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Development of UNFC guidance on national level

19 of June 2024, Ljubljana

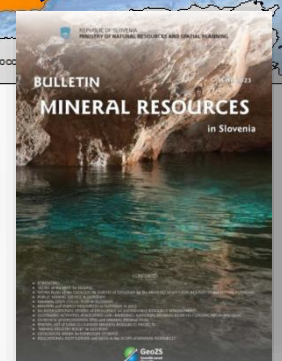
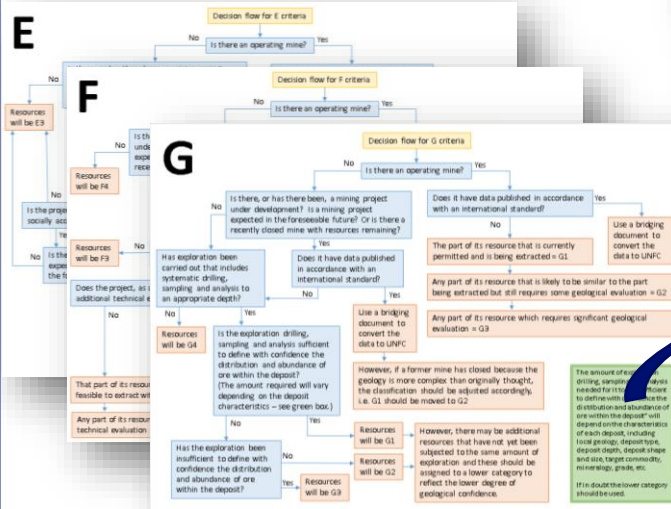


Funded by
the European Union





Existing guidance-type documents



Existing guidance and guidance-type documents:
Czech Republic, Hungary, Poland, Slovenia, Finland, Norway, Sweden, and United Kingdom

Significant developments:
Portugal, France, Austria, Ukraine.





Link between UNFC trainings and development of UNFC guidance on national level

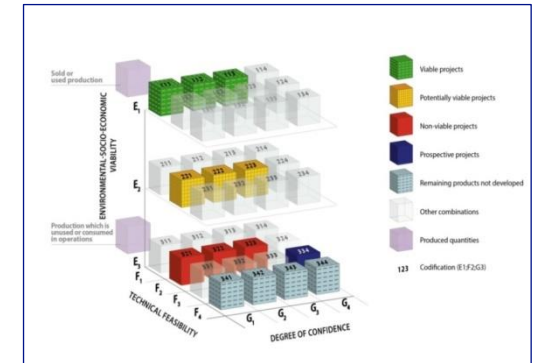
GSEU and CRMA objectives

UNFC trainings

- Partners together
- Skills
- Practice
- Cases
- Examples for itinerary
- Examples for bridging

UNFC guidance on national level

- Partners on national level with help
- Use skills, cases
- Overview of national legislation and data management
- Development of bridging and itinerary how to use UNFC



Three necessary steps in development of the national guidance:

1) Preparation phase

- Get acquainted with UNFC (training of NGS plus other stakeholders)
- Translate basic UNFC documents into national language
- Define working group for the mapping procedure
- Prepare list of definitions of the national system categories (legislation)
- Identify sources of data for UNFC E, F and G axis on national level

2) Mapping phase (see level 2)

- Compare definitions
- Identify thresholds between categories that fit the UNFC

3) Application plan

- Needs to involve Ministries, Mining Authorities, etc.





Existing guidance documents as an inspiration

Examples for identification of data sources of UNFC E, F and G categories, relevant authorities (D2.1, 2023)

UNFC methodology is summarized
Austria (GeoSphere)
Czech Republic (CGS)
Finland (GTK)
France (BRGM)
Hungary (SARA)
Norway (NGU)
Portugal (LNEG)
Slovenia (GEOZS)
Sweden (SGU)
United Kingdom (BGS)
Ukraine*

UNFC E,F, G categories are summarized
Austria (GBA-GeoSphere)
Belgium (VPO)
Czech Republic (CGS)
Croatia (HGI-CGS)
Cyprus (GSD)
Greece (HSGME)
Finland (GTK)
Hungary (SARA)
Italy (ISPRA)
Norway (NGU)
Romania
Slovakia (SGUDS)
Spain (IGME)
Sweden (SGU)
United Kingdom (BGS)
Ukraine (GIU)

Barriers and solutions
Austria (GBA-GeoSphere)
Belgium (VPO)
Czech Republic (CGS)
Croatia (HGI-CGS)
Cyprus (GSD)
Greece (HSGME)
Finland (GTK)
Hungary (SARA)
Italy (ISPRA)
Norway (NGU)
Romania
Slovakia (SGUDS)

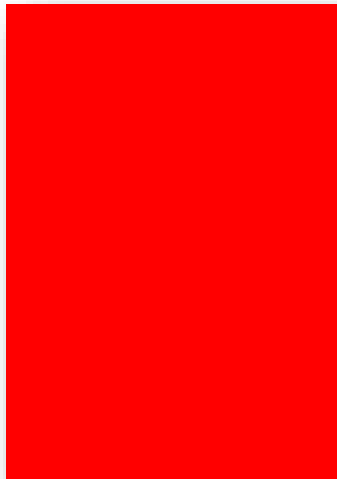


A good base for a guidance on national level



Helpful tools in developing the national UNFC guidance

UNECE Guidance for national guidance documents???



Basic UNFC documents (Level 2) in search for best fit between UNFC and national definitions.



UNFC (EGDI) Template

T Project Metadata	
Name of project*	
Location (reference system: WGS84 decimal degrees)*	Latitude: <input type="text"/> Longitude: <input type="text"/> <input type="button" value="go to map"/>
Licence owner*	
Company webpage (URL)	
Main commodity*	
Other commodities (multiple entries possible)	
Origin of the resource*	<input type="radio"/> Greenfield <input type="radio"/> Mine waste stockpiles <input type="radio"/> Brownfield <input type="radio"/> Mine tailings
Is this a strategic project?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Type of mining* (multiple entries possible)	<input type="radio"/> Onshore <input type="checkbox"/> Surface mining <input type="checkbox"/> Underground mining <input type="radio"/> Offshore
Project stage / Activities*	<input type="radio"/> Potential resource <input type="radio"/> Exploration stage <i>Reconnaissance</i> <i>Detailed surface exploration</i> <i>Subsurface exploration</i> <i>Target assessment</i> <input type="radio"/> Design, Planning, Evaluation stage <i>Scoping study completed</i> <i>Technical pre-feasibility study completed</i> <i>Economic pre-feasibility study completed</i> <i>Compendium report completed</i> <i>Technical feasibility study completed</i> <i>Economic feasibility study completed</i> <i>Final mining / investment decision taken</i> <input type="radio"/> Construction and Development stage <i>Construction is pending approval</i> <i>Mine is under construction</i> <input type="radio"/> Production Stage <input type="radio"/> Operation pending <i>Technical care and maintenance</i> <i>On hold due to unfavourable economic conditions</i> <input type="radio"/> Closure and Reclamation Stage <i>Shutting down</i> <i>Decommissioning</i> <i>Remediation / Rehabilitation / Restoration ongoing</i> <i>Post-closure monitoring (technical / environmental / surface monitoring, technical / environmental / subsurface monitoring)</i> <input type="radio"/> Closed without plans for potential future recovery <input type="radio"/> Abandoned without plans for potential future recovery <input type="radio"/> Idle/stop without plans for potential future recovery <input type="radio"/> No information on project stage available
Type of production* (multiple entries possible)	<input type="radio"/> Extraction <input type="radio"/> Processing <input type="radio"/> Refining

proposal for DG GROW





Why to propose UNFC Guidance on the national level?

UNECE Perspective

- Aim of the Guidance?
 - Voluntary recommendations how to classify according UNFC
 - Why? National mineral inventory?
 - Building common understanding on national level
 - terminology, definitions, translations to English, tables,
 - Stakeholders /practitioners, users, .../
- Existing documents and its structure (incl. Poland, Ukraine, ...)
- The content of UNFC National Guidance should fit national needs / obligations
- Should UNFC Guidance include basic rules of national inventory?





