Republic of Serbia
Ministry of Mining and Energy

UNECE

European Commission

GSEU
GEOLOGICAL SERVICE FOR EUROPE

Workshop on
Implementing the United Nations Framework Classification for Resources (UNFC) in Southeast Europe

From ABC_1C_2 to UNFC and Hungarian Experience

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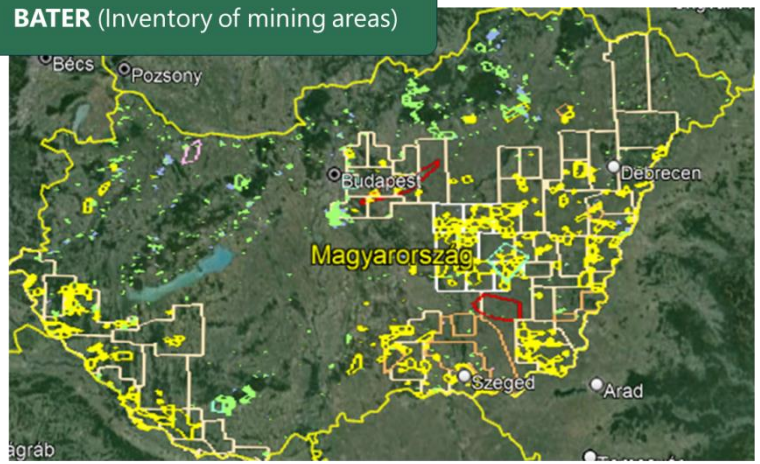
Resource management in Hungary

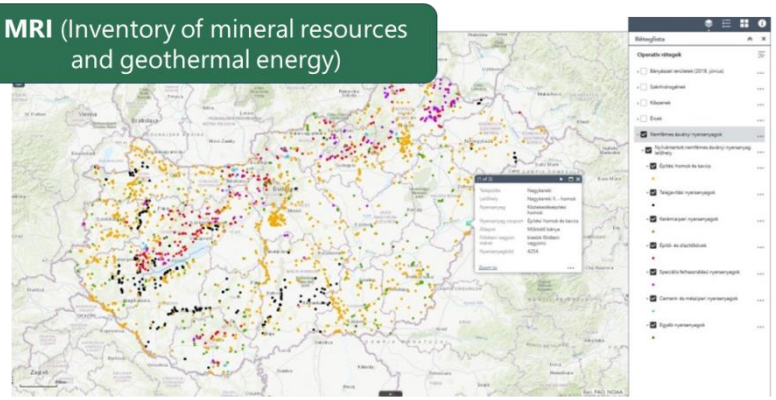
- The Directorate of the Mining Supervision in the SARA with its regional Mining Supervision Departments performs the procedures of mining activity.
- Act XLVIII of 1993 on Mining, the management of mineral resources is a set of decisions and measures of the mining inspectorate.
- 20/2022 (I.31.) SARA 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.
- SARA maintains the State Register of Mineral Resources and Geothermal Energy (MRI, since 1953) and the inventory of mining areas (BATER) and inventories for closed and open mining waste facilities.
- Act CL (2016) on general administrative regulations.

BATER (Inventory of mining areas)



https://sztfh.hu/nyilvantartasok/banyaszati-teruletek-nyilvantartasa/

MRI (Inventory of mineral resources and geothermal energy)



https://map.mbfsz.gov.hu/asvanyvagyon_kataszter/

UNFC relevant topics in the legislation

- 20/2022. (I. 31.) SARA Decree on certain rules of law enforcement XLVIII of 1993 on mining

Experts
Legally binding involvment of national qualified experts in reporting of changes of resource volume

Reporting form and frequency
Annual, legally binding for companies, „G" category in the form, Mineral resource inventory is being developed with UNFC

