

Regional Training Course on “United Nations Framework Classification – 2009 for evaluation of uranium and thorium resources and to leverage transparent and effective communications”

16-22 October, Luxor, Egypt

UNFC-2009 Nuclear fuel Resources Bridging Document and Guidelines

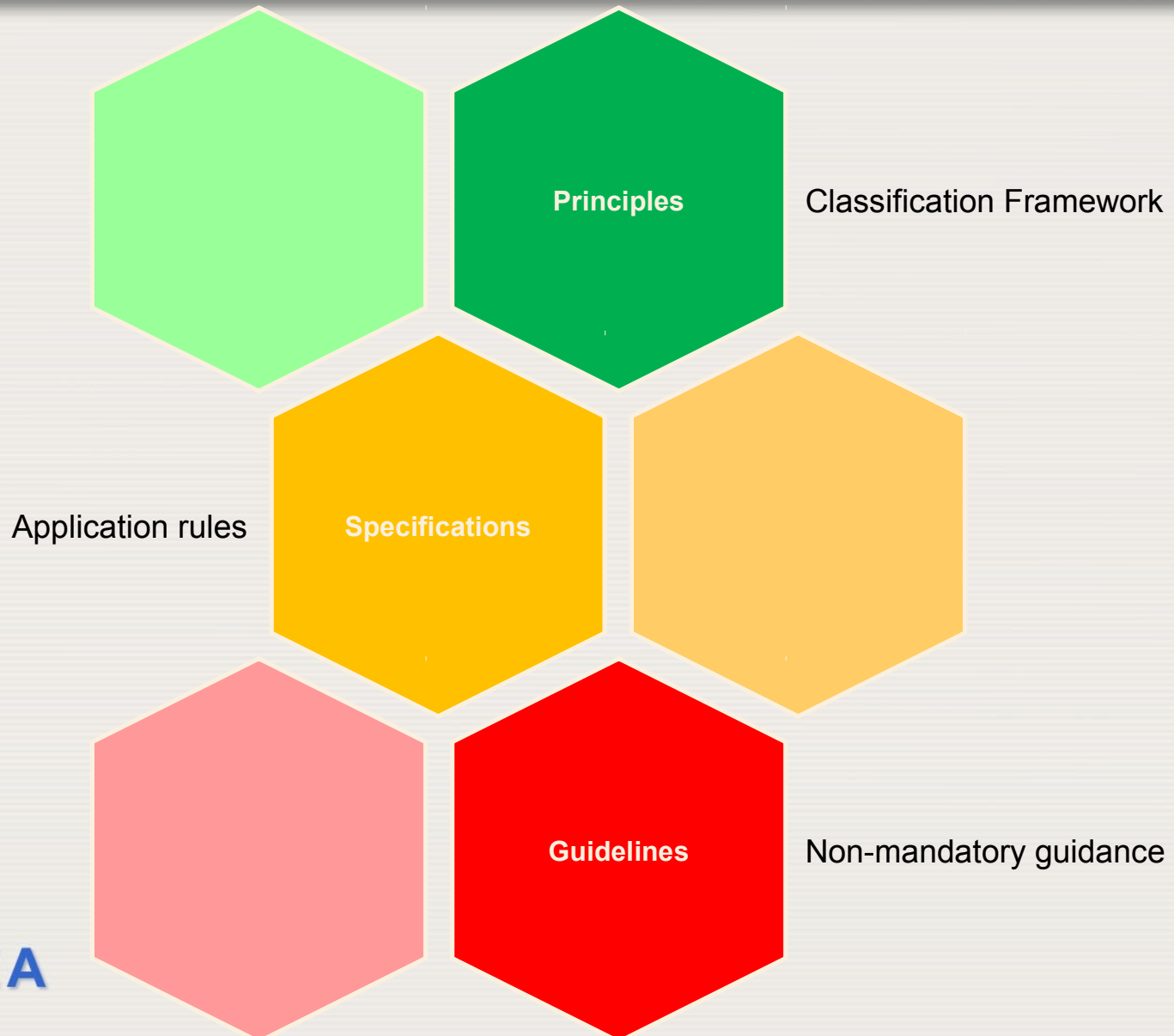
Hari Tulsidas



IAEA

International Atomic Energy Agency

UNFC-2009 is a 3-tier system



Bridging Documents explain the relationship between UNFC-2009 and another classification system