UNFC Guidance on National Level / UNECE Draft Proposal

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Executive Summary

Introduction

UNFC

National Classification System

Competency and Qualification Requirements

Bridging National Classification System to UNFC Project

Overall mapping

- Detailed mapping of the E-axis
- Detailed mapping of the F-axis
- Detailed mapping of the G-axis
- Exploration
- Additional Considerations
- National UNFC-based Inventory
- CRM Act Template
- Exploration
- Monitoring Supply Risks

Recycling

Conclusions

References

Recommended Figures

- General Relationships between Exploration Results, Mineral Resources and Mineral Reserves, as set out in the National Template
- Diagrammatic representation of the UNFC classification

Recommended List of Tables

- UNFC Classes, Sub-Classes, Categories and Sub-Categories (from UNECE, 2021)
- Standard mapping of National Classification Template aligned estimates to UNFC categories
- Specification of the UNFC-E-axis and corresponding National Classification Template considerations
- Specification of the UNFC- F-axis and corresponding National Classification Template considerations
- Specification of the UNFC-G-axis and corresponding National Classification Template considerations

Reference:

- UNFC 2019
- CRIRSCO Template & UNFC Bridging document
- UNFC Guidance Europe
- Poland Mineral Book 2022
- Application of the UNFC resource code in Finland / Practical guidelines
- Minventory report
- United Nations Framework Classification for Resources Case Study from Austria - Sand and Gravel Resources in Greenfield Areas
- MINLAND: Deliverable 4.1: Existing valorisation and classification schemes and valuation methods for mineral land use practices





Using basic UNFC documents – Guidance for Europe

Minimum UNFC Categories	INSPIRE Code Name (Mine Status)	INSPIRE Code ListDescription
E1 F1.2 G1,2,3	under development	Under development.
	under construction	Under construction.
E1 F1.3 G1,2,3	pending approval	A mine waiting for the exploitation authorization, generally given by a State Mining

Minimum UNFC Categories	INSPIRE Code Name (Exploration Activity)	INSPIRE Code ListDescription
E3.2 F2.2 G1,2,3	resource assessment	The aim of this phase is the delineation of the envelope of an orebody. Logging of cores, sampling of mineralized sections to better understand the distinctive features of the deposit, the physical properties of the ore, and finally to lead to a first (still approximate) calculation of the resource.
	percussion assessment	The assessment of the resource using percussion drilling, sometimes on a grid with a wide mesh. The aim of this phase is the (still rough) delineation of the envelope of an orebody. Drill logging

E2 F2.1 G1,2,3	feasibility study
E1 F2	feasibility study
E2 F1	feasibility study
E2 F2.1 G1,2,3	evaluation and development
	mining
	core drilling system
	mine works reconnaissance
	geostatistical
	feasibility study
E2 F2.2 G1,2,3	not operating
E1 F2.2 or E2 F1	care and maintenance
E2 F1 or E2 F2.2	retention

Minimum UNFC Categories	INSPIRE Code Name (Exploration Activity)	INSPIRE Code ListDescription
E3.2 F3 G4	not operating	A mine is not operating.
F3.1	subsurface exploration	Subsurface exploration using the low costs techniques (trenching, destructive drilling, etc.), of resources appraisal.
	excavation	Detailed geological mapping of the area(s) of interest.
	auger drilling	Detailed surveys (often on a grid) with the most appropriate method, to confirm and delineate and characterize geochemical anomalies identified during the previous phase.
	percussion drilling	Detailed surveys (often on a grid) with the most appropriate method, to confirm and better delineate and characterize geophysical anomalies identified during the previous phase.
	core drilling	Detail prospecting in a local scale with a hand-held washing tool, usually shaped like a plate or a flat cone, at the bottom of which the densest fractions of a soil, a stream sediment is collected.
F3.2	detailed surface exploration	Detailed surface exploration to delineate anomalies and describe occurrences in their refined geological context.
	detailed geology	Detailed geological mapping of the area(s) of interest.
	detailed geochemistry	Detailed surveys (often on a grid) with the most appropriate method, to confirm and better delineate and characterize geochemical anomalies identified during the previous phase.
	detailed geophysics	Detailed surveys (often on a grid) with the most appropriate method, to confirm and better delineate and characterize geophysical anomalies identified during the previous phase.
	detailed heavy mineral sampling	Detail prospecting in a local scale with a hand-held washing tool, usually shaped like a plate or a flat cone, at the bottom of which the densest fractions of a soil, a stream sediment is collected.
F3.3	regional reconnaissance	Regional investigation to identify anomalies (geochemical, geophysical, mineralogical) and discover occurrences.
	regional geology	Drafting of a very preliminary geological map with the main formations and the main structures, including the location of discovered mineral showings.
	regional geochemistry	The detection of abnormal concentrations of chemical elements in superficial water, soils, or organisms, usually accomplished by instrumental, spot-test, or rapid techniques which are applicable in the field.
	regional geophysics	Exploration technique based on the detection of anomalous physical characteristics of a ground.
	regional heavy mineral sampling	Prospecting with a hand-held washing tool, usually shaped like a plate or a flat cone, at the bottom of which the densest fractions of a soil, a stream sediment is collected.





Using basic UNFC documents – Guidance for Europe

Example for identification of data sources of UNFC E,F and G categories, relevant authorities (D2.1, 2023)

UNFC Classes Defined by Categories and Sub-categories						INSPIRE Code List	National/regional data sources and used databases for E,F,G categories by raw material data provider organizations (mainly GSOs or other Authorities) here: Hungarian answers briefly
Produced	Sold or used production						
	Production which is unused or consumed in operations Future production that is either unused or consumed in the Project operations is categorized as E3.1. These can exist for all Classes of recoverable quantities ^c						
Total products	Class	Sub-class	Categories				
			E	F	G ^e		
Known Sources	<u>Viable Projects</u> Estimates associated with Viable Projects are defined in many classification systems as Reserves, but there are some material differences between the specific definitions that are applied within different industries and hence the term is not used here. ^c	On Production	1	1.1	1, 2, (3)	operating continuously	<p>E: Inventory of mining areas where data can be found for exploration areas and mines with permissions (Technical Operational Plans: TOP) and mine plots and on other mining activities (extraction, suspension, closure). With more details: The State Geological, Geophysical and Mining Data Store (e.g. original exploration reports).</p> <p>F: Inventory of mining areas (see E category especially regarding TOPs). The State Geological, Geophysical and Mining Data Store (incl. exploration reports and other documents of geoscientific survey).</p> <p>Regarding E and F categories: Basically there are no missing data types at SARA. At most contact is necessary to Environmental Authorities or to Municipalities in some specific cases (complex cases, results of public hearing/SLO) or internet search are solutions (e.g. for feasibility studies).</p> <p>G: Mineral resource inventory.</p>
		Approved for Development	1	1.2	1, 2, 3	under development	
		Justified for Development	1	1.3	1, 2, 3	pending approval	
	<u>Potentially Viable Projects</u> Not all Potentially Viable Projects will be developed	DevelopmentPending	2 ^b	2.1	1, 2, 3	feasibility evaluation of the ore deposit	
		Development OnHold	2	2.2	1, 2, 3	care and maintenance retention	
	<u>Non-Viable Projects</u> Non-Viable Projects include those that are at an early stage of evaluation in addition to those that are considered unlikely to become Viable developments within the Foreseeable Future. ^c	DevelopmentUnclassified	3.2	2.2	1, 2, 3	resource assessment (geological interpretation, approximate calculation of the resource)	
<u>Remaining Products not developed from identified Projects</u> Remaining Products not developed from identified Projects or Prospective Projects may become developable in the future as technological or environmental-socio-economic conditions change. Some or all these estimates may never be developed due to physical and/or environmental-socio-economic constraints. ^c	DevelopmentNot Viable	3.3	2.3	1, 2, 3	closed abandoned/historic		
Potential Sources			3.3	4	1, 2, 3		
			3.2	3.1	4	subsurface exploration	
	Prospective Projects		3.2	3.2	4	detailed surface exploration	
			3.2	3.3	4	regional reconnaissance	
	Remaining Products not developed from Prospective Projects		3.3	4.1	4		
		3.3	4.2	4			
		3.3	4.3	4			





