Overview of UNFC (2009)

Presented by
Per Blystad

Member of Expert Group on Resource Classification (EGRC)
Senior Geologist
Norwegian Petroleum Directorate (NPD)

CCOP EPPM Program Workshop on UNFC Resource Classification (for Oil, Gas and Minerals) organized in cooperation with UNECE

9-10 February 2012, Bangkok, Thailand

Acknowledgement

- *This presentation was made by and presented by Mr. Jim Ross at an UNFC workshop in Ankara, Turkey, 2011.*

- *A large number of experts in the Expert Group of Resource Classification (EGRC) have through the years contributed to the making of presentation material for the UNFC.*

- *The current presentation draws advantage of this*

UNFC – 2009

- **What is it?**

- **How it works**

- **Alignment**

- **The Next Steps**

UNFC – 2009

● **United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources**

● **Generic, principles-based system**
  – **Applicable to both solid minerals and fluids**

● **Based on three criteria**
  – **Economic and social viability**
  – **Field project status and feasibility**
  – **Geological knowledge**

CCOP EPPM and UNECE workshop on UNFC, 9 - 10 February 2012, Bangkok, Thailand

Primary Objectives

- **A key goal of the UNFC is to provide a tool to facilitate global communications**
  - **Uses a numerical coding system**
  - **Language independent reporting**

- **It has been designed to meet, to the extent possible, the needs of applications pertaining to:**
  - **Energy and mineral studies**
  - **Government resources management functions**
  - **Corporate business processes**
  - **Financial reporting standards**
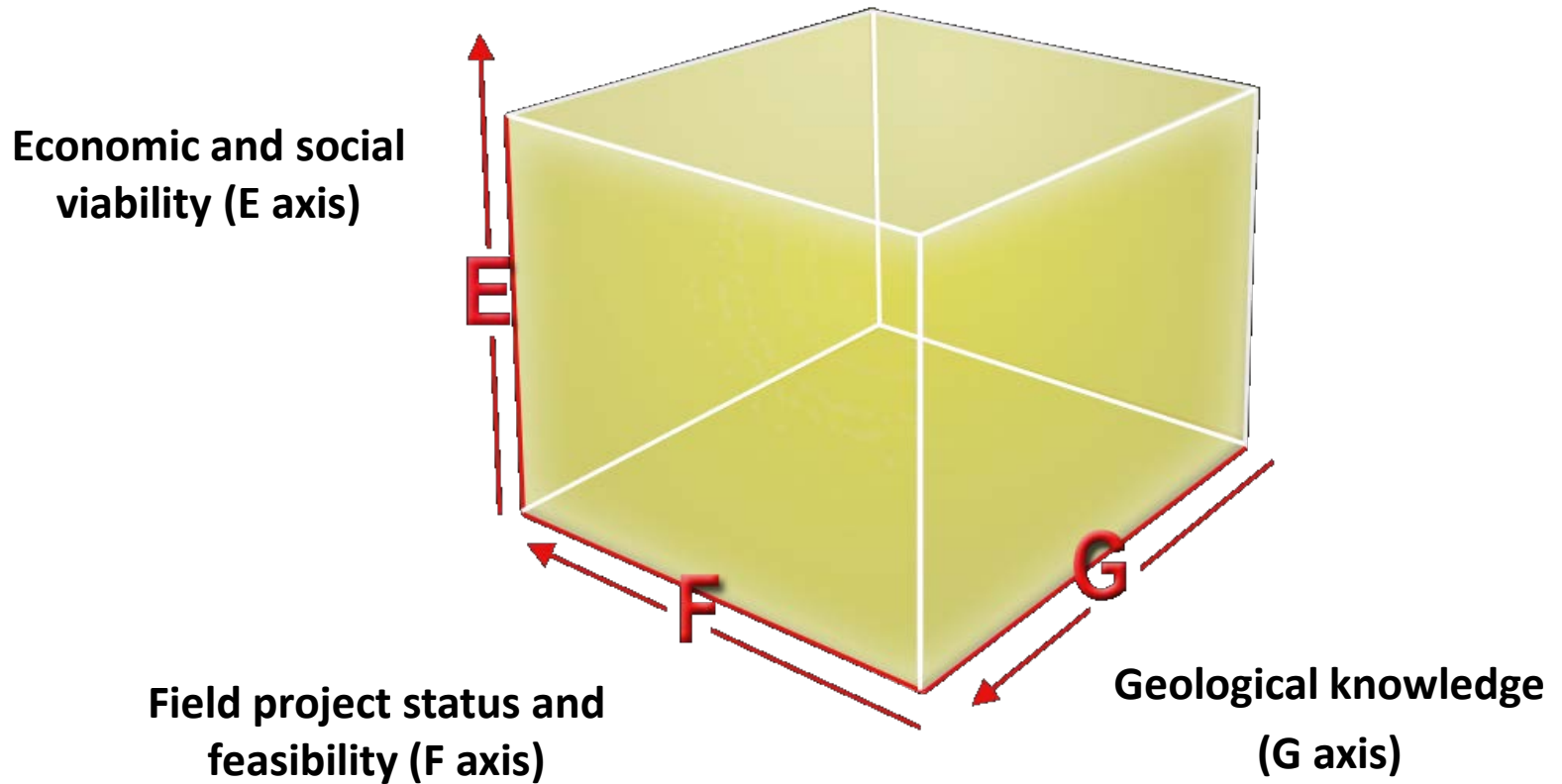
Why was UNFC-2004 updated?

