to such sites, the mineral raw materials will not be supplied to society.

According to the Oxford English Dictionary the noun "*Safeguard*" means *a measure taken to protect someone or something or to prevent something undesirable*, while the verb "*Safeguard*" means *to protect from harm or damage with an appropriate measure*. Often it is used when referring to measures to protect the well-being and human rights of individuals, especially children and other vulnerable groups. Therefore, **safeguarding mineral resources** should be understood as the protection of mineral resources with appropriate measures. This raises two main questions: ***protection from what*** and ***which appropriate measure(s)*****?**

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In the competition for land, several types of activities may prevent the access of the extractive industry. Pendock (1984) was one of the first authors to answer the aforementioned questions, saying that there is a need to protect mineral resources from being sterilised during the land use planning process, that is, the loss of the option to exploit them. Knepper Jr (2002) states that resource sterilisation occurs when the development of a resource is precluded by another existing land use. Because the effects of sterilisation are not necessarily felt in the present time, but by future generations, these authors also argue that to avoid unnecessary sterilisation of mineral resources, safeguarding the areas where they occur through active long-term planning policies should be enforced. The decision on whether or not to exploit a given resource must be based on an integrated assessment of ecological, environmental, economic, and social impacts, and be governed by a land use strategy that incorporates the principles of sustainable development (MMSD, 2002).

These issues were initially addressed in European policies during the late 1990s[5], but especially during the preparatory works for the European Thematic Strategy on the Sustainable Use of Natural Resources[6]. Several documents and research papers (e.g. Christmann, 2004; Regueiro et al., 2002; Wellmer F.-W. and Becker-Platen J., 2002) state that the extractive industry is unable to compete for land on an equal footing with other activities, and that the long-term availability of minerals in Europe depends largely on accessibility to the land where they exist. In 2008, with the Raw Materials Initiative[7], this issue was addressed politically through the awareness that EU is rich in mineral deposits, but their exploration and extraction are facing increased competition from different land uses and a highly regulated environment. Simultaneously it states that *strategies are necessary to safeguard access to these deposits for future use*.

Two years before, in 2006, strategies for the inclusion of the mineral resources in land use planning policies and practices through safeguarding areas to prevent unnecessary sterilisation of mineral resources were already addressed by the UK government on policy and guidance documents (Wrighton et al., 2014). The UK National Planning Policy Framework Guidance on Minerals[8] states that Minerals Safeguarding is the process of ensuring that non-minerals development does not needlessly prevent the future extraction of mineral resources, of local and national interest.

[5] See COM(2000) 265 final - Communication from the Commission. Promoting sustainable development in the EU non-energy extractive industry.

[6] COM(2003) 572 final - Communication from the Commission to the Council and the European Parliament. Towards a Thematic Strategy on the Sustainable Use of Natural Resources.

[7] COM(2008) 699 - Communication from the Commission to the European Parliament and the Council. The Raw Materials Initiative — Meeting our Critical Needs for Growth and Jobs in Europe.

[8] https://www.gov.uk/guidance/minerals

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2.1. A comprehensive concept

Several interpretations of the minerals safeguarding concept are usual, especially regarding which mineral resources should be safeguarded or, in other words, which mineral resources should be considered in spatial planning.

The main issue is the existing level of geological knowledge about mineral resources, which in turn has an equivalence with their greater or lesser (economic) interest: should all the minerals be targeted for consideration in spatial planning or only those with already or nearly already demonstrated interest? For this, the McKelvey diagram for the classification of mineral resources may be taken into account, especially its main division between identified and undiscovered resources (Figure 1).

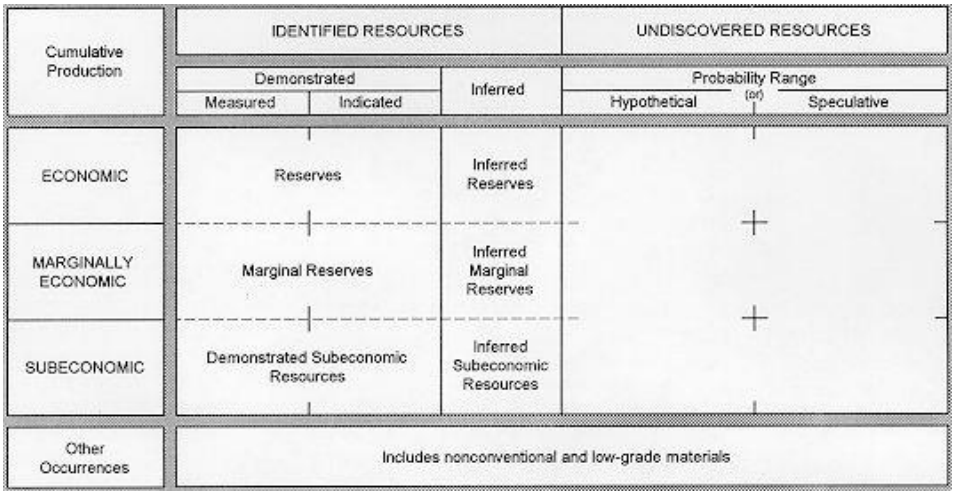

Figure 1- McKelvey diagram for the classification of mineral resources (USGS, 1980)

Based on the McKelvey classification, the more recent CRIRSCO[9] and UNFC[10] standards also illustrate this main division: the McKelvey's Undiscovered Resources have a direct correspondence to the geological level of confidence resulting from Exploration Results of the CRIRSCO template (Figure 2) or from the G4 class (Potential Deposits) of the UNFC code (Figure 3).

It seems plausible that the areas where identified mineral resources exist should be safeguarded due to the inherent interest of those resources (as mentioned in the UK concept of minerals safeguarding), **but should the protection also take into consideration the undiscovered resources (i.e. the safeguarding of areas potentially containing minerals)?**

[9] Committee for Mineral Reserves International Reporting Standards - International Reporting Template for the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves. International Council on Mining & Metals, November 2013. http://www.crirsco.com/template.asp

[10] United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009. United Nations Economic Commission for Europe. http://www.unece.org/energy/se/unfc_2009.html

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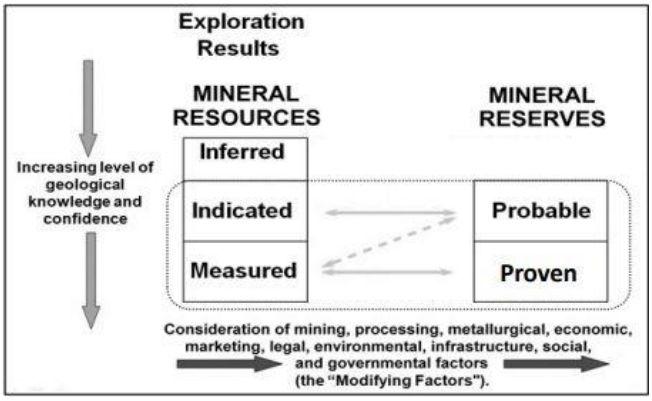

Figure 2- General relationship between Exploration Results, Mineral Resources and Mineral Reserves (in CRIRSCO template)

UNFC Classes Defined by Categories and Sub-categories						
Total Commodity Initially in Place	Extracted	Sales Production				
		Non-sales Production				
	Class		Sub-class	Categories E	F	G
	Known Deposit	Commercial Projects	On Production	1	1.1	1, 2, 3
			Approved for Development	1	1.2	1, 2, 3
			Justified for Development	1	1.3	1, 2, 3
		Potentially Commercial Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development On Hold	2	2.2	1, 2, 3
		Non-Commercial Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development Not Viable	3.3	2.3	1, 2, 3
		Additional Quantities in Place		3.3	4	1, 2, 3
	Potential Deposit	Exploration Projects	[No sub-classes defined][c]	3.2	3	4
		Additional Quantities in Place		3.3	4	4

Figure 3- UNFC-2009 Classes and Sub-classes defined by Sub-categories

It is widely accepted that **resources with an already known economic interest are those that will supply the society in a near future**, and many of the areas where they occur are already protected by some kind of land use planning easement (e.g. mining concessions). Therefore, **the long-term (sustainable) supply depends on the undiscovered or poorly defined resources** (e.g. Briskey et al., 2000) which will only be mineable if the areas containing them are also protected from unnecessary sterilisation. For this reason, as is widely accepted for the conservation of nature, where there is uncertainty about the full extent of possible harms but "doing nothing" is also risky ((DG Environment, 2017), the precautionary principle may be used[11].

[11] According to Henckens (2016), the EU, in its regulations, has broadened the scope of the precautionary principle from human health and environment specifically to the well-being of future generations in general, including economic security. However, beyond the EU there seems to be disagreement regarding the appropriateness of the precautionary principle. Therefore, the applicability of the precautionary principle to the problem of depletion of

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The Minerals Safeguarding concept, as agreed upon by the MinLand Consortium is **the act, process or procedure to ensure that areas containing, or potentially containing, mineral resources are not needlessly occupied by other uses that may prevent their future extraction, including the places for installing mining/quarrying infrastructures**. Moreover, the MinLand Consortium emphasises that **mineral resources safeguarding assumes a fair and equal prior assessment of the possible land uses.**

3. Survey on Minerals and Land Use Planning legislation framework

The purpose of WP2 of the MinLand project is to support subsequent work packages on the existing policy practices across Europe with respect to mineral resources and land use planning. WP2 intends to take into account the existing data repositories, particularly with respect to mineral resources safeguarding practices.

LUP and Mineral Resources framework policies are particularly linked to interventions on the territories of the respective member states. Being aware of this, the collection of information on related repositories of spatial data is also an objective.

A first step was to search existing databases on legislative frameworks and spatial data, including consultation on previous projects. A second step consisted of surveys among partners and third parties through questionnaires. After discussing relevant data collected in other projects, the current deliverable focuses on the results obtained through the WP2 questionnaires, as they sought to fill gaps in existing data coverage and secure new data relevant to minerals safeguarding in land use planning and mineral resources policies and legislations

3.1. Survey Methodology

Data search between partners corresponded to the main part of the WP2 data gathering exercise through questionnaires, which were addressed to all project partners and third-party participants.

A first questionnaire was structured according to the template presented in Annex 1. Because there is a jargon on the subjects of mineral resources and land use planning, which sometimes is not understood in a similar manner by all respondents, the questionnaire was accompanied by a glossary of terms to be used as Common Concepts. These were agreed upon by the consortium partners. In order to adapt this questionnaire template to the EU online survey tool,

geologically scarce mineral resources is not sufficiently unambiguous for justifying the creation of an international agreement on this issue

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for distribution and data acquirement purposes, it was re-structured to the flow chart presented in Annex 2.

Considering the findings from other projects, in particular from the MINATURA project, which will be presented further ahead, the first MinLand questionnaire comprises a major distinction between policy and legislation, where policy corresponds to public documents having a strategic/visionary approach, and legislation corresponds to the laws and regulations aimed at the establishment of the strategies. Policies and legislation concerning mineral resources are addressed independently of those related to land use planning, and each one of these policy frameworks are structured according to their hierarchy level (national, regional, and local), respecting previous findings on their respective vertical arrangement (Dallhammer et al., 2018; Endl et al., 2016; European Commission et al., 2016). Secondly, the questionnaire addresses the existing relationships between the minerals and land use planning policies and legislations.

The first questionnaire also includes specific questions regarding the available data repositories, emphasizing the integration of minerals and land use data.

Once the work on the data started, a quality assessment procedure has been invoked in which the different WP leaders have been involved. As will be shown later, this assessment found several inconsistencies in the answers, and therefore it was necessary to return to the respondents with a new supplementary questionnaire aimed at solving the inconsistencies. The template of this new questionnaire is presented in Annex 3.

The second questionnaire explores the three stages in which mineral resources / mining activity interact with land use planning:

- During the development of policies and legislations on mineral resources management and land use planning;
- During the Permitting for Exploration;
- During the Permitting for Extraction (Concession, Licensing, or another legal figure);

In addition, the structure of the second questionnaire takes into account the level of geological knowledge about mineral resources, particularly the distinction between identified and undiscovered mineral deposits that is used in the international reporting codes for mineral resources (*cf*. chapter 2.1). A quality assessment procedure with the respondents was again invoked for the obtained answers, and some were adjusted by the results presented in the MINLEX report, which will be presented further ahead.

The MinLand data repository is a restricted access SharePoint platform hosted by the Geological Survey of Norway. It hosts two spreadsheets: one respecting the answers collected in the first questionnaire through the on-line survey, and other respecting the supplementary questionnaire. Both were the basis for the analysis of the minerals safeguarding legislative practices. As can be seen in Table 1, no answers were obtained from Croatia and France to questionnaire 2. In fact, the French partner was not surveyed by questionnaire 2 because he responded very late to questionnaire 1.

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Table 1- Identification of partners who replied to the questionnaires.

COUNTRY	ORGANISATION	AUTHOR	QUEST. 1	QUEST. 2
Austria	Montanuniversität Leoben	Katharina Gugerell	X	X
Croatia	Croatian Geological Survey	Željko Dedić	X	
Cyprus	Geological Survey Department	Christodoulos Hadjigeorgiou	X	X
Czech Repub.	Czech Geological Survey	Excluded because of data protection policy.	X	X
Finland	GTK – Geological Survey of Finland	Excluded because of data protection policy.	X	X
France	BRGM – Bureau de Recherches Géologiques et Minières	Guillaume Bertrand	X	
Greece	IGME GR – Institute of Geology & Mineral Exploration	Kiki Hatzilazaridou	X	X
Hungary	Mining and Geological Survey of Hungary	Excluded because of data protection policy.	X	X
Ireland	MacCabe Durney Barnes	Sybil Berne	X	X
Italy - Emilia-Romagna Region	Soil and Coast protection and land reclamation Service	Christian Marasmi	X	X
Netherlands	Wageningen Environmental Research	T. van der Sluis, A. Cormont, I. Bouwma, M. van der Meulen (TNO)	X	X
Norway	NGU – Geological Survey of Norway	Excluded because of data protection policy.	X	X
Portugal	Direção Geral da Energia e Geologia (DGEG) & Laboratório Nacional de Energia e Geologia (LNEG)	Paula Dinis, Maria Figueira (DGEG) Jorge Carvalho, Vitor Lisboa (LNEG)	X	X
Poland	MEERI PAS - Mineral and Energy Economy Research Institute of the Polish Academy of Sciences	Alicja Kot-Niewiadomska	X	X
Slovenia	Geological Survey of Slovenia	Excluded because of data protection policy.	X	X
Spain	IGME SP – Geological Survey of Spain	Excluded because of data protection policy.	X	X
Sweden	SGU – Sweden Geological Institute	Erika Ingvald	X	X
Ukraine	SRDE "Geoinform of Ukraine"	Boris Malyuk	X	X

4. Results from other EU projects

This chapter presents the results from the survey of existing legislation and spatial data repositories. They are useful tools for the development of further WPs of the MinLand project.

With more or less detail, some previous projects have already dealt with the minerals and land use policy frameworks, including spatial data, namely:

- The MINVENTORY Project. Its objective is to characterize and deliver a metadata inventory on European mineral resources and reserves, as well as information on mining waste and landfill stocks. Maintained by the Joint Research Centre at: https://ec.europa.eu/jrc/en/scientific-tool/minventory.