Using UNFC pdf Template (Sebastian)

- The CRM Act calls for templates to be developed and used for (a) applications for the recognition of Strategic Projects, (b) progress reports related to Strategic Projects, and (c) reporting of Member States pertaining to mining projects, exploration, monitoring, strategic stocks and circularity.
- The UNFC Europe template for PRM was developed as a concerted effort by the UNFC Coordination Team (UNECE, EC DG Grow, GSEU) with significant contributions from GSEU experts. It is supposed to become the designated tool for the systematic collection of comprehensive data and metadata on European mineral resource projects which have been classified according to UNFC.
- The template defines a minimum set of criteria to be addressed when collecting the data.
- The template currently comes as a user-friendly PDF form which allows data export to CSV format, but could easily be further developed into a web-based data collection form.
- It is expected to be used for the provision of data on critical raw materials (CRM) in the frame of the European CRM Act. It also represents a valuable basic data collection tool for serving data of different resource types to the database of the European Geodata Infrastructure (EGDI).
- The purpose of the template is to ensure that the collected data is uniform and complete, ready to be entered into this database, and to support CRMA objectives.
- The template was tested: Hungary for baryte (SARA), in Finland for lithium (GTK) and in the United Kingdom for lithium and tungsten (BGS) and in Austria for a lithium project (GeoSphere).
- GSEU partners contributed to the UNFC template: Zoltán Horváth (SARA), Sebastian Pflaiderer (GeoSphere Austria), Tom Bide and Eimear Deady (BGS), Antje Wittenberg (BGR), Meta Dobnikar (GeoZS), Guillaume Bertrand (BGRM), Pasi Eilu and Janne Hokka (GTK) and Francisco Javier González Sanz (IGME-Spain). (Details: GSEU WP2 T2.4. „UNFC Report”).





Using UNFC pdf Template

reset form

reset form

reset form

UNFC EU Template for Mineral Resources Data Collection and Classification

1. Project Metadata	
Name of project*	<input type="text"/>
Location (reference system: WGS84 decimal degrees)*	<ul style="list-style-type: none"> Latitude <input type="text"/> Longitude <input type="text"/> <input type="button" value="go to map"/>
Licence owner*	<input type="text"/>
Company webpage (URL)	<input type="text"/>
Main commodity*	<input type="text"/>
Other commodities (multiple entries possible)	<input type="text"/>
Origin of the resource*	<input type="radio"/> Greenfield <input type="radio"/> Mine waste stockpiles <input type="radio"/> Brownfield <input type="radio"/> Mine tailings
Is this a strategic project?	<input type="radio"/> Yes <input type="radio"/> No
Type of mining* (multiple entries possible)	<input type="radio"/> Onshore <input type="checkbox"/> Surface mining <input type="checkbox"/> Underground mining <input type="radio"/> Offshore
Project stage / Activities*	<input type="radio"/> Potential resource <input type="radio"/> Exploration stage <input type="checkbox"/> Regional reconnaissance <input type="checkbox"/> Detailed surface exploration <input type="checkbox"/> Subsurface exploration <input type="checkbox"/> Target assessment <input type="radio"/> Design, Planning, Evaluation stage <input type="checkbox"/> Scoping study completed <input type="checkbox"/> Technical pre-feasibility study completed <input type="checkbox"/> Economic pre-feasibility study completed <input type="checkbox"/> Competent person's report completed <input type="checkbox"/> Technical feasibility study completed <input type="checkbox"/> Economic feasibility study completed <input type="checkbox"/> Final mining / investment decision taken <input type="radio"/> Construction and Development stage <input type="checkbox"/> Construction is pending approval <input type="checkbox"/> Mine is under construction <input type="radio"/> Production Stage <input type="radio"/> Operation pending <input type="checkbox"/> Technical care and maintenance <input type="checkbox"/> On hold due to unfavourable economic conditions <input type="radio"/> Closure and Reclamation Stage <input type="checkbox"/> Shutting down <input type="checkbox"/> Decommissioning <input type="checkbox"/> Remediation / Rehabilitation / Restoration ongoing <input type="checkbox"/> Post-closure monitoring (technical / environmental surface monitoring, technical / environmental subsurface monitoring) <input type="radio"/> Closed without plans for potential future recovery <input type="radio"/> Abandoned without plans for potential future recovery <input type="radio"/> Historic without plans for potential future recovery <input type="radio"/> no information on project stage available
	Type of production* (multiple entries possible)

1. Project Metadata (continued)	
Stage of permitting process*	Exploration permit <input type="radio"/> No request submitted <input type="radio"/> Request submitted <input type="radio"/> Permit granted <input type="radio"/> Permit declined <input type="radio"/> Permit not required <input type="radio"/> No information available Environmental permits (water, forests...) <input type="radio"/> No requests submitted <input type="radio"/> Requests submitted <input type="radio"/> All permits granted <input type="radio"/> Permits declined <input type="radio"/> Permits not required <input type="radio"/> No information available Mining waste permit <input type="radio"/> No request submitted <input type="radio"/> Request submitted <input type="radio"/> Permit granted <input type="radio"/> Permit declined <input type="radio"/> Permit not required <input type="radio"/> No information available Land use <input type="radio"/> Land owner agreement in place <input type="radio"/> Land owner agreement not in place <input type="radio"/> Land use for mineral extraction granted <input type="radio"/> Land use for mineral extraction declined <input type="radio"/> No information available Construction license <input type="radio"/> No request submitted <input type="radio"/> Request submitted <input type="radio"/> License granted <input type="radio"/> License declined <input type="radio"/> License not required <input type="radio"/> No information available Extraction permit <input type="radio"/> No request submitted <input type="radio"/> Request submitted <input type="radio"/> Permit granted <input type="radio"/> Permit declined <input type="radio"/> No information available
	Social Impact Assessment <input type="checkbox"/> Assessment carried out / submitted for approval <input type="checkbox"/> Assessment approved <input type="checkbox"/> Approval declined <input type="checkbox"/> Assessment not carried out <input type="checkbox"/> No information available Engagement with stakeholders <input type="checkbox"/> No active engagement <input type="checkbox"/> Active engagement initiated but too early to assess outcome of conflict resolution <input type="checkbox"/> Conflicts resolved or likely to be resolved <input type="checkbox"/> Conflicts unresolved or unlikely to be resolved <input type="checkbox"/> Probability of conflict resolution unknown <input type="checkbox"/> No conflicts <input type="checkbox"/> No information available
Social contingencies (multiple entries possible)	

2. Classification Background Information		
Classification system used*	<input type="radio"/> Direct UNFC application <input type="radio"/> International system bridged to UNFC <input type="checkbox"/> JORC <input type="checkbox"/> PERC <input type="checkbox"/> NI43-101 <input type="checkbox"/> Other: <input type="radio"/> National system translated to UNFC if yes, please specify:	
In case of direct UNFC application:		
Base data used for assessment *	Data confidentiality	Data quality
Data set 1: Source: <input type="text"/> Year: <input type="text"/> Holder: <input type="text"/>	<input type="radio"/> Restricted access <input type="radio"/> No restriction	<input type="radio"/> adequate <input type="radio"/> inadequate
Data set 2: Source: <input type="text"/> Year: <input type="text"/> Holder: <input type="text"/>	<input type="checkbox"/> Restricted access <input type="checkbox"/> No restriction	<input type="checkbox"/> adequate <input type="checkbox"/> inadequate
Data set 3: Source: <input type="text"/> Year: <input type="text"/> Holder: <input type="text"/>	<input type="checkbox"/> Restricted access <input type="checkbox"/> No restriction	<input type="checkbox"/> adequate <input type="checkbox"/> inadequate
In case an international or national system was used to derive UNFC:		
Citation for original classification *	<ul style="list-style-type: none"> Author: <input type="text"/> Affiliation: <input type="text"/> Year: <input type="text"/> Title: <input type="text"/> 	
Comment: <input type="text"/>		

