



UNFC FOR EUROPE GUIDANCE DRAFT

Guidance for the Application
of the
United Nations Framework Classification for Resources for
Mineral and Anthropogenic Resources
in Europe

Slavko Solar
Economic Affairs officer

UNECE

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DRAFT

UNFC FOR EUROPE GUIDANCE

Guidance for the Application of the
United Nations
Framework Classification for
Resources for Mineral and
Anthropogenic Resources in Europe

→ What is UNFC for Europe Guidance?

→ Why is UNFC for Europe Guidance?

- Facilitates decision-making
- Provides reliable and relevant Information
- Assists the EU Action Plan for implementation of UNFC at the Member State level

→ Aims:

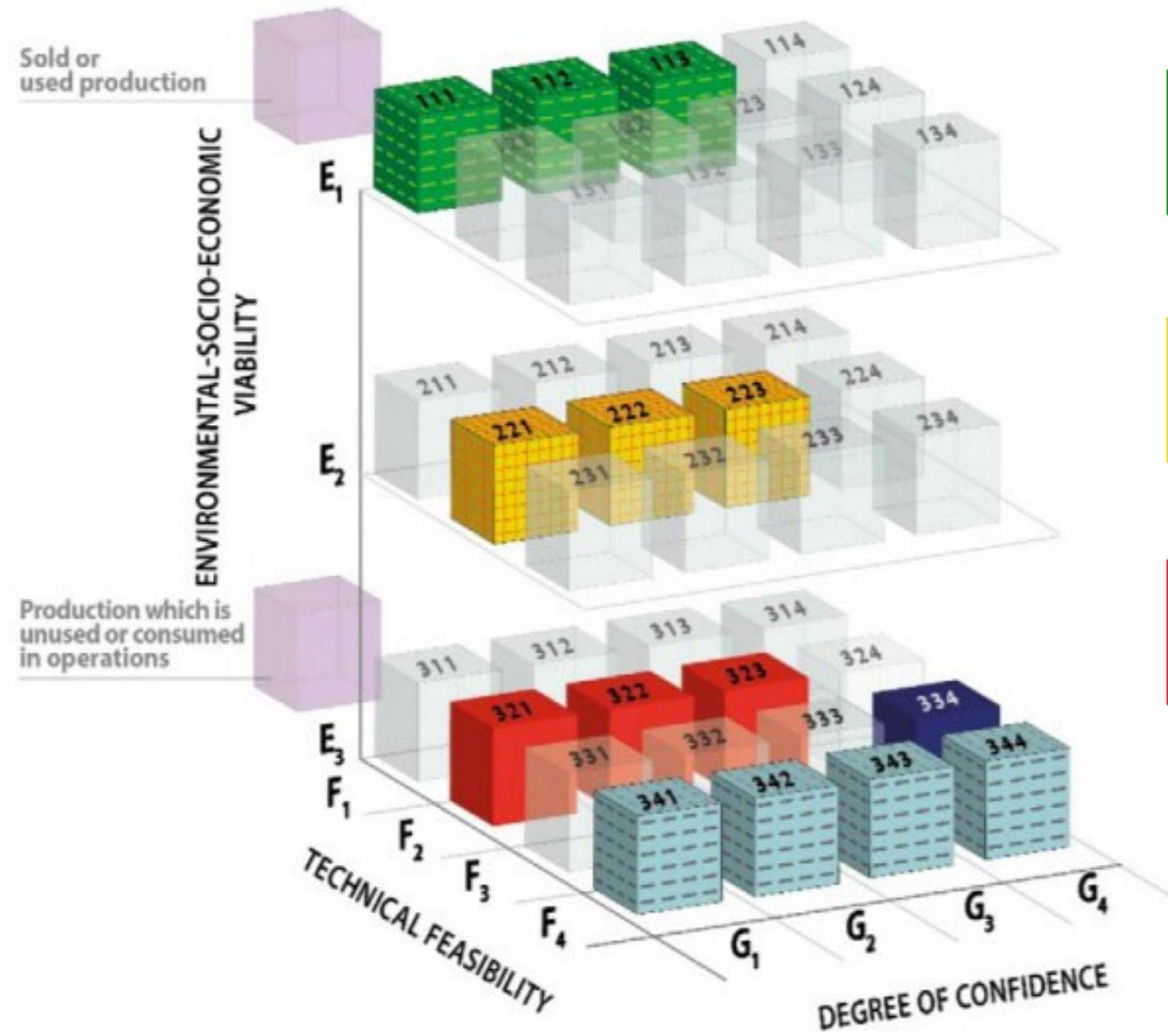
- To upgrade the inventory for stakeholders
- To promote and strengthen the community of UNFC practitioners
- To assures quality
- To adds to continuous development of UNFC and UNRMS.
- To assists to the coordinated implementation of UNFC in Europe

