



CLASSIFICATION OF SUBSOIL RESOURCES AND RESERVES

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CIC international**





STRUCTURE OF PRESENTATION

- 1. Introduction and SA background**
 - 2. Methods of classification**
 - 3. Comparison**
 - 4. Recommendations as to way forward**
 - 5. Conclusion**
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INTRODUCTION AND SA BACKGROUND

- Minerals accounts developed by SA for Gold and Coal (Blignaut & Hassan 2002, Published in *Ecological economics*)
 - Further work to include Platinum done by StatsSA and accounts released as a discussion document
 - Issues for further consideration identified were, *inter alia*, -
 - determining the opening stocks,
 - use of Gov. royalties,
 - types of investments made by companies, and
 - how to utilise resource rents
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INTRODUCTION AND SA BACKGROUND

- On the issue of opening stocks, proven reserves was used, but little further interrogation of issue
- SA also compiled water accounts based on SEEA2003 and StatsSA published as discussion paper, forestry accounts and prelim energy accounts

This study:

- Assists in formulating a way to reconcile the various minerals reserve & resource classification systems
 - Assists in compiling an energy account
- Consider ways to link energy and minerals accounts (*sic.* coal accounts (but also gas, oil, etc.))

METHODS OF MINERAL RESERVE AND RESOURCE CLASSIFICATION

Three methods:

- McKelvey Box (used in SEEA-2003)
- UNFC framework (approved by UN general assembly)
- CRIRSCO-template (approved by the Council for Mining and Metallurgical Institutions - CMMI)



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METHODS OF MINERAL RESERVE AND RESOURCE CLASSIFICATION

McKelvey box

	Identified			Undiscovered	Feasibility of economic recovery
	Proved	Probable	Possible		
Recoverable	<i>Reserve</i>	<i>Reserve</i>	<i>Reserve</i>	<i>Resource</i>	↑
Para-marginal	<i>Resource</i>	<i>Resource</i>	<i>Resource</i>		
Sub-marginal	<i>Resource</i>	<i>Resource</i>	<i>Resource</i>		
	← Degree of certainty →				

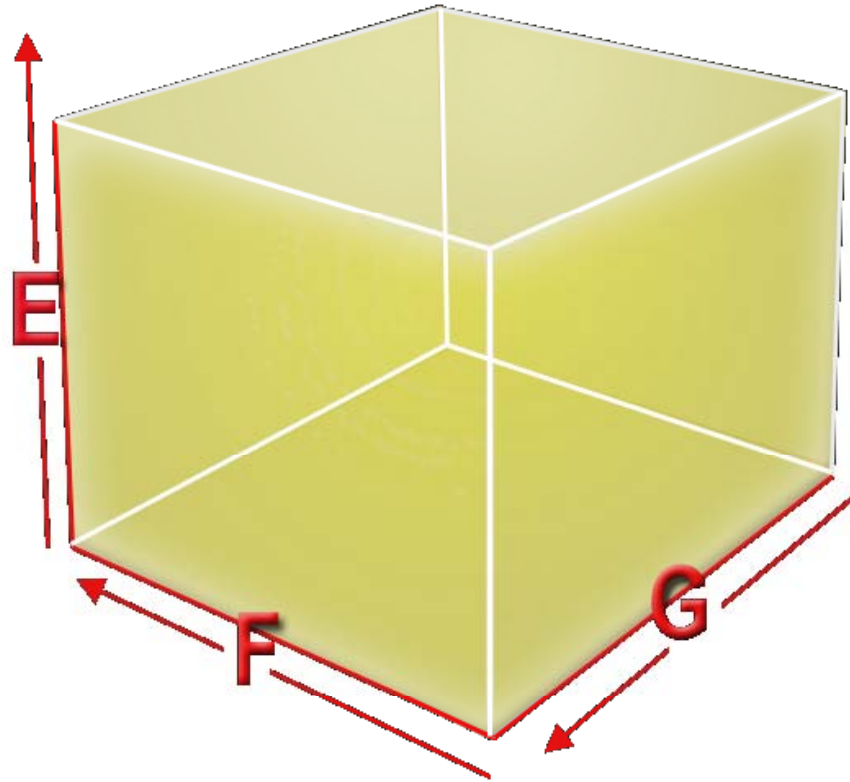
Though intuitively clear, but not supported by rigorous guidelines or codes for the various categories

Sources:

http://www.unece.org/ie/se/pdfs/UNFC/nov05/9nov/Blystad_NorPetDirect_9Nov1.pdf
or http://www.ssb.no/ocg/blystad_unfc_oslocitygroup2006.ppt

