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Training on United Nations Framework Classification for Resources (UNFC) Application to Strategic Projects in accordance with EU Critical Raw Materials Act (CRMA)

2 July 2024 | Online

Training Opening

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Agenda

- Training Opening
- Introduction to UNFC – Generic
- UNFC for Primary Raw Materials – Minerals Specifications
- UNFC for Secondary Raw Materials – Anthropogenic Resources Specifications
- Q&A Session 1
- Break
- UNFC and the Strategic Project Form for CRMA
- Classroom Exercise: Classifying Strategic Projects according to UNFC
- Q&A Session 2
- Closing Remarks

Welcome Speech – DG GROW

Critical Raw Materials Act

&

UNFC

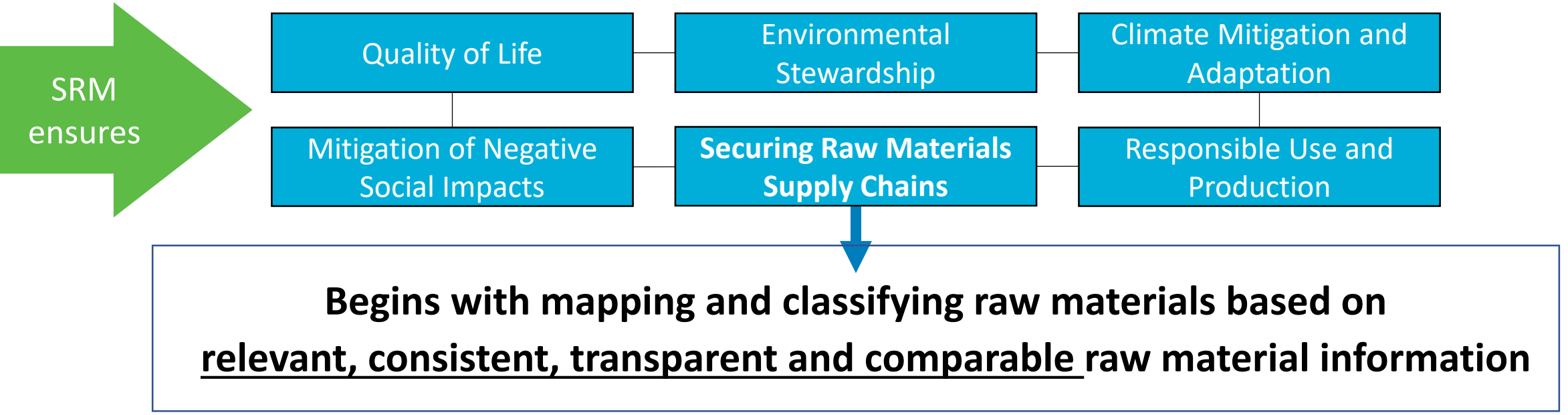
Robert Tomas, Policy Officer, DG GROW

Introduction to UNFC - Generic

Slavko Solar, EGRM Secretariat

Sustainable Resource Management

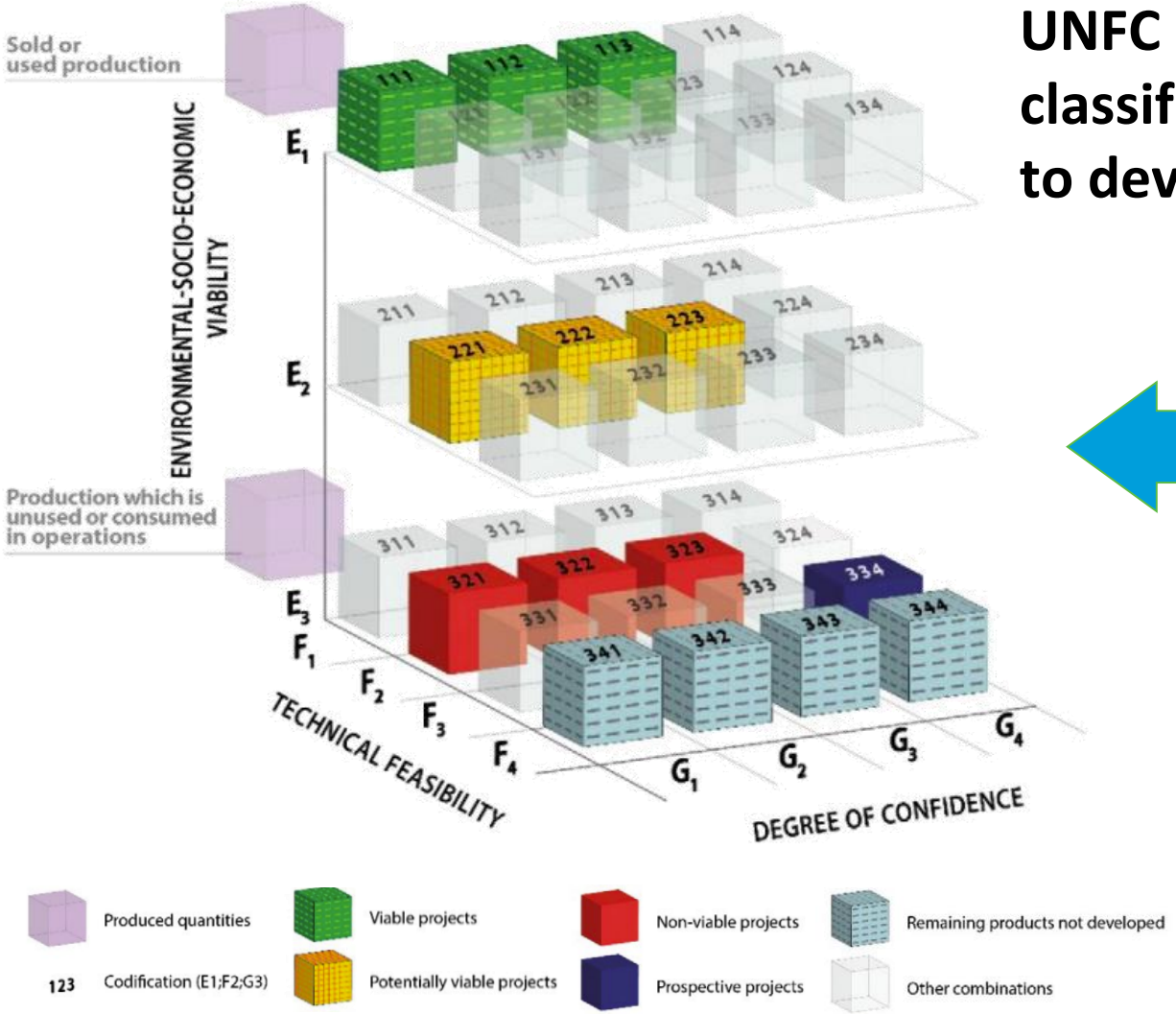
- How can we ensure production of raw materials without compromising the environment, economic stability, and social equity?
- **Sustainable Resource Management (SRM)** balances the need for economic development with the preservation of the environment and the well-being of future generations. It is critical to deliver the UN Agenda 2030 and its Sustainable Development Goals



Challenge of Classification – How?

How to Classify?	
	By genre
	By artist
	By composer
	By instruments
	By tempo
	By date recorded
	By date purchased

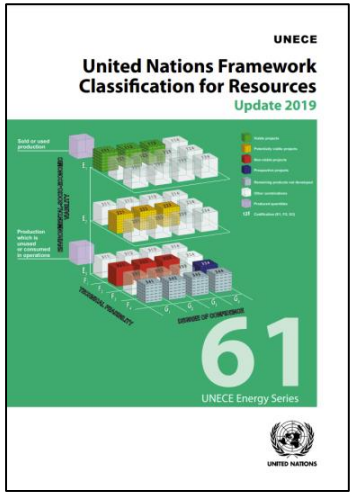
UNFC 2019 Generic – 3 Tier Framework



UNFC is a resource project- and principles-based classification system based on 3 fundamental criteria to develop resources

UNFC is based on 3 fundamental criteria:

- **E axis**: Environmental-socio-economic viability
- **F axis**: Technical Feasibility
- **G axis**: Degree of Confidence



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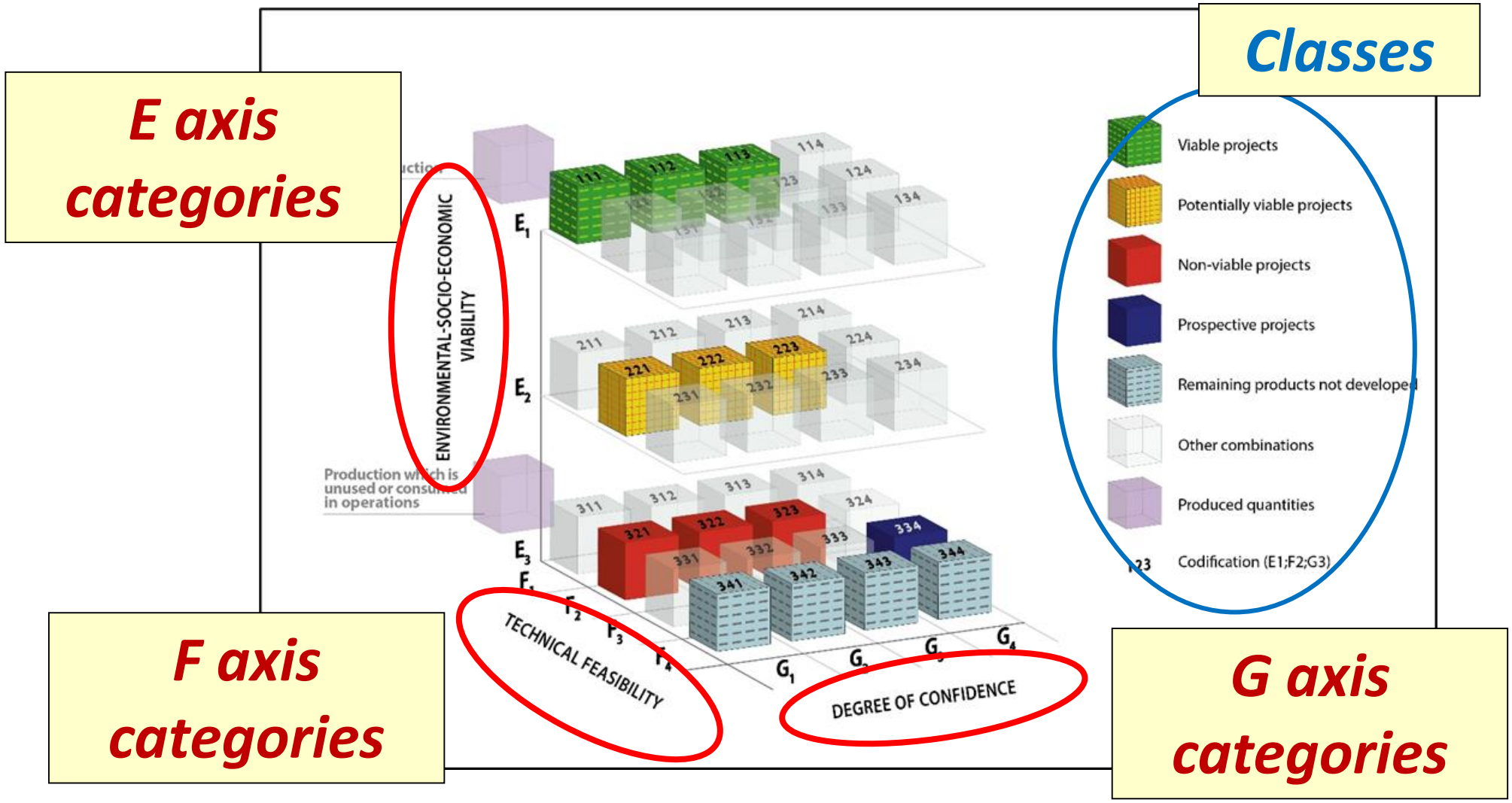
UNFC – Categories & Classes



UNFC Categories Definitions – E axis

- Degree of favourability of environmental social and economic conditions in establishing the viability of the project
- **Includes consideration of market prices and relevant legal, regulatory, social, environmental and contractual conditions**
- E1, E2 and E3 categories
- **E1 is "best"**
- Definitions should always be read in conjunction with supporting explanation

Category	Definition
E1	Development and operation **are confirmed to be** environmentally-socially-economically viable.
E2	Development and operation **are expected to become** environmentally-socially-economically viable in the foreseeable future.
E3	Development and operation **are not expected to become** environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.

UNFC Sub-Categories Definitions – E axis

Sub-Category	Sub-Category Definition
E1.1	Development is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions.
E1.2	Development is not environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions, but is made viable through government subsidies and/or other considerations.
No Sub-categories defined	
E3.1	Estimate of product that is forecast to be developed, but which will be unused or consumed in operations.
E3.2	Environmental-socio-economic viability cannot yet be determined due to insufficient information.
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.

UNFC Categories Definitions – F axis

- Maturity of technology, studies and commitments necessary to implement the project
- **These projects range from early conceptual studies through to a fully developed project that is producing**
- F1, F2 and F3 and F4 categories
- **F1 is "best"**
- Definitions should always be read in conjunction with supporting explanation

Category	Definition
F1	Technical feasibility of a development project **has been confirmed.**
F2	Technical feasibility of a development project is **subject to further evaluation**.
F3	Technical feasibility of a development project **cannot be evaluated due to limited technical data**.
F4	**No development project has been identified**.

UNFC Sub-Categories Definitions – F axis

Sub-Category	Sub-Category Definition
F1.1	Production is currently taking place.
F1.2	Capital funds have been committed and implementation of the development is underway.
F1.3	Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming
F2.1	Project activities are ongoing to justify development in the foreseeable future.
F2.2	Project activities are on hold and/or where justification as a development may be subject to significant delay.
F2.3	There are no plans to develop or to acquire additional data at the current time due to limited potential.

Sub-Category	Sub-Category Definition
F3.1	Site-specific studies have identified a potential development with sufficient confidence to warrant further testing.
F3.2	Local studies indicate the potential for development in a specific area but requires more data acquisition and/or evaluation in order to have sufficient confidence to warrant further testing.
F3.3	At the earliest stage of studies, where favourable conditions for the potential development in an area may be inferred from regional studies.
F4.1	The technology necessary is under active development, following successful pilot studies, but has yet to be demonstrated to be technically feasible for this project.
F4.2	The technology necessary is being researched, but no successful pilot studies have yet been completed.
F4.3	The technology is not currently under research or development.

UNFC Categories Definitions – G axis

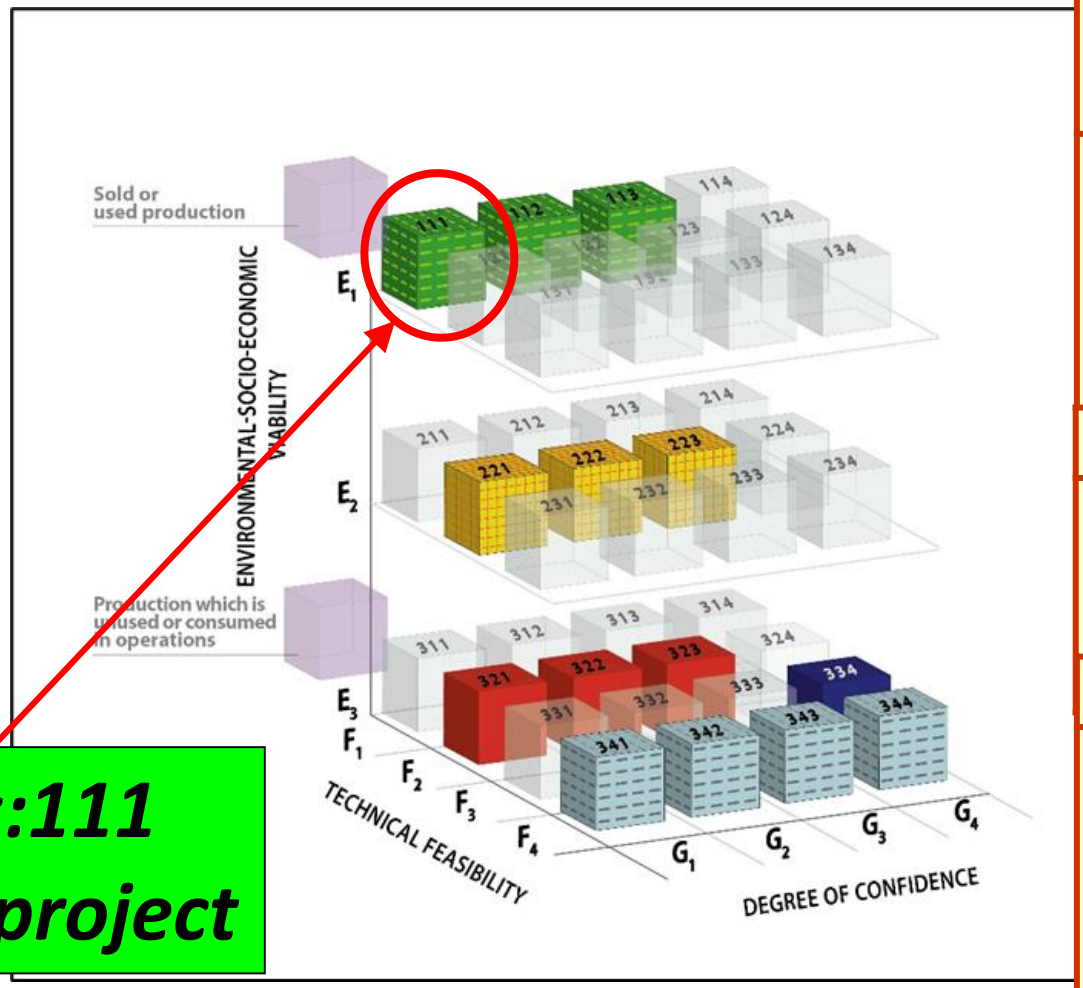
- Degree of confidence in the estimate of the quantities of products from the project
- **Generally defined as discrete increments for solids (G1, G2, G3), but often defined as scenarios for fluids (G1, G1+G2, G1+G2+G3)**
- G1, G2, G3 and G4 categories
- **G1 is "highest confidence"**
- Definitions should always be read in conjunction with supporting explanation

Category	Definition
G1	Product quantity associated with a project that can be estimated with **a high level of confidence**.
G2	Product quantity associated with a project that can be estimated with **a moderate level of confidence**.
G3	Product quantity associated with a project that can be estimated with **a low level of confidence**.
G4	Product quantity associated with a Prospective Project, **estimated primarily on indirect evidence**.

UNFC Sub-Categories Definitions – G axis

Sub-Category	Sub-Category Definition
G4.1	Low estimate of the quantities.
G4.2	Incremental amount to G4.1 such that G4.1+G4.2 equates to a best estimate of the quantities.
G4.3	Incremental amount to G4.1+G4.2 such that G4.1+G4.2+G4.3 equates to a high estimate of the quantities.

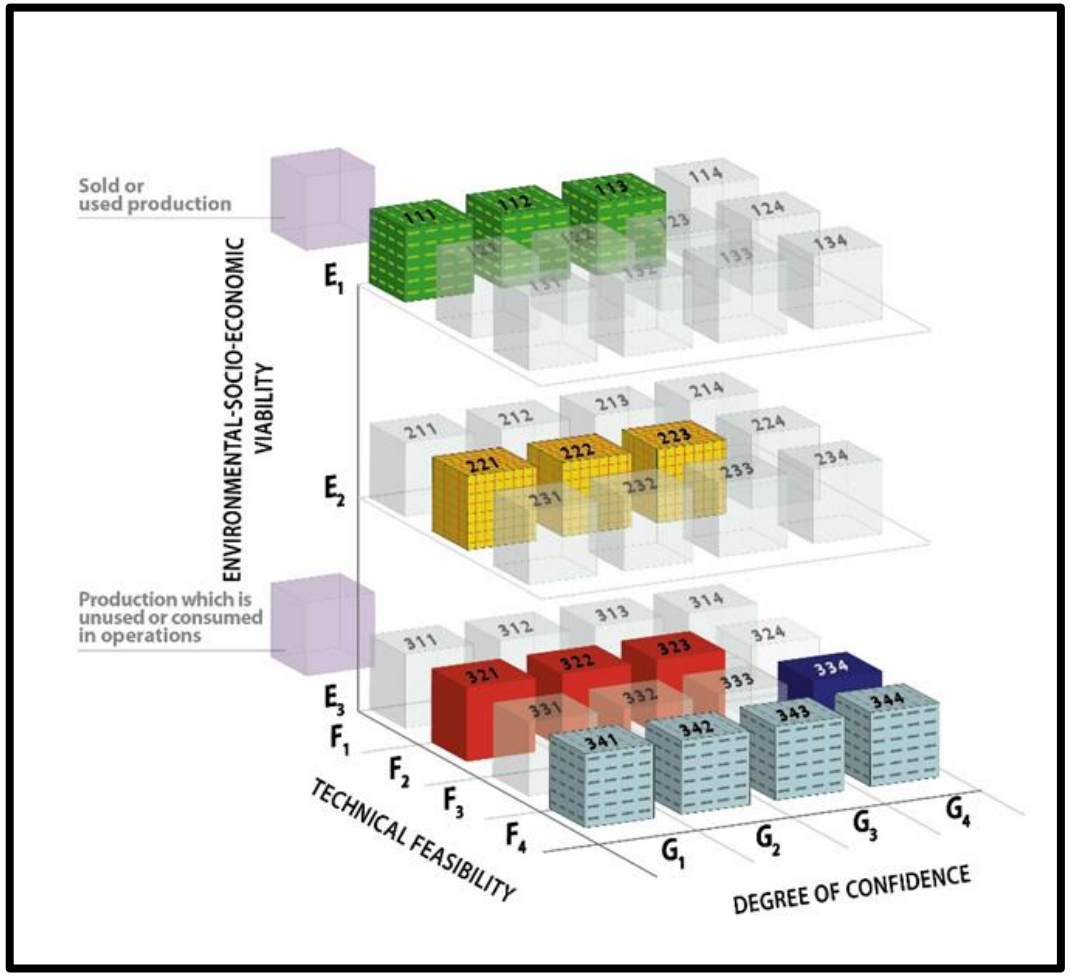
UNFC – How it works



Class:111
Viable project

Category	Definition
E1	Development and operation are confirmed to be environmentally-socially-economically viable.
Category	**Definition**
F1	Technical feasibility of a development project has been confirmed.
Category	**Definition**
G1	Product quantity associated with a project that can be estimated with a high level of confidence.

