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Geological and Geophysical Institute of Hungary

Classification of Selected Hungarian Mineral Resources according to UNFC-2009, CRIRSCO Template, PRMS and the Importance of a Common Language for Mineral Resources in SEE Countries (SNAP SEE Project)

5th UNECE EGRC Meeting, 29 of April to 2 of May 2014 , Geneva

» Content

National project

> Introduction of the project (structure, tasks, participating organizations)
> Results for non-metallic solid mineral resources
> Results for coals
> Results for petroleum
> Summary

International project

(Sustainable Aggregates Planning in South East Europe)

> Introduction
> Multisectoral analysis
> Mineral classification systems

Hungarian Office for Mining Geology (MBFH)

Geological and Geophysical Institute of Hungary (MFGI)

Hungarian Geological Society (MFT)

Harmonization of the National Mineral Resources Classification System with International Standards, Codes and UNFC-2009

Modernization of the National Mineral Resources Inventory - project since 2013

1. Overview of the National Mineral Resources Inventory
2. Translations of the UNFC-2009, CRIRSCO-2010, JORC-2012, PERC-2012, SPE-PRMS, Australian and Canadian Codes for Geothermy-2010, CSLS-2007, CO2CRC-2008 and USGS definitions.
3. Clarification of the terminology – comparison
4. Methodology for conversions considering national criteria

Hydro-carbons	Geo-thermal Energy	CO_2 storage	Coals	Non-metallic solid mineral resources	Ores
WG 1-2-3	WG 1-2-3	WG 1-2-3	WG 1-2-3	WG 1-2-3	WG 1-2-3

Participants in 3 Working Groups:

WG1: Research Institute (MFGI): Z. Horváth, K. Sári, Zs. Kovács, A. Jobbik, L. Zilahi-Sebess, A. Nádor, Á. Gulyás, Gy. Falus, Z. Püspöki, K. Török, Z. Lantos, D. Tolmács

WG2: Mining Authority (MBFH): G. Katona, F. Lesták, G. Gál, G. Szepessy, Mrs Gombár G. Forgács, L. Ó. Kovács, G. Kovács, Gy. Bihar

WG3: NGO-Companies-other experts (MFT): B. Fodor, Cs. Baksa, G. Bada, A. Király, V. Lemberkovics, S. Trömböczky, J. Szanyi, L. Livó, I. Horányi, T. Zelenka, J. Földessy.

EURÓPAI GAZDASÁGI BIZOTTSÁG

Az ENSZ fosszilis energiahordozó- és ásványi nyersanyagkészletre és -vagyonra vonatkozó osztályozási keretrendszere, 2009

EGB ENERGIA SOROZAT, 39. sz.

Fordította: Sári Katalin
Közreműködtek:
Dr. Horváth Zoltán, Dr. Fodor Béla, Trömböczki Sándor, Bihari György

Ellenőrizte: Dr. Semseiné Szekeres Edit, Dr. Püspöki Zoltán
Készült a Magyar Földtani és Geofizikai Intézetben a Magyar Földtani és Bányászati Hivatal és a Magyarhoni Földtani Társulat közreműködésével 2013-ban

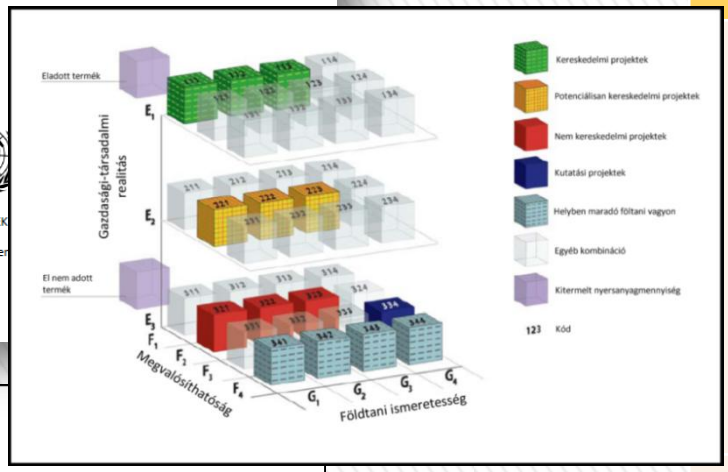
EGYESÜLT NEMZETEK

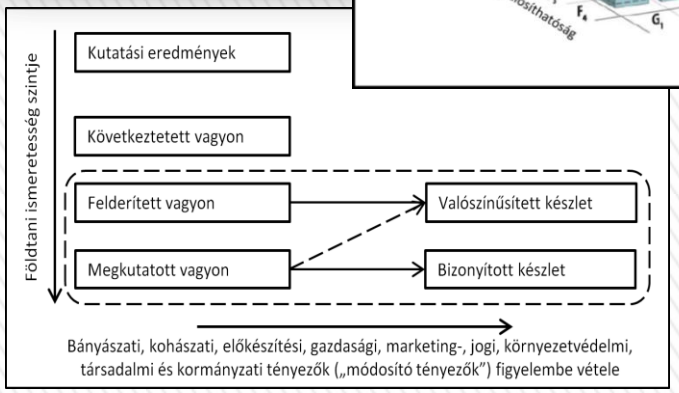
New York és Ge

i

Available on the UNECE webpage since the spring of 2014

UNFC		CRIRSCO	Hungarian/Russian) magyar (orosz)
111	Kereskedelmi projekt	Bizonyított készlet	Ipari vagyon feltárt telepei
112		Valószínűsített készlet	Ipari vagyon becsült telepei
221	Potenciálisan kereskedelmi projekt	Részletesen megkutatott vagyon	A, B, C1 – 1–3. komplexitási csoport
222		Felderített vagyon	C1 – 4. komplexitási csoport, C2
223		Következtetett vagyon	D1
334	Kutatási projekt	Kutatási eredmények	-





CRIRSCO Modifying F.