3. UNFC Classes of Resources					
Main commodity*	UNFC class*	Resource quantity (kt)	Resource quantity in other unit	Metal content in kt	Metal content in other unit
<input type="text"/>	<input type="text"/>				
<input type="text"/>	<input type="text"/>				
<input type="text"/>	<input type="text"/>				
Other commodities	UNFC class	Resource quantity (kt)	Resource quantity in other unit	Metal content in kt	Metal content in other unit
<input type="text"/>	<input type="text"/>				
<input type="text"/>	<input type="text"/>				
Comment: <input type="text"/>					

4. Information on the person who performed this UNFC classification	
Name and affiliation of national expert*	<ul style="list-style-type: none"> Name: <input type="text"/> Affiliation: <input type="text"/>
Year of UNFC classification*	<input type="text"/>

* Mandatory fields are marked by an asterisk and a coloured line around the edge.
Underlined words show explanatory text at mouse over.
 To unselect a button, simply click on it again.
 Export to csv requires Adobe Acrobat Pro.
 (Csv files can be opened e.g. with MS Excel.)

show EFG

* Mandatory fields are marked by an asterisk and a coloured line around the edge.
Underlined words show explanatory text at mouse over.
 To unselect a button, simply click on it again.
 Export to csv requires Adobe Acrobat Pro.
 (Csv files can be opened e.g. with MS Excel.)

show EFG

Mandatory fields are marked by an asterisk and a coloured line around the edge.
Underlined words show explanatory text at mouse over.
 To unselect a button, simply click on it again.
 Export to csv requires Adobe Acrobat Pro.
 (Csv files can be opened e.g. with MS Excel.)

show EFG



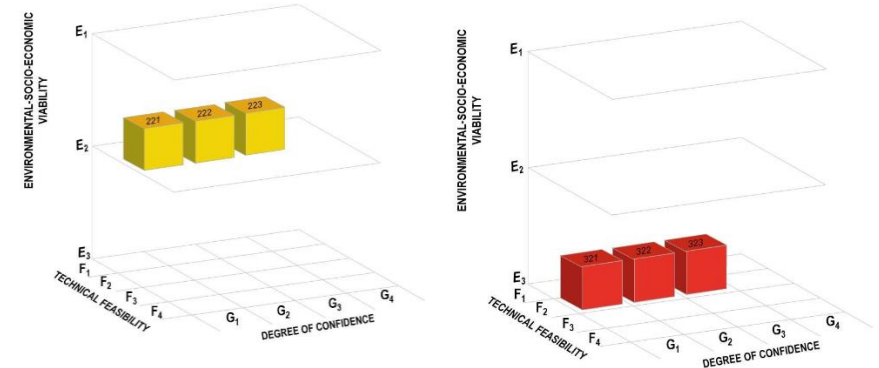
Using UNFC pdf Template

Benefits:

- Most important UNFC relevant information
- UNFC classes are preliminary shown, expert, or evaluator can decide on the final UNFC class
- Map viewer helps for the evaluator (visual support)
- E-instructions in the text next to the template
- Separated document as a summary is available in the Nextcloud: <https://geuscloud.geus.dk/index.php/apps/files/files/1069960?dir=/GSEU-WP2/T2.4%20-%20UNFC/UNFC%20Template%20for%20RMs>



3. UNFC Classes of Resources					
Main commodity*	UNFC class*	Resource quantity (kt)	Resource quantity in other unit	Metal content in kt	Metal content in other unit
Please select a commodity from the drop-down menu (list defined by INSPIRE - https://inspire.ec.europa.eu/codelist/CommodityCodeValue). If					
Other commodities					
Comment:					



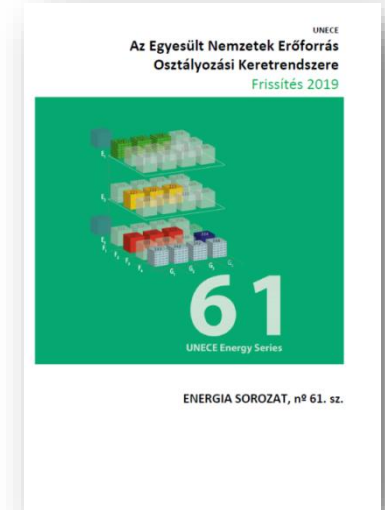
UNFC_cube_potentially_viable_project.jpg (33 KB)





Hints for translating the documents

- Translation of the UNFC Guidance for Europe (2022) for all official EU and European languages: *may be useful for national purposes (e.g. trainings, national use of the UNFC), but may require capacity.*
- Preparation of a shortened template for translations taking into account national and regional circumstances: *Shortening may cause loss of information.*
- Minimum: identification of national and regional UNFC circumstances based on comparison with UNFC Guidance for Europe (partially done: D2.1. (Delivery 2.1 of the GSEU WP2 Project...))
- Important:
 - To be aligned with
 - INSPIRE codes
 - UNFC (2019)
 - UNFC Pdf template
 - Easy to use
 - Introduction to UNFC would be useful
- Other:.....
.....





Development of UNFC guidance on national level from Geological Surveys (and Mining Authority) point of view that can facilitate the development of UNFC guidance on national level via trainings and stakeholder consultations on national / regional levels





146/2, 147–154., Budapest, 2

A nemfemes, szilárd ásványvagyon-nyilvántartás korszerűsítése a nemzetközi ásványvagyon-osztályozási keretrendszer és az ásványi nyersanyagok kutatási jelentéseire vonatkozó szabványok szerint

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The modernisation of the Hungarian non-metallic mineral resource inventory based on the international mineral classification framework and reporting standards

Abstract

The preparation of the modernization of the non-metallic mineral resource inventory (and its concomitant commendations) were parts of a particular task related to a project which has been operating since 2013. This paper presents a process of co-operation between the Hungarian Office for Mining and Geology and the Geological Geophysical Institute of Hungary. In conjunction with the work on the national inventory, different international reporting standards — including the UNECE classification framework (UNFC-2009, UNECE 2013) — were also studied. This paper presents suggestions on how the national inventory of Hungary could be harmonized with an international classification framework for reporting standards on mineral resources. A case study is also considered.

Keywords: non-metallic mineral resource inventory, UNECE, classification, reporting standards, case study (Borsod-Abaúj-Zemplén County)

Összefoglalás

A Magyar Bányászati és Földtani Hivatal (MBFH) és a Magyar Földtani és Geotípusok Intézete (MFGI) együttes feladatának keretében 2013-ban indult projekt egyik részfeladata a nemfemes, szilárd ásványvagyon-nyilvántartás korszerűsítésének előkészítése, javaslatok tételére az MBFH felé. A munka során tanulmányoztuk a h nyilvántartást, különböző nemzetközi jelentési szabványokat és az ENSZ osztályozási keretrendszerét. Cikkinet bemutatjuk, hogyan illeszhető a hazai nyilvántartás a nemzetközi ásványi nyersanyag-osztályozási rendszerhez, ill jelentési szabványokhoz. Az eredményeket esettanulmányként is előadjuk.

Tárgyszavak: nemfemes, szilárd ásványvagyon-nyilvántartás, ENSZ, osztályozás, jelentési szabványok, esettanulmány (Borsod-Abaúj-Zemplén megye)

Bevezetés

A harmadik évezred első évtizedében felértékelődött az ásványi nyersanyagok jelentősége, mind európai, mind pedig globális viszonylatban. Az Európai Unióban az Európai Bizottság különböző támogatási eszközökkel segíti elő a közös nyelv kialakítását az ásványi nyersanyagok vonatkozásában, ugyanakkor globális projekt is zajlik az 1990-es évek óta az ENSZ Európai Gazdasági Bizottság Ásványi Nyersanyagvagyon Osztályozási Szakértői Csoportja irányításával (UNECE EGRC).