- **To simplify the definitions**
  - Remove unnecessary labels for categories
  - Remove commodity-specific guidelines

- **To establish generic principles-based definitions**
  - Applicable to both solid minerals and fluids

- **To ensure that the revised definitions facilitated mapping with other systems**
  - Alignment with CRIRSCO Template and SPE-PRMS
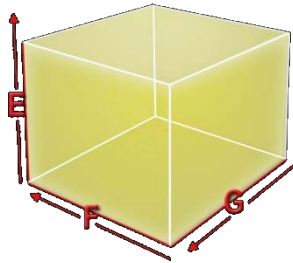 - Minimising changes from 2004

UNFC – 2009

- **What is it?**

- **How it works**

- **Alignment**

- **The Next Steps**

CCOP EPPM and UNECE workshop on UNFC, 9 - 10 February 2012, Bangkok, Thailand

UNFC – Three Criteria

Economic and social viability (E axis)

E

F

Field project status and feasibility (F axis)

G

Geological knowledge (G axis)
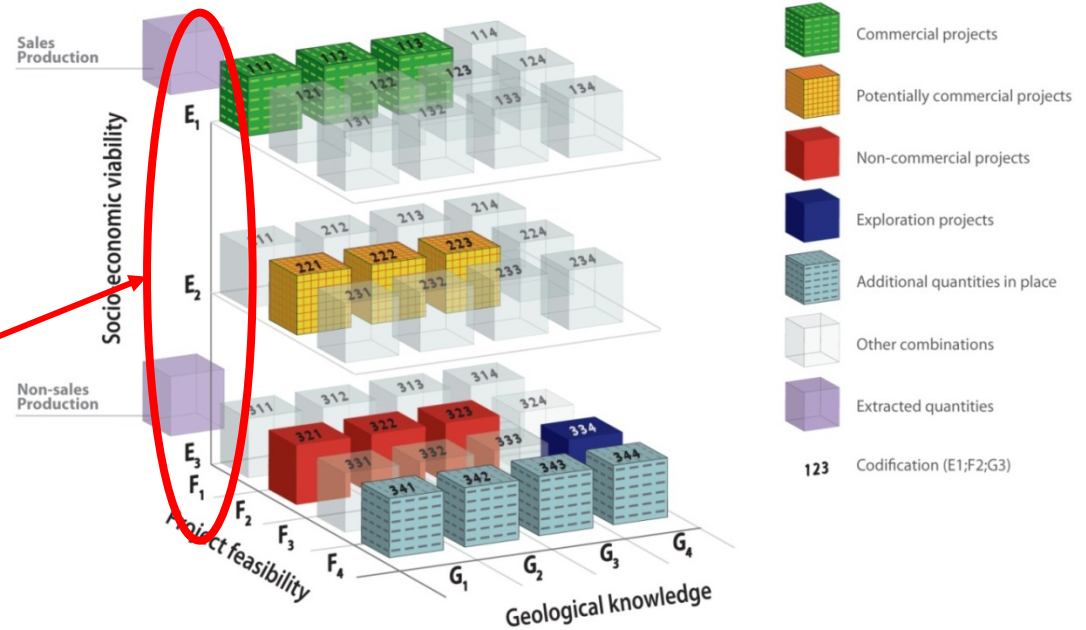
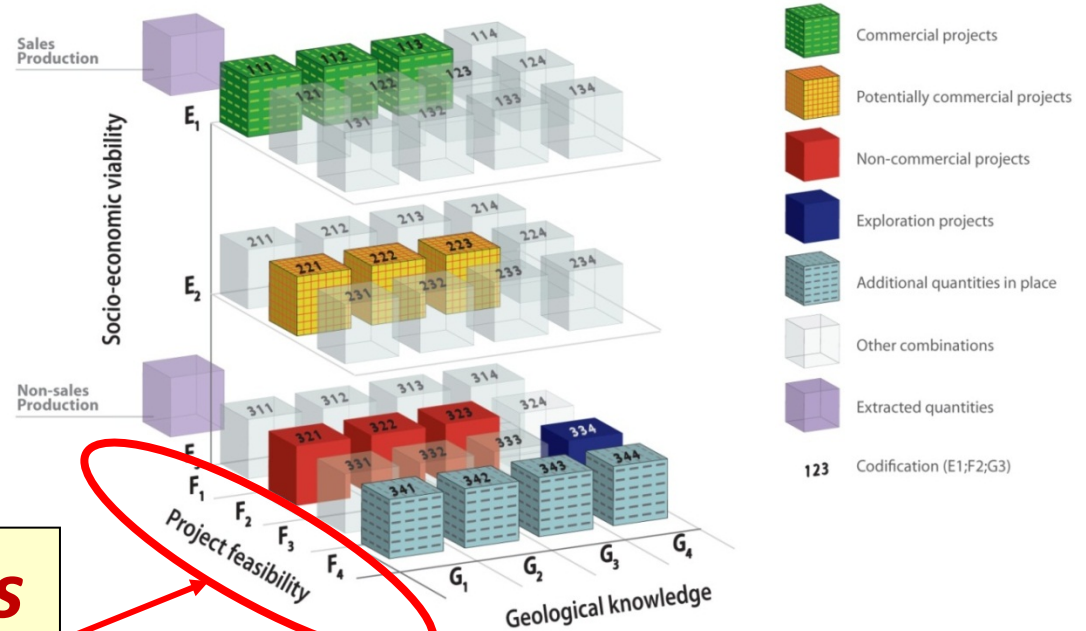# UNFC – Categories