→ Useful for:

- Regional/National resource management
- Company internal business process innovation
- Financial reporting

UNFC →

Quantities are classified by the three fundamental criteria



E Axis Social, Environmental, and Economic viability

F Axis Field Project Status and Feasibility

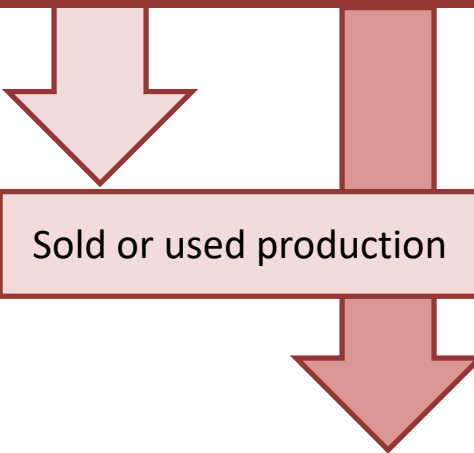
G Axis Level of Knowledge/Confidence in the Estimates

UNFC-2019 Classes and Sub-classes defined by Sub-categories & their link to INSPIRE and Technological Readiness Level

Total Products

Produced

Known Sources



Class	Sub-Class	Categories			INSPIRE Code List	TRL
		E	F	G		
<u>Viable Projects</u>	In Production	1	1.1	1,2,3	Operating Continuously Operating intermittently	9
	Approved for Development	1	1.2	1,2,3	Under development	8
	Justified for Development	1	1.3	1,2,3	Pending approval	5,6,7
<u>Potentially Viable Projects</u>	Development Pending	2	2.1	1,2,3	Evaluation of Resources	3,4
	Development On Hold	2	2.2	1,2,3	Care and maintenance Retention	
<u>Non-Viable Projects</u>	Development Unclassified	3.2	2.2	1,2,3	Assessment of Resources	3,4
	Development Not Viable	3.3	2,3	1,2,4	Closed Abandoned Historic	
<u>Remaining products not developed from identified projects</u>		3.3	4	1,2,3		1,2

UNFC-2019 Classes and Sub-classes defined by Sub-categories & their link to INSPIRE and Technological Readiness Level

Potential Sources					
Class	Categories			INSPIRE Code List	TRL
	E	F	G		
Prospective Projects	3,2	3,1	4	Subsurface exploration	3,4
	3,2	3,2	4	Detailed surface exploration	3,4
	3,2	3,3	4	Regional reconnaissance	3,4
Remaining products not developed from prospective projects	3,3	4,1	4		2
	3,3	4,2	4		1
	3,3	4,3	4		

Mapping of the E-F Matrix to TRL Classification

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4.1	F4.2	F4.3
E.1.1	TRL 9	TRL 8	TRL 5,6,7									
E.1.2	TRL 9	TRL 8	TRL 5,6,7									
E2				TRL 3, 4								
E3.1												
E3.2					TRL 3,4		TRL 3,4	TRL 3,4	TRL 3,4			
E3.3										TRL 2	TRL 1	