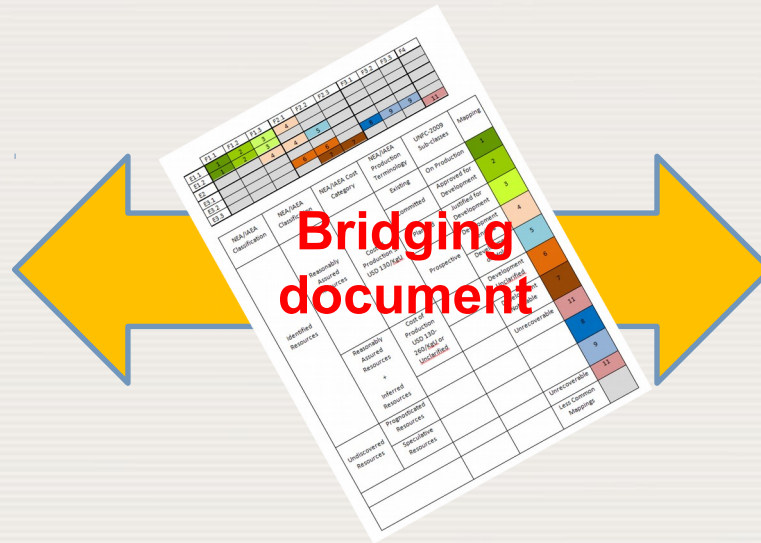
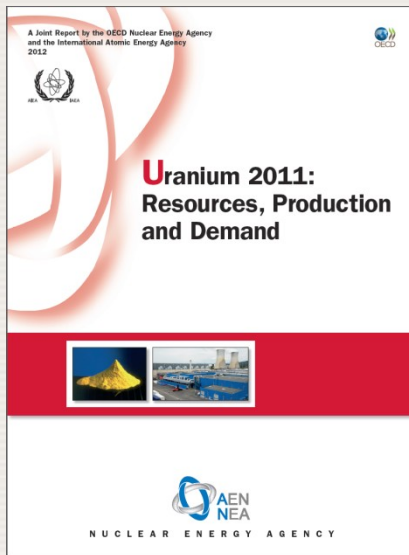
UNFC Classification					NEA/IAEA Classification	
UNFC Classes and Sub-classes		UNFC Categories				
Class	Sub-Class	E	F	G	Status	IAEA-NEA Categories
Commercial Projects	On Production	1	1.1	1,2	Existing	Reasonably Assured Resources (RAR)
	Approved for Development	1	1.2	1,2	Committed	
	Justified for Development	1	1.3	1,2	Planned	
Potentially commercial projects	Development Pending	2	2.1	1,2,3	Prospective	Identified Resources RAR IR*
	Development On Hold	2	2.2	1,2,3		
Non-commercial projects	Development Unclassified	3.2	2.2	1,2,3	Unclassified	Identified Resources RAR IR*
	Development not Viable	3.3	2.3	1,2,3	Not viable	
Exploration projects		3.2	3.1	4		Prognosticated Resources
		3.2	3.2, 3.3	4		Speculative Resources

*Inferred Resources

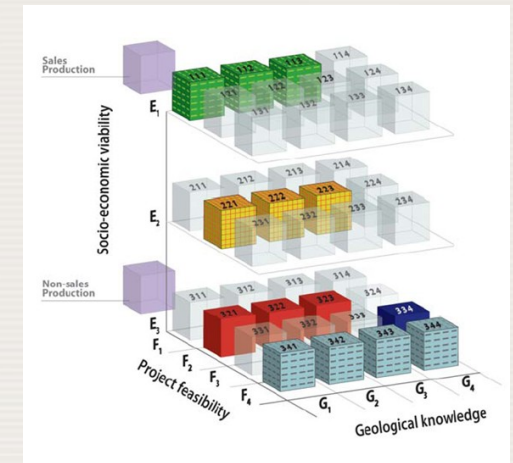


Bridging document will aid transfer of resources reported in Red Book system to UNFC-2009 or vice-versa

