



UNFC Implementation on National Level

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KNOWLEDGE SHARING ON RESOURCE CLASSIFICATION AND ESTIMATION

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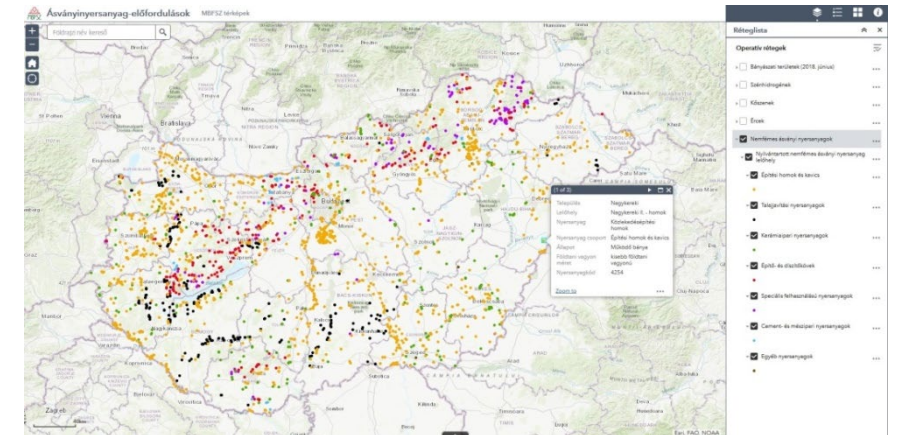
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National experience in introducing UNFC

Resource management in Hungary



- The Directorate of the Mining Supervision in the SARA with its regional Mining Supervision Departments performs the procedures of mining activity.
- Act XLVIII of 1993 on Mining, the management of mineral resources is a set of decisions and measures of the mining inspectorate.
- 20/2022 (I.31.) SARA Decree on certain rules for the implementation of the Mining Act.
- In Hungary, mineral resources and geothermal energy are state-owned at their natural location.
- SZTFH maintains the State Register of Mineral Resources and Geothermal Energy (since 1953).



https://map.mbfisz.gov.hu/asvanyvagon_kataszter/

- quantity and quality of mineral resources;
- annual change in mineral resources (exploitation, exploration, reclassification)
- the mineral resources left behind when the mine is closed or the field is abandoned.

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Existing reporting system



- Level of confidence: A,B, C1 and C2 (D) categories
- The Annex 1 of the SZTFH decree 20/2022 on certain rules for the implementation of the Act. (I. 31.) XLVIII of 1993 on mining: Hungarian categories of mineral resource classification, their correspondence with the terms of JORC international reporting standard, definitions of the JORC standard on the most important resource and reserve categories, the modifying factors, and some UNFC categories are specified.

MRI (Inventory of mineral resources and geothermal energy – *official database*)

BATER (Inventory of mining areas – *official database*)

Category	General knowledge	Additional parameters	Sampling, recovery
A	 Extrapolation is forbidden	 	 Min 80 % Full logging Boreholes
B	 Extrapolation allowed	 	Min. 80 %, in boreholes more than half with logging
C1	 Extrapolation based on similarities	 	Sampling: less than in category B
C2	 Extrapolation Single observations	-	Sampling in not a requirement

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Experience with UNFC



- Translation of international reporting codes (CRIRSCO: JORC, PERC, SPE-PRMS, Australasian Geothermal Code) and UNFC
- UNFC (2009) and UNFC (2019) in Hungarian are published on the UNECE webpage.
- Mapping between the national classification and international reporting and UNFC.
- Stakeholder consultations: experts, authorities, universities and industry.
- Case studies: non-metallic solid raw materials on local-country levels (~ 3000 sites), ores on local level (porphyric copper, manganese oxid ore and manganese carbonate ore, baryte, apatite, Pb-Zn; on 5 mining or exploration areas), hydrocarbons (local-country level; 360 gas and oil fields), geothermal energy (at least 10 sites)
- Bridging Document was prepared and is being developed in the frame of GSEU project.



