



# OECD TASK FORCE ON THE IMPLEMENTATION OF THE SEEA-CF – REPORTING OF STOCKS OF NATURAL RESOURCES IN PHYSICAL UNITS

*20th Meeting of the London Group on  
Environmental Accounting  
New Delhi, October 15-17, 2014*

Statistics Directorate, OECD



# Mandate of the OECD Task Force on the implementation of the SEEA-CF

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- Air Emissions and **Natural Resources**
- Collect internationally comparable data on air emissions (flows) and natural resources (stocks and flows, physical and monetary units).
- Develop common methodology for the monetary valuation of natural resource stocks.



# Outline of the Presentation

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- Overview of international classification standards for natural resources.
- Mapping with the SEEA-2012 classification: main issues.
- Comparison of currently available data: national and international datasets.
- Findings and conclusions.



# International classifications systems for natural resources and reserves

Abbreviation	Full Name	Subject Resource	Latest edition (first edition)
<b>SPE-PRMS</b> <sup>1</sup>	Society of Petroleum Engineers – Petroleum Resources Management System	Fossil Energy (crude oil and natural gas)	2007
<b>CRIRSCO</b> <sup>2</sup>	Committee For Mineral Reserves International Reporting Standards	Minerals	2013 (2006)
<b>UNFC-2009</b> <sup>3</sup>	United Nations Framework Classification for Fossil Energy and Mineral Resources	Minerals and Fossil Energy	2009 (1997)
<b>SEEA-2012</b> <sup>4</sup>	System of Environmental-Economic Accounting – Central Framework	Renewable and non-renewable natural resources and land	2012 (2003)

<sup>1</sup> SPE-PRMS (2007)

[http://www.spe.org/industry/docs/Petroleum\\_Resources\\_Management\\_System\\_2007.pdf#search=%27Petroleum\\_Resources\\_Management\\_System\\_2007.pdf](http://www.spe.org/industry/docs/Petroleum_Resources_Management_System_2007.pdf#search=%27Petroleum_Resources_Management_System_2007.pdf)

<sup>2</sup> CRIRSCO (2013) [http://www.crirSCO.com/templates/crirSCO\\_international\\_reporting\\_template\\_2013.pdf](http://www.crirSCO.com/templates/crirSCO_international_reporting_template_2013.pdf)

<sup>3</sup> UNECE (2009) <http://www.unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/EnergySeriesNo33.pdf>

<sup>4</sup> SEEA (2012) [http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA\\_CF\\_Final\\_en.pdf](http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf)



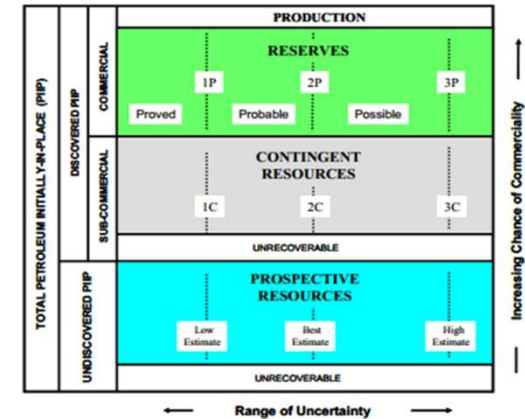
# SPE-PRMS, CRIRSCO & UNFC-2009 classifications

## SPE-PRMS (fossil energy)

2 Dimensional System, based on;

Vertical axis Degree of commerciality of the resource

Horizontal axis Range of geological uncertainty



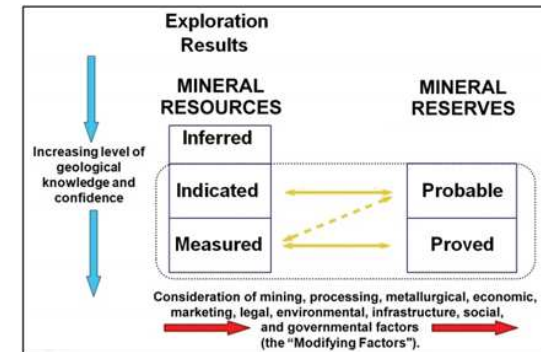
## CRIRSCO (minerals)

2 Dimensional System, based on;

Vertical axis Geological confidence

Horizontal axis Modifying factors

(e.g. socio-economic factors such as resource prices or legal constraints)



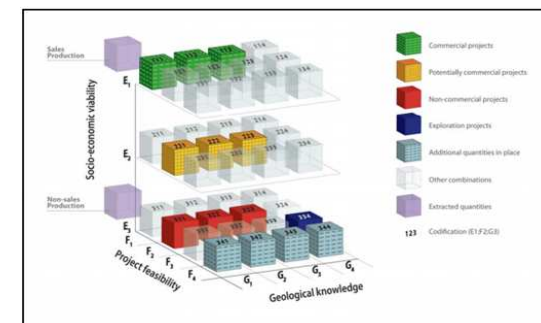
## UNFC 2009 (fossil energy and minerals)

3 Dimensional System, based on;

E axis Economic and social viability of the project

F axis Field project status and its feasibility

G axis Geological knowledge about the available quantities



Sources:

SPE-PRMS (2007) [http://www.spe.org/industry/docs/Petroleum\\_Resources\\_Management\\_System\\_2007.pdf#search=%27Petroleum\\_Resources\\_Management\\_System\\_2007.pdf](http://www.spe.org/industry/docs/Petroleum_Resources_Management_System_2007.pdf#search=%27Petroleum_Resources_Management_System_2007.pdf)

CRIRSCO (2013) [http://www.criresco.com/templates/crisco\\_international\\_reporting\\_template\\_2013.pdf](http://www.criresco.com/templates/crisco_international_reporting_template_2013.pdf)

UNECE (2009) <http://www.unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/EnergySeriesNo33.pdf>



# SEEA-2012 classification

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SEEA-2012 classification on natural resources distinguishes three classes for reporting known deposits, based on UNFC 2009.

**Class A: Commercially recoverable resources.**

This class includes deposits for projects that fall in categories E1 and F1 and where the level of confidence in the geologic knowledge is high (G1), moderate (G2) or low (G3);

**Class B: Potentially commercially recoverable resources.**

This class includes deposits for those projects that fall in the category E2 (or eventually E1) and at the same time in F2.1 or F2.2 and where the level of confidence in the geologic knowledge is high (G1), moderate (G2) or low (G3);

**Class C: Non-commercial and other known deposits.**

These are resources for those projects that fall into category E3 and for which the feasibility is categorized as F2.2, F2.3 or F4 and where the level of confidence in the geologic knowledge is high (G1), moderate (G2) or low (G3).

**How to relate this classification to international classification standards?**



# Correspondence Table (Oil and Gas)

## Correspondence between SPE-PRMS, UNFC-2009 and SEEA-2012 classifications

Fundamental Characterization	PRMS Classes	PRMS Sub-Class	UNFC E axis	UNFC F axis	UNFC G axis			
					1P/1C Low Estimate	2P/2C Best Estimate	3P/3C High Estimate	
Discovered and Commercially Recoverable	Reserves	On Production	1.1 or 1.2	1.1	1	1+2	1+2+3	SEEA-2012 Class A
		Approved for Development	1.1 or 1.2	1.2	1	1+2	1+2+3	
		Justified for Development	1.1 or 1.2	1.3	1	1+2	1+2+3	
Discovered and Not Commercially Recoverable	Contingent Resources	Development Pending	1	2.1	1	1+2	1+2+3	SEEA-2012 Class B
			2.1	2.1	1	1+2	1+2+3	
		Development Unclearified or on Hold	2.1	2.2	1	1+2	1+2+3	SEEA-2012 Class C
			3.2	2.2	1	1+2	1+2+3	
		Development not Viable	2.2	2.3	1	1+2	1+2+3	
Unrecoverable	3.3	4.1	1	1+2	1+2+3			
Undiscovered	Prospective Resources	Prospect	3.2	3.1	4.1	4.1+4.2	4.1+4.2+4.3	
		Lead	3.2	3.2	4.1	4.1+4.2	4.1+4.2+4.3	
		Play	3.2	3.3	4.1	4.1+4.2	4.1+4.2+4.3	
	Unrecoverable	3.3	4.2	4.1	4.1+4.2	4.1+4.2+4.3		

Developed based on UNECE (2009) and SEEA 2012 mapping exercises.

Rows correspond to items of the SPE-PRMS classification and columns to items of the UNFC-2009 classification. SEEA-2012 natural resource classes are indicated with colours.



# Correspondence Table (Minerals)

## Correspondence between CRIRSCO, UNFC-2009 and SEEA-2012 classifications

Fundamental Characterization	Solid Mineral Classes	Mineral Project Development Stage	UNFC E axis	UNFC F axis	UNFC G axis				
					Proved Measured	Probable Indicated	----- Inferred		
Discovered and Commercially Recoverable	Mineral Reserves	On Production	1	1.1	1	2		SEEA-2012 Class A	
		Project Implementation	1	1.2	1	2			
		Feasibility Study	1	1.3	1	2			
Discovered and Not Commercially Recoverable	Mineral Resources	Pre-Feasibility Study	1	2.1	1	2	3	SEEA-2012 Class B	
			2.1	2.1	1	2	3		
		Order of Magnitude Studies	2.1	2.2	1	2	3		
	3.2		2.2	1	2	3			
	Discovered Not Economic Unrecoverable	Discovered Not Economic		2.2	2.3	1	2	3	SEEA-2012 Class C
		Unrecoverable		3.3	4.1	1	2	3	
Undiscovered	Exploration Results Unrecoverable	Conceptual Studies	3.2	3.3	4				
			3.3	4.2	4				

Developed based on UNECE (2009) and SEEA 2012 mapping exercises. Rows correspond to items of the SPE-PRMS classification and columns to items of the UNFC-2009 classification. SEEA-2012 natural resource classes are indicated with colours.

Source: UNECE (2009) <http://www.unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/EnergySeriesNo33.pdf>





# National and international datasets considered so far

## National Data \*

- Australia (ABS)
- Canada (STATCAN)
- UK (ONS)
- Netherlands (CBS)
- Norway (NPD)
- Russia (MNRE)
- US (EIA / USGS)

## International Data

- British Petroleum (BP)
- U.S. Energy Information Administration (EIA)
- U.S. Geological Survey (USGS)
- Organization of the Petroleum Exporting Countries (OPEC)

Investigated for crude oil, natural gas, coal and iron ore\*\*

\* Members of the OECD SEEA Task Force on natural resources.

\*\* Coal and Iron ore have only been investigated for Australia and Canada.

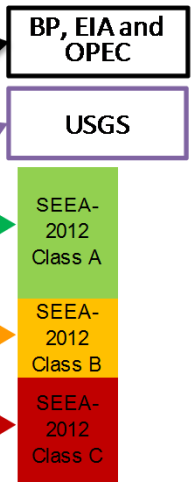


# Physical Stocks of Natural Resources: Australia (1/2)

Fundamental Characterization	Solid Mineral Classes	PRMS Classes	Mineral Project Development Stage	PRMS Sub-Class	UNFC E axis	UNFC F axis	UNFC G axis		
							Proved Measured	Probable Indicated	Possible Inferred
							1P/1C Low Estimate		
							2P/2C Best Estimate		
							3P/3C High Estimate		
Discovered and Commercially Recoverable	Mineral Reserves	Reserves	On Production	<i>On Production</i>	1	1.1	1	2	3
			Project Implementation	<i>Approved for Development</i>	1	1.2	1	2	3
			Feasibility Study	<i>Justified for Development</i>	1	1.3	1	2	3
Discovered and Not Commercially Recoverable	Mineral Resources	Contingent Resources	Pre-Feasibility Study	<i>Development Pending</i>	1	2.1	1	2	3
			Order of Magnitude Studies	<i>Development Unclassified or on Hold</i>	2.1	2.2	1	2	3
			Discovered Not Economic	<i>Development not Viable</i>	3.2	2.2	1	2	3
	Unrecoverable		3.3	4.1	1	2	3		
	Exploration Results		<i>Prospective Resources</i>	Conceptual Studies	<i>Prospect</i>	3.2	3.1	4.1	4.2
Undiscovered	Exploration Results	Prospective Resources	Conceptual Studies	<i>Lead</i>	3.2	3.2	4.1	4.2	4.3
			Conceptual Studies	<i>Play</i>	3.2	3.3	4.1	4.2	4.3
			Unrecoverable		3.3	4.2	4.1	4.2	4.3

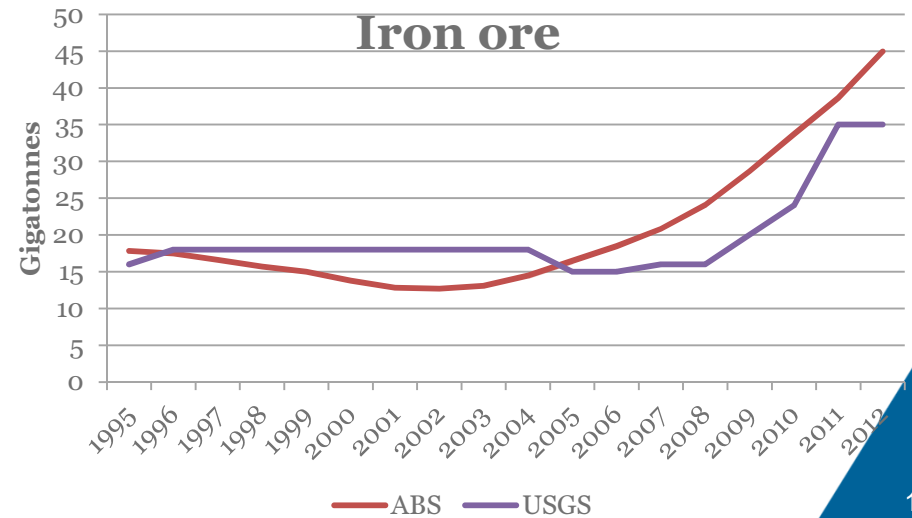
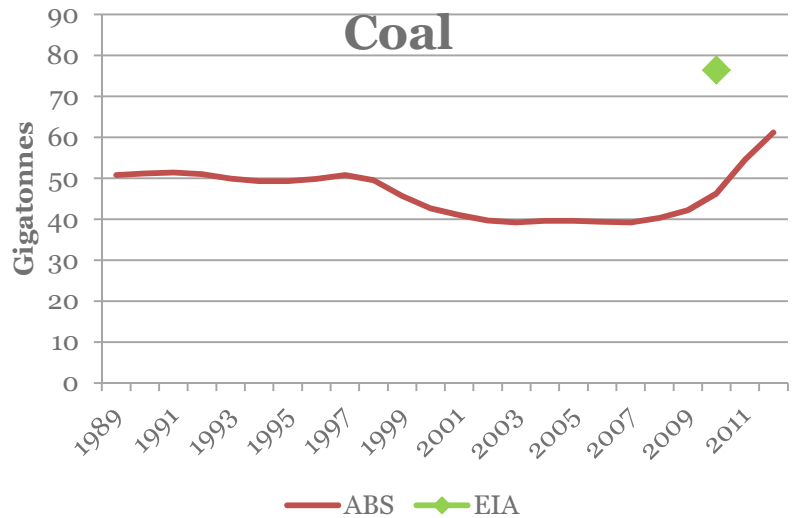
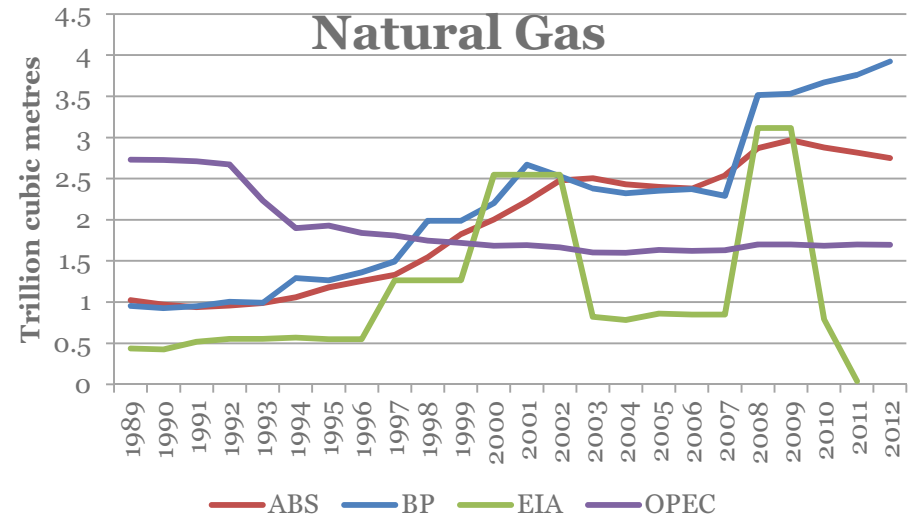
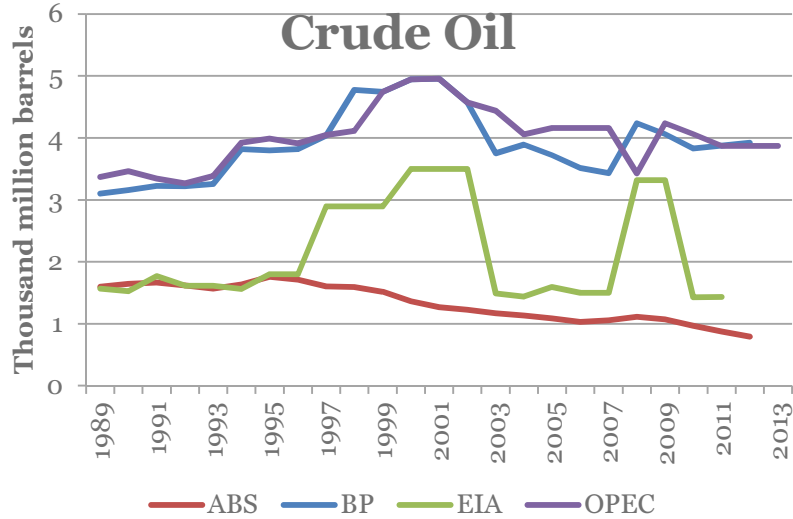
  

<b>Australia's Natural Resource System</b>	<b>Reported Categories</b>	<b>E axis</b>	<b>F axis</b>	<b>G axis</b>
Economically Demonstrated Resources (EDRs)	JORC Reserves and JORC Resources (measured and indicated) Development Pending			





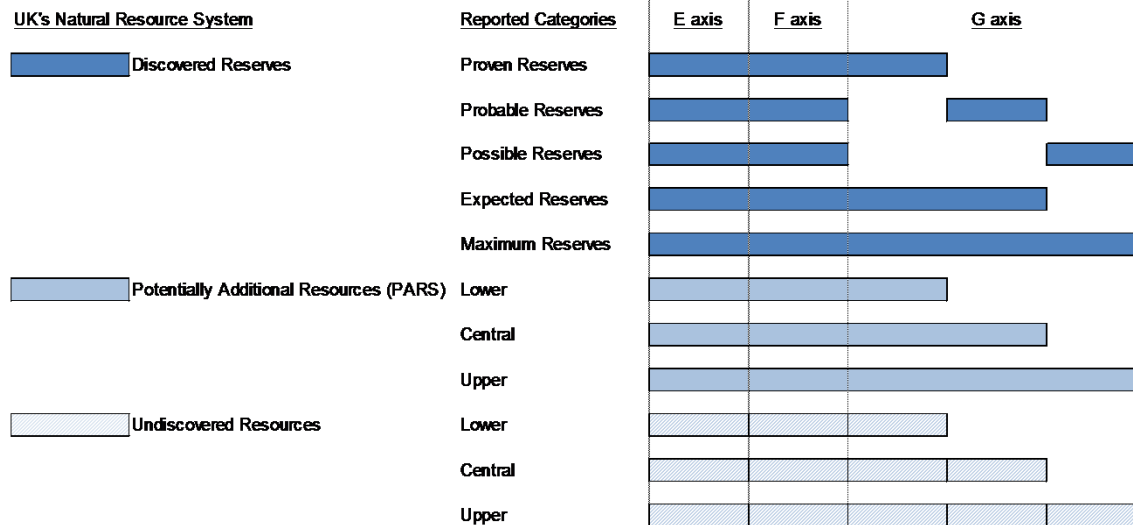
# Physical Stocks of Natural Resources: Australia (2/2)





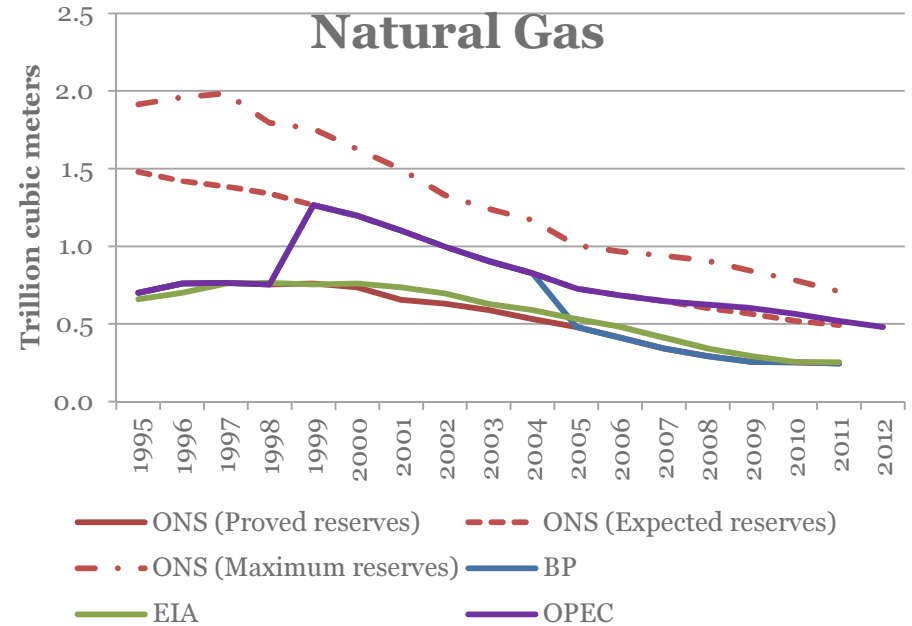
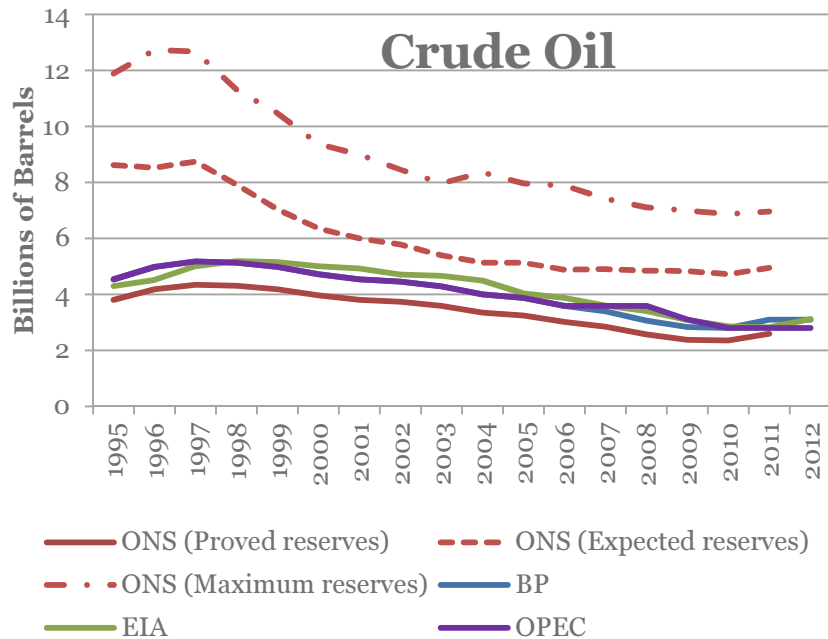
# Physical Stocks of Natural Resources: United Kingdom (1/2)

Fundamental Characterization	Solid Mineral Classes	PRMS Classes	Mineral Project Development Stage	PRMS Sub-Class	UNFC E axis	UNFC F axis	UNFC G axis				
							Proved Measured	Probable Indicated	Possible Inferred		
							1P/1C Low Estimate				
							2P/2C Best Estimate				
							3P/3C High Estimate				
Discovered and Commercially Recoverable	Mineral Reserves	Reserves	On Production	<i>On Production</i>	1	1.1	1	2	3	BP, EIA and OPEC	
			Project Implementation	<i>Approved for Development</i>	1	1.2	1	2	3		
			Feasibility Study	<i>Justified for Development</i>	1	1.3	1	2	3		
Discovered and Not Commercially Recoverable	Mineral Resources	Contingent Resources	Pre-Feasibility Study	<i>Development Pending</i>	1	2.1	1	2	3	SEEA-2012 Class A	
			Order of Magnitude Studies	<i>Development Unclassified or on Hold</i>	2.1	2.1	1	2	3		
				<i>Development not Viable</i>	2.1	2.2	1	2	3		
	Discovered Not Economic	Unrecoverable			3.2	2.2	1	2	3		
					2.2	2.3	1	2	3		
				3.3	4.1	1	2	3			
Undiscovered	Exploration Results	Prospective Resources	Conceptual Studies	Prospect		3.2	3.1	4.1	4.2	4.3	SEEA-2012 Class B
				Lead		3.2	3.2	4.1	4.2	4.3	
				Play		3.2	3.3	4.1	4.2	4.3	
	Unrecoverable				3.3	4.2	4.1	4.2	4.3		





# Physical Stocks of Natural Resources: United Kingdom (2/2)





## Findings and Conclusions (1/2)

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- The main issue is the coexistence and interpretation of different classification systems to measure remaining stocks (e.g. SEEA-2012, UNFC-2009, SPE-PRMS, CRIRSCO).
  
- Two main difficulties can be encountered in practice when trying to move to the SEEA-2012 classification:
  - Data need to be available with a sufficient level of disaggregation in the original classification system. This is not always the case.
  - Countries need to consider a wide range of resource types in order to fill the (quite large) resource classes advocated by the SEEA-CF.
  
- Even when definitions are aligned, reported estimates may be extremely different (e.g. for Australia and the U.K.).



## Findings and Conclusions (2/2)

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- Countries engaged or interested in the statistical reporting of physical stocks of natural resources should (1) provide enough metadata to enable clear understanding of how the reported volumes fit into the international classification standards and (2) keep the SEEA-2012 classification in mind.
- National data sources should be preferred, even if this implies to focus on some resources and the main producing countries in a first stage.
- All countries are kindly invited to share their experience and the difficulties they encounter for the volume measurement of stocks of natural resources.



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**Thank you for your attention!**

For more information, please contact:  
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