UNFC National Workshop to Cuba
Mapping and Bridging to UNFC-2009

Presented on behalf of the EGRC
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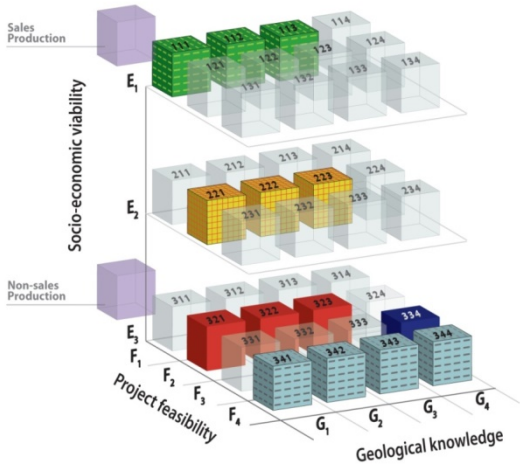
Workshop Format



1. Introduction
2. Framework and Definitions
3. Generic Specifications
4. Bridging Documents
5. Case Study – Petroleum
6. Case Study – Solid Minerals
7. Future Developments and Summary

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Bridging documents

Aligned systems – commodity-specific basis

- **Solid minerals**
  - **CRIRSCO Template of 2006 developed by the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) and the reporting codes and standards that are based on it. Now updated to CRIRSCO Template 2013**
- **Petroleum**
  - **Petroleum Resources Management System of 2007 (PRMS) which has been endorsed by SPE, WPC, AAPG, SPEE and SEG**
- **Further bridging documents are being developed for other classification systems**
  - **Must be aligned with UNFC and lead to results that are comparable to those based on CRIRSCO/PRMS**

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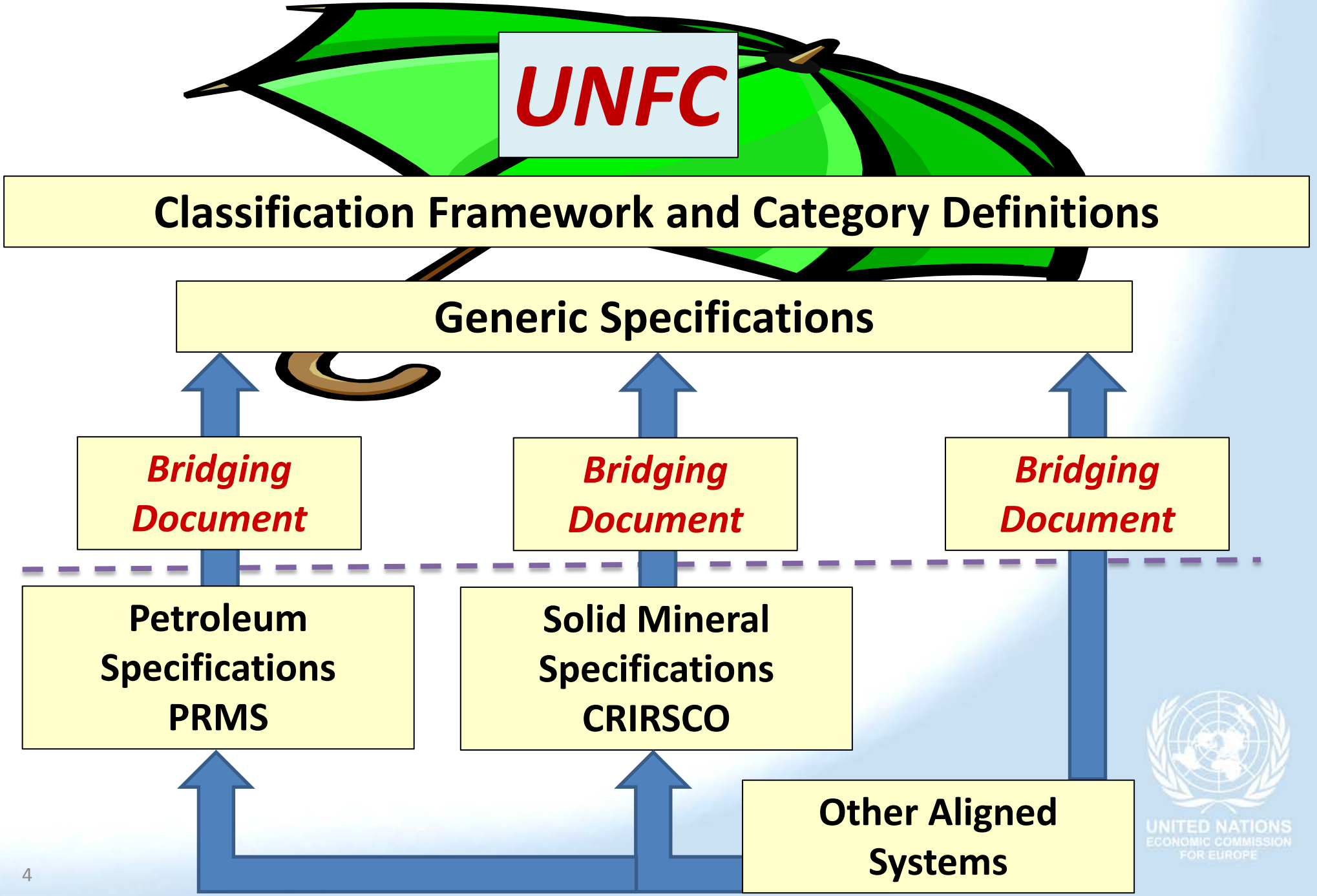
UNFC
Classification Framework and Category Definitions
Generic Specifications
Bridging Document
Bridging Document
Bridging Document
Petroleum Specifications PRMS
Solid Mineral Specifications CRIRSCO
Other Aligned Systems
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Key definitions

