

An Overview of the Petroleum Resources Management System (**PRMS**) *and its Relationship to UNFC*

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Disclaimer

The material, views and opinions expressed in this presentation are solely those of presenter and do not reflect Shell International E&P or any other person at Royal Dutch Shell plc.

Readers are urged to obtain independent advice on any matter relating to the interpretation of resources definitions and guidance on classification.

Topics for Discussion

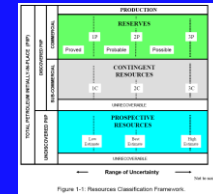
- Why are definitions needed?

DEFINE

- Brief history of PRMS and its Goals



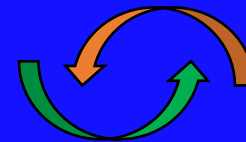
- Overview of PRMS



- PRMS adoption



- Relationship of PRMS to UNFC



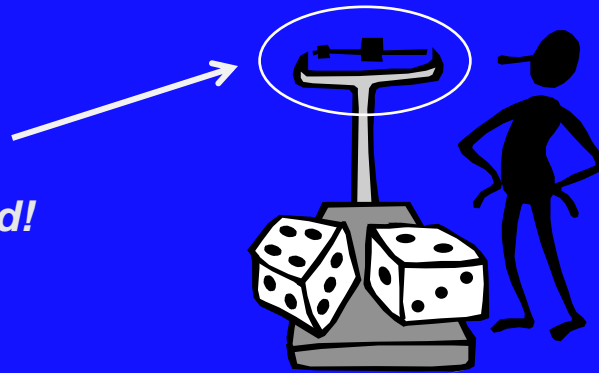
- Questions

What's it all About?

Its all about predicting potentially recoverable volumes under defined conditions!

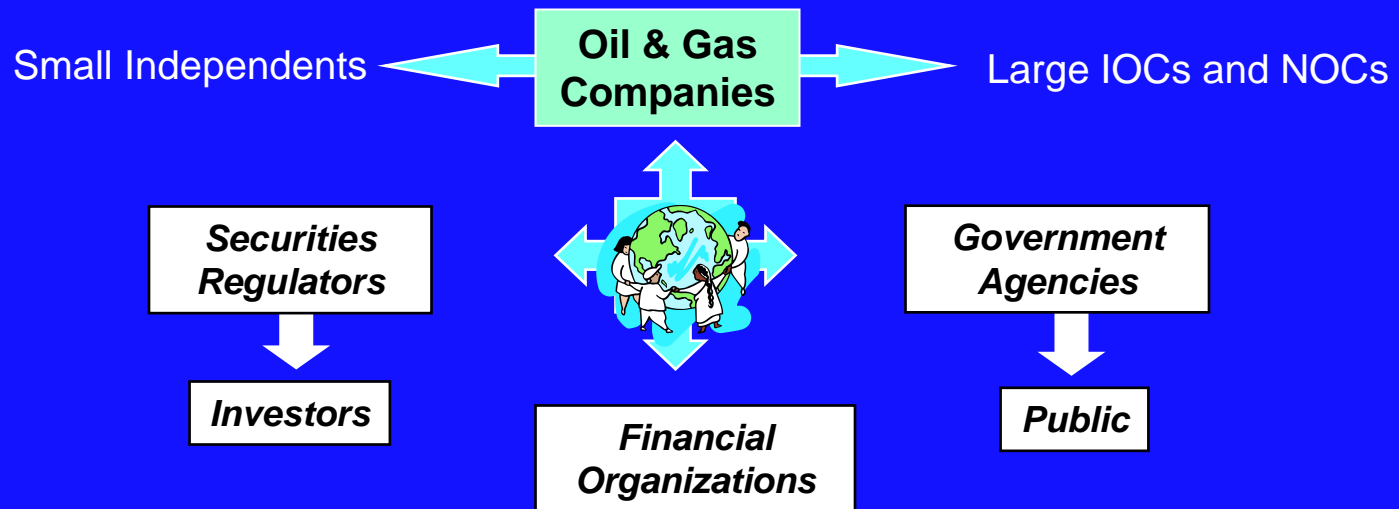
“The quantity of usable resources is not fixed but changes with progress in science, technology, and exploration and with shifts in economic conditions.” (V. McKelvey)

**We need an
international standard!**



**We need consistency in communicating future sales volumes
..... with associated risk and uncertainty!**

Understand all Stakeholders' Requirements



Create a Global Consensus Reference for the Industry – a “Standard”

All stakeholders require complete, consistent and reliable information on future production and associated cash flow estimates through full life recovery

Why do we need standard definitions?