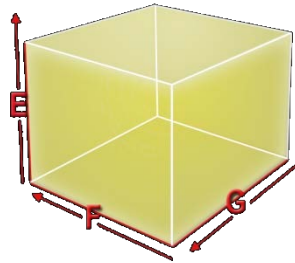*E axis categories*

UNFC – E axis

- **Degree of favourability of social and economic conditions in establishing the commercial viability of the project**

- **Includes consideration of market prices and relevant legal, regulatory, environmental and contractual conditions**

- **E1, E2 and E3 categories**

E axis category definitions

Category	Definition
E1	Extraction and sale has been confirmed to be economically viable.
E2	Extraction and sale is expected to become economically viable in the foreseeable future.
E3	Extraction and sale is not expected to become economically viable in the foreseeable future or evaluation is at too early a stage to determine economic viability.

UNFC – Categories

F axis categories

CCOP EPPM and UNECE workshop on UNFC, 9 - 10 February 2012, Bangkok, Thailand

UNFC – F axis

- **Degree of maturity of studies and commitments necessary to implement mining plans or development projects**

- **These extend from early exploration efforts before a deposit or accumulation has been confirmed to exist through to a project that is extracting and selling a commodity**

- **F1, F2, F3 and F4 categories**

F axis category definitions

Category	Definition
F1	Feasibility of extraction by a defined development project or mining operation has been confirmed.
F2	Feasibility of extraction by a defined development project or mining operation is subject to further evaluation.