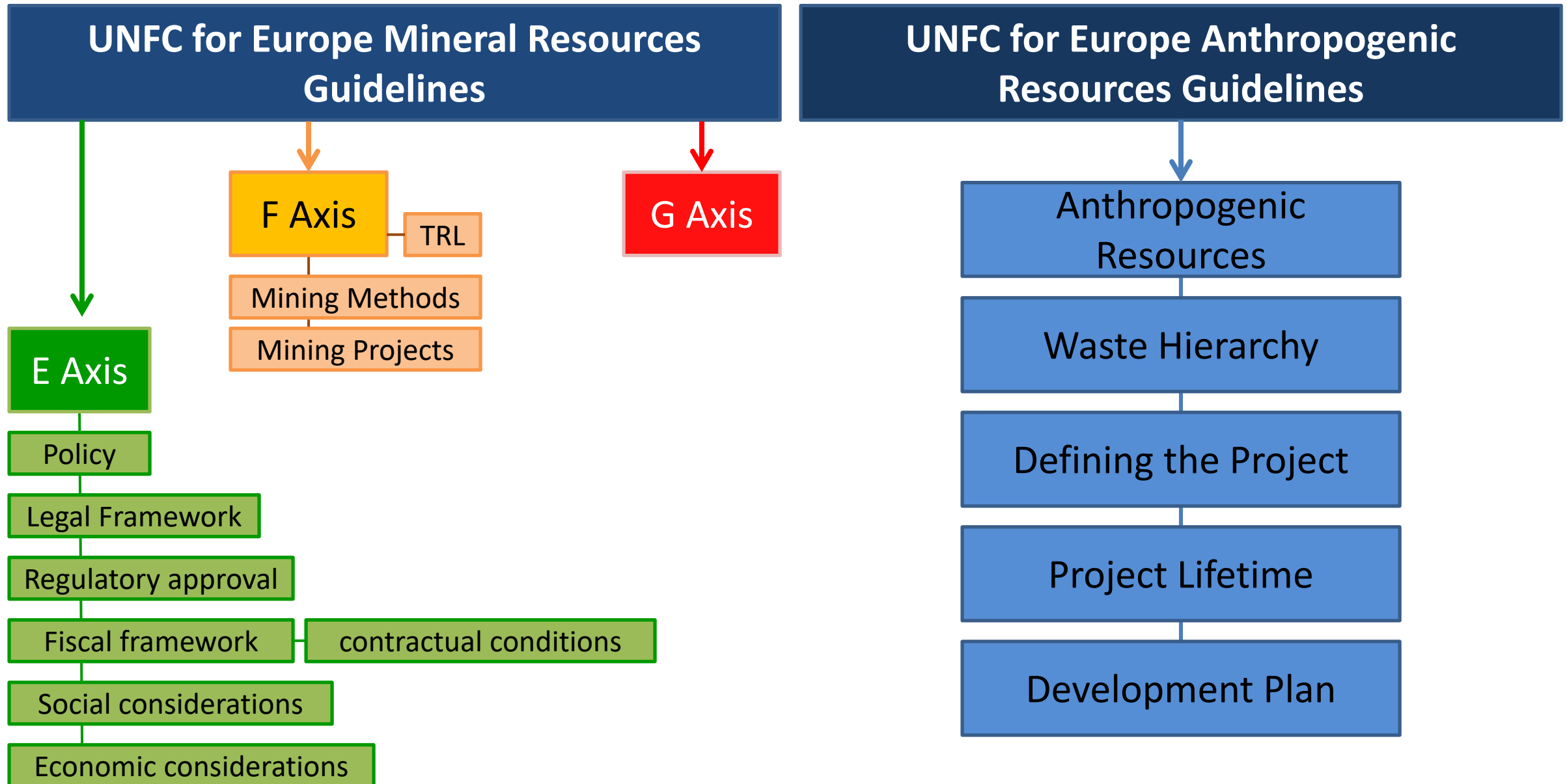
TRL	Definition
1	basic principles observed
2	technology concept formulated
3	experimental proof of concept
4	technology validated in lab
5	technology validated in relevant environment
6	technology demonstrated in relevant environment
7	system prototype demonstration in operational environment
8	system complete and qualified
9	actual system proven in operational environment

Mapping of the E-F Matrix to INSPIRE code list classification

	F1.1	F1.2	F1.3	F2.1	F2.2	F3.1	F3.2	F3.3
E.1.1	Operating Continuously Operating intermittently	Under development	Pending approval					
E.1.2	Operating Continuously Operating intermittently	Under development	Pending approval					
E2				Evaluation of Resources (Detailed Feasibility Study, Prefeasibility)				
E3.1								
E3.2					Assessment of Resources (Advanced exploration, Resources definition, Prefeasibility, Scoping study (resources))	Subsurface exploration (Exploration Target Outline)	Detailed surface exploration (Exploration)	Regional reconnaissance (Grassroots)