- Internal business decisions
- Public reporting requirements
- Government reporting
- Project finance
- Mergers & Acquisitions

Petroleum Resources Management System

Published in April 2007; maintained by SPE OGRC; co- sponsored by:



Society of Petroleum Engineers (SPE)



World Petroleum Council (WPC)



American Association of Petroleum Geologists (AAPG)



Society of Petroleum Evaluation Engineers (SPEE)

Endorsed by Society of Exploration Geophysicists (SEG)



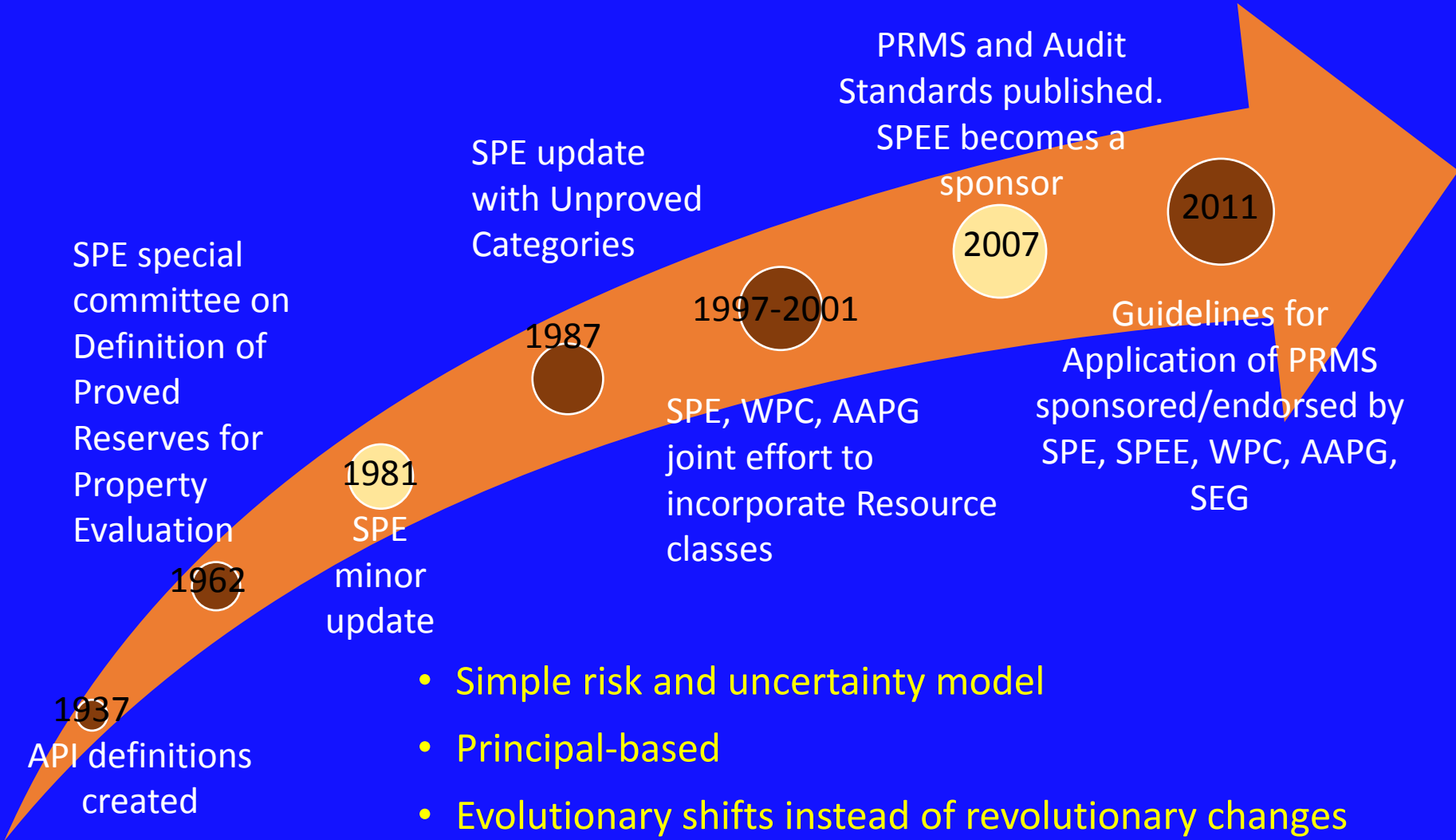
Free Download at www.spe.org

Brief History of PRMS



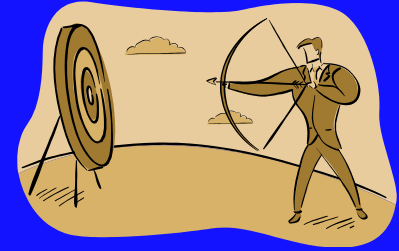
- SPE & partners recognized the need for **common global standards** for petroleum resource definitions to provide **consistency, transparency and reliability**
- Create and maintain an **international standard petroleum reserves and resources classification system** based on industry best practices
- Built on the past
- Incorporated current best practice
- Prepared for the future

Historic Milestones



- Simple risk and uncertainty model
- Principal-based
- Evolutionary shifts instead of revolutionary changes