Partnerség (EIP) 2012 óta a nyersanyagokkal foglalkozó szakemberek konzultatív fóruma, amely összehozza az ipari, a közszolgáltatások, a tudományos élet és a civil szervezetek képviselőit. Az EIP feladata, hogy ma szintű irányítást adjon az Európai Bizottságnak, a vállalkozásoknak és a magánszektor szereplőinek az alapvető kérdésekkel kapcsolatos kihívások innovatív megközelítését. Az EIP Stratégiai Megvalósítási Terve (SIP) határozza meg a konkrét célokat. Az intézkedések között szereplő kutatási tevékenység célja az ásványi nyersanyag-politika kiépítésének elősegítése, az elfogadott gyakorlatok terjesztése, az ismeretek bővítésével és a nemzetközi együttműködés elősegítésével. Az átfogó európai ásványi nyersanyag-nyilvántartás és az összehangolt tagországok ásványi nyersanyag-nyilvántartásának kiépítése.

Földtani Közlemények 146/2 (2016)

150

HORVÁTH Zoltán, SÁRI Katalin: A nemfemes szilárd ásványi nyersanyagok nyilvántartásának korszerűsítése

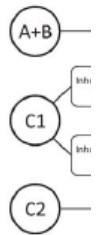
Földtani Közlemények 146/2 (2016)

151

szempontokat is figyelembe ves (HORVÁTH et al. 2016b, ebben a megnevezési harmonizációt. A G kategóriát lehet ez alapján kijelölni megadható a vagyonka

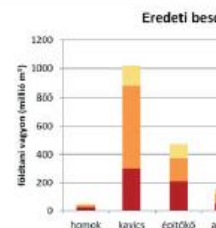
1. táblázat. Az esettanulmányban alkalmazott csoportosításhoz tartozó, 54/2008 kormányrendelet szerinti főcsoport- és csoportnevek

Table with 3 columns: Főcsoportnév, Csoportnév, and Az esettanulmányban alkalmazott csoportosítás. Rows include Homok, Kavics, Mész, Kő, Ággyag, Ipari ásványok, Egyéb nyersanyagok.

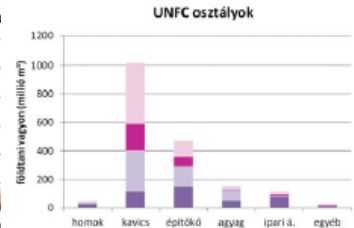


1. ábra. A CRIRSCO szerinti osztályozás

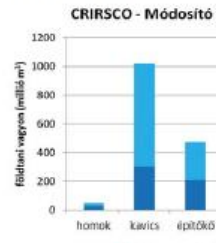
szabványok alapján a nemfemes, szilárd ásványi nyersanyagok nyilvántartásának korszerűsítése, javaslatok tételére az MBFH felé. A munka során tanulmányoztuk a h nyilvántartást, különböző nemzetközi jelentési szabványokat és az ENSZ osztályozási keretrendszerét. Cikkinet bemutatjuk, hogyan illeszhető a hazai nyilvántartás a nemzetközi ásványi nyersanyag-osztályozási rendszerhez, ill jelentési szabványokhoz. Az eredményeket esettanulmányként is előadjuk.



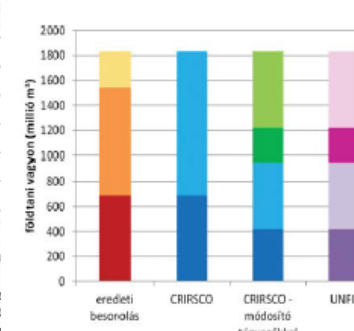
2. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) a jelenlegi besorolás szerint



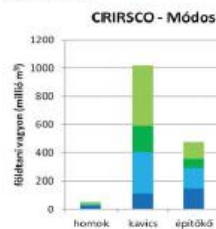
6. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) UNFC osztályok szerint



3. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) CRIRSCO módosító tényezőkre



6. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) - összesítő



4. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) CRIRSCO módosító tényezőkre

6. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) - összesítő

6. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) - összesítő

6. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) - összesítő

6. ábra. A Borsod-Abaúj-Zemplén megyei nemfemes szilárd ásványvagyon-nyilvántartás (2013. 01. 01.) - összesítő

eredeti formájukban vagy kötőanyaggal szilárdítva épületek vagy közművek építéséhez használnak fel. Eredetük szerint beszélhetünk elsődleges (homok, kavics, zúzott kő) és másodlagos (építési-bontási hulladék, bányameddő, építési munkálatakból származó talaj és kőzet, erőművi pernye, salak) aggregátumokról. A SNAP-SEE projekt célja az aggregátumtervezést megalapozó eszközök elkészítése volt.

A projekt során azt is felmértük, hogy jelenleg Délkelet-Európában hogyan történik az ásványi nyersanyagok nyilvántartása (7. ábra). A legtöbb volt szocialista ország az 1913-as torontói világkongresszuson bemutatott, orosz rendszerként ismert, hagyományos osztályozási rendszert használja, míg Ausztria, Olaszország és Görögország saját, nemzeti rendszert alkalmaz.

Albánia saját osztályozási rendszert használ az ásványi nyersanyagok osztályozására, amely minden elsődleges nyersanyagfajtra alkalmazható. Nincs összhangban a nemzetközi rendszerekkel, de történetik kezdeményezések a harmonizáció érdekében. Ausztriának saját osztályozási rendszere van, amely eredetileg a UNFC-re épült, azonban ma már nem összeegyeztethető a nemzetközi rendszerekkel. Bosznia-Hercegovina törvénye előírja a nemzeti osztályozási rendszer használatát, amely megegyezik a hagyományos (orosz) rendszerrel. Bulgária nemzeti rendszere összhangban van a UNFC-vel. A különböző forrásokból származó adatokat harmonizálják. Görögországban térinformatikai alapú adatbázisban tartják nyilván az ásványvagyonra vonatkozó adatokat. Az adatbázis nem alkalmas egységes osztályozási rendszert használni, az adatokat a vállalkozóktól megkapott formában tartják nyilván. Horvátország (a hagyományos megegyező) nemzeti osztályozási rendszert használ. Olaszország se nemzeti, se nemzetközi osztályozási rendszert nem használ az ásványvagyon osztályozására. Jelenleg zajlik egy olyan rendszer létrehozása, amely megfelel a nemzetközi szabványoknak. Montenegróban a hagyományos rendszert használják. Romániában 1998 óta a UNFC szerint működik a nyilvántartás, korábban ott is a hagyományos rendszert használták. Szerbiában a hagyományos rendszernek megfelelő nemzeti rendszert használnak, azonban a hivatalos (törvényben foglalt) ásványvagyon- és ásványi nyersanyag-nyilvántartás-definíció megegyezik a PERC definíciójával. Az osztályozási rendszert jelenleg felülvizsgálják, és a PERC-vel összehangolt rendszert terveznek bevezetni. A vállalkozók egy része már most is a PERC-nek megfelelően írja meg az éves jelentést. Szlovákiában a hagyományos osztályozási rendszert használják. 1999-ben tesztelték a UNFC alkalmazhatóságát lignit-, mangán- és vasérclepeken. Szlovéniában a hagyományos osztályozási rendszert használják. Törökországban a 2010 előtt használt osztályozási rendszer elsősorban a földtani ismeretességére épült. Jelenleg folyamatban van az ENSZ szabvány alkalmazhatóságának vizsgálata. Néhány cég a CRIRSCO szabvány-családba tartozó, kanadai CIM szabvány szerint adja le a jelentését (PARKER et al. 2015, SNAP-SEE).