UNFC – 2D or 3D Representation



	Produced	Sold or used production		
		Production which is unused or consumed in operations[a]		
		Class	Minimum Categories	
			E	F	G[b]
Total Products	The project's environmental-socio-economic viability and technical feasibility has been confirmed	Viable Projects[c]	1	1	1, 2, 3
	The project's environmental-socio-economic viability and/or technical feasibility has yet to be confirmed	Potentially Viable Projects[d]	2[e]	2	1, 2, 3
		Non-Viable Projects[f]	3	2	1, 2, 3
	Remaining products not developed from identified projects[g]		3	4	1, 2, 3
	There is insufficient information on the source to assess the project's environmental-socio-economic viability and technical feasibility	Prospective Projects	3	3	4
	Remaining products not developed from prospective projects[g]		3	4	4

https://unece.org/DAM/energy/se/pdfs/UNFC/publ/UNFC_ES61_Update_2019.pdf

UNFC Classes Defined by Categories and Sub-categories						
Total Products	Produced	Sold or used production				
		Production which is unused or consumed in operations				
		Class	Sub-class	Categories		
				E	F	G
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, 3
			Approved for Development	1	1.2	1, 2, 3
			Justified for Development	1	1.3	1, 2, 3
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development On Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development Not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

UNFC

Sub-Categories and Classes provide more granularity

https://unece.org/DAM/energy/se/pdfs/UNFC/publ/UNFC_ES61_Update_2019.pdf

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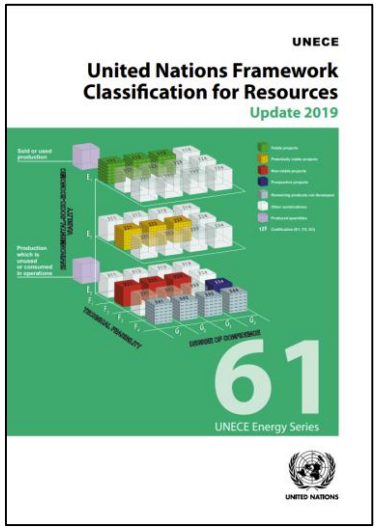
Resource Classification Stakeholders

UNFC – Documents Sequence

UNFC and Generic Specifications



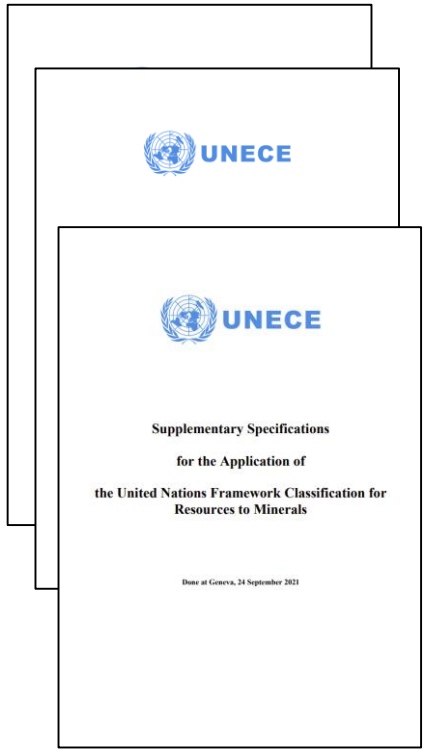
- 1. Definitions: Classification framework
- 2. Specifications: Application rules
- 3. Guidelines: Non-mandatory guidance

Principles

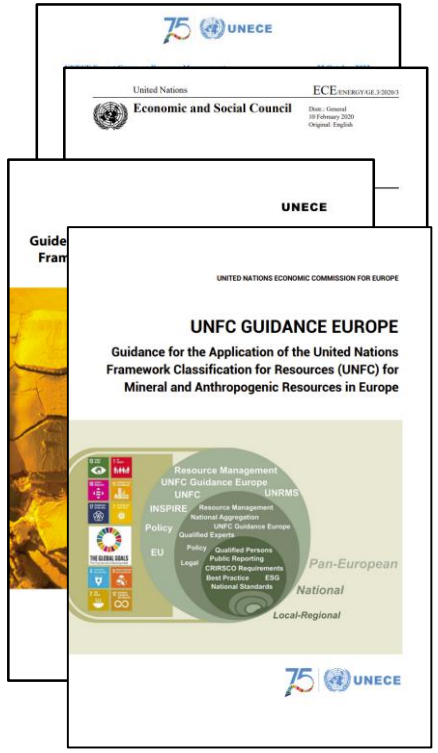
Rules

Guidelines

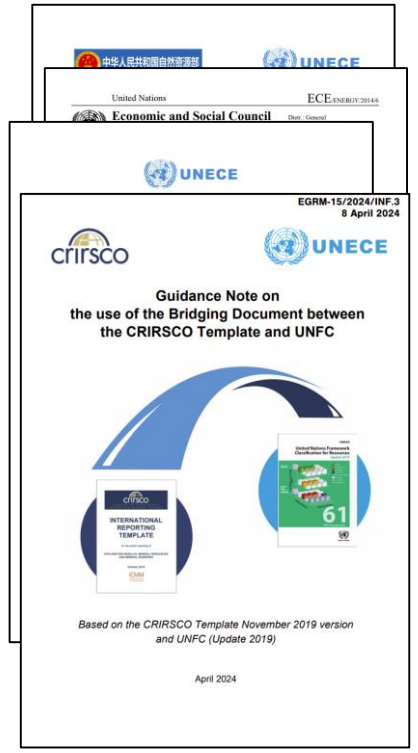
Supplementary Specifications



Guidance



Bridging Documents



GB/T 17766-1999		UNFC		
		级	亚级	
经济意义	1	E1	E1.1	经济和社会活力
			E1.2	
	2M	E2		
	2S			
	3			
		E3	E3.1	
	3		E3.2	
			E3.3	
可行性评价阶段		F1/F2		项目状态和技术可行性
	2			
	3			
		F3		
		F4		
地质可靠程度	1	G1		地质认知程度
	2	G2		

Law (2015) and Proposed New Book of Regulations for Solid Mineral Raw Materials	Results of Geological Exploration	Mineral Resources			Mineral Reserves	
		Inferred	Indicated	Measured	Probable	Proved
Official Book of Regulations for Solid Mineral Raw Materials (1979)		Mineral Reserves				
	Potential	Potential	Established (*in situ* – Geological: *Out-of-Balance and Balance*)		Exploitation (*inclusive of dilutions and losses during mining*)	
	D_2, D_1	C_2	C_1	B,A	C_1	B,A
UNFC			Mineral Resources		Mineral Reserves	
	334	223	222	221	112	111

UNFC-2009 Classification					CRIRSCO Template		NEA/IAEA Classification	
UNFC Classes and Sub-classes		UNFC Categories			CRIRSCO Classes and Sub-classes			
Class	Sub-Class	E	F	G	Class	Sub-Class	IAEA-NEA Categories	Status
Commercial Projects	On Production	1	1.1	1	Mineral Reserves	Proved	Reasonably Assured Resources (RAR)	Existing
				2		Probable		
	Approved for Development	1	1.2	1		Proved		Committed
				2		Probable		
	Justified for Development	1	1.3	1		Proved		Planned
				2		Probable		
Potentially Commercial Projects	Development Pending	2	2.1	1	Mineral Resources	Measured	Identified Resources: RAR	Prospective
				2		Indicated		
				3		Inferred	Identified Resources: IR*	
	Development On Hold	2	2.2	1		Measured	Identified Resources: RAR	
				2		Indicated		
				3		Inferred	Identified Resources: IR*	
						Development Unclarified		

CRIRSCO Template		UNFC-2009 "minimum" Categories			UNFC-2009 Class
Mineral Reserve	Proved	E1	F1	G1	Commercial Projects
	Probable			G2	
Mineral Resource	Measured	E2	F2	G1	Potentially Commercial Projects
	Indicated			G2	
	Inferred			G3	
Exploration Results		E3	F3	G4	Exploration Projects

Examples

UNFC – Benefits

UNFC allows
consistent comparison within and across multiple commodities

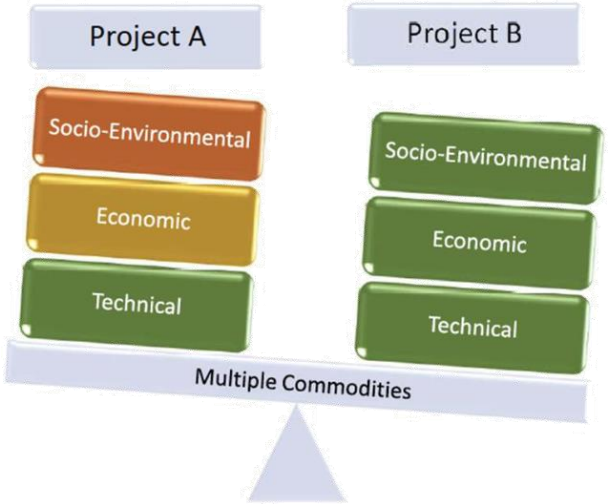
Globally deployed and endorsed by the UN ECOSOC for application

Simple to use: 3 categories (E, F, G) lead to 3 basic classes (viable, potentially viable, non-viable)

Combines all resources such as **energy, minerals and ground water** into one global classification system

Informs on **environmental, social** and **governmental issues** at **local, regional,** and **national level**

UNFC improves financial resilience through business process innovation
UNFC derives necessary social, environmental, and economic outcomes



UNFC speeds up decision-making, rendering it more rational, efficient, predictable, and safe. It makes information processing simpler as it integrates a resource management approach

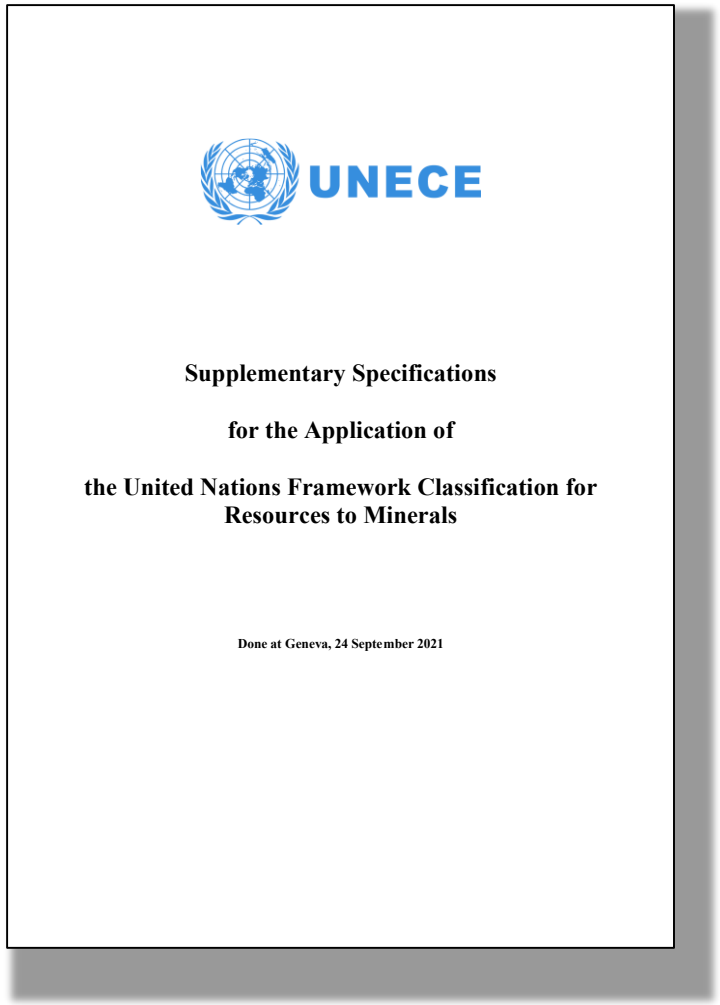
UNFC 2019 – Key Takeaways

- **UNFC-2019 is a generic, project- and principles-based classification system**
  - Applicable to solid minerals, anthropogenic resources, and a wide range of renewable and non-renewable resources
- **Based on three fundamental criteria**
  - Environmental-socio-economic viability
  - Technical feasibility
  - Degree of confidence
- **Each criterion is sub-divided into 3 or 4 defined categories**
  - Optional use of sub-categories for more granularity
  - Numerical category or sub-category for E, for F and for G (EFG is mandatory order)
  - Axis letters can be dropped: e.g. Class 221
- **Consistent classification depends on careful application of category definitions**
  - Definitions should always be read in conjunction with supporting explanation

UNFC for Primary Raw Materials – Minerals Specifications

Hendrik Falck, Chair, Minerals Working Group

Minerals - How it works



These minerals specifications are intended to support the attainment of the Sustainable Development Goals as relevant to the minerals industry.

Through their application, the collective industry will be directed towards the shared global goals.

This document incorporates the changes introduced by the recent update of UNFC (2019).

Mineral project evaluation

- Mineral projects may adopt various methodologies in the various stages of the mineral lifecycle including in the estimation of quantities as appropriate to the project.
- The basis for any estimations shall be appropriately referenced in the evaluation.
- This includes not only third-party data but also methodologies or procedures that have been used by the evaluating entity to generate in-house data.

Minerals - Supplemental Specifications for Mineral Projects

Mineral project plan and definition

- Prospecting/Exploration
- Mining
- Beneficiation / Processing
- Decommissioning
- Remediation

Mineral Project Lifetime

Project Lifetime is the remaining period of time that a project is expected to operate, constrained by technical, economic, regulatory or other permit/license cut-offs.

Mineral project lifetime is normally constrained by the period for which prospecting, exploration or mining license may apply for the project.

Mining license may include beneficiation, processing, decommissioning and remediation stages of the mineral lifecycle.

Project Classification

- **Classification of projects based on the level of maturity**
  - Where it is considered appropriate or helpful to sub-classify mineral projects to reflect different levels of project maturity, based on the current status of the project, optional sub-classes may be adopted.

- **Distinction between Environmental-Socio-Economic assumptions**
  - The environmental-socio-economic axis categories encompass the non-technical issues that directly impact the viability of a project, including product prices, costs, legal/fiscal framework, environmental regulations and known environmental or social impediments, barriers or benefits.

- **Distinction between potentially produced quantities and undeveloped quantities**
  - Quantities of products associated with projects are categorized as F1 to F3 as potentially developable using existing technology or technology currently under development or operation. There may be remaining quantities with no development project. The product quantity associated with these are categorized as F4. These are quantities which, if produced, could be bought, sold or used.

Minerals - Supplemental Specifications for Mineral Projects

- Degree of confidence in the estimate of the quantities of products from the project
- **Generally defined as discrete increments for solids (G1, G2, G3), but often defined as scenarios for fluids (G1, G1+G2, G1+G2+G3)**
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G4	Product quantity associated with a Prospective Project, estimated primarily on indirect evidence.

Minerals - Supplemental Specifications for Mineral Projects

Additional Comments

- The G axis in minerals and mining conditions primarily reflect geologic uncertainty impacting the estimate forecast for the project.
- Uncertainties include availability and resolution of direct data such as drill hole density in relation to the mineralisation and or deposit type.
- In addition, indirect data such as geophysical data might be included, which should be measured against redundancy of methods (e.g. geophysical measurements calibrated against drill core evaluation, drill hole logs.
- Calibrated methods provide higher certainty than uncalibrated methods.) The accuracy of measurements controls the level of the category (lab assay, rock mechanics, mineralogical phase assessment).

See Page 16 of the Mineral Specifications

Minerals - Supplemental Specifications for Mineral Projects

Project reporting

Baseline requirements:

- Basis for the estimate
- Effective date
- Mineral product
- Reference point
- Aggregation of quantities
- Use of numerical codes
- Units and conversion factors
- Documentation
- Avoidance of double counting
- National reporting

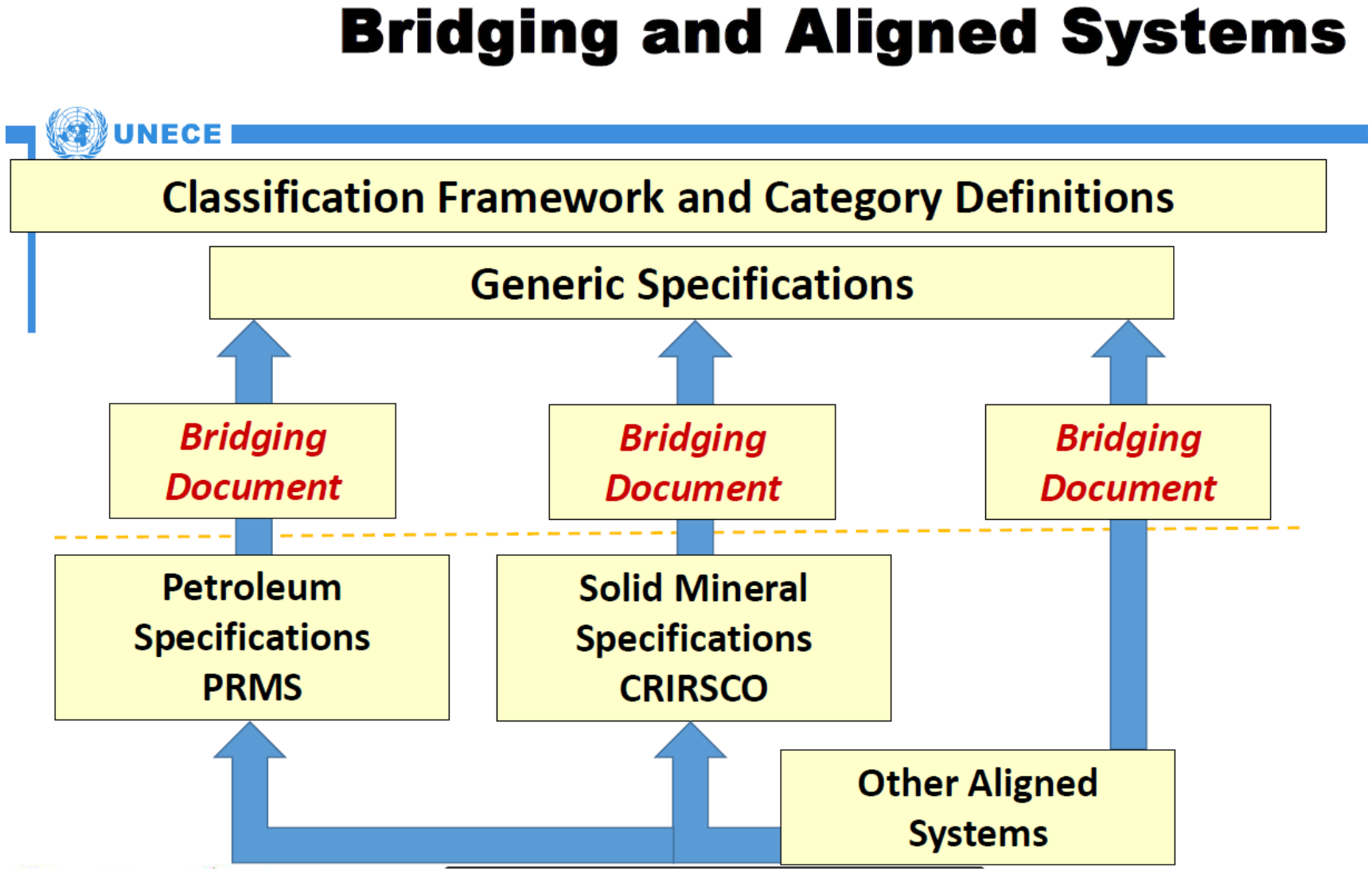
The relevant requirements of the aligned system, esp. regarding Competent / Qualified Person requirements, must be met (mandatory).

Minerals – Bridging Documents

- Aligned System –
  A classification system that has been aligned with UNFC as demonstrated by the existence of a Bridging Document that has been endorsed by the Expert Group on Resource Management.

- Bridging Document –
  A document that explains the relationship between UNFC and another classification system, including instructions and guidelines on how to classify estimates generated by application of that system using the UNFC Numerical Codes.

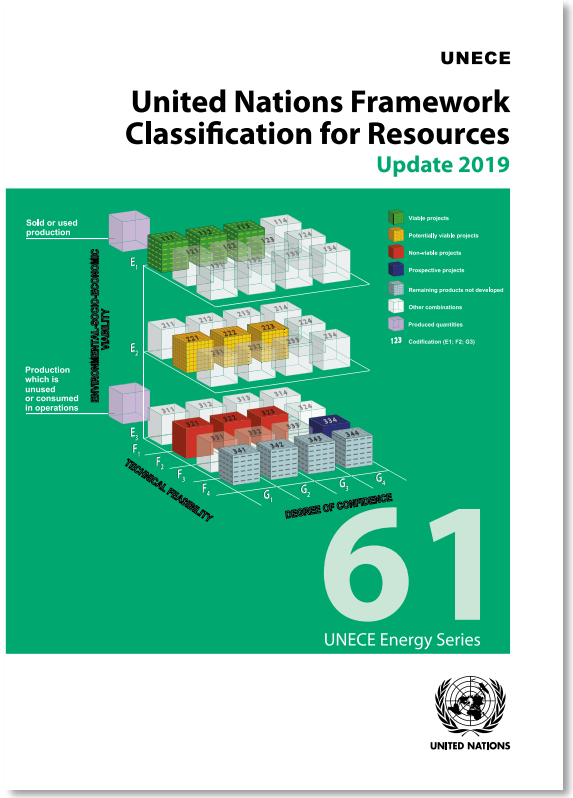
Minerals – Bridging Documents



Minerals – Bridging Documents

- CRIRSCO for Minerals
- PRMS for Petroleum
- IAEA Red Book – Nuclear
- Russian Federation – Petroleum
- China – Minerals
- China – Petroleum

Minerals – Bridging Documents



Use of UNFC

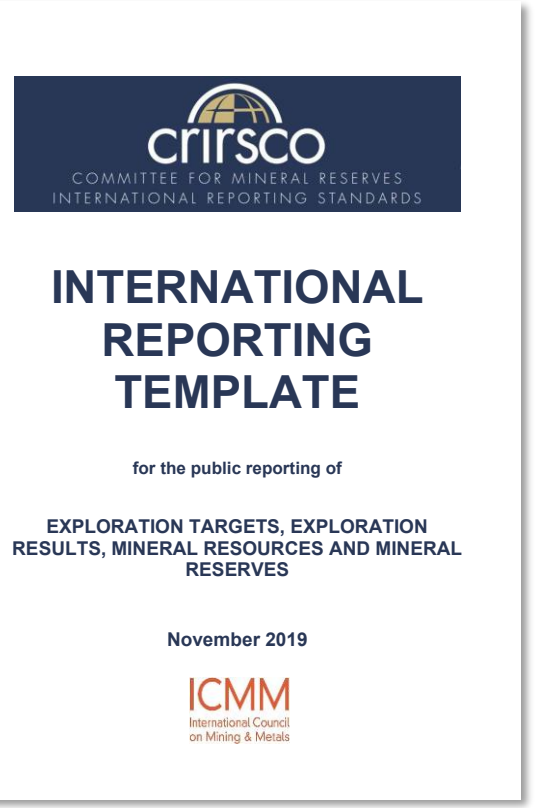
UNFC provides a method for governments and NGOs to incorporate published data into databases, mineral inventories, etc.

Use of CRIRSCO Template

PERC is recognised by ESMA for use on European Union stock exchanges (ESMA = European Securities and Markets Authority)

The SAMREC Code sets out minimum standards, recommendations and guidelines for Public Reporting for solid minerals of Exploration Results, Mineral Resources and Mineral Reserves in South Africa.

Accepted on a number of other stock exchanges around the world (Canada, Singapore, ...)



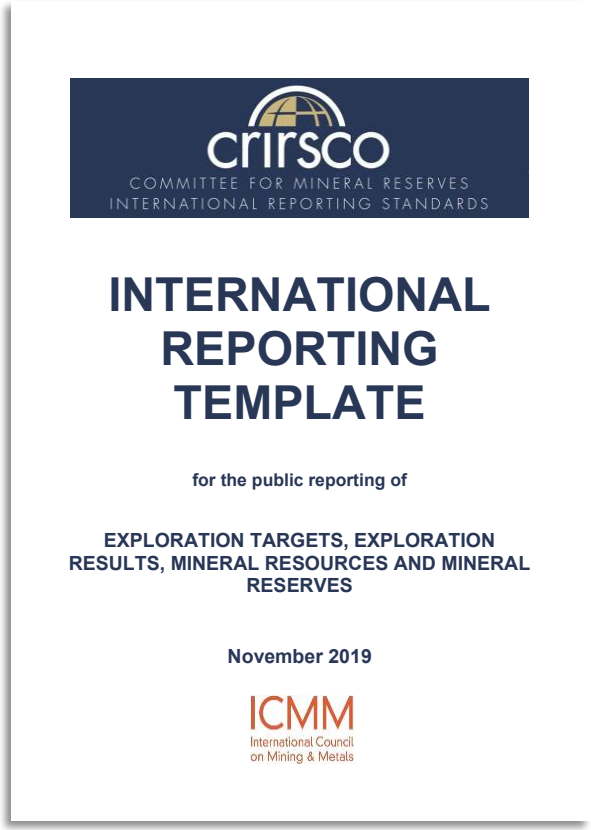
Minerals – Bridging Documents

CRIRSCO Reporting Standards

To promote best practice in the international public reporting of Mineral Exploration Results, Mineral Resources and Mineral Reserves.

CRIRSCO is an international advisory body without legal authority, relying on its constituent members to ensure regulatory and disciplinary oversight at a national level.

It recognizes the truly global nature of the minerals industry and the agreed need for international consensus on reporting standards.



Minerals – Bridging Documents

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- Fifteen national reporting organisations (NROs)

Most companies use this system for their own internal and public reporting.

Most stock exchanges and security commissions require the reports following this standard.

