

# Reporting the “Whole Enchilada” - Going Beyond Reserves -



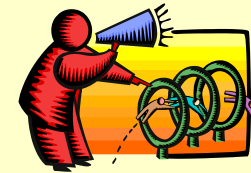
**Prepared for SPEE AGM  
Halifax – June 8, 2015**

**by John Etherington, Managing Director, PRA International Ltd**

# Agenda



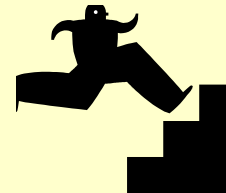
**Internal vs External Reporting**



**Impact of ROTR & Unconventionals**



**NI 51-101 Amendments**



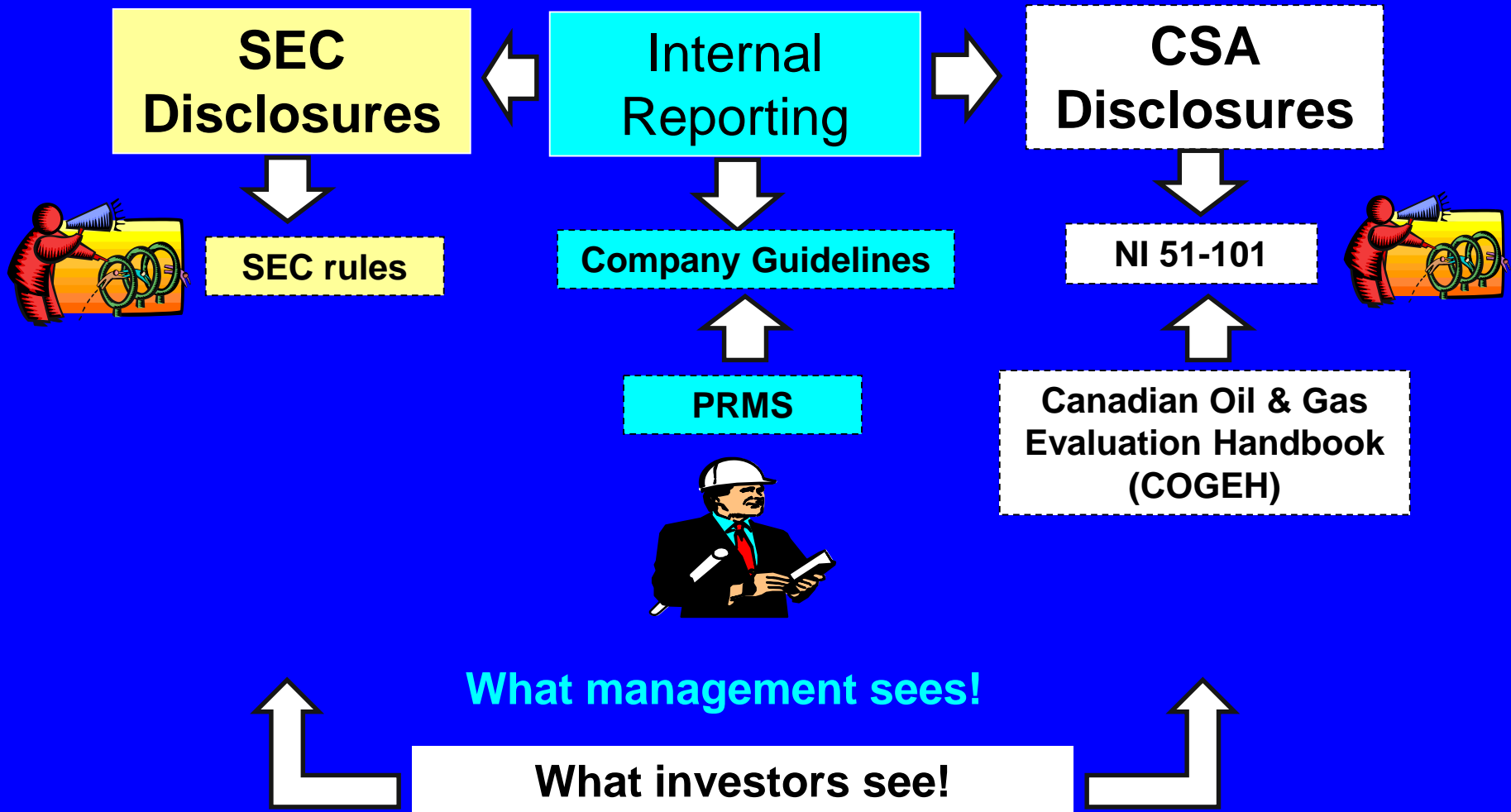
**Summary**

# How to Provide Investors a Full View of the Company's Portfolio?