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- SNAP-SEE Project - Sustainable Aggregates Planning in South East Europe (2012 – 2014). Its main objective was to improve the aggregates planning process to make it more sustainable, socio-environmentally and economically friendly. It included a multi-sectoral analysis about sustainable development, environment, minerals, and land use planning issues, amongst others. http://www.southeast-europe.net/en/
- MINERALS4EU Project (2013 – 2015). Designed to meet the recommendations of the Raw Materials Initiative and develop an EU Mineral intelligence network structure delivering a web portal, a European Minerals Yearbook and foresight studies. It provides links to policy documents of some countries. http://www.minerals4eu.eu/
- MINLEX Project (2015 – 2016). The project's full name is "Study - Legal framework for mineral extraction and permitting procedures for exploration and exploitation in the EU", which explicit very well its objective. Besides covering the EU legislation on minerals and on other sectors to which the mining industry is related (e.g. environment, waste, and transparency), the project covers the mining permitting procedure for all the 28 member states. The project web site is http://www.minlex.eu/index.html. The final report is available at https://publications.europa.eu/en/publication-detail/-/publication/18c19395-6dbf-11e7-b2f2-01aa75ed71a1/language-en. Some major findings on this work to which safeguarding is related:
  - All MSs have a main Mining Act, which is regularly updated. These acts contain permitting provisions and deadlines for decisions along the permitting chain, define the mineral ownership and establish provisions for permitting procedures
  - During the exploration phase, the number of permits/licences required is much lower than those required for extraction
  - The location of the exploration activities may be an important deterrent or retardant obstacle for the permitting process if that location geographically coincides with competing land uses, and this is valid for all the phases of the mineral development
  - Major competing land uses include high population density, areas protected for the conservation of nature or cultural heritage.
  - Efficient permitting regimes have parallel and coordinated assessment of permits/licences among co-authorities and with the mining authorities, instead of sequential assessments
  - Usually, Environmental Impact Assessment is not required for exploration works, but they generally are for extraction
  - Public acceptance is a key aspect in the viability of any project because the lack of it endangers the predictability of the permitting process and consequently discourages investors. Good practice shows that an early community engagement is necessary.
  - The positive combination of minerals planning, and land use planning facilitates and streamlines the permitting procedure of exploration and extraction.
- MIN-GUIDE (2016 – 2019). This ongoing project is carried out by 10 organisations representing 9 European countries. It addresses the need for a secure and sustainable supply of minerals in the European Union by developing a Minerals Policy Guide. One of its key activities is to develop a comprehensive, customizable, user-friendly and up-to-

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date "Minerals Policy Guide" through an online knowledge repository on mineral policy across the EU countries. Currently, it is the main repository of minerals related legislation, which is available at: https://www.min-guide.eu/.

- ESPON 2020. It is a Cooperation Programme from the European Commission that aims at promoting and fostering a European territorial dimension in development and cooperation by providing evidence, knowledge transfer and policy learning to public authorities and other policy actors at all levels through the consolidation of a European Territorial Observatory Network. It covers the entire territory of the 28 EU Members States, as well as 4 Partner States of Iceland, Liechtenstein, Norway and Switzerland. This programme started in 2002 with ESPON2006, it was followed by the ESPON2013, and by the ongoing ESPON2020 (https://www.espon.eu/). It has an associated database portal (ESPON 2013 Database: https://www.espon.eu/tools-maps/espon-2013-database). Within this programme, several projects were funded by the EC, some of them dealing with the land use planning policy at several European levels, particularly:
    - The Project 2.3.2 - Governance of territorial and urban policies (https://www.espon.eu/programme/projects/espon-2006/policy-impact-projects/governance-territorial-and-urban-policies)
    - ESPON Project 3.1 - Integrated tools for European spatial development (https://www.espon.eu/programme/projects/espon-2006/coordinating-cross-thematic-projects/integrated-tools-european-spatial)
    - The COMPASS project - Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe (https://www.espon.eu/planning-systems)
    - TANGO - Territorial Approaches for New Governance (https://www.espon.eu/programme/projects/espon-2013/applied-research/tango-territorial-approaches-new-governance)
- MINATURA2020 Project (2015 – 2018). This project aimed to develop a concept and methodology for the definition and subsequent protection of "mineral deposits of public importance" in land use planning (https://minatura2020.eu/). This is the most relevant project for consideration by MinLand partners. For this reason, it will be analysed in more detail.

4.1. The MINATURA2020 Project

The now completed MINATURA2020 project (2015 – 2018), was funded through the European Commission's Horizon 2020 Programme for Research & Innovation (R&I). Its overall objective was the development of a concept and methodology for the definition and subsequent protection of "mineral deposits of public importance" in order to ensure their "best use" in the future and their inclusion in a harmonised European regulatory/guidance/policy framework. As for the MinLand project, the concept underlying the MINATURA2020 project is the protection of mineral resources from being sterilised during land use planning processes. For that reason, MINATURA had a specific Work Package – WP3 – to deal with the existing regulatory framework on national, regional and local levels.

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The MINATURA consortium had 24 partners representing 17 countries. Except for Finland, Greece, and Norway, all the remaining countries represented in the MinLand project were also represented in the MINATURA project.

The work developed in the WP3 of MINATURA consisted of gathering data on existing framework policies on mineral resources and land use planning, as well as on other related policies. The collection of data was performed through surveys to the partners and third-parties in the project. In addition to the questionnaires other sources of information have been explored, including data and results from other EU projects (MINVENTORY, MINLEX and SNAP-SEE). The results of the MINATURA survey are presented in the Deliverable 3.1[12], specifically in its Annex 2. It is systematised by countries' answers and addresses the legal frameworks on minerals and land use planning, permitting, mineral resources inventory and mineral economy.

All the partners and third parties represented in the MinLand consortium, except for Greece, Norway, Cyprus, and Ukraine, answered the MINATURA questionnaire (Table 2). Besides the questionnaire, Austria, Portugal, Sweden, and the UK contributed with selected European Safeguarding Practices for the MINATURA project.

Table 2- Partners and Third Parties answering MINATURA and MINLAND questionnaires.

MINLAND PARTNERS & THIRD PARTIES*	MINATURA PARTNERS & COUNTRIES OUTSIDE MINATURA CONSORTIUM*	MINLAND SURVEY	MINATURA SURVEY
Austria	Austria	X	X
	Belgium/Flanders*		X
	Bosnia and Herzegovina		X
	Bulgaria*		X
Croatia*	Croatia	X	X
Cyprus*		X	
Czech Republic*	Czech Republic*	X	X
Finland	Finland*	X	X
France*	France*	X	X
Greece		X	
Hungary*	Hungary	X	X
Ireland	Ireland	X	X
Italy/Emilia Romagna	Italy/Emilia Romagna	X	X
	Montenegro		X
Netherlands	Netherlands	X	X
Norway		X	
Poland	Poland	X	X
Portugal	Portugal	X	X
	Romania		X
	Serbia		X
	Slovakia		X
Slovenia*	Slovenia	X	X
Spain	Spain	X	X
Sweden	Sweden	X	X
	UK		
Ukraine*		X	

The Deliverable 3.1 of MINATURA reports that the sectors that could have impact on minerals safeguarding are the minerals, environment, waste management, and land use planning sectors, and that they have a hierarchy covered by regulations and policies, as shown in Figure 4.

[12] Available at: https://minatura2020.eu/wp-content/uploads/2018/01/MINATURA2020_D3.1.pdf

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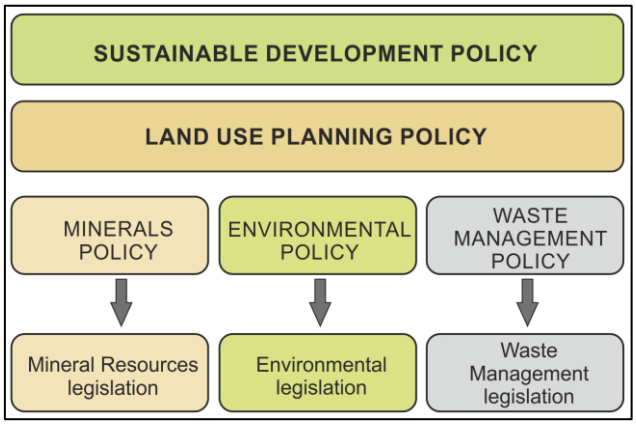

Figure 4- Relevant policy sectors for safeguarding minerals (adapted from MINATURA2020 D3.1)

The report points out that the legal framework of Europe is quite heterogeneous: the management and protection of mineral deposits are properly regulated in some countries but, on the other hand, some countries suffer from the lack of regulations covering these issues. The report states that the obtained results show that in most European countries mineral management is connected to land use planning; however, the inclusion of mineral deposits into land use plans is quite various, and it can be divided into three groups, according to current practices:

- Countries/regions that apply some kind of mineral safeguarding concept: This group consists of six countries (Austria, the Czech Republic, Slovakia, Slovenia, Sweden and the UK) whose safeguarding concept can be highlighted as best practices, especially in the case of Austria, Sweden and the United Kingdom.
- Countries/regions where the protection of mineral deposits is not regulated yet but is assured by/in other ways: In Hungary, Poland and Portugal some legislation (land use planning or mining law) deals with the protection of mineral deposits. In the Emilia-Romagna Region (IT) mineral protection covers only the gypsum heritage exploitation site.
- Countries/regions that do not apply mineral safeguarding: Herzegbosnian Canton (BA), Croatia, Ireland, Montenegro, the Netherlands, Romania, Serbia and Spain do not consider the concept of mineral safeguarding in their legislation.

The WP2 of MINATURA2020 project was dedicated to the establishment of an appropriate mapping framework based on detailed qualifying conditions for classifying mineral deposits of public importance. In its Deliverable 2.1 - Harmonised Mapping Framework, it states that safeguarding an area hosting mineral resources means that the authorities officially acknowledge its value and that particular condition will be assessed in parity with other land uses by the competent spatial planning authorities. In this sense, it means that mineral extraction will be at least considered before any form of sterilising development can go ahead.

The Deliverable 2.1 also presents an overview of land use planning practices and concepts for mineral protection across Europe. It was based on the answers provided by the D3.1 questionnaire, complemented with data from previous projects.

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Regarding available spatial data, the MINATURA project is also an important source of information. Its WP 2 was dedicated to enquiries on available spatial data across European countries on several topics, including environmental protection areas, mineral deposits, infrastructures, and land use. MINATURA's Delivery D 1.1 - Overview of Spatial Data Available (https://minatura2020.eu/wp-content/uploads/2018/01/MINATURA2020_D1.1.pdf) presents a summary of the available spatial data based on the enquiries, and some major achievements, from which are here highlighted the following:

- Restrictions on spatial data seem to disappear gradually. General data is often available and freely downloadable via online portals. This complies with the INSPIRE agreements. However, the user-friendliness of these portals is not always optimal: on some portals, it is difficult to find the relevant maps, despite the build-in search functions (e.g. national georegister for the Netherlands).
- The availability of specific spatial data, e.g. on the occurrence of particular minerals, varies among countries and minerals. Due to for instance strategic importance, not all mineral deposits are publicly accessible, only those of major availability (e.g. Slovenia). Moreover, some countries have indicated the spatial data availability of the specific minerals of which deposits exist within their territories or case study regions, while other countries have indicated the spatial data availability on minerals only very generally.
- In some cases, qualitatively good spatial data is available for the local scale, whereas data of this quality is not or limitedly available on the national scale (e.g. Emilia-Romagna).
- In some cases, only analogous spatial data is available (paper maps). The downloadability may be limited to single (local) map sheets, downloadable one at a time or in non-GIS formats (like PDF) only. Often the use of the data is limited to just viewing the maps at a portal using WMS/WFS format (e.g. Sweden, Portugal, Slovakia, EU data).

The filled questionnaires from this Work Package of the MINATURA project are available at the MinLand SharePoint. One respects the MINATURA's case studies (MINATURA WP1.1 data inventory CaseStudydata.xlsm) and the other respects data gathered from other European projects (MINATURA WP1.1 data inventory EUdata.xlsm).

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5. The MinLand Survey

5.1. Results from Questionnaire 1

5.1.1. Safeguarding the access to mineral resources in the policy frameworks

Several specific questions about the safeguarding of mineral resources are posed throughout the questionnaire. The objective of the analysis is to collect information on which type of policy documents address safeguarding and how is safeguarding being addressed.

Often, the collected responses reveal a misinterpretation of strategic policy documents versus normative legislative documents. In these cases, data released by the MIN-GUIDE project in English were also taken as a source for reliable information. It is common that many of the key normative legislative documents, the "Mining Acts", do also have a strong strategic component, which justifies their use as basis for many of the answers regarding minerals policy.

In addition, for a better understanding of some of the answers concerning country specific permitting issues, the MINLEX final report was used.

Regarding the land use policy framework, and taking into account the recent study of Dallhammer et al. (2018) on that subject, the answers revealed some inconsistencies on the existing hierarchy levels of each country. Therefore, other sources were used to complement the collected data, including the Organisation for Economic Co-operation and Development (OECD)[13], and the United Nations Economic Commission for Europe (UNECE)[14].

- **Minerals Policy**

With the exceptions of Italy, Spain, Cyprus, Ireland, Poland and Netherlands, all 18 countries of the MinLand project have a national policy document for the development and governance strategy of mineral resources. Italy and Spain, being decentralized administrations, only have a mineral resources policy at regional level. In Poland, the national strategy is under preparation.

Most of these strategies foresee the safeguarding of mineral resources; exceptions are Croatia, Finland, France, Ukraine and Sweden. The Slovenian and Greek policies stress the need to preserve the access to mineral resources (Slovenia) by an adequate land use planning (Greece). The Swedish Mineral Strategy promotes the coordination and dialogue among the industries and activities that lay claim to the same land, especially for reindeer husbandry areas. Strategies from other countries are more explicit and address the safeguarding by pointing to the need to ensure the supply of mineral raw materials and that this should be promoted by delimiting mineral potential areas (Portugal, Norway) or areas where resources of relevant interest are known. The Austrian strategy promotes the delimitation of mineral safeguarding areas only where no land use conflicts exist ("no-conflict areas").

[13] https://www.oecd.org/regional/regional-policy/country-profiles.htm
[14] http://www.unece.org/unece/search?q=ukraine&op=Search

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Regional minerals policies are emblematic for Italy and Spain, although Norway, Croatia, Czech Republic, Sweden and Austria also have such regional strategies, which, in the case of Spain do not draw attention to the minerals safeguarding issue.

- **Minerals Legislation**

All the interviewed countries have a national regulatory body on minerals, often topped by a higher-level document: A Mineral Act or Mining Law. Besides the national legislation, Italy and Spain also have regional legislations for mineral resources. The Norwegian mining law contain specific conditions for the Finnmark County and the Portuguese for the Azores and Madeira autonomous regions.

Figure 5- Countries having a main national/regional mining law. In green: mining law addresses minerals safeguarding, mining permits and areas with well documented resources are appointed to land use planning authorities. In blue: mining law does not address safeguarding; mining permits are appointed to land use planning authorities. In grey: EU non-surveyed countries.

Countries answering that their respective national mining law deals with safeguarding the access to mineral resources constitutes about half of the respondents: Austria, Cyprus, Czech Republic, Hungary, Italy (Emilia Romagna), Portugal, Poland, Slovenia, and Sweden (Figure 5). All of them report that safeguarding is achieved by notifying the land use authorities about areas assigned to some sort of mining rights (mining concessions, exploitation licenses or other kind of mineral permits). Moreover, some countries report that safeguarding is also achieved by notifying land use plan authorities of areas where well-documented mineral resources exist, even if they do not have immediate economic interest for extraction (e.g. Austria, Hungary, Norway, Poland,

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and Sweden). Usually, the areas with mining rights are necessarily integrated into land use planning as constraints (easements), whereas areas with well-documented mineral resources are often included on a voluntary basis.

Portugal, Slovenia, Poland, Cyprus, and Hungary also report that the granting of extraction permits is subordinate to the existing land use plans and to environmental impact assessments.

The remaining countries answered that their national or regional legislation on minerals does not address the safeguarding issue. However, although with slight differences, for all countries the areas granted for minerals exploitation are appointed to land use authorities as mineral resources easements after prior environmental and location authorizations.

- **Land Use Planning Policy**

Almost all countries have national and/or regional policies on land use; Cyprus, Finland, Greece, Poland, Slovenia, the Netherlands and Ukraine, only have a national policy; Austria, Italy and Spain only have regional policies. Sweden does not have a formal national policy, having the strategic principles of land use planning defined at municipal level[15].

Safeguarding of mineral resources is not addressed in the national land use policies of the Ukraine, France, Finland, Ireland, the Netherlands, and Croatia, nor in the regional policies of the last four mentioned countries. For the remaining countries, it is addressed in very general terms, usually by stating that mineral resources are non-renewable goods essential for the society that must be protected from competing land uses considering not only their scarcity but also the impacts on environment and social conditions (e.g. Portugal, Greece).