Mineral and Anthropogenic Resources

Sectoral Guidelines For Europe



UNFC for Europe Mineral Resources Guidelines

E Axis

Policy

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
EU policy on non-energy raw materials	Minerals included in the Critical Raw Materials (CRM) list, minerals for energy transition	Yes, No	E1, E2.1 (Yes) E2.2 (No)	CRM can be different for MS
Raw Materials Policy at EU MS/Regional/local level	Policy is favourable, neutral, unknown or not favourable	High, medium, low	E1, E2.1 (favourable) E2.2 (neutral) E3.2 (unknown) E3.3 (not favourable)	
National interest	Mineral may be of national, regional, local interest	Yes (high, medium) No (medium, low)	E2.1, E2.2 (Yes) E2.2, E3.2, E3.3 (No)	
Regulatory approval process	Efficient permitting process ¹²		E1, E2.1 (efficient) E2.2 (neutral) E3.2 (unknown) E3.3 (inefficient)	

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E Axis

Legal Framework

Exploration rights (early exploration)

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
Exploration rights (early exploration)				
Exploration exclusivity	The exploration rights are exclusive to the holder, including undiscovered minerals	Yes/No/unknown	E3.2 (Yes) E3.3 (No, unknown)	Should be E3 because it's exploration
Exploration duration	Right to keep exploration rights by performing work	Yes/No/unknown	E3.2 (Yes) E3.3 (No, unknown)	Should be E3 because it's exploration

Exploration rights (advanced exploration)

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
Exploration rights (early exploration)				
Exploration exclusivity	The exploration rights are exclusive to the holder, including undiscovered minerals	Yes/No/unknown	E3.2 (Yes) E3.3 (No, unknown)	Should be E3 because it's exploration
Exploration duration	Right to keep exploration rights by performing work	Yes/No/unknown	E3.2 (Yes) E3.3 (No, unknown)	Should be E3 because it's exploration?

Mining rights

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
Mining rights				
Right to Mine	Explorationist has priority to acquire mining rights	Yes/No	E1, E2.1, E2.2 (Yes) E3.2 (unknown) E3.3 (No)	In the case Yes, E2.1/E2.2 will depend on how effective is the transmission of rights
Tenure certainty, duration	Priority for renewal	Yes/No	E1, E2.1, E2.2 (Yes) E3.2 (unknown) E3.3 (No)	

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E Axis

Regulatory approval

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
Exploration permit (early exploration)	Not been initiated	Unknown	E3.3	
Exploration permit	Been approved	high	E3.2	Should be E3 because it's exploration
	Not been approved	low	E3.3	
Application, submission to public enquiry	Being initiated and in the process of being considered	high, medium, low	E3.2 (high, medium probability) E3.3 (low probability)	Should be E3 because it's exploration
Exploration permit (advanced exploration)	Not being initiated	-	E3.3	
Exploration permit	Been approved	high	E2.1 (evaluation of resources) E2.2 (scoping study?) E3.2 (assessment of resources)	E3.2 should be assigned since early exploration can be considered granted
	Not been approved	low	E3.2	
Application, submission to public enquiry	Being initiated and in the process of being considered	high, medium, low	E3.2 (evaluation of resources & medium probability) E3.2 (assessment of resources & high/medium probability) E3.3 (low probability)	<i>Estimation</i>

Exploration permits (early exploration)

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E Axis

Regulatory approval

Extraction permits

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
Extraction license	Not been initiated		E3.2, E3.3	
Extraction	Been approved	high	E1, E2.1	Risk of appeals should be assessed and could lower E beyond E2.1 Would construction risks be assessed here or under F-axis?
	Approved subject to modifications	high, medium	E2.1, E2.2	
	Not been approved	low	E3.3	There could be a contradiction with the first row "extraction license not been initiated" that could be E3.2 or E3.3
Extraction license application, submission to public enquiry	Being initiated and in the process of being considered	high, medium, low	E2.1, E2.2, E3.2	<i>Estimation</i>
Timing	<5 year		<5 year: E2	
	>5 year		>5 year: E3.2, E3.3	

UNFC for Europe

E Axis

Regulatory approval

EIA

EU requires Member States to carry out EIA of certain public and private projects, before they are authorized, where it is believed that the projects are likely to have a significant impact on the environment. The objective is to identify the environmental impacts and assess whether prevention or mitigation is appropriate.

Mining Waste

Extractive Waste Directive sets up measures, procedures and guidance to prevent or reduce the possible adverse effects of the management of mining wastes (wastes from the extractive industry) on the environment, fauna and flora, as well as water, air and soil and human health.

