


UNFC-2009

how it works and current status

**Presented by
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on Resource Classification**



UNFC – 2009

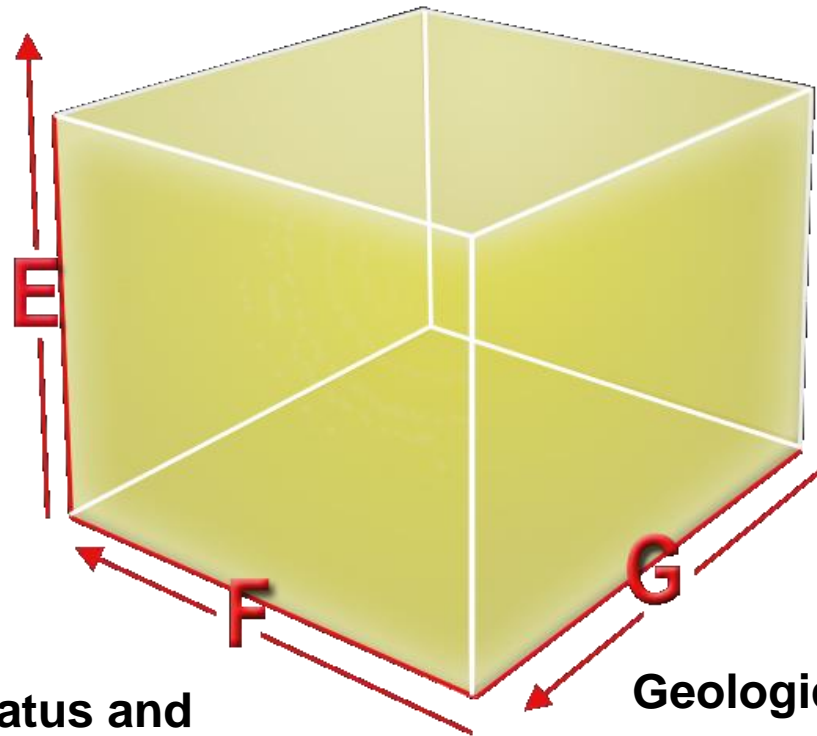
- **What is it?**
- **How it works**
- **Alignment with other systems**
- **Current status**
- **Australian experience**

UNFC – What is it?

- **United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources**
 - Common global language for resource estimates
- **Generic, principles-based system**
 - Applicable to both solid minerals and fluids
- **Based on three criteria**
 - **E**conomic and social viability
 - **F**ield project status and feasibility
 - **G**eological knowledge

UNFC – Three Criteria

Economic and social
viability (E axis)