The approach is similar to existing policies at regional level, with the exception of Spain and Portugal. For these, safeguarding is not an issue in regional land use policies.

- **Land Use Planning Legislation**

Contrary to what is most common for the mineral's legislative framework, the land use planning is fragmented and spread across different administration levels. In general, at national and / or regional levels, the legislation provides the main principles for the spatial planning and guidelines to the subsidiary levels. At local level, where the decision-making process usually takes place, the legislation has a regulatory character par excellence. Local planning authorities are responsible for outlining land use plans through regulations and maps (zoning, building schemes, etc.). It is during this process that several types of constraints to the use of land are mandatorily integrated in the land use plans (e.g. Natura2000 areas, existing infrastructures and respective defence areas, etc.). The same applies for the mineral resources' easements from the minerals permitting process. The integration of the appointed areas with well documented mineral resources is mostly voluntary.

[15] Land-use planning systems in the OECD: country fact sheets, 2017

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With minor differences, this hierarchy and procedure is common to most countries, but some differences are noteworthy. The Netherlands and Croatia have regulatory instruments at all the three levels of governance: national, regional and local. Austria, Italy and Spain have regional and local legislation, while Ukraine at national and regional levels, and Cyprus only at national level.

The approach to safeguarding mineral resources in the national level legislation (or regional for the case of Italy and Austria) is made by establishing principles and guidelines (Figure 6). For Portugal, these are intended to foster a land use planning where there is compatibility between the several uses of land, avoiding conflicts, and preventing uses that might compromise the current and future access to known mineral deposits. For rural areas, the national legislation establishes the obligation of delimiting spaces for the exploitation of mineral deposits. However, at the local level, these spaces may or may not be fully or partially included in land use plans, depending on whether they are mining permits or areas with well-documented but not yet exploited mineral resources, and depending on conflicts that may exist with other uses of the land, particularly those for environmental protection. Specific local legislation associated to the local plans rules the use of these spaces.

Figure 6- Countries (Emilia Romagna region in Italy) with land use planning legislation addressing safeguarding of mineral resources (in green) and not addressing safeguarding (in blue). EU non-surveyed countries in grey.

With minor differences, the Portuguese approach to safeguarding in land use planning legislation also applies for Hungary, Norway, Poland, and Slovenia, as well as for Austria and Italy at regional level. Through it, the access to mineral resources in the areas corresponding to the mining permits is ensured.

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In Sweden the high-level legislation on land use planning requires that municipalities elaborate a comprehensive plan indicating how the municipality intends to safeguard the Areas of National interest, which include national interest mineral areas[16].

The safeguarding of mineral resources is not addressed in the land use legislation of the remaining countries: Croatia, Czech Republic, Finland, France, Greece, Ireland, Netherlands, Spain, and Ukraine.

5.1.2. Specific Safeguarding issues

Besides questions on how the safeguarding is addressed in the minerals and land use policy frameworks, the questionnaire also poses specific questions as to how the access to mineral resources is ensured, and to the integration of minerals in land use planning systems.

- **Are all mineral resources considered for safeguarding?**

The MinLand project does not deal with all the geological resources, rather only with the so-called NEMR: Non-Energy Mineral Resources. Their approach by the environmental authorities is done in the context of the extractive activity (NEEI - Non-Energy Extractive Industry). Of these, the questionnaire poses specific questions to determine whether they are all included in the policy frameworks, especially with respect to ensuring the access to the territory.

Almost all the high-level strategic policies on minerals include every kind of mineral resource, with Italy being the only exception. Italian high-level (regional) and French national policy does not consider all resource types within the non-energy mineral resources. The same concerns the high-level regulatory legislation, with the exception of Ireland (Ireland does not have a strategy for minerals, and the high-level Mining Act considers a specific list of minerals). However, for some countries (e.g. Austria, Finland, France and Sweden), not all mineral resources are covered by the Mining Act; the remaining minerals being addressed by other (e.g. in Finland, the Land Extraction Act regulates extraction of gravel, sand, and natural stone).

- **Which authority defines the areas for safeguarding?**

The answers to this question were very diverse. Some countries have indicated the planning authority responsible for the delimitation of the area in the land use plans, others have indicated the entity responsible for providing the area to the planning authorities, and others have indicated the entity responsible for the area definition. Therefore, no reliable data can be

[16] Boverket (Swedish National Board of Housing, Building and Planning): Planning and Building Act (2010:900), Planning and Building Ordinance (2011:338)

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gathered. However, given the responses of the various countries throughout the questionnaire, it is possible to draw a general picture of the process.

In many countries, the entity responsible for outlining areas with interesting well-documented resources is the geological survey (e.g. Portugal, Poland, Norway and Sweden). The areas can be complemented by local studies provided by the local planning authorities (e.g. Norway). Making these areas available to local planning authorities is done either directly by the geological survey (e.g. Sweden, Cyprus and Norway) or indirectly by the mining authority (e.g. Portugal).

Regarding the outline of the mining permits (exploration areas, licensed areas, and concession areas) the mining authority is the responsible entity. The mining authorities provide these areas to the local planning authorities, which have the responsibility to incorporate them into the land use maps.

- **Are stakeholders involved in defining safeguarding areas?**

Regarding stakeholder involvement, most of the countries answered that stakeholders are not involved. Only Italy, Slovenia, Portugal and Cyprus answered that stakeholders are involved in the definition of the safeguarding areas. Greece, Ireland and Netherlands did not answer.

- **Safeguarding of undiscovered resources (mineral potential areas)**

Besides the protection in land use planning of the mining permits and areas with well documented resources, three different questions were made in the survey regarding the protection of the access to not yet discovered resources. The respective answers are presented in the Table 3.

Table 3- Questions on safeguarding undiscovered resources.

COUNTRY	Has your country already defined areas for the protection of undiscovered resources?		Are mineral potential areas taken into account in LUP prior to the permitting for exploration and extraction?		Is sterilisation prevented in LUP?	
	YES	NO	YES	NO	YES	NO
Austria		X	X		X	
Croatia		X	X			X
Cyprus		X	X		X	
Czech Repub.		X	X		X	
Finland		X	X			X
France		X		X		X
Greece	X			X		X
Hungary		X		X	X	
Ireland		X		X		X
Italy		X		X	X	
Netherlands		X		X		X
Norway	X			X		X
Portugal	X		X			X
Poland		X		X		X

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Slovenia	X		X		X	
Spain		X		X		X
Sweden		X		X		X
Ukraine		X		X		X

With respect to the question "Is sterilisation prevented in Land Use Planning?", some countries specify that some sort of protection only applies to resources that are somehow classified as quite relevant (Austria, Czech Republic, Cyprus, Hungary, Italy and Norway). Therefore, sterilisation is not prevented for resources that, for some reason, are not currently of economic interest, and for undiscovered resources in mineral potential areas.

5.1.3. Spatial Data

Answers provided in questionnaire 1 concerning the availability of spatial data also show some inconsistencies, especially regarding the existence of data-sharing mechanisms for exchange of information between entities. However, for Finland, Hungary, Norway and Portugal there must be a data-sharing mechanism for exchange of information among different entities because the spatial data (or at least the respective metadata) can be obtained on a single web-portal. The repositories of the remaining countries are topic-specific and independent of each other.

Most of the countries in the MinLand project have INSPIRE compliant data on mineral resources, but not necessarily INSPIRE compliancy in land use planning data. Public availability of data on land use planning are also variable. As an example, Ukraine have non-INSPIRE compliant information on mineral resources in the minerals-ua.info portal, but data on land use planning is not available. Spain have publicly available data on mineral resources, but only publicly available land use data for some regions such as Andalusia.

Table 4 summarizes the main repositories and addressed topics. It shows that spatial data on minerals in most repositories respect to exploration and extraction permits.

Table 4- Existing repositories for Spatial Data.

COUNTRY	REPOSITORY	SPATIAL DATA COVERAGE
Austria	http://bergis.rmdatacloud.com/Start http://gis2.stmk.gv.at/atlas/(S(1wvylo5qo32jxypwor5okhxu))/init.aspx?ks=das&cms=da&karte=kat http://www.landesentwicklung.steiermark.at/cms/beitrag/12653734/143660187/ https://maps.tirol.gv.at/tirisMaps/synserver;jsessionid=B756E44A4F058A6DD7F866AD131F1DA6?synergis_session=242913dc-ba4d-4920-805e-eada68e64716&user=guest&project=tmap_master	Each Austrian province is running an online GIS platform, where information on land-use, zoning, etc. is available
Croatia		
Cyprus		
Czech Republic	http://mapy.geology.cz/GISViewer/?mapProjectId=13&cultureInfo=en	Geology and minerals
Finland	https://tiedostopalvelu.maanmittauslaitos.fi/tp/kartta?lang=en https://kartta.paikkatietoikkuna.fi/?lang=fi	Land use, environment, mineral easements and other topics

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COUNTRY	REPOSITORY	SPATIAL DATA COVERAGE
	http://en.gtk.fi/informationservices/map_services/ http://gtkdata.gtk.fi/kaivosrekisteri/	
Greece		
Hungary	https://www.teir.hu/	Land use (partial)
Ireland		
Italy	http://geoportale.regione.emilia-romagna.it/it/catalogo/dati-cartografici/cartografia-di-base/database-topografico-regionale/area-di-pertinenza/cave-discariche/area-estrattiva-o-discarica-dbtr-ssd_gpg	
Netherlands	www.delfstoffenonline.nl www.nlog.nl	
Norway	http://www.ngu.no/en/topic/datasets https://www.geonorge.no	Land use, environment, prospects, mineral easements and other topics are available through the Geonorge portal, while geological data also are available from NGU.
Poland	http://emgsp.pgi.gov.pl/emgsp/	Geology, mineral easements and well documented areas
Portugal	http://snig.dgterritorio.pt/geoportalMapViewer/index.html	Land use, environment, mineral easements and other topics
Slovenia	https://ms.geo-zs.si/en-GB http://www.geoprostor.net/PisoPortal/Default.aspx?	Mineral easements and land use
Spain		
Sweden	www.sgu.se www.naturvardsverket.se www.bergsstaten.se www.boverket.se	Geology, mineral easements and environment
Ukraine	www.geoinf.kiev.ua www.eng.minerals-ua.info	Geology, minerals

6. Results from Questionnaire 2

The purpose of questionnaire 2 was to resolve some of the inconsistencies discovered and to address, in a more objective way, the legislative practice on safeguarding minerals, taking into account the steps where the minerals value chain interacts with land use planning. Some inconsistencies have been interpreted as resulting from the existence of different legal systems between partner countries. For this reason and because this new questionnaire is focused in the safeguarding issue, the questions were addressed regardless of which legislation was considered.

Annex 4 presents the answers obtained through the Questionnaire 2, and the following topics summarise these results.

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6.1. Mineral potential areas

Mineral Potential Areas are here understood as those areas where mineral deposits with economic interest are not known, but geological knowledge shows a certain degree of probability for their occurrence. These areas are host to hypothetical resources known from regional exploration surveys, and include areas identified only by a high number of showings, or geophysical and geochemical anomalies.

The results presented in Annex 4, regarding how legislation addresses these areas, show that only in Slovenia and Ukraine they must be considered when designating land for uses other than mineral developments.

6.2. Areas with well-documented mineral resources.

This topic regards how legislation addresses areas where well-documented mineral resources occur. Well-documented mineral resources are here considered as equivalent to McKelvey's demonstrated mineral resources or to the G1 – G3 categories of the UNFC. Thus, these include all known mineral deposits, regardless of whether they are subject to some type of permitting. However, the way in which the legislation addresses mineral resources subject to prospecting and extraction permits will be discussed later, so that only those areas with demonstrated resources, but not subject to any kind of permitting, are considered here.

When asked about the existence of any legislation specifically mentioning the obligation to consider these areas in land use planning, 10 out of 17 respondents of the second questionnaire answered YES specifying that all non-energy mineral resources were considered when delimiting these areas, with the exception of the Czech Republic where only state-owned minerals are considered (Figure 7). Of these, seven have identified the corresponding legislation.

In Austria areas with well-documented mineral resources refer only to land use conflict-free areas, thus excluding known mineral deposits in conflicting areas.

6.3. Areas corresponding to exploration permits.

Some countries have legal distinctions for different exploratory activities: research, prospecting, exploration. However, exploration in the current context is encompassing all types of geological survey for the discovery of mineral deposits.

A question on the exploration of mineral resources sought to find out whether this activity is allowed throughout the territory of the countries represented in the project but taking into account the common sense in which important infrastructures are excluded (e.g. urban areas, roads, railways, heritage or religious structures, etc.). Most of the respondents (11 out of 17)

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answered No (Figure 8). Mostly, nature conservation areas (e.g. Natura2000, Natural Parks) are those that interdict exploration activities.

Concerning whether exploration activities require a permit, all the countries have replied "Yes." This requirement is necessary for all non-energy minerals in Croatia (MinLex information), Cyprus, Hungary, Netherlands, Poland, Slovenia, Spain, and Ukraine. For the remaining countries, permitting for exploration only applies to mineral resources considered to have some sort of relevance (e.g. state-owned minerals for Norway, Portugal, and Sweden; "free to mine minerals" for Austria, "reserved minerals" for Czech Republic, etc.).

Figure 7- Safeguarding of well-documented resources through legislation. In green: countries where legislation safeguards well-documented resources; in blue: no safeguarding; in grey: EU non-surveyed countries.

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Figure 8- Use of land for exploration activities. In green: exploration allowed in all territory; in orange: exploration not allowed in all territory; in grey: EU non-surveyed countries.

A question was asked to know if any legislation specifies the obligation to include exploration permits in land use planning, so that they become land use easements in which minerals are safeguarded, even if temporarily. This question was interpreted in very different ways. Therefore, the validation process was aimed at finding out if the granted mineral exploration rights somehow protect mineral resources from being sterilized.

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Figure 9- Countries where exploration permits protect mineral resources. In green: minerals are protected; in blue: minerals not protected; in grey: EU non-surveyed countries.

More than half of the respondents answered Yes (Figure 9), specifying that the exploration permit is not integrated in land use plans, but the exploration rights protect mineral deposits from being sterilized. Only in Portugal, the exploration permit becomes an administrative easement included in land use plans. Croatia did not answer this question and no information is available in Minlex regarding this issue.

For eight of the considered countries, the issue of an exploration permit is not dependent upon a prior approval by land use planning authorities (Figure 10). Concerning a prior Environmental Impact Assessment (EIA), it is mandatory for Cyprus, Greece, and Poland. For the remaining respondents, granting a permit is not dependent on EIA. However, a prior screening on the need of an EIA is mandatory for Austria, Finland, Hungary, Ireland, Italy (Emilia Romagna), Netherlands, and Slovenia.

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Figure 10- Dependence of exploration permits on planning authorities. In green: exploration permits need approval by LUP authorities; in blue: exploration permits issued without needing approval of LUP authorities; in grey: EU non-surveyed countries.

6.4. Areas corresponding to extraction permits.

Depending on the ownership of mineral resources, their extraction is administered by two main legal figures: a mining concession, in the case of state-owned minerals, and an extracting (quarrying) license, in the case where minerals are privately owned. Both are here considered under the generic name Extraction Permits.

A question regarding extraction permits was aimed to explore if extraction permits are mandatorily included in land use planning, in order to become land use restrictions where mineral deposits are safeguarded. With the exceptions of Ireland and Sweden, in all the remaining countries the extraction permits safeguard mineral deposits. For most of the countries this applies to all non-energy mineral resources, being the exceptions the Czech Republic and Italy (Emilia Romagna).

In six of the countries, the granting of an extraction permit is dependent upon a prior approval by land use authorities, as well as on a prior EIA, meaning a double-check of land use compatibility. For the remaining countries, there is no need of a prior approval by land use authorities for issuing an extraction permit (Figure 11), but there is a need of EIA.