Land Use

Water Framework Directive Construction

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Issue / potential CF	Level of engagement	Probability of approval	Potential E Category	Comments
Environmental Impact Assessment (exploitation)	Not been initiated		E2.2 (high), E3.3 (medium)	When not initiated should have a lower ranking since can be considered there is not active engagement
EIA permits	Been approved		E1, E2.1	
	Not been approved		E3.2, E3.3	
Application/Submission to public enquiry	Being initiated and in the process of being considered	high, medium, low	E1, E2.1 (not affected) E2.2 (affected but compatible) E3.2 (unknown; further studies required) E3.3 (affected incompatible)	Potential affections: population, human health, biodiversity, land, water, air, climate, human health, landscape, material assets, cultural heritage ¹⁵
Mining waste (external emergency plans, financial guarantee, EWMP)	Not been initiated	-	E2.2 (high), E3.3 (medium)	When not initiated should have a lower ranking since can be considered there is not active engagement
Mining waste permits	Been approved	high	E1, E2.1	
	Not been approved	low	E3.2, E3.3	
Application/Submission to public enquiry	Being initiated and in the process of being considered		E2.1, E2.2, E3.2	
Land use planning	Not been initiated	-	E2.2 (high), E3.3 (medium)	When not initiated should have a lower ranking since can be considered there is not active engagement
Land use planning considers the area as "minerals area"	Been approved (including landowners agreement)		E1, E2.1	
Change of land uses for non-minerals areas	Not been approved		E3.2, E3.3	
		Feasible (high), not feasible (low)	E2.2 (feasible) E3.2; E3.3 (not feasible)	
Landowner agreement	A process to resolve differences and align interests with a good chance of success	high	E1, E2.1	
	Landowner issues are complex or there is a strong misalignment	low	E3.2, E3.3	
Construction	Not been initiated	-	E2.2 (high), E3.3 (medium)	
Construction licenses	Been approved	high	E1, E2.1	
	Not been approved	low	E3.2, E3.3	
Application submitted	Being initiated and in the process of being considered	high, medium, low	E1, E2.1	
Timing	<5 year		<5 year: E2	
	>5 year		>5 year: E3.2, E3.3	

UNFC for Europe Mineral Resources Guidelines

E Axis

Fiscal framework

Contractual Conditions

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
Fiscal framework				
Taxes	Have been established and allows the project or are being negotiated	high, medium, low	E1 (established and allows project) E2.1, E2.2 (being negotiated, in dispute, uncertain) E3.2 (not determined) E3.3 (not approved)	
Royalties	Have been established and allows the project or are being negotiated	high, medium, low	E1 (established and allows project) E2.1, E2.2 (being negotiated, in dispute, uncertain) E3.2 (not determined) E3.3 (not approved)	
Production sharing	Have been established and allows the project or are being negotiated	high, medium, low	E1 (established and allows project) E2.1, E2.2 (being negotiated, in dispute, uncertain) E3.2 (not determined) E3.3 (not approved)	
Corporate tax	Have been established and allows the project or are being negotiated	high, medium, low	E1 (established and allows project) E2.1, E2.2 (being negotiated, in dispute, uncertain) E3.2 (not determined) E3.3 (not approved)	

UNFC for Europe Mineral Resources Guidelines

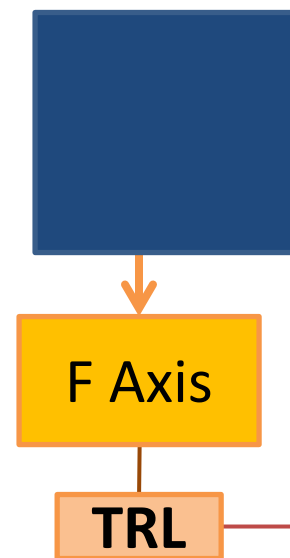
E Axis

Social considerations

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
National/regional/local(political) interests	Support from national, regional, local authorities.	high, medium, low	E1, E2.1 (formal support) E2.1, E2.2 (support but not formal) E3.2 (support unknown) E3.3 (opposition)	
Local community interests	Support from local community	high, medium, low	E1, E2.1 (formal support) E2.1, E2.2 (support but not formal) E3.2 (support unknown) E3.3 (opposition)	
Other organisations involved	Support from third organizations.	high, medium, low	E1, E2.1 (formal support) E2.1, E2.2 (support but not formal) E3.2 (support unknown) E3.3 (opposition)	