F3	Feasibility of extraction by a defined development project or mining operation cannot be evaluated due to limited technical data.
F4	No development project or mining operation has been identified.
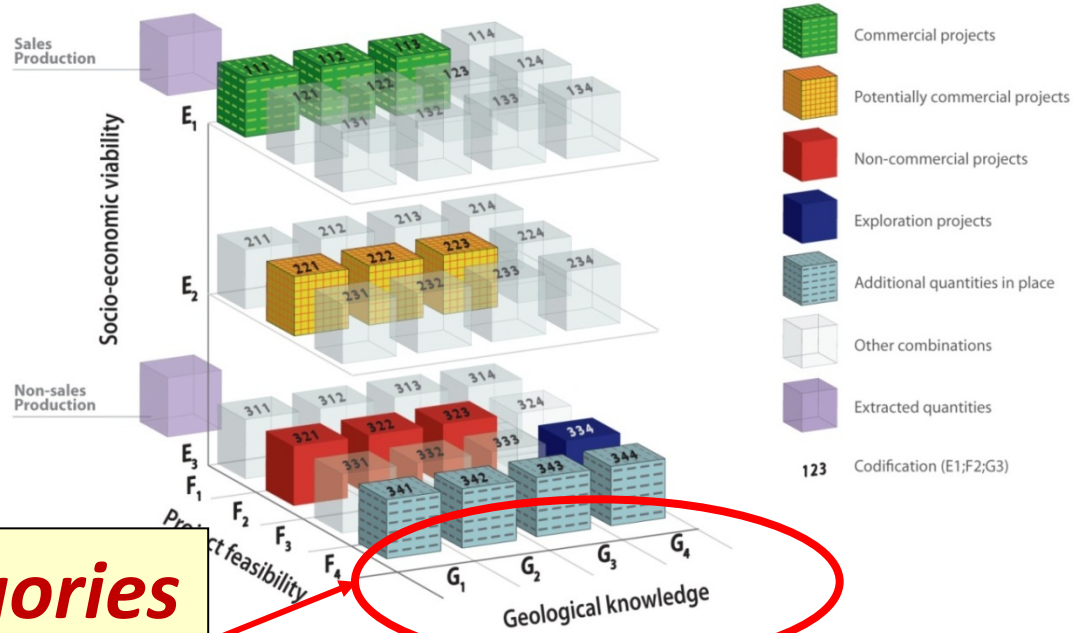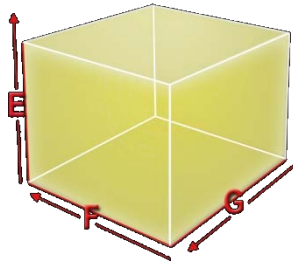
UNFC – Categories

G axis categories

UNFC – G axis

- **Level of confidence in the geological knowledge and potential recoverability of the quantities**

- **G1, G2, G3 and G4 categories**

G axis category definitions

Category	Definition
G1	Quantities associated with a known deposit that can be estimated with a high level of confidence.
G2	Quantities associated with a known deposit that can be estimated with a moderate level of confidence.
G3	Quantities associated with a known deposit that can be estimated with a low level of confidence.
G4	Estimated quantities associated with a potential deposit, based primarily on indirect evidence.

UNFC – How it works

- **The category definitions are the building blocks of the system**

- **These are combined (E, F, G) in the form of** classes

- **Class 111** **means that the reported quantities have satisfied the definitions for:**

  - **E1, F1 and G1**

- **There are no constraints on combinations, but not all will be meaningful**

UNFC – How it works
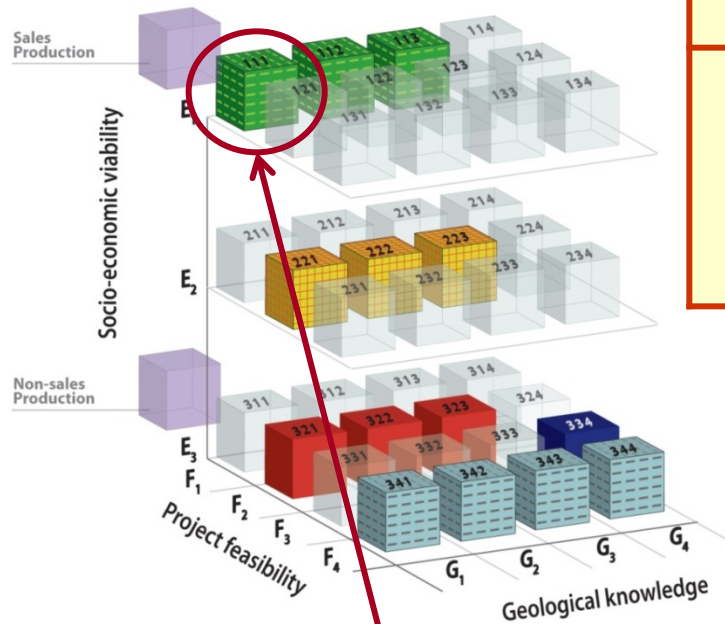
Category	Definition
E1	Extraction and sale has been confirmed to be economically viable.