PRMS osztályok		UNFC-2009 "minimum" kategóriák			UNFC-2009 osztályok
Feltárt	Készlet	E 1	F1	G1, G2, G3	Kereskedelmi értékű projektek
	Feltételes vagyon	E2	F2	G1, G2, G3	Potenciálisan kereskedelmi értékű projektek
		E3	F2	G1, G2, G3	Nem kereskedelmi értékű projektek
	Nem kitermelhető	E3	F3	G1, G2, G3	Helyben maradó mennyiség
Feltáratlan	Reménybeli vagyon	E3	F3	G4	Kutatási projektek
	Nem kitermelhető	E3	F4	G4	Helyben maradó mennyiség

Pathway from the Hungarian system to CRIRSCO via the UNFC-2009.

Contractors serve information on mining activity including data on mineral resources

Supplement of former reporting form → New (suggestion)

Non-metallic minerals – based on declarations		
Economical declaration (based on market conditions and expenses planned by the contractor)	**Environmental and social permissions**	**UNFC E**
Yes (if E1)	Yes	**1**
Yes (if E1)	No	**2**
No (if E1)	No	**3**
Yes (if E2)	Yes	**2**
Yes (if E2)	No	**3**
Yes (if E3)	Yes	**3**

UNFC – category E

Reporting form for mineral resources (draft)

Identification of mining plot	
Density Inhomogenity	State of mining site:
Quantity in m^3 including data on mine spoil	
Exploited and the total amount of the registered mineral resource per quarters	
Changes in registered mineral resources	

Proved Reserve or Measured Resource	former A
	former B
	former C1 (1-3. comp. gr.)
Probable Reserve or Indicated Resource	former C1 (4. comp. gr.)
	former C2
Inferred Resource	former D1

Economic category (E1, E2 or E3):

Modifying factors	OK	In progress	Not fulfilled
Mining			
Processing			
Metallurgical			
Infrastructure			
Economic			
Marketing			
Environment-Social			
Government			

Coals – based on the inventory		
Attainment		UNFC F
1	Under exploratory research	**4**
2	Under preliminary exploration	**4**
3	Under detailed exploration	**4**
4	Measured exploration	**3**
5	Planned mine	**3**
6	Mine under construction	**2**
7	Mine on production	**1**
8	Mine on hold	**1**
9	Closed mine	**2**

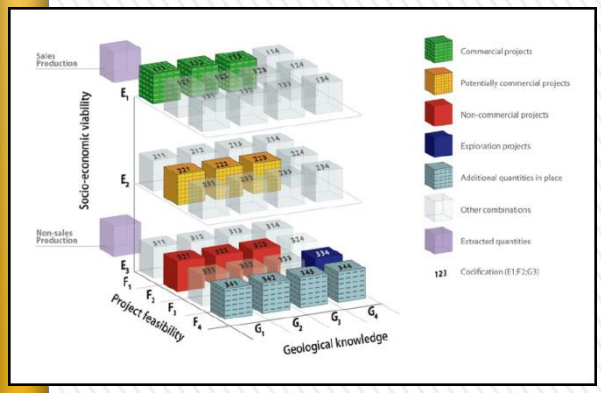
Non-metallic solid minerals – based on the inventory		
The state of the mine		UNFC F
1	On Production	**1**
2	On Hold	**2.2**
3	Closed	**2.3**
0	Explored Area	**3**

UNFC – category F

UNFC		CRIRSCO	Hungarian (Russian)
111	Commercial project	Proved Reserves	Exploitation Reserves in fully explored deposits
112		Probable Reserves	Exploitation Reserves in estimated deposits
221	Potentially commercial project	Measured Resources	Resources of category **C1** in deposits of 1st, 2nd, and 3rd complexity groups and categories **A** and **B**
222		Indicated Resources	Resources of category **C2** in deposits of all complexity groups and category **C1** in deposits of the 4th complexity group
223		Inferred Resources	**D1**
334	Exploration project	Exploration Results	

Recent classification	UNFC G	Possible UNFC G sub-categories
A	**1**	G1.1
B	**1**	G1.2
1st, 2nd, and 3rd complexity groups of C1	**1**	G1.3
4th complexity group of C1	**2**	G2.1
C2	**2**	G2.2
D1 (not included in mineral resource inventory)	**3**	-
-	**4**	-

UNFC – category G



3x3x4+4=**40** → **6**

UNFC		CRIRSCO	Hungarian (Russian)
111	Commercial project	Proved Reserves	Exploitation Reserves in fully explored deposits
112		Probable Reserves	Exploitation Reserves in estimated deposits
221	Potentially commercial project	Measured Resources	Resources of category **C1** in deposits of 1st, 2nd, and 3rd complexity groups and categories **A** and **B**
222		Indicated Resources	Resources of category **C2** in deposits of all complexity groups and category **C1** in deposits of the 4th complexity group
223		Inferred Resources	**D1**
334	Exploration project	Exploration Results	-