METHODS OF MINERAL RESERVE AND RESOURCE CLASSIFICATION

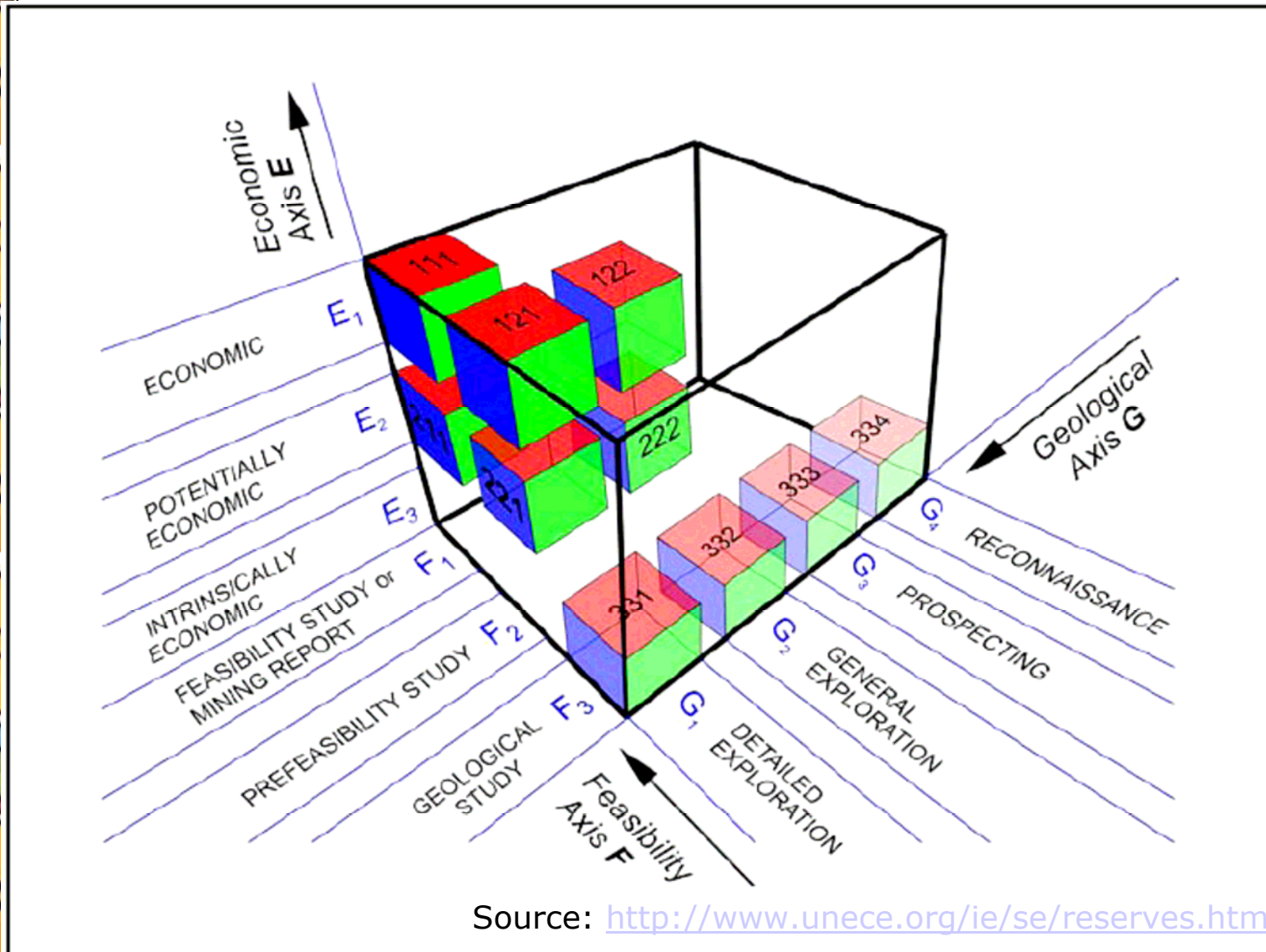
UNFC (accepted by Governments);



economic and commercial viability (\bar{E});
field project status and feasibility (F);
geological knowledge (G)