**Complete and Consistent .. not Misleading**

# Internal vs External Reporting



# Two Reporting Objectives

**Internal**

**(Business Management)**

**Make money!**



**Project and Portfolio  
Management system**

**Resource  
Inventory**

Production

Proved  
Developed

Proved  
Undeveloped

Probable

Possible

Discovered  
Not Yet  
Commercial

Undiscovered  
Potential

**External**

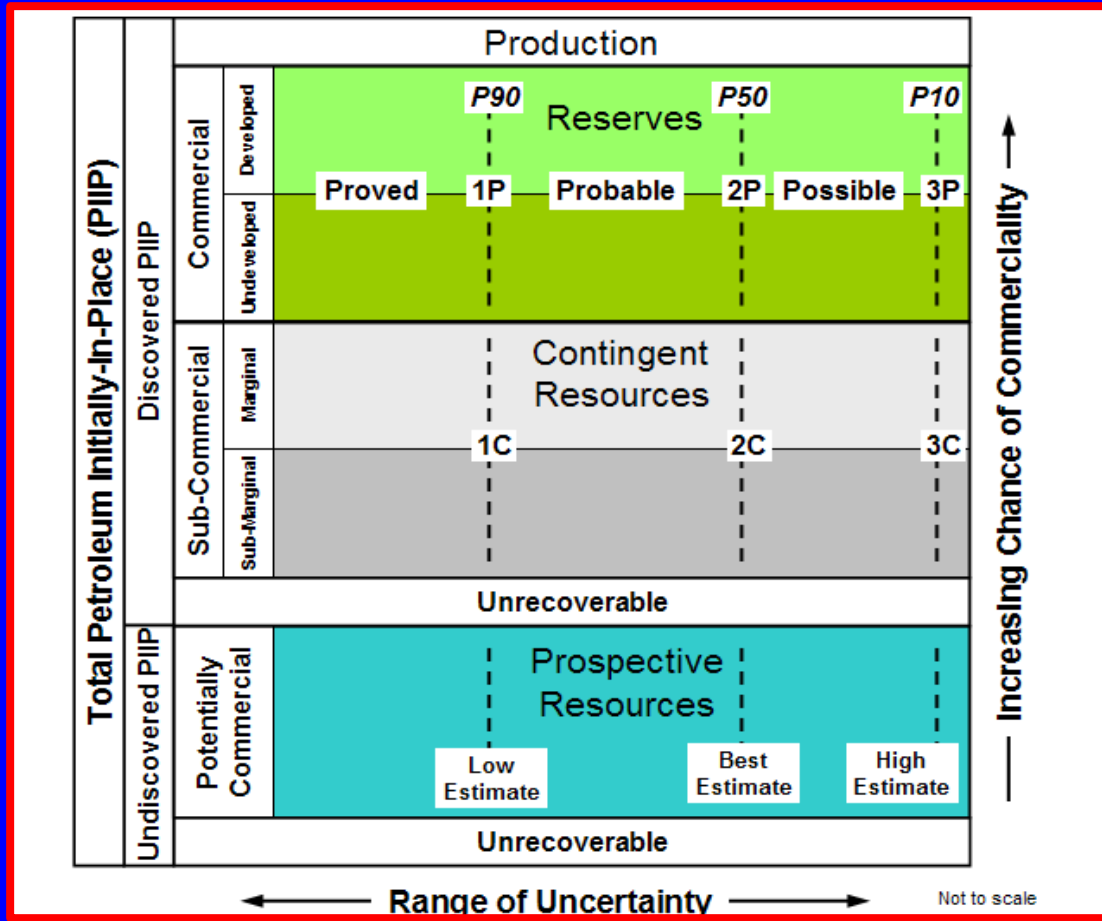
**(Required by Law)**

**Stay out of jail!**



**Regulatory Commissions  
Government Reporting  
Shareholders Rights**

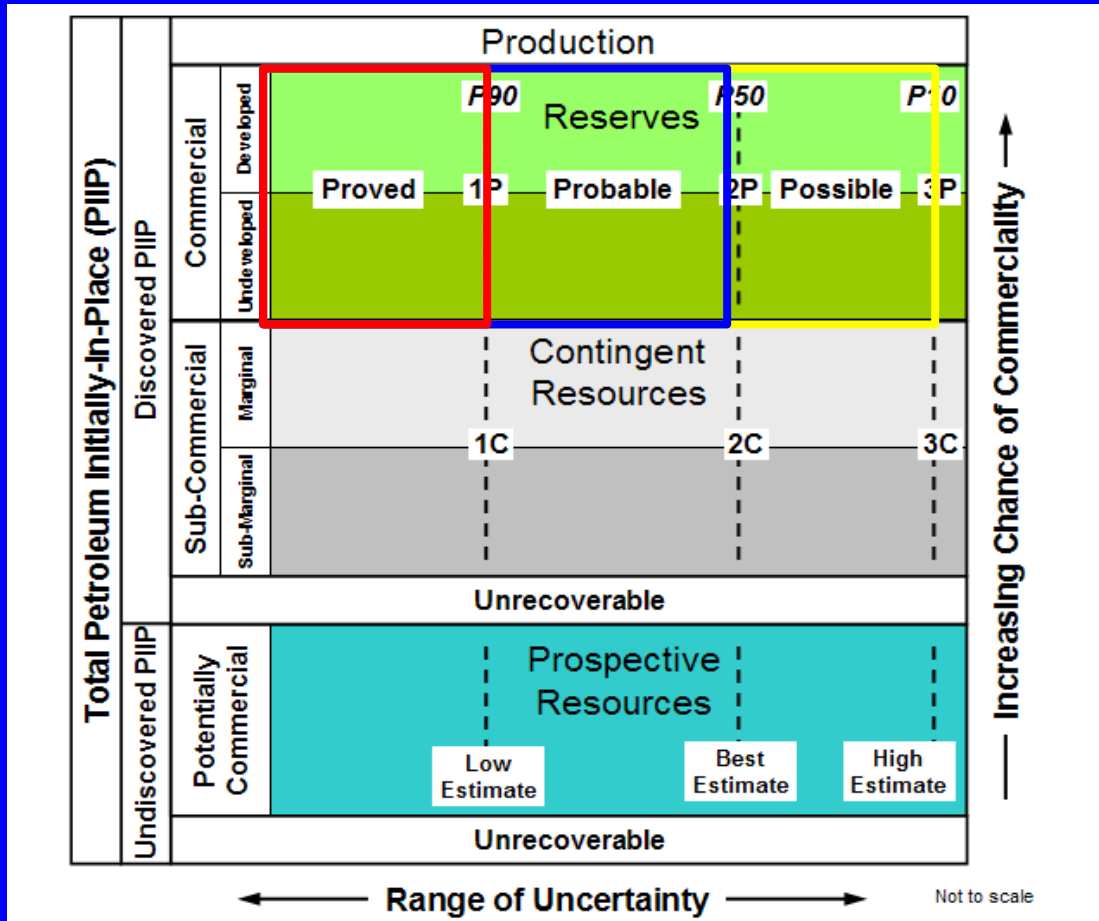
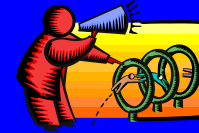
# Internal Reporting