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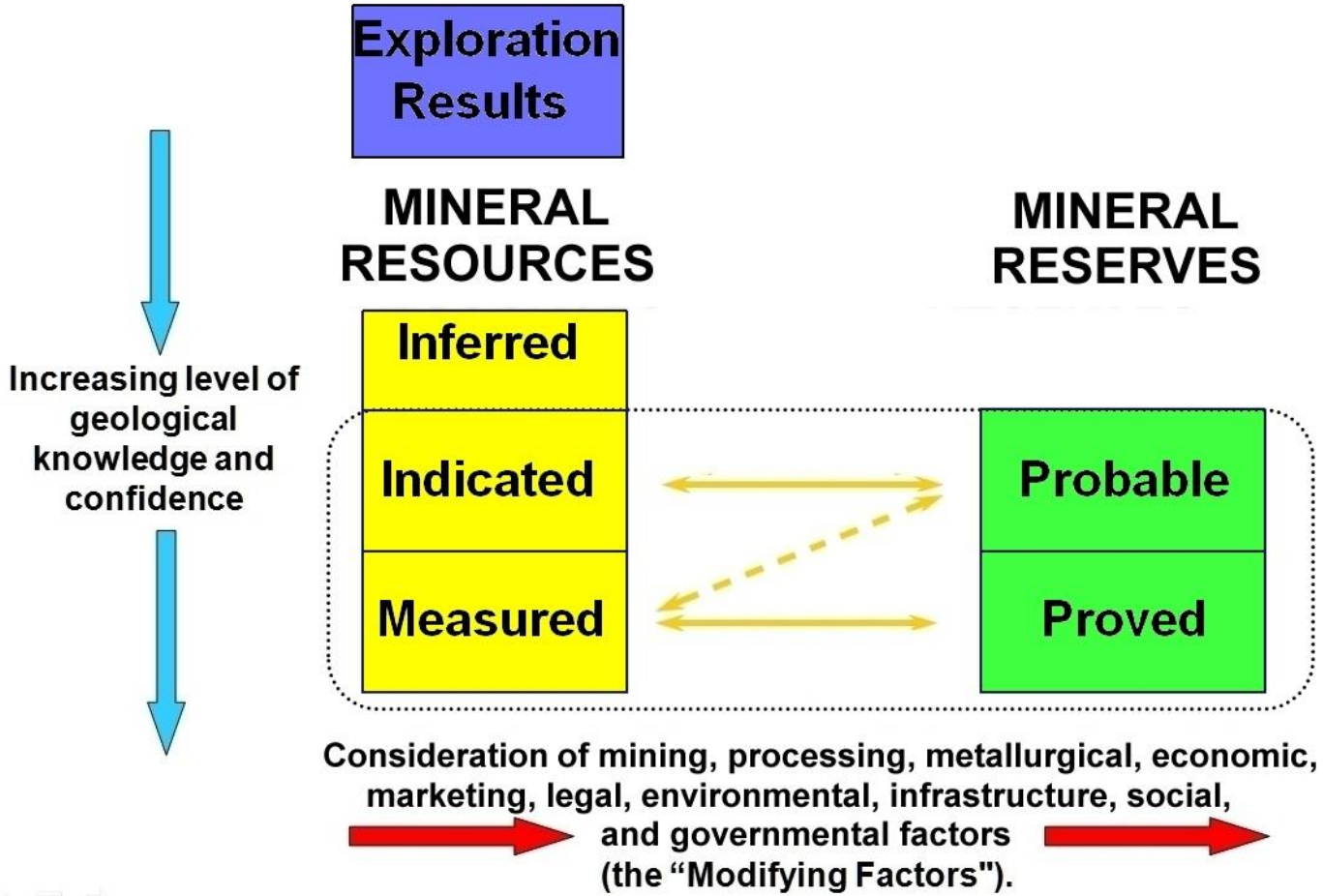
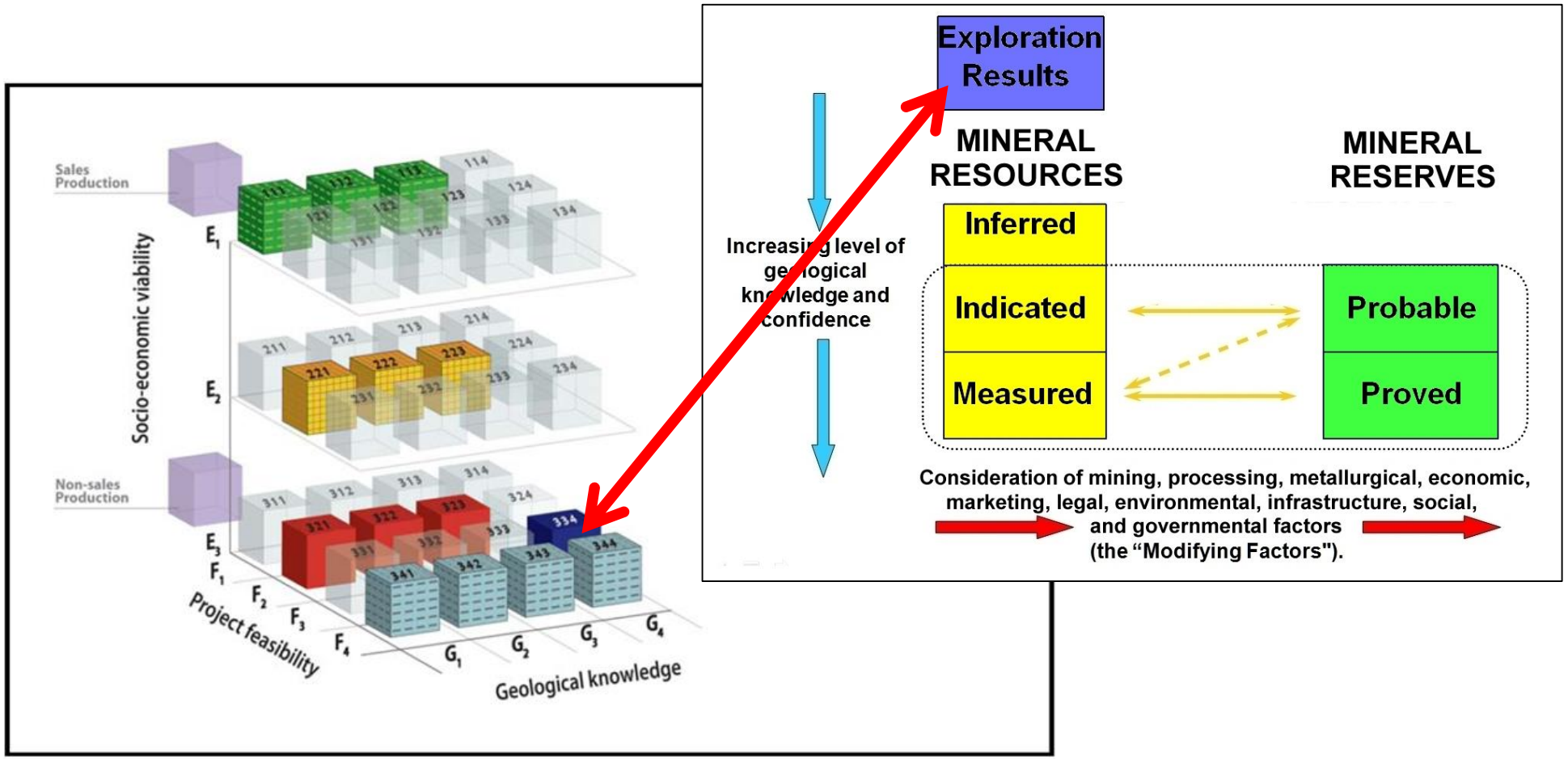
Minerals – Bridging Documents



Minerals – Bridging Documents

Alignment of Systems



Minerals – Bridging Documents

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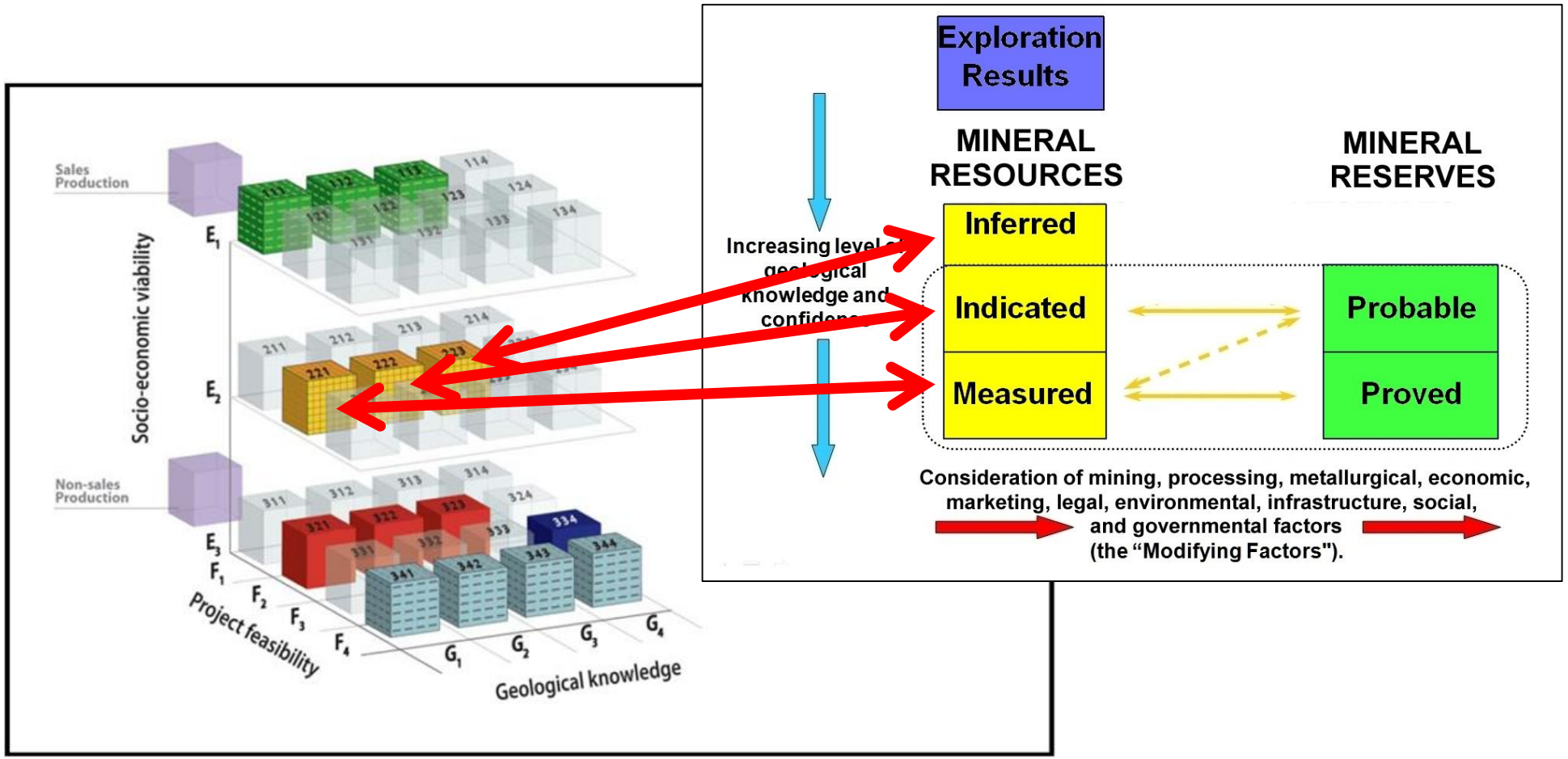
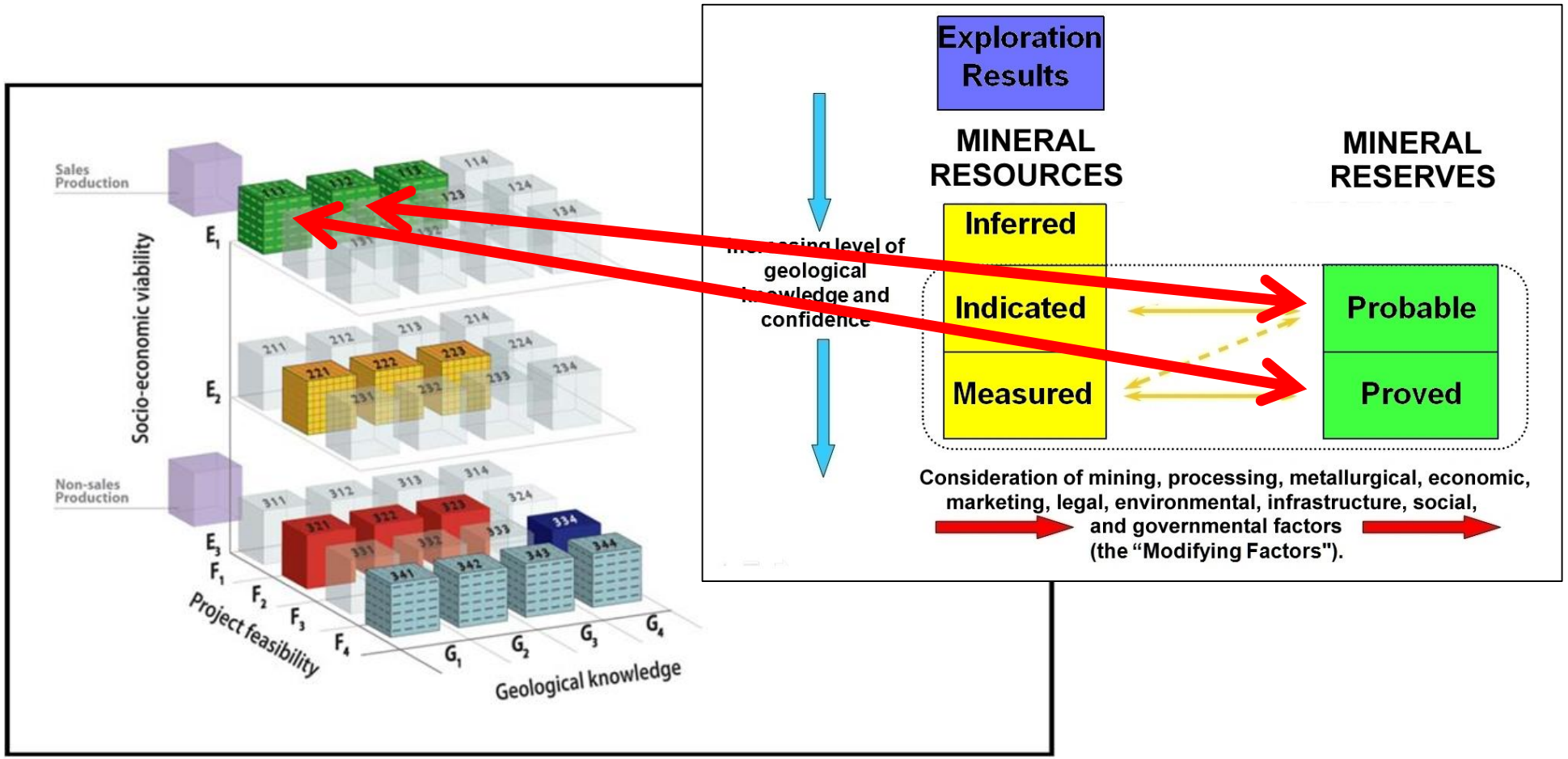
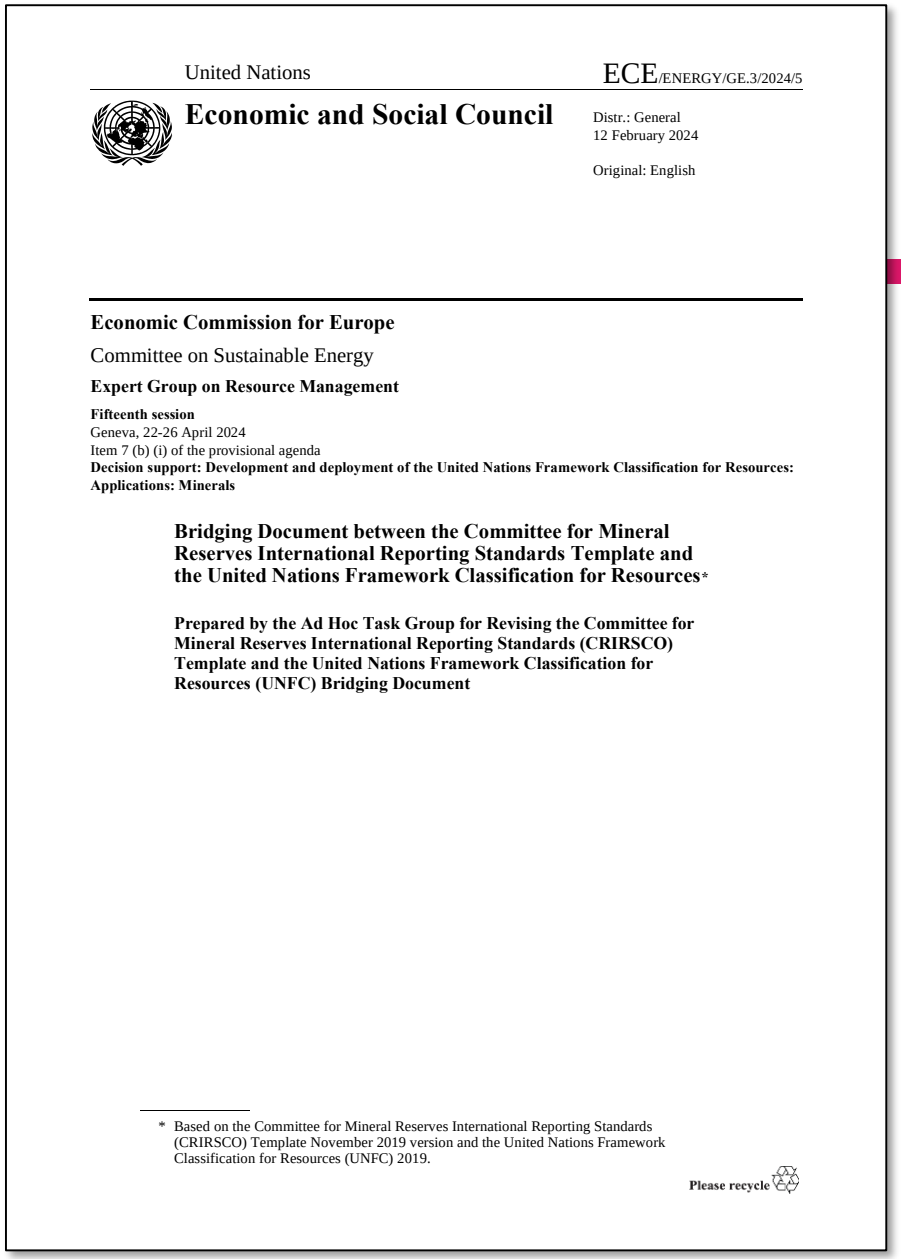


Minerals – Bridging Documents

Alignment of Systems





United Nations ECE/ENERGY/GE.3/2024/5

Economic and Social Council

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Economic Commission for Europe

Committee on Sustainable Energy

Expert Group on Resource Management

Fifteenth session
Geneva, 22-26 April 2024
Item 7 (b) (i) of the provisional agenda
Decision support: Development and deployment of the United Nations Framework Classification for Resources: Applications: Minerals

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

Prepared by the Ad Hoc Task Group for Revising the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template and the United Nations Framework Classification for Resources (UNFC) Bridging Document

* Based on the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template November 2019 version and the United Nations Framework Classification for Resources (UNFC) 2019.

Please recycle

Bridging Documents

Alignment of Systems

This document has been prepared by the Ad Hoc Task Group for Revising the CRIRSCO-UNFC Bridging Document (2023) which was established in April 2023 at the request of the UNECE's Expert Group on Resource Management and the CRIRSCO Executive. The Task Group was charged with updating the previous version of the CRIRSCO-UNFC Bridging Document, which was issued in 2015, in order to take account of subsequent changes including the publication in 2019 of updated versions of both systems.

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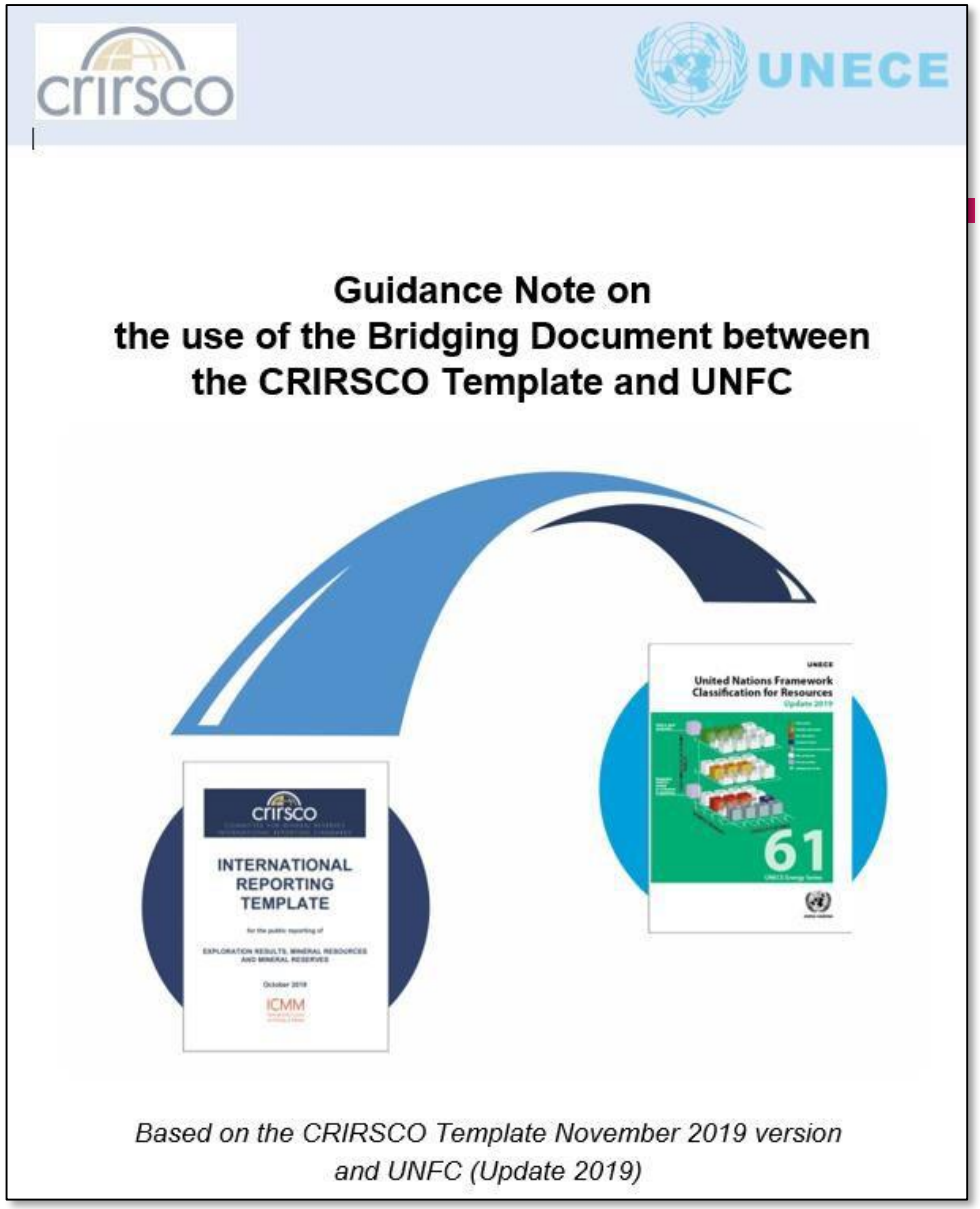
Bridging Documents

Alignment of Systems



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Minerals – Bridging Documents

- I. INTRODUCTION
- II. BACKGROUND
- III. OVERVIEW OF SYSTEM CONTENTS
- IV. COMPETENCY AND QUALIFICATION REQUIREMENTS
- V. MAPPING CRIRSCO TEMPLATE TO THE UNFC CATEGORIES AND SUB-CATEGORIES
- VI. MAPPING UNFC 2019 TO THE CRIRSCO TEMPLATE 2019
- VII. References
- VIII. Appendix I: Key features of the CRIRSCO Template and the UNFC
- IX. Appendix II: Terminology
- + 3 Figures and 9 Tables

Minerals – Bridging Documents

CRIRSCO Template			Corresponding UNFC category[a]			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[b]	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[c]	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[d]	Mineral Resources	Measured	E2	F2	G1	
		Indicated			G2	
		Inferred			G3	
Public Report on exploration stage projects	Exploration Target		E3	F3	G4	Prospective Projects
	Exploration Results		Estimates not published			
Not applicable[e]	Estimates obtained from historical reports[f]					Non-viable Projects

(a)	These are the categories which would normally be used for a study when the mapping is based on a current (or recently published) study. Where there have been material changes since the effective date of a report, or the study is otherwise no longer considered current, the assumptions used in the study should be reviewed in order to determine whether the results obtained are still valid and whether the E and F axis values need to be altered. For instance, where an operating mine has ceased operation, where mining licences have expired or been revoked, or where there have been material changes in costs of prices the mapping of Mineral Reserves from a feasibility study or life of mine plan would be downrated from E1 to E2 and from F1 to F2.
(b)	Estimates included in a life of mine plan which is potentially viable under current conditions.
(c)	Estimates of material not included in the life of mine plan which could be economically extracted using reasonably assumed future conditions.
(d)	Estimates which are considered to have 'reasonable prospects for eventual economic extraction' under reasonably assumed future conditions
(e)	CRIRSCO Template aligned reporting does not allow the Public Reporting of estimates on non-economic mineralisation.
(f)	Historical estimates will generally be downrated to E3 and F3, with the original G categories being retained

Since their initial releases, both the UNFC and the CRIRSCO Template have been updated several times. Additionally, the national reporting codes and standards aligned to the CRIRSCO Template are also updated periodically and may not necessarily be aligned with the most recent version of the CRIRSCO Template. Relevant information with respect to the use of UNFC in the minerals sector was published in the Supplementary Specifications for the Application of the United Nations Framework Classification for Resources to Minerals as adopted in 2021 (UNECE, 2021). Users of the Bridging Document should use the most recent version of guidance documents for both systems

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Minerals – Bridging Documents

Category	Definition	CRIRSCO considerations
E1	Development and operation are confirmed to be environmentally-socially economically viable.	The reported estimates have confirmed prospects for economic extraction under currently realistic assumptions. This may be demonstrated by the results of a FS or the LoMP for an operating mine ….
E2	Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.	The reported estimates have reasonable prospects for eventual economic extraction based on a preliminary judgement with respect to reasonably assumed Modifying Factors (including ESG aspects). This should be based on the results of studies carried out at Pre-Feasibility or Scoping study levels.
E3	Development and operation are not expected to become environmentally-socially- economically viable in the foreseeable future **OR**	The reported estimates do not have reasonable prospects for eventual economic extraction based on an initial consideration of reasonably assumed Modifying Factors (including ESG aspects)…. **[OR]**
	evaluation is at too early a stage to determine environmental-socio-economic viability.	[There is a] lack of sufficient information to complete a reliable assessment.