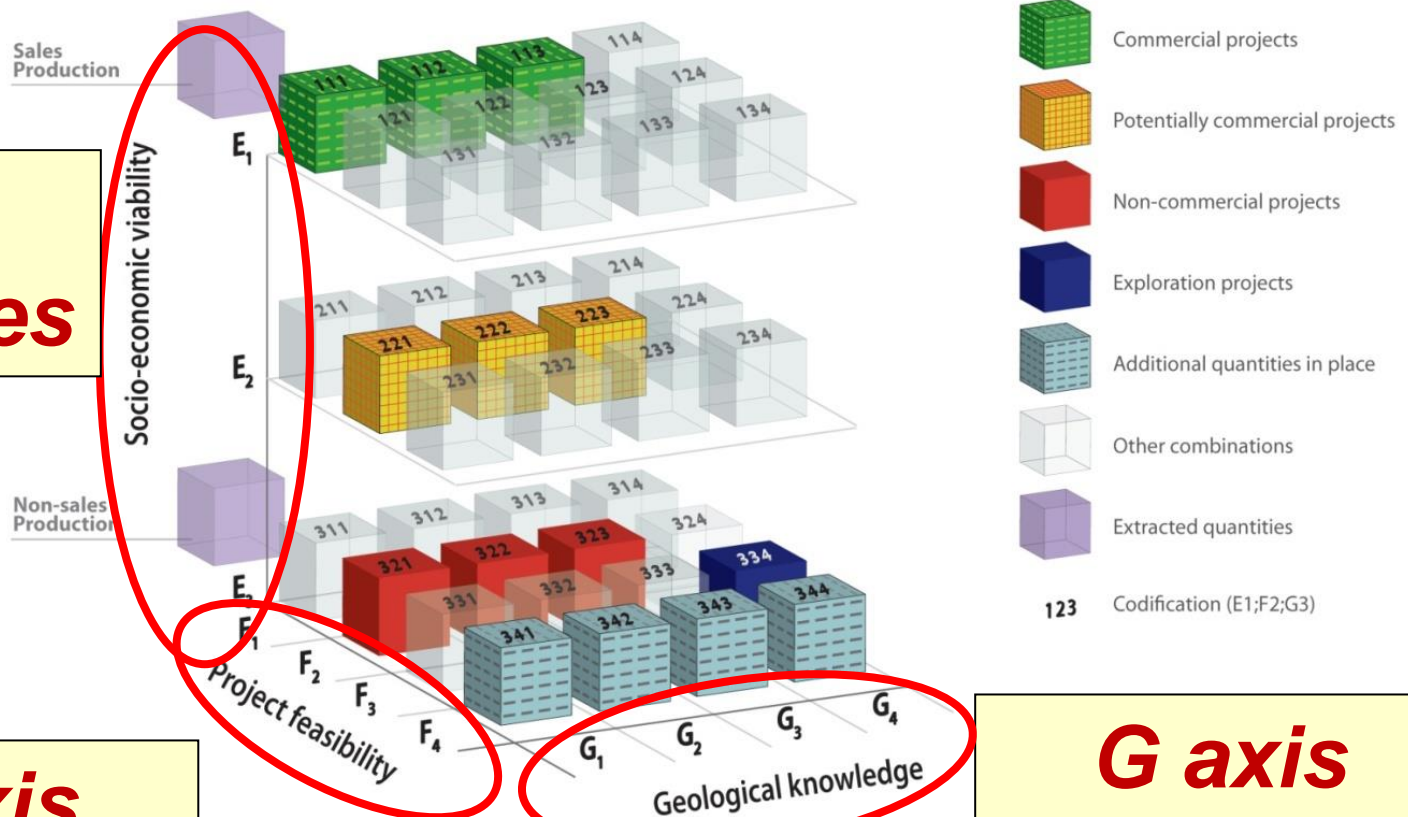


Field project status and
feasibility (F axis)

Geological knowledge
(G axis)

UNFC – How it works

E axis categories



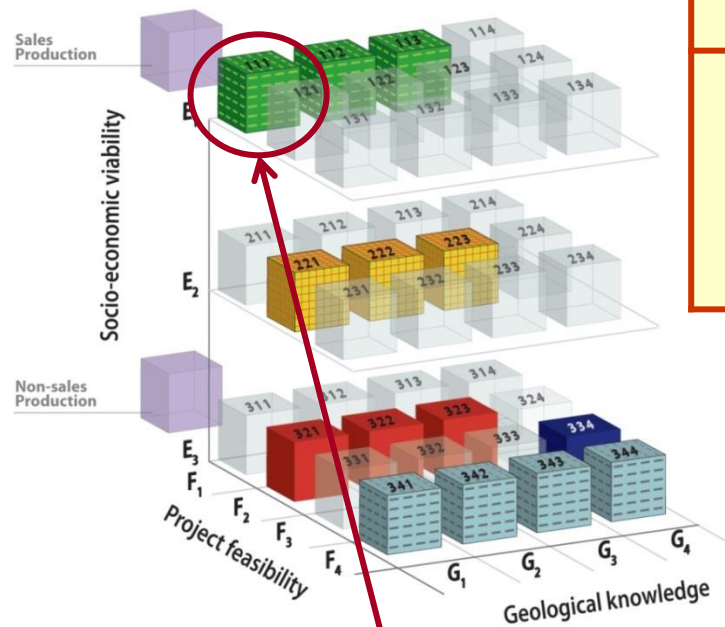
F axis categories

G axis categories

UNFC – How it works

- **The (E, F, G) category definitions are the building blocks of the system**
- **Combined (E, F, G) categories in the form of classes**
- **Class 111 means that the reported quantities have satisfied the definitions for:**
 - **E1, F1 and G1**

UNFC – How it works



Category	Definition
E1	Extraction and sale has been confirmed to be economically viable.

