



# GSEU

**GEOLOGICAL SERVICE | FOR EUROPE**

## **GSEU WP2 TRAIN-THE-TRAINER COURSE**

### **Module Data gaps**

### **Level 1**

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11h20 – 12h20

## Data Gaps principles

- Most common data gaps
- underpinning plenary case exercises



# Data gaps

## Training Level 1

- What are data gaps in the context of UNFC?
- Availability of information to allow for UNFC mapping
- How to map cases where resources include reserves into UNFC
- How to map cases where only a total resource is reported into UNFC



## Data gaps

- When information required for straightforward UNFC mapping is not available
- Heavily dependent on legislation / what information is available to the GSO in each member state
- **Data confidentiality** is the most significant cause of data gaps
- Common data gap issues that can be handled are:
  - No distinction between reserves and resources
  - Industrial mineral project where overall resources are published only indirectly (e.g. in Environmental Impact Assessment)





## Resource information availability

- Member states where legislation requires operators to report their resources annually (to GeoSurveys or mining authority) are in the best position
  - Possible to automate UNFC mapping if bridging from reporting system to UNFC exists or is created
  - Information is brought forward by companies, no need to seek it out
  - Depending on reporting system, information on projects with a lower UNFC class than 223 may also be included in annual reporting
- In other cases, mineral resource estimates may need to be collected from press releases or other information provided in the public domain by operators
  - Monitoring of company reporting and manual updating of resource databases required
  - Unlikely that estimates from non-viable or prospective projects reported
  - Important to note the effective date of a resource; mines may have produced raw materials since the resource estimate



## Data gaps: Raw materials data not accessible to GSO

- Some member states do not have access to raw materials data through GSO/mining authority
  - Or data may only be available to mining authority while the responsible UNFC evaluator works for GSO
- UNFC mapping dependent on public reporting by companies and/or other authorities
  - If company reports publicly through CRIRSCO-aligned system, no problem
- If resource estimate numbers are not available to the evaluator, no UNFC mapping can be performed



## Data gaps: Raw materials data not accessible to GSO

- Evidence for E- and F-axis classification may be found from other sources such as:
  - Permit applications
  - Mining and exploration licenses
  - Environmental impact assessments
  - Economic feasibility studies
  - Technical operation plans
  - Land use plans

Report on methodology and guidance for EU-level data harmonization with UNFC p. 44-45



## Data gap: Resources include reserves

- In cases where a company reports mineral resources that also include mineral reserves, such **resources** should not be mapped into UNFC in order to avoid double counting
  - In the UNFC-CRIRSCO bridging document this is clearly stated for CRIRSCO-aligned reporting systems
- In this case only the mineral **reserves** should be mapped into UNFC
- This leads to "underestimating" mineral inventories, preferably companies would report reserves and resources separately
- Calculating resources by subtracting the reserves from the resources should not be done; the quantities reported by companies should not be changed when mapping to UNFC

Bridging Document between the Committee for Mineral Reserves International Reporting Standards Template and the United Nations Framework Classification for Resources p. 17





# Example: Resources include reserves

## Resource and Reserves

In 2006, a mineral company released (“Public Report”) the following reserve and resource information from a Fe-Cu-Au deposit in 2012 under the NI43-101 and following CIM guideline.

	Mt	Fe %	Cu %	Au g/t	UNFC as of 2012
<i>Resources (include reserve tonnages):</i>					
Measured	154	32.24	0.18	0.09	<div style="font-size: 4em; color: red; opacity: 0.5;">X</div>
Indicated	6	30.37	0.17	0.07	
Inferred	61	32.25	0.15	0.044	
Total	221	32.2	0.17	0.077	
<i>Reserves:</i>					
Proved	91.8	32.2	0.186	0.088	111
Probable	0.8	32.6	0.148	0.06	112

Reported in accordance with CIM best practice guidelines and disclosed within NI43-101

9 **Resources include reserves**

Note: numbers are from a 2012 estimate. Project has since undergone ownership change, and the UNFC mapping shown here is not up-to-date. This is only used to illustrate how to deal with “resources include reserves” cases

Table V.1 Standard mapping of CRIRSCO Template aligned estimates to UNFC categories

CRIRSCO Template			Corresponding UNFC category <sup>(a)</sup>			UNFC Class
Public Report and Study Types	Standard Definitions					
Feasibility Study or Life of Mine Plan (for an operating mine)	Mineral Reserves	Proved	E1	F1	G1	Viable Projects
		Probable			G2	
Pre-feasibility Study <sup>(b)</sup>	Mineral Reserves	Proved	E2	F2	G1	Potentially Viable Projects
		Probable			G2	
Feasibility Study, Life of Mine Plan (for an operating mine) or Pre-feasibility Study <sup>(c)</sup>	Mineral Resources (exclusive of Mineral Reserves)	Measured	E2	F2	G1	
		Indicated			G2	
		Inferred			G3	
Scoping Study report or other Public Report on a Mineral Resource estimate <sup>(d)</sup>	Mineral Resources	Measured	E2	F2	G1	
		Indicated			G2	
		Inferred			G3	

**When reserves are included in resources, the resources should not be mapped to UNFC to avoid double counting!**



## Data gap: Only total resources reported

- Sometimes only the total resource of a deposit is reported
  - Might only be reported indirectly, e.g. in EIA
  - Often the case with industrial mineral projects
- When the only quantity reported is a total resource
  - E-axis; **if a mine/quarry is in production -> E1**, otherwise as long as the estimate was made/confirmed by the current holder and **development is ongoing -> E2**
  - From a producing mine, technical feasibility has to have been extensively investigated, but since we have no knowledge of how much of it is technically feasible, a decision must be made regarding F1 or F2. Following a similar logic **producing mines/quarries -> F1**, if **under development -> F2**
  - Since there is no knowledge on degree of confidence besides 'total resource', the **recommendation** is to classify the G-axis into **G3**

This should not be applied to projects reported under CRIRSCO-aligned systems!