Mapping between the Hungarian and UNFC system	111	112	121, 211, 221	122, 212, 222	-	131, 231, 331, 321, 322, 132, 232, 332
	↓	↓	↓	↓	↓	↓
UNFC – 6 main classes	111	112	221	222	223	334
UNFC Class	Commercial project		Potentially commercial project			Exploration project
CRIRSCO	Proved Reserves	Probable Reserves	Measured Resources	Indicated Resources	Inferred Resources	Exploration Results

UNFC → CRIRSCO/PERC

Pathway from the Hungarian system to UNFC-2009 via CRIRSCO

UNFC		CRIRSCO	Hungarian (Russian)
111	Commercial project	Proved Reserves	Exploitation Reserves in fully explored deposits **(No reserves in the Hungarian system)**
112		Probable Reserves	Exploitation Reserves in estimated deposits
221	Potentially commercial project	Measured Resources	Resources of category **C1** in deposits of 1st, 2nd, and 3rd complexity groups and categories **A** and **B**
222		Indicated Resources	Resources of category **C2** in deposits of all complexity groups and category **C1** in deposits of the 4th complexity group
223		Inferred Resources	**D1**
334	Exploration project	Exploration Results	-

Modifying factors

Hungarian inventory

Russian Federal Government Agency State Commission on Mineral Reserves (FGU GKZ) – Committee for Mineral Reserves International Reporting Standards (CRIRSCO) 2010: Guidelines on Alignment of Russian minerals reporting standards and the CRIRSCO Template – Moscow.

UNECE, Comittee on Sustenable Energy, Expert Group on Resource Classification 2013: Specifications for the application of the United Nations Framework Classification for fossil energy and mineral reserves and recources 2009 (UNFC-2009), Annex III. Bridging document between CRIRSCO Template and UNFC-2009. – ECE/Energy/GE3/2013/3., pp. 17–22., Geneve.

Competent Person is necessary

Non-metallic minerals

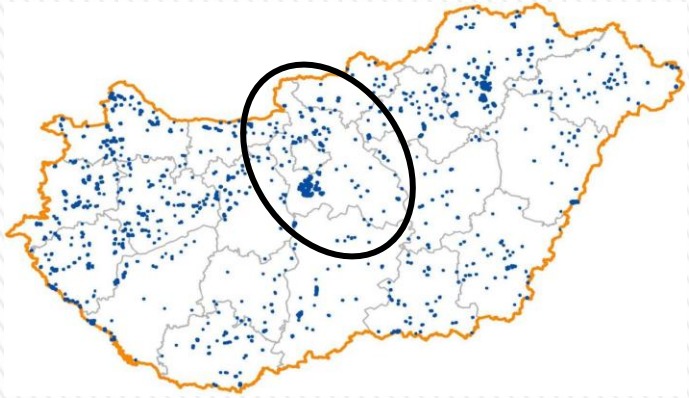
UNFC		CRIRSCO	Hungarian (Russian)
111	Commercial project	Proved Reserves	Exploitation Reserves in fully explored deposits
112		Probable Reserves	Exploitation Reserves in estimated deposits
221	Potentially commercial	Measured Resources	Resources of category **C1** in deposits of 1st, 2nd, and 3rd complexity groups and categories **A** and **B**
222		Indicated Resources	Resources of category **C2** in deposits of all complexity groups and category **C1** in deposits of the 4th complexity group
223		Inferred Resources	**D1**
334	Exploration project	Exploration Results	-

Russian Federal Government Agency State Commission on Mineral Reserves (FGU GKZ) – Committee for Mineral Reserves International Reporting Standards (CRIRSCO) 2010: Guidelines on Alignment of Russian minerals reporting standards and the CRIRSCO Template – Moscow.

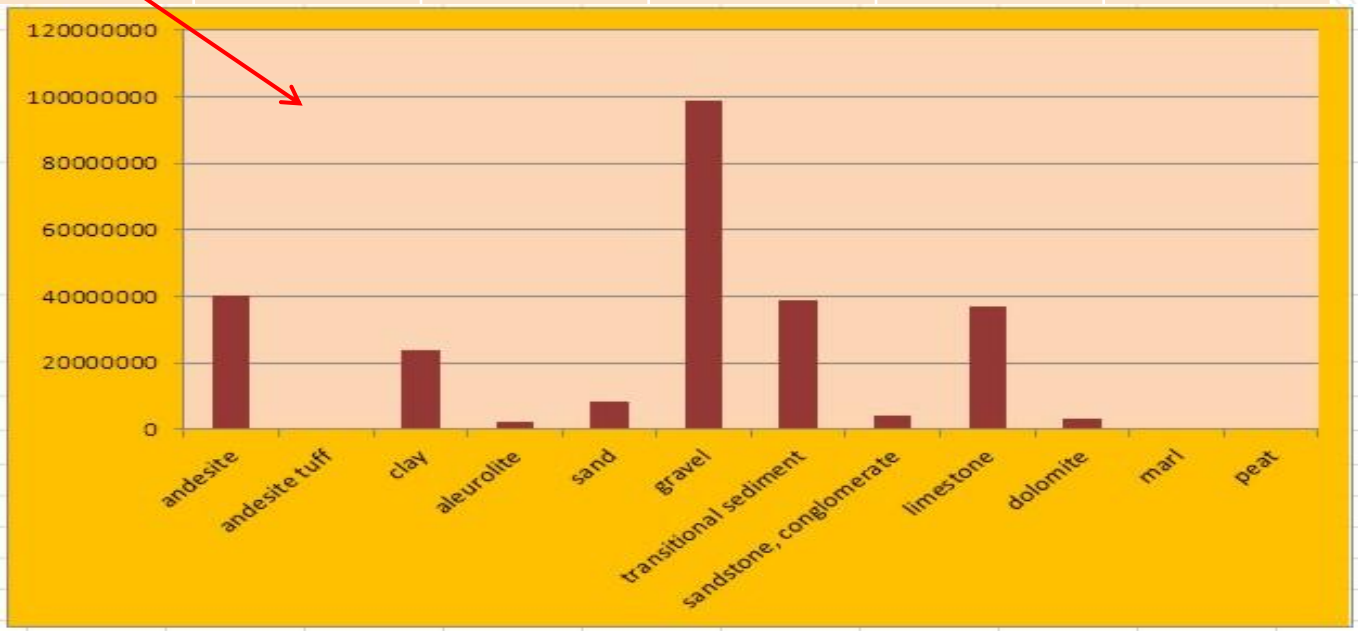
UNECE, Comittee on Sustenable Energy, Expert Group on Resource Classification 2013: Specifications for the application of the United Nations Framework Classification for fossil energy and mineral reserves and recources 2009 (UNFC-2009), Annex III. Bridging document between CRIRSCO Template and UNFC-2009. – ECE/Energy/GE3/2013/3., pp. 17–22., Geneve.