In some countries (Czech Republic, Finland, and Portugal), small-scale extraction projects of private-owned minerals may be authorized without EIA. However, the extraction permit for

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these small-scale projects is necessarily dependent upon a prior approval by land use planning authorities.

Figure 11- Dependence of extraction permits on planning authorities. In green: extraction permits need approval by LUP authorities; in blue: extraction permits issued without needing approval of LUP authorities; in grey: EU non-surveyed countries.

7. Discussion on survey results

A detailed analysis of the answers provided in Questionnaire 1 concerning minerals policy and legislation (available at the MinLand repository) shows that some countries not having a national strategic policy for minerals but having a main regulatory document (Mining Act), have considered that the respective Mining Act also incorporates a strategic approach. For this reason, answers regarding the strategic policy and the normative/regulatory legislation on mineral resources should be taken together as the policy framework for minerals.

Specifically, regarding the regulatory legislation on minerals, data from Questionnaire 1 and other sources show that all countries have a national regulatory body for minerals, often topped by a higher-level document: The Mineral Act or Mining Law. Italy and Spain have regional laws for the management of the mineral resources that are topped by a national law that only provides major guidelines.

These Mining Acts (and/or subsidiary regulative documents) are mainly directed towards the establishment of criteria for licensing the exploitation (extraction plus mining facilities) of mineral resources (when minerals are privately owned) and award exploration and exploitation

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concessions (when minerals are state owned), i.e. the permits management. A Mining Authority usually makes this management. However, in some countries, this management may be shared with other authorities (e.g. environmental or land use planning authority), and is regulated by other legal documents, particularly with regard to privately owned mineral resources (i.e. mineral resources owned by the landowner).

For most of the countries, the approach to safeguarding in these laws is carried out indirectly, supported by the designation of areas for the exploration and extraction of mineral resources: the mining permits. However, it has not been clear whether these permits become formally designated as restrictions on land use (i.e. mineral easement).

In some countries the minerals legislation also rules the designation of areas with well-documented resources, i.e. areas where demonstrated or inferred resources are known (G1 to G3 categories of the UNFC). Typically, these areas are appointed by the mining authority or by the geological survey of each country to the planning authority. However, it was also unclear in the responses given in Questionnaire 1 whether these areas are necessarily integrated into land use plans to consider the safeguarding of minerals, or whether such integration is voluntary.

In terms of the questions concerning how mineral safeguarding is addressed in the legislative body, about half of the countries answered that minerals legislation does not address minerals safeguarding, even though their legislative practice is similar to the aforementioned, concerning mining permits and well-documented resources. Therefore, it seems that some sort of inconsistency exists, at least in part of the provided answers.

It is worth noting that some of the interviewees explicitly states that the granting of mining permits is subordinated to their location on conflict-free areas in land use plans. In these cases, it is clear that valuable mineral deposits found outside conflict-free areas are not safeguarded.

When determining whether safeguarding of resources is mandatory or voluntary, there is also an inconsistency in data collected from Questionnaire 1. This inconsistency seems to be directly linked to the way the legislation addresses safeguarding. The same applies for the question on which authorities are responsible for the definition or delimitation of safeguarding areas and for the stakeholder involvement.

Finally, for what concerns safeguarding, the access to undiscovered resources, Questionnaire 1 included three similar questions, each with a different approach. The provided answers still show some inconsistencies, but in general, it may be concluded that undiscovered/hypothetical resources (= mineral potential areas) are not considered in land use planning.

Questionnaire 1 focused on getting simple Yes or No answers. However, the provided answers were often accompanied by a great diversity of justificatory comments, many of them stressing the difficulty in giving a simple answer. This and the aforementioned doubts and inconsistencies seem, somehow, related to the differences in the legal systems adopted across the countries. Even if only Ireland and Cyprus have a legal system based on Common Law and the remaining countries have their legal systems based on Civil Law, each has its own particularities, especially

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the Scandinavian countries in which the legal systems are a hybrid resulting from a mix of civil law and customary law which is partially codified.

Thus, trying to overcome some of the mentioned uncertainties, especially those related to minerals safeguarding in the legislation framework of each country, Questionnaire 2 focused on the mineral resources value chain stages in which there is interaction with spatial planning, seeking answers to what type of legislation and authorities regulate these phases.

The results obtained by Questionnaire 2 are a summary of the detailed answers provided by each of the respondents, which are available in the MinLand SharePoint along with their validation documents. As will be presented below, they allowed solving doubts and inconsistencies resulting from questionnaire 1. However, these detailed answers still demonstrate some complexity in providing simple YES and NO answers. The conclusions obtained should not be considered definitive, but rather a broad approach as to how safeguarding is addressed in the legislation framework of the partner countries.

In Questionnaire 2, the safeguarding of mineral resources is addressed in the light of the inclusion of the areas where they occur in land use planning. This does not mean that these areas are exclusively for the protection of mineral resources; rather it means that these areas are necessarily considered during land use planning through a decision-making process in which some kind of assessment on an equal footing with other possible uses is applied.

For Mineral Potential Areas (i.e. Category G4 of the UNFC), the results provided by Questionnaire 2 are similar to the ones from Questionnaire 1: the legislation framework does not address the safeguarding of minerals in these areas, with the exception of Norway, Slovenia and Ukraine.

Regarding areas with well-documented resources (G1 to G3 categories of the UNFC) not subject to any kind of permit, their inclusion in land use planning is addressed by the legislation of 10 of the 17 interviewed countries. For the seven countries where the legislation does not oblige to consider these deposits in land use planning, Table 5 presents the respective responses to whether exploration and extraction permits protect minerals from being sterilised. For these we may conclude that well-documented mineral resources are only protected if subjected to a mining permitting, with the exceptions of Cyprus and Ireland, where exploration (Cyprus and Ireland) and extraction (Ireland) permits do not safeguard minerals.

Table 5- Protection of well-documented resources by mining permits

Well-documented resources not considered in LUP	Exploration permits protect minerals	Extraction permits protect minerals	Exploration permits require LUP approval
Cyprus	N	Y	N
Finland	Y	Y	Y
Greece	Y	Y	Y
Ireland	N	N	N
Netherlands	Y	Y	Y
Portugal	Y	Y	N
Spain	Y	Y	N

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In the Czech Republic, private owned well-documented mineral deposits are not considered by legislation for safeguarding, and in Austria these deposits only are safeguarded if located in conflict free-areas.

From the results provided by Questionnaire 2 it also deserves discussion the fact that granting an exploration permit is dependent upon a prior approval by land use planning authorities. This happens in nine of the 17 countries, meaning that valuable mineral deposits that exist or may exist in the required exploration areas only are safeguarded if located in conflict-free areas.

Moreover, well-document deposits located in countries whose legislation does not require them to be considered in land use planning (Finland, Greece, and Netherlands) and located in conflict areas (Austria, Finland, Greece, and Netherlands) tend to become sterilized (Table 5).

These findings should be further investigated, especially as to whether the land use planning authorities' assessment process results from an equal weight of the interests involved.

Regarding the spatial data coverage on minerals and land use planning, the obtained results show that, with a few exceptions, the available repositories in each country are independent of each other. As most repositories respect extraction permits, which are necessarily included in land use plans (as shown by Questionnaire 2 results), this independence may reflect a lack of integration of minerals and land use planning policies. Even when this kind of spatial data is available through a single web-portal, it is presented separately, i.e. by topics that are a mirror of independent repositories. This seems to reflect that these centralised repositories of spatial data only fulfil the centralization service without some kind of preliminary evaluation of possible land uses (as they also incorporate other kinds of competing land uses), even if in a very broad approach.

8. Conclusions

The objectives of this report are to present the major sources of information available for mineral resources safeguarding practices across Europe, as well as to report the main findings on the same subject provided by a survey among the MinLand partners and third parties on the minerals and land use planning policy frameworks.

Among the consulted sources of information, the ongoing MIN-GUIDE project is the best repository of mineral resources related legislation across the European countries. The MINLEX final report is uppermost for the understanding of the mining permitting process across Europe and provides detailed data on each country.

Through the available deliverables, the MINATURA project also provides data and information regarding the legislative framework. However, its relevance stems from the fact that it presents data on safeguard practices in Europe.

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Regarding the results of the MinLand survey, more precisely on the **legislative practices for minerals safeguarding** across their partners and third parties, they were obtained through two questionnaires. Some inconsistencies and unclear results were detected on the answers provided in the first questionnaire and that was the reason justifying the delivery of the second questionnaire. From the conjunction of both results, some major findings can be drawn:

- Usually, mineral potential areas (hosting the UNFC's G4 category of mineral resources) are not considered for safeguarding through the legislative framework.
- Well-documented resources (categories G1-G3) are not considered for safeguarding in land use planning in about half of the surveyed countries, unless they are framed by some type of mining permit. In addition, if, in those countries, they are located in land use conflicting areas, no exploration activities will be allowed on them, unless, after an equal footing assessment, the mining interests prevail over other competing land uses.
- For most of the countries, there are certain areas where exploration of minerals is not allowed (i.e. where minerals sterilisation occurs). These mostly correspond to nature conservation areas.
- For most of the countries, the exploration permits are a way to temporary safeguard minerals from sterilisation. However, typically, these permits depend upon a prior approval by the LUP authorities, meaning that exploration is allowed only in conflict-free areas, or when the mining interests prevail over other competing land uses, after an equal footing assessment.
- With the exceptions of Ireland, Sweden, and the Czech Republic (for non-reserved minerals), the extraction permit is a mining easement that definitively protects minerals in the remaining countries. However, in some of them, granting an extraction permit is also dependent on approval by LUP authorities. Therefore, the extraction is allowed only in conflict-free areas, or when the mining interests prevail over other competing land uses, after an equal footing assessment.

These findings show that the current practice of safeguarding access to mineral resources through **the existing legislative framework is effective, but not efficient.**

The legislative framework is effective because:

- With few exceptions, mining easements are successfully integrated in land use plans, thus protecting the mineral resources therein included.
- Areas with well-documented resources are considered in legislation for minerals safeguarding and, therefore, are successfully integrated in land use planning in about half of the surveyed countries.

The legislative framework is inefficient because:

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- Only a minor part of the known mineral resources may be safeguarded through the above procedures, namely,
    - The resources covered by mining easements located in conflict-free areas or in areas where the mining interests prevail over other land uses. This process does not safeguard valuable resources located in conflict areas or those that were not subjected to an equal footing assessment, regardless of the possible assessment result.
    - The well-documented resources not framed by mining permits only are considered by legislation for safeguarding in some of the countries. In addition, typically they are considered for safeguarding only if they are located in conflict-free areas.
- The safeguarding of hypothetical mineral resources is only addressed in few countries.

Most of the countries have spatial data repositories on land use planning, environmental protection areas and mineral resources, besides other land use planning topics. Only a few countries have spatial data repositories available through a single web-portal. However, even these centralised services seem to reflect a lack of integration between the minerals and land use planning policies.

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ANNEX 1

MinLand Survey – Questionnaire 1 template

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1. COMMON CONCEPTS

Some common (but not formal) concepts that shall be considered when answering the questionnaire:

CRM: List of critical raw materials for the EU, created by the European Commission, which is subject to a regular review and update. The list is found here: https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-490-F1-EN-MAIN-PART-1.PDF

EXPLOITATION: Integrated extraction, processing, and refining of mineral resources to produce mineral raw commodities.

GOVERNANCE: All formal and informal arrangements and institutions to establish, implement and monitor policies and legislation.

LAND USE PLANNING: The act or process of ordering and regulating the use of land.

LEGISLATION: The action or process of making governmental (national, federal, regional or local) laws, regulations, decrees, etc. aiming at the relationships within the administrative public institutions and between those institutions and the individuals by establishing rules, obligations, procedures, etc

MINERALS: The same as Mineral Resources when referred to in policy and economic contexts.

MINERAL RESOURCES: A concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. [17] It includes undiscovered and identified resources[18]. Their relative economic interest may be classified according specific schemes of common usage (UNFC, PERC, JORC, etc.).

MINERAL RESERVE: the economically mineable part of a Mineral Resource.

MINERALS SAFEGUARDING: The same as Mineral Resources Protection. The act, process or procedure of ensuring that areas containing, or potentially containing, mineral resources are not occupied by other uses that may prevent their future extraction, including the places for installing mining/quarrying infrastructures.

MINERAL STERILISATION: The loss of or disruption to access to mineral resources due to the use of land for the development of activities that prevent their exploration or extraction.

[17] http://www.crirsco.com/news_items/CRIRSCO_standard_definitions_oct2012.pdf
[18] https://www.nwrc.usgs.gov/techrpt/sta13.pdf

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MINERALS VALUE: The same as Mineral Reserves Value. It refers to the intrinsic value of the mineral resources, but taking into account the environmental, social, techno-economical, market and other components, which are the Modifying Factors in the Mineral Resources classification codes. It is not applicable to undiscovered mineral resources.

NEEI: Non-energy extractive industry.

ONE-STOP-SHOP: A public administration facilitating a full-service operation, allowing multiple authorisation and permitting requirements to be met in one place.

POLICY: Public documents presenting the principles and/or strategic governmental approaches (national, regional or local) for a specific topic. Policies show goals and planned activities, and eventually will need implementation of pieces of legislation to be effective It must be taken into account that some countries distinguish between Policy and Legislation (e.g. National Strategy for Sustainable Development is a policy document. Legislation related to environmental protection, land use planning, etc., must comply with that policy).

SPATIAL DATA: The data or information that identifies the geographic location of features on Earth. The same as geospatial data or geographic information.

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2. MINERAL RESOURCES POLICY & LEGISLATION

Table 1- Mineral resources policy

GOVERNANCE LEVEL	MINERAL RESOURCES POLICY			COMMENTS
NATIONAL	Does your country have a national policy for mineral resources? If yes, please comment or add URL to other national policies considering mineral resources and describe shortly the goals of the policy.	Y	N	
	If not, are there other national policies considering mineral resources? If yes, please comment or add URL to other national policies considering mineral resources and describe shortly the goals of the policy.	Y	N	
	Does the policy address all mineral resources? If not, please explain. If not, which mineral resources are addressed? i.e. metallic ores, non-metallic minerals, natural stone, aggregates and construction materials etc. Please add references as well.	Y	N	
	How is the mineral resource policy linked to other national policies? Please describe and add references to relevant documents.			
	Who is involved in the policy design (governmental bodies or other)? Please describe.			
	Is the implementation mandatory/voluntary? Who is in charge of the implementation of the policy (state, region/county/province, local) and how is the implementation of the policy (reaching the goals) monitored and audited? Please describe.			
	Does the national policy address safeguarding or protection of mineral deposits and prospective areas? If yes, how does it address safeguarding or protection? Please describe and add references to relevant documents.	Y	N	
	When you value the minerals in your country which of the following factors are being considered? Multiple choice: economic, social, environmental and geological. If other, please specify.			
	Is the mineral resources policy translated into English?	Y	N	
	Is the mineral resources policy available at MIN-GUIDE (https://www.min-guide.eu)?	Y	N	
REGIONAL/LOCAL	Do regions/provinces or municipalities in your country have separate policies for mineral resources? If not, are there other regional/local policies considering mineral resources? Please describe and add references to relevant documents and describe shortly the goal of the policy.	Y	N	
	Does your regional/local policy address all mineral resources? If not, explain. Which mineral resources are addressed?	Y	N	
	Who is in charge of the implementation of the policy (region, county, province, municipality…) and how is the implementation of the policy (reaching the goals) monitored and audited? Please describe.			
	Does the policy address safeguarding or protection of mineral deposits and prospective areas? If yes, what are the criteria for the safeguarding or protection of mineral deposits and prospective areas? Please describe and add references to relevant documents.	Y	N	
	Are the regional/local policies translated into English?	Y	N	

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	Are the regional/local policies available at MIN-GUIDE (https://www.min-guide.eu)?	Y	N	
HIERARCHY	When national and/or regional and/or local policies exist, which have priority? Please describe.			
	Are the EU policies, such the Raw Materials Initiative, reflected in national frameworks?			