Minerals – Bridging Documents

Category	Definition	CRIRSCO considerations
F1	Technical feasibility of a development project has been confirmed.	Feasibility Study or Operating Mine (Life of Mine Plan). ….
F2	Technical feasibility of a development project is subject to further evaluation.	Pre-Feasibility Study or Scoping Study Report, or a Public Report on a Mineral Resource Estimate. …
F3	Technical feasibility of a development project cannot be evaluated due to limited data.	A Public Report on Exploration Results which includes an estimate(s) of an Exploration Target(s).
F4	No development project has been identified.	A Public Report on an exploration opportunity which includes historical estimate(s) and/or estimates of Exploration Target(s).

Minerals – Bridging Documents

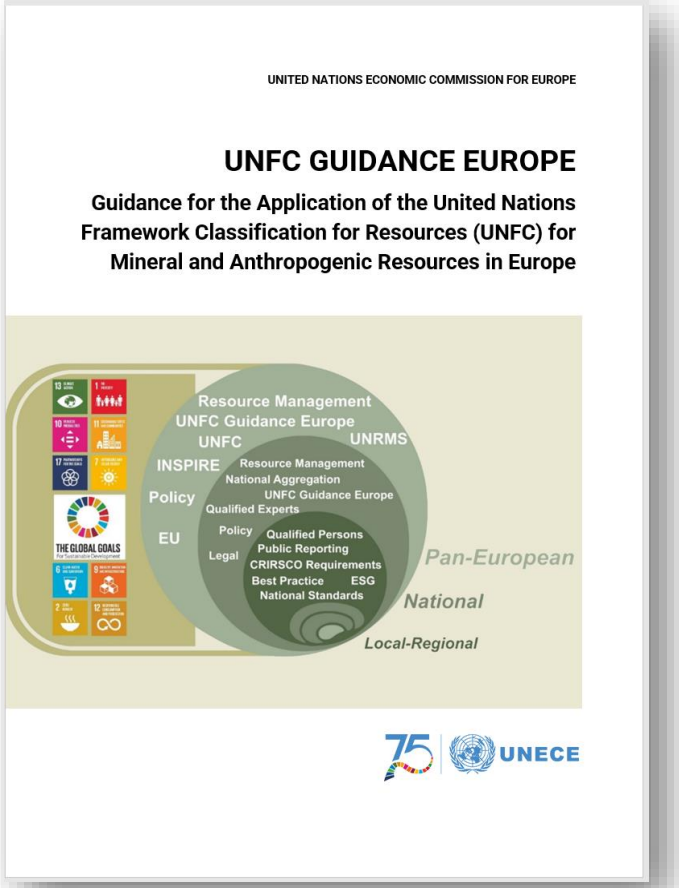
Category	Definition	CRIRSCO considerations
G1	Product quantity associated with a project that can be estimated with a high level of confidence.	Corresponds with a Measured Resource or Proved Reserve category of confidence.
G2	Product quantity associated with a project that can be estimated with a moderate level of confidence.	Corresponds with an Indicated Resource or Probable Reserve category of confidence.
G3	Product quantity associated with a project that can be estimated with a low level of confidence.	Corresponds with an Inferred Resource category of confidence. In certain situations, Exploration Targets may be assigned to this category.
G4	Product quantity associated with a Prospective Project, estimated primarily on indirect evidence.	Corresponds with the CRIRSCO Exploration Target which is a statement or estimate of exploration potential for a mineral deposit where there has been insufficient exploration to estimate Mineral Resources. Exploration Targets must be expressed as a range of quantity and quality.

Minerals – Bridging Documents

- Reported Exploration Target estimate
  - Tonnage: Tmin to Tmax;
  - Grade: Gmin to Gmax
- Estimated contained product quantities:
  - Minimum estimated quantity: Qmin = Tmin * Gmin
  - Maximum estimated quantity: Qmax = Tmax * Gmax
  - Average estimated quantity: Qav = 0.5 * (Qmin + Qmax)
- The following UNFC classifications would then be reported:
  - E3, F3, G4 - Qav

Minerals - UNFC Guidance Europe

- Guidance for the Application of the United Nations Framework Classification for Resources (UNFC) for Mineral and Anthropogenic Resources in Europe
  - To facilitates the development of UNFC-based inventories across Europe and provide alignment with Infrastructure for Spatial Information in Europe (INSPIRE) for Mineral Resources.
  - To ensure clarity and comparability in national resource reporting, especially, how resource quantities are classified in accordance with UNFC and linked to various EU instruments, such as INSPIRE.
  - To assist evaluators to identify relevant controlling factors (CFs) and give the Qualified Expert assistance when making a balanced judgement in respect to categorization which may have a direct impact to the viability of a Project.



Minerals - UNFC Guidance Europe

Whom is the UNFC Guidance Europe for?

Users, including regional and national authorities in Europe to facilitate decision-making and maintain databases for primary and secondary raw material projects

Qualified experts and resource estimate preparers in Europe to classify primary and secondary raw material projects

Minerals - UNFC Guidance Europe

National mineral resources accounting

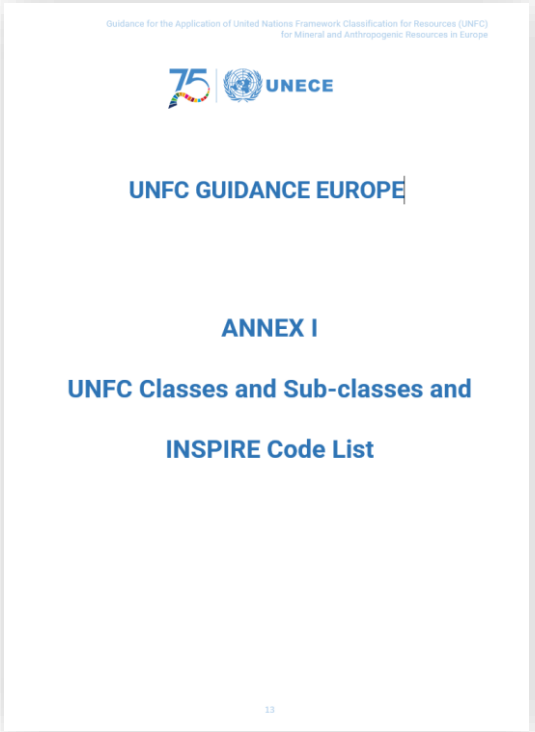
Practical approach with emphasis to **national inventories where all commodities can be aggregated and reported in consistent and coherent manner.**
Government organisations compile **the mineral resource data and report aggregated CRM endowments under UNFC to the European Commission**.
Member States may use a Bridging Document for conversion if **national reporting standard is in use**.

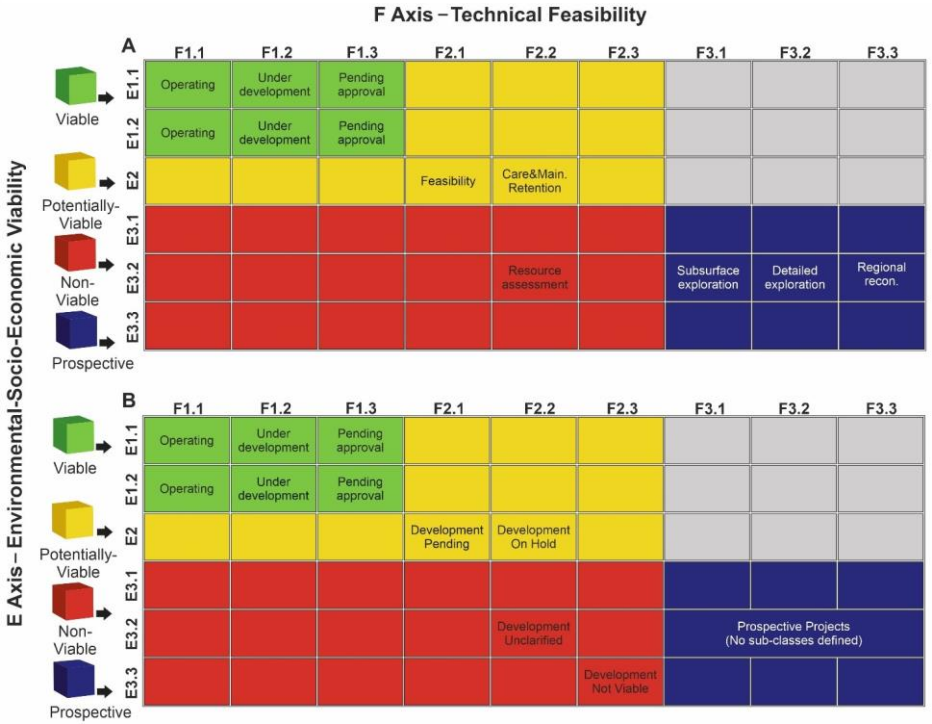
- The information is used in research, planning of mineral exploration, national resource accounting and, hence, also in decision making on national and EU level mineral policies.

Minerals - UNFC Guidance Europe

Classes and Sub-classes and INSPIRE Code List

To facilitates the development of UNFC-based inventories across Europe and **provide alignment with** Infrastructure for Spatial Information in Europe (**INSPIRE**) for Mineral Resources.

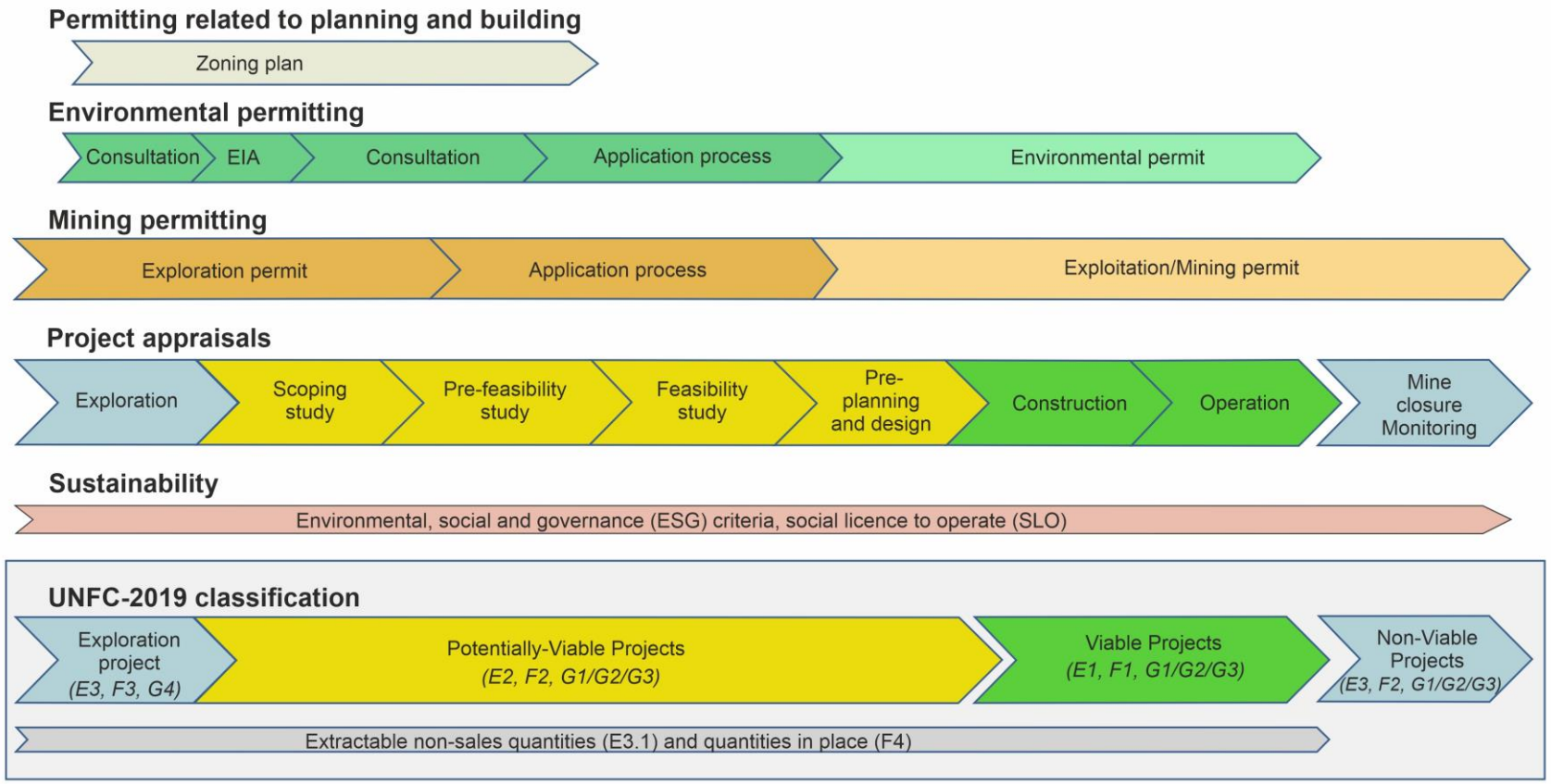




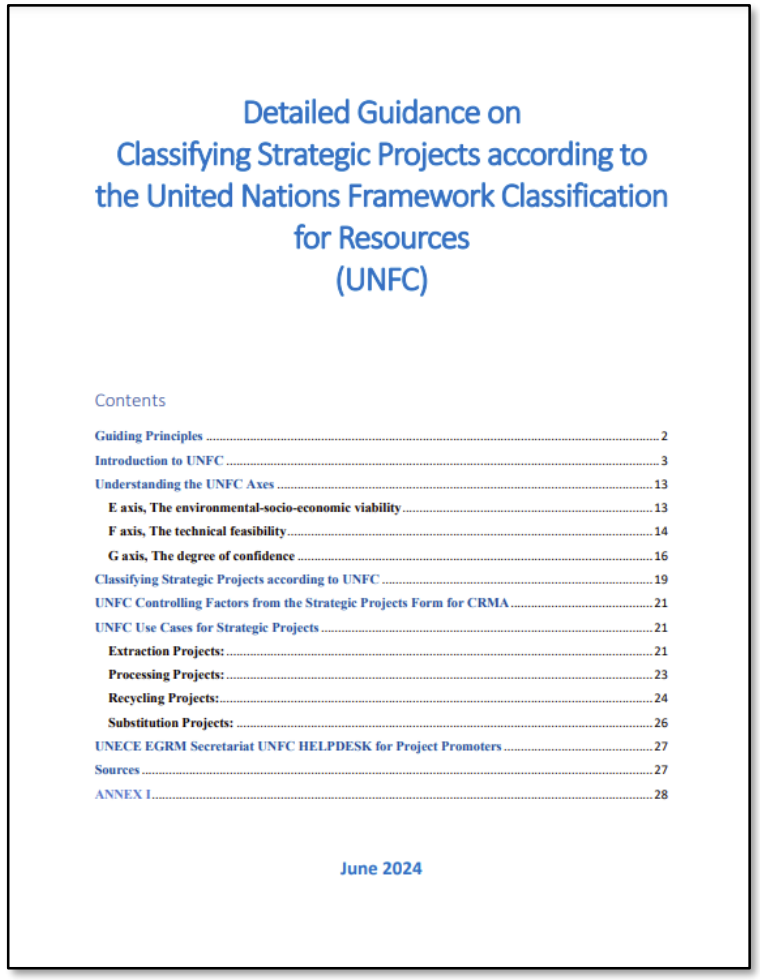
UNFC Classes Defined by Categories and Sub-categories						INSPIRE Code List
		Sold or used production				
Produced		Production which is unused or consumed in operations *Future production that is either unused or consumed in the Project operations is categorized as E3.1. These can exist for all Classes of recoverable quantities*				
	Class	Sub-class	Categories E	F	G	
Total Products	Known Sources	Viable Projects *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.*	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
		Potentially Viable Projects *Not all Potentially Viable Projects will be developed*	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
		Non-Viable Projects *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.*	Development Unclarified	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
		Remaining Products not developed from identified Projects *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.*		3.3	4	1, 2, 3	
Potential Sources		Prospective Projects		3.2	3.1	4	subsurface exploration
				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	

Minerals - UNFC Guidance Europe

To assist evaluators to identify relevant **controlling factors (CFs)** and give the Qualified Expert assistance when making a balanced judgement in respect to categorization which may have a direct impact to the viability of a Project.



Detailed Guidance UNFC to SP



Detailed Guidance on
Classifying Strategic Projects according to
the United Nations Framework Classification
for Resources
(UNFC)

Contents

June 2024

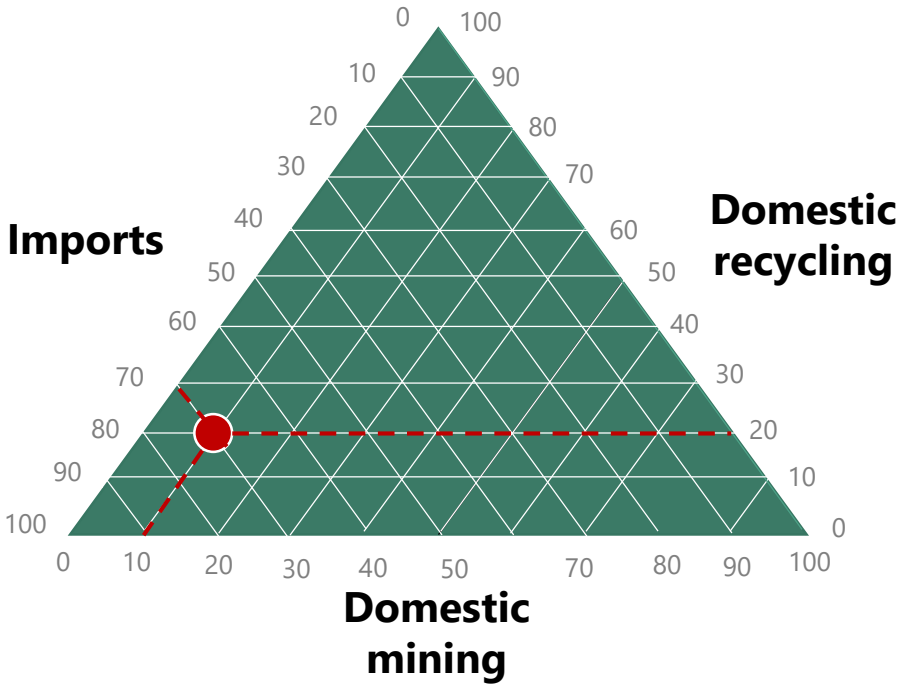
- Detailed guidelines on how to classify Strategic Projects in UNFC
- For Project Promoters
- Strategic Projects focused
- UNFC simplified and detailed explanation of the axes
- Strategic Projects UNFC Use Cases
- Helpdesk information
- Strategic Projects Form Controlling Factors

https://ec.europa.eu/docsroom/documents/60154

UNFC for Secondary Raw Materials – Anthropogenic Resources Specifications

Ulrich Kral & Marina von Vietinghoff-Scheel
Anthropogenic Resources Working Group

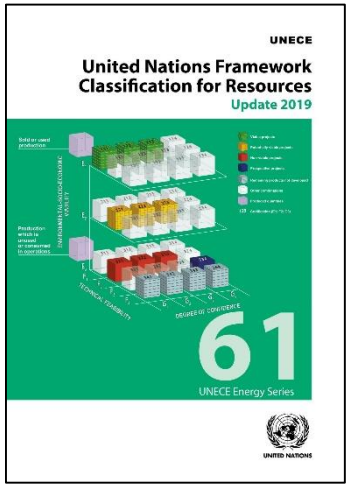
Context



- Raw materials can be sourced either from mining or recycling projects.
- Primary raw materials dominate the supply, but secondary raw materials are getting more attention.
- The UNFC allows to compare mining and recycling projects on a common playing field.

UNFC documents

Generic
Terminology & principles



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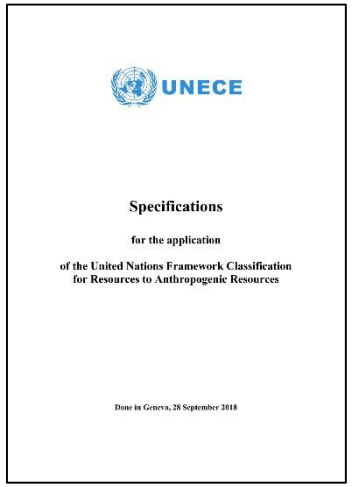
Specifications
Anthropogenic Resources



https://doi.org/10.5281/zenodo.3759026

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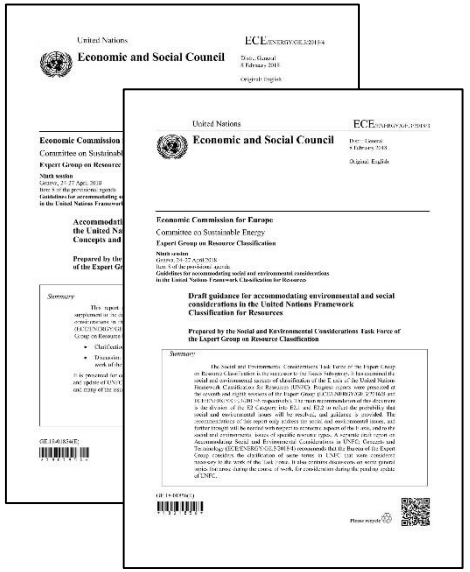
Guidelines



Agenda

1. What is a “recycling” project?
2. UNFC use case
3. Conclusions

What is a Recycling Project?