Non-metallic minerals

Pest county, non-metallic mineral resources in m^3, 2012

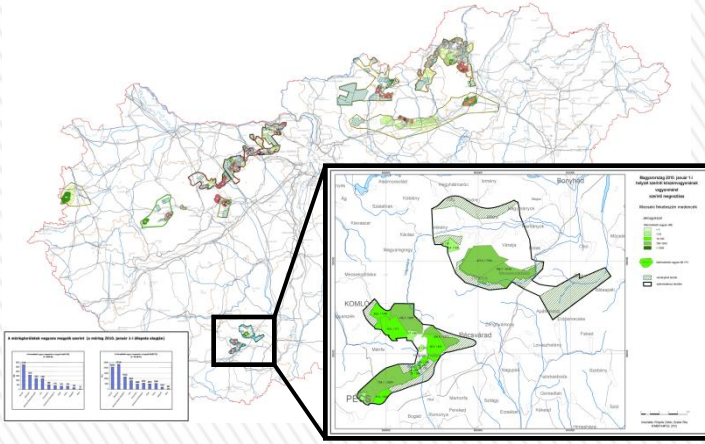


CRIRSCO	Proved Reserves	Probable Reserves	Measured Resources	Indicated Resources	Inferred Resources	Exploration Results
UNFC Class	Commercial project		Potentially commercial project			Exploration project
UNFC 6	111	112	221	222	223	334
andesite						
andesite tuff						
clay						
aleurolite						
sand						
gravel						
transitional sediment						
sandstone, conglomerate						
limestone						
dolomite						
marl						
peat						