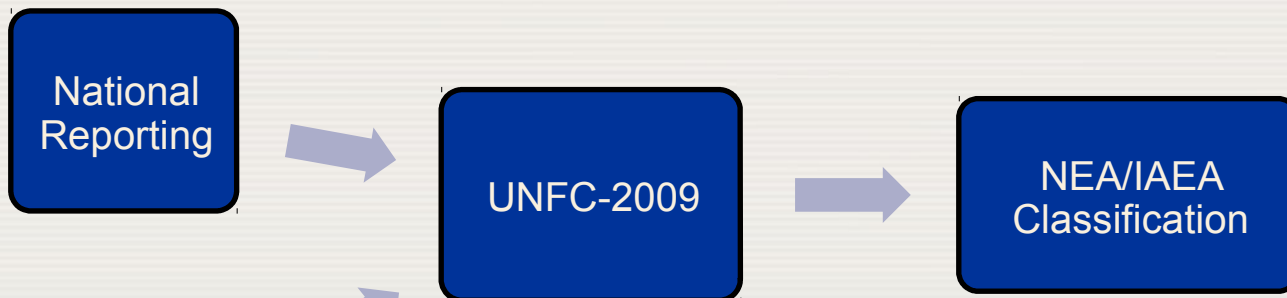
NEA/IAEA Red Book System



UNFC-2009



Workflows in national reporting



IAEA

Guidelines provide non-mandatory instructions

The easy application of UNFC-2009 to uranium and thorium resource projects

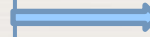
or

The transfer of resource data from other resource classification schemes into UNFC-2009

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	Provided	Reasonably Assured Resources (RAR)		Existing	
				2		Probable				
	Approved for Development	1	1.2	1		Provided			Probable	Planned
				2						
	Justified for Development	1	1.3	1		Provided			Probable	
				2						
Potentially Commercial Projects	Development Pending	2	2.1	1	Mineral Reserves	Measured	Identified Resources		Prospective	
				2		Indicated				RAR
				3		Inferred				IR*
	Development On Hold	2	2.2	1		Measured			RAR	
				2		Indicated			IR*	
				3		Inferred				
Non-commercial Projects	Development Unclarified	3.2	2.2	1,2,3	Inventory (not defined in Template)	Development Unclarified (not defined in Template)	Identified Resources RAR IR*		Unclarified	
	Development Not Viable	3.3	2.3	1,2,3		Not Viable (not defined in Template)			Not Viable	
Exploration Projects		3.2	3.1	4	Exploration Results		Undiscovered Resources	Prognosticated Resources		
		3.2	3.2, 3.3	4				Speculative Resources		

Uranium guidelines are hinged on critical control point and milestone-driven approach

Geologic knowledge
Project feasibility
Socio-economic viability
Policy and regulatory frameworks



Small, critical number of control points in a project life-cycle

(combination approach of E, F, and G axis considerations)

Socio-economic viability issues (E-axis)

Known environmental or social impediments or barriers to projects (E-axis)