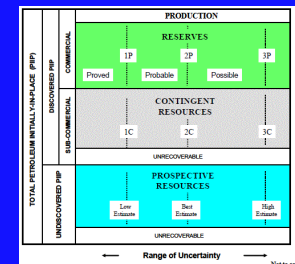
PRMS Goals



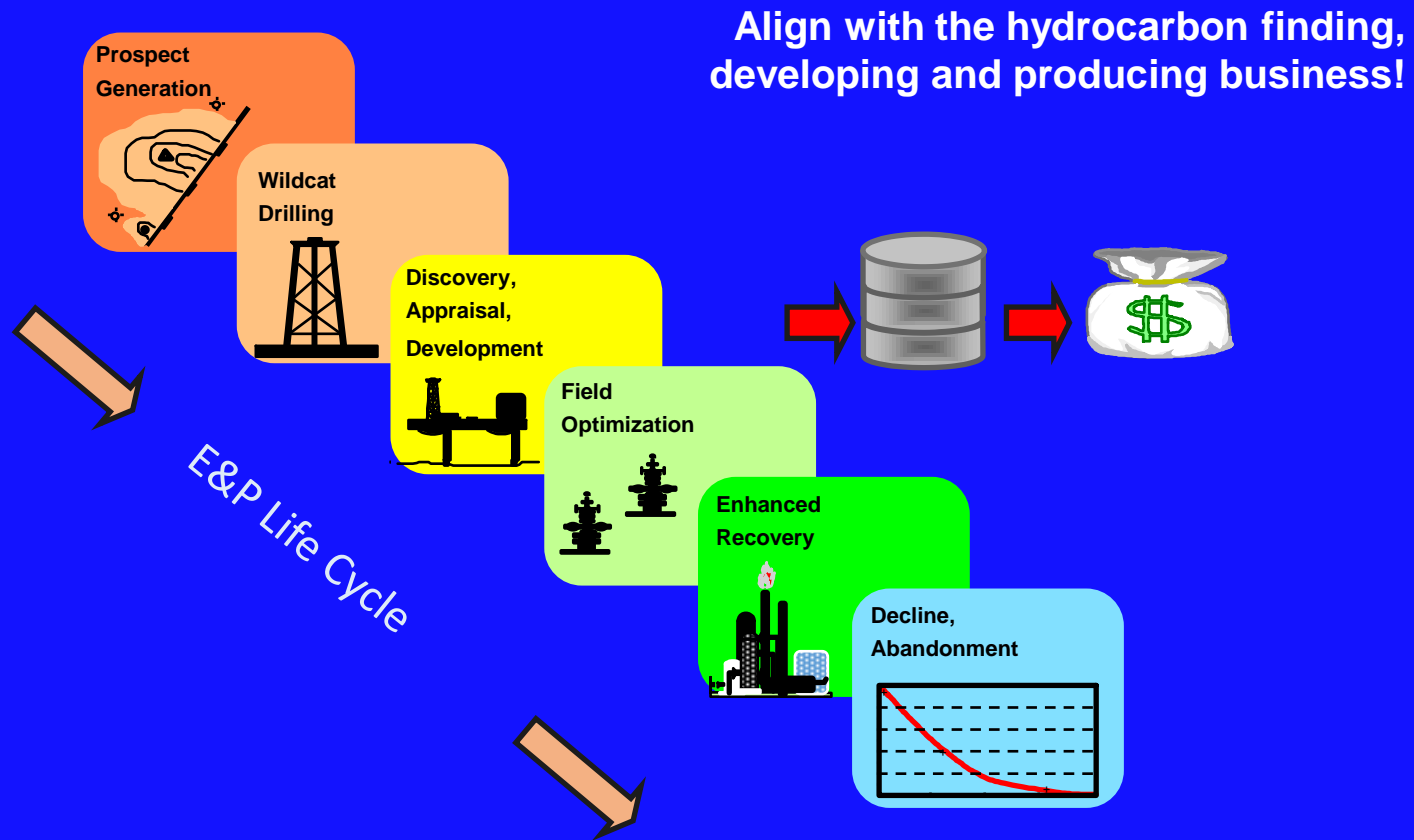
- Provide a **common reference** for the international petroleum industry, including national reporting and regulatory disclosure agencies, and to support petroleum project and portfolio management requirements
- **Improve clarity** in global communications regarding petroleum resources
- **Supplement** with industry **education** programs and **application guides**

PRMS Strategy

- Allow **flexibility** and can be tailored to particular needs
- **Does not modify** the interpretation or application of any existing **regulatory reporting** requirements
- Consider both **technical and commercial factors** that impact the project's economic feasibility, its productive life, and its related cash flow