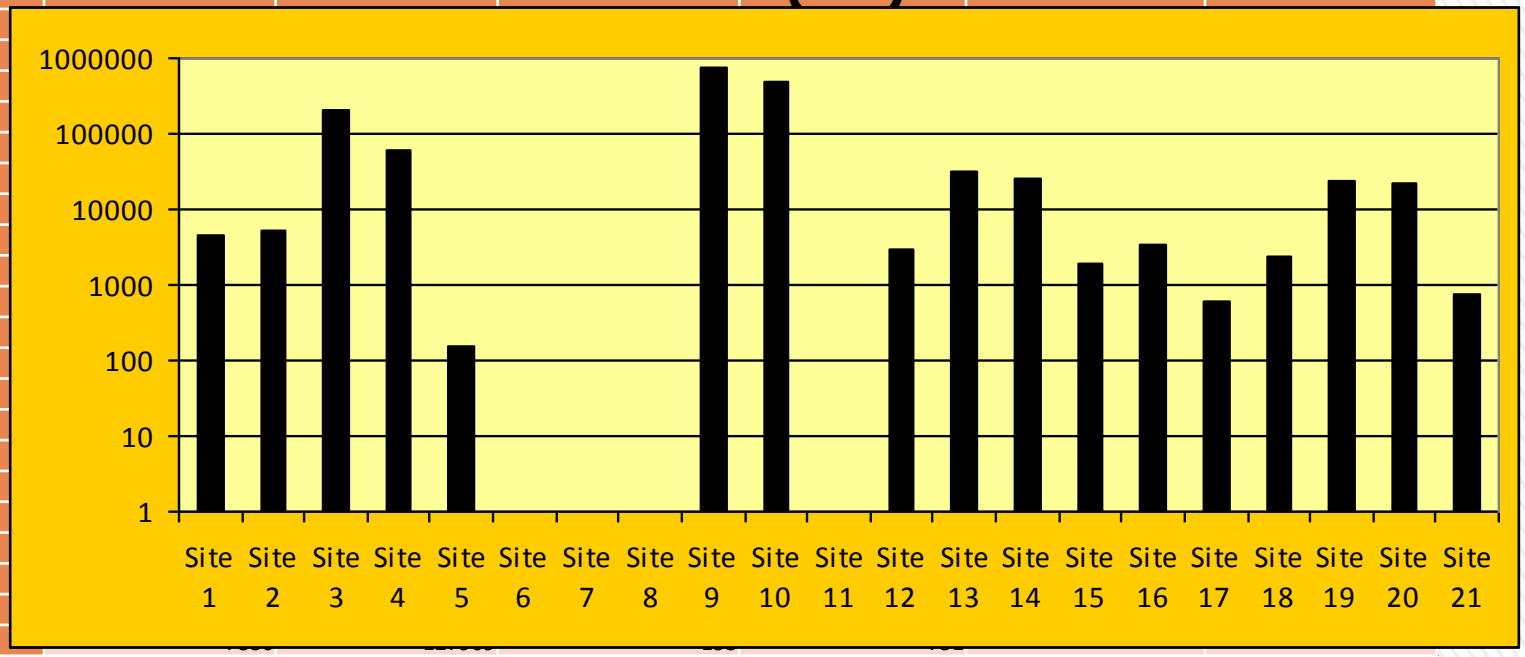


Non-metallic minerals – example

Mecsek, coal resources in kt, 2010



CRIRSCO	Proved Reserves	Probable Reserves	Measured Resources	Indicated Resources	Inferred Resources	Exploration Results
UNFC Class	Commercial project		Potentially commercial project			Exploration project
UNFC 6	111	112	221	222	223	334
Site 1						
Site 2						
Site 3						
Site 4						
Site 5						
Site 6						
Site 7						
Site 8						
Site 9						
Site 10						
Site 11						
Site 12						
Site 13						
Site 14						
Site 15						
Site 16						
Site 17						
Site 18						
Site 19						
Site 20						
Site 21						



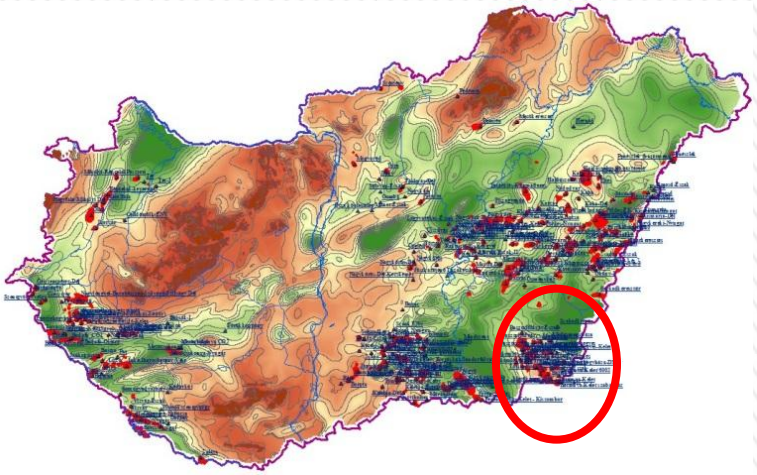
Coals – example

Mapping of the Hungarian Hydrocarbon Inventory and SPE/UNFC systems

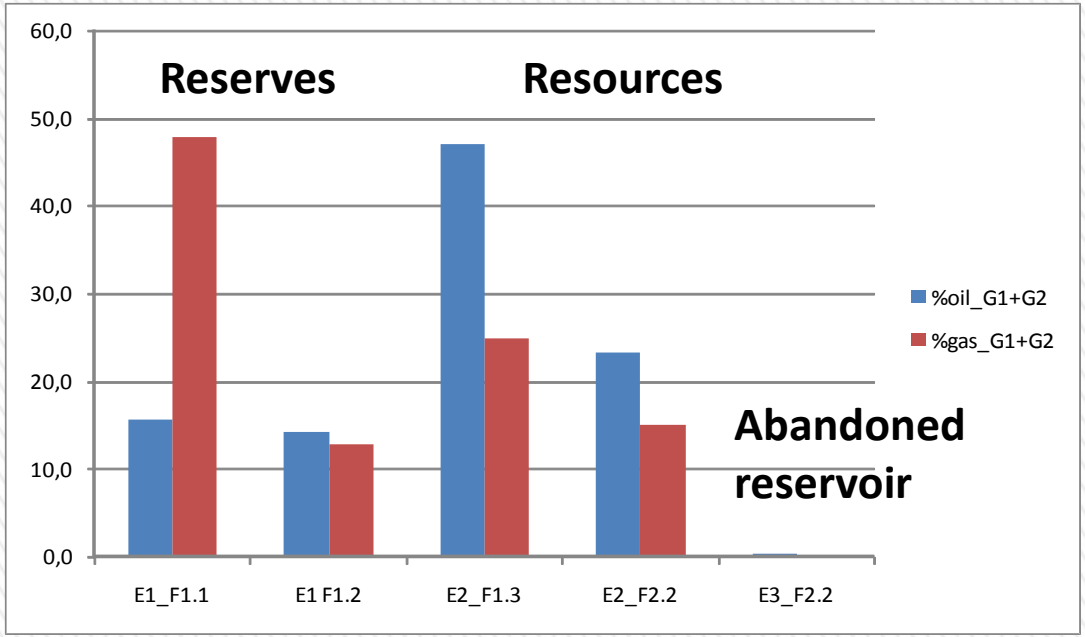
Recently used Hungarian system					International systems				
Phase of work	Project documentation	acquisition	Base of qualification	Category	**SPE Resource Class**	**SPE/PRMS uncertainity**	**UNFC G axis**	**UNFC F axis**	**UNFC E axis**
Exploration, Request for lease	Final Geological and Well Report, Preliminary Field Development Plan	explored	final report	C2	Discovered Petroleum Initially In Place	P90, P50, P10	G1, G1+G2, G1+G2+G3	F2.2	E3.2
			final report, preliminary development plan	C2	Reserves	1P, 2P, 3P	G1, G1+G2, G1+G2+G3	F2.2	E3.2
			final report	C2	Contingent Resources	1C, 2C, 3C	G1, G1+G2, G1+G2+G3	F2.2	E3.2
Lease	Technical Plan (max. 5 years)	developed (under construction)	development plan	C1, C2	Reserves	1P, 2P, 3P	G1, G1+G2, G1+G2+G3	F1.3	E1
			development plan	C2	Contingent Resources	1C, 2C, 3C	G1, G1+G2, G1+G2+G3	F1.3	E2
Production phase	Technical Plan (yearly)	on production	development plan	B, C1	Reserves	1P, 2P, 3P	G1, G1+G2, G1+G2+G3	F1.2	E1
	Field Development Plan		development plan	C1, C2	Contingent Resources	1C, 2C, 3C	G1, G1+G2, G1+G2+G3	F2.1	E2
	Intermission Plan	stopped or abandoned	intermission plan	B	Reserves	1P, 2P, 3P	G1, G1+G2, G1+G2+G3	F2.2	E2
	Annual Report/Change	on production	production analysis, reserve evaluation	A, B	Reserves	1P, 2P, 3P	G1, G1+G2, G1+G2+G3	F1.1	E1
			geological appraisal	C1	Contingent Resources	1C, 2C, 3C	G1, G1+G2, G1+G2+G3	F2.1	E2