- **Mapping Document:**
  - The output of a comparison between another resource classification system and UNFC-2009, or between that system and existing Aligned Systems, which highlights the similarities and differences between the systems. A Mapping Document can provide the basis for assessing the potential for the other system to become an Aligned System through the development of a Bridging Document.

- **Bridging Document:**
  - A document that explains the relationship between UNFC-2009 and another classification system, including instructions and guidelines on how to classify estimates generated by application of that system using the UNFC-2009 Numerical Codes.

- **Aligned system:**
  - A classification system that has been aligned with UNFC-2009 as demonstrated by the existence of a Bridging Document that has been endorced by the Expert Group on Resource Classification

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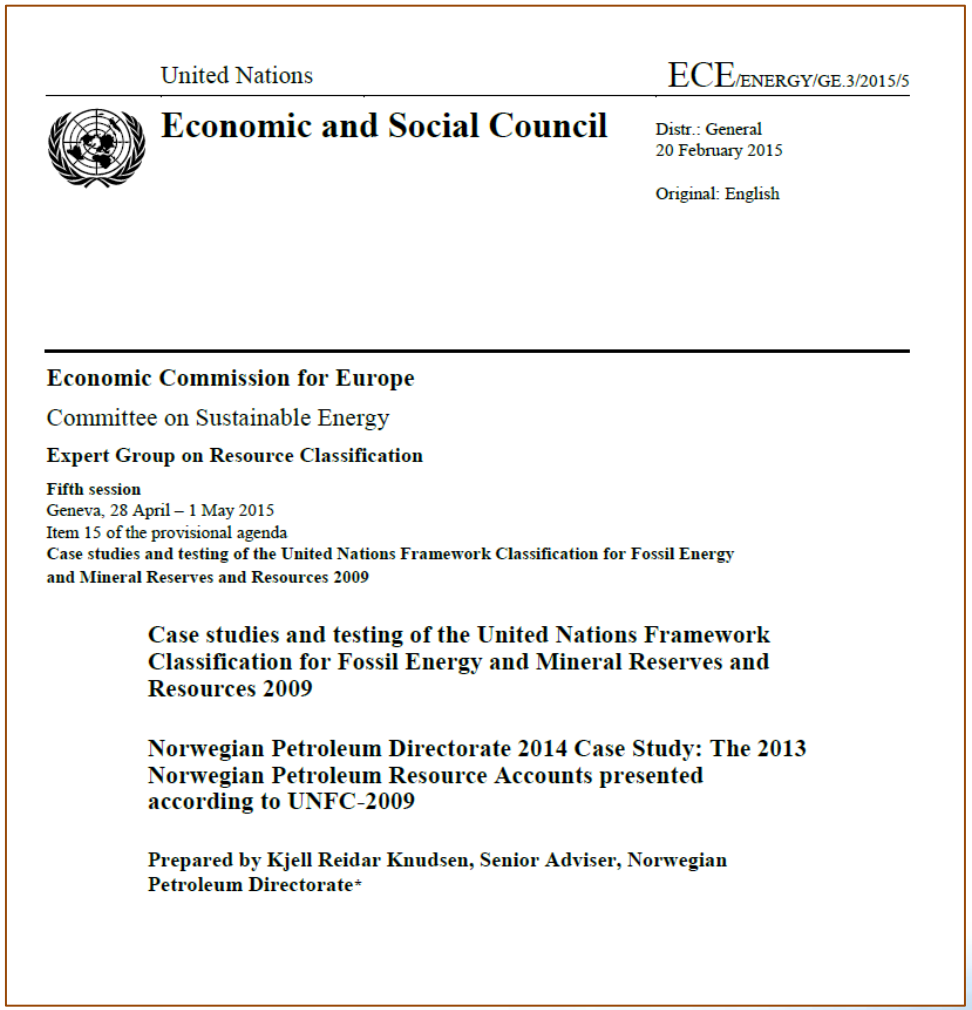
Example: NPD Case Study