National experience in introducing UNFC

Reporting terms in the Hungarian legislation (UNFC)



- 1. UNFC 221 class:** E2: The development and operation will be viable for environmental, social and economic reasons in the near future; F2: The technical feasibility of the development project is subject to further evaluation; G1: The product belonging to the project (mineral raw material) can be estimated with a high level of certainty.
- 2. UNFC 222 class:** E2: The development and operation will be viable for environmental, social and economic reasons in the near future; F2: The technical feasibility of the development project is subject to further evaluation; G2: The product belonging to the project (mineral raw material) can be estimated with a medium level of certainty.
- 3. UNFC 112 class:** E1: The development and operation are proven viable from environmental, social and economic considerations; F1: The technical feasibility of the development project is verified; G2: The product belonging to the project (mineral raw material) can be estimated with a medium level of certainty.
- 4. UNFC 111 class:** E1: The development and operation are proven viable from environmental, social and economic considerations; F1: The technical feasibility of the development project is verified; G1: The product belonging to the project (mineral raw material) can be estimated with a high level of certainty.

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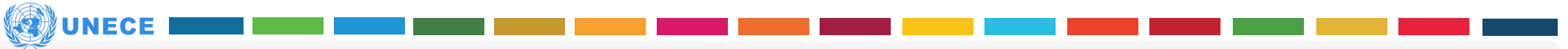
Reporting terms in the Hungarian legislation (CRIRSCO)



- **Solid geological mineral resource (Mineral Resource):** A geological mineral resource is a concentration or occurrence of solid material of economic value located in the earth's crust or on its surface, the knowledge of which (form, quantity and quality) provides a realistic prospect for future economic extraction.
- **Modifying Factors:** The aspects that determine the classification of geological mineral raw material reserve as industrial resource (industrial resource according to Section 49, point 14 of the Mining Law). These are: mining, processing, metallurgical, infrastructural, economic, marketing, legal, environmental, social and governmental factors.
- **Measured Mineral Resource:** The measured mineral resource is the part of the geological mineral resource that quantity, quality, density, geometry and physical properties can be estimated with sufficient certainty for the detailed mining planning and the final evaluation of the site's economics. using modifying factors. *Further details are in the training material.*
- **Indicated Mineral Resource:** Indicated Mineral Resource is the part of the geological mineral resource that quantity, quality, density, geometry and physical properties can be estimated with sufficient certainty so that the mine planning and raw material deposit can be determined using the modifying factors, in order to assess its economic viability and to ensure its reclassification to reserve. *Further details are in the training material.*

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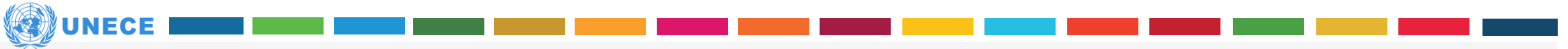
Reporting terms in the Hungarian legislation (CRIRSCO)



- **Inferred geological mineral resources (Inferred Mineral Resource):** The inferred geological mineral resource is the part of the mineral resources whose quantity and quality can only be estimated based on limited geological data and samples. The geological facts suggest, but do not prove, the geological and qualitative continuity. *Further details are in a separated file: enclosure.*
- **Solid mineral reserves (Mineral Reserve):** This category corresponds to industrial resource according to § 49, point 14 of the Mining Law. This is a part of the measured or indicated geological mineral resources that can be economically extracted. During its determination, production dilution and production loss are also taken into account. The necessary estimates and studies were completed, in which realistic mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors were taken into account as modifying factors. *Details: enclosure.*
- **Probable solid mineral reserves (probable industrial resource) (Probable Mineral Reserves):** Probable mineral reserves are the part of the indicated or, in some cases, measured mineral resources that can be economically extracted. The certainty level of the modifying factors used in the case of the probable raw material reserve is lower than that used in the case of the proven raw material reserve.
- **Proven Mineral Reserve:** The proven mineral reserve is the part of the measured mineral resource that can be economically extracted. The proven raw materials reserve means a high level of awareness of the modifying factors.