## Data gap: Only total resources reported

- E- and F-axes can be determined indirectly through permitting and activity information
- If the project is in production: E1;F1
  - **E1:** "Development is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions."
  - **F1:** "Technical feasibility of a development project has been confirmed."
- If company active (e.g. permitting pending) but not producing: E2;F2
  - **E2:** "Development and operation are expected to become environmentally-sociallyeconomically viable in the foreseeable future."
  - **F2:** "Technical feasibility of a development project is subject to further evaluation."

United Nations Framework Classification for Resources Update 2019 Annex I p. 6-9



## Data gap: Only total resources reported

- If project non-active; past producing but now closed: E3.3;F2.3
  - **E3.3:** "On the basis of realistic assumptions of future conditions, it is currently considered that there are not reasonable prospects for environmental-socio-economic viability in the foreseeable future."
  - **F2.3:** "There are no plans to develop or to acquire additional data at the current time due to limited potential."
- If project non-active, never mined: E3;F3
  - **E3:** "Development and operation are not expected to become environmentally-sociallyeconomically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socioeconomic viability."
  - **F3:** "Technical feasibility of a development project cannot be evaluated due to limited data."



# Case study

## Case Study Topics:

- Data gap: Only total resource reported in EIA

## Project Background

**Commodities:** Talc

**Location:** Municipality of Sotkamo in Eastern Finland

**Project status:** Active Project, Viable Project

**Geology:**

Talc deposit hosted by soapstone.

## Project history:

The deposit was discovered during reconnaissance drilling in 1966-1967. A mining pilot test was performed 1992. The quarry has been operating as an open-pit since 2005, and is active to this day. The published resource from the deposit is from a 2006 EIA report.

## Production

### Historic Production:

A total of 3,17 Mt of ore, with talc as its primary product, has been extracted from the open-pit during 2005-2022.

**Current Production:** 0,1 Mt mined in 2022

## Recognized Challenges and/or Block Factors

The resource given in the EIA is vague, and there is no other mineral resource in the public domain. The quarry has a mining permit and is in production. However, we have no new resource information since 2006, after which almost all the mine production has taken place.



# Case study: Uutela

## Resource and Reserves

In 2006, an industrial mineral company gave a mineral resource in the EIA report, but there is no information on when the resource was estimated, nor on the code used. It is not even reported whether the 5 Mt is a resource or reserve.

	Mt	Talc %	UNFC
<i>Resources</i>			
Measured	5	50	

## UNFC Classification

E	F	G
<ul style="list-style-type: none"> <li>“Development and operation are environmentally-socially-economically Viable based on current conditions and realistic assumptions of future conditions.”</li> <li>The mining permit for the project is approved.</li> <li>The mine is active and reports annual production to the Mining Authority.</li> </ul>	<ul style="list-style-type: none"> <li>“Production or operation is currently taking place.”</li> <li>The mine is active and reports annual production to the Mining Authority.</li> </ul>	<ul style="list-style-type: none"> <li>There is almost no information on the resource. However, since the mine is in production, we can assume that the information isn’t completely inaccurate. We have no information on what parts of the deposit are reserve and resource.</li> </ul>

The mined 3,17 Mt of ore cannot be subtracted from the resource. What should be reported is the most recent resource with the effective date while acknowledging how much mining has taken place since then (if that information is available).





UNFC Classes Defined by Categories and Sub-categories						INSPIRE Code List	
Produced	Sold or used production						
	Production which is unused or consumed in operations <i>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</i>						
Total Products	Class	Sub-class	Categories				
			E	F	G		
Known Sources	<b>Viable Projects</b> <i>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.</i>	On Production	1	1.1	1, 2, (3)	operating continuously operating intermittently	
		Approved for Development	1	1.2	1, 2, 3	under development	
		Justified for Development	1	1.3	1, 2, 3	pending approval	
	<b>Potentially Viable Projects</b> <i>Not all Potentially Viable Projects will be developed</i>	Development Pending	2	2.1	1, 2, 3	feasibility evaluation of the ore deposit	
		Development On Hold	2	2.2	1, 2, 3	care and maintenance retention	
	<b>Non-Viable Projects</b> <i>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.</i>	Development Unclassified	3.2	2.2	1, 2, 3	resource assessment (geological interpretation, approximate calculation of the resource)	
		Development Not Viable	3.3	2.3	1, 2, 3	closed abandoned historic	
	<b>Remaining Products not developed from identified Projects</b> <i>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.</i>		3.3	4	1, 2, 3		
	Potential Sources	<b>Prospective Projects</b>		3.2	3.1	4	subsurface exploration
				3.2	3.2	4	detailed surface exploration
3.2				3.3	4	regional reconnaissance	
<b>Remaining Products not developed from Prospective Projects</b>		3.3	4.1	4			
		3.3	4.2	4			
		3.3	4.3	4			



slido



**How is UNFC mapping performed from a project where the company states that resources include reserves?  
The company is following the PERC Standard for reporting of Mineral Resource and Mineral Reserves.**

① Start presenting to display the poll results on this slide.



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**Thank you for your attention**

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