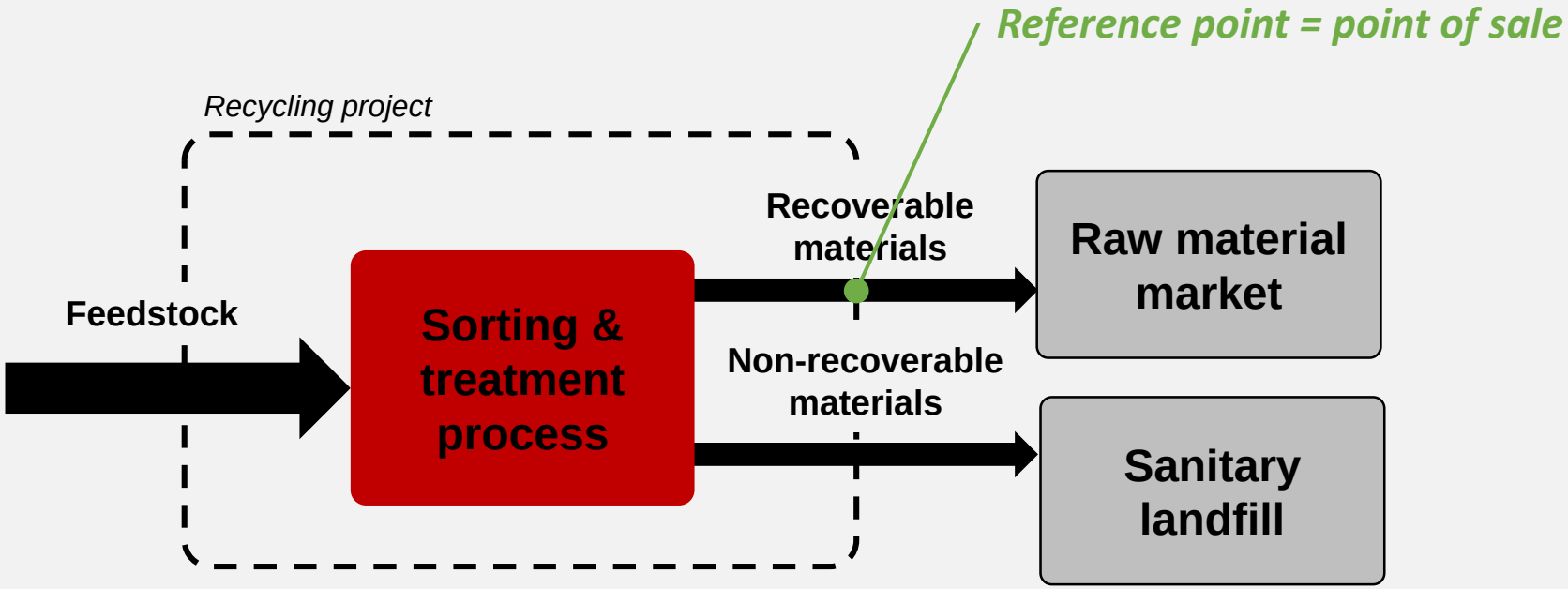
Definitions according to EU CRM Act

- '**critical raw material project**' means any planned facility or planned significant extension or repurposing of an existing facility that is active in the extraction, processing or recycling of critical raw materials. CRM Act, Article 2, point (14)
- '**recycling**' means recycling as defined in Article 3, point (17), of Directive 2008/98/EC. CRM Act, Article, point 2 (10)
- '**recycling**' means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations. Directive 2008/98/EC, Article 3, point (17)

Potential raw material sources, e.g.

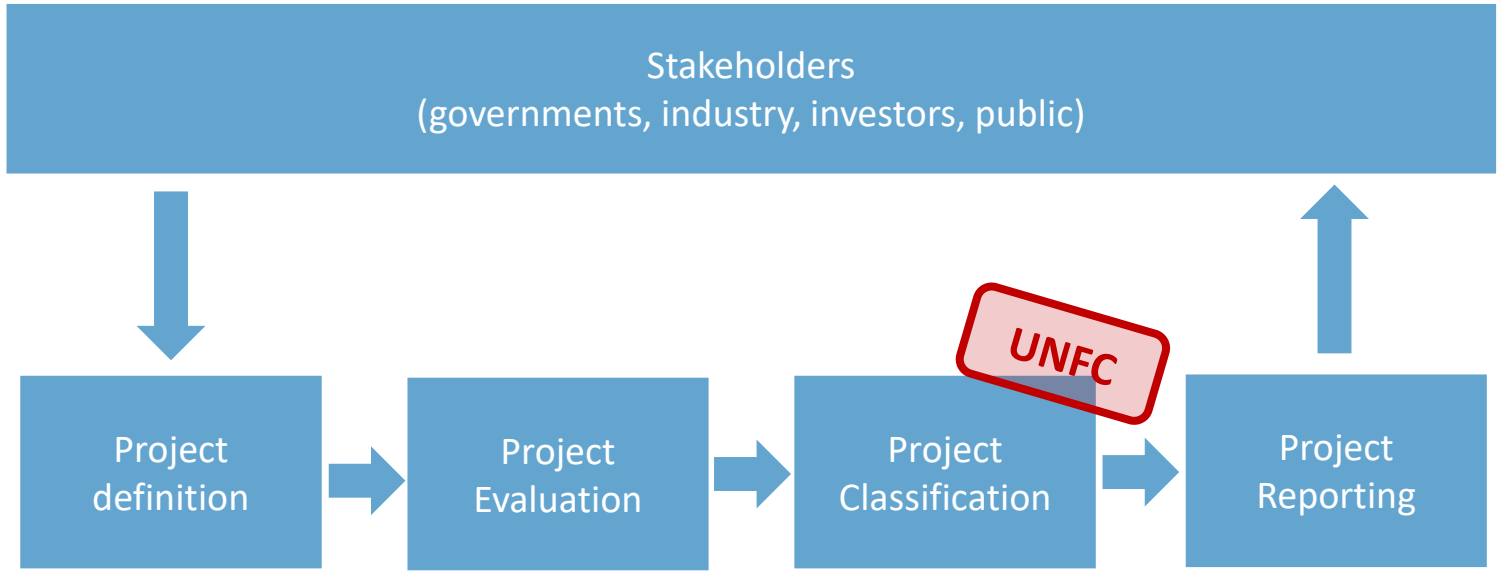
- End-of-life residues
- Metallurgical residues

Imagine the development of a recycling project

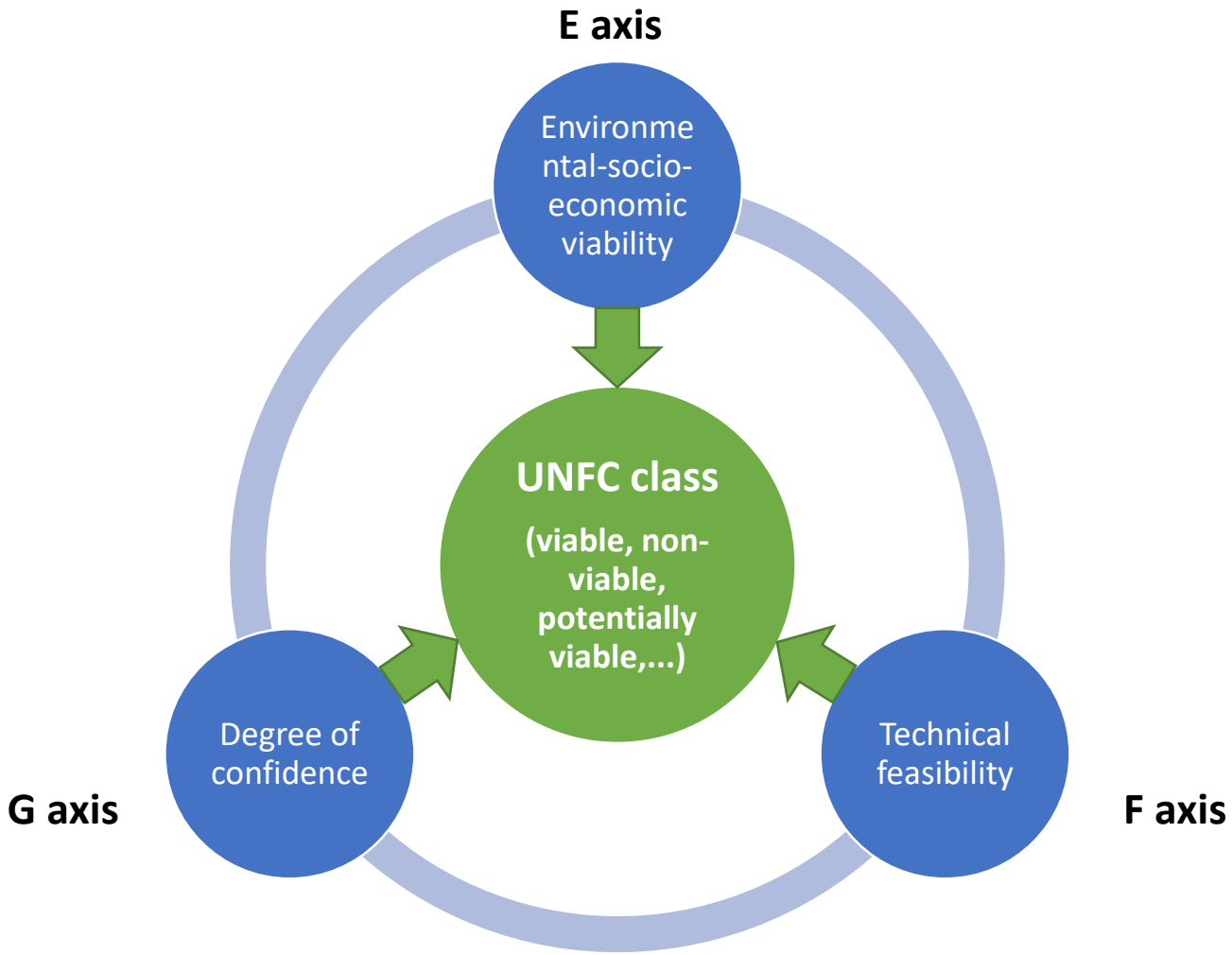


How to classify the recycling project based on UNFC principles?

Framework


Stakeholders
(governments, industry, investors, public)
Project definition
Project Evaluation
Project Classification
UNFC
Project Reporting

Project classification based on 3 criteria



E axis – Environmental-socio-economic viability

1 **Identifying the environmental-socio economic contingencies that affect the development of the recycling project.**

Contingency
Legal compliance
Social compliance
Profitability
Offtaker
…

E axis – Environmental-socio-economic viability

2 Assigning E axis Category to each contingency

Contingency	Assessment and justification for E axis Category assignment	E axis (Sub-) Category
Legal compliance	Environmental Impact Assessment (EIA) has been completed and submitted to the authority. Permits according to national building regulation and other regulations are pending.	E2
Social compliance	A stakeholder consultations process with citizens has been initiated. Concerns regarding noise from the facility have been addressed by noise reduction measurement beyond the legal requirements.	E1
Profitability	A cost benefit analysis shows the profitability as long as the bank loan has a interest rate below X % p.a.	E1.2
Offtaker	Negations with three offtakers is currently going on.	E2

E2 Development and **operation are expected to become** environmentally-socially-economically **viable in the foreseeable future**.

3 Assigning E axis Category to the project (based on lowest rank)

F axis – Technical Feasibility

1 Performing a technical feasibility study of the development project.

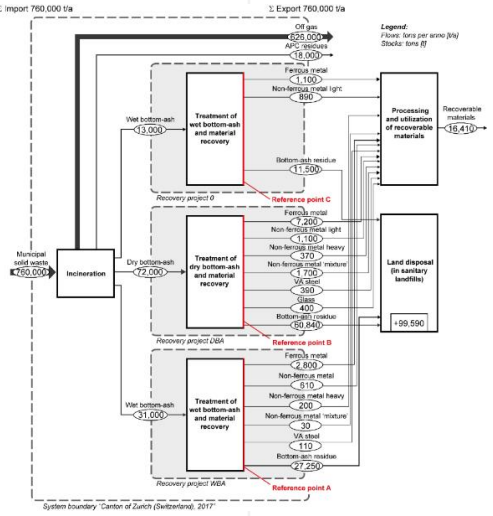
Contingency	Assessment and justification for F axis Category assignment	F axis (Sub-) Category
Readiness of sorting and treatment technologies	The system prototype has been demonstrated in operational environment, which corresponds to TRL7.	F1.3
Transport infrastructure	The property of the facility is accessible via an existing road network and the construction of a rail cargo station on site has been authorized.	F1
Energy supply	The facility will receive electricity supply from the local grid. A contract has already been signed with the electricity provider	F1

F1.3 **Studies have been completed** to demonstrate the technical feasibility of development and operation. There shall be a **reasonable expectation** that **all necessary approvals/contracts for the project to proceed to development will be forthcoming**.

2 Assigning F axis Category to the project (based on lowest rank)

G axis – Degree of Confidence

- Degree of confidence in product quantity estimates
- Three different G axis uses → The “Confidence in estimate” has been selected
- Forecasting product quantities alongside the E & F axis settings



https://doi.org/10.1016/j.jclepro.2020.120490

Reference point A

Quantity	Product	Justification for G axis Category assignment	G
2’800 t/a 610 t/a 200 t/a 110 t/a	Ferrous metals Non-Ferrous metals (heavy fraction) including Strategic Raw Materials Non-Ferrous metals (mixture) including Strategic Raw Materials VA steel	Sampling and analysis of the feedstock has been undertaken over the last 5 years. The regional waste outlook estimates a slight increase of waste volumes by 3% (2020-2030). A change in waste composition is not expected, because the feedstock includes metal-containing wastes that are not separately collected.	**G1** Product quantity associated with a project that can be estimated with a **high level of confidence**.
27’250 t/a	Non-recoverable materials.	The residues will be send to a sanitary landfill.	Remaining products

Project Classification

Total Products	Produced	Sold or used production			
		Production which is unused or consumed in operations[a]			
		Class	Minimum Categories		
			E	F	G[b]
	The project's environmental-socio-economic viability and technical feasibility has been confirmed	Viable Projects[c]	1	1	1, 2, 3
	The project's environmental-socio-economic viability and/or technical feasibility has yet to be confirmed	Potentially Viable Projects[d]	2[e]	2	1, 2, 3
		Non-Viable Projects[f]	3	2	1, 2, 3
	Remaining products not developed from identified projects[g]		3	4	1, 2, 3
	There is insufficient information on the source to assess the project's environmental-socio-economic viability and technical feasibility	Prospective Projects	3	3	4
	Remaining products not developed from prospective projects[g]		3	4	4

E2 F1.3 G1

Conclusions

- UNFC is applicable to **recycling projects**
- The **classification** of the project needs to be **based on evidence**
- The classification is a **snapshot in time**. Project **re-classification** over time

Q&A Session 1

UNECE

BREAK

Resuming at 16:30

2 July 2024 | Online

UNFC and the Strategic Project Form for CRMA

Guiding Principles – Application Scope

- As per **Article 7 of CRMA**: UNFC Classification is a criterion for recognizing raw materials projects as Strategic Projects. Projects must be classified by Project Promoters in UNFC
- **UNFC is applicable to extraction, processing, recycling, and substitution of raw materials**
- **Purpose:**
  - Highlights project's sustainability measures
  - Indicates project's technical maturity
  - Degree of confidence in product estimates
- **Supporting Evidence:** Strategic raw material potential, Technological feasibility, Economic viability, Environmental and social sustainability.

- **Role of UNFC**
  - Assessment Tool
  - The given UNFC Class is not a determining factor for Strategic Project recognition
  - Used for assessing environmental, social, and economic viability.
  - Indicates need for permitting fast track and/or financial support
  - Monitors long-term progression of projects. Identifies project strengths, gaps, and areas for improvement
- **Classification Process:**

  1) Project promoters classify their projects during the preparation of their application (less than one day)

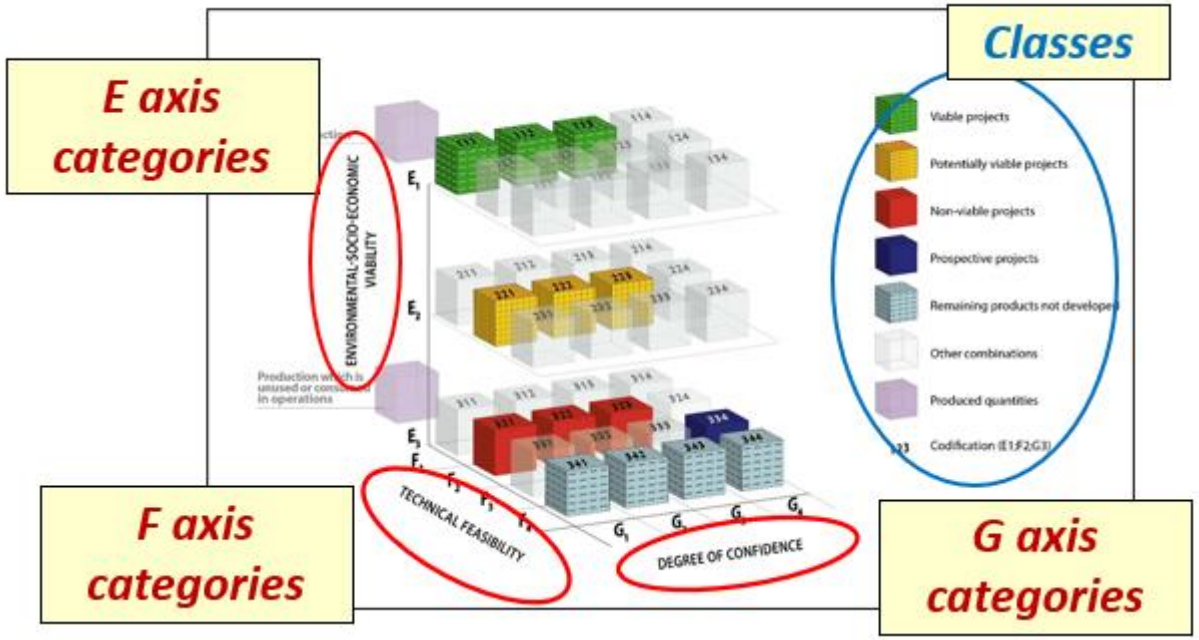
  2) Classification reviewed by European Commission and technical experts, including UNFC experts (after a positive completeness check)

Classifying Strategic Projects in UNFC

The classification for Strategic Projects under UNFC is simplified following **a top-down approach**, beginning with **a broad classification** and progressively diving into **details** with **the verification** at the end.

Connecting with the Strategic Projects Form: classification supported by interconnecting the different fields specified in the Strategic Projects Form for CRMA to the UNFC axes. These fields serve as "Controlling Factors" for the different axes of UNFC (ANNEX).

- **UNFC Class and Sub-Class Classification**
- **UNFC Categories and Sub-Categories**
- **Overall Classification and Verification**



Classifying Strategic Projects in UNFC

Connecting with the Strategic Projects Form (SPF):

- **Useful to facilitate UNFC Classification:** Incorporate required field and documents from Strategic Projects Form for CRMA into UNFC. These elements are pivotal for UNFC classification
- **UNFC Controlling Factors (CFs):**
  - Defined by social, environmental, economic, technological, and geological factors
  - Assist the classification process in UNFC
- **Impact on Project Viability:**
  - CFs directly or indirectly influence project viability
  - Assist classifiers in the final classification
- **Connection of SPF required fields and documents to UNFC Axes:**
  - E axis CFs: Social, environmental, and economic aspects
  - F axis CFs: Technical aspects
  - G axis CFs: Confidence in product estimation
- **Information Clarity and Granularity of CFs** depend on information provided by Project Promoters
- **Notice:**
  - Not all CFs are equally important in every case
  - Review of CFs is based on the project promoter's balanced judgement

Connecting SPF with UNFC Axes

- The SPF is comprised of 9 sections:

1. Project Basic Information
2. Project Ownership
3. Strategic Raw Materials (SRM) Information
4. Project Technical Feasibility
5. Project Financial Viability
6. Project Operational/Permitting Status
7. Security of Supply, Cross-border Benefits, Trade
8. Project Sustainability
9. Attestation

- The difference between the SPF for each type of project is found only in Section 1 and 3. The other sections are similar for all types of projects

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma_en#:~:text=The%20European%20Critical%20Raw%20Materials,supply%20of%20strategic%20raw%20materials.

- UNFC Axes and related CFs are highlighted:
  - E axis: Green
  - F axis: Yellow
  - G axis: Blue

Supporting evidence = Attached document(s)

Classifying Strategic Projects in UNFC

1. UNFC Class Classification:

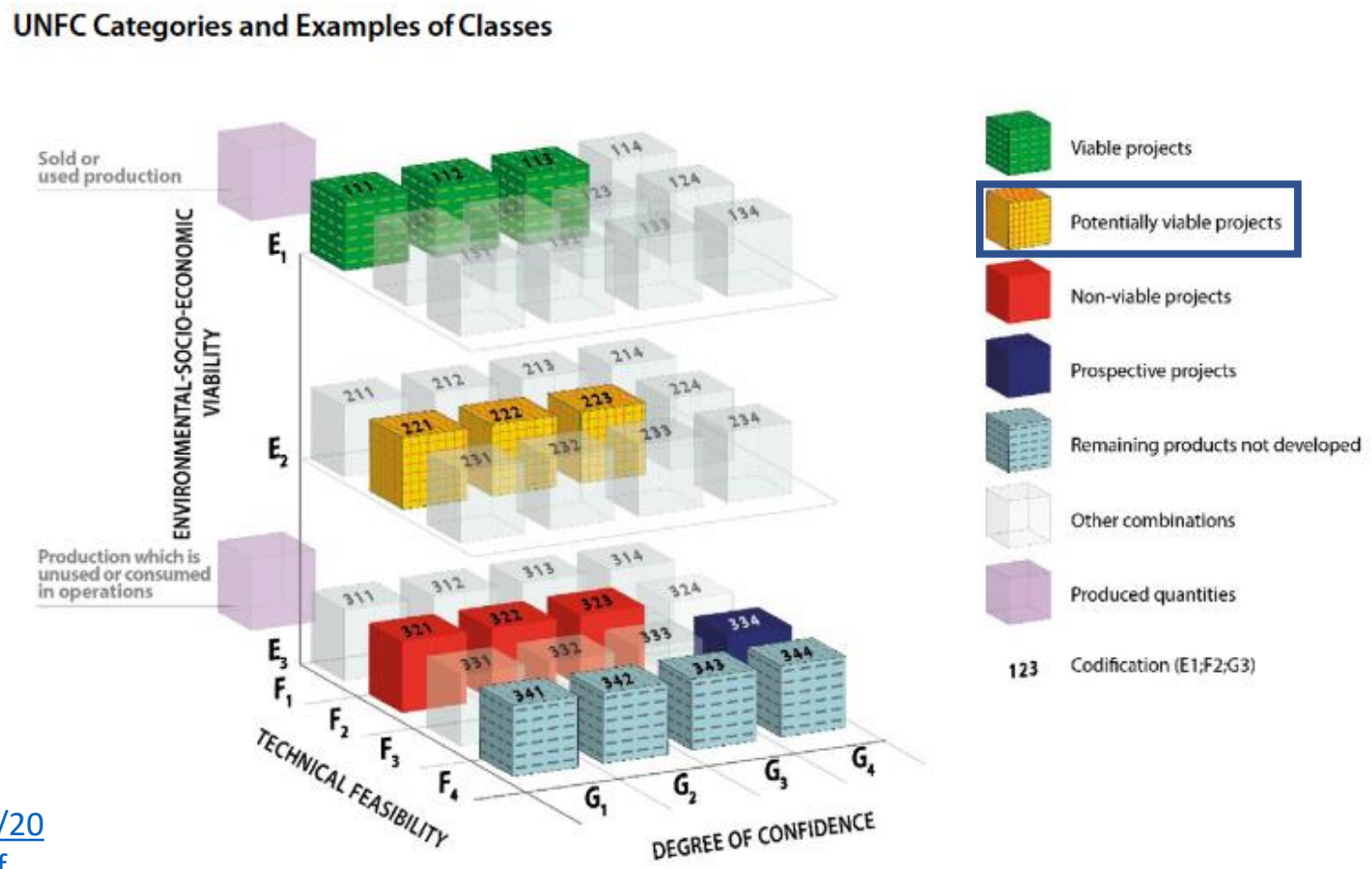


FIGURE 1 UNFC Categories and Examples of Classes, UNFC 2019
https://unece.org/sites/default/files/2023-10/UNFC_ES61_Update_2019.pdf

Classifying Strategic Projects in UNFC

2. Sub-Class Identification:

UNFC Classes Defined by Categories and Sub-categories

		Class	Sub-Class	Categories		
				E	F	G
Total Products	Produced	Sold or used production				
		Production which is unused or consumed in operations				
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

FIGURE 3 UNFC Classes and Sub-classes defined by Sub-categories, UNFC 2019
https://unece.org/sites/default/files/2023-10/UNFC_ES61_Update_2019.pdf

UNECE

Classifying Strategic Projects in UNFC

3. Categories and Sub-Categories:

Category	Definition	Supporting Explanation
E1	Development and operation are confirmed to be environmentally-socially-economically viable.	Development and operation are environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions. All necessary conditions have been met (including relevant permitting and contracts) or there are reasonable expectations that all necessary conditions will be met within a reasonable timeframe and there are no impediments to the delivery of the product to the user or market. Environmental-socio-economic viability is not affected by short-term adverse conditions provided that longer-term forecasts remain positive.
E2	Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.	Development and operation are not yet confirmed to be environmentally-socially-economically viable but, on the basis of realistic assumptions of future conditions, there are reasonable prospects for environmental-socio-economic viability in the foreseeable future.
E3	Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.	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; or, environmental-socio-economic viability cannot yet be determined due to insufficient information. Also included are estimates associated with projects that are forecast to be developed, but which will be unused or consumed in operations.