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 – How it works

- **Some users prefer the 3D representation of UNFC**
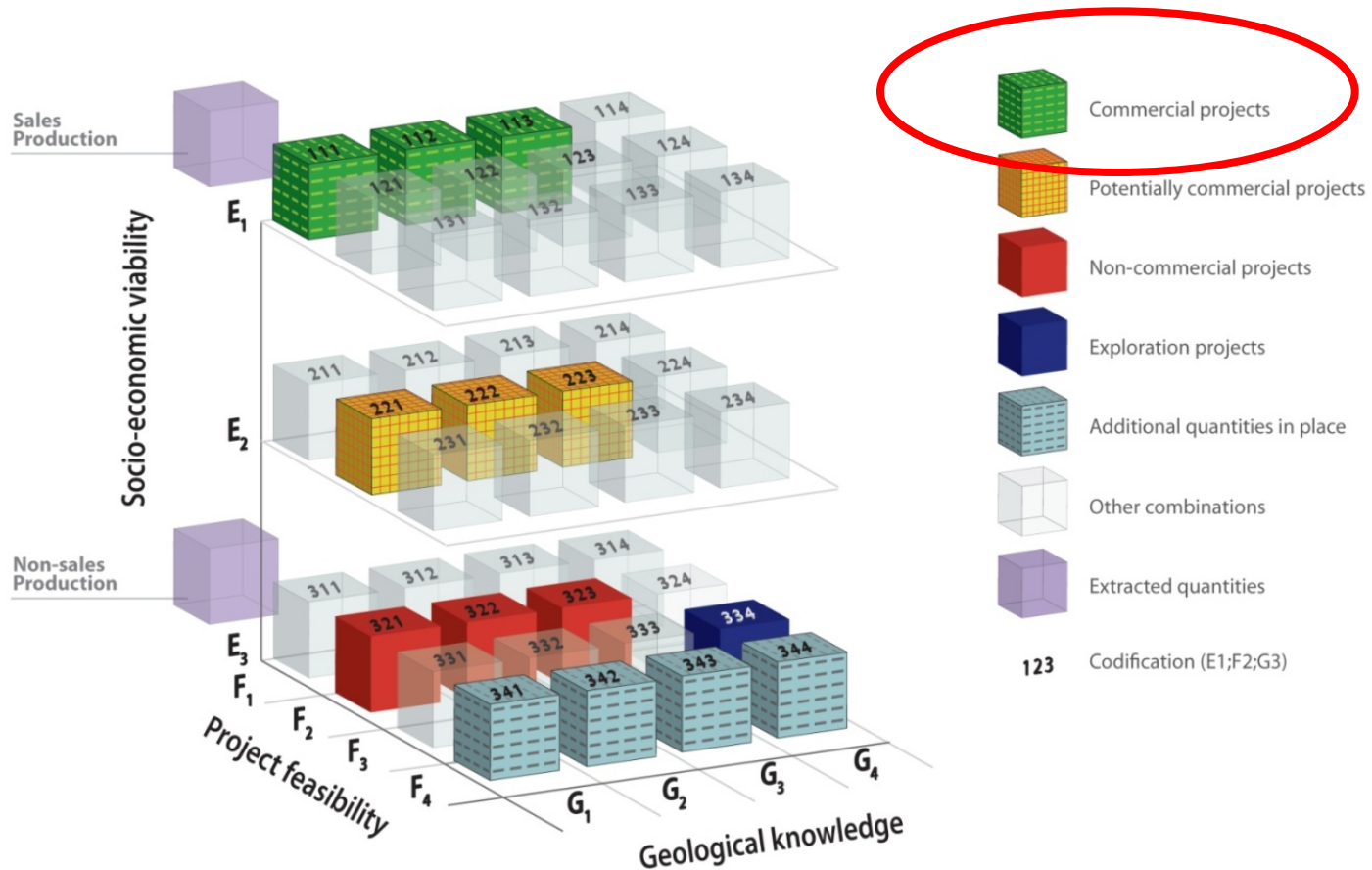
- **Other users prefer a 2D representation**

- **Consensus meant we needed both!**

- **They are simply different visualisations of the same system**

- **Classes may be a single code (e.g. 111) or groups of codes (e.g. 111, 112 and 113)**

CCOP EPPM and UNECE workshop on UNFC, 9 - 10
February 2012, Bangkok, Thailand

UNFC – 2D representation

Extracted		Sales Production			
		Non-sales Production			
	Class		Categories		
			E	F	G
Future recovery by commercial development projects or mining operations	Commercial Projects		1	1	1, 2, 3
Potential future recovery by contingent development projects or mining operations	Potentially Commercial Projects		2	2	1, 2, 3
	Non-Commercial Projects		3	2	1, 2, 3
Additional quantities in place associated with known deposits			3	4	1, 2, 3
Potential future recovery by successful exploration activities	Exploration Projects		3	3	4
Additional quantities in place associated with potential deposits			3	4	4