Category	Definition
F1	Feasibility of extraction by a defined development project or mining operation has been confirmed.

Category	Definition
G1	Quantities associated with a known deposit that can be estimated with a high level of confidence.

UNFC Class: 111

UNFC – 2D representation

UNFC Classes defined by categories and sub-categories						
Extracted	Sales Production					
	Non-sales Production					
Class	Sub-class	Categories				
		E	F	G		
Total commodity initially in place	Known Deposit	Commercial 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 Commercial Projects	Development Pending	2	2.1	1, 2, 3
			Development On Hold	2	2.2	1, 2, 3
		Non-Commercial Projects	Development Unclassified	3.2	2.2	1, 2, 3
			Development Not Viable	3.3	2.3	1, 2, 3
		Additional quantities in place		3.3	4	1, 2, 3
		Potential Deposit	Exploration Projects	[No sub-classes defined]	3.2	3
Additional quantities in place			3.3	4	4	

Alignment of systems (schematic)

UNFC-2009

PRMS

CRIRSCO

Total commodity initially in place	Sales Production	Production	Extracted
	Non-sales Production		
	<u>Class</u>	<u>Class</u>	<u>Class</u>
	Commercial Projects	Reserves	Mineral Reserves
	Potentially Commercial Projects	Contingent Resources	Mineral Resources
	Non-Commercial Projects		Not reported
	Additional quantities in place	Unrecoverable	Not reported
	Exploration Projects	Prospective Resources	Exploration Results
	Additional quantities in place	Unrecoverable	Not reported

How can we use alignment?

- **Quantities can be estimated using current well-established commodity-specific systems**
- **Reporting under these systems continues unchanged**
- **But the same quantities can also be reported under UNFC using the numerical codes**
- **The reporting is then independent of commodity type, extraction methodology and ambiguous terminology**

Current status

- **Expert Group on Resource Classification
4th Meeting, 23-26 April 2013, Geneva**
 - 28 countries, 4 international organisations, 9 non-governmental organisations
- **Specifications document was approved**
 - Generic specifications
 - Bridging documents with CRIRSCO Template and PRMS
- **Presentations of case studies from countries testing and mapping UNFC**