The  
“Whole  
Enchilada”

$$2P + r 2C + r BE$$

# SEC Disclosures



**Required**

**Optional**  
 Probable (Dev/Undev)  
 Possible (Dev/Undev)

**Prohibited**

# CSA Disclosures (2013)



## Required

Proved and 2P  
Developed and Undeveloped

1P & 2P

## Optional

Possible Reserves  
Developed/Undeveloped

Contingent Resources

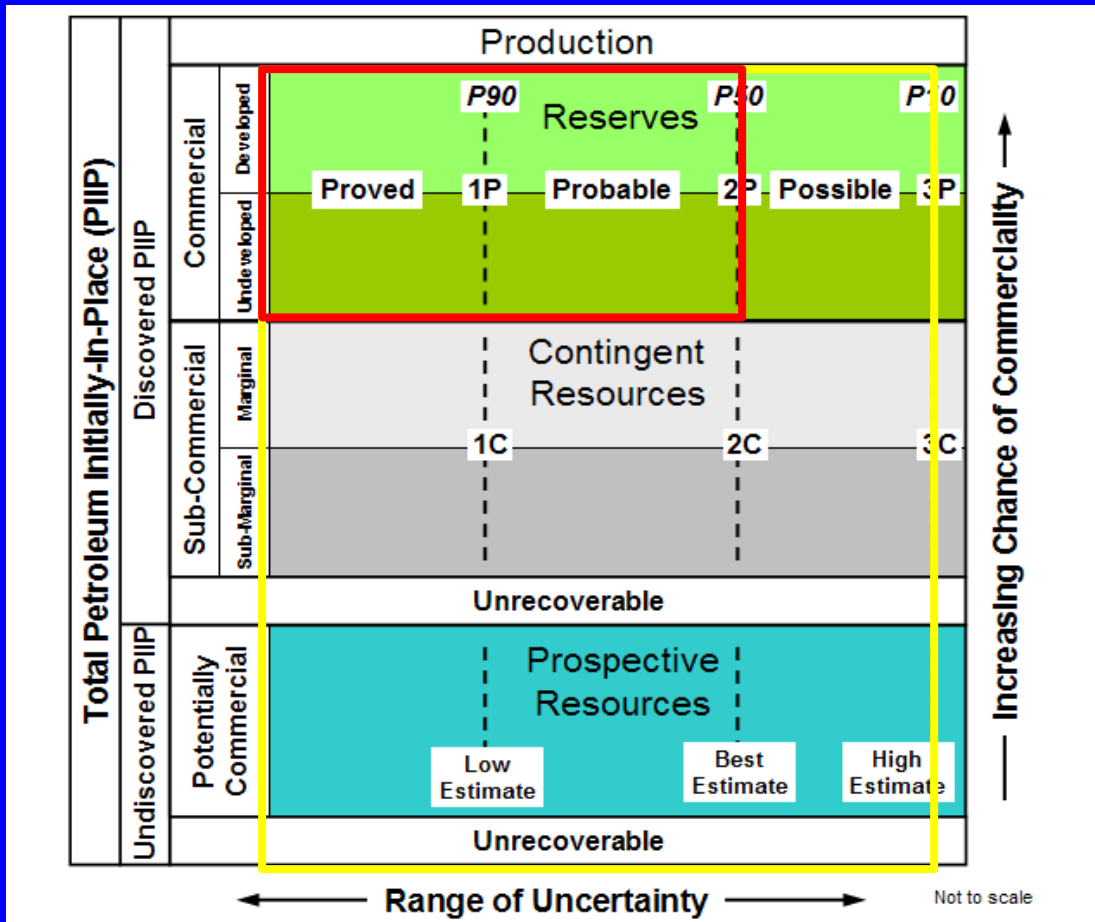
Prospective Resources

C



r? E

**ROTR**





# Resources Other Than Reserves (ROTR)



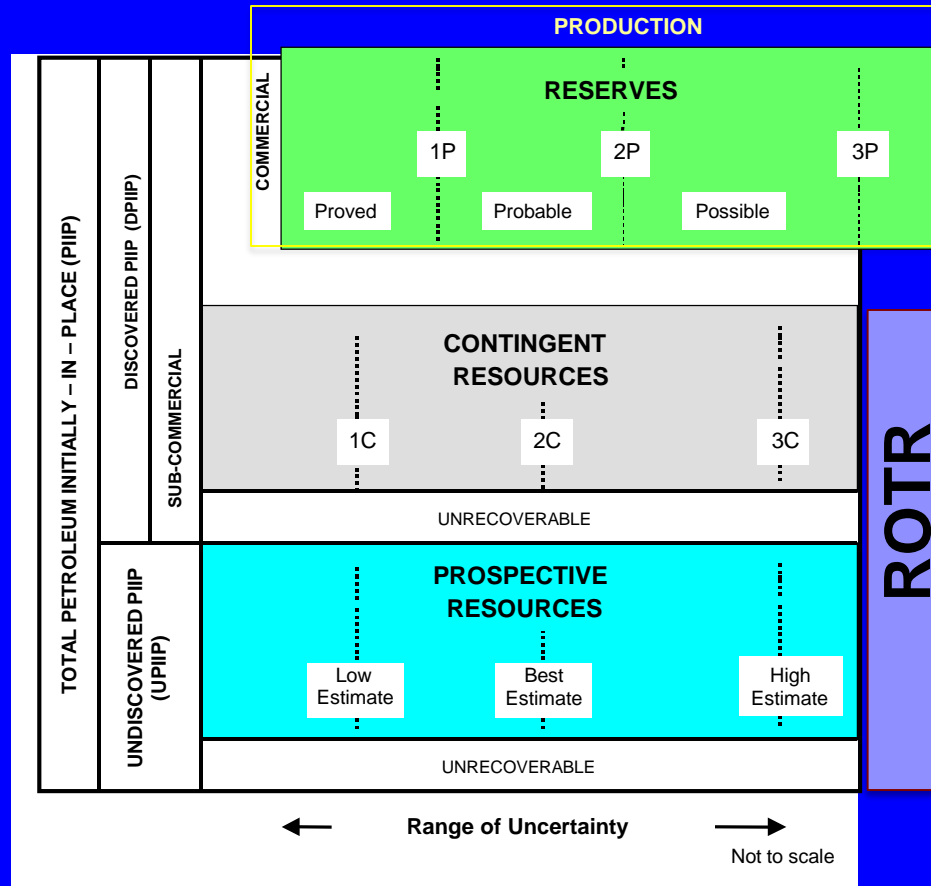
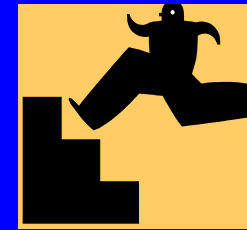
**Do you want to open that door?**

- + Show investors the whole picture**
- + Significant value in ROTR**

- High degree of risk and uncertainty**
- High volatility in volume/value/timing**

**Voluntary - not continuous**  
**Potentially misleading?**

# What is ROTR?



classify by  
Chance of Commerciality  
of project applied

categorize estimates based on uncertainty  
of sales quantities associated with a project

# What is ROTR?

Chance of Commerciality (COC%): Reserves = 100% **ROTR < 100%**

**ROTR** includes : conventional and **unconventional**  
: primary and enhanced recovery projects  
: in-place and recoverable (& unrecoverable)



## The Challenges

How can we achieve reporting consistency and comparability?

Do current definitions “work”? Are they complete?

Same guidelines for conventional and **unconventional** resources?

# Types of Unconventional Resources

Coal Bed Methane



Bitumen

Tight Gas  
Shale Gas



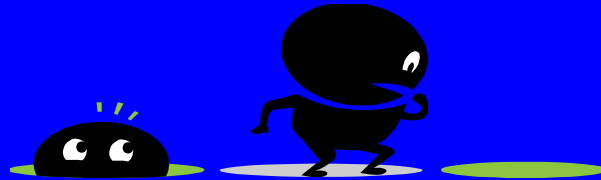
Tight Oil

Kerogen Shale

Coal Gasification

Methane Hydrates

# Unconventional Resources - Evaluation Issues



Relatively limited history - few good analogs

Porosity and water saturation may have little relevance  
Total organic carbon & rock mechanics important

Production mechanisms not the same  
Requires stimulation – fracs, thermal, solvents (mining?)

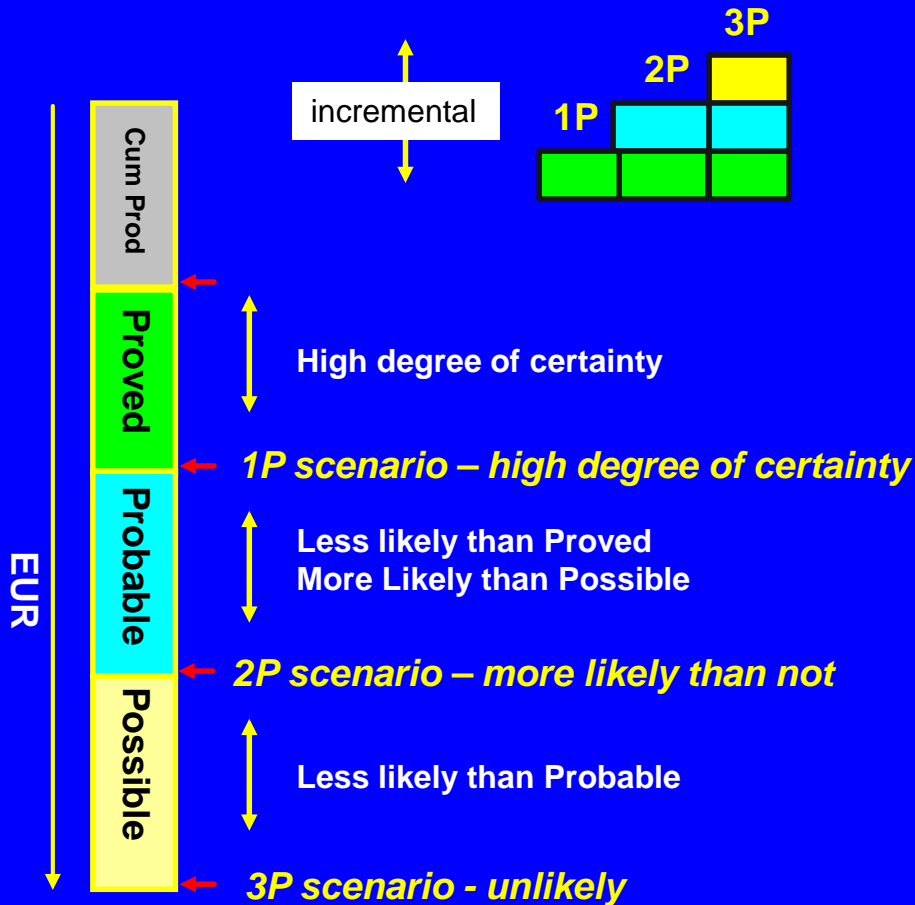
Areally extensive - Poorly defined limits  
Productivity extremely heterogeneous

What is discovered?

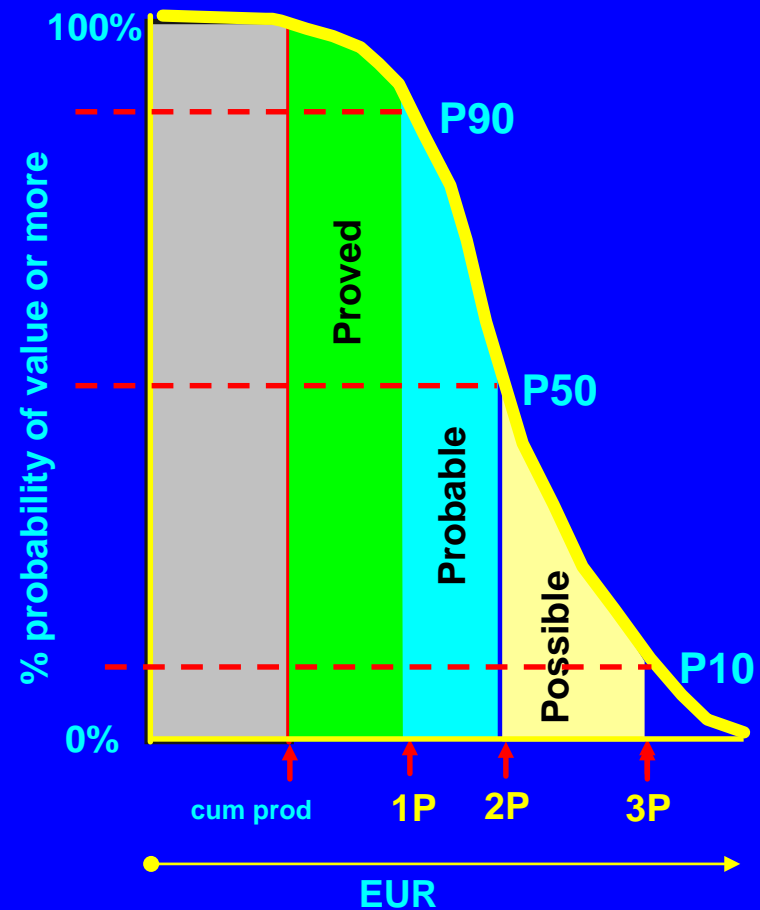
# Reporting Uncertainty by Category

*Estimates based on deterministic and/or probabilistic methods.*

## Deterministic Methods



## Probabilistic Methods



# Sub-classify as Specific as Possible



TOTAL PETROLEUM INITIALLY-IN-PLACE (PIIP)	DISCOVERED PIIP	COMMERCIAL	<b>PRODUCTION</b>		
			<b>RESERVES</b>	On Production	
				Approved for Development	
		Justified for Development			
		SUB-COMMERCIAL	<b>CONTINGENT RESOURCES</b>		Development Pending
					Development On Hold
	Development Unclassified				
	Development not Viable				
	<b>UNRECOVERABLE</b>				
	UNDISCOVERED PIIP	<b>PROSPECTIVE RESOURCES</b>		Prospect	
Lead					
Play					
<b>UNRECOVERABLE</b>					

— Increasing Chance of Commerciality —

- Economic
- Economic Undetermined
- Sub-economic

- Development
- Pre-Development
- Conceptual Plan

- Established Technology
- Technology Under Development
- Experimental Technology

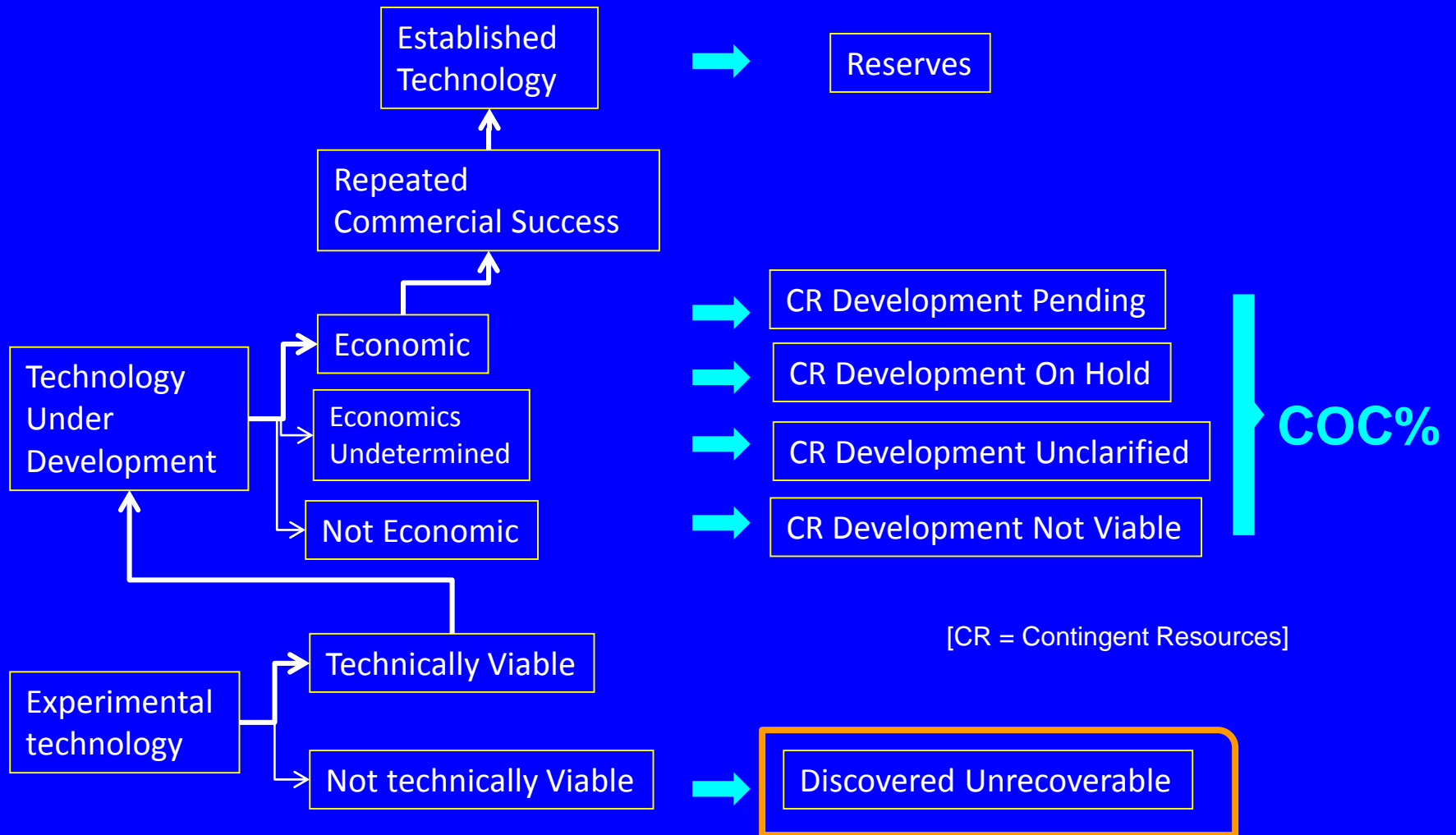
**Range of Uncertainty**



Not to scale

# Pulling it all Together

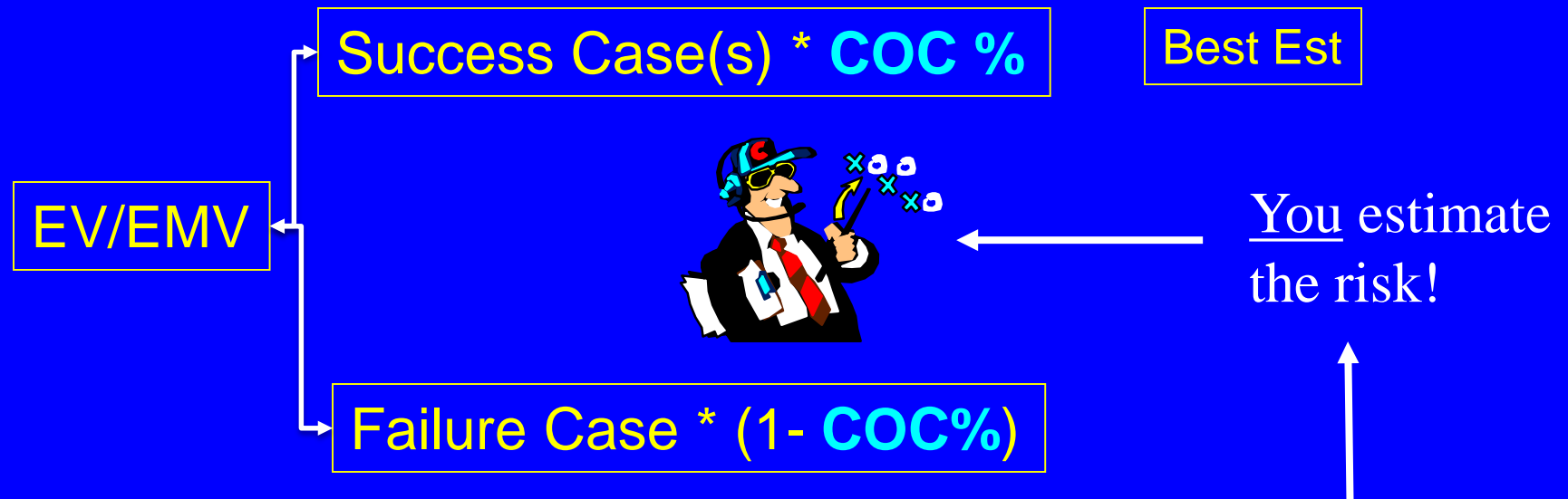
Qualitative to  Quantitative Risk for Discovered Resources





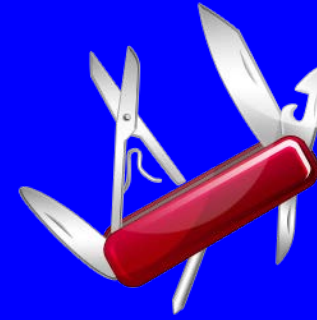
# Risking Volume and Value

Chance of Commerciality (COC) = Chance of Discovery \* Chance of Development



“Because an evaluator with access to all available data for a prospect (or project) should have an informed opinion of the chance of discovery (and development), it can be potentially misleading to disclose unrisks estimates and leave the risking to the investor.”

# ROTR Summary



COGEH provides the tools to consistently classify and report both conventional and unconventional resources

The key is to clearly define the projects and sub-classify as specifically as possible.

- Contingent Resources are technically recoverable but one or more contingencies prevent commerciality (chance of development <100%).
- Discovered Unrecoverable are known but current chance of development = 0%.
- Prospective Resources have both discovery & development risk.

# NI 51-101 Guidance



TOTAL PETROLEUM INITIALLY-IN-PLACE (PIIP)	DISCOVERED PIIP	COMMERCIAL	<b>PRODUCTION</b>	
			<b>RESERVES</b>	On Production
				Approved for Development
		Justified for Development		
		SUB-COMMERCIAL	<b>CONTINGENT RESOURCES</b>	Development Pending
				Development On Hold
	Development Unclassified			
	Development not Viable			
	UNRECOVERABLE			
	UNDISCOVERED PIIP	<b>PROSPECTIVE RESOURCES</b>	Prospect	
Lead				
Play				
UNRECOVERABLE				

Increasing Chance of Commerciality

Risk all estimates for chance of commerciality

Risk Contingent Resources for Chance of Development

Risk Prospective Resources for chance of discovery and chance of development

Range of Uncertainty

Not to scale

# NI 51-101 Guidance



TOTAL PETROLEUM INITIALLY-IN-PLACE (PIIP)	DISCOVERED PIIP	COMMERCIAL	<b>PRODUCTION</b>	
			<b>RESERVES</b>	On Production
				Approved for Development
		Justified for Development		
		SUB-COMMERCIAL	<b>CONTINGENT RESOURCES</b>	Development Pending
				Development On Hold
	Development Unclassified			
	Development not Viable			
	<b>UNRECOVERABLE</b>			
	UNDISCOVERED PIIP	<b>PROSPECTIVE RESOURCES</b>	Prospect	
Lead				
Play				
<b>UNRECOVERABLE</b>				

Increasing Chance of Commerciality

Disclose by project maturity sub-class

Risk **net present value** of future net revenue

Provide detailed explanation of chance of commerciality

Range of Uncertainty

Not to scale

SUMMARY OF RISKED OIL AND GAS CONTINGENT RESOURCES<sup>(1)</sup>

as of December 31, 2015

FORECAST PRICES AND COSTS

<u>RESOURCES</u> <u>PROJECT</u> <u>MATURITY SUB-</u> <u>CLASS</u>	<u>CONTINGENT RESOURCES <sup>(2)</sup></u>							
	<u>LIGHT CRUDE OIL</u> <u>AND</u> <u>MEDIUM CRUDE OIL</u>		<u>HEAVY</u> <u>CRUDE OIL</u>		<u>CONVENTIONAL</u> <u>NATURAL GAS</u>		<u>NATURAL GAS</u> <u>LIQUIDS</u>	
	<u>Gross</u> <u>(Mbbbl)</u>	<u>Net</u> <u>(Mbbbl)</u>	<u>Gross</u> <u>(Mbbbl)</u>	<u>Net</u> <u>(Mbbbl)</u>	<u>Gross</u> <u>(MMcfe)</u>	<u>Net</u> <u>(MMcfe)</u>	<u>Gross</u> <u>(Mbbbl)</u>	<u>Net</u> <u>(Mbbbl)</u>
<u>CONTINGENT (2C)</u> <u>Development</u> <u>Pending</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>

(1) This disclosure is triggered by optional disclosure of *contingent resources* in the statement prepared in accordance with item 1 of section 2.1 of NI 51-101. Disclosure of risked estimates of volume are required under item 7.1(1)(a) of Form 51-101F1.

(2) Other *product types* must be added if *material*.

(3) The disclosure in this table must comply with and include the disclosure required by section 5.9 of NI 51-101, including section 5.9(2)(d).

(4) A *reporting issuer* should consider whether the disclosure of *development unclarified* or *development not viable sub-classes contingent resources* in the statement of *reserves data* and other *oil and gas information* would be *misleading* given the *uncertainty and risk* associated with those estimates. Section 2 of volume 2 of the *COGE Handbook* details *commerciality factors*.

From NI -51-101 Companion Policy

OPTIONAL  
SUPPLEMENTARY

SUMMARY OF RISKED OIL AND GAS PROSPECTIVE RESOURCES<sup>(1)</sup>  
as of December 31, 2015  
VOLUMES

<u>RESOURCES</u>	<u>PROSPECTIVE RESOURCES<sup>(2)</sup></u>							
	<u>LIGHT CRUDE OIL AND MEDIUM CRUDE OIL</u>		<u>HEAVY CRUDE OIL</u>		<u>CONVENTIONAL NATURAL GAS</u>		<u>NATURAL GAS LIQUIDS</u>	
	<u>Gross (Mbbbl)</u>	<u>Net (Mbbbl)</u>	<u>Gross (Mbbbl)</u>	<u>Net (Mbbbl)</u>	<u>Gross (MMcfe)</u>	<u>Net (MMcfe)</u>	<u>Gross (Mbbbl)</u>	<u>Net (Mbbbl)</u>
<u>PROSPECTIVE (Best Estimate)</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>	<u>xx</u>

(1) This disclosure is triggered by optional disclosure of *prospective resources* in the statement prepared in accordance with item 1 of section 2.1 of NI 51-101. Disclosure of risked estimates of volume are required under Item 7.2(1) of Form 51-101F1

(2) Other *product types* must be added if *material*.

(3) The disclosure in this table must comply with and include the disclosure required by section 5.9 of NI 51-101

(4) A *reporting issuer* should consider whether the disclosure of *prospective resources* in the statement of *reserves data* and other *oil and gas* information would be misleading given the uncertainty and risk associated with those estimates.



OPTIONAL  
SUPPLEMENTARY

From NI -51-101 Companion Policy

SUMMARY OF RISKED NET PRESENT VALUE OF FUTURE NET REVENUE<sup>(1)</sup>  
(CONTINGENT RESOURCES)  
as of December 31, 2015  
FORECAST PRICES AND COSTS

An estimate of risked net present value of future net revenue of contingent resources is preliminary in nature and is provided to assist the reader in reaching an opinion on the merit and likelihood of the company proceeding with the required investment. It includes contingent resources that are considered too uncertain with respect to the chance of development to be classified as reserves. There is no certainty that the estimate of risked net present value of future net revenue will be realized.

<u>RESOURCES PROJECT</u> <u>MATURITY SUB-</u> <u>CLASS</u>	<u>RISKED NET PRESENT VALUE OF FUTURE NET REVENUE</u>									
	<u>BEFORE INCOME TAXES</u>					<u>AFTER INCOME TAXES</u>				
	<u>DISCOUNTED AT (%/year)</u>									
	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>
	<u>(MM\$)</u>	<u>(MM\$)</u>	<u>(MM\$)</u>	<u>(MM\$)</u>	<u>(MM\$)</u>	<u>(MM\$)</u>	<u>(MM\$)</u>	<u>(MM\$)</u>	<u>(MM\$)</u>	<u>(MM\$)</u>
<u>CONTINGENT (2C)</u> <u>Development</u> <u>Pending</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>	<u>XX</u>

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 OPTIONAL  
SUPPLEMENTARY

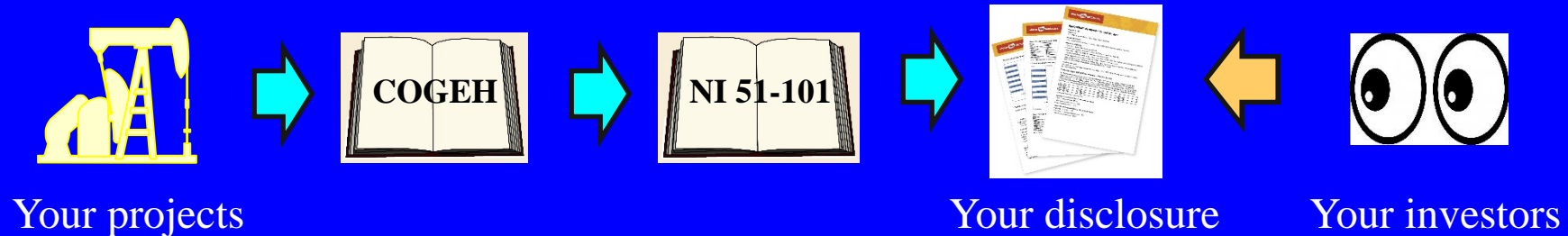
From NI -51-101 Companion Policy

# Summary

Prior NI 51-101 allowed voluntary disclosures beyond Reserves  
But... disclosures were not consistent (and sometimes misleading)

COGEH Volume 2 Section 2 (June 2014) provides **ROTR** guidelines  
Also see COGEH Volume 3 **Bitumen** Guidelines (April 2014)

**NI 51-101 (July 2015 revised) provides regulatory guidance  
for voluntary disclosure of Contingent & Prospective Resources**







Investors may not see the “whole enchilada”  
... but close to it!

**Also see:**

***SPE 169861- MS: Disclosures of Resources Other Than Reserves Under Canadian Guidelines***

*J.R. Etherington, PRA Intl. Ltd.; J.L. Chipperfield, Sproule Associates Ltd.; D.C. Elliott, Geosgil Consulting Ltd.; P.B. Chan, Alberta Securities Commission.*



**Questions?**