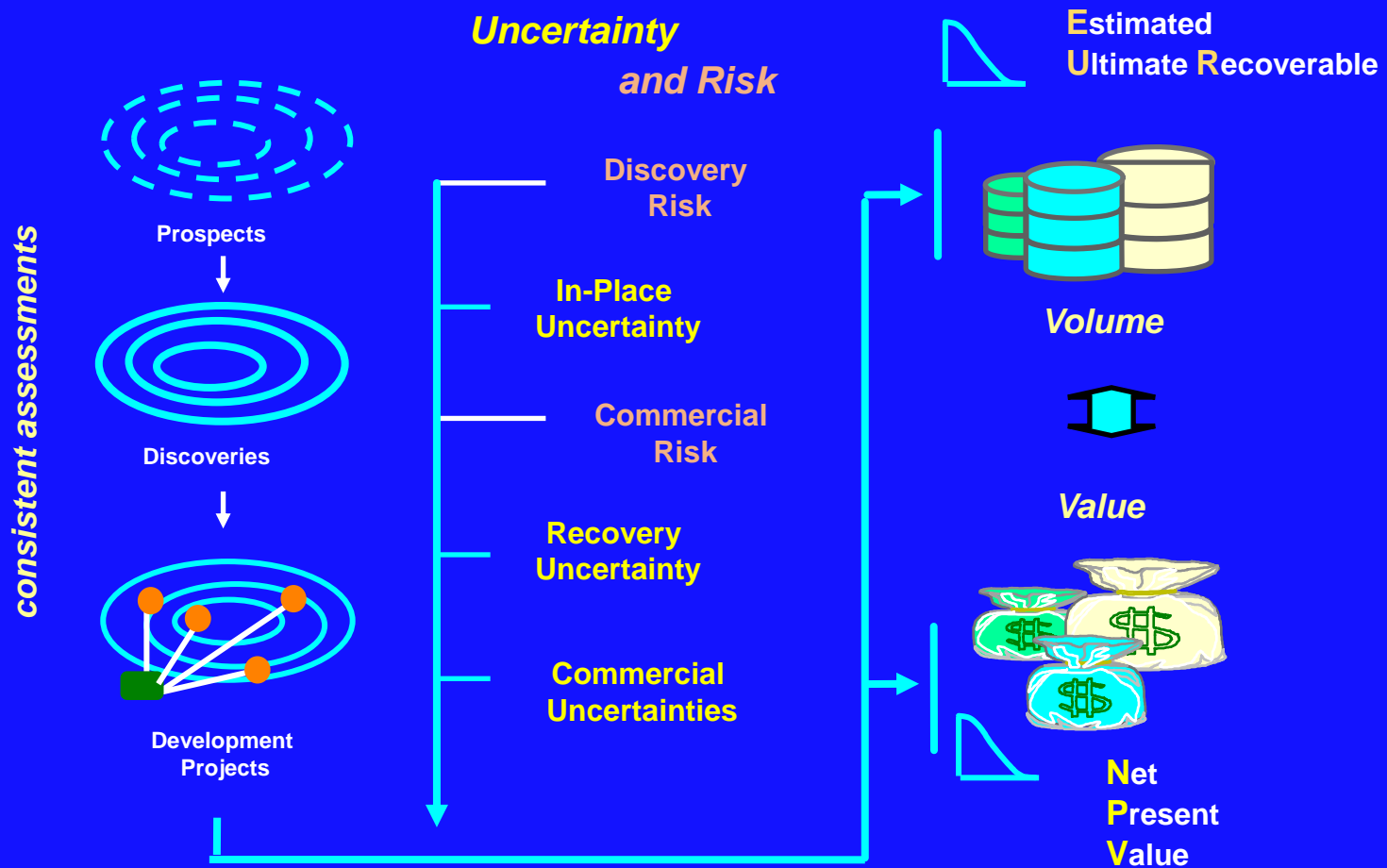
PRMS is Designed to Support Asset Management – “Cradle to Grave”



PRMS - Major Principles

0. **Understand the reservoir and “in place” resources**
1. The System is **“Project–Based”**
2. ▲ Classification is based on project’s **chance of commerciality**
(technology, economic, legal, social environmental & regulatory)
▲ Categorization is based on **recoverable uncertainty**
3. Base case uses **forecast of future conditions**
4. Provides more **granularity for project management**
5. Estimates based on **deterministic and/or probabilistic** methods
6. Reserves /resources are estimated in terms of the **sales products**
7. Reserves allocation based on **contractual entitlement**
8. Applies to both conventional and **unconventional resources**