(left axis label: Total commodity initially in place)

Each class is uniquely defined by its code

UNFC

- **What is it?**

- **How it works**

- **Alignment**

- **The Next Steps**

Alignment of systems (schematic)

	UNFC-2009	CRIRSCO (minerals)	SPE-PRMS (petroleum)
Known Deposit	**Commercial Projects**	**Mineral Reserves**	**Reserves**
	Potentially Commercial Projects	**Mineral Resources**	**Contingent Resources**
	Non-Commercial Projects	*Discovered Not Economic**	
	Additional quantities in place	*Discovered Unrecoverable**	**Unrecoverable**
Potential Deposit	**Exploration Projects**	**Exploration Results**	**Prospective Resources**
	Additional quantities in place	*Undiscovered Unrecoverable**	**Unrecoverable**

*Not part of the Template but may be used for internal project management

UNFC – How it works

- **The system allows further granularity through sub-categories**

- **These are optional**

- **They facilitate mapping with the project maturity sub-classes of SPE-PRMS**

- **These sub-classes also align with some mining companies' reporting practices and with the IAEA classification of production centres**

UNFC – How it works

Axis	Criteria	Categories	Sub-categories
E-axis	Economic and social viability	E1	E1.1, E1.2
E-axis	Economic and social viability	E2	
E-axis	Economic and social viability	E3	E3.1, E3.2, E3.3
F-axis	Field project status and feasibility	F1	F1.1, F1.2, F1.3
F-axis	Field project status and feasibility	F2	F2.1, F2.2, F2.3
F-axis	Field project status and feasibility	F3	
F-axis	Field project status and feasibility	F4	
G-axis	Geological knowledge	G1	
G-axis	Geological knowledge	G2	
G-axis	Geological knowledge	G3	
G-axis	Geological knowledge	G4	

UNFC – Using all sub-categories

UNFC Classes defined by categories and sub-categories					
Extracted	**Sales Production**				
	Non-sales Production				
	Class	**Sub-class**	**Categories**		
			E	**F**	**G**
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 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

Total commodity initially in place (left axis label)

Alignment of systems (schematic)

	UNFC-2009		CRIRSCO (minerals)	SPE-PRMS (petroleum)	
Known Deposit	Commercial Projects	On Production	Mineral Reserves	Reserves	On Production
		Approved for Development			Approved for Development
		Justified for Development			Justified for Development
	Potentially Commercial Projects	Development Pending	Mineral Resources	Contingent Resources	Development Pending
		Development On Hold			Development Unclarified or on hold
	Non-Commercial Projects	Development Unclarified	Not Defined		
		Development Not Viable			Development Not Viable
	Additional quantities in place		Not Defined	Unrecoverable	
Potential Deposit	Exploration Projects		Exploration Results	Prospective Resources	Prospect
					Lead
					Play
	Additional quantities in place		Not Defined	Unrecoverable	

*Not part of the Template but may be used for internal project management

Alignment of systems (schematic)

UNFC-2009		Rio Tinto Corporate Reporting	IAEA Production Centres
Commercial Projects	On Production	Reserves at operating mines	Existing
	Approved for Development	Reserves at development projects	Committed
	Justified for Development	Other undeveloped reserves	Planned

How can we use alignment?

- **Quantities can be estimated using current well-established commodity-specific systems**

- Reporting under these systems can continue 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 (e.g. "reserves")

UNFC

- **What is it?**

- **How it works**

- **Alignment**

- **The Next Steps**

What are Specifications?

Definitions — **Classification Framework**

Specifications — **Application Rules**

Guidelines — **Non-Mandatory Guidance**

CCOP EPPM and UNECE workshop on UNFC, 9 - 10 February 2012, Bangkok, Thailand

Summary of Development Process

- **UNFC-2009 simplification with generic definitions only** ✓

- **Survey of stakeholder requirements for specifications** ✓

- **Development of specifications** *In progress*

- **Public comment period** *When draft completed*

- **Any questions?**

Overview of UNFC (2009)

Presented by
Per Blystad

CCOP EPPM Program Workshop on UNFC Resource Classification (for Oil, Gas and Minerals) organized in cooperation with UNECE

9-10 February 2012, Bangkok, Thailand