ANNEX I: DEFINITION OF CATEGORIES AND SUPPORTING EXPLANATIONS, UNFC 2019
https://unece.org/sites/default/files/2023-10/UNFC_ES61_Update_2019.pdf

E axis Category

Classifying Strategic Projects in UNFC

3. Categories and Sub-Categories:

Category	Definition	Supporting Explanation
E1	Development and operation are confirmed to be environmentally-socially-economically viable.	Developm economic assumptio been met reasonabl within a re the deliver socio-eco conditions
E2	Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.	Developm environm realistic as prospects foreseeabl
E3	Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.	On the bas currently for enviro future; or, determine Also included are estimates associated with projects that are forecast to be developed, but which will be unused or consumed in operations.

Category	Definition	Supporting Explanation
F1	Technical feasibility of a development project has been confirmed.	Development or operation is currently taking place or, sufficiently detailed studies have been completed to demonstrate the technical feasibility of development and operation. A commitment to develop should have been or will be forthcoming from all parties associated with the project, including governments.
F2	Technical feasibility of a development project is subject to further evaluation.	Preliminary studies of a defined project provide sufficient evidence of the potential for development and that further study is warranted. Further data acquisition and/or studies may be required to confirm the feasibility of development.
F3	Technical feasibility of a development project cannot be evaluated due to limited data.	Very preliminary studies of a project, indicate the need for further data acquisition or study in order to evaluate the potential feasibility of development.
F4	No development project has been identified.	Remaining quantities of product not developed by any project. These are quantities which, if produced, could be bought, sold or used (i.e. electricity, heat, etc., not wind, solar irradiation, etc.).

ANNEX I: DEFINITION OF CATEGORIES AND SUPPORTING EXPLANATIONS, UNFC 2019
https://unece.org/sites/default/files/2023-10/UNFC_ES61_Update_2019.pdf

F axis Category

Classifying Strategic Projects in UNFC

3. Categories and Sub-Categories:

Category	Definition	Supporting Explanation
E1	Development and operation are confirmed to be environmentally-socially-economically viable.	Developm economica assumptio been met reasonabl within a re the delive socio-eco conditions
E2	Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.	Developm environme realistic as prospects foreseeabl
E3	Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.	On the bas currently c for environ future; or, determine Also included are estimates associated with projects t forecast to be developed, but which will be unused or operations.

Category	Definition
F1	Technical feasibility of a development project has been confirmed.
F2	Technical feasibility of a development project is subject to further evaluat
F3	Technical feasibility of a development project can be evaluated due to limit data.
F4	No development project been identified.

Category	Definition	Supporting Explanation
G1	Product quantity associated with a project that can be estimated with a high level of confidence.	Product quantity estimates may be categorized discretely as G1, G2 and/or G3 (along with the appropriate E and F Categories), based on the degree of confidence in the estimates (high, moderate and low confidence, respectively) based on direct evidence. Alternatively, product quantity estimates may be categorized as a range of uncertainty as reflected by either (i) three specific deterministic scenarios (low, best and high cases) or (ii) a probabilistic analysis from which three outcomes (P90, P50 and P10)[3] are selected. In both methodologies (the "scenario" and "probabilistic" approaches), the estimates are then classified on the G Axis as G1, G1+G2 and G1+G2+G3 respectively. In all cases, the product quantity estimates are those associated with a project. Additional Comments: The G axis Categories are intended to reflect all significant uncertainties (e.g. source uncertainty, geologic uncertainty, facility efficiency uncertainty, etc.) impacting the estimate forecast for the project. Uncertainties include variability, intermittency and the efficiency of the development and operation (where relevant). Typically, the various uncertainties will combine to provide a full range of outcomes. In such cases, categorization should reflect three scenarios or outcomes that are equivalent to G1, G1+G2 and G1+G2+G3.
G2	Product quantity associated with a project that can be estimated with a moderate level of confidence.	
G3	Product quantity associated with a project that can be estimated with a low level of confidence.	
G4	Product quantity associated with a Prospective Project, estimated primarily on indirect evidence.	A Prospective Project is one where the existence of a developable product is based primarily on indirect evidence and has not yet been confirmed. Further data acquisition and evaluation would be required for confirmation. Where a single estimate is provided, it should be the expected outcome but, where possible, a full range of uncertainty should be calculated for the prospective project. In addition, it is recommended that the chance of success (probability) that the prospective project will progress to a Viable Project is assessed and documented.

G axis Category

Classifying Strategic Projects in UNFC

3. Categories and Sub-Categories:

E axis Sub-Category

Category	Sub-Category	Sub-Category Definition
E1	E1.1	Development is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions.
	E1.2	Development is not environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions, but is made viable through government subsidies and/or other considerations.
E2	No Sub-categories defined	
E3	E3.1	Estimate of product that is forecast to be developed, but which will be unused or consumed in operations.
	E3.2	Environmental-socio-economic viability cannot yet be determined due to insufficient information.
	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.

F axis Sub-Category

Category	Sub-Category	Sub-Category Definition
F1	F1.1	Production is currently taking place.
	F1.2	Capital funds have been committed and implementation of the development is underway.
	F1.3	Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming
F2	F2.1	Project activities are ongoing to justify development in the foreseeable future.
	F2.2	Project activities are on hold and/or where justification as a development may be subject to significant delay.
	F2.3	There are no plans to develop or to acquire additional data at the current time due to limited potential.

ANNEX II: DEFINITION OF SUB-CATEGORIES, UNFC 2019
https://unece.org/sites/default/files/2023-10/UNFC_ES61_Update_2019.pdf

Classifying Strategic Projects in UNFC

4. Overall Classification and Verification:

UNFC Classes Defined by Categories and Sub-categories

Total Products		Sold or used production				
	Produced	Production which is unused or consumed in operations				
	Class		**Sub-Class**	**Categories**		
				E	F	G
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

Classifying Strategic Projects in UNFC - Reminder

Connecting with the Strategic Projects Form: classification supported by interconnecting the different fields specified in the Strategic Projects Form for CRMA to the UNFC axes. These fields serve as “Controlling Factors” for the different axes of UNFC (ANNEX).

1. **UNFC Class Classification:** starting with assigning a UNFC Class to the project (Viable, Potentially Viable, and Non-Viable). This initial step provides a broad overview of the project's potential and establishes its primary status within UNFC.
2. **UNFC Sub-Class Classification:** first level of detail that is also easy to recognize.
3. **Categories and Sub-Categories:** Each Category and Sub-Category clarifies specifics of the project. This step involves assigning a Category followed by a Sub-Category (if applicable), verified by the provided UNFC definitions. Link to Strategic Projects Form
4. **Overall Classification and Verification:** The final step involves taking a holistic view of the classification and assessing its overall coherence and accuracy with the given UNFC classification (e.g., E1.2; F2.1; G2). The assigned E, F, and G Categories and Sub-Categories of the final classification should be verified in accordance with the suitable Class and Sub-Class.

Use the (extended) **Detailed Guidance on Classifying Strategic Projects according to UNFC !**

ANNEX - Connecting SPF with UNFC Axes

- The SPF is comprised of 9 sections:

1. Project Basic Information
2. Project Ownership
3. Strategic Raw Materials (SRM) Information
4. Project Technical Feasibility
5. Project Financial Viability
6. Project Operational/Permitting Status
7. Security of Supply, Cross-border Benefits, Trade
8. Project Sustainability
9. Attestation

- UNFC Axes and related CFs are highlighted:
  - E axis: Green
  - F axis: Yellow
  - G axis: Blue

- The difference between the SPF for each type of project is found only in Section 1 and 3. The other sections are similar for all types of projects

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma_en#:~:text=The%20European%20Critical%20Raw%20Materials,supply%20of%20strategic%20raw%20materials.

SPF fields as UNFC Controlling Factors

1) Project basic information (project fiche) – if not specified (free text fields)
   a) Project name
   b) Project type (CRMA - Extraction, Processing, Recycling, Substitution) *(drop down list with possibility to select only 1)*
   c) Project main products *(multiple triplets).*
      i) SRM Name(s) (*drop down SRM list)*
      ii) SRM chemical form and purity, Combined Nomenclature (CN) and Production (PRODCOM) codes.
      iii) SRM foreseen amount(s) – yearly production capacity *(in t)* **6-1-b**
      iv) Other products
   d) Project development stage (scoping study, pre-feasibility, feasibility, construction, production) *(drop down list).*
   e) Project short summary
   f) Estimated starting date of production *(date)* and estimated full capacity *(date)*
   g) Project lifetime *(in years - number)* **6-1-b**
   h) Describe the relevance of the project for the EU including position of the project in the value chain. **6-1-a**
   i) Describe how this recognition would be beneficial for the project development.
   j) Project promoter
      i) Undertaking's name
      ii) Undertaking's country *(drop down list)*
      iii) Undertaking's stock symbol (if available) *(in code)*
      iv) Participant Identification Code (PIC – EU Funds) (if available)
   k) Project contact person
      i) Name
      ii) Position
      iii) Email
   l) Project location
      i) Country *(drop down list)*
      ii) Location
      iii) Geographical coordinates

m) Project UNFC Classification (E/F/G) at the subcategory level *(UNFC classification automatically generated from input on E, F, G axis below)* **7-1-b**
   i) E axis *(drop down list)*
   ii) F axis *(drop down list)*
   iii) G axis *(drop down list)*

2) Project ownership **7-1-d**
   a) Describe the ownership structure of the project (include a diagram if relevant).
   b) List the undertakings or persons involved in the project. Provide information on each of them:
      i) undertaking /person name(s)
      ii) undertaking /person country(s) *(drop down list)*
      iii) undertaking /person address(es)
      iv) undertaking stock symbol(s) (if available) *(in code)*
      v) undertaking website(s)
      vi) PIC Number
   c) Describe the roles/rights of the undertakings/persons involved in the project including the relative ownership share.
   d) Provide information allowing to determine who controls the undertakings involved.
   e) Provide financial statements for the last 3 years for the main undertaking involved.

3) Strategic raw materials information
   a) SRM resource (in t) and grade in (% or ppm) (**extraction projects**) / material input (in t) and SRM content in (% or ppm) (**processing, recycling, substitution projects**) *(drop down for SRM and numbers for tonnage and %/ppm).*
   b) Estimated amount of substituted SRM (t) (**substitution projects**) *(drop down for SRM and number for tonnage).*
   c) Describe the assessment methods, used classification of resources and the level of confidence in the resource. Describe also other co-products if relevant. (**extraction projects**).
   d) Provide any available third-party documentation about resource estimates (**extraction projects**). **(Document 1)**
   e) Describe the raw material inputs, their origin and assessment methods (**processing, recycling and substitution projects**).

4) Project technical feasibility **6-1-b**
   a) Summarise the project's technical feasibility. Summarise risks related to access to necessary technology (e.g. trade restrictions) including the intellectual property rights related to the technology used.
   b) Summarise the status and potential needs of infrastructure support (electricity and water access, roads, railways, harbour access).
   c) Provide the level of confidence in delivering the expected project outputs within its operational environment.
   d) Describe the innovation potential of the substitute material **(substitution projects)**

5) Project financial maturity
   a) Provide a project business plan. **(Document 3)** **7-1-f**
   b) Summarise the project value proposition, including company strategy, approach to commercialisation, market analysis including target markets, key customers, and main competitors.
   c) Summarise the project's financing including foreseen capital expenditure (CAPEX) and operational expenditure (OPEX) at different project development stages.
   d) Summarise the key risks related (including market, credit, liquidity) to the business plan which could impact the financial viability of the project and describe mitigation measures.
   e) If available and relevant, provide any financial due diligence reports produced by independent parties. **(Document 4)**
   f) Would you be interested in discussing financial needs of your project with the CRM Board dedicated sub-group on project financing? *(yes/no)*

6) Project operational/permitting status **7-1-c**
   a) Summarise the operational planning for the development of the project (timetable) and the key milestones including construction and roll out.
   b) Provide an overview of the permits required for the project, including a short description, their timeline, and their status (for each permit also specify if granted, applied, to be applied).
   c) Identify the key operational risks affecting the project and describe risk mitigation measures. Include risks associated with project design, construction, operation, and decommissioning.

7) Security of supply, cross-border benefits, trade
   a) Summarise the strategy for securing key raw material inputs, including quantities, for the production of SRM and list already secured or foreseen sources (**processing, recycling and substitution projects**).
   b) Summarise the strategy for securing the off-takers for the produced SRM and list already secured or foreseen off-take agreements, including information on the level of commitments, the amounts involved, and the time period covered.
   c) Provide basic information on the raw materials suppliers, including ownership and headquarters location.
   d) Provide basic information on (expected) off-takers, including ownership and headquarters location.
   e) Would you be interested in the EU support to find potential off-takers via the off-take mechanism under the CRM Act. *(yes/no)*

8) Project sustainability **6-1-c**

   a) Do you adhere to any international certification schemes. *(yes/no)*
   If yes, provide the relevant documentation. **(Document 5)**

Environmental impacts

   b) Summarise how the monitoring, prevention and minimisation of environmental impacts is carried out.
   For EU projects, refer to the relevant EU and national legislation.
   For projects in third countries or OCTs, refer to the national legislation where that national law provides sufficient assurance and compliance with the sustainability criteria from the CRM Act.
   For projects in third countries or OCTs you can refer to relevant international instruments listed in the Annex III of the CRMA.
   i) If available, provide a summary document of EIA, SEIA or similar environmental impact assessment report. **(Document 6)**
   ii) **For extraction projects in third countries or OCTs only,** the summary (8b) has to include a plan to improve the environmental state of the affected sites after the end of exploitation, with a view to restoring the prior environmental state while taking into account technical and economic feasibility. **7-1-h**
   iii) For EU processing or recycling projects only located in areas protected under the Birds or Habitats Directives, the summary (8b) has to include a description of the technically appropriate alternative locations, assessed by the project promoter, and why those alternative locations are not considered appropriate. **7-1-i**

Social impacts

   c) Summarise how socially adverse impacts are prevented and minimised using socially responsible practices as concerns respect.
   For projects in third countries or OCTs, refer to the national legislation where that national law provides sufficient assurance and compliance with the sustainability criteria from the CRM Act.
   For projects in third countries or OCTs you can refer to relevant international instruments listed in the Annex III of the CRMA.
   i) **For projects with the potential to affect indigenous peoples,** the summary (8c) has to include a plan containing measures dedicated to a meaningful consultation of the affected indigenous peoples about the prevention and minimisation of the adverse impacts on indigenous rights

Section 1: Project Basic Information

For Extraction

SECTION 1: PROJECT BASIC INFORMATION

Project Name	Project Type	Project Development Stage	Project Lifetime (in Years)
Name	Extraction	Pre-feasibility	123

Estimated Starting Date of Production	Estimated Full Capacity Date
22/05/2024	31/05/2024

Project Main Products

Strategic Raw Material Name
Bauxite/Alumina/Aluminium

Chemical Form	How do you measure the Strategic Raw Material purity?	Purity (%)	Foreseen Yearly Production (in tonnes)
Formula	◉ Percentage ○ PPM	12 %	123

Project Short Summary
Text

Describe the relevance of the project for the EU including position of the project in the value chain
Text

Describe how the recognition as strategic project would be beneficial for the project development
Text

Main Project Promoter Details

Undertaking's Name	Undertaking's Country	Address	Undertaking's Stock Symbol
Text		Text	

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 1: Project Basic Information

For Processing & Recycling

SECTION 1: PROJECT BASIC INFORMATION

Project Name	Project Type	Project Development Stage	Project Lifetime (in Years)
Name	Processing	Feasibility	123

Estimated Starting Date of Production	Estimated Full Capacity Date
22/05/2024	31/05/2024

Project Main Products

Strategic Raw Material Name
Bauxite/Alumina/Aluminium

Material Input (in tonnes)	Yearly Production (in tonnes)	Strategic Raw Material content (%)
123	123	12 %

Project Short Summary
Text

Describe the relevance of the project for the EU including position of the project in the value chain
Text

Describe how the recognition as strategic project would be beneficial for the project development
Text

Main Project Promoter Details

Undertaking's Name	Undertaking's Country	Address	Undertaking's Stock Symbol
Text		Text	

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 1: Project Basic Information

For Substitution

SECTION 1: PROJECT BASIC INFORMATION

Project Name	Project Type	Project Development Stage	Project Lifetime (in Years)
Name	Substitution	Production	123

Estimated Starting Date of Production	Estimated Full Capacity Date
22/05/2024	31/05/2024

Project Main Products

For Substitution Projects

New Material Name	Strategic Raw Material To Be Substituted
Text	Bauxite/Alumina/Aluminium

Yearly Production (in tonnes) of the new material	Amount of Strategic Material Substituted
123	123

Project Short Summary

Text

Describe the relevance of the project for the EU including position of the project in the value chain

Text

Describe how the recognition as strategic project would be beneficial for the project development

Text

Main Project Promoter Details

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 1: Project Basic Information

For All

	Belgium	
EU-Participant Identification Code (PIC)	**Undertaking's Website**	**Relative Ownership Share** 12 %

Describe the roles/rights of the project promoter involved in the project
Text

Provide information allowing to determine who controls the project promoter
Text

Project Contact Person

Full Name	**Position**	**E-Mail**
Text	Text	Text@ec.europa.eu

Project Location(s)

Country	**Location**	**Geographical Coordinates (LAT)**	**Geographical Coordinates (LONG)**
Belgium	Text	123	456

UNFC Classification Details

E Axis	**F Axis**	**G Axis**	**UNFC Classification**
E1.1	F1.1	G1	E1.1;F1.1;G1

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 2: Project Ownership

For All

SECTION 2: PROJECT OWNERSHIP

Describe the ownership structure of the project. If relevant, also include a diagram as an additional document [document name: Application ID_Ownership_Structure]

Text

Are there any additional Undertakings or persons that are relevant to the project?

○ Yes
◉ No

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 3: SRM Information

For Extraction

SECTION 3: STRATEGIC RAW MATERIALS INFORMATION

Main Products Details

For Extraction Projects

Strategic Raw Material Name

Bauxite/Alumina/Aluminium

Chemical Form Formula	Purity (%)	Foreseen Yearly Production (in tonnes)
	12 %	123

Describe the assessment methods, used classification of resources and the level of confidence in the resource. Describe also other co-products if relevant.

Text

Provide any available third-party documentation about resource estimates as an additional document [document name: Application ID_Resource_Estimates]

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 3: SRM Information

For Processing & Recycling

SECTION 3: STRATEGIC RAW MATERIALS INFORMATION

Main Products Details

For Processing or Recycling Projects

Strategic Raw Material Name

Bauxite/Alumina/Aluminium

Material Input (in tonnes)	Yearly Production (in tonnes)	Strategic Raw Material content (%)
123	123	12 %

Describe the material inputs, their origin and assessment methods

Text

If relevant provide further information as an additional document [document name: Application ID_Material_Inputs]

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 3: SRM Information

For Substitution

SECTION 3: STRATEGIC RAW MATERIALS INFORMATION

Main Products Details

For Substitution Projects

New Material Name	Strategic Raw Material To Be Substituted
Text	Bauxite/Alumina/Aluminium
Yearly Production (in tonnes) of the new material	**Amount Of Strategic Material Substituted**
123	123

For Substitution projects, describe the innovation potential of the project

Text

If relevant provide further information as an additional document [document name: Application ID_Material_Inputs]

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 4: Project Technical Feasibility

For All

SECTION 4: PROJECT TECHNICAL FEASIBILITY

Summarise the project's technical feasibility

Text

Summarise risks related to access to necessary technology (e.g. trade restrictions) including the intellectual property rights related to the technology used

Text

Summarise the status and potential needs of infrastructure support (electricity and water access, roads, railways, harbour access)

Text

Provide the level of confidence in delivering the expected project outputs within its operational environment

Text

Provide available studies on project's technological maturity as an additional document [document name: Application ID_Technical_Feasibility_Study]

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 5: Project Financial Viability

For All

SECTION 5: PROJECT FINANCIAL VIABILITY

Provide the project business plan as an additional document [document name: Application ID_Business_Plan]

Summarise the project value proposition, including company strategy, approach to commercialisation, market analysis including target markets, key customers, and main competitors

Text

Summarise the project's financing including foreseen capital expenditure (CAPEX) and operational expenditure (OPEX) at different project development stages

Text

Summarise the key risks related (including market, credit, liquidity) to the business plan which could impact the financial viability of the project and describe mitigation measures

Text

If available and relevant, provide any financial due diligence reports produced by independent parties as an additional document [document name: Application ID_Due_Diligence_Reports]

Would you be interested in discussing financial needs of your project with the CRM Board dedicated sub-group on project financing?

◉ Yes
○ No

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 6: Project Operational/Permitting Status

For All

SECTION 6: PROJECT OPERATIONAL/PERMITTING STATUS

Summarise the operational planning for the development of the project (timetable) and the key milestones including construction and roll out

Text

If relevant provide further information as an additional document [document name: Application ID_Operational_Planning]

Permits Overview

Permit Name	Permit Status	Acquisition/Application Date
Text	Acquired	01/05/2024

Permit Description

Text

Identify the key operational risks affecting the project and describe risk mitigation measures. Include risks associated with project design, construction, operation, and decommissioning

Text

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 7: Security of Supply, Cross-border benefits, Trade

For All

SECTION 7: SECURITY OF SUPPLY, CROSS-BORDER BENEFITS, TRADE

Summarise the strategy for sourcing Strategic Raw Materials and securing the off-takers for the produced Strategic Raw Materials and list already secured or foreseen off-take agreements

Text

Provide basic information on the raw materials suppliers, including ownership and headquarters location and information on the level of commitments, the amounts involved, and the time period covered

Text

Provide basic information on (expected) off-takers, including ownership and headquarters location and information on the level of commitments, the amounts involved, and the time period covered.

Text

Would you be interested in the EU support to find potential off-takers via the off-take mechanism under the CRM Act?

◉ Yes

○ No

Would you be interested in participating in the joint purchasing mechanism under the CRM Act?