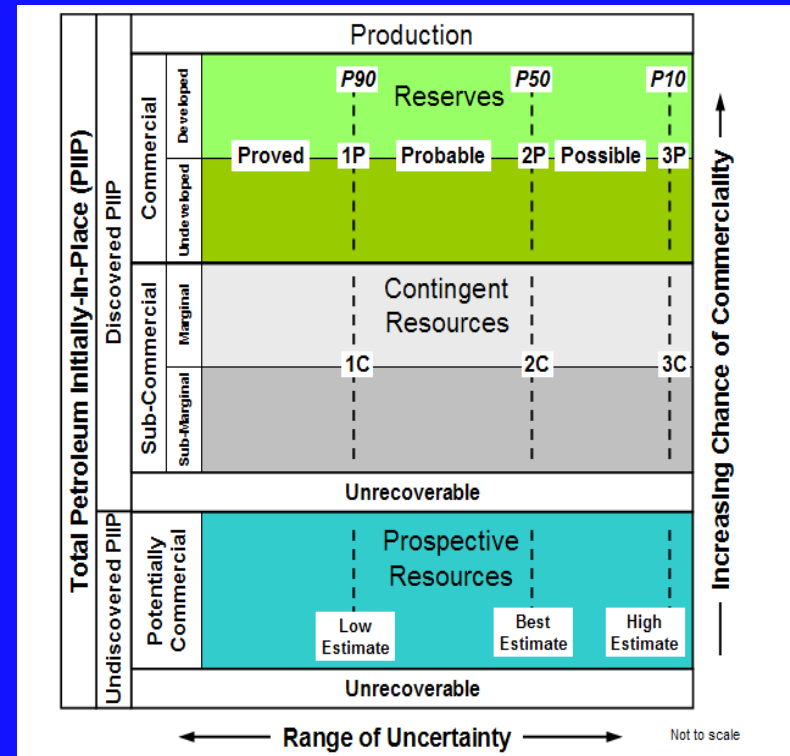
Its all about Risk and Uncertainty



Resources Classification

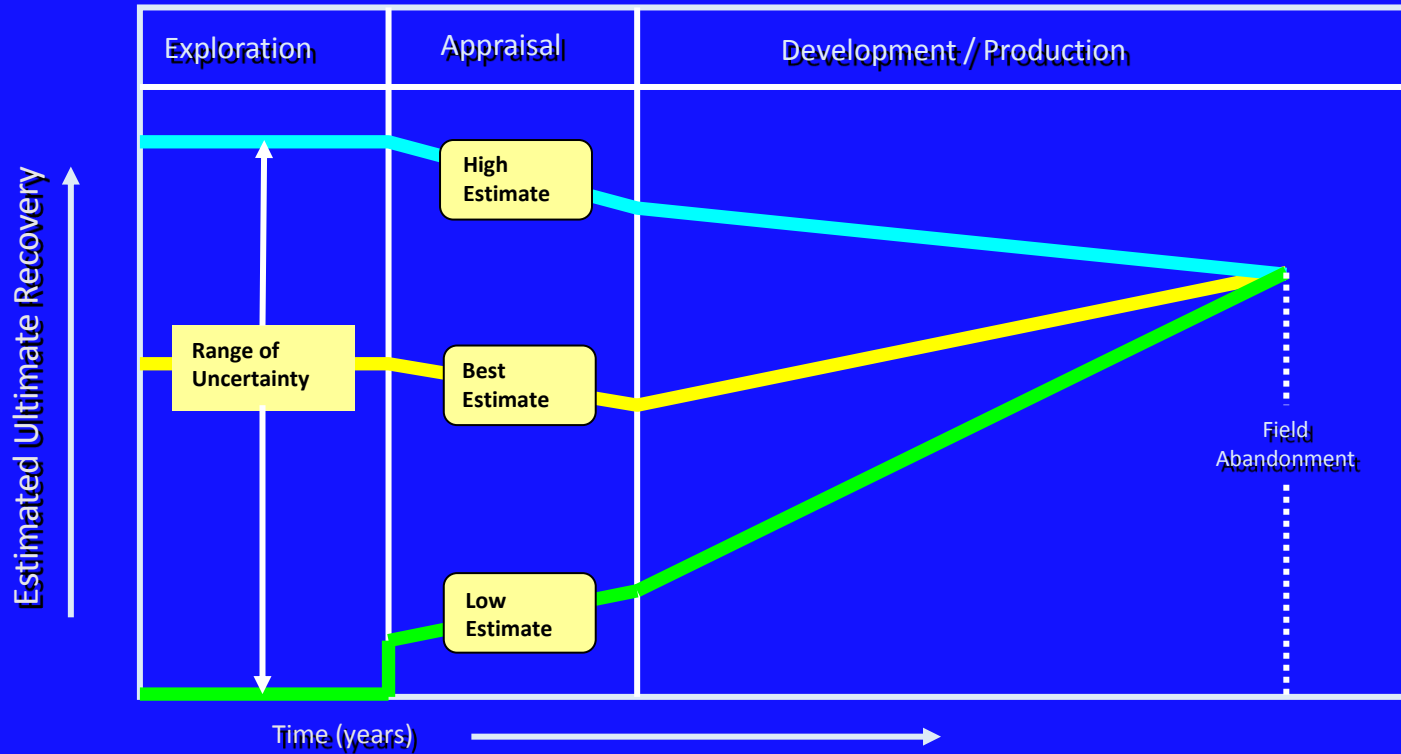
Classification (*risk*) ↑

- Reserves
- Contingent Resources