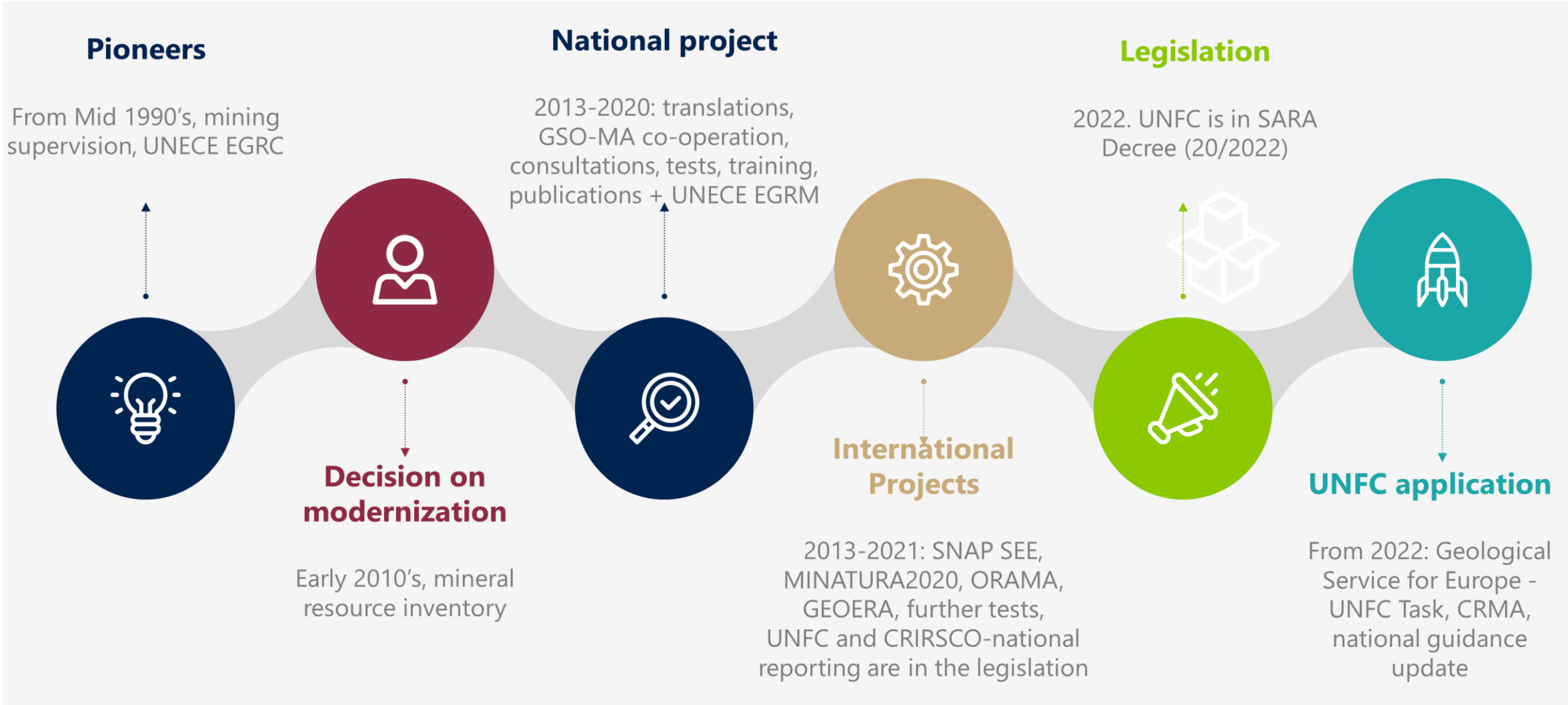
Solid and fluid type
+ mining wastes

Viable and Potential-viable projects
UNFC 111, 112, 221 and 222 classes are defined

CRIRSCO-type reporting (PERC, JORC)
Defined in the context of the traditional reporting

A,B,C1 and C2 categories
Probability based, traditional, all MRI data in traditional classification

UNFC history in Hungary



Steps to the UNFC application

- **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 site-country levels, ores on local level (porphyric copper, manganese oxid ore and manganese carbonate ore, barite, apatite, Pb-Zn) hydrocarbons and geothermal energy + mining wastes
- **Bridging Document** was prepared and is being developed in the frame of GSEU project.

Reporting terms in the Hungarian legislation (UNFC)

- **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.
- **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.
- **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.
- **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.

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 based on using modifying factors.
- **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 reclassifiication to reserve.

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.
- **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.
- **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.

Reporting terms in the Hungarian legislation (National)

- **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.
- **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.
- **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.