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Economic Commission for Europe

Committee on Sustainable Energy

Expert Group on Resource Classification

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Geneva, 28 April – 1 May 2015
Item 15 of the provisional agenda
Case studies and testing of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009

Case studies and testing of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009

Norwegian Petroleum Directorate 2014 Case Study: The 2013 Norwegian Petroleum Resource Accounts presented according to UNFC-2009

Prepared by Kjell Reidar Knudsen, Senior Adviser, Norwegian Petroleum Directorate*

Scope of Case Study:

- ***Use UNFC-2009 to the full portfolio of petroleum resources (projects) in Norway.***
- ***More than 800 projects, most of them reported by the oil industry.***
- ***Producing fields, discoveries, increased recovery projects to prospective resources***

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Mapping challenge, two alternatives:

- **Direct Mapping from NPD-2001 to UNFC-2009**
  - Require a Bridging Document to be developed by NPD.
  - The Bridging Document needs endorsement by the Expert Group on Resource Classification
  - UNFC Generic Specifications have to be followed

- **Mapping through existing Aligned System (PRMS)**
  - Require mapping of NPD-2001 to PRMS
  - Use the PRMS Bridging Document
  - Follow the UNFC Generic Specifications as well as the PRMS Commodity Specific Specifications

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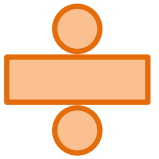
Two alternatives: pro et cons

- **Direct Mapping from NPD-2001 to UNFC-2009**
  - Require a Bridging Document to be developed by NPD.
  - The Bridging Document needs endorsement by the Expert Group on Resource Classification
  - UNFC Generic Specifications have to be followed



- Resource demanding
- Takes longer time

- **Mapping through existing Aligned System (PRMS)**
  - Require mapping of NPD-2001 to PRMS
  - Use the PRMS Bridging Document
  - Follow the UNFC Generic Specifications as well as the PRMS Commodity Specific Specifications

- Similarity between NPD and PRMS classifications
- Easier process
- Timesaving

The Norwegian Petroleum Resource Classification System 2001

	NPD 2001				
			Category		Class
Discovered	Reserves		In production	1	Reserves
			Approved PDO	2 F	
				2 A	
			Licencees decided to recover	3 F	
				3 A	
	Contingent Resources		In the planning phase	4 F	Contingent Resources
				4 A	
			Recovery likely but undecided	5 F	
				5 A	
			Not yet evaluated additional potential	7A	
			Not yet evaluated	7 F	
			Recovery not very likely	6	
Undis-covered	Undiscovered Resources		Prospect	8	Undiscovered resources
			Lead and Play	9	