Hazánk mellett Románia, Szerbia és Törökország is rendszeresen képviselteti magát a UNECE-EGRC (az ENSZ Európai Gazdasági Bizottságának Vagyonosztályozással



Bridging Document

between
the Hungarian Mineral Resource Classification System for selected mineral
commodities
and
the United Nations Framework Classification for Resources (UNFC-2020)
and
the Family of the Committee for Mineral Reserves
International Reporting Standards (CRIRSCO) including the the Australasian
Code for Reporting of Exploration Results, Mineral Resources and Ore
Reserves ('the JORC Code') Pan-European Reserves and Resources Reporting
Committee ('the PERC Code')

Authors: Zoltán Horváth Dr., Katalin Sári, Géza Szabó

Mining and Geological Survey of Hungary
Budapest, 2020

(unofficial working material)

Content

- Summary: reason why the data harmonization is important.
- Introduction
- Background: national project for harmonization
- Summary of the national data raw material data collection
- Summary of the link between the Russian and the Hungarian resource classification International systems
- International systems
 - UNFC
 - International reporting codes (CRIRSCO: JORC, PERC)
- Methodology of the harmonization
- Terminology / Recommendations
- References
- Annex





Hungary

After 2022 in the frame of the GSEU it has changed...

Plan for development of an updated UNFC guidance on national level

Content

Introduction: Why UNFC guidance is important on national level? (CRMA, UNECE, GSEU objectives)

Background: Short description of the national activity with UNFC (past and recent projects, etc.)

National resource management system: brief description with reference on the legislation, the role of Ministry, GSO, MA, other Authorities. How UNFC can be linked to national resource management?

Introduction to international reporting codes (e.g. CRIRSCO: JORC, PERC, other)

UNFC: Short introduction to the UNFC with reference on basic UNECE UNFC documents

UNFC methodology

- Data source for E category
- Data source for F category
- Data source for G category

Project based approach

- Mining Projects
- Viable Projects
- Potential Viable Projects
- Prospective Projects
- Non Viable Projects
- Historic Estimates

References, Glossary, Enclosure (1-few UNFC cases on national level?)





A core table identification UNFC E and F classes of projects based on inventory of mining areas (G category is from mineral resource inventory)

	UNFC code	Description of cases with valid licences (TOP)	UNFC name
1	E1.1., F1.1., G1+G2	Mining plot with extraction TOP (Technical Operation Plan).	viable project
2	E1.1., F2., G1+G2	A newly established mining plot that does not have a TOP yet. Within 5 years from the date when the authority decision on establishing the mine becomes final, the licensee must submit the extraction TOP.	viable project
3	E2., F2.2., G1+G2	Mine that currently has no TOP, but neither tendering, nor new licensee, nor mine closure are not the case. In this case, the mining authority obliges the licensee to submit a TOP.	potentially viable project
4	E2, F2.1., G1+G2	Mine or mineral deposit that has TOP for development or mine for which tendering is in progress. After cancellation of the mining right by the authority the mining right can be obtained again through a tender.	potentially viable project
5	E2, F2.2., G1+G2	Mine that has TOP for suspending mining activity. After suspending the activity, extraction can be restarted at any time.	potentially viable project
6	E3.3, F4, G1+G2	Mine that has TOP for mine closure and mine where mining activity has been permanently stopped. E.g. the landscaping and reclamation tasks are carried out; or mine where implementation of the mine closure TOP has already been approved by the mining authority.	non-viable project
7	E3.1, F2.3, G1+G2	Mine without licensee, after failed tendering. The mining right was tendered on two occasions but both were unsuccessful.	non-viable project





Czech Republic

CGS Project Number: 389700

Project report

Methodology for the implementation of the UNFC system in the legislative framework of the Czech Republic.

Project leader: RNDr. Zbyněk Gabriel, CSc.

Česká geologická služba/ Czech Geological Survey
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Dačického náměstí 11, 284 01 Kutná Hora
IČO 00025798, DIČ CZ 00025798
www.geology.cz

15. 12. 2023

Content

1. Project specification
2. Abstract
3. Introduction
4. Objectives of the project
5. Overview of mineral resource and reserve classifications
 - 5.1. Czech national resources classification system – Description
 - 5.2. UNFC classification - Description
 - 5.3. CRIRSCO Standard Classification - Description
6. Methodology for conversion of mineral classification under the Czech Mining Act to the UNFC
 - 6.1. Existing classification of deposits in the Czech Republic and the method of their conversion to the UNFC system
 - 6.2. Classification conversion of the deposits classified under the Czech Mining Act to the UNFC
 - 6.2.1. Category E
 - 6.2.2. Category F
 - 6.2.3. Category G
 - 6.3. Conversion of the historic Czech ABC₁C₂ classification to UNFC
 - 6.4. Active and non-active projects
7. Conclusion and next steps
8. Referencias
9. Annexes – Conversion table, 2D Matrix, 3D Matrix





Czech Republic

Conversion table

Czech Mining Law Categories	UNFC Category	UNFC Sub-category	Reasoning
Approved Mineable Reserves <i>Approved Commissioning, Development and Mining Plan</i> <i>In operation</i>	111, 112	E1.1 F1.1 G1,2	Mineable Reserves at an operated deposit that has all necessary approvals for mining activities. Czech Mining Law definition of "Mineable Reserves" is approximate to CRIRSCO definition of "Reserves". In UNFC the CRIRSCO Reserves are E1F1G1,2.
Approved Mineable Reserves <i>Approved Commissioning, Development and Mining Plan</i> <i>In development</i>	111, 112	E1.1 F1.2 G1,2	Mineable Reserves at a deposit in commissioning/development that has all necessary approvals for mining activities. Czech Mining Law definition of "Mineable Reserves" is approximate to CRIRSCO definition of "Reserves". In UNFC the CRIRSCO Reserves are E1F1G1,2.
Approved Mineable Reserves <i>Approved Commissioning, Development and Mining Plan</i> <i>Currently not operating</i>	111, 112	E1.1 F1.3 G1,2	Mineable Reserves at a deposit that has all necessary approvals for mining activities which is active but currently not operated. Czech Mining Law definition of "Mineable Reserves" is approximate to CRIRSCO definition of "Reserves". In UNFC the CRIRSCO Reserves are E1F1G1,2.
Mineable Reserves <i>Commissioning, Development and Mining Plan not approved</i> <i>Currently not operating</i>	221, 222	E2 F2.1 G1,2	Active projects that do not have approved Commissioning, Development and Mining Plan, but have already calculated "Mineable Reserves". E2: "Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future." F2.1: "Project activities are ongoing to justify development in the foreseeable future." G1 and G2 are acknowledged in the CRIRSCO template for Reserves and Measured and Indicated Resources.
Economic Explored Free Reserves <i>Established Mining Area</i>	221, 222	E2 F2.1 G1,2	Active projects that have Established Mining Area, but do not have approved Commissioning, Development and Mining Plan. E2: "Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future." F2.1: "Project activities are ongoing to justify development in the foreseeable future." "Explored Reserves"