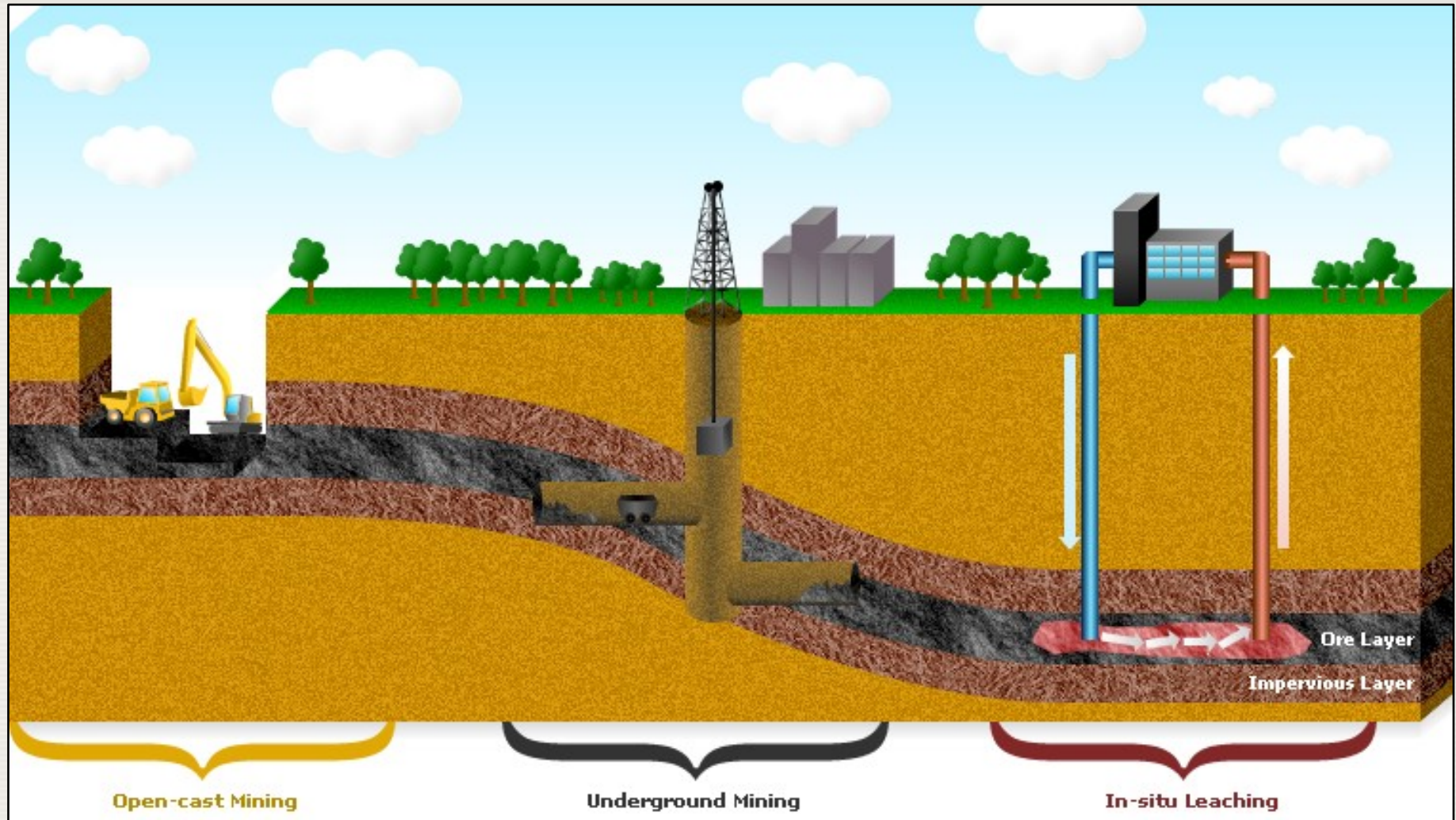
Project viability issues (F-axis)

Geological knowledge challenges (G-axis)

In-situ leach production (solution mining of underground uranium deposits)



Uranium recovery can involve different methodologies



Companies requires the services of a “Competent Person”

Required under relevant regulations (national, financial)

Companies need all public reports (technical reports, brochures, presentations etc) signed off by a Competent Person.

A Competent Person is a minerals industry professional who is a member of a professional body with an **enforceable disciplinary process** including the powers to suspend or expel a member. A Competent Person must have a minimum of five years relevant experience in the style of mineralisation or type of deposit under consideration and in the activity which that person is undertaking. (Clause 11 , CRIRSCO Template)

Government organizations (e.g USGS, Geoscience Australia) do not have a requirement of a Competent Person



Who is an UNFC Evaluator?