Table 2- Mineral resources legislation

GOVERNANCE LEVEL	MINERAL RESOURCES LEGISLATION			COMMENTS
NATIONAL	Does your country have a specific legislation for mineral resources? If not, are there other national legislative instruments considering mineral resources? Please describe and add references to relevant documents.	Y	N	
	Does the legislation address all mineral resources? If not, which mineral resources are addressed? Metallic ores, non-metallic minerals, natural stone, aggregates and construction materials, etc	Y	N	
	Does the national legislation address safeguarding or protection of mineral deposits and prospective areas? If yes, how does the regional/local legislation address safeguarding or protection of mineral deposits and prospective areas? Please describe and add references to relevant documents.	Y	N	
	How is mineral resource legislation linked to other legal frameworks? Please describe.			
	Who is in charge of the implementation of the mineral resource legislation? Are there any interdepartmental working groups (formal or informal) where different work together? Please describe.			
	Is the national legislation translated into English and available at MIN-GUIDE?	Y	N	
REGIONAL/LOCAL	Are there regional or local specific legislations for mineral resources? If not, are there other regional legislations considering mineral resources?	Y	N	
	Does the regional/local legislation address all mineral resources? If not, which mineral resources are addressed? Metallic ores, non-metallic minerals, natural stone, aggregates and construction materials etc	Y	N	
	Who is in charge of the implementation of the regional/local mineral resources legislation? Please describe			
	Does the legislation address safeguarding or protection of mineral deposits and prospective areas? If yes, how does the legislation address safeguarding or protection of mineral deposits and prospective areas? If yes, what are the criteria for safeguarding or protection of mineral deposits and prospective areas? Please describe and add references to relevant documents.	Y	N	
	Are the regional/local legislations translated into English?	Y	N	
	Are the regional/local legislations available at MIN-GUIDE (https://www.min-guide.eu)?	Y	N	
HIERARCHY	When national and regional or local legislations exist, which have priority?			

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Table 3- Mineral resources permitting

MINERAL RESOURCES PERMITTING			COMMENTS
Are the exploration/exploitation permitting procedures similar for all kind of mineral resources (e.g. private *versus* state owned minerals)? If not, please explain the main differences.	Y	N	
Are the permitting procedures in your country/region a "one-stop-shop"? Please describe shortly who is involved and how they are selected, possible conflict management and resolution mechanisms and if the processes are formalized or informal and who manage/facilitate the processes.	Y	N	
Are applications to explore, mine or quarry processed by the government (Mining Authority) or regional/local authorities? Please specify which, and state if the permitting process is performed in sequence involving multiple authorities/departments.	Y	N	
Are stakeholders involved in the authorization processes?	Y	N	
How long are exploration permits/licenses valid?			
How long are mining permits/licenses valid in average?			
Are exploitation activities subject to an assessment procedure of environmental impact?	Y	N	
In which stage of the legal process are licenses obtained?			
Is your country's permitting procedure for –mineral resources available at MINLEX?	Y	N	
If YES, does it require updating?	Y	N	
If your country answered the questionnaire from the MINATURA deliverable D3.1 (PERMITTING procedures related to mineral protection and supply), does it require updating?	Y	N	

3. LAND USE PLANNING POLICY & LEGISLATION

Table 4- Land use policy

GOVERNANCE LEVEL	LAND USE POLICY			COMMENTS
NATIONAL	Does your country have a national land use policy? If yes, please describe the legal status of the national land use policy. Please describe the legal status of the national land use policy, describe shortly the goals of the policy, if and how the policy addresses mineral resources and add references to relevant documents.	Y	N	
	Who is in charge of the implementation and monitoring of the land use policy (state, region/county/province, local) and what happens if goals are not reached. Please describe.			
	How are mineral resources addressed (such as being classified and valorised or legal goals) in land use planning and reflected in the land use planning process? Please describe.			
	How does the national land use policy address safeguarding or protection of mineral resources?			
	Is the land use policy translated into English and available at MIN-GUIDE?	Y	N	
	If your country answered the questionnaire from the MINATURA deliverable D2.3 (Land use planning and mineral deposits) and D3.1 (Land Use Planning), does it require updating?	Y	N	
REGIONAL / LOCAL	Do your regions/provinces or municipalities have separate regional-specific policies for land use planning?	Y	N	

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	Does the regional land use policy address the safeguarding or protection of mineral resources?	Y	N	
	Are the regional/local land use policies translated into English?	Y	N	
	Are the regional/local land use policies available at MIN-GUIDE (https://www.min-guide.eu)?	Y	N	
HIERARCHY	When national and regional/local land use policies exist, which have priority? Please describe.			
	What are the issues of higher-level land use policies which must be taken into account at project level? Please describe.			
	How are higher level land use policies reflected in the regional and local land use plans? Please describe.			
	At what level are decisions made or permits issued for specific land use? Please describe			
	Are mineral life cycle stages reflected in land use planning frameworks (i.e. exploration, exploitation, restoration)? If yes, how.	Y	N	

Table 5- Land use legislation

GOVERNANCE LEVEL	LAND USE LEGISLATION			COMMENTS
NATIONAL	Does your country have specific legislation for land use planning?	Y	N	
	Does the land use legislation address the safeguarding or protection of mineral resources?	Y	N	
	If no: Are there possibilities to include safeguarding or protection of mineral resources in land use policies?	Y	N	
	Which authority or governmental body/bodies is/are responsible for the implementation and monitoring of land use legislation on what level (national, regional, local)?			
	Which legislations govern land use/ zoning? Please add references and if legislations are available in English or not.			
	Does land use legislation regulate ownership and property rights on the surface and in the sub-surface for exploration and exploitation activities?	Y	N	
	Are mineral life cycle stages reflected in land use planning frameworks (i.e. exploration, exploitation, restoration)? If yes, please describe	Y	N	
	How and at what stage(s) are stakeholders involved in the legal/planning systems? Please describe. Who can attend the participation process and how are participants selected? Are the processes institutionalized (described in legal systems) or voluntarily facilitated? What happens with the outcome of the process (is there mandatory consideration, changing of plans and how is reporting back to the citizens)?			
	Which conflict resolution mechanisms are in place in land use legislation, how are these organised and working and who is involved? Please describe.			
	How does the legislation address safeguarding or protection of mineral deposits and prospective areas? Please describe and add references to relevant documents.			
	Are there compensatory measures or community gain programmes for the local communities or parties affected by extraction? If yes, please describe.	Y	N	
	Is the land use planning legislation translated into English?	Y	N	

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	Is the land use planning legislation available in MIN-GUIDE (https://www.min-guide.eu)?	Y	N	
REGIONAL / LOCAL	Does your country have regional- or local-specific legislation for land use planning? If yes, who are in charge of the implementation and monitoring of the regional/local land use legislation? Please describe.	Y	N	
	Does the regional or local land use legislation address the safeguarding or protection of mineral resources?	Y	N	
	Does it address all mineral resources?	Y	N	
	How does the regional/local legislation address safeguarding or protection of mineral deposits and prospective areas? Please describe and add references to relevant documents	Y	N	
	Is the regional land use legislation translated into English?	Y		N
	Is the regional land use legislation available at MIN-GUIDE (https://www.min-guide.eu)?	Y		N
	Are rights of indigenous peoples protected in regional or local legal frameworks?	Y		N
HIERARCHY	When national and regional land use legislations exist, is there interdependency between them? Please describe.	Y		N

4. MINERAL RESOURCES SAFEGUARDING AND PROTECTION: POLICY & LEGISLATION

Table 6- Mineral resources safeguarding

GOVERNANCE LEVEL	MINERAL RESOURCES SAFEGUARDING			COMMENTS
NATIONAL/REGIONAL	Does your country have a specific policy for safeguarding or protection of mineral resources at national level?	Y	N	
	Is there a legislation/procedure to prevent sterilisation of areas containing known or potential mineral resources?	Y	N	
	Are the areas for safeguarding mineral resources defined by national, regional or local authorities (e.g. Mining Authority, geological surveys, other)? Please specify.			
	Has your country implemented the UNFC classification standard?	Y	N	
	Are local stakeholders involved in defining safeguarding areas of mineral resources? If yes, who is involved and how are they involved? Please specify.	Y	N	
	Does your country have defined areas for safeguarding undiscovered mineral resources (ASUM) in regions where there are adequate information indicating the likelihood of their presence (mineral potential areas)?	Y	N	
	If yes, is there a procedure defined by legislation to define areas for safeguarding of undiscovered mineral resources (ASUM)?	Y	N	
	If yes, Are the ASUM supported by an effective geological assessment?	Y	N	
	In the process of defining a mineral safeguarding area, which weighs more: the geological assessment, alternative local / regional / state land use priorities or other? How is the valuation and are there national standards? Please describe and link to relevant documents.			
	If you participated in the MINATURA2020 (http://minatura2020.eu/), are your answers still valid regarding NEEI in land use plans and key LUP concepts for the safeguarding	Y	N	

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	of the area hosting the mineral deposit (MINATURA2020/D2.1), or should it be updated? If no, please comment.			
	If you participated in the MINATURA2020, are your answers still valid regarding the implementation of a common harmonised mapping framework (HMF) allowing effective safeguarding of MDoPI (MINATURA2020/D2.1), or should it be updated? If yes, please comment.	Y	N	
	Did your country answer the questionnaire from MINATURA deliverable D2.3 (Land use planning and mineral deposits)? If YES does it require updating?	Y	N	

5. MINERAL RESOURCES AND LAND USE PLAN INTEGRATION / Relations

Table 7- Policy integration, mineral resources and land use planning

POLICY INTEGRATION			COMMENTS
Are mineral potential areas (prospects) defined and taken into account in land use planning prior to exploration and extraction permitting and zoning?	Y	N	
Are there separate mineral and land use plans? If yes, how are the separate plans integrated in land-use or zoning systems? Please describe.	Y	N	
Under which authority are mineral plans designed and monitored (specify if national/ regional/ local)? And who is involved in the design (inter-departmental, experts, local authorities etc)? Please describe.			
Are there national data repositories integrating both mineral deposits and land uses?	Y	N	
Are mineral resources classified in land use plans? Please explain which kind of resources are classified and at which development stage.	Y	N	
Are mineral resources *protected* from land uses which cause their sterilization in land use planning? Explain which kind of resource are *protected* and at which development stage.	Y	N	
Are there any quantitative evaluation criteria/processes attached to different land uses? If yes, please describe.	Y	N	
Which authorities are involved in the land use planning decision process and who makes the final decision and how is transparency ensured? Please describe and add references to relevant documents.			
Are strategic transport and energy infrastructure required for mineral resources exploitation integrated into land use plans? (e.g. rail, road, ports)	Y	N	
How are the societal benefits and costs of mineral extraction valorised and conveyed to the stakeholders? Please describe and add references to relevant documents			

6. SPATIAL DATA, DATA REPOSITORIES AND KNOWLEDGE

Table 8- Spatial data, data repositories and knowledge

Data sharing and knowledge	Are there specific data-sharing mechanisms for exchange of information between geological surveys, mining authorities, other land use planners and authorities responsible for the zoning plans? Please describe.			
	Are there national/regional/local data repositories integrating both mineral deposits and land uses?	Y	N	
	Is information publicly available (industry included)?	Y	N	
Spatial data	Are national/regional/local policy/legislations INSPIRE compliant?	Y	N	
	Are spatial mineral resource data available as polygons for deposits, prospects, provinces or other levels?	Y	N	

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	If spatial data in 3D exists for mineral resources, are they publicly available?	Y	N	
	Is land use planning and mineral planning information publicly available?	Y	N	

7. REFERENCES

Data are based on the following sources/interviews etc. Please list:

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ANNEX 2

Questionnaire 1 flow chart showing dependencies of questions programmed into the online survey

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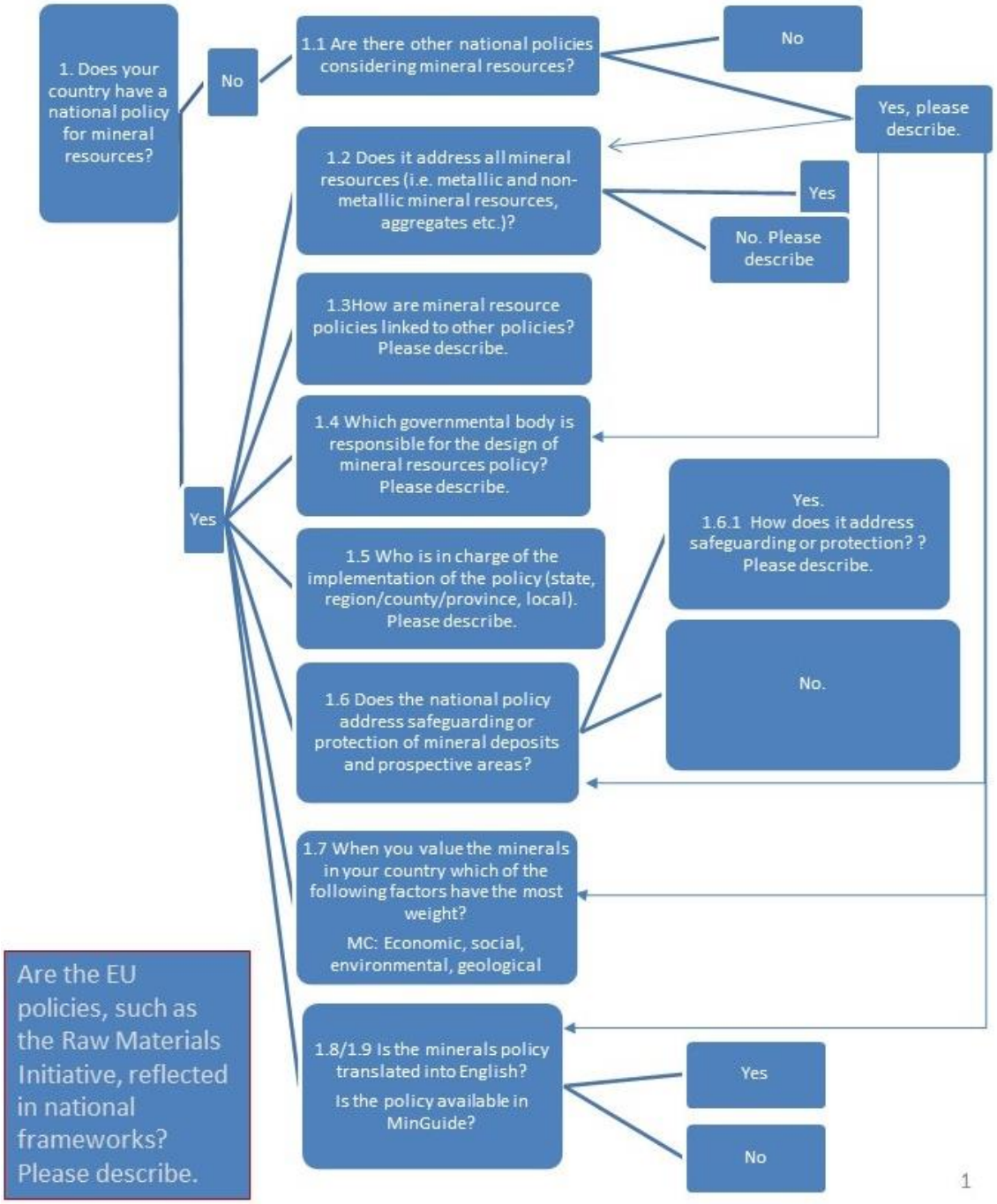
Mineral resources policy – national level



