



PanAfGeo+

Partnerships and Capacity Building

The Pan-African Support to Geological Sciences and Technology

Slavko Solar, Geological Survey of Slovenia/ICE-SRM EU

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Guidance for the Application of UNFC for Mineral and Anthropogenic Resources in Europe



**Funded by
the European Union**

Implemented by:



1. Introduction
2. Document structure
3. Particularities
4. Conclusion



Introduction - Why it matters

UNFC Guidance Europe is important because it:

- Enables **comparability of resource data across EU countries**
- Supports **evidence-based policymaking** on critical raw materials
- Strengthens **transparency and investment confidence**
- Aligns resource classification with **sustainability and circular economy goals**

Introduction – 1/3

UNFC Guidance Europe refers to **interpretation and implementation guidance tailored to European policies, regulatory frameworks, and reporting needs**, especially in areas such as:

1. Alignment with EU policy frameworks

Supports implementation of **EU Raw Materials Policy and Critical Raw Materials Act (CRMA)**

Links UNFC to EU classification systems and reporting requirements

Facilitates harmonised reporting across Member States

2. Bridging national systems and UNFC

Provides guidance for **mapping national resource classification systems** (e.g., JORC, PERC, CRIRSCO-based codes) to UNFC

Ensures comparability of resource data across Europe

3. Integration with UNRMS

Prepares the transition from UNFC to the broader **United Nations Resource Management System (UNRMS)**

Promotes **sustainable resource management principles**, including ESG considerations

4. Practical application guidance

Methodologies for classifying:

- Minerals and raw materials
- Energy resources (including geothermal, hydrocarbons)

Guidance on handling:

- Data uncertainty (G-axis)
- Project maturity (F-axis)
- Economic viability and policy constraints (E-axis)

5. Support to European projects and institutions

Used in initiatives such as:

- EuroGeoSurveys (EGS) projects
- PanAfGeo+ (for external cooperation)
- National geological survey reporting

Helps ensure **consistent reporting in EU-funded projects**

6. Critical Raw Materials Act (CRMA)

- Exploration
- Strategic projects
- Monitoring
- Extractive mining waste

Introduction



Aim of UNFC Guidance Europe

The purpose of the UNFC Guidance Europe is to **provide a uniform raw materials dataset that would be suitable for aggregated data** across Europe for both primary and secondary raw materials.



Users include national governments, regional authorities, geological surveys, corporations, academics, and qualified experts in Europe

To make resource management decisions including ensuring that the best information is available for making those decisions

Audience

- **Public-sector decision-making** ranging from onsite, municipality, regional, country, European and the UN level on aspects of the resource life cycle
- **Economic management** for planning, organization, and leading activities of management of all corporate levels
- **Finance investment decision making** considering economic, environmental, and social aspects of raw material Projects
- In **expertise**, knowledge, and education

Introduction

- **Users, including regional and national authorities** in Europe to **facilitate decision-making** and **maintain databases** for primary and secondary raw materials Projects based on UNFC which is outlined in the Section “Overview of UNFC Implementation for European Regional and National Authorities”.
- **Qualified Experts and estimate preparers** in Europe to **classify primary and secondary raw materials Projects** using UNFC as outlined in the Section “Practical Guidance in Applying UNFC for Primary and Secondary Raw Materials in Europe” and Annexes.

ANNEX I

UNFC Classes and Sub-classes and INSPIRE Code List

Alignment with Infrastructure for Spatial Information in Europe (INSPIRE) for Mineral Resources.

UNFC Classes Defined by Categories and Sub-categories							INSPIRE Code List
Total Products	Produced	Sold or used production					
		Production which is unused or consumed in operations <i>Future production that is either unused or consumed in the Project operations is categorized as E3.1. These can exist for all Classes of recoverable quantities ^c</i>					
	Class	Sub-class	Categories				
				E	F	G ^a	
Known Sources	<u>Viable Projects</u> <i>Estimates associated with Viable Projects are defined in many classification systems as Reserves, but there are some material differences between the specific definitions that are applied within different industries and hence the term is not used here. ^c</i>	On Production	1	1.1	1, 2, (3)	operating continuously operating intermittently	
		Approved for Development	1	1.2	1, 2, 3	under development	
		Justified for Development	1	1.3	1, 2, 3	pending approval	
		<u>Potentially Viable Projects</u> <i>Not all Potentially Viable Projects will be developed</i>	Development Pending	2 ^b	2.1	1, 2, 3	feasibility evaluation of the ore deposit
			Development On Hold	2	2.2	1, 2, 3	care and maintenance retention
		<u>Non-Viable Projects</u> <i>Non-Viable Projects include those that are at an early stage of evaluation in addition to those that are considered unlikely to become Viable developments within the Foreseeable Future. ^c</i>	Development Unclassified	3.2	2.2	1, 2, 3	resource assessment (geological interpretation, approximate calculation of the resource)
			Development Not Viable	3.3	2.3	1, 2, 3	closed abandoned historic
		<u>Remaining Products not developed from identified Projects</u> <i>Remaining Products not developed from identified Projects or Prospective Projects may become developable in the future as technological or environmental-socio-economic conditions change. Some or all these estimates may never be developed due to physical and/or environmental-socio-economic constraints. ^c</i>		3.3	4	1, 2, 3	
		Potential Sources	<u>Prospective Projects</u>		3.2	3.1	4
3.2	3.2				4	detailed surface exploration	
3.2	3.3				4	regional reconnaissance	
<u>Remaining Products not developed from Prospective Projects</u>			3.3	4.1	4		
			3.3	4.2	4		
			3.3	4.3	4		

a - G Categories may be used discreetly, or in cumulative scenario form (e.g., G1+G2).

b - Potentially Viable Projects may satisfy the requirements for E1.

c - Commentaries in *Italics* are essential for further clarifications of related terms.

Standard mapping of CRIRSCO Template aligned estimates to UNFC categories.

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

E1.1

Development is environmentally- socially- economically viable on the basis of current conditions and realistic assumptions of future conditions.

E1.2

...made viable through government subsidies and/or other considerations.

Minimum UNFC Categories	INSPIRE Code Name (Mine Status)	INSPIRE Code (Mine Status)	INSPIRE Code List Description
E1 F1.1 G1,2,(3) ¹⁷	operating	operating	A mine is operating.

E1;F1.1;G1, 2, (3)

Minimum UNFC Categories	INSPIRE Code Name (Mine Status)	INSPIRE Code (Mine Status)	INSPIRE Code List Description
E1 F1.2 G1,2,3	under development	underDevelopment	Under development.
	under construction	construction	Under construction.

E1;F1.2;G1, 2, (3)

Minimum UNFC Categories	INSPIRE Code Name (Mine Status)	INSPIRE Code (Mine Status)	INSPIRE Code List Description
E1 F1.3 G1,2,3	pending approval	pendingApproval	A mine waiting for the exploitation authorization, generally given by a State Mining Engineering Department.

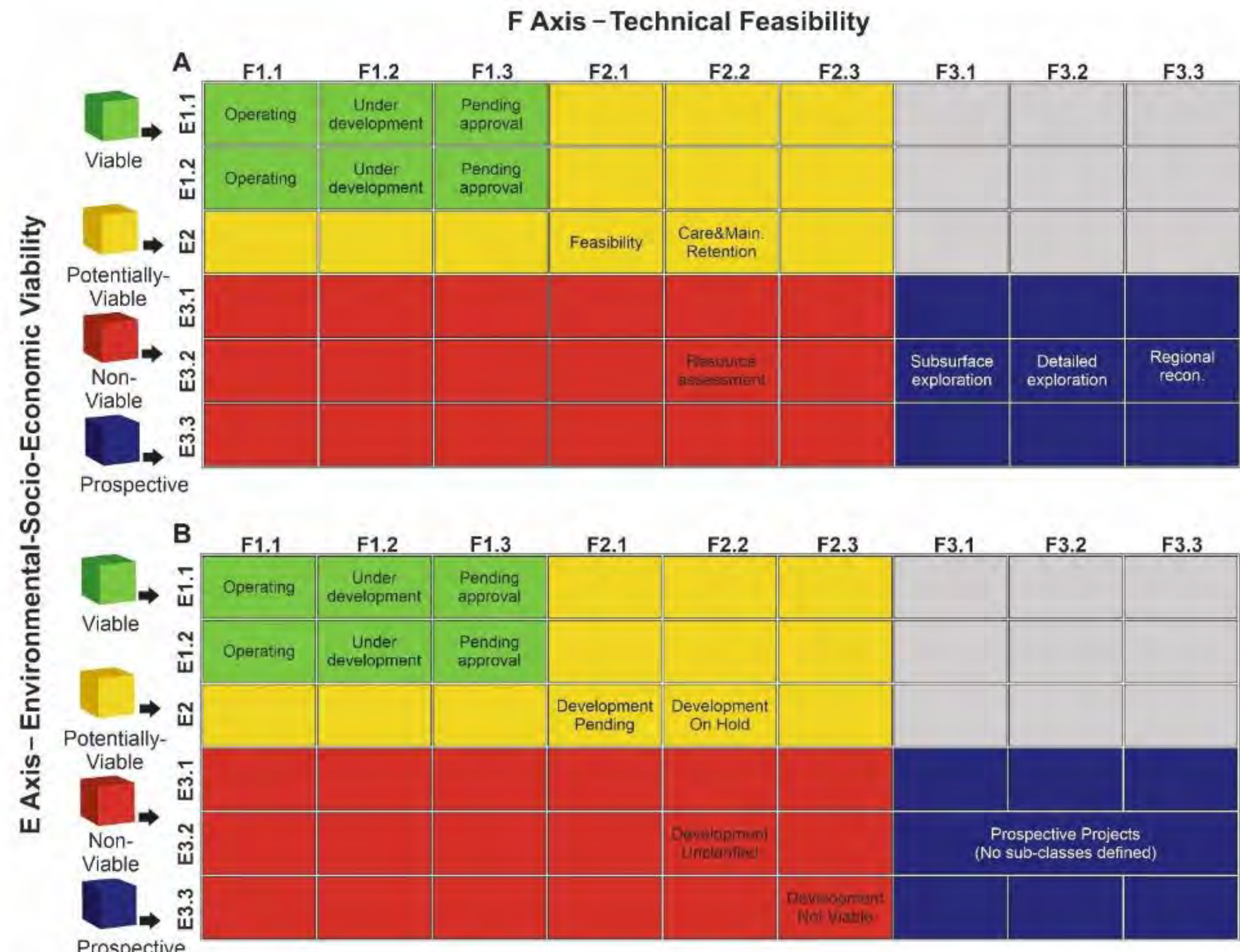
All necessary conditions are met regards the Project viability with Reasonable Expectation (F1.3)

E1;F1.3;G1, 2, (3)

ANNEX I

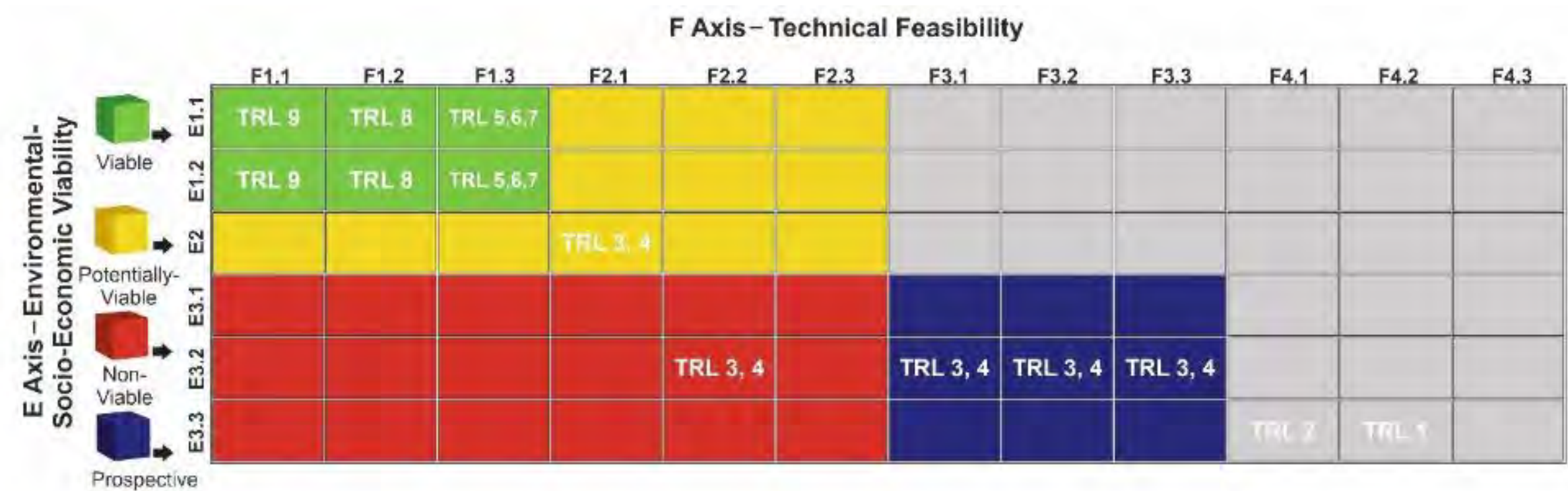
UNFC Classes and Sub-classes and INSPIRE Code List

Mapping of the E-F Matrix to (A) INSPIRE Codes and Comparison to (B) UNFC Sub-classes



ANNEX I

UNFC Classes and Sub-classes and Technology Readiness Level



Technology Readiness Levels (TRLs) in E-F Matrix

ANNEX II

Supplemental Guidance for the National Resource Reporting

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.

Guidance for National Resource Reporting

- National Reporting
- The Use of Relevant Bridging Documents
- Reported Resource Quantities and Quality
- Product Type
- Viable Projects Turn Non-Viable
- Historic Estimates
- Terminology
- Documentation

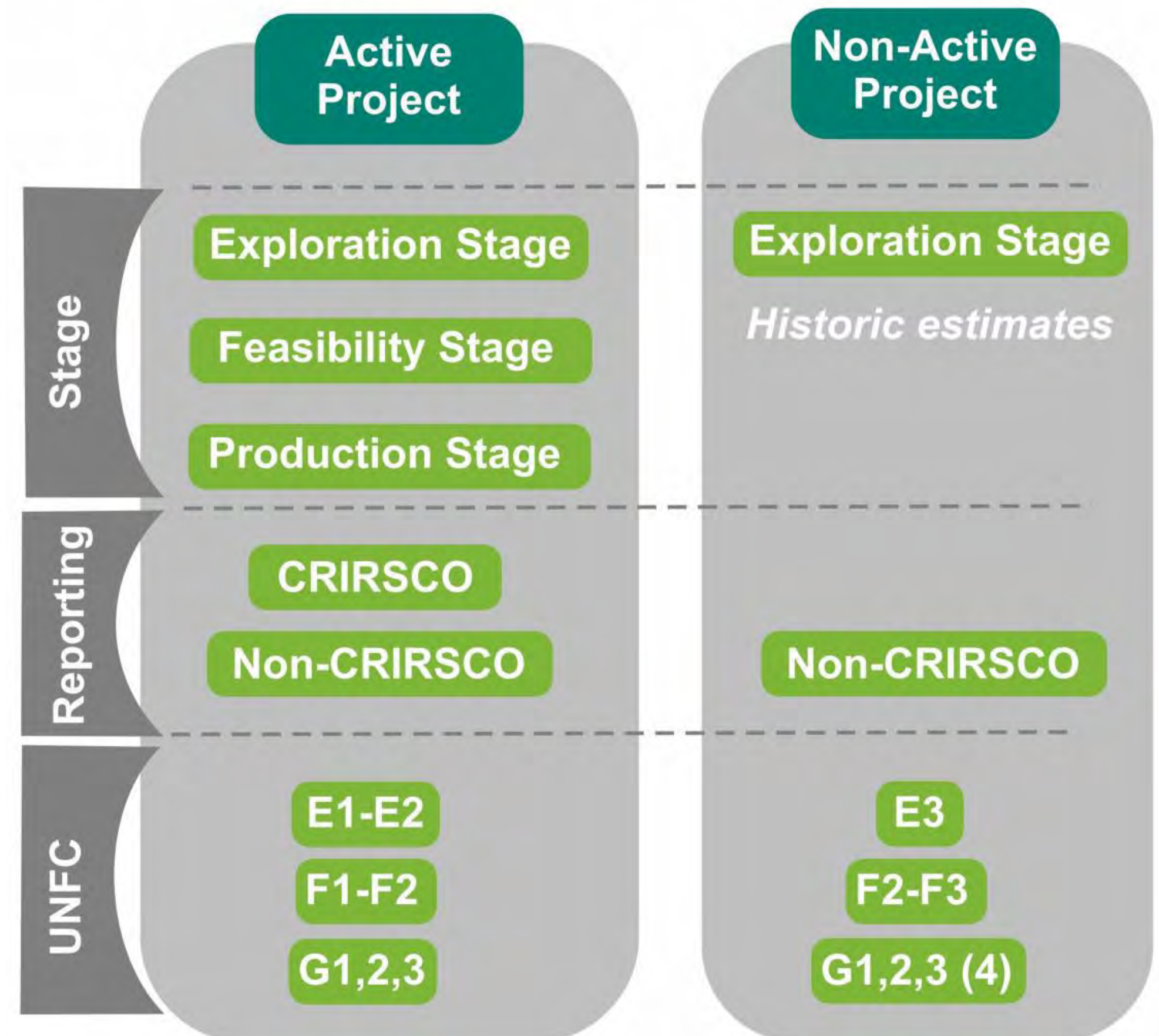
Janne Hokka, GTK
UNFC Guidance for Europe
GSEU WP2 TRAIN-THE-TRAINER COURSE
Module Introduction Level 1
Ljubljana , 15-16 April 2024



Guidance for National Resource Reporting

Active versus Non-Active Project

- Looking at the project status is a useful way to start the assessment.
- Active projects are either Prospective, Potentially-Viable or Viable Projects which means that E-category range from E3 to E1.
- Non-active projects are always Non-Viable and, therefore, E-category is always E3.



ANNEX III

Mineral and Anthropogenic Resources

Sectoral Guidelines for 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.

E Axis – Environmental-Socio-Economic Viability

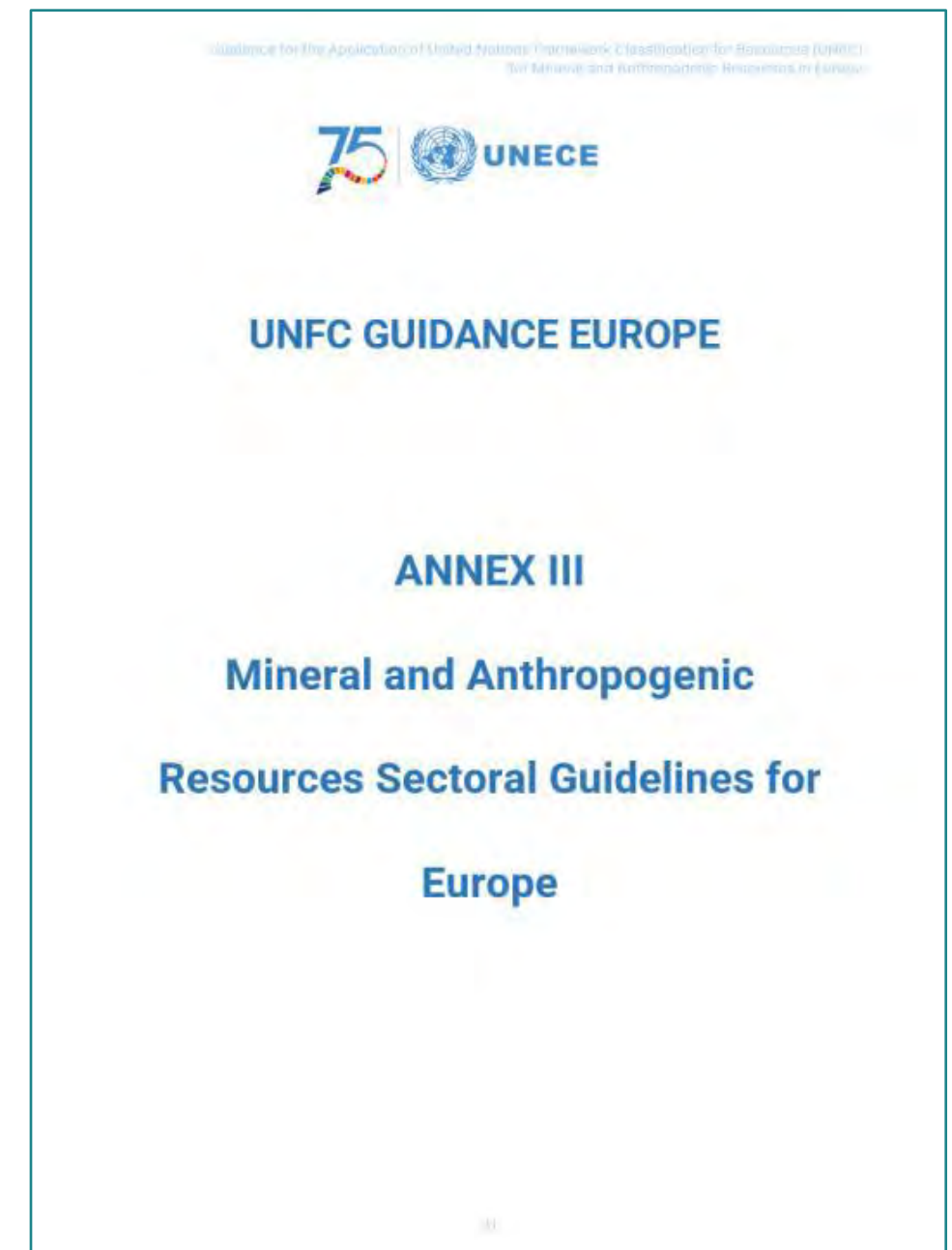
Policy Legal Framework Exploration Rights Regulatory Approval

Exploration Permits Extraction Permit Economic Considerations

Fiscal Framework/Contractual Conditions Social Considerations

F-Axis – Technical Feasibility

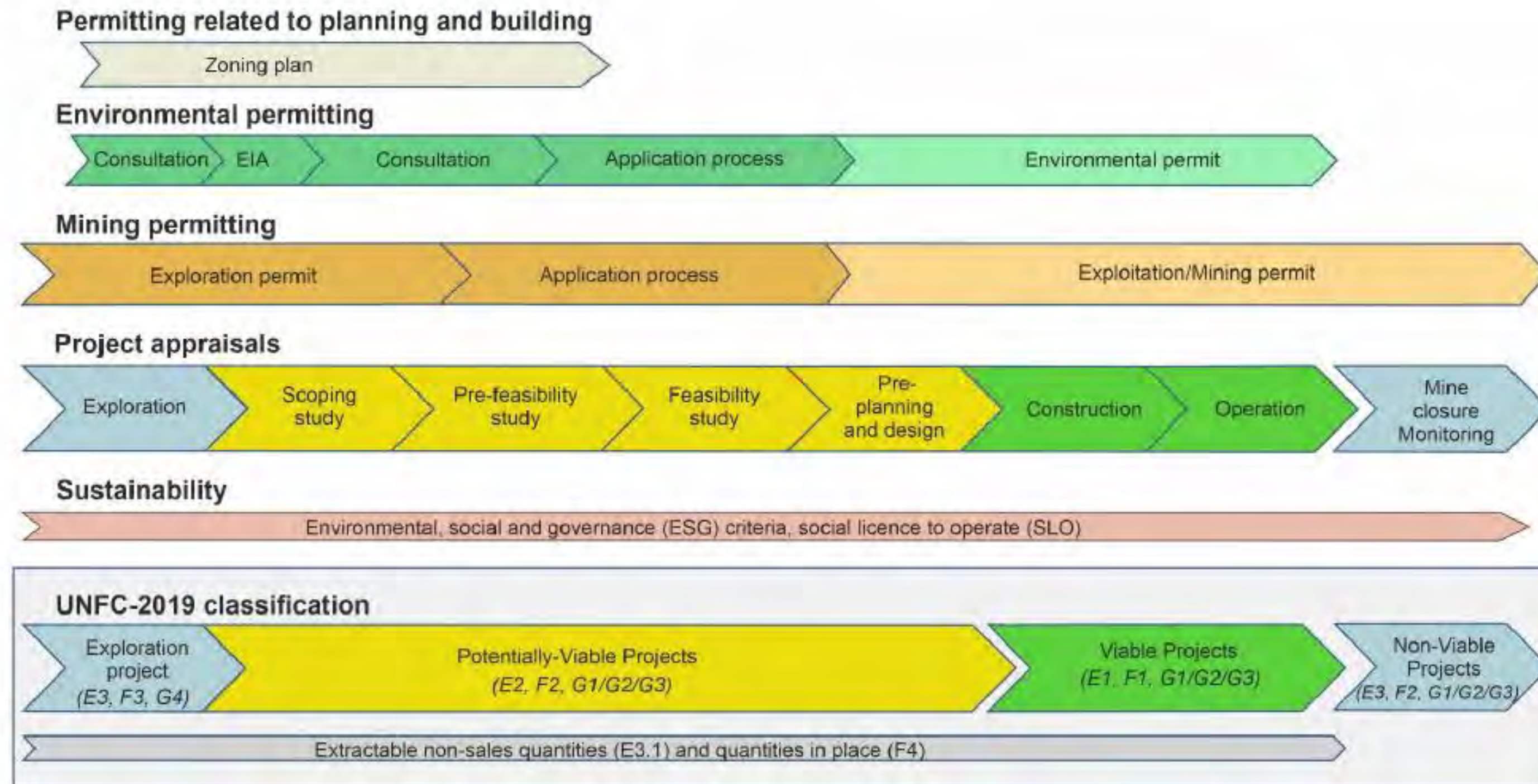
Technology Readiness Levels Mining Methods Mining Projects



ANNEX III

Mineral and Anthropogenic Resources

Sectoral Guidelines for Europe



Schematic mining-related project life cycles* in governmental and industry processes with some E-Axis controlling factors

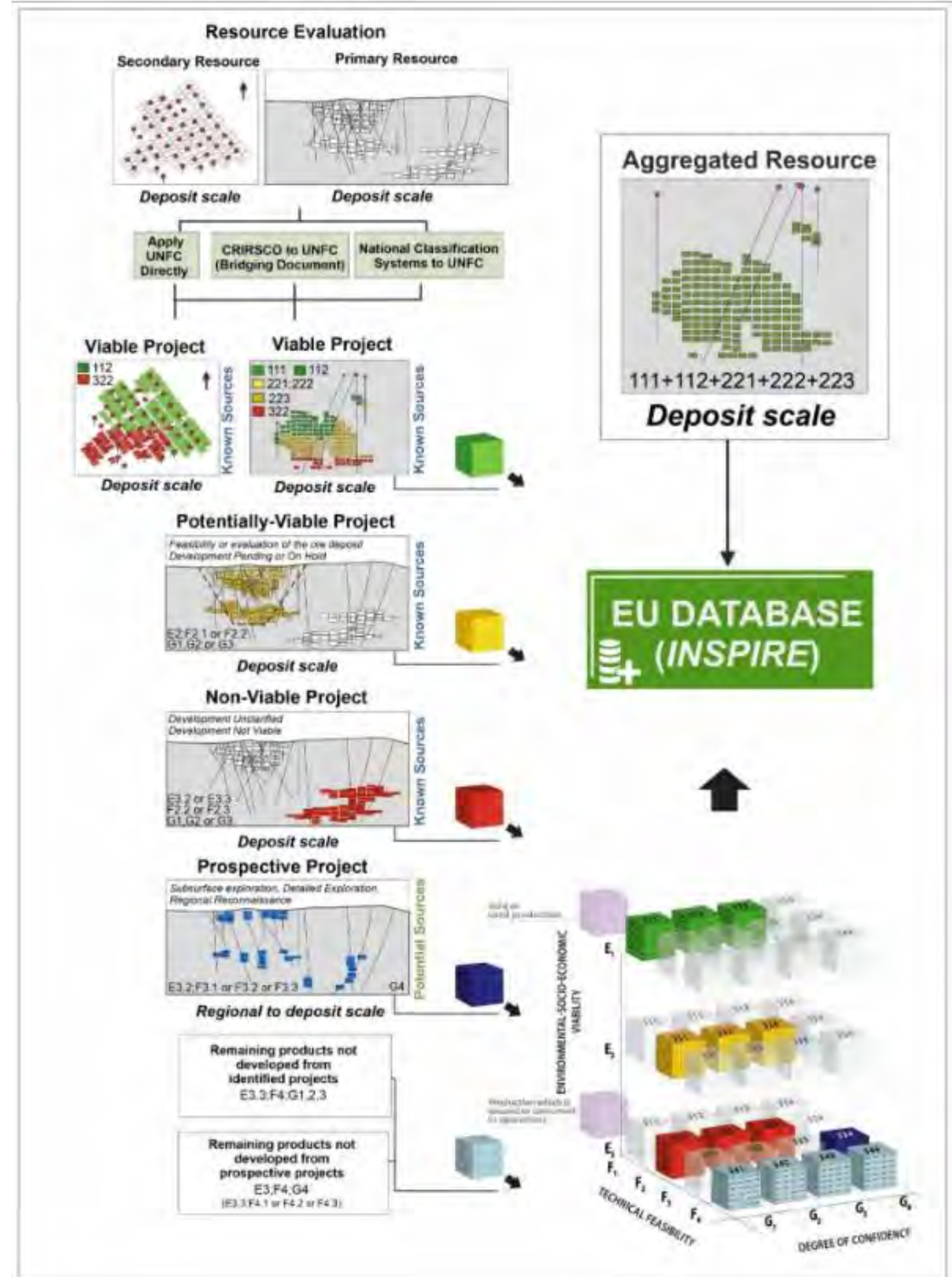
ANNEX IV

Glossary of Terms

Example →

Term	Definition
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.
Anthropogenic Material	An Anthropogenic Material is physical matter without any attribution from an economic, legislative, social, or environmental perspective, and without a specification of the aggregate state (solid, liquid, gaseous). Anthropogenic materials include, for instance, mineral materials, sewage sludge, biomass, and off-gas.
Anthropogenic Resource	An Anthropogenic Resource is a concentration or occurrence of Anthropogenic Material of intrinsic economic interest, in such form, quality and quantity that there are Reasonable Prospects for eventual economic exploitation. It is recognized that in traditional resource classification systems, the quantity is subdivided into resources and reserves with elaborate definitions of the two. UNFC does not use these terms but refers to "Classes" (Section C) instead. The term "Anthropogenic Resource" has been adapted from the term "Mineral Resource" as defined in CRIRSCO.
Anthropogenic Material Product	is a quantity that is saleable in markets. The cumulative quantities are equivalent to "Sales Production" according to UNFC. It is noted that the term Anthropogenic Material Product does not necessarily correlate with legal Product declarations. Guidance for Projects with multiple Anthropogenic Material Products and energy quantities is given in section III.C.
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 UNFC Numerical Codes.
Category	Primary basis for classification using each of the three fundamental Criteria of environmental-socio-economic viability (related Categories being E1, E2, and E3), field Project status and feasibility (related Categories being F1, F2, F3 and F4), and level of knowledge and/or confidence in estimates of quantities (related Categories being G1, G2, G3 and G4). Definitions of Categories are provided in UNFC Part I.
Competence	The power of a person, business, court, or government to deal with something or take legal decisions.
Class(es)	Primary level of resource classification resulting from the combination of a Category from each of the three Criteria (axes).
Criteria	UNFC utilizes three fundamental Criteria for resource classification: favorability of environmental-socio-economic conditions in establishing the viability of the Project (E axis); maturity of technology, studies, and commitments necessary to implement the Project (F axis); and degree of confidence in the estimate of quantities of Products from the Project (G axis). These Criteria are each subdivided into Categories and Sub-categories, which are then combined in the form of Classes or Sub-classes.

Graphical Abstract



Key points and takeaways



- UNFC is a resource management tool that can classify projects, their sources, and products in a **coherent** and **consistent** manner to **ensure the sustainable supply of critical and strategic raw materials within Europe**.
- UNFC Guidance Europe is to ensure **clarity and comparability in national resource reporting** and to **assist** Qualified Experts in **identifying relevant technical and non-technical contingencies and blocking factors**, and to determine how these can be **communicated under UNFC to facilitate reporting of Critical Raw Materials Projects within the European Union**.
- UNFC Guidance for Europe is mainly **used in national-level by the governmental organisations to support INSPIRE compliant reporting of raw materials project within EU**.

Questions? Comments ?

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Thank you
Merci
Obrigado



<https://unece.org/sites/default/files/2022-11/UNFC%20GUIDANCE%20EUROPE-FINAL.pdf>