- Prospective Resources
- Unrecoverable



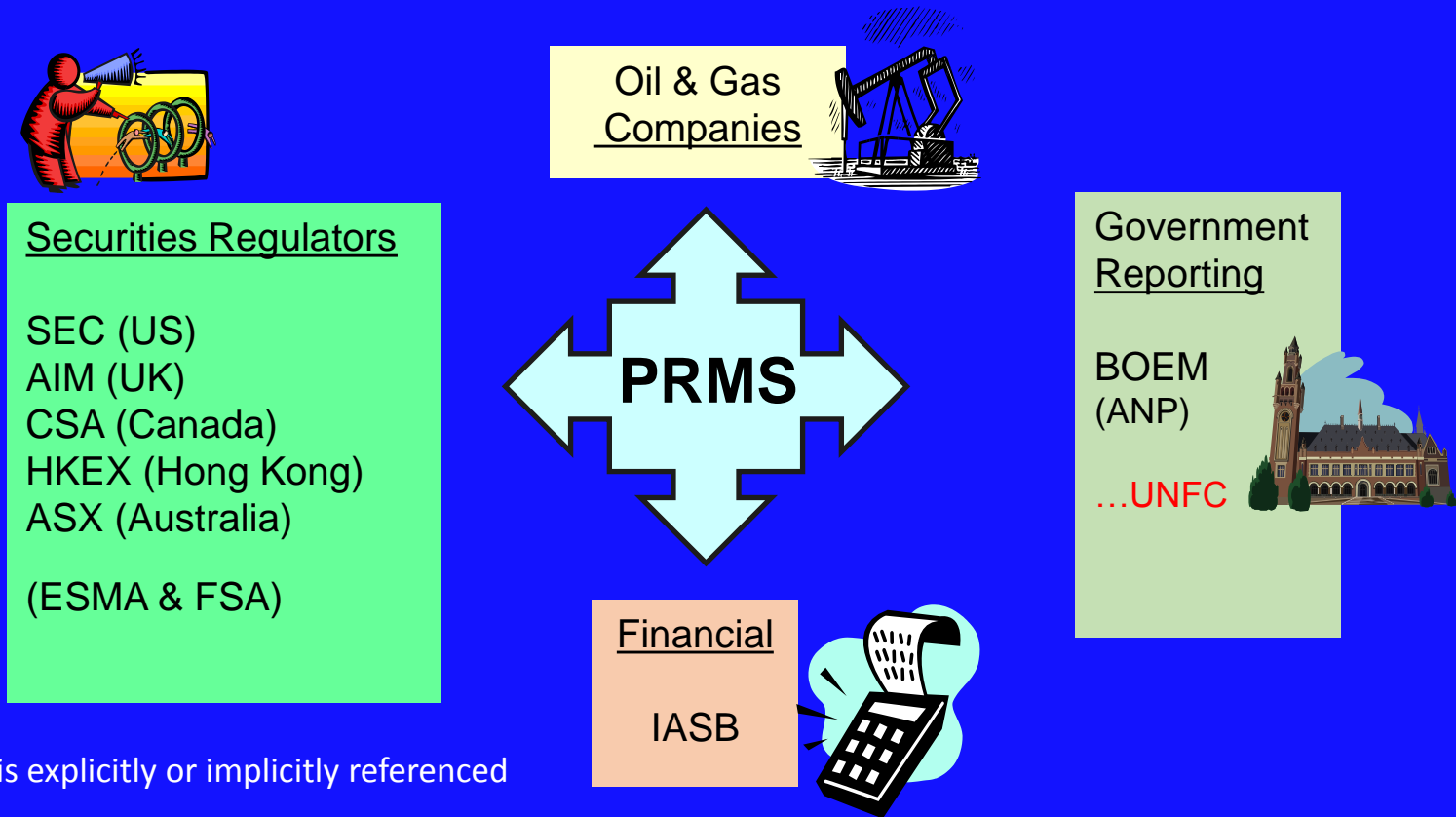
↔ Categorization (*uncertainty*)

Resources Categorization



Absolute Range of Uncertainty Should Diminish as Project Proceeds (Arps, 1956)