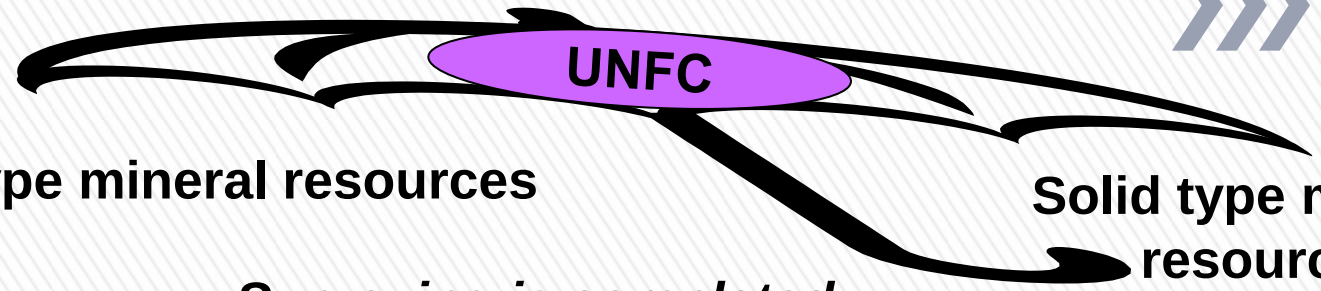
UNFC Classification of Reserves and Contingent Resources of Battonya High, SW- Hungary

Status	Proved+Probable Reserves		Proved+Probable Resources			
UNFC E,F	E1_F1.1	E1 F1.2	E2_F1.3	E2_F2.2	E3_F2.2	All volume
	on production continous	on production starting	develop-ment phase	eariler production stopped	abandoned	
% oil_G1+G2	15,6	14,0	47,0	23,2	0,2	100,0
% gas_G1+G2	47,7	12,7	24,7	14,9	0,0	100,0
No. of reservoirs	33	7	61	66	1	**168**
No. of fields	12	7	19	10	1	49
Sum. of fields						30



Battonya High





Fluid type mineral resources

Solid type mineral resources

Surveying is completed

SPE-PRMS system

Hydro-carbones

In the new reporting form 1P 2P 3P would be involved

Preliminary suggestion for new mineral re-sources reporting form

CO2 storage

Potential assessment is in progress

Economic study is required

Geothermy

- Australian system accepted, UNFC-2009 compliance in progress

-Reports on concessions will serve data on geothermal plays

- Technology dependence

CRIRSCO family (PERC, JORC)

Coals

Non-metallic solid mineral resources

Ores

Suggestion: PERC with minor addition from JORC for ores on national level (definiton of „ore reserve")

- preliminary suggestion for new mineral resources reporting form

- conversion between national data on mineral resources and international standards and UNFC-2009 can be achieved considering national criteria

Definitions and Modifying Factors were discussed.

Conversion by UNFC-2009 can be solved if there is data on „E" and Modifying Factors.

» Summary of the national project

- First steps were taken, operating project, experiences and questions
- The traditional/Russian system allows our project to prepare the datasets for conversion to UNFC-2009 and CRIRSCO family categories (PERC, JORC) and SPE/PRMS if we have data on „E" category and on modifying factors.
- Contribution of contractors by data serving in new reporting forms is important. Trainings are necessary on national level.
- The well structured project with regular consultations between Stakeholders (contractors, NGO, authority, experts, researchers) in Hungary and by following the UNECE EGRC Working Group is ready to suggest the best practice for classification and reporting system to the Mining Authority in order to support the sustainable mineral resources management.

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SNAP SEE
Planning Aggregates Supply

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Background

Assuring sustainable supply of aggregates is an important challenge due to their economic importance and the potential environmental and social impacts associated with their production. The SNAP-SEE project focuses on developing and disseminating tools for aggregates management planning in Southeast Europe (SEE). It builds on the results of the Sustainable Aggregates Resource Management (SARMa) project.