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Harmonization: national – CRIRSCO (2019) – UNFC (2019)



- **Category "A"**: The geometry of the mineral raw material bodies, internal variability and fault displacements are known and contoured in detail. The natural and technological types and quality types of the mineral raw material, useful and harmful components, are known in detail - in sufficient detail to design the complex processing tree - and have been characterized according to the enumeration conditions. The hydrogeological, engineering-geological (geotechnical), mining geology and other natural conditions are known in such detail that provides the basic data necessary for planning the development of the deposit. Details: enclosure.
- **2. Category "B"**: The position and geometry of the mineral raw material bodies and significant fault displacements are known and contoured, the internal variability, the nature of barren deposits and the location of the tectonized parts are known. The natural types of the mineral raw material are known and contoured, the spatial distribution patterns and quantitative ratios of the technological types and quality types are known, the binding of mineral and useful and harmful components - in sufficient detail to select the principle tree of the rational and complex processing of the raw material - is known and characterized according to the conditions. Details are in an enclosure.
- **3. "C1" category**: The dimensions and characteristic shapes of the raw material bodies, their settlement conditions and the basic characteristics of their internal structure are known; the variability of the raw material bodies and the possible interruption of continuities, in the case of mineral raw material occurrences with layer-like development and the occurrences of building and construction stones, the low-amplitude intensively tectonized areas were evaluated. Details are in an enclosure.

National experience in introducing UNFC

Harmonization: national – CRIRSCO (2019) – UNFC (2019)



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- **Category „C2“:** The size, shape, internal structure, settlement conditions of the raw material bodies were evaluated based on geological and geophysical data, which are confirmed by cutting the raw material with drilling or mining facilities. The quality and technological properties of the raw material were determined based on the data of a small number of laboratory tests, or were evaluated according to the analogy of the parts known in detail from the same or similar deposit. The evaluation of the hydrogeological, engineering-geological (geotechnical), mining geology and other natural conditions was based on the data observed in the research facilities, the data existing in other parts of the given deposit, and the analogy of known deposits in the given area. Details are in an enclosure.
- The knowledge categories **"A" and "B" and the lower complexity (1-3) "C1"** can be classified as **measured mineral resources** according to the international reporting standard.
- According to the international reporting standard, an economic evaluation can be carried out on the basis of these and taking into account the **modifying factors** (proven or probable industrial resource, i.e. reserve).
- The **measured geological mineral resources** correspond to **the UNFC 221** category.
- **Proven industrial resource (proven reserve)** corresponds to **UNFC 111**, **probable industrial resource (probable reserve)** corresponds to **UNFC 112** category.

National experience in introducing UNFC

New UNFC methodology in Hungary



	UNFC code	Description	UNFC name
1.	E1.1., F1.1., G1+G2	Mining plot with extraction TOP (Technical Operation Plan).	viable project
2.	E1.1., F1.2., 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.	E1.2, 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, F3.2, 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