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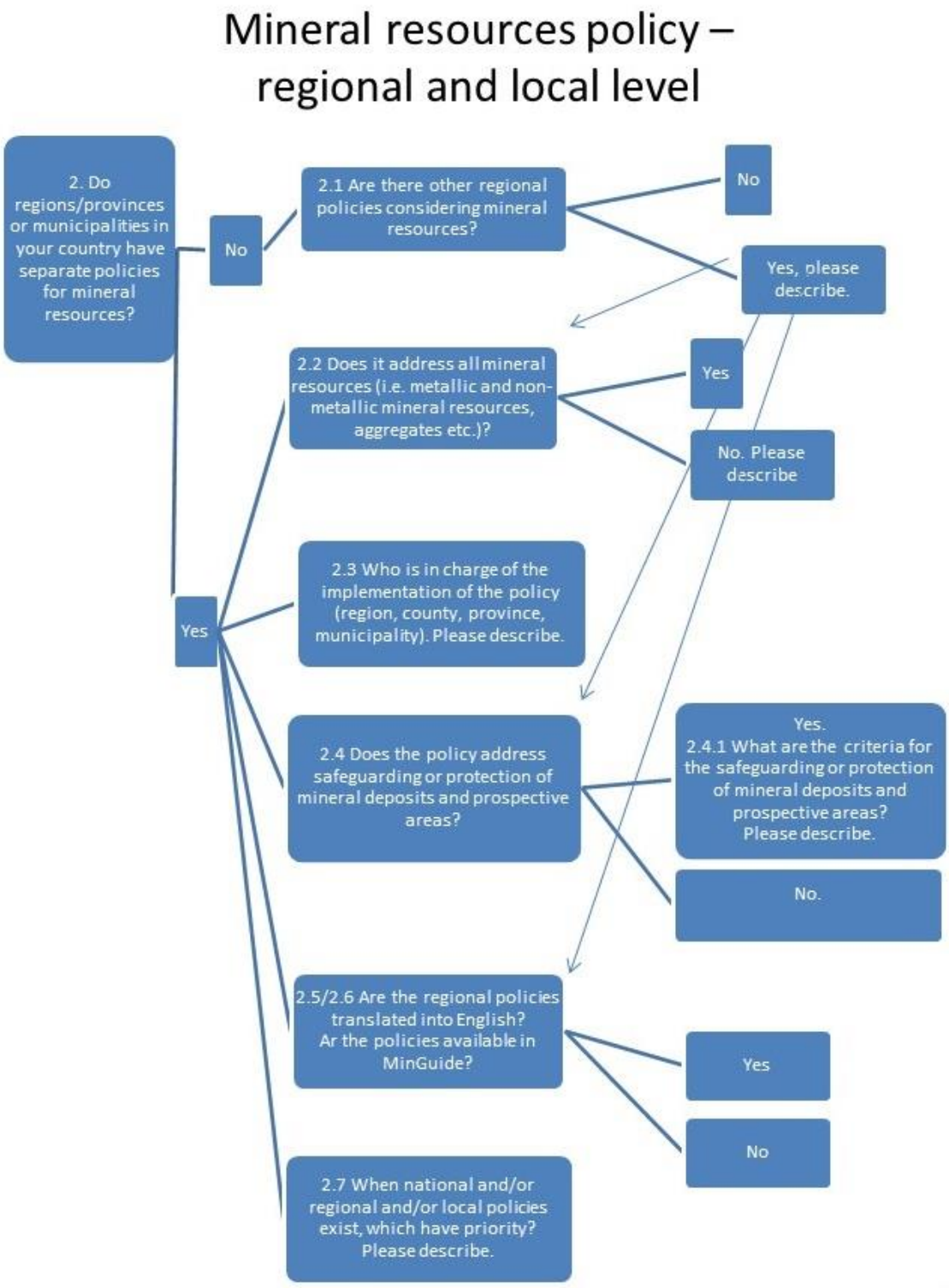

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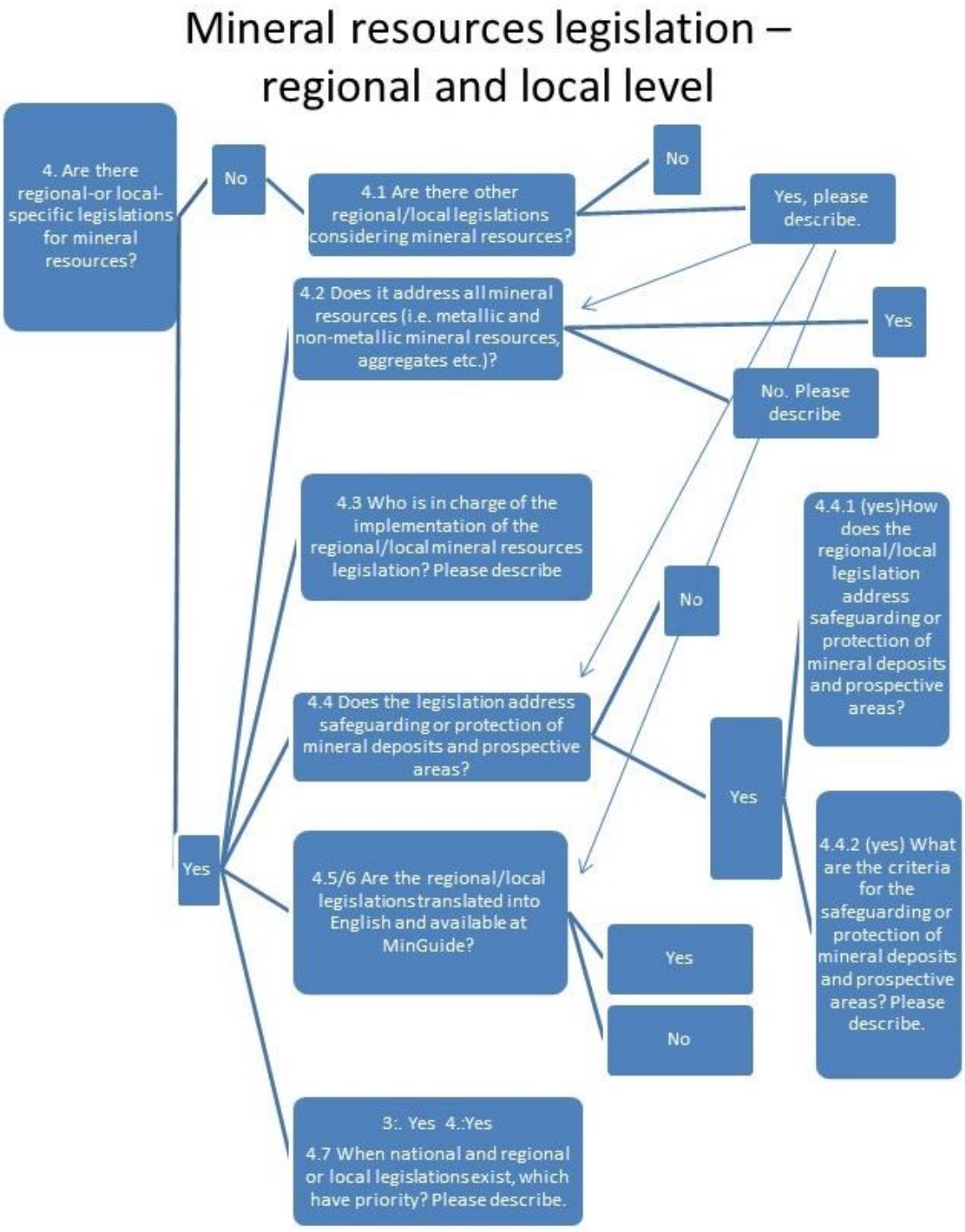

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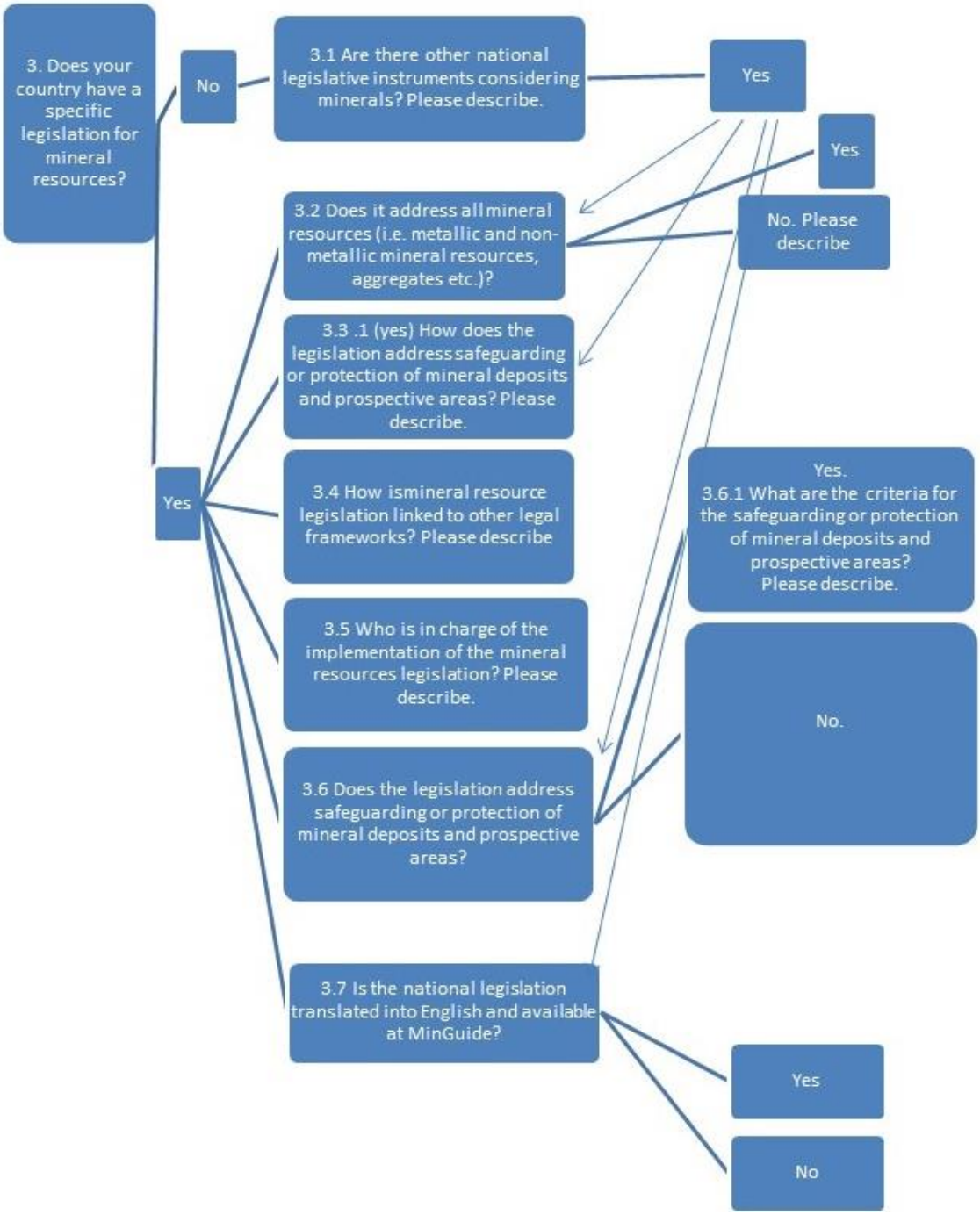
Mineral resources legislation – national level



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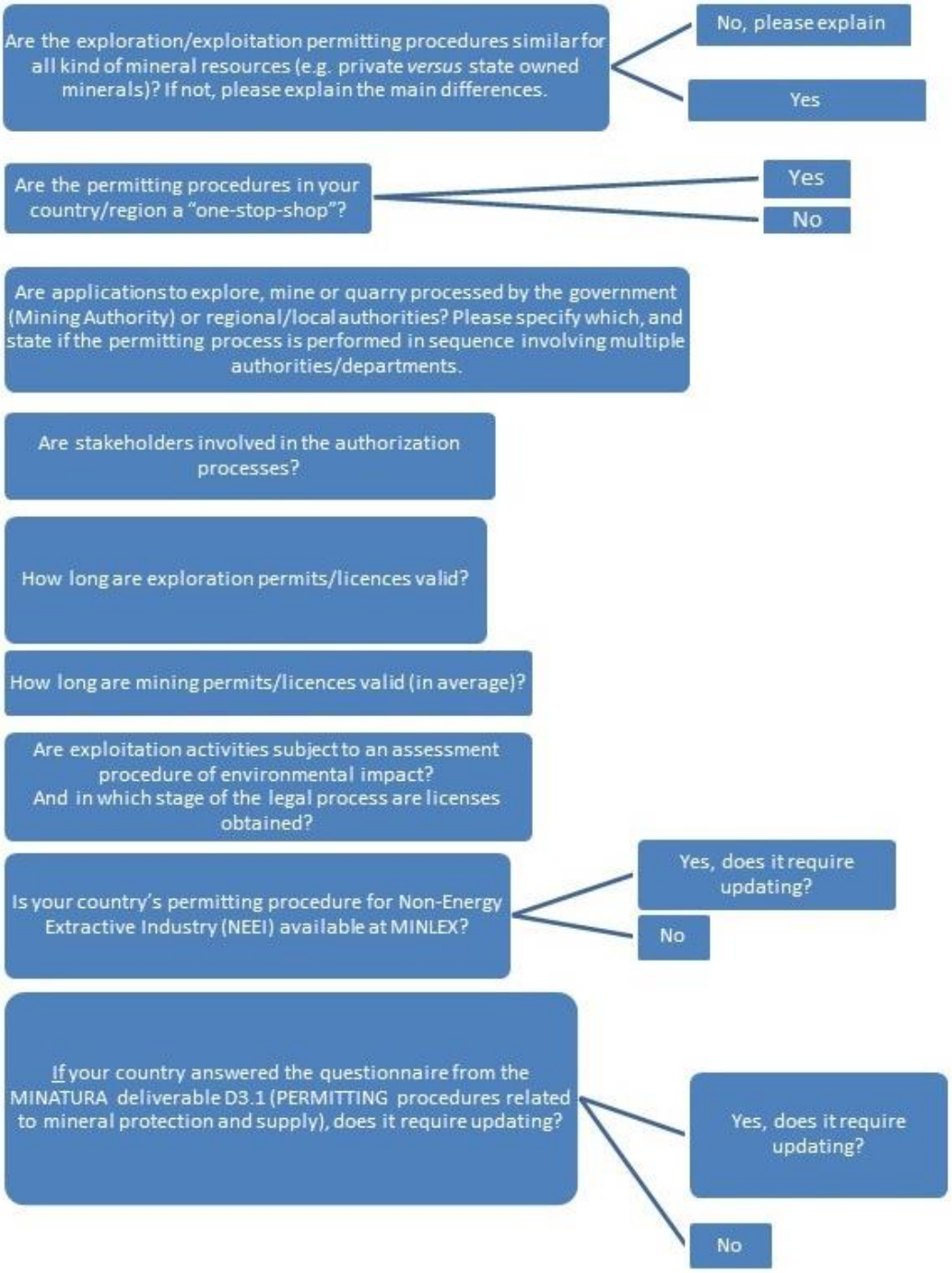
Mineral resources permitting