Step 1: Bridge from Norwegian system to PRMS

NPD Resource Account Mapping

	NPD Category				PRMS		PRMS Bridging
	Class	*Sub-class*	*Main*	*Sub*			
Project A	Reserve	In production	RK1	F+A	Reserve	On Production	1
Project B	Reserve	Approved for development	RK2	F	Reserve	Approved for development	2
Project C	Reserve	Approved for development		A			
Project D	Reserve	Decided for development	RK3	F	Reserve	Justified for development	3
Project E	Reserve	Decided for development		A			
Project F	Contingent Resource	In planning phase	RK4	F	Contingent Resource	Development pending	4
Project G	Contingent Resource	In planning phase		A			
Project H	Contingent Resource	Recovery Likely, but undecided	RK5	F	Contingent Resource	Development on hold	5
Project I	Contingent Resource	Recovery Likely, but undecided		A			
Project J	Contingent Resource	Not evaluated/ Improved rec pot	RK7	F	Contingent Resource	Development unclarified	6
Project k	Contingent Resource	Not evaluated/ Improved rec pot		A			
Project L	Contingent Resource	Recovery not very likely	RK6	F+A	Development not viable	Development not viable	7
Project M	Undiscovered	Prospect	RK8		Prospective Resources	Prospect	8
						Lead	9
Project O	Undiscovered	Lead and play	RK9			Play	10
					Specified but not classified		12

NPD Resource Account Mapping

Step 2: Bridge from PRMS to UNFC

Discovered	Reserves	On production		1
		Approved for development		2
		Justified for development		3
	Contingent resources	Development Pending		4
		Development Unclarified or On hold	On hold	5
			Unclarified	6
		Development not viable		7
	Unrecoverable			11
Undiscovered	Prospective resources	Prospect		8
		Lead		9
		Play		10
	Unrecoverable			11
Special cases		Defined but not classified in PRMS		12
		Less common mappings		

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4
E1.1	1	2	3	4						
E1.2	1	2	3							
E2			4	4	5					
E3.1	12	12	12	12	12	12				
E3.2			6	6	6		8	9	10	
E3.3			7	7		7				11

PRMS Bridging Document Fig.IV.3

NPD Resource Account Mapping

Step 3: Result: Mapping between NPD and UNFC

Norwegian resource category codes inserted (PRMS colour codes used)

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4
E1.1	RK1	RK2	RK3	RK4						
E1.2	RK1	RK2	RK3							
E2			RK4	RK4	RK5					
E3.1										
E3.2			RK7	RK7	RK7		RK8	RK8	RK9	
E3.3			RK6	RK6	RK6	RK6				

Intermediate mapping of NPD project categories to the E-F Matrix by use of the PRMS Bridging Document

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4
E1.1	RK1	RK2	RK3	RK4						
E1.2										
E2				RK4	RK5					
E3.1										
E3.2					RK7		RK8	RK8	RK9	
E3.3			RK6	RK6	RK6	RK6				

NPD Resource Account Mapping

Step 3: Result: Mapping between NPD and UNFC

Intermediate mapping of NPD project categories to the E-F Matrix by use of the PRMS Bridging Document

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4
E1.1	RK1	RK2	RK3	RK4						
E1.2										
E2				RK4	RK5					
E3.1										
E3.2					RK7		RK8	RK8	RK9	
E3.3			RK6	RK6	RK6	RK6				

Final mapping of NPD project categories to the E-F Matrix by use of the PRMS Bridging Document

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4
E1.1	RK1	RK2	RK3	RK4						
E1.2										
E2				RK4	RK5					
E3.1										
E3.2					RK7		RK8 + RK9			
E3.3						RK6				

Norwegian Resource Account according to the UNFC Numerical Codes

UNFC Sub-class	Oil mill Sm³	NGL mill ton	Conden-sate mill Sm³	Gas bill Sm³	o.e mill Sm³
1.1;1.1;1+2	586	94	25	1394	2183
1.1;1.2;1+2	189	11	6	200	416
1.1;1.3;1+2	11	12	0	352	386
1.1;2.1;1+2	623	16	2	147	803
2;2.1;1+2	31	2	2	16	52
2;2.2;1+2	304	16	6	307	648
3.2;2.2;1+2	267	1	11	156	436
3.3;2;1+2	0	0	0	0	0
3.2;3;4	1265	0	120	1450	2835

UNFC Class	Oil mill Sm³	NGL mill ton	Conden-sate mill Sm³	Gas bill Sm³	o.e mill Sm³
1;1;1+2	786	117	31	1946	2985
1;2;1+2	623	16	2	147	803
2;2;1+2	335	18	8	323	700
3;2;1+2	267	1	11	156	436
3;3;4	1265	0	120	1450	2835

The numbers reflect the G1+G2 values