Due to regional differences in historical development, there are **diverse approaches** to aggregates policies, planning and management in SEE, which is **hindering resource efficiency** and economic development in the region:

- **differences** among mineral policies;

- aggregates policies and plans are distributed among **many different legal documents**, making coordination and a comprehensive understanding difficult;

- authorities in SEE countries do not have the **understanding of either sustainable aggregates resource management (SARM) or planning for sustainable supply mix (SSM)** and

- there is almost a complete **lack of coordination** on planning supply from primary and secondary aggregates sources.

Challenges

The identified problems are **a lack of**:

- **coordinated national/regional planning** for aggregates' supply that addresses cross-sectoral interactions, and ensures that documents are consistent;

- **integrated planning** for primary and secondary aggregates that addresses resource efficiency;

- **capacity and competence** to address the preceding two problems;

- **stakeholder engagement** and consultation process to ensure that planning addresses the concerns and needs of all target groups.

Main Objectives

The primary objective is to develop a Toolbox for Aggregates Planning to support national/regional, primary and secondary aggregates planning in SEE countries, which will include:

- **SNAP-SEE Vision** for a transition to integrated, comprehensive sustainable aggregates planning in SEE;

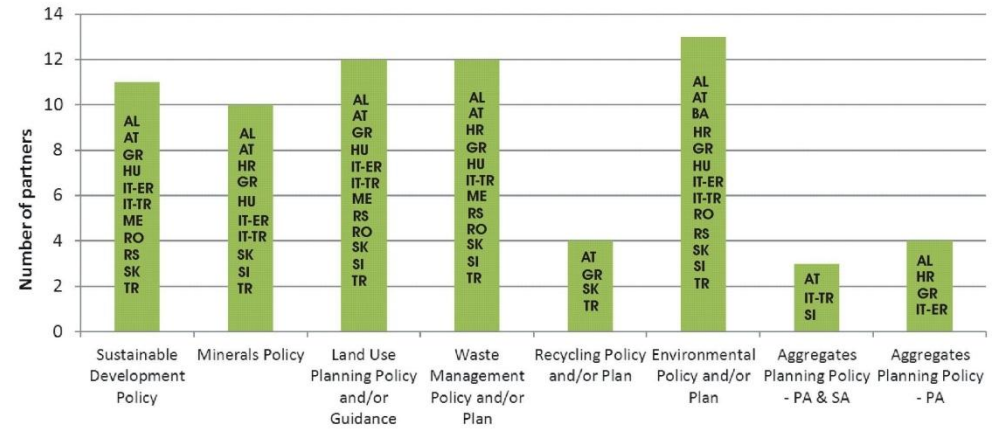
- **Handbook on Capacity Building** and Stakeholder Consultation;

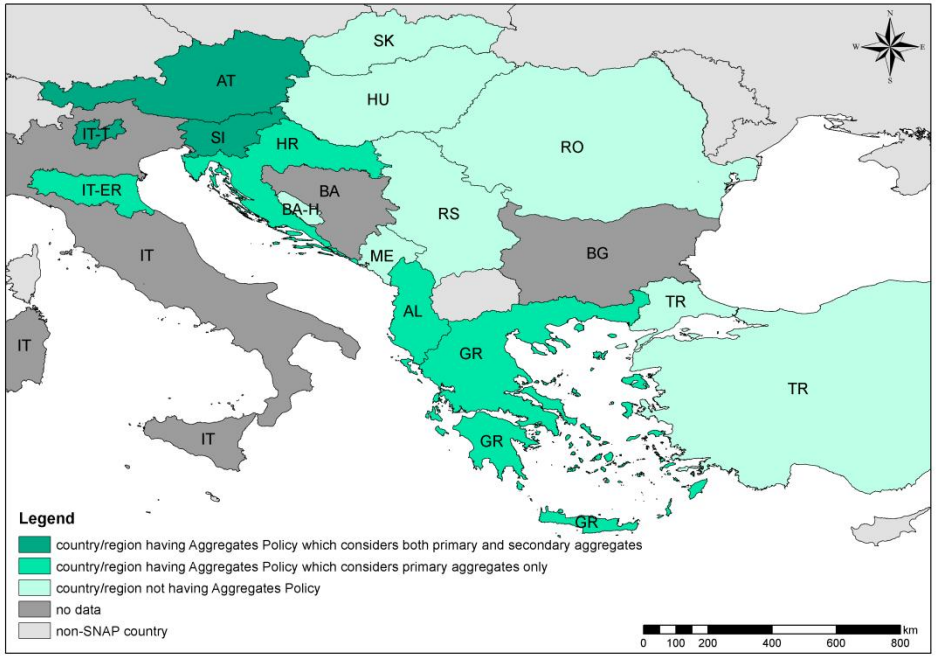
- **Handbook on Data and Analysis Methods**;

- **Aggregates Planning Scheme**, containing planning modules that embody the principles, approaches and action necessary to achieve the goals of the Vision.