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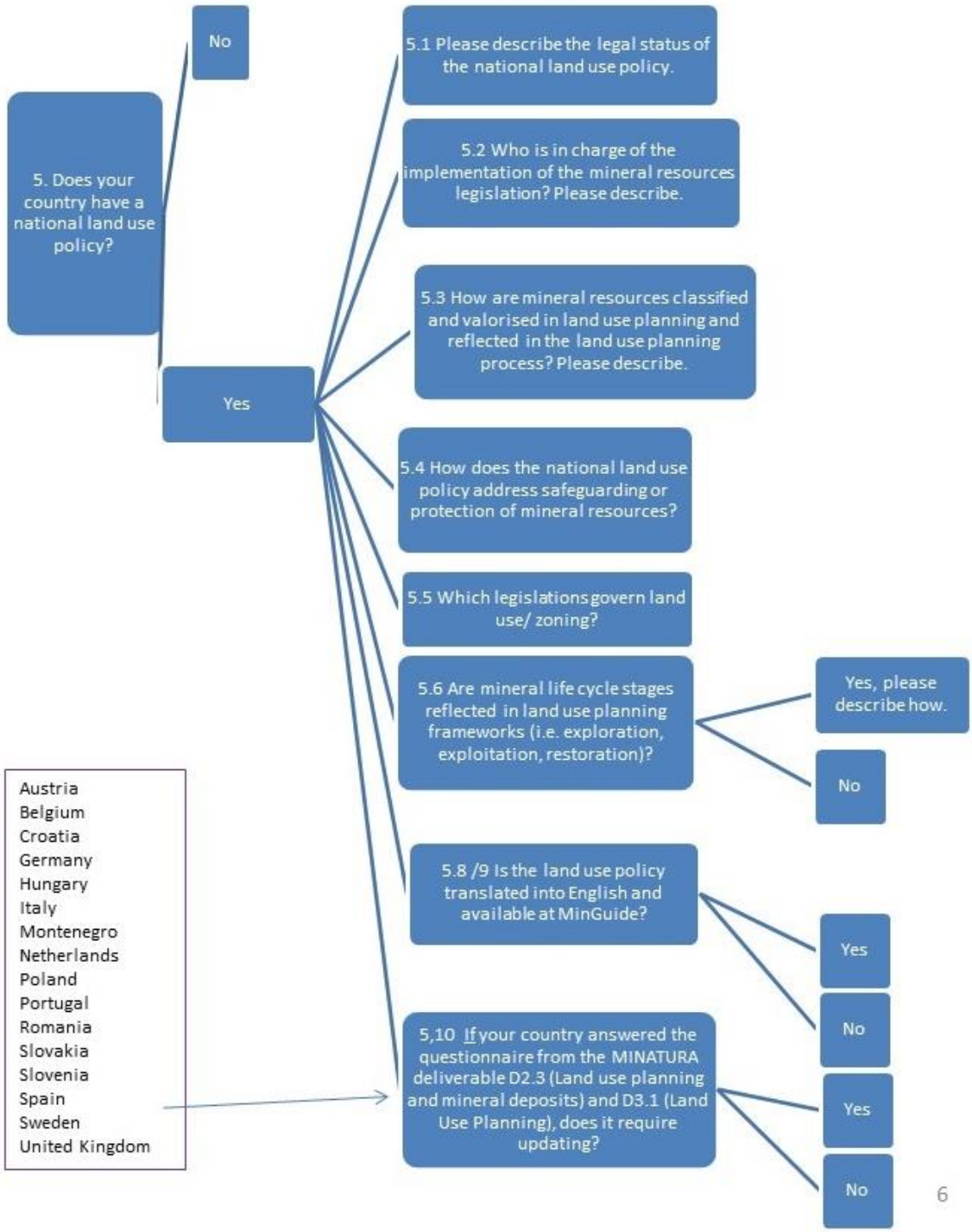
Land use policy – national level



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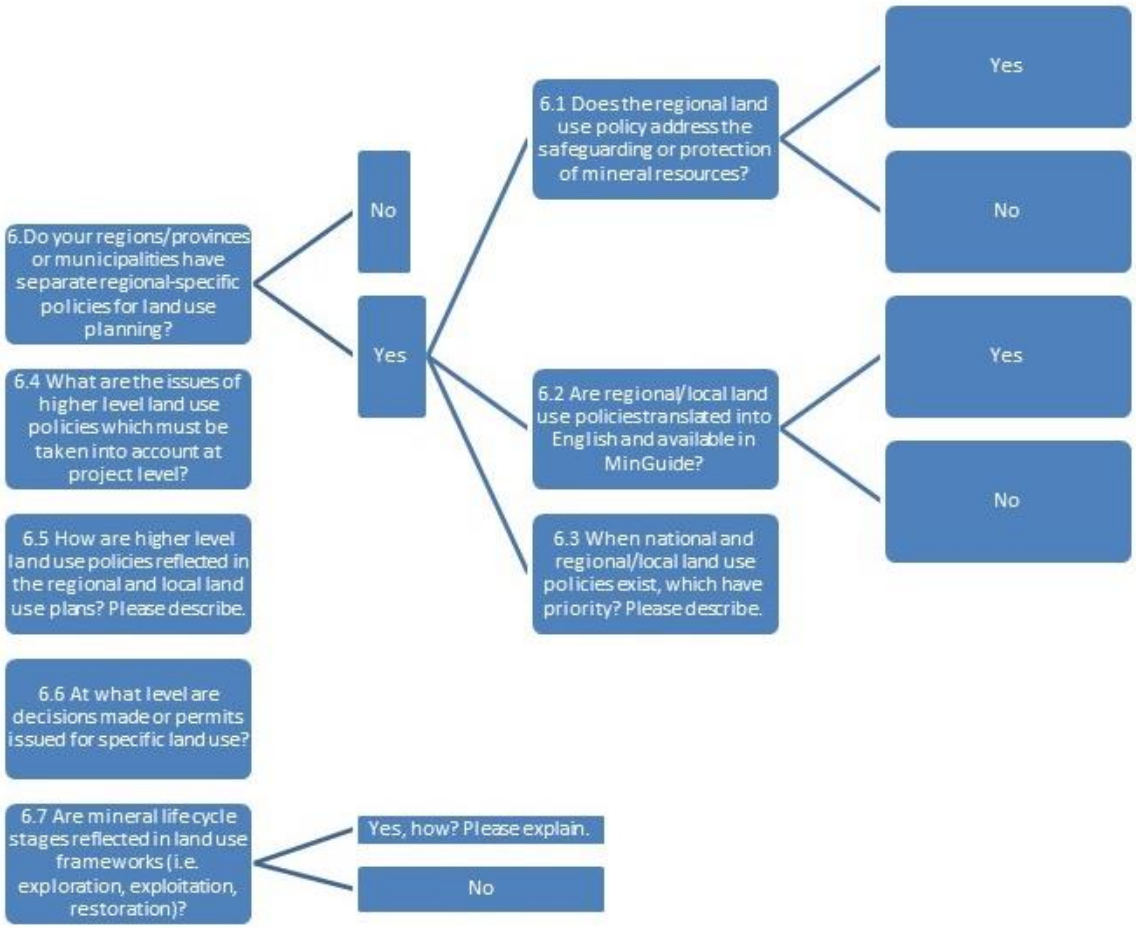
Land use policy – regional and local level



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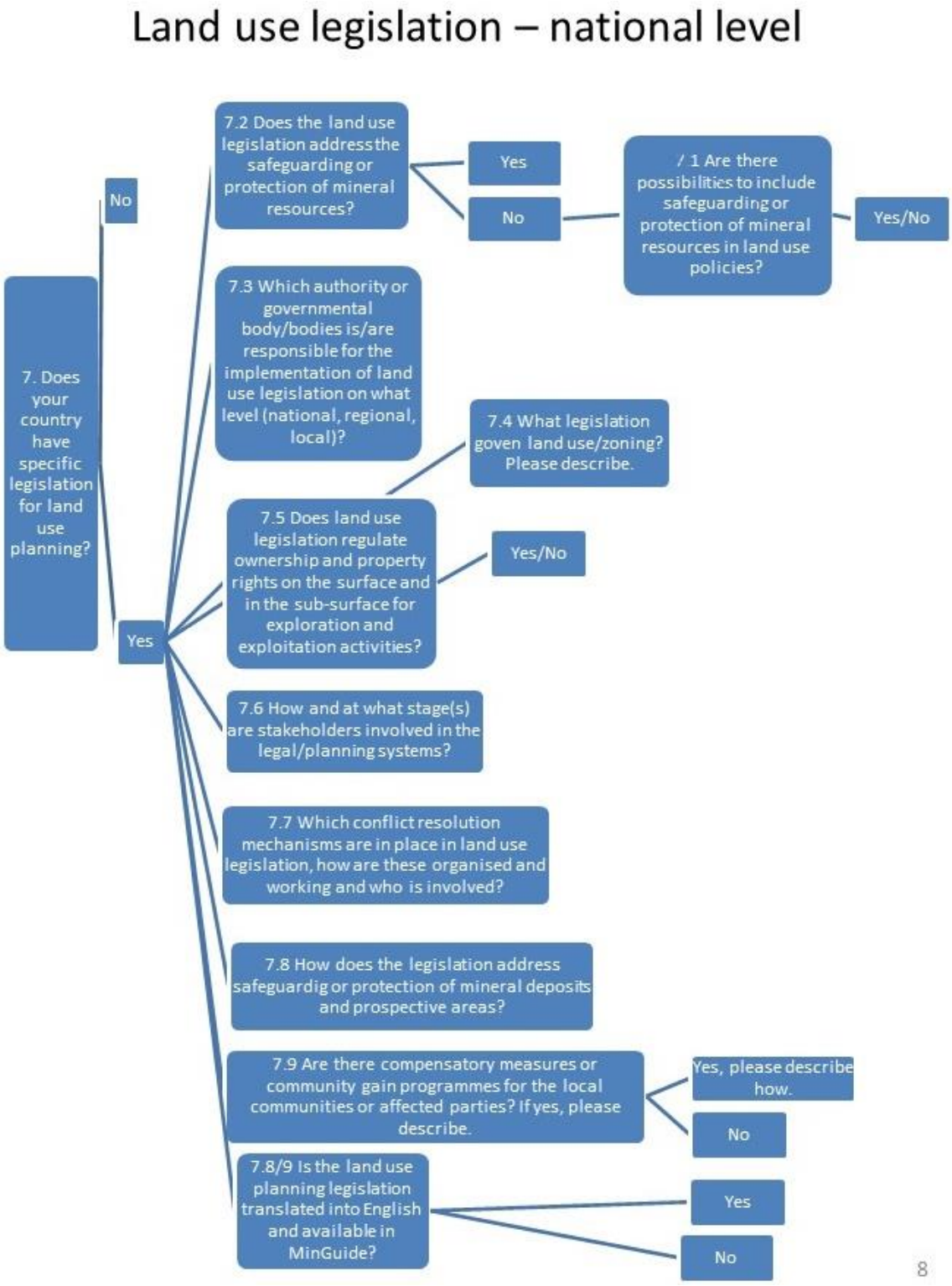

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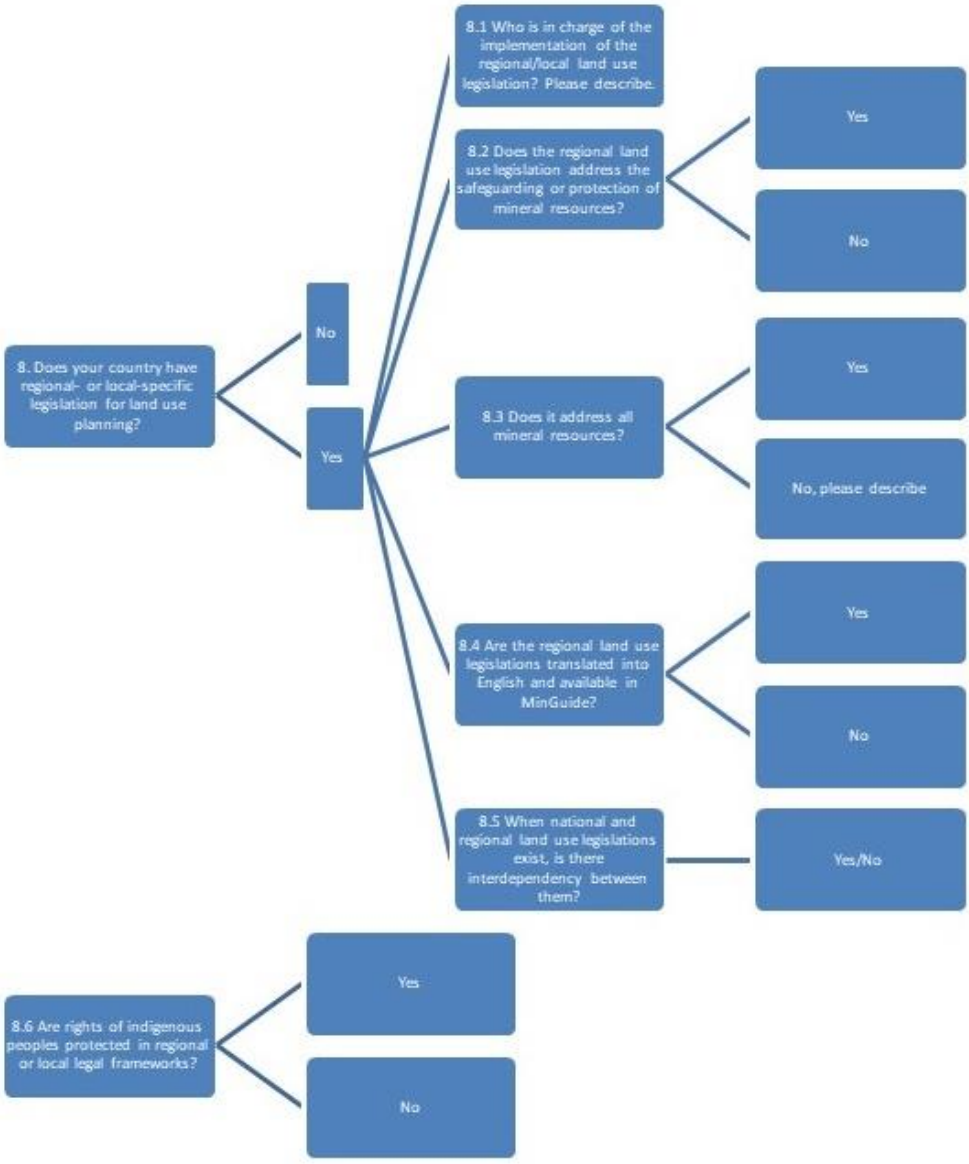
Land use legislation – regional and local level



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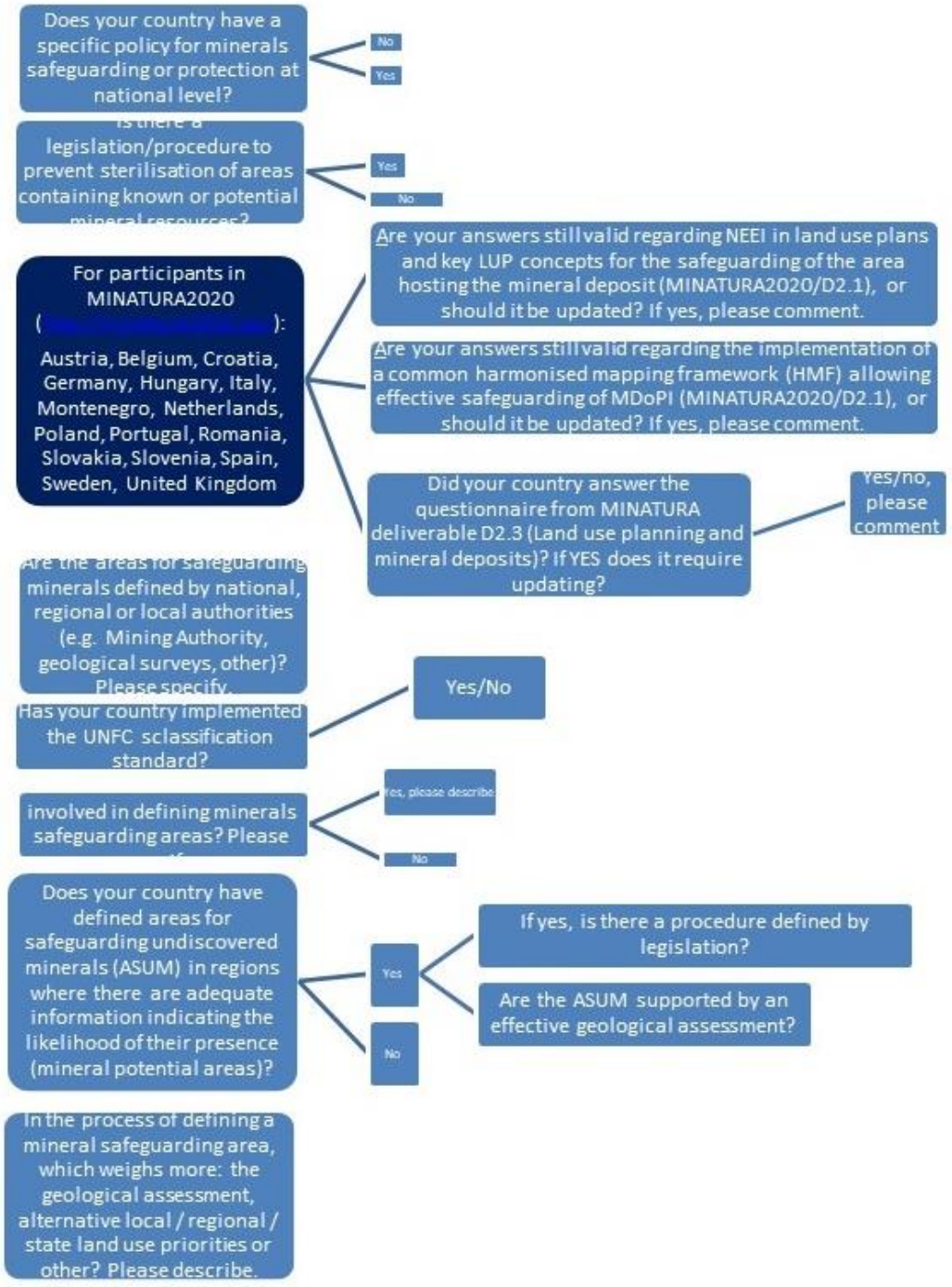
Minerals safeguarding and protection – policy and legislation



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ANNEX 3

MinLand Survey – Questionnaire 2 template

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MINLAND WP2 SURVEY

- QUESTIONNAIRE 2 -

IMPORTANT DEFINITIONS:

MINERALS SAFEGUARDING = Minerals protection from sterilization

MINERALS STERILISATION: The loss of the option to extract mineral resources due to incompatible uses of land. It occurs when mineral extraction is precluded by another existing land use without a prior equal footing assessment.