PRMS is the Global Standard for Petroleum Reserves and Resource Reporting

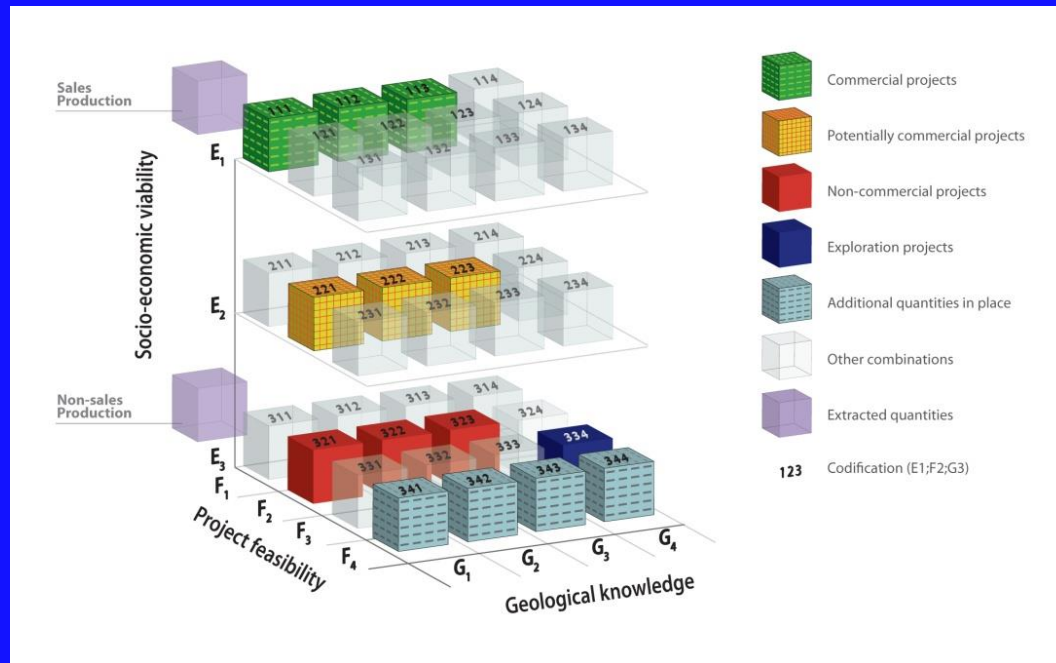


PRMS is explicitly or implicitly referenced

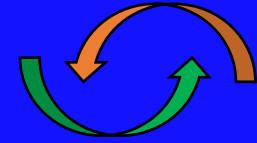
PRMS Current Adoption



The **United Nations Framework Classification (UNFC)** system identifies the PRMS as the reference standard for petroleum reserves and resources

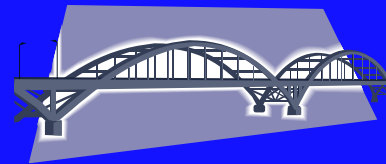


SPE Relationship with UNFC



- Long-standing agreement for the SPE to provide the commodity-specific specifications for petroleum
 - Petroleum Resources Management System of 2007 (“PRMS”)

- Link provided by a **Bridging Document** in 2013



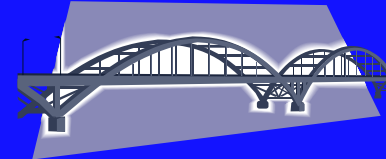
- PRMS Bridging Document, together with the UNFC Generic Specifications, provide operational application of UNFC-2009 for petroleum

(see details at: http://www.unece.org/energy/se/unfc_2009_spcfc.html)

- PRMS will be maintained “evergreen” by SPE OGRC

PRMS – UNFC Bridging Document

Using Categories only

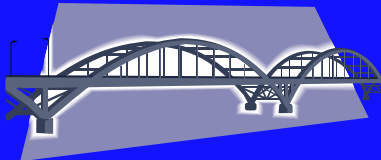


PRMS Class		UNFC-2009 “minimum” Categories			UNFC-2009 Class
Discovered	Reserves	E1	F1	G1,G2,G3	Commercial Projects
	Contingent Resources	E2	F2	G1,G2,G3	Potentially Commercial Projects
		E3	F2	G1,G2,G3	Non-Commercial Projects
	Unrecoverable	E3	F4	G1,G2,G3	Additional in Place*
Undiscovered	Prospective Resources	E3	F3	G4	Exploration Projects
	Unrecoverable	E3	F4	G4	Additional in Place*

From EGRC 4th Session Geneva April 2013

PRMS – UNFC Bridging Document

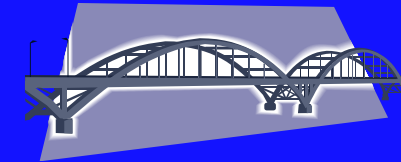
*G-axis, using
Categories only*



PRMS Categories		UNFC-2009 Categories
Reserves (Incremental)	Proved	G1
	Probable	G2
	Possible	G3
Reserves (Scenario)	Proved (1P)	G1
	Proved plus Probable (2P)	G1+G2
	Proved plus Probable plus Possible (3P)	G1+G2+G3
Contingent Resources	Low Estimate (1C)	G1
	Best Estimate (2C)	G1+G2
	High Estimate (3C)	G1+G2+G3
Prospective Resources	Low Estimate	G4.1
	Best Estimate	G4.1+G4.2 (=G4)
	High Estimate	G4.1+G4.2+G4.3