IAEA workshop

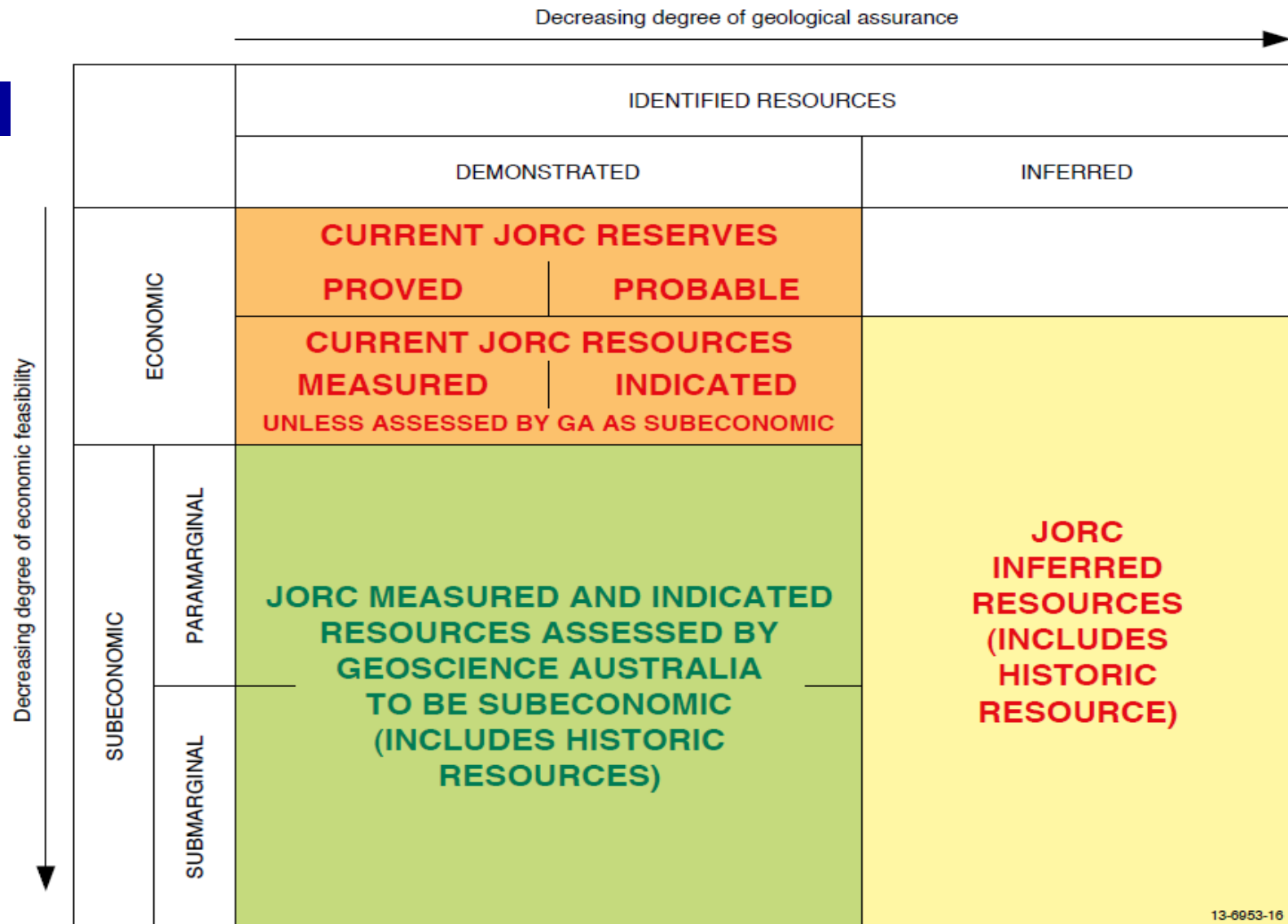
- To discuss and develop a Draft bridging document between the UNFC and the Red Book scheme
- **UNFC is not intended to replace the Red Book scheme**
- **Complimentary system**
 - UNFC may be a useful system for countries with no resource reporting system
- **3 workshops organised by IAEA – Hari Tulsidas**
 - Work in progress


Draft UNFC – Red Book alignment

UNFC Classification					NEA/IAEA Classification	
UNFC Classes and Sub-classes		Class				
Class	Sub-Class	E	F	G	Status	IAEA-NEA Costs Categories
Commercial Projects	On Production	1	1.1	1,2	Existing	Reasonably Assured Resources (RAR) <USD 130/KgU
	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* <USD 130/KgU
	Development On Hold	2	2.2	1,2,3		
Non-commercial projects	Development unclarified	3.2	2.2	1,2,3		Identified Resources RAR IR* >USD130/KgU
	Development not viable	3.3	2.3	1,2,3		
Exploration project		3.2	3	4		Undiscovered Resources

* Inferred Resources

The Australian Experience

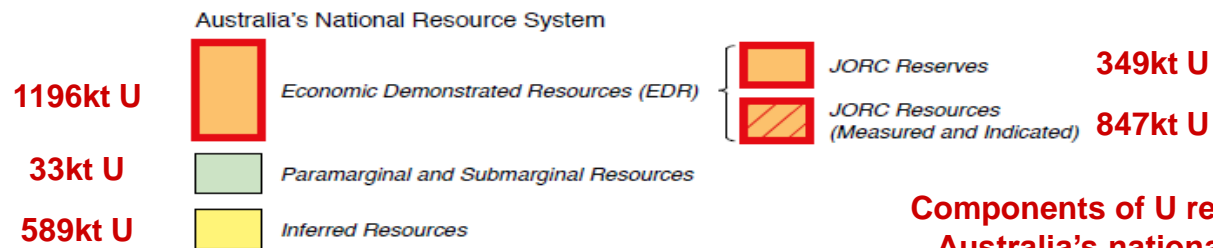


 *Economic Demonstrated Resources (EDR)*

Australia's resource system with UNFC

UNFC Classes defined by categories and sub-categories							
Total commodity initially in place	Extracted	Sales production					
		Non-sales production					
		Class	Sub-class	Categories			
E	F			G			
Known deposit	Commercial projects	On production	1	1.1	1	2	
		Approved for development	1	1.2	1	2	
		Justified for development	1	1.3	1	2	
	Potentially commercial projects	Development pending	2	2.1	1	2	3
		Development on hold	2	2.2	1	2	3
	Non-commercial projects	Development unclarified	3.2	2.2	1	2	3
		Development not viable*	3.3	2.3	1	2	3
Additional quantities in place		3.3	4	1	2	3	
Potential deposit	Exploration projects	(No sub-classes defined)	3.2	3			4
	Additional quantities in place		3.3	4			4