QUESTIONS

MINERAL POTENTIAL AREAS (the same as areas without well-documented resources; the same as areas with only hypothetical resources; usually provided by geological surveys)		
	YES	**NO**
Is there in your country/region any **legislation** specifically mentioning the **obligation** to include these areas in LUP zoning (or to consider them in LUP even if there is no zoning) for the safeguarding of the possibly existing mineral resources (i.e. to avoid mineral sterilisation)?		
If YES, please identify it (name/document number).		
If YES, does it apply to all non-energy minerals?		
If it does not apply to all non-energy minerals, to which groups of minerals does it apply?		
If there is no mandatory legislation, is there any **legislation** mentioning the **voluntary** inclusion?		
IF YES, please identify it.		
Do you have comments? (e.g. if you only represent a region, not a country; which ministry is responsible for legislation, more than one legislation specifying the same, etc.)		
AREAS WITH WELL-DOCUMENTED RESOURCES (the same as areas with demonstrated resources (inferred, measured, etc.) that are usually provided by geological surveys).		
Is there in your country/region any **legislation** specifically mentioning the **obligation** to include these areas in LUP zoning (or to consider them in LUP even if there is no zoning) for the safeguarding of the known mineral resources (i.e. to avoid mineral sterilisation)?		
If YES, please identify it.		
If YES, does it apply to all non-energy minerals?		
If it does not apply to all non-energy minerals, to which groups of minerals does it apply?		
If there is no mandatory legislation, is there any **legislation** mentioning the **voluntary** inclusion?		
If YES, please identify it.		
Do you have comments?		

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PERMITTING FOR EXPLORATION (the same as permitting for prospecting)		
Is minerals exploration in your country/region allowed in all territory outside urban areas (and outside of existing infrastructures like roads, etc., **but inside nature conservation areas, indigenous people areas, and other similar areas)?**		
Do exploration activities require a permit in your country (no matter from which authority)?		
If YES, does it apply to all <u>non-energy</u> minerals?		
If it does not apply to all non-energy minerals, to which groups of minerals does it apply?		
If the exploration activities require a permit, is there any **legislation** that mentions the **obligation** to include exploration areas in the LUP (so that they become land use easements (even temporary) in which minerals are safeguarded)?		
If YES, please identify it.		
And mentioning the **voluntary** inclusion?		
If YES, please identify it.		
If exploration activities require a permit, does the **<u>legislation</u>** make it dependent upon a prior approval by LUP authorities?		
If exploration activities require a permit, does the **<u>legislation</u>** make it dependent upon a prior EIA?		
If yes, does the EIA address the existing land use plans?		
Comments?		
PERMITTING FOR EXTRACTION		
Is there in your country/region any **<u>legislation</u>** specifically mentioning the **obligation** to include extraction permits in LUP (so that they become land use easements where minerals are safeguarded)?		
If YES, please identify it.		
If YES, does it apply to all <u>non-energy</u> minerals?		
If it does not apply to all non-energy minerals, to which groups of minerals does it apply?		
And mentioning the **voluntary** inclusion?		
If YES, please identify it.		
Does the legislation make the extraction permit dependent on a prior approval by LUP authorities?		
Does the legislation make the extraction permit dependent on a prior approval of EIA (i.e. an extraction project only can be located in places for which there is LUP compatibility)?		
Comments?		

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Annex 4

Results from Questionnaire 2

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COUNTRY	MINERAL POTENTIAL AREAS						
	Is there any legislation mentioning the obligation to include these areas in LUP?	If YES, please identify it	If YES, does it apply to all non-energy minerals?	If it does not apply, to which minerals does it apply?	Legislation mentioning the voluntary inclusion?	IF YES, please identify it.	Comments
Austria	NO				NO		
Croatia	NO				NO		Did not respond: Answers taken form MINLEX
Cyprus	NO				NO		
Czech Republic	NO				NO		
Finland	NO				NO		There are good governance practices between authorities to include these areas in LUP to avoid minerals sterilisation but are not translated to legislation.
Greece	NO				NO		
Hungary	NO				NO		
Ireland	NO				NO		
Italy (EmRo)	NO				NO		
Netherlands	NO				NO		
Norway	NO				NO		
Poland	NO				NO		
Portugal	NO				NO		
Slovenia	YES	Spatial Management Act	YES		NO		
Spain	NO				NO		
Sweden	NO				NO		
Ukraine	YES	Code of Ukraine on Subsurface, Article 58 (a)	YES		NO		(a) states: It is prohibited projecting and building up the settlements without preceded geological study of the areas to be involved

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COUNTRY	AREAS WITH WELL-DOCUMENTED RESOURCES						
	Is there any legislation mentioning the obligation to include these areas in LUP?	If YES, please identify it.	If YES, does it apply to all non-energy minerals?	If it does not apply, to which minerals does it apply?	Legislation mentioning the voluntary inclusion?	IF YES, please identify it.	Comments
Austria	YES		YES		NO		(a) MINLEX: AUTMINPLAN is not legally binding, but "according to the land use planning laws of individual countries ("provinces") raw material priority zones have to be included in the land use plans based on results from AUTMINPLAN. AUTMINPLAN only addresses conflict-free areas.
Croatia	YES		YES				Answers taken form MINLEX
Cyprus	NO				NO		Town planning and housing law is implemented by the Town Planning and Housing Department – Ministry of Interior which are responsible for LUP. Even though the legislation does not mention any obligation to include areas with mineral resources, it is considered good practice to request information on mineral resources from the Geological Survey
Czech Republic	YES	Act No. 62/1988 (Geological Act), Act No. 44/1988 (Mining Act), Act No. 183/2006 (Building Act)	NO	Reserved Minerals (excludes building materials, which are land owned)	NO		Comprehensive assessment of land development and land-use plans with respect to areas with specific geological structures is provided by virtue of Act No. **62/1988**, on geological work (Geological Act), and Act No. **44/1988**, on the protection and use mineral resources (Mining Act), in cases affecting reserved deposits (including relevant protected deposit areas).
Finland	NO				NO		
Greece	NO				NO		
Hungary	YES	(a) Mining Act (Bt), 39. § (3) and National Spatial Planning Plan (OTRT) 2. § 1., 12. § (2) e), 12/A. § (2), 19/B. §, 1/12.	YES		NO		(a) States that it is obligatory to take into consideration mineral resources in the land use planning. However, other land use planning issues may have higher priority.
Ireland	NO				NO		
Italy (EmRo)	YES	Provincial Mining Plan	YES		NO		
Netherlands	NO				NO		
Norway	YES				NO		
Poland	YES	Act of 09 June 20011 Geological and Mining Law	YES		NO		
Portugal	NO				NO		
Slovenia	YES	Spatial Management Act (Official Gazette RS, No.	YES		NO		
Spain	NO				NO		
Sweden	YES	Environmental Code (chapter 3 and 4)	YES		NO		The Planning and Building Act contains provisions that make all municipalities obliged to establish an overview plan for the entire municipality. National Interest Areas are appointed to municipalities.

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COUNTRY	AREAS WITH WELL-DOCUMENTED RESOURCES						
	Is there any legislation mentioning the obligation to include these areas in LUP?	If YES, please identify it.	If YES, does it apply to all non-energy minerals?	If it does not apply, to which minerals does it apply?	Legislation mentioning the voluntary inclusion?	IF YES, please identify it.	Comments
Ukraine	YES	Code of Ukraine on Subsurface, Article 56 (a)	YES		NO		(a) States: … prevention the ungrounded and unauthorized building up the areas of mineral location and keep on the procedure defined by the law concerning use of these lands in other purposes.

COUNTRY	PERMITTING FOR EXPLORATION											
	Is exploration allowed in all territory?	Exploration requires a permit?	Applies to all non-energy minerals?	If not applies, to which minerals does it apply?	Is any legislation mentioning the obligation to include exploration in LUP?	IF YES, identify it.	And voluntary inclusion?	If YES, identify it.	Is exploration dependent on prior LUP approval?	Is exploration dependent on prior EIA?	Does EIA address the existing land use?	Comments?
Austria	NO	YES	NO	Free to mine minerals, (§ 8 ff MINROG)	YES (a)	(§ 9 (1) MinroG	NO		YES	NO (b)		(a) Minlex: An exploration license offers the exclusive exploration right for free for mining minerals. (b) there is screening evaluation on the need of EIA
Croatia	NO (a)	YES	YES				NO		YES	NO		(a) only in areas planned for mineral activities; Answers taken form MINLEX
Cyprus	YES	YES	YES		NO		NO		NO	YES	YES	
Czech Republic	YES	YES	NO	Reserved Minerals (excludes building materials)	NO		NO		YES (a)	NO	NO	(a) Only permits by Ministry of environment a local authority
Finland	YES (a)	YES	NO	Mining Minerals (excludes aggregates and clays)	YES	Mining Act	NO		YES	NO (b)	YES	(a) Needs special permit for some areas (e.g. Natura2000); (b) there is screening evaluation on the need of EIA
Greece	NO	YES	NO	Metallic minerals	YES (a)		NO		YES	YES		(a) the permit is not included in LUP, but the rights are ensured.
Hungary	YES	YES	YES		YES (a)		NO		YES	NO (b)		(a) No modification of LUP but exploration rights are protected. (b) there is screening evaluation on the need of EIA

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COUNTRY	PERMITTING FOR EXPLORATION											
	Is exploration allowed in all territory?	Exploration requires a permit?	Applies to all non-energy minerals?	If not applies, to which minerals does it apply?	Is any legislation mentioning the obligation to include exploration in LUP?	IF YES, identify it.	And voluntary inclusion?	If YES, identify it.	Is exploration dependent on prior LUP approval?	Is exploration dependent on prior EIA?	Does EIA address the existing land use?	Comments?
Ireland	NO (a)	YES	NO	Extensive but not complete list in Mining Act	NO		NO		NO	NO (b)		(a) allowed in Natura2000, not allowed in National Parks; (b) it is screened on the need of EIA
Italy (EmRo)	NO	YES	NO	1st category mineral	YES (a)		NO		YES	NO (b)		(a) No modification of LUP but exploration rights are protected. (b) there is screening evaluation on the need of EIA
Netherland	NO	YES	YES		YES (a)	Excavation law/environmental law	NO		YES	NO (b)		(a) No modification of LUP but exploration rights are protected. (b) Need EIA in Natura2000 areas and environmental screening on the need of EIA in other areas.
Norway	NO	YES	NO	State owned minerals	NO (a)		NO		NO	NO		(a) The license to explore does not come with any additional rights beyond the right to explore and there are no obligations to consider them in LUP
Poland	NO	YES	YES		NO		NO		NO	YES	YES	
Portugal	YES	YES	NO (a)	State owned minerals	YES	Law 54/2015 (b)	NO		NO	NO		(a) Exploration for private owned minerals is voluntary; (b) Article 53.º Administrative easement, No. 1: The granting of rights for prospecting or for experimental exploitation shall be accompanied by the establishment of an administrative easement in the concerned areas.
Slovenia	YES (a)	YES	YES		NO		NO		YES	NO (b)		(a) MINLEX: No size limits theoretically. (b) there is screening evaluation on the need of EIA
Spain	NO	YES	YES		YES		NO		NO	NO		
Sweden	NO	YES	NO	State owned minerals	YES (a)	Environmental Code (chapter 3 and 4)	NO		NO	NO		(a) Only applies for permits included in Areas of National Interest
Ukraine	NO	YES	YES		YES	Code of Ukraine on Subsurface	NO		NO	NO		

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COUNTRY	PERMITTING FOR EXTRACTION								
	Is any legislation mentioning the obligation to include extraction permits in LUP?	If YES, identify it.	Does it apply to all non-energy minerals?	If it does not apply, to which groups of minerals does it apply?	And voluntary inclusion?	If YES, identify it.	IS extraction permit dependent on prior approval by LUP authorities?	IS extraction permit dependent on prior EIA approval?	Comments
Austria	YES		YES		NO		YES (a)	YES	(a) MINLEX: law refers the need of "other permissions must not be opposed to the mining right"
Croatia	YES		YES				NO	YES	Answers taken form MINLEX
Cyprus	YES	Town planning and housing law	YES		NO		YES	YES	
Czech Republic	YES	Act No. 44/1988, on the protection and use mineral resources (Mining Act),	NO	To all reserved minerals and deposits. Non-reserved minerals are generally in the frame Act No. 183/2006, Building Act and Mining Act.	NO		NO (a)	YES	(a) Extraction permit for land owned minerals (non-reserved minerals) in small-scale projects (not subjected to EIA) needs LUP approval
Finland	YES	Mining Act and Government Decree 391/2012	YES		NO		NO (a)	YES	(a) LUP approval only is required for small scale extraction projects of private owned minerals that are not subjected to EIA
Greece	YES	Industry Special Spatial Plan and the Strategic Study of its Environmental Impacts (J.M.D.11508/ FEK	YES		NO		YES	YES	
Hungary	YES	Mining law & Implementation Decree	YES				NO	YES	
Ireland	NO				NO		NO	YES	
Italy (EmRo)	YES	Provincial spatial plan	NO	1st category minerals	NO		YES	YES	
Netherlands	YES (a)	Excavation law/environmental law	YES		NO		NO	YES	(a) No modification of LUP but exploration rights are protected.
Norway	YES		YES		NO		NO	YES	
Poland	YES	Act of 09 June 20011 Geological and Mining Law	YES		NO		YES	YES	
Portugal	YES	Law 54/2015 - Article 28 – f); Regulatory Decree 15/2015 – Article 20	YES		NO		NO (a)	YES	(a) Extraction permit for private owned minerals in small-scale projects (not subjected to EIA) needs LUP approval: Decree-Law 340/2007 – Article 9, Nos. 1 and 2

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COUNTRY	PERMITTING FOR EXTRACTION								
	Is any legislation mentioning the obligation to include extraction permits in LUP?	If YES, identify it.	Does it apply to all non-energy minerals?	If it does not apply, to which groups of minerals does it apply?	And voluntary inclusion?	If YES, identify it.	IS extraction permit dependent on prior approval by LUP authorities?	IS extraction permit dependent on prior EIA approval?	Comments
Slovenia	YES	Mining Act (Official Gazette RS, No. 14/14 – official consolidated text and 61/17-GZ); Spatial Management Act (Official Gazette RS, No. 61/17)	YES		NO		YES	YES	
Spain	YES		YES		NO		NO	YES	
Sweden	NO		YES		NO		NO	YES	
Ukraine	YES	Code of Ukraine on Subsurface	YES		NO		NO	YES	

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