Reporting terms in the Hungarian legislation (National +)

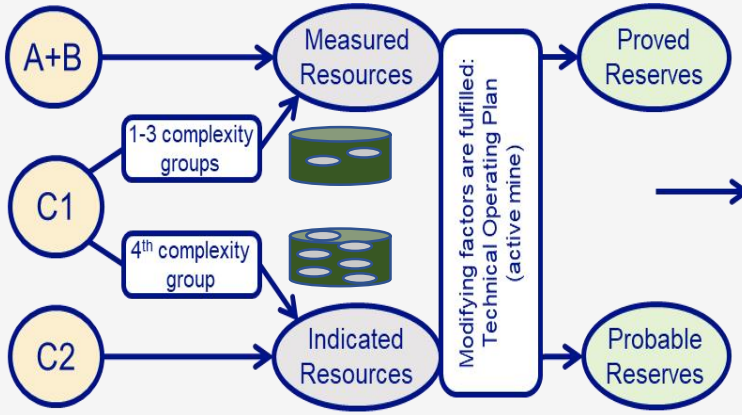
- **Category „C2":** The size, shape, internal structure, settlement conditions of the raw material bodies were evaluated based on geological and geophysical data, which are confirmed by cutting the raw material with drilling or mining facilities. The quality and technological properties of the raw material 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.
- **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 and FGU-GKZ (2010).
- **Measured geological mineral resources correspond to the UNFC 221 category.**
- **Proven industrial resources (proven reserves) correspond to UNFC 111.**
- **Probable industrial resource (probable reserve) corresponds to UNFC 112 category.**

Mineral resource related inventories

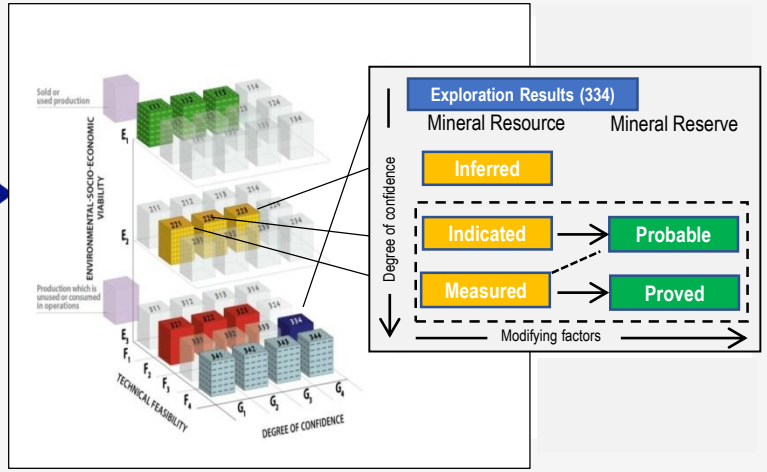
National classification and reporting

Category	General knowledge	Knowledge on additional parameters	Sampling, recovery
A	Extrapolation is forbidden	Groundwater Tectonics	Min. 80 % full logging Boreholes
B	Extrapolation may be allowed		Min. 80 %, in bore-holes more than half with logging
C1	Extrapolation based on similarities		Sampling: less than in category B
C2	Extrapolation single observations		Minimum