The organization responsible for the evaluation

Independent

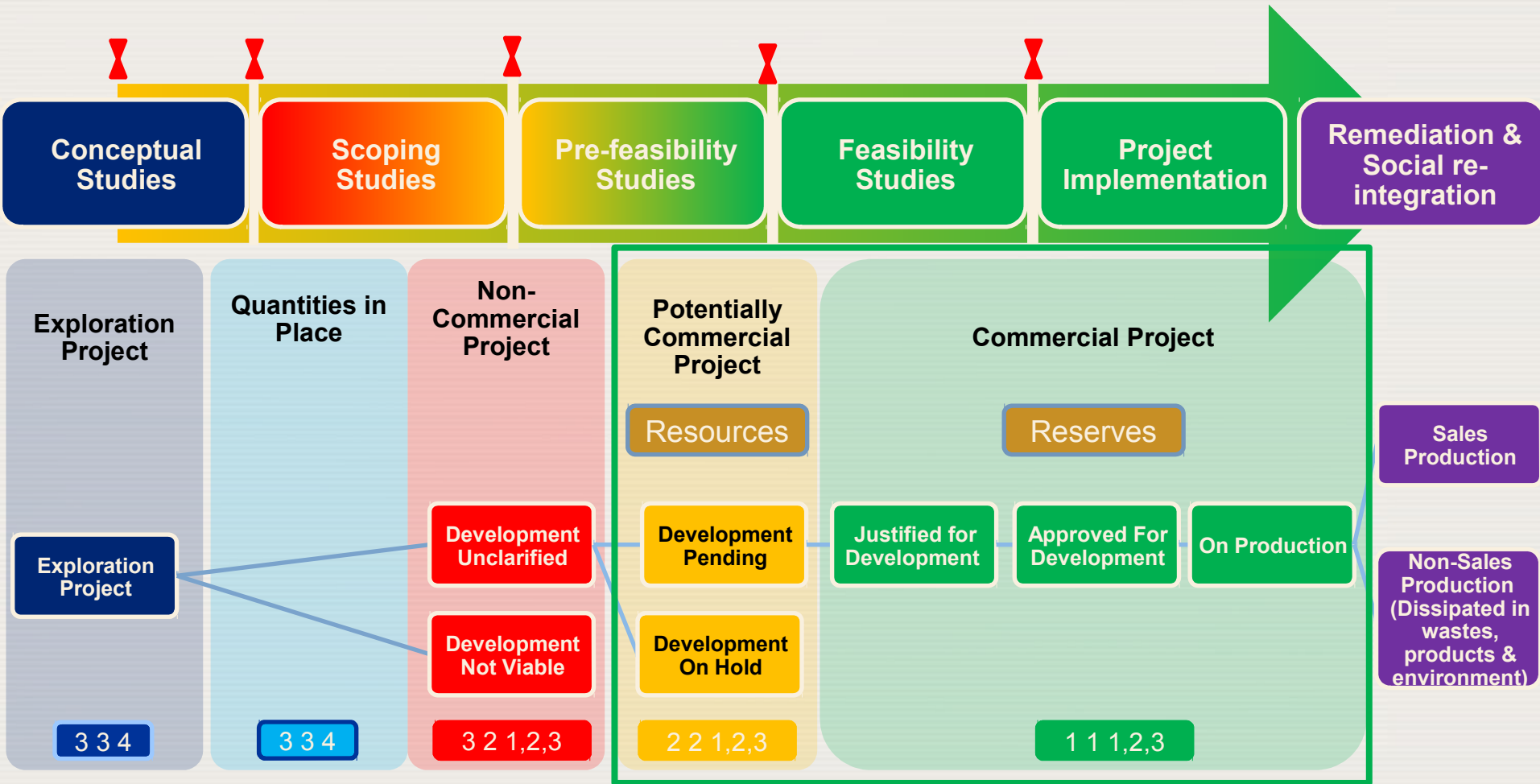
“Evaluators must possess an appropriate level of expertise and relevant experience in the estimation of quantities associated with the type of deposit under evaluation” - UNFC-2009 Generic Specifications (Clause M)

Other requirements, such “enforceable disciplinary process”, jurisdiction, should be based on national regulations.