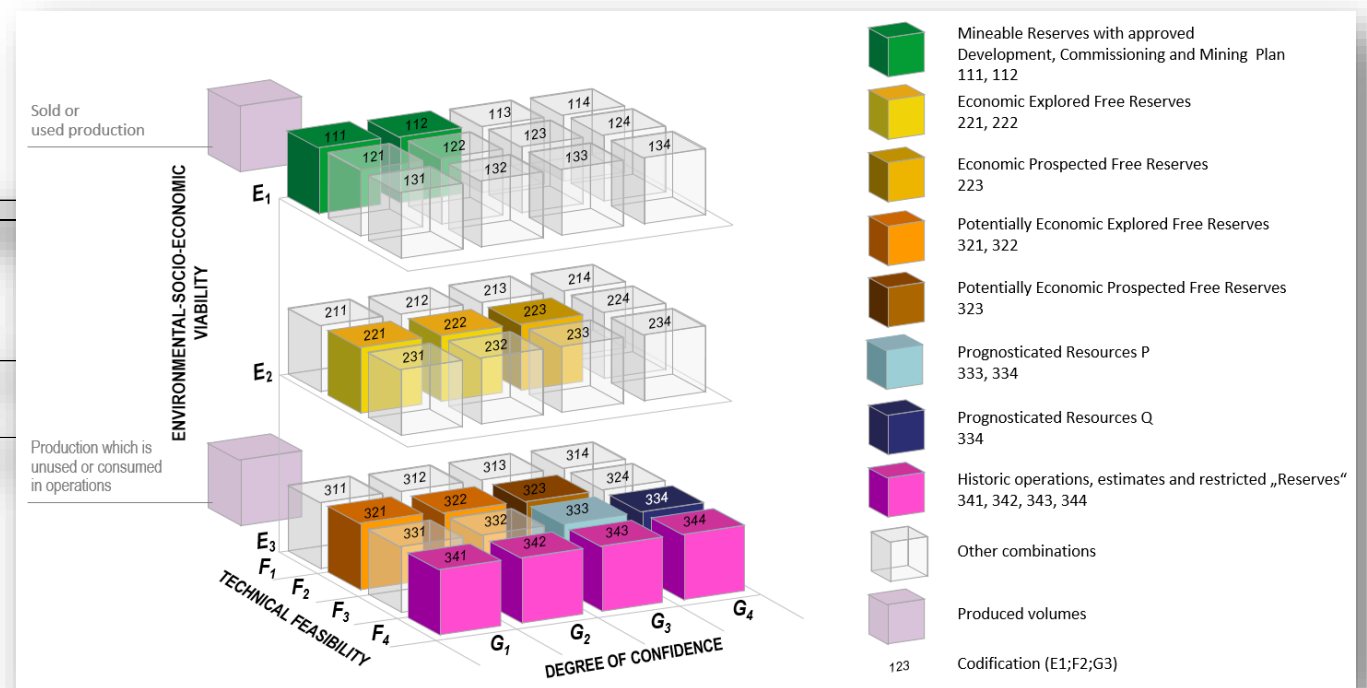




Czech Republic

Output: 2D and 3D matrix

UNFC	F1.1	F1.2	F1.3	F2.1	F2.2
E1.1	"Approved Mineable Reserves" Approved "POPD" On Production G1,2	"Approved Mineable Reserves" Approved "POPD" Approved for Development G1,2	"Approved Mineable Reserves" Approved "POPD", currently not operating Justified for Operation G1,2		
E1.2					
E2				"Mineable Reserves" "POPD" not approved Development Pending G1,2	
				"Economic Free Reserves" Established Mining Area Development Pending	
				"Economic Explored Free Reserves" G(1),2	
				"Economic Prospected Free Reserves" G3	
E3.1				Non-economic reserves in Economic Reserve blocks G1,2,3	
E3.2				"Economic Free Reserves" Without Established Mining Area or Preliminary Approval to Establishing Mining Area Development Unclassified	"Potentially Economic Free Reserves" Established/Without Mining Area Development Unclassified
				"Economic Explored Free Reserves"	"Potentially Economic Explored Free Reserves" G(1),2





Development of UNFC guidance on national level (Austria-Sebastian)

- Since INSPIRE is mandatory in all of Europe, everything that is said in the UNFC Guidance for Europe, is valid for Austria as well.
- We (have to) use the same data sources like everybody else for deciding on the E-, F- and G-axis categories.
- The Austrian Mining Act and the resulting process of licensing (including environmental and social considerations) will not change the way we apply the Guidance Europe document at the national scale. And it will not add any country-specific detail which would go beyond the Guidance Europe document.
- The only thing which may have an effect on how to do UNFC specifically in Austria is access to land (which is actually specific to each of the 9 federal states in Austria). Spatial planning of land-use priorities is indeed something which is country-specific. For example, are NATURA2000 areas categorically off-limits for mining or not? This is different from member state to member state. Unfortunately, many land-use issues here are decided on a case-by-case basis. So it is hard to give general guidance.
- What is very country-specific are data gaps and data access. In the GeoSphere there is no sufficient access to data to do UNFC on deposits which are (or have recently been) active. So all we can do here at GeoSphere is resource estimates of historic mines or greenfields and – regarding UNFC – classify along the G-axis.



THE AUSTRIAN CLASSIFICATION STANDARD G 1050

Austrian Standard G 1050 “Classification of Resources and Occurrences for Solid Mineral Raw Materials”

- Classes of Assessment

mining assessment :

Class E: resource worthy of economic extraction

Class S: sub-economic resource (potentially economic in the foreseeable future)

Class N: resource not assessed
studies include market analysis

mining geological assessment :

Class U: deposit unworthy of economic extraction (i.e. not a resource)

Class N: deposit not assessed

studies consider socio-economic factors and legal, technical and economic conditions

geological assessment:

Class Y: occurrence of purely geo-scientific significance (i.e. not a deposit)

Class Z: occurrence not sufficiently investigated
studies investigate grades, depth, thickness



THE AUSTRIAN CLASSIFICATION STANDARD G 1050

Austrian Standard G 1050 “Classification of Resources and Occurrences for Solid Mineral Raw Materials”

- Classes of Economic Usability

resources:	Classes r- -E:	marketable part of economic resource
	Classes R- -E:	total economic resource including products unused or consumed in operations
	Classes R- -S:	sub-economic resource
	Classes R- -N:	resource without mining assessment
occurrences:	Classes O- -U:	deposit unworthy of economic extraction (i.e. not a resource)
	Classes O- -N:	deposit not assessed
	Classes O- -Y, O- -Z:	natural mineralization



THE AUSTRIAN CLASSIFICATION STANDARD G 1050

Austrian Standard G 1050 “Classification of Resources and Occurrences for Solid Mineral Raw Materials”

- Classes of geological certainty

Class 1: reliable estimates: **1A certain (certainty 90% ± 20%) - 1B probable (90% ± 30%) - 1C indicated (90% ± 50%)**
(depending on data density)

volumes estimated on the basis of outcrops, trenches, shafts, adits or drillings

Class 2: preliminary estimates: assumed by analogy to neighboring, similar deposits

volumes estimated on the basis of regional geology and some outcrops; needs further exploration

Class 3: tentative estimates: existence and size of speculative nature

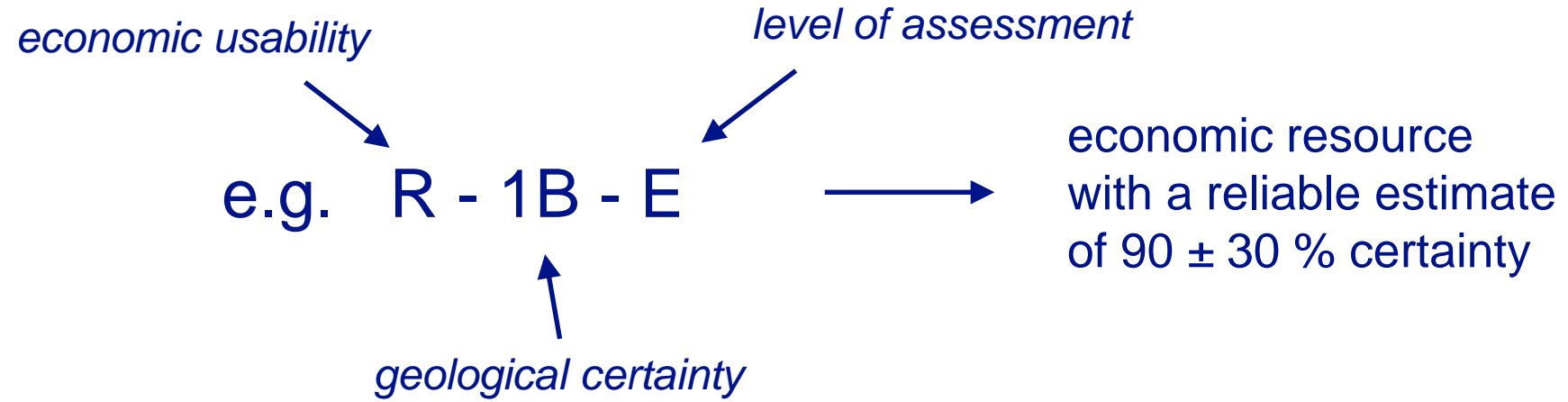
volumes estimated on the basis of geological extrapolation, geophysical or geochemical indications or statistical analogies