Economic considerations

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>	<i>Comments</i>
Preliminary economic assessment (Scoping study)		high, medium, low	E2.2	
Prefeasibility		high, medium, low	E2.1	
Detailed feasibility		high, medium	E1, E2.1	
Pre-planning and design		high, medium	E1, E2.1	
Construction		high	E1, E2.1	
Operation		high	E1	
Mine closure		low	E3	Mine closure maybe on-off
Post closure monitoring		low	E3	
Timing	Not applicable			



<i>TRL Definition</i>	<i>TRL</i>	<i>Potential F Category</i>	<i>Definition</i>	<i>Comments</i>
Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)	9	F1.1	Extraction is currently taking place	
System complete and qualified	8	F1.2	Capital funds have been committed and implementation of the development project or mining operation is underway	
System prototype demonstration in operational environment	7	F1.3		
Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)	6	F1.3	Sufficiently detailed studies have been completed to demonstrate the feasibility of extraction by implementing a defined development project or mining operation.	
Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)	5	F1.3		
Project activities are ongoing to justify development in the foreseeable future.	?	F2.1		
Project activities are on hold and/or where justification as a viable development may be subject to significant delay.	?	F2.2		
Technology validated in laboratory	4	F3	Feasibility of extraction by a defined development project or mining operation cannot be evaluated due to limited technical data	
Experimental proof of concept	3	F3		
Technology concept formulated	2	F4		
Basic principles observed	1	F4	No development project or mining operation has been identified	

UNFC for Europe Mineral Resources Guidelines

F Axis

Mining Methods

Conventional Mining Methods:

- Surface Mining (Open Pit Mining, Quarrying)
- Subsurface Mining (Room & Pillar, Longwall, Slope Mining and others)
- Placer Mining (Trenching).

Unconventional mining technologies:

- In-situ Recovery (ISR) or In-situ Leaching (ISL)
- Solution Mining
- Brine Mining
- Borehole Mining
- Seafloor Mining
- Tailings Re-mining
- Space Mining.

F Axis

Mining Projects

Exploration projects

<i>Issue / potential CF</i>	<i>Level of engagement</i>	<i>Potential F Category</i>	<i>Inspire category</i>
Technical feasibility			
	F1.1 (extraction on-going)	F1 if TRL > 5	
Detailed Feasibility Studies	F1.2 (detailed feasibility studies)		
Prefeasibility Studies Complete and Successful or Ongoing	F2.2		Advanced Exploration/Resource definition Prefeasibility
Scoping Study Completed or Ongoing	F2.2		Scoping study (resources)
Detailed Feasibility / Prefeasibility Studies Not Planned	F2.3		Closed, Abandoned, Historic