National experience in introducing UNFC

Comments to UNFC application in Hungary



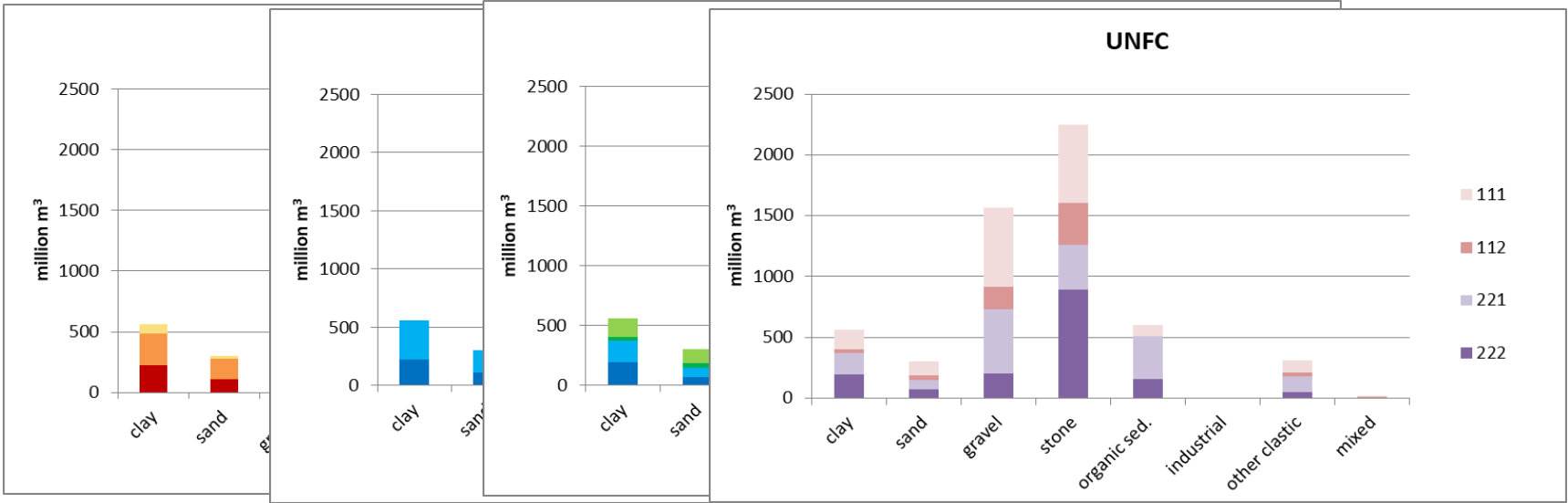
- **G category** can be provided based on the **State Register of Mineral Resources**:
 - **A,B,C1 and C2 (L/M complexity): G1**
 - **C2 (High complexity): G2**
- **Technical Operation Plan (TOP)**: permitting stages are related to the economic, social and environmental viability (**E**) of the project and technical feasibility (**F**); present or lack of the stages of TOPs + other considerations
- **Considerations**: Accessible periods for establishment of mine plots, renewals of TOP, other permits: environmental, public hearing.
- **Benefits**:
 - All E,F,G related geological and mining data are available in the database of the mining inspectorate.
 - Active and non-active projects can be compared on a uniform way and the importance and viability of projects can be considered transparently.

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Examples for UNFC application in in Hungary



- Regional level for aggregates (published: 2016 on the UNECE EGRM Meeting): Transdanubia



Local level, industrial mineral

Main commodity	Owner	Development stage	State of activity	E category	F category	G category	Resource/ reserve
				Exploration report accepted, EIA is pending, no mine plot, high interest on EU-level	Viable technology, prior TOP for extraction	Proved Measured and Indicated resources	Measured and Indictaed Resource
Baryte	Company	Resource definition	(In)active	E2	F 2	G1,G2	Confidential

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Further developments



- Development of skills and database to apply UNFC more easily.
- Preparation of raw materials data sets for data provision to the EC DG Grow (RMSG) and to the European Geo Data Infrastructure (EGDI) in the frame of Geological Service for Europe project (GSEU).
- Leading of the UNFC Task in the GSEU project: coordination, baseline assessment, development of a guidance on EU-level based on comparison with UNECE UNFC Guidance for Europe (2022) and taking into account RMSG instructions and national/regional similarities and differences.
- Comparison between recent national legislative documents on resource management including UNFC with prescriptions of the Critical Raw Materials Act (2023)
- Share experience with stakeholders, dissemination and communication.





Thank you!

Zoltán Horváth
Supervisory Authority of Regulatory Affairs
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