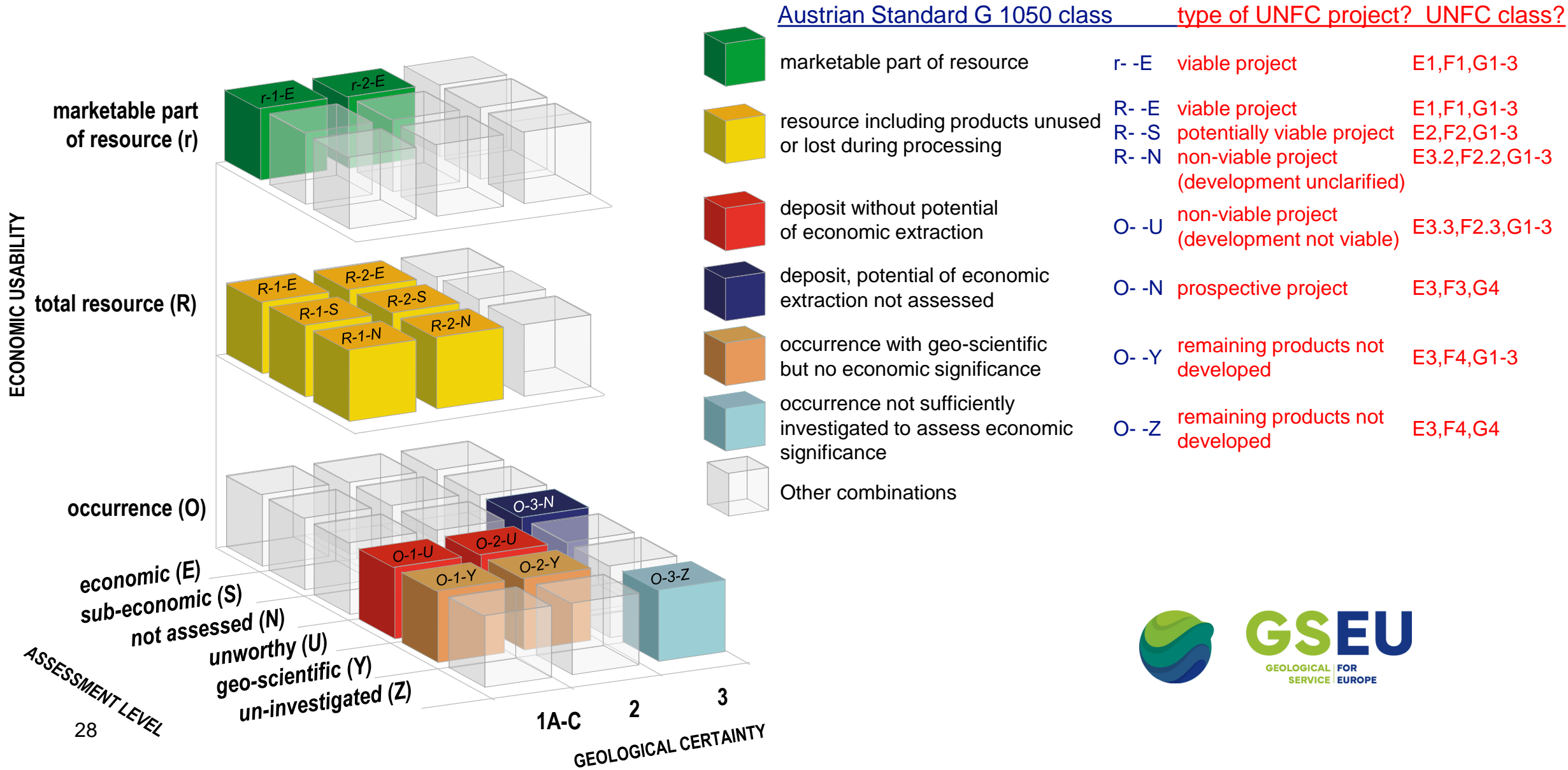
THE AUSTRIAN CLASSIFICATION STANDARD G 1050

Austrian Standard G 1050 “Classification of Resources and Occurrences for Solid Mineral Raw Materials”

- Codification



TOWARDS A NATIONAL GUIDANCE TO MAP G 1050 TO UNFC





Development of UNFC guidance on national level (Finland-Janne and Tuomas)

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Proposal – for the development of UNFC guidance on national level (Germany - Antje)

Content

- ❑ **German Network of UNFC interested**
 - Pool of Experts from authorities, State Geological Surveys and industry
 - Cooperation with BDG (German professional association of geoscientists)
 -
- ❑ **Overview of mineral resource and reserve classifications in use**
 - Spatial mapping of classification systems, local specialities
 - UNFC classification – Description
 - UNFC Guidance for Europe
- ❑ **Most common reporting standards and its bridging to UNFC**
 - PERC/CRIRSCO Standard Classification - Description
- ❑ **Legal framework**
 - Mapping relevant legal framework (Bundesberggesetz, Landesgesetze, Umweltgesetze)
 - Developing a methodology for conversion
 - Providing case studies (e.g. based on cases of potential Strategic Projects)
- ❑ **Proposal of recommendations, guidelines, assistance (e.g. workshops on implementation)**
- ❑ **Development of federal database utilising UNFC**

Note:

There is no mandate to develop a guidance. Moreover the competence on raw material management is with the 16 German States. However, a Federal Mining Act (BBergG - https://www.gesetze-im-internet.de/englisch_bbergg/englisch_bbergg.html#p0290) exists. Yet, it does not require any reporting or classification on the national raw materials inventory.





Development of UNFC guidance on national level (Norway - Janja)

- Guidance for the Application of the UNFC for Mineral Resources in Finland, Norway and Sweden

- The mineral strategy on mapping the Norwegian resource potential

- NGU will prioritize mapping in areas that are considered to have critical mineral potential and increase the availability of geological data from such areas.
- Strengthen NGU's work on mineral mapping aimed at critical metals and minerals, and complete the geophysical surveying of Norway...
- The Geological Survey of Norway will implement the UNFC standard in the national resource databases

- UNFC-Classification of Norwegian Mineral Resources (NGU)

- UNFC Training, dissemination, exchange of experiences with other geological surveys
- Data compilation and interpretation
- UNFC classification, Implementation of the UNFC in NGUs resources database,
- Collaboration with the project "Modernisering av ressursdatabasene" to establish services for application of UNFC in the resources database (data registration, storing, displaying),
- Harmonisation of the workflow to the ongoing EU project Geological Service for Europe (GSEU)





Development of UNFC guidance on national level (Slovenia - Duska)

Title of doc: Introduction to methodology of UNFC classification and » bridging guidance« for Slovenia

Content

- The aim of UNFC classification
- 3-D concept of UNFC classification
- Legal framework and relevant institutions in Slovenia
- National data of mineral reserves and resources
- National mineral reserves classification system and harmonisation with UNFC
- Public awareness of »bridging« Slovenian mineral reserves classification into UNFC





Joint approach to develop UNFC guidance on national level

- UNFC training experience, notes and training materials help to prepare the first or an updated UNFC guidance on national level.
- „*The National UNFC Guidance should be the outcome of discussion on national level (between experts national administration, industry and other stakeholders)...we can only make suggestions and give advice.*” (Slavko Solar)
- In the frame of the GSEU project partners have good opportunity to develop guidance (report on it February 2025).
- The first draft of the UNFC guidance proposal document on national level prepared by WP2 T2.3. and T2.4. partners can effectively contribute to the national level trainings and stakeholder consultations.
- UNFC guidance on national level should be short, transparent, easy to use, and should be based on relevant UNFC documents
- The preliminary content that may be changed according to national/regional circumstances:

- 1. Introduction:** Why UNFC guidance is important on national level? (CRMA, UNECE, GSEU objectives)
- 2. Background:** Short description of the national activity with UNFC (past and recent projects, etc.)
- 3. National resource management system:** brief description with reference on the legislation and roles
- 4. UNFC:** Short introduction to the UNFC with reference on basic UNECE UNFC documents

5. UNFC methodology

- Data source for E category
- Data source for F category
- Data source for G category

Project based approach

- Mining Projects, Viable Projects, Potential Viable Projects
- Prospective Projects, Non Viable Projects, Historic Estimates