National to CRIRSCO



From CRIRSCO to UNFC

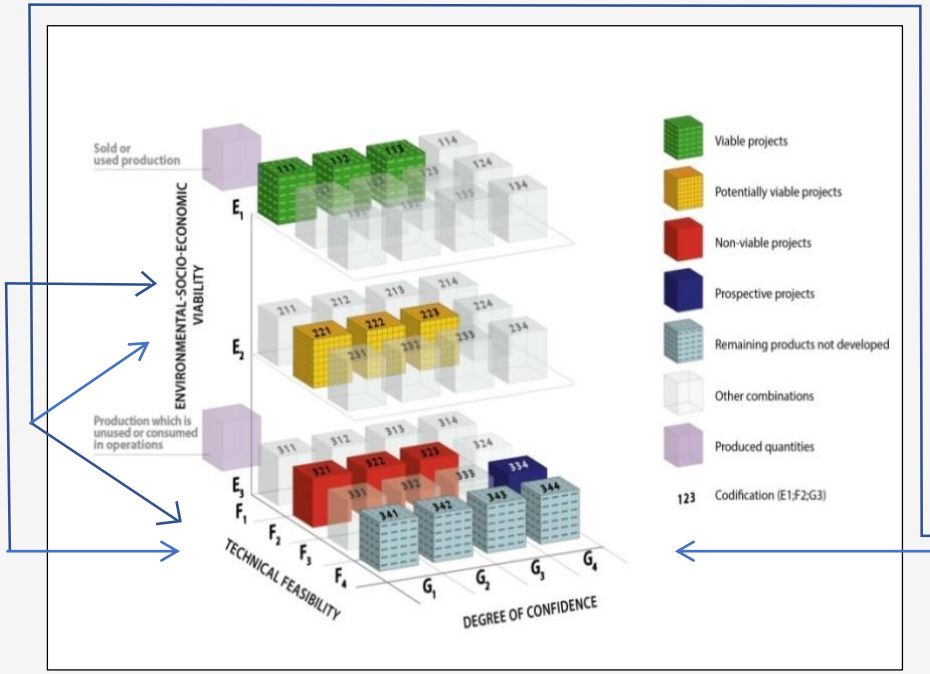


- „G" is based on Mineral Resource Inventory including the status of mining areas
- „E" and „F" is based on Inventory of Mining Areas (Technical Operation Plan and status of a project) E.g. mining plot with extraction TOP: E1.1;F1.1. (viable project); mine with TOP for suspending: E2;F2.2. (potential viable project); mine without licensee: E3.1, F2.3 (non-viable project).
- The recent status of exploration or mining activity and historical data (UNFC E3,F4,G1-2-3) need to be considered.

Data sources for UNFC

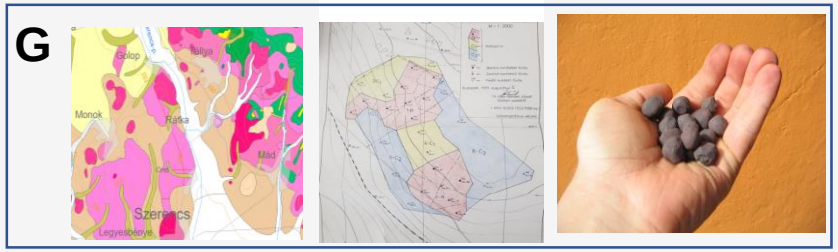
- Decisions:
  Technical Operation Plans
- Environmental permissions (including public hearing)
- Co-authorities
- Internet: feasibility studies (not official)

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



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

- Exploration reports
- Annual reports
- Data Repository of SARA (Mining and Geoscientific)



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New UNFC methodology including ABC_1C_2 categorization and harmonization (based on BATER and MRI)

	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, F2.1, 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;F2.3; G1+G2 (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**

- **G category**: State Register of Mineral Resources:
- A,B and C_1 (L/M complexity): G1
- C_1 (High complexity) and C_2: G2 (D: G3)

- **Technical Operation Plan (TOP)**: permitting stages are strongly related to the economic, social and environmental viability (E) of the project and technical feasibility (F); present or lack or the stages of TOPs + other considerations.

- **Considerations**: Accessible periods for establishment of mine plots, renewals of TOP, permits: environmental, public hearing

- **Benefits**: Most E,F,G related geological and mining data are available in the database of the mining inspectorate.

Summary

- UNFC activity goes back 30 years in Hungary. The collaboration between mining supervision and geological survey organizations has significantly contributed to the modernization of mineral resource inventory with UNFC applications.
- The official resource classification and the data collection are primarily based on A, B, C_1 and C_2 categories (UNFC „G” is in the reporting form) but there is an existing data model to integrate the relevant inventories (resource and mining areas) to support the proper UNFC classification.
- UNFC classification can be done based on using available bridging (e.g. FGU-GKZ 2010), or with a direct use of the UNFC Guidance for Europe (2022). The preparation of UNFC guidance document on national / regional levels is an objective (the support of drafts is in progress in the frame of the Geological Service for Europe project).
- Experience with UNFC supports the official data provision to the EU in the context of the CRMA.

- UNFC can be applied for sites (projects), with aggregation of data on county and on country levels.
- UNFC makes easier the comparison between different projects that have different readiness level.
- UNFC supports the sustainable resource management.

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Thank you!

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