METHODS OF MINERAL RESERVE AND RESOURCE CLASSIFICATION

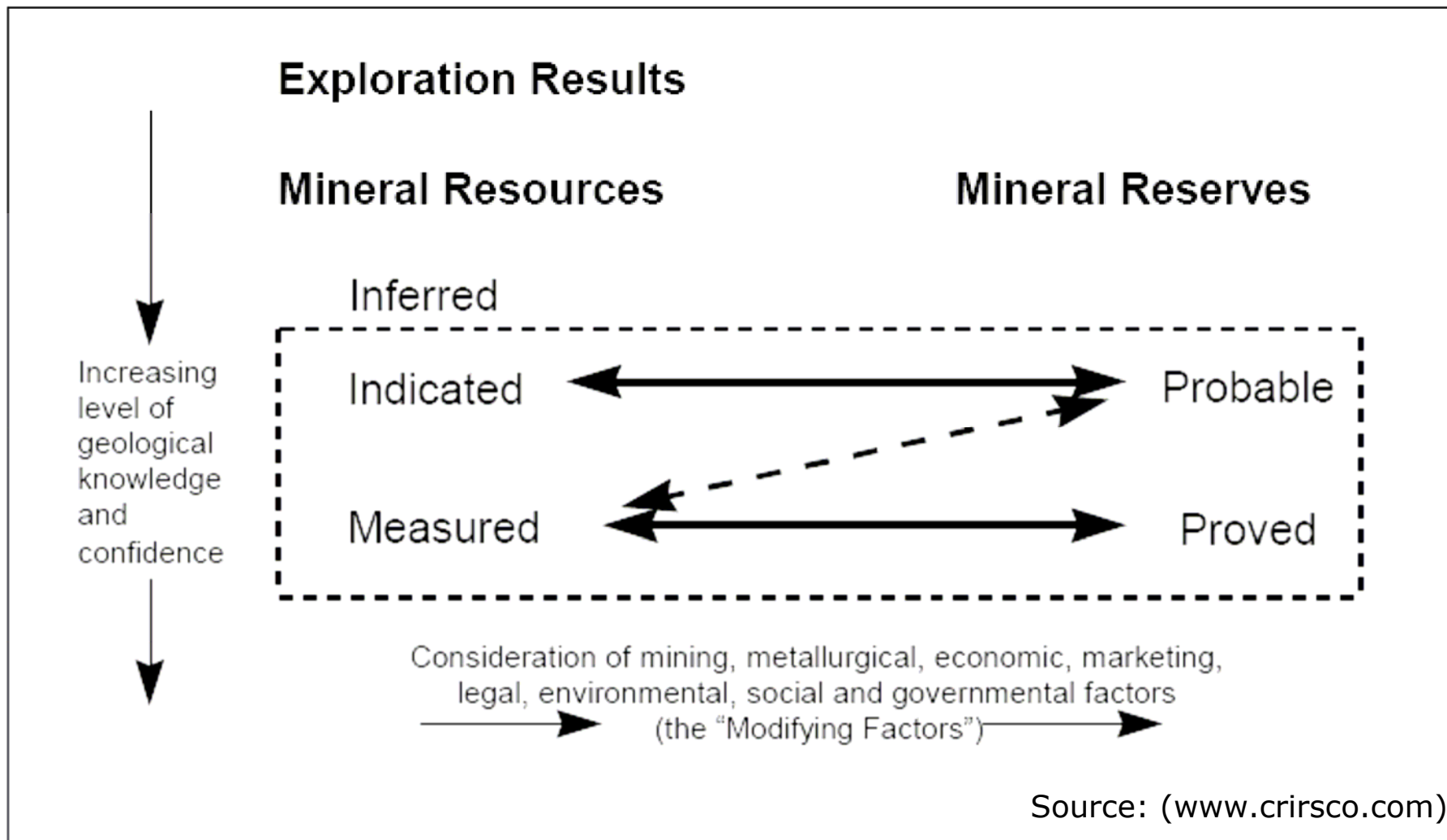
UNFC cont.



METHODS OF MINERAL RESERVE AND RESOURCE CLASSIFICATION

CRIRSCO-template (accepted by industry - CMMI)

(Committee for Mineral Reserves International Reporting Standards)