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Components of U resources in Australia's national system

Australia's U resources using UNFC

UNFC Classes defined by categories and sub-categories										
Total commodity initially in place	Extracted	Sales Production								
		Non-sales Production								
	Class	Sub-class	Categories							
			E	F	G					
Known Deposit	Commercial Projects	On Production	1	1.1	1	67.1k t U	2	171.8k t U		
		Approved for Development	1	1.2	1		2			
		Justified for Development	1	1.3	1		2	110.9k t U		
	Potentially Commercial Projects	Development Pending	2	2.1	1	172.6k t U	2	563.1k t U	3	490.6k t U
		Development On Hold	2	2.2	1		2	110.8k t U	3	39.4k t U
	Non-Commercial Projects	Development Unclarified	3.2	2.2	1		2	33k t U	3	59k t U
		Development Not Viable	3.3	2.3	1		2		3	
	Additional quantities in place		3.3	2.3	1		2		3	
Potential Deposit	Exploration Projects	[No sub-classes defined]	3.2	3						4
	Additional quantities in place		3.3	4						4

LEGEND

	Economic Demonstrated Resources	1196 kt U
	Paramarginal and Submarginal Resources	33 kt U
	Inferred Resources	530 kt U (total inferred Resources = 589 kt U)

Inferred Resources associated with uranium deposits classified by GA as sub-economic

Mapping Australia's U resources

UNFC Classification					NEA/IAEA Classification	
UNFC Classes and Sub-classes		UNFC Categories			Status	IAEA-NEA Costs Categories
Class	Sub-Class	E	F	G		
Commercial Projects	On Production	1	1.1	1,2	Existing 238.9kt U RAR	Reasonably Assured Resources (RAR) = 349kt U in EDR=RAR <USD 130/KgU <USD50/lb U ₃ O ₈
	Approved for Development	1	1.2	1,2	Committed Nil	
	Justified for Development	1	1.3	1,2	Planned 110.9kt U RAR	
Potentially commercial projects	Development Pending	2	2.1	1,2,3	Prospective 847kt U RAR + 530ktU IR*	Identified Resources RAR (847kt U in EDR=RAR) and IR* (530kt U in IR*) at <USD 130/KgU <USD50/lb U ₃ O ₈
	Development On Hold	2	2.2	1,2,3		
Non-commercial projects	Development Unclearified	3.2	2.2	1,2,3	33kt U RAR 59kt U IR*	Identified Resources 33kt U subeconomic, 59kt U IR* RAR and IR* >USD 130/KgU >USD50/lb U ₃ O ₈
	Development not Viable	3.3	2.3	1,2,3	Nil	
Exploration projects		3.2	3	4	Nil	Undiscovered Resources

*Inferred Resources

Australia's system:
EDR (RAR <130) =
349 ktU (OR) +
847 ktU (M&IND) =
1196 ktU

Total Inferred =
530 ktU + 59ktU =
589ktU

Sub-economic =
33ktU

In summary ...

- **UNFC-2009 is a generic, principles-based system**
 - Applicable to both solid minerals and fluids
 - Uses a numerical coding system
- **Based on three criteria**
 - Economic and social viability
 - Field project status and feasibility
 - Geological knowledge
- **Direct linkage to PRMS and the CRIRSCO Template**
 - Quantities can be estimated using these systems and reported using the UNFC numerical codes
- **Key goal is to provide a tool to facilitate global communications**
 - Other systems can be linked to the UNFC
 - Potential to use system for renewable energy and CCS projects

More info...

- **UNFC**

www.unece.org/energy/se/reserves

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Please come talk to me

- **UNFC-IAEA mapping**

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