PRMS – UNFC Bridging Document

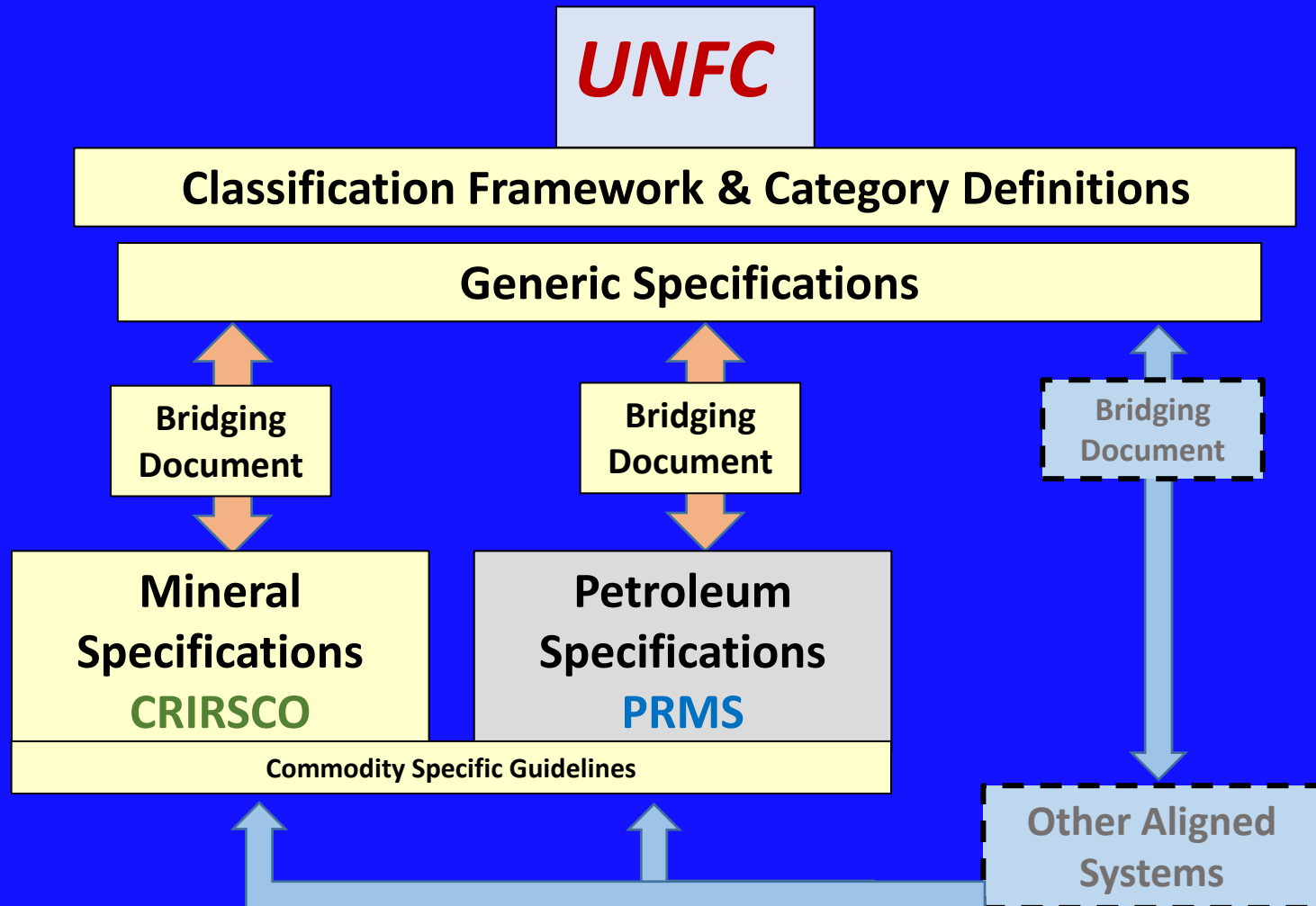
Using Sub-Categories



	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							Reserves	On Production	1	
E1.2	1	2	3									Approved for Development	2	
E2			4	4	5							Justified for Development	3	
E3.1	12	12	12	12	12	12					Contingent Resources	Development Pending	4	
E3.2			6	6	6		8	9	10			Development Unclarified or On Hold	On Hold	5
													Unclarified	6
E3.3			7	7	7	7						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		

Facilitates transfer of quantities to correct class or sub-class

Beyond Mapping → “Integration”



For other systems seeking alignment, a bridging document to UNFC-2009 is required which allows results considered to be comparable with no significant difference to those that would result from the application of the classification system for which the Bridging documents have already been endorsed (i.e. aligned Systems).

Concluding Remarks

- UNFC-2009 provides common language for classification and reporting of solid mineral and petroleum resources
- PRMS 2007 is the dominant industry-standard classification for petroleum resources and reserves
- CRIRSCO is the dominant industry-standard classification for solid mineral reserves and mineral resources
- PRMS & CRIRSCO referenced by IASB Extractive Activities Project

Are We There Yet?

Have we achieved a global common code?

Not quite!... but ...the building blocks are in place which will allow greater harmonization and consistency in the area of natural resources assessment and reporting.... ...and valuation.



PRMS and UNFC will both be part of the solution!

Thank you!

Questions?