SNAP-SEE – Sustainable Aggregates Planning in South East Europe

SNAP SEE – Multisectoral Analysis of the State of Planning

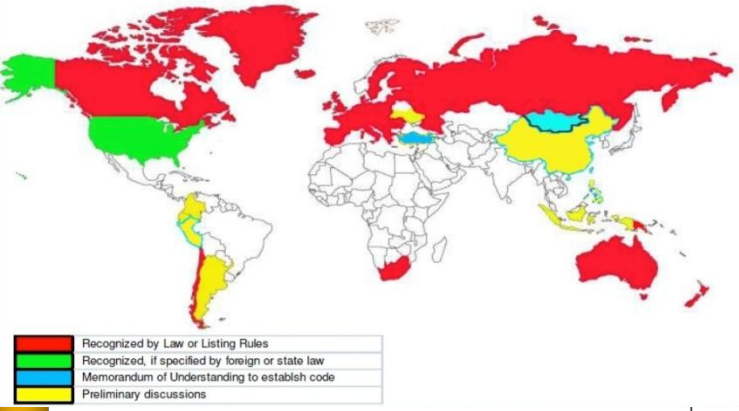




- Where and how aggregates are mentioned in legal documents representing different sectors.
  - Sustainable Development
  - Minerals Management
  - Land Use Planning
  - Waste Management
  - Recycling
  - Environment
- Only 3 participating partners have Aggregates Planning Policies which consider both primary and secondary aggregates.
- In other 4 countries/regions there are Aggregates Policies considering primary aggregates only.

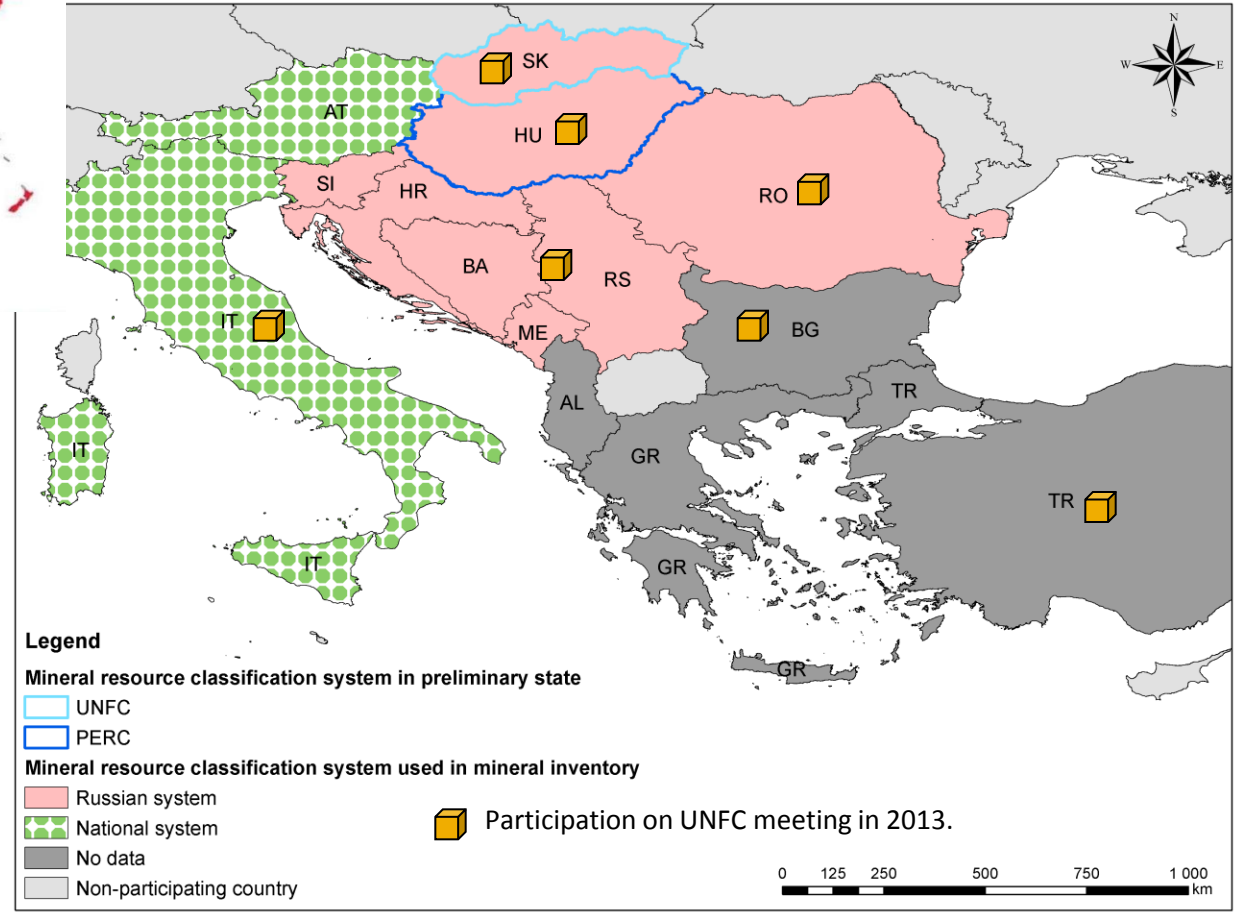
Questionnaire survey with project partners (SNAP SEE)

Mineral resource classification systems used in SEE countries' inventories



Stephen Henley (2012)

Importance of the common language for mineral resources.



UNFC-209 can be a good tool to support sustainable mineral resources management.

THANK YOU FOR YOUR ATTENTION!

The national project is supported
by the Hungarian Office for Mining and Geology and
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The international SNAP SEE project is co-funded by
the South East transnational cooperational programme
(European Union)