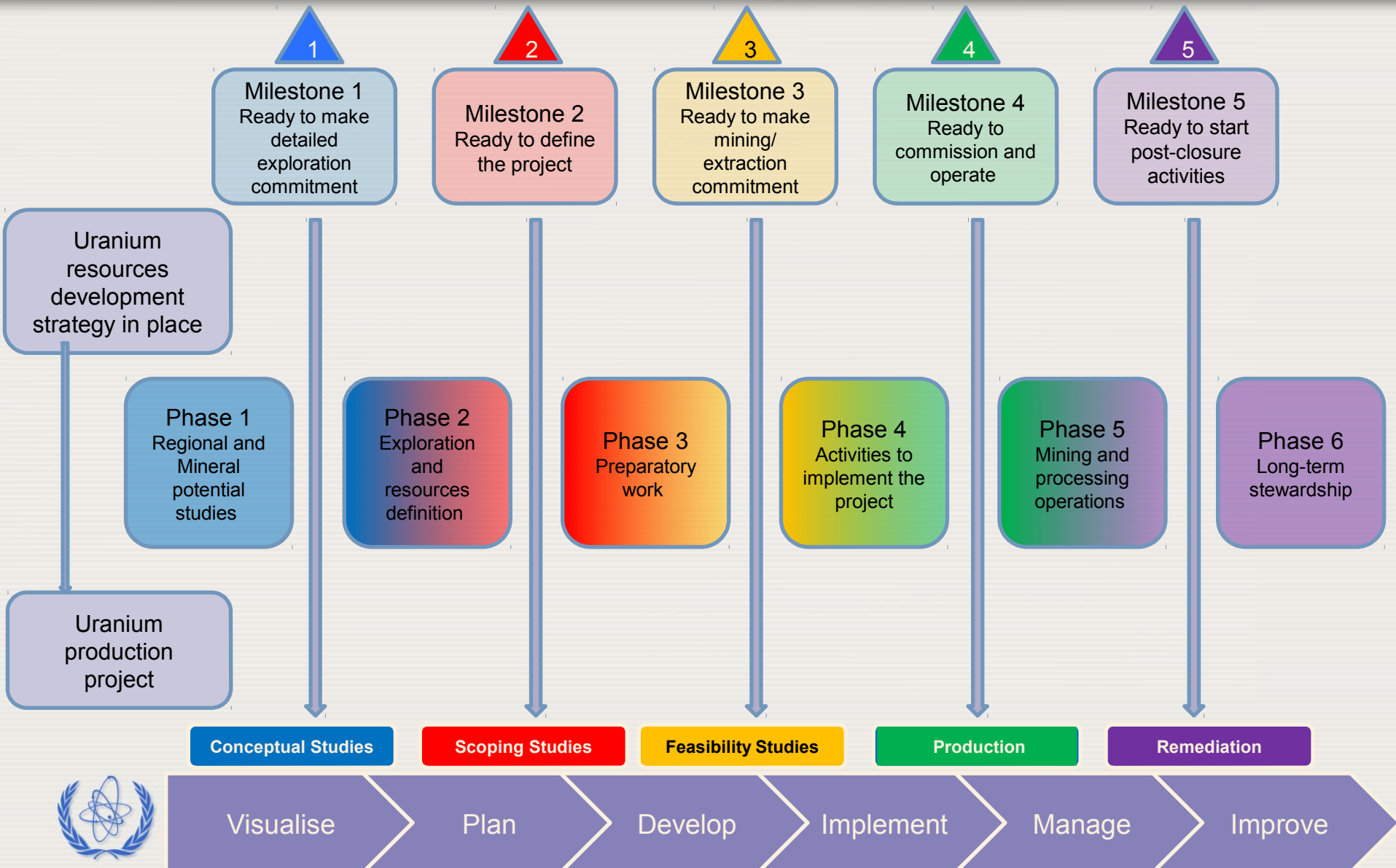
UNFC White Paper on “UNFC Evaluator (Competent Person) is under preparation



U mining lifecycle and resources



Key milestones to success



Comprehensive extraction maximize returns from mining and processing

Conventional resources — Uranium is recovered as a primary product, a co-product, or as a significant by-product

Unconventional Resources — Uranium is recovered as a minor by-product (example – phosphate deposits)

Comprehensive Extraction benefits:

- Support principles of sustainability and resource conservation
- Optimizing returns from all resources in an ore body
- Reuse, recycle (tailings or residues)

Thank you

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