◉ Yes
○ No

For projects in the EU only, describe the project's cross-border benefits beyond the Member State involved

Text

For projects in third countries or Overseas Countries and Territories (OCTs) that are emerging markets or developing economies only, describe how the project is adding value to the EU and the third country concerned

Text

For projects in third countries or OCTs identify any potential bottlenecks you may encounter regarding trade and investment conditions

Text

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 8: Project Sustainability

For All

SECTION 8: PROJECT SUSTAINABILITY

Do you adhere to any international certification schemes?

(•) Yes
( ) No

Provide any relevant documentation as additional document [document name: Application ID_Certification_Scheme]

Environmental Impacts

Summarise how the monitoring, prevention and minimisation of environmental impacts is carried out

Text

If available, provide a summary document of EIA, SEIA or similar environmental impact assessment report as additional document [document name: Application ID_Sustainability]

☐ Check the box to reveal more instructions about how to provide the environmental summary

Social Impacts

Summarise how socially adverse impacts are prevented and minimised using socially responsible practices as concerns respect

Text

☐ Check the box to reveal more instructions about how to provide the social impact summary

Describe how meaningful engagement with local/affected communities and relevant social partners is carried out. List all concrete measures and their status to facilitate public acceptance

Text

Provide a summary of potential jobs to be created by the project (directly and indirectly) and their areas. Describe how would you support the upskilling and/or reskilling

Text

Governance

Summarise how transparent business practices with adequate compliance policies are used in the project to prevent and minimise adverse impacts on the functioning of public administration including anti-bribery and anti-corruption measures

Text

☐ Check the box to reveal more instructions about how to provide the governance summary

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Section 9: Attestation

For All

SECTION 9: ATTESTATION

The Project Promoter represented by the person mentioned below confirm that to the best of their knowledge and belief, the information given in this form is true, correct, and complete, that true and complete copies of documents required by this form have been supplied, that all estimates are identified as such and are their best estimates of the underlying facts, and that all the opinions expressed are sincere.

Signatory Full Name	Signatory E-Mail	Date
Text	Text@ec.europa.eu	22/05/2024

☑ I Confirm All of The Above

Application ID

Name_
Extraction_2024-05-22

https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/strategic-projects-under-crma/application-form_en

Classroom Exercise: Classifying Strategic Projects according to UNFC

Exercise 1: Lithium Extraction Project

Consider a lithium mining project in Italy, with a plan to extract lithium from high-quality Spodumene deposits. Given the defined benchmarks for Strategic Raw Materials outlined in the CRMA, this lithium extraction project holds strategic significance due to the increasing demand for lithium-ion batteries in electric vehicles and renewable energy storage systems. The project is in need to expediate the permitting process, therefore applying for Strategic Project.

The Project Promoter has collected the relevant information for the UNFC classification tied to this project, based on the Strategic Project Form and the UNFC Controlling Factors and assigned them to the E, F, and G axes.

SCAN TO ANSWER THE QUESTIONS

Exercise 1: Lithium Extraction Project

E axis: The project was in ownership of an exploration permit, during which a Pre-Feasibility study, evaluation of the resource/reserve, environmental impact assessment, and operational plan were conducted. The project is currently preparing to apply for an extraction permit. Current plans and assessments suggest that the project's development could proceed forward in the foreseeable future. With regards to the economic aspect, the submitted business plan includes information on production sharing, royalties, taxation, market demand, and production costs. From an environmental standpoint, the project has issued a positive environmental impact assessment, compliant with the Italian regulation. Additionally, the project is initiating an application for mining wastes permits to be submitted for public enquiry. Land use planning is also under process. Given that the area is remote and historically centered on mining activities, social contingencies and opposition seem unlikely.

Q1: What is the correct UNFC category for the E axis?

A. E1 B. E2 C. E3

Category	*Definition*	*Supporting explanation for minerals*
E1	*Development and operation are confirmed to be environmentally-socially- economically viable.*	*Development and operation* (prospecting, exploration, mine production, processing, sales-access to market, rehabilitation) *are environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions. All necessary conditions have been met (including relevant permitting and contracts) or there are reasonable expectations that all necessary conditions will be met within a reasonable timeframe and there are no impediments to the delivery of the product to the user or market. Environmental-socio-economic viability is not affected by short-term adverse conditions provided that longer-term forecasts remain positive.*
E2	*Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.*	*Development and operation* (prospection, exploration, mine production, processing, sales-access to market, rehabilitation) *are not yet confirmed to be environmentally-socially-economically viable but, on the basis of realistic assumptions of future conditions, there are reasonable prospects for environmental-socio-economic viability in the foreseeable future.*
E3	*Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.*	*On the basis of realistic assumptions of future conditions, it is currently considered that there are not reasonable prospects for environmental-socio-economic viability* of mining *in the foreseeable future; or, environmental-socio-economic viability cannot yet be determined due to insufficient information* (e.g. during prospecting and exploration). *Also included are estimates associated with projects that are forecast to be developed, but which will be unused or consumed in operations* (sub-economic ore, waste).

Exercise 1: Lithium Extraction Project

E axis: The project **was in ownership** of an exploration permit, during which a **Pre-Feasibility study**, evaluation of the resource/reserve, environmental impact assessment, and operational plan were conducted. The project is currently **preparing to apply** for an extraction permit. Current plans and assessments **suggest** that the project's development could proceed forward in the foreseeable future. With regards to the economic aspect, the submitted business plan includes information on production sharing, royalties, taxation, market demand, and production costs. From an environmental standpoint, the project has issued a positive environmental impact assessment, compliant with the Italian regulation. Additionally, the project is initiating an application for mining wastes permits to be submitted for public enquiry. Land use planning is also under process. Given that the area is remote and historically centered on mining activities, social contingencies and opposition seem unlikely.

Category	*Definition*	*Supporting explanation for minerals*
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E2	*Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.*	*Development and operation* (prospection, exploration, mine production, processing, sales-access to market, rehabilitation) *are not yet confirmed to be environmentally-socially-economically viable but, on the basis of realistic assumptions of future conditions, there are reasonable prospects for environmental-socio-economic viability in the foreseeable future.*
E3	*Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.*	*On the basis of realistic assumptions of future conditions, it is currently considered that there are not reasonable prospects for environmental-socio-economic viability* of mining *in the foreseeable future; or, environmental-socio-economic viability cannot yet be determined due to insufficient information* (e.g. during prospecting and exploration). *Also included are estimates associated with projects that are forecast to be developed, but which will be unused or consumed in operations* (sub-economic ore, waste).

Q1: What is the correct UNFC category for the E axis?

A. E1 **B. E2** C. E3

Exercise 1: Lithium Extraction Project

F axis: The project has completed the Pre-Feasibility study, but the project is still in the planning phase and hasn't commenced extraction operations since the developments await the extraction permit.

Category	*Definition*	*Supporting explanation for minerals*
F1	*Technical feasibility of a development project has been confirmed.*	*Development or operation is currently taking place or, sufficiently detailed studies have been completed to demonstrate the technical feasibility of development and operation. A commitment to develop should have been or will be forthcoming from all parties associated with the project, including governments.*
F2	*Technical feasibility of a development project is subject to further evaluation.*	*Preliminary studies of a defined project provide sufficient evidence of the potential for the development and that further study is warranted. Further data acquisition and/or studies maybe required to confirm the feasibility of development.*
F3	*Technical feasibility of a development project cannot be evaluated due to limited data.*	*Very preliminary studies of a project indicate the need for further data acquisition or study in order to evaluate the potential feasibility or development.* Additional exploration and investigation are required to confirm or to assess the technical feasibility of the project.
F4	*No development project* or mining operation *has been identified.*	*Remaining quantities of product not developed by any project* (not recoverable ore, at least not with available technology, too deep, groundwater issues etc.).

Q2: What is the correct UNFC category for the F axis?

A. F1.1 B. F2.1 C. F2.2 D. F3.1

Category	*Sub-Category*	*Sub-Category Definition*
F1	F1.1	*Production or operation is currently taking place.*
	F1.2	*Capital funds have been committed and implementation of the development is underway.*
	F1.3	*Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming*
F2	F2.1	*Project activities are ongoing to justify development in the foreseeable future.*
	F2.2	*Project activities are on hold and/or where justification as a development may be subject to significant delay.*
	F2.3	*There are no plans to develop or to acquire additional data at the current time due to limited potential.*
F3	F3.1	*Site-specific studies have identified a potential development with sufficient confidence to warrant further testing.*
	F3.2	*Local studies indicate the potential for development in a specific area but requires more data acquisition and/or evaluation in order to have sufficient confidence to warrant further testing.*
	F3.3	*At the earliest stage of studies, where favourable conditions for the potential development in an area may be inferred from regional studies.*

Exercise 1: Lithium Extraction Project

F axis: The project has completed the **Pre-Feasibility study**, but the project is **still in the planning phase** and **hasn't commenced extraction operations since the developments await the extraction permit.**

Category	*Definition*	*Supporting explanation for minerals*
F1	*Technical feasibility of a development project has been confirmed.*	*Development or operation is currently taking place or, sufficiently detailed studies have been completed to demonstrate the technical feasibility of development and operation. A commitment to develop should have been or will be forthcoming from all parties associated with the project, including governments.*
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F4	*No development project* or mining operation *has been identified.*	*Remaining quantities of product not developed by any project* (not recoverable ore, at least not with available technology, too deep, groundwater issues etc.).

Category	*Sub-Category*	*Sub-Category Definition*
F1	F1.1	*Production or operation is currently taking place.*
	F1.2	*Capital funds have been committed and implementation of the development is underway.*
	F1.3	*Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming*
F2	F2.1	*Project activities are ongoing to justify development in the foreseeable future.*
	F2.2	*Project activities are on hold and/or where justification as a development may be subject to significant delay.*
	F2.3	*There are no plans to develop or to acquire additional data at the current time due to limited potential.*
F3	F3.1	*Site-specific studies have identified a potential development with sufficient confidence to warrant further testing.*
	F3.2	*Local studies indicate the potential for development in a specific area but requires more data acquisition and/or evaluation in order to have sufficient confidence to warrant further testing.*
	F3.3	*At the earliest stage of studies, where favourable conditions for the potential development in an area may be inferred from regional studies.*

Q2: What is the correct UNFC category for the F axis?

A. F1.1 B. F2.1 **C. F2.2** D. F3.1

Exercise 1: Lithium Extraction Project

G axis: The lithium reserves have undergone a detailed exploration campaign, and are well documented, with sufficient investigation measures and carried studies, including geochemical and geophysical analyses, to estimate the lithium quantities and quality (volumes and grades). There's also substantial geological knowledge about the area. The project has conducted a Pre-Feasibility Study, that includes reserves estimates signed off by a Competent Person. The reserve estimates are probable as per the PERC standards. The project is certain, with moderate degree of confidence, that the foreseen amount of produced lithium will be met. All supporting documents on the estimates have been submitted with the Strategic Project Application Form.

Q3: What is the correct UNFC category for the G axis?

A. G1

B. G2

C. G3

G-Axis Categories Definitions (UNFC 2019 and UNFC Minerals Specifications)

Category	Definition
G1	Product quantity associated with a project that can be estimated with a high level of confidence
G2	Product quantity associated with a project that can be estimated with a moderate level of confidence
G3	Product quantity associated with a project that can be estimated with a low level of confidence

CRIRSCO Template			*Corresponding UNFC Category*[f]			*UNFC Class*
Public Report and Study Types[a]	*Standard Definitions*					
Feasibility Study or Life of Mine Plan[b] (for an operating mine)	Mineral Reserves	Proved	E1	F1	G1	Viable Projects
		Probable			G2	
Pre-feasibility Study[d]	Mineral Reserves	Proved	E2	F2	G1	Potentially Viable Projects
		Probable			G2	
Feasibility Study, Life of Mine Plan[b] (for an operating mine) or Pre-feasibility Study[e]	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[f]	Mineral Resources	Measured	E2	F2	G1	
		Indicated			G2	
		Inferred			G3	
Public Report on exploration stage projects	Exploration Target		E3	F3	G4	Prospective Projects
	Exploration Results		Estimates not published			
Not applicable[g]	Estimates obtained from historical reports[h]					Non-viable Projects

Exercise 1: Lithium Extraction Project

G axis: The lithium reserves have undergone a detailed exploration campaign, and are **well documented**, with sufficient investigation measures and carried studies, including geochemical and geophysical analyses, to estimate the lithium quantities and quality (volumes and grades). There's also substantial geological knowledge about the area. The project has conducted a **Pre-Feasibility Study**, that includes reserves estimates signed off by a Competent Person. The **reserve estimates are probable** as per the PERC standards. The project is certain, with **moderate degree of confidence**, that the foreseen amount of produced lithium will be met. All supporting documents on the estimates have been submitted with the Strategic Project Application Form.

Q3: What is the correct UNFC category for the G axis?

A. G1

B. G2

C. G3

G-Axis Categories Definitions (UNFC 2019 and UNFC Minerals Specifications)

Category	Definition
G1	Product quantity associated with a project that can be estimated with a high level of confidence
G2	**Product quantity associated with a project that can be estimated with a moderate level of confidence**
G3	Product quantity associated with a project that can be estimated with a low level of confidence

CRIRSCO Template			*Corresponding UNFC Category*[f]			*UNFC Class*
Public Report and Study Types[a]	*Standard Definitions*					
Feasibility Study or Life of Mine Plan[b] (for an operating mine)	Mineral Reserves	Proved	E1	F1	G1	Viable Projects
		Probable			G2	
Pre-feasibility Study[d]	Mineral Reserves	Proved	E2	F2	G1	Potentially Viable Projects
		Probable			G2	
Feasibility Study, Life of Mine Plan[b] (for an operating mine) or Pre-feasibility Study[e]	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[f]	Mineral Resources	Measured	E2	F2	G1	
		Indicated			G2	
		Inferred			G3	
Public Report on exploration stage projects	Exploration Target		E3	F3	G4	Prospective Projects
	Exploration Results		Estimates not published			
Not applicable[g]	Estimates obtained from historical reports[h]					Non-viable Projects

Exercise 1: Lithium Extraction Project

Q4: What is the correct UNFC classification for this lithium mining project?

A. E1.1;F1.2;G1 (Viable, Approved for Development)

B. E2;F2.2;G2 (Potentially Viable, Development on Hold)

C. E3.2;F2.2;G2 (Non-Viable, Development Unclarified)

UNFC Classes Defined by Categories and Sub-categories

				Categories		
		Class	Sub-Class	E	F	G
Total Products	Produced	Sold or used production				
		Production which is unused or consumed in operations				
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

Exercise 1: Lithium Extraction Project

Q4: What is the correct UNFC classification for this lithium mining project?

A. E1.1;F1.2;G1 (Viable, Approved for Development)

B. E2;F2.2;G2 (Potentially Viable, Development on Hold)

C. E3.2;F2.2;G2 (Non-Viable, Development Unclarified)

UNFC Classes Defined by Categories and Sub-categories

Total Products	Produced		Sold or used production			
			Production which is unused or consumed in operations			
	Class		**Sub-Class**	**Categories**		
				E	F	G
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

Exercise 2: Permanent Magnet Recycling

E axis: The project is the result of several R&D projects in the field of permanent magnet recycling and had public subventions from regional entities, the company bought last year a land where they built the new recycling plant in a region with an interest to invest in circular economy. They are waiting to sign a partnership with a big company from E-waste collection sector. In this moment the project is working with an environmental consultancy company on the environmental impact assessment in order to present the project to environmental/industrial authorities. The previous work has been done in the R&D plant that the company already has elsewhere.

Category	*Definition*	*Supporting explanation for minerals*
E1	*Development and operation are confirmed to be environmentally-socially- economically viable.*	*Development and operation* (prospecting, exploration, mine production, processing, sales-access to market, rehabilitation) *are environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions. All necessary conditions have been met (including relevant permitting and contracts) or there are reasonable expectations that all necessary conditions will be met within a reasonable timeframe and there are no impediments to the delivery of the product to the user or market. Environmental-socio-economic viability is not affected by short-term adverse conditions provided that longer-term forecasts remain positive.*
E2	*Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.*	*Development and operation* (prospection, exploration, mine production, processing, sales-access to market, rehabilitation) *are not yet confirmed to be environmentally-socially-economically viable but, on the basis of realistic assumptions of future conditions, there are reasonable prospects for environmental-socio-economic viability in the foreseeable future.*
E3	*Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.*	*On the basis of realistic assumptions of future conditions, it is currently considered that there are not reasonable prospects for environmental-socio-economic viability* of mining *in the foreseeable future; or, environmental-socio-economic viability cannot yet be determined due to insufficient information* (e.g. during prospecting and exploration). *Also included are estimates associated with projects that are forecast to be developed, but which will be unused or consumed in operations* (sub-economic ore, waste).

Category	*Sub-Category*	*Sub-Category Definition*
E1	E1.1	*Development and operation is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions.*
	E1.2	*Development and operation is not environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions, but is made viable through government subsidies and/or other considerations.*
E2	No Sub-categories defined	
E3	E3.1	*Estimate of* mineral *product that is forecast to be developed, but which will be unused or consumed in operations.*
	E3.2	*Environmental-socio-economic viability cannot yet be determined due to insufficient information.*
	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.*

Q1: What is the correct UNFC category for the E axis?

A. E1.1

B. E1.2

C. E2

D. E3.1

UNECE

Exercise 2: Permanent Magnet Recycling

E axis: The project is the result of several R&D projects in the field of permanent magnet recycling and **had public subventions** from regional entities, the company **bought last year a land where they built the new recycling plant in a region with an interest to invest in circular economy**. They are **waiting to sign a partnership** with a big company from E-waste collection sector. In this moment the project is **working** with an environmental consultancy company **on the environmental impact assessment** in order to present the project to environmental/industrial authorities. The previous work has been done in the R&D plant that the company already have elsewhere.

Category	*Definition*	*Supporting explanation for minerals*
E1	*Development and operation are confirmed to be environmentally-socially- economically viable.*	*Development and operation* (prospecting, exploration, mine production, processing, sales-access to market, rehabilitation) *are environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions. All necessary conditions have been met (including relevant permitting and contracts) or there are reasonable expectations that all necessary conditions will be met within a reasonable timeframe and there are no impediments to the delivery of the product to the user or market. Environmental-socio-economic viability is not affected by short-term adverse conditions provided that longer-term forecasts remain positive.*
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Category	*Sub-Category*	*Sub-Category Definition*
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	E1.2	*Development and operation is not environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions, but is made viable through government subsidies and/or other considerations.*
E2	No Sub-categories defined	
E3	E3.1	*Estimate of* mineral *product that is forecast to be developed, but which will be unused or consumed in operations.*
	E3.2	*Environmental-socio-economic viability cannot yet be determined due to insufficient information.*
	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.*

Q1: What is the correct UNFC category for the E axis?

A. E1.1

B. E1.2

C. E2

D. E3.1

UNECE

Exercise 2: Permanent Magnet Recycling

F axis: The project looks to recycle permanent magnets in a close loop (magnet to magnet recycling). The process is validated in an industrial pilot scale, the company estimates their TRL of the process at 5. The upscaling of the process is under assessment by experts of the company. A first environmental benefit of the processes, compared to primary extraction of REE, has been done and demonstrates the benefits of recycling.

Category	*Definition*	*Supporting explanation for minerals*
F1	*Technical feasibility of a development project has been confirmed.*	*Development or operation is currently taking place or, sufficiently detailed studies have been completed to demonstrate the technical feasibility of development and operation. A commitment to develop should have been or will be forthcoming from all parties associated with the project, including governments.*
F2	*Technical feasibility of a development project is subject to further evaluation.*	*Preliminary studies of a defined project provide sufficient evidence of the potential for the development and that further study is warranted. Further data acquisition and/or studies maybe required to confirm the feasibility of development.*
F3	*Technical feasibility of a development project cannot be evaluated due to limited data.*	*Very preliminary studies of a project indicate the need for further data acquisition or study in order to evaluate the potential feasibility or development.* Additional exploration and investigation are required to confirm or to assess the technical feasibility of the project.
F4	*No development project* or mining operation *has been identified.*	*Remaining quantities of product not developed by any project* (not recoverable ore, at least not with available technology, too deep, groundwater issues etc.).

Q2: What is the correct UNFC category for the F axis?

A. F1.1 B. F1.2 C. F2.1 D. F2.2

Category	*Sub-Category*	*Sub-Category Definition*
F1	F1.1	*Production or operation is currently taking place.*
	F1.2	*Capital funds have been committed and implementation of the development is underway.*
	F1.3	*Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming*
F2	F2.1	*Project activities are ongoing to justify development in the foreseeable future.*
	F2.2	*Project activities are on hold and/or where justification as a development may be subject to significant delay.*
	F2.3	*There are no plans to develop or to acquire additional data at the current time due to limited potential.*
F3	F3.1	*Site-specific studies have identified a potential development with sufficient confidence to warrant further testing.*
	F3.2	*Local studies indicate the potential for development in a specific area but requires more data acquisition and/or evaluation in order to have sufficient confidence to warrant further testing.*
	F3.3	*At the earliest stage of studies, where favourable conditions for the potential development in an area may be inferred from regional studies.*

Exercise 2: Permanent Magnet Recycling

F axis: The project looks to recycle permanent magnets in a close loop (magnet to magnet recycling). The process is **validated in an industrial pilot scale, the company estimates their TRL of the process at 5.** The upscaling of the process is under assessment by experts of the company. A first environmental benefit of the processes, compared to primary extraction of REE, has been done and demonstrates the benefits of recycling.

Category	*Definition*	*Supporting explanation for minerals*
F1	*Technical feasibility of a development project has been confirmed.*	*Development or operation is currently taking place or, sufficiently detailed studies have been completed to demonstrate the technical feasibility of development and operation. A commitment to develop should have been or will be forthcoming from all parties associated with the project, including governments.*
F2	*Technical feasibility of a development project is subject to further evaluation.*	*Preliminary studies of a defined project provide sufficient evidence of the potential for the development and that further study is warranted. Further data acquisition and/or studies maybe required to confirm the feasibility of development.*
F3	*Technical feasibility of a development project cannot be evaluated due to limited data.*	*Very preliminary studies of a project indicate the need for further data acquisition or study in order to evaluate the potential feasibility or development.* Additional exploration and investigation are required to confirm or to assess the technical feasibility of the project.
F4	*No development project* or mining operation *has been identified.*	*Remaining quantities of product not developed by any project* (not recoverable ore, at least not with available technology, too deep, groundwater issues etc.).

Category	*Sub-Category*	*Sub-Category Definition*
F1	F1.1	*Production or operation is currently taking place.*
	F1.2	*Capital funds have been committed and implementation of the development is underway.*
	F1.3	*Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming*
F2	F2.1	*Project activities are ongoing to justify development in the foreseeable future.*
	F2.2	*Project activities are on hold and/or where justification as a development may be subject to significant delay.*
	F2.3	*There are no plans to develop or to acquire additional data at the current time due to limited potential.*
F3	F3.1	*Site-specific studies have identified a potential development with sufficient confidence to warrant further testing.*
	F3.2	*Local studies indicate the potential for development in a specific area but requires more data acquisition and/or evaluation in order to have sufficient confidence to warrant further testing.*
	F3.3	*At the earliest stage of studies, where favourable conditions for the potential development in an area may be inferred from regional studies.*

Q2: What is the correct UNFC category for the F axis?

A. F1.1 B. F1.2 **C. F2.1** D. F2.2

Exercise 2: Permanent Magnet Recycling

G axis: In press releases, the company is communicating that the plant will have a capacity to treat up to 1000 t/year of magnets, doing first physical treatment and later magnet recovery. The product is re-processed magnets. The company declares the intention to work with 3 main permanent magnets waste flows: permanent magnets from e-scooters, magnets contained in vehicles, and wind turbines. For e-scooters the company knows that the dismantling of the product is easy and cost effective. The company is discussing with a E-waste collector in order to secure a certain volume of e-scooters end of life in 2 or 3 European countries but this partnership is still not fully finalized. In vehicles, the company is under discussion with vehicles scrap companies but discussions are less in advance compared to e-scooters. Finally, based on MFA, the decommissioning of wind turbines with permanent magnets is not expected to have a significant volume of magnets in the short term. The company does not consider it as a major waste for recycling until 2035

Q3: What is the correct UNFC category for the G axis?

A. G2 of re-processed magnets from e-scooters, G3 from vehicles

B. All G2

C. G1 from e-scoters and vehicles, G2 from turbines

Category	*Definition*	*Supporting explanation for minerals*
G1	*Product quantity associated with a project that can be estimated with a high level of confidence.*	*Product quantity estimates may be categorised discretely as G1, G2 and/or G3 (along with the appropriate E and F Categories), based on the degree of confidence in the estimates (high, moderate and low confidence, respectively) based on direct evidence. Alternatively, product quantity estimates may be categorized as a range of uncertainty as reflected by either (i) three specific deterministic scenarios (low, best and high cases) or (ii) a probabilistic analysis from which three outcomes (P90, P50 and P10) are selected. In both methodologies (the "scenario" and "probabilistic" approaches), estimates are then classified on the G Axis as G1, G1+G2 and G1+G2+G3 respectively. In all cases, the product quantity estimates are those associated with a project.*
G2	*Product quantity associated with a project that can be estimated with a moderate level of confidence.*	
G3	*Product quantity associated with a project that can be estimated with a low level of confidence.*	*The G-axis Categories are intended to reflect all significant uncertainties (e.g. source uncertainty, geologic uncertainty, facility efficiency uncertainty, etc.) impacting the estimate forecast for the project. Uncertainties include variability, intermittency and the efficiency of the development and operation (where relevant). Typically, the various uncertainties will combine to provide a full range of outcomes. In such cases, categorization should reflect three scenarios or outcomes that are equivalent to G1, G1+G2 and G1+G2+G3.* Additional Comments: The G axis in minerals and mining conditions primarily reflect geologic uncertainty impacting the estimate forecast for the project. Uncertainties include availability and resolution of direct data such as drill hole density in relation to the mineralisation and or deposit type. In addition, indirect data such as geophysical data might be included, which should be measured against redundancy of methods (e.g. geophysical measurements calibrated against drill core evaluation, drill hole logs. Calibrated methods provide higher certainty than uncalibrated methods.) The accuracy of measurements controls the level of the category (lab assay, rock mechanics, mineralogical phase assessment).

Exercise 2: Permanent Magnet Recycling

G axis: In press releases, the company is communicating that the plant will have a capacity to treat up to 1000 t/year of magnets, doing first physical treatment and later magnet recovery. The product is re-processed magnets. The company declares the intention to work with 3 main permanent magnets waste flows: permanent magnets from e-scooters, magnets contained in vehicles, and wind turbines. For e-scooters the company knows that the dismantling of the product is easy and cost effective. **The company is discussing with a E-waste collector in order to secure a certain volume of e-scooters end of life in 2 or 3 European countries but this partnership is still not fully finalized**. **In vehicles, the company is under discussion with vehicles scrap companies but discussions are less in advance compared to e-scooters**. Finally, based on MFA, the decommissioning of wind turbines with permanent magnets is **not expected to have a significant volume of magnets in the short term**. The company does not consider it as a major waste for recycling **until 2035**

Q3: What is the correct UNFC category for the G axis?

A. G2 of re-processed magnets from e-scooters, G3 from vehicles

B. All G2

C. G1 from e-scoters and vehicles, G2 from turbines

Category	*Definition*	*Supporting explanation for minerals*
G1	*Product quantity associated with a project that can be estimated with a high level of confidence.*	*Product quantity estimates may be categorised discretely as G1, G2 and/or G3 (along with the appropriate E and F Categories), based on the degree of confidence in the estimates (high, moderate and low confidence, respectively) based on direct evidence. Alternatively, product quantity estimates may be categorized as a range of uncertainty as reflected by either (i) three specific deterministic scenarios (low, best and high cases) or (ii) a probabilistic analysis from which three outcomes (P90, P50 and P10) are selected. In both methodologies (the "scenario" and "probabilistic" approaches), estimates are then classified on the G Axis as G1, G1+G2 and G1+G2+G3 respectively. In all cases, the product quantity estimates are those associated with a project.*
G2	*Product quantity associated with a project that can be estimated with a moderate level of confidence.*	
G3	*Product quantity associated with a project that can be estimated with a low level of confidence.*	*The G-axis Categories are intended to reflect all significant uncertainties (e.g. source uncertainty, geologic uncertainty, facility efficiency uncertainty, etc.) impacting the estimate forecast for the project. Uncertainties include variability, intermittency and the efficiency of the development and operation (where relevant). Typically, the various uncertainties will combine to provide a full range of outcomes. In such cases, categorization should reflect three scenarios or outcomes that are equivalent to G1, G1+G2 and G1+G2+G3.* Additional Comments: The G axis in minerals and mining conditions primarily reflect geologic uncertainty impacting the estimate forecast for the project. Uncertainties include availability and resolution of direct data such as drill hole density in relation to the mineralisation and or deposit type. In addition, indirect data such as geophysical data might be included, which should be measured against redundancy of methods (e.g. geophysical measurements calibrated against drill core evaluation, drill hole logs. Calibrated methods provide higher certainty than uncalibrated methods.) The accuracy of measurements controls the level of the category (lab assay, rock mechanics, mineralogical phase assessment).

Exercise 2: Permanent Magnet Recycling

Q4: What is the correct UNFC classification for this permanent magnet recycling project?

A. E2;F2.1;G2+G3 (Potentially Viable, Development Pending)

B. E1;F1.2;G1+G2 (Viable, Approved for Development)

C. E1.1;F1.3;G1 (Viable, Justified for Development)

D. E2;F2.2;G2+G3 (Potentially Viable, Development on Hold)

UNFC Classes Defined by Categories and Sub-categories

Total Products	Produced	Sold or used production				
		Production which is unused or consumed in operations				
	Class		**Sub-Class**	**Categories**		
				E	F	G
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

Exercise 2: Permanent Magnet Recycling

Q4: What is the correct UNFC classification for this permanent magnet recycling project?

A. **E2;F2.1;G2+G3 (Potentially Viable, Development Pending)**

B. E1;F1.2;G1+G2 (Viable, Approved for Development)

C. E1.1;F1.3;G1 (Viable, Justified for Development)

D. E2;F2.2;G2+G3 (Potentially Viable, Development on Hold)

UNFC Classes Defined by Categories and Sub-categories

Total Products	Produced		Sold or used production			
			Production which is unused or consumed in operations			
	Class		**Sub-Class**	**Categories**		
				E	F	G
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

Exercise 3: Copper Processing Project

A copper mining project is planning to expand its operations with a processing plant. The mine is currently located in a historically significant mining region in Spain. The project aims to leverage the existing mining site to process copper ore into copper concentrate, which is crucial for various industries, including electronics, construction, and renewable energy infrastructure. The copper-rich region is well-established with infrastructure to support mining and processing operations, including transportation networks and access to utilities. The foreseen processing plant will be at a 20 km distance from the mine. This processing project wants to apply for the Strategic Project label for financial purposes.

The Project Promoter has collected the relevant information for the UNFC classification tied to this project, based on the Strategic Project Form and the UNFC Controlling Factors and assigned them to the E, F, and G axes.

SCAN TO ANSWER THE QUESTIONS

Exercise 3: Copper Processing Project

E axis: An environmental impact assessment has been completed, and the project has received preliminary environmental approval. The processing facility is designed to minimize emissions and water usage, complying with Spanish environmental regulations. The project is also preparing to submit waste management plans for public consultation. The project has undergone a detailed feasibility study. However, adequate funding has not yet been secured for the project's development. The project site is in a region with a long history of mining activities, and provides jobs to most of the community. Preparations for final permits are ongoing.

Category	*Definition*	*Supporting explanation for minerals*
E1	*Development and operation are confirmed to be environmentally-socially- economically viable.*	*Development and operation* (prospecting, exploration, mine production, processing, sales-access to market, rehabilitation) *are environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions. All necessary conditions have been met (including relevant permitting and contracts) or there are reasonable expectations that all necessary conditions will be met within a reasonable timeframe and there are no impediments to the delivery of the product to the user or market. Environmental-socio-economic viability is not affected by short-term adverse conditions provided that longer-term forecasts remain positive.*
E2	*Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.*	*Development and operation* (prospection, exploration, mine production, processing, sales-access to market, rehabilitation) *are not yet confirmed to be environmentally-socially-economically viable but, on the basis of realistic assumptions of future conditions, there are reasonable prospects for environmental-socio-economic viability in the foreseeable future.*
E3	*Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.*	*On the basis of realistic assumptions of future conditions, it is currently considered that there are not reasonable prospects for environmental-socio-economic viability* of mining *in the foreseeable future; or, environmental-socio-economic viability cannot yet be determined due to insufficient information* (e.g. during prospecting and exploration). *Also included are estimates associated with projects that are forecast to be developed, but which will be unused or consumed in operations* (sub-economic ore, waste).

Category	*Sub-Category*	*Sub-Category Definition*
E1	E1.1	*Development and operation is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions.*
	E1.2	*Development and operation is not environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions, but is made viable through government subsidies and/or other considerations.*
E2	No Sub-categories defined	
E3	E3.1	*Estimate of* mineral *product that is forecast to be developed, but which will be unused or consumed in operations.*
	E3.2	*Environmental-socio-economic viability cannot yet be determined due to insufficient information.*
	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.*

Q1: What is the correct UNFC category for the E axis?

A. E1.1 B. E1.2 C. E2 D.E3.1

Exercise 3: Copper Processing Project

E axis: An environmental impact assessment has been completed, and the project has received preliminary environmental approval. The processing facility is designed to minimize emissions and water usage, complying with Spanish environmental regulations. The project is also preparing to submit waste management plans for public consultation. The project has undergone **a detailed feasibility study**. However, **adequate funding has not yet been secured** for the project's development. The project site is in a region with a long history of mining activities, and provides jobs to most of the community. **Preparations for final permits are ongoing**.

Category	*Definition*	*Supporting explanation for minerals*
E1	*Development and operation are confirmed to be environmentally-socially- economically viable.*	*Development and operation* (prospecting, exploration, mine production, processing, sales-access to market, rehabilitation) *are environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions. All necessary conditions have been met (including relevant permitting and contracts) or there are reasonable expectations that all necessary conditions will be met within a reasonable timeframe and there are no impediments to the delivery of the product to the user or market. Environmental-socio-economic viability is not affected by short-term adverse conditions provided that longer-term forecasts remain positive.*
E2	*Development and operation are expected to become environmentally-socially-economically viable in the foreseeable future.*	*Development and operation* (prospection, exploration, mine production, processing, sales-access to market, rehabilitation) *are not yet confirmed to be environmentally-socially-economically viable but, on the basis of realistic assumptions of future conditions, there are reasonable prospects for environmental-socio-economic viability in the foreseeable future.*
E3	*Development and operation are not expected to become environmentally-socially-economically viable in the foreseeable future or evaluation is at too early a stage to determine environmental-socio-economic viability.*	*On the basis of realistic assumptions of future conditions, it is currently considered that there are not reasonable prospects for environmental-socio-economic viability* of mining *in the foreseeable future; or, environmental-socio-economic viability cannot yet be determined due to insufficient information* (e.g. during prospecting and exploration). *Also included are estimates associated with projects that are forecast to be developed, but which will be unused or consumed in operations* (sub-economic ore, waste).

Category	*Sub-Category*	*Sub-Category Definition*
E1	E1.1	*Development and operation is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions.*
	E1.2	*Development and operation is not environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions, but is made viable through government subsidies and/or other considerations.*
E2	No Sub-categories defined	
E3	E3.1	*Estimate of* mineral *product that is forecast to be developed, but which will be unused or consumed in operations.*
	E3.2	*Environmental-socio-economic viability cannot yet be determined due to insufficient information.*
	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.*

Q1: What is the correct UNFC category for the E axis?

A. E1.1 B. E1.2 C. E2 D.E3.1

Exercise 3: Copper Processing Project

F axis: The project has completed its feasibility study, which includes detailed engineering designs and technological assessments. The processing technology to be used is proven and reliable, ensuring efficient conversion of copper ore to copper concentrate. Although the feasibility study is complete, the project is in need to secure adequate investments before commencement of construction.

Category	*Definition*	*Supporting explanation for minerals*
F1	*Technical feasibility of a development project has been confirmed.*	*Development or operation is currently taking place or, sufficiently detailed studies have been completed to demonstrate the technical feasibility of development and operation. A commitment to develop should have been or will be forthcoming from all parties associated with the project, including governments.*
F2	*Technical feasibility of a development project is subject to further evaluation.*	*Preliminary studies of a defined project provide sufficient evidence of the potential for the development and that further study is warranted. Further data acquisition and/or studies maybe required to confirm the feasibility of development.*
F3	*Technical feasibility of a development project cannot be evaluated due to limited data.*	*Very preliminary studies of a project indicate the need for further data acquisition or study in order to evaluate the potential feasibility or development.* Additional exploration and investigation are required to confirm or to assess the technical feasibility of the project.
F4	*No development project* or mining operation *has been identified.*	*Remaining quantities of product not developed by any project* (not recoverable ore, at least not with available technology, too deep, groundwater issues etc.).

Category	*Sub-Category*	*Sub-Category Definition*
F1	F1.1	*Production or operation is currently taking place.*
	F1.2	*Capital funds have been committed and implementation of the development is underway.*
	F1.3	*Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming*
F2	F2.1	*Project activities are ongoing to justify development in the foreseeable future.*
	F2.2	*Project activities are on hold and/or where justification as a development may be subject to significant delay.*
	F2.3	*There are no plans to develop or to acquire additional data at the current time due to limited potential.*
F3	F3.1	*Site-specific studies have identified a potential development with sufficient confidence to warrant further testing.*
	F3.2	*Local studies indicate the potential for development in a specific area but requires more data acquisition and/or evaluation in order to have sufficient confidence to warrant further testing.*
	F3.3	*At the earliest stage of studies, where favourable conditions for the potential development in an area may be inferred from regional studies.*

Q2: What is the correct UNFC category for the F axis?

A. F1.1 B. F1.2 C. F1.3 D. F2.1

Exercise 3: Copper Processing Project

F axis: The project has completed its **feasibility study**, which includes detailed engineering designs and technological assessments. The processing technology to be used is **proven and reliable**, ensuring efficient conversion of copper ore to copper concentrate. Although the feasibility study is complete, the project is in need **to secure adequate investments before commencement of construction**.

Category	*Definition*	*Supporting explanation for minerals*
F1	*Technical feasibility of a development project has been confirmed.*	*Development or operation is currently taking place or, sufficiently detailed studies have been completed to demonstrate the technical feasibility of development and operation. A commitment to develop should have been or will be forthcoming from all parties associated with the project, including governments.*
F2	*Technical feasibility of a development project is subject to further evaluation.*	*Preliminary studies of a defined project provide sufficient evidence of the potential for the development and that further study is warranted. Further data acquisition and/or studies maybe required to confirm the feasibility of development.*
F3	*Technical feasibility of a development project cannot be evaluated due to limited data.*	*Very preliminary studies of a project indicate the need for further data acquisition or study in order to evaluate the potential feasibility or development.* Additional exploration and investigation are required to confirm or to assess the technical feasibility of the project.
F4	*No development project* or mining operation *has been identified.*	*Remaining quantities of product not developed by any project* (not recoverable ore, at least not with available technology, too deep, groundwater issues etc.).

Category	*Sub-Category*	*Sub-Category Definition*
F1	F1.1	*Production or operation is currently taking place.*
	F1.2	*Capital funds have been committed and implementation of the development is underway.*
	F1.3	*Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming*
F2	F2.1	*Project activities are ongoing to justify development in the foreseeable future.*
	F2.2	*Project activities are on hold and/or where justification as a development may be subject to significant delay.*
	F2.3	*There are no plans to develop or to acquire additional data at the current time due to limited potential.*
F3	F3.1	*Site-specific studies have identified a potential development with sufficient confidence to warrant further testing.*
	F3.2	*Local studies indicate the potential for development in a specific area but requires more data acquisition and/or evaluation in order to have sufficient confidence to warrant further testing.*
	F3.3	*At the earliest stage of studies, where favourable conditions for the potential development in an area may be inferred from regional studies.*

Q2: What is the correct UNFC category for the F axis?

A. F1.1 B. F1.2 **C. F1.3** D. F2.1

Exercise 3: Copper Processing Project

G axis: The copper ore at the existing mining site has been well-documented through extensive exploration and drilling campaigns. Detailed geological surveys and sampling have provided a high degree of confidence in the quantity and quality of the ore, meaning that the ore reserves are confirmed and the processing facility is assured of a consistent supply of raw material. The project promoter has all supporting documents in order.

Q3: What is the correct UNFC category for the G axis?

A. G1

B. G2

C. G3

Category	*Definition*	*Supporting explanation for minerals*
G1	*Product quantity associated with a project that can be estimated with a high level of confidence.*	*Product quantity estimates may be categorised discretely as G1, G2 and/or G3 (along with the appropriate E and F Categories), based on the degree of confidence in the estimates (high, moderate and low confidence, respectively) based on direct evidence. Alternatively, product quantity estimates may be categorized as a range of uncertainty as reflected by either (i) three specific deterministic scenarios (low, best and high cases) or (ii) a probabilistic analysis from which three outcomes (P90, P50 and P10) are selected. In both methodologies (the "scenario" and "probabilistic" approaches), estimates are then classified on the G Axis as G1, G1+G2 and G1+G2+G3 respectively. In all cases, the product quantity estimates are those associated with a project.*
G2	*Product quantity associated with a project that can be estimated with a moderate level of confidence.*	
G3	*Product quantity associated with a project that can be estimated with a low level of confidence.*	*The G-axis Categories are intended to reflect all significant uncertainties (e.g. source uncertainty, geologic uncertainty, facility efficiency uncertainty, etc.) impacting the estimate forecast for the project. Uncertainties include variability, intermittency and the efficiency of the development and operation (where relevant). Typically, the various uncertainties will combine to provide a full range of outcomes. In such cases, categorization should reflect three scenarios or outcomes that are equivalent to G1, G1+G2 and G1+G2+G3.* Additional Comments: The G axis in minerals and mining conditions primarily reflect geologic uncertainty impacting the estimate forecast for the project. Uncertainties include availability and resolution of direct data such as drill hole density in relation to the mineralisation and or deposit type. In addition, indirect data such as geophysical data might be included, which should be measured against redundancy of methods (e.g. geophysical measurements calibrated against drill core evaluation, drill hole logs. Calibrated methods provide higher certainty than uncalibrated methods.) The accuracy of measurements controls the level of the category (lab assay, rock mechanics, mineralogical phase assessment).

Exercise 3: Copper Processing Project

G axis: The copper ore at the existing mining site has been well-documented through extensive exploration and drilling campaigns. Detailed geological surveys and sampling have provided **a high degree of confidence** in the quantity and quality of the ore, meaning that the ore reserves are confirmed and **the processing facility is assured of a consistent supply of raw material**. The project promoter has all supporting documents in order.

Q3: What is the correct UNFC category for the G axis?

A. G1

B. G2

C. G3

Category	*Definition*	*Supporting explanation for minerals*
G1	*Product quantity associated with a project that can be estimated with a high level of confidence.*	*Product quantity estimates may be categorised discretely as G1, G2 and/or G3 (along with the appropriate E and F Categories), based on the degree of confidence in the estimates (high, moderate and low confidence, respectively) based on direct evidence. Alternatively, product quantity estimates may be categorized as a range of uncertainty as reflected by either (i) three specific deterministic scenarios (low, best and high cases) or (ii) a probabilistic analysis from which three outcomes (P90, P50 and P10) are selected. In both methodologies (the "scenario" and "probabilistic" approaches), estimates are then classified on the G Axis as G1, G1+G2 and G1+G2+G3 respectively. In all cases, the product quantity estimates are those associated with a project.*
G2	*Product quantity associated with a project that can be estimated with a moderate level of confidence.*	
G3	*Product quantity associated with a project that can be estimated with a low level of confidence.*	*The G-axis Categories are intended to reflect all significant uncertainties (e.g. source uncertainty, geologic uncertainty, facility efficiency uncertainty, etc.) impacting the estimate forecast for the project. Uncertainties include variability, intermittency and the efficiency of the development and operation (where relevant). Typically, the various uncertainties will combine to provide a full range of outcomes. In such cases, categorization should reflect three scenarios or outcomes that are equivalent to G1, G1+G2 and G1+G2+G3.* Additional Comments: The G axis in minerals and mining conditions primarily reflect geologic uncertainty impacting the estimate forecast for the project. Uncertainties include availability and resolution of direct data such as drill hole density in relation to the mineralisation and or deposit type. In addition, indirect data such as geophysical data might be included, which should be measured against redundancy of methods (e.g. geophysical measurements calibrated against drill core evaluation, drill hole logs. Calibrated methods provide higher certainty than uncalibrated methods.) The accuracy of measurements controls the level of the category (lab assay, rock mechanics, mineralogical phase assessment).

Exercise 3: Copper Processing Project

Q4: What is the correct UNFC classification for this copper processing project?

A. E1.1;F1.1;G1 (Viable, On Production)

B. E1.1;F1.2;G1 (Viable, Approved for Development)

C. E1.1;F1.3;G1 (Viable, Justified for Development)

D. E2;F2.1;G2 (Potentially Viable, Development Pending)

UNFC Classes Defined by Categories and Sub-categories

Total Products	Produced		Sold or used production			
			Production which is unused or consumed in operations			
	Class		**Sub-Class**	**Categories**		
				E	F	G
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

Exercise 3: Copper Processing Project

Q4: What is the correct UNFC classification for this copper processing project?

A. E1.1;F1.1;G1 (Viable, On Production)

B. E1.1;F1.2;G1 (Viable, Approved for Development)

C. E1.1;F1.3;G1 (Viable, Justified for Development)

D. E2;F2.1;G2 (Potentially Viable, Development Pending)

UNFC Classes Defined by Categories and Sub-categories

				Categories		
		Class	Sub-Class	E	F	G
Total Products	Produced	Sold or used production				
		Production which is unused or consumed in operations				
	Known Sources	Viable Projects	On Production	1	1.1	1, 2, (3)[c]
			Approved for Development	1	1.2	1, 2, (3)[c]
			Justified for Development	1	1.3	1, 2, (3)[c]
		Potentially Viable Projects	Development Pending	2[b]	2.1	1, 2, 3
			Development on Hold	2	2.2	1, 2, 3
		Non-Viable Projects	Development Unclarified	3.2	2.2	1, 2, 3
			Development not Viable	3.3	2.3	1, 2, 3
		Remaining products not developed from identified projects		3.3	4	1, 2, 3
	Potential Sources	Prospective Projects	[No Sub-classes defined]	3.2	3	4
		Remaining products not developed from prospective projects		3.3	4	4

Q&A Session 2

Closing Remarks

Closing Remarks – DG GROW

Robert Tomas, Policy Officer, DG GROW

Main Takeaways & Helpdesk

- UNFC is part in the Strategic Projects Application Form
- INFO DAY – 30 April 2024: https://youtu.be/skGQNWCoosg

Strategic projects under the CRMA - European Commission (europa.eu)

- Post-Training Material:
  - **Detailed Guidance on the application of UNFC to Strategic Projects**
  - **Training Recordings**
  - **Presentations**
- UNFC Classification by project promotors
- Review of UNFC Classification by experts
- Feedback on UNFC Classification
- The given UNFC Class in the Strategic Project Form is not determining the Project Recognition

HELPDESK for Project Promoters

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https://unece.org/sustainable-energy/sustainable-resource-management

UNECE

END OF TRAINING

Thank you for your attention and participation!

2 July 2024 | Online

Sources

- Strategic projects under the CRMA - European Commission (europa.eu)
- INFO DAY: https://youtu.be/skGQNWCoosg
- UNFC2019, 2020.
- Supplementary Specifications for the Application of the United Nations Framework Classification for Resources to Minerals, 2021.
- Specifications for the application of the United Nations Framework Classification for Resources to Anthropogenic Resources, 2018.
- Bridging Document between the Committee for Mineral Reserves International Reporting Standards Template and the United Nations Framework Classification for Resources, 2024.
- UNFC GUIDANCE EUROPE - Guidance for the Application of the United Nations Framework Classification for Resources (UNFC) for Mineral and Anthropogenic Resources in Europe, 2022