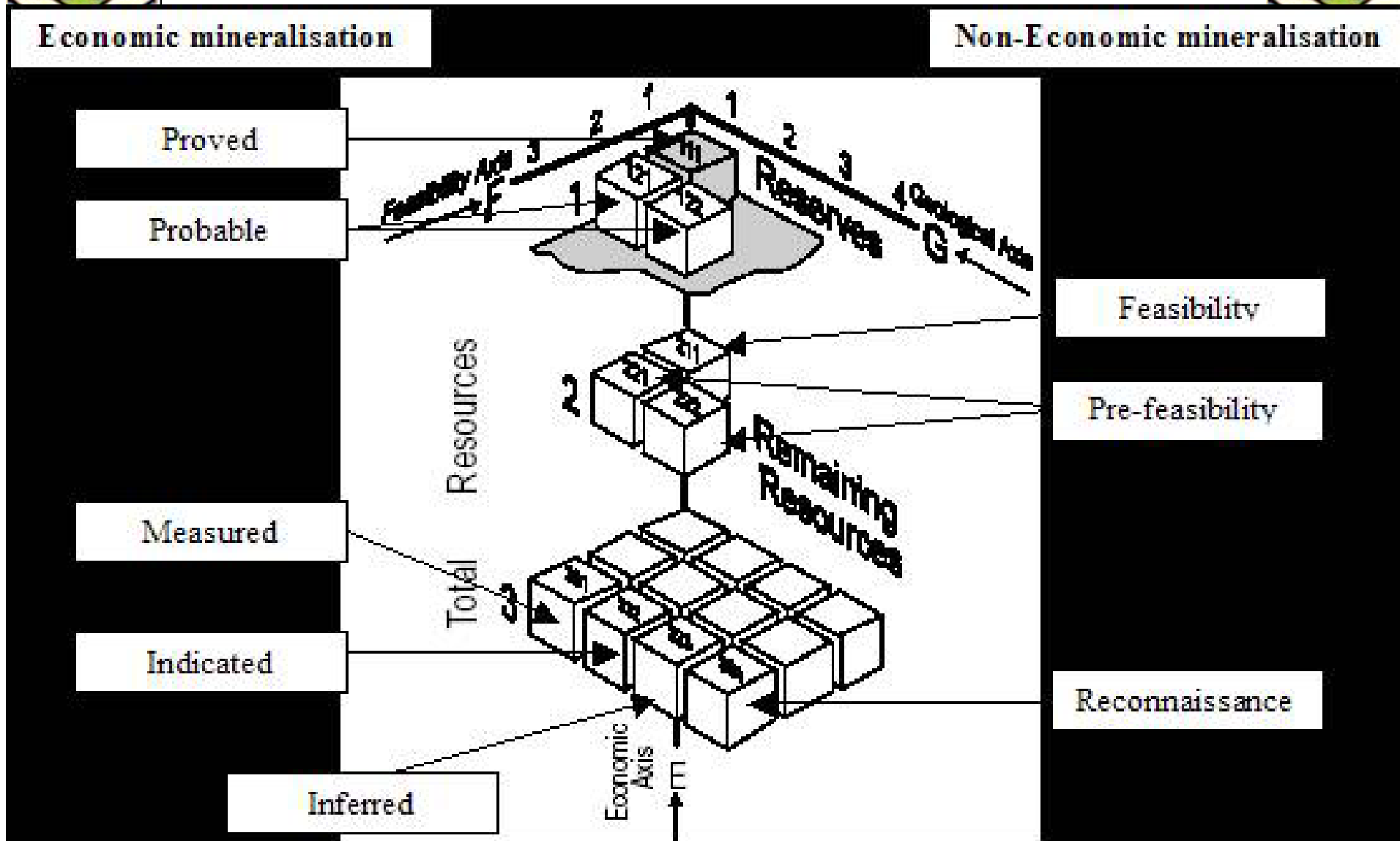
Source: (www.criusco.com)

COMPARISON

Economic materialisation		Non-Economic materialisation		McKelvey Box equivalent
CRIRSCO	UNFC	CRIRSCO	UNFC	
Mineral resources				Mineral resources
- inferred	333	- reconnaissance	334	- sub-marginal resources
- indicated	332	- pre-feasibility	221+222	- para-marginal resources
- measured	331	- feasibility	211	- para-marginal resources
Mineral reserves				Recoverable reserves
- probable	121+122			- probable
- proved	111			- proved

Source: Camisani-Calzolari, F. 2006. *CRIRSCO progress report*. Discussion paper presented at joint workshop of the UNFC and CRIRSCO in Geneva in October 2006

COMPARISON



Source: Camisani-Calzolari, F. 2006. *CRIRSCO progress report*. Discussion paper presented at joint workshop of the UNFC and CRIRSCO in Geneva in October 2006

COMPARISON

Petroleum and gas

SPE/WPC/AAPG/SPEE Reserves & Resources Classification System				United Nations Framework Classification			
Group	Class	Operational/Economic - based Sub-classes	Decision-based Sub-classes	Code E	Code F	Category Criteria	
	Production						
Discovered	Commercial	Reserves		1	1	Economic, Justified Development	
			Developed	1	1.2	Economic, Committed	
			Developed Producing	1	1.1	Economic, Producing	
			Developed Non-Producing	1	1.2.1	Economic, Committed, (Non-Producing)*	
			Undeveloped	Under Development	1	1.2.2	Economic, Committed ¹ (under development)
				Planned for Development	1	1.2.3	Economic, Committed ¹ (planned for development)
	Sub-commercial	