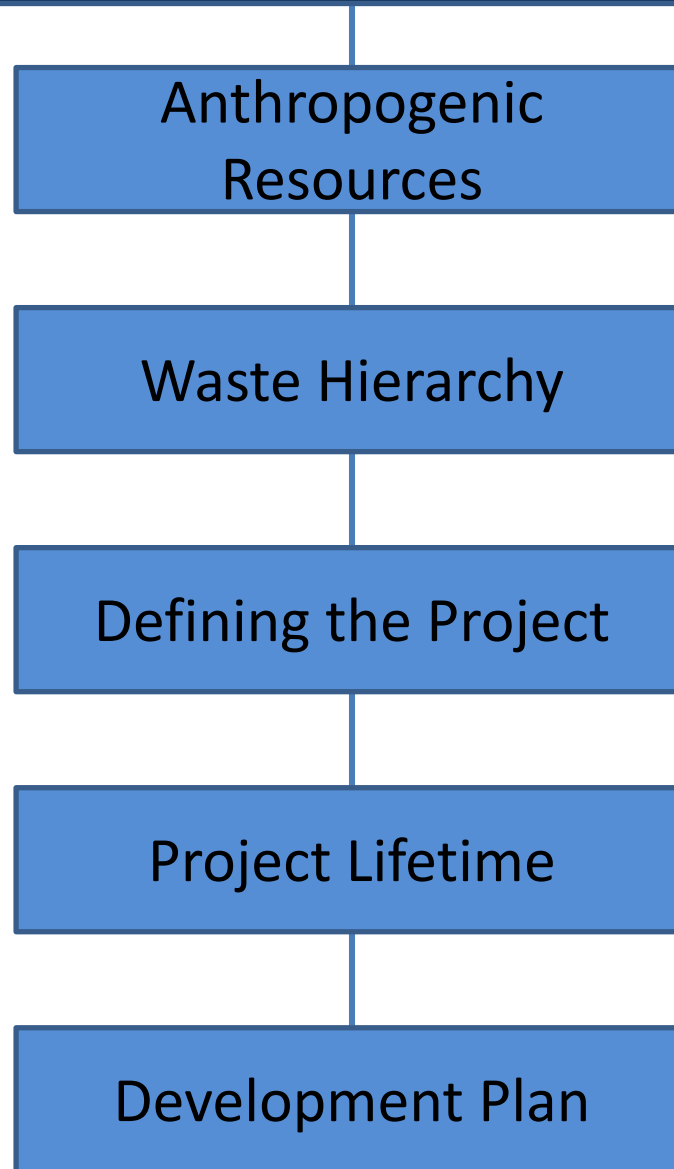
<i>Issue / potential CF</i>	<i>Potential F Category</i>	<i>Comments</i>	<i>Inspire category</i>
Exploration Projects Site-specific geological studies and exploration activities have identified the potential for an individual deposit with sufficient confidence to warrant drilling or testing that is designed to confirm the existence of that deposit in such form, quality and quantity that the feasibility of extraction can be evaluated	F3.1	TRL 3 and 4	Subsurface exploration (Exploration Target Outline)
Local geological studies and exploration activities indicate the potential for one or more deposits in a specific part of a geological province, but requires more data acquisition and/or evaluation in order to have sufficient confidence to warrant drilling or testing that is designed to confirm the existence of a deposit in such form, quality and quantity that the feasibility of extraction can be evaluated	F3.2		Detailed surface exploration (Exploration)
Earliest stage of exploration activities, where favorable conditions for the potential discovery of deposits in a geological province may be inferred from regional geological studies.	F3.3		Regional reconnaissance (Grassroots)
Conceptual studies Ongoing or Planned	F4	TRL 1 and 2	
Additional Quantities in place:			
Technology under active development	F4.1	TRL 2	
Technology being researched	F4.2	TRL 1	
Technology not under research or development	F4.3	TRL 1	

UNFC for Europe Mineral Resources Guidelines

G Axis

<i>Issue / potential CF</i>	<i>Potential G Category</i>	<i>Comments</i>
Geological Evidence		
Derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation.	G1	
Derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation	G2	
Sufficient to imply but not verify geological and grade or quality continuity.	G3	
Based primarily on indirect evidence.	G4	

UNFC for Europe Anthropogenic Resources Guidelines





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**SUSTAINABLE
DEVELOPMENT GOALS**

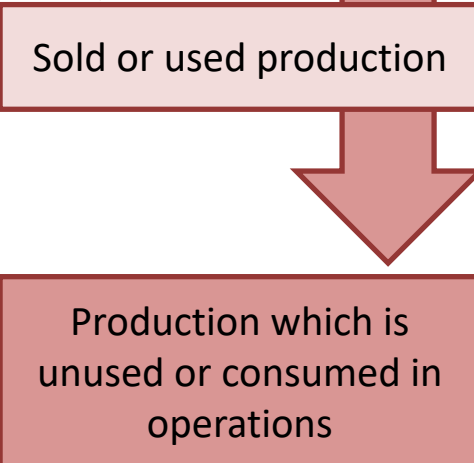
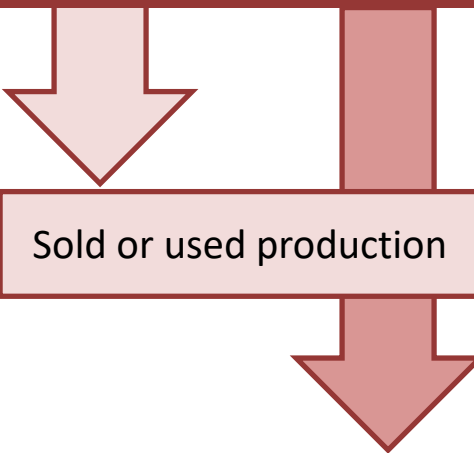
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	Development Not Viable	3.3	2,3	1,2,4	Closed Abandoned Historic	
Remaining products not developed from identified projects		3.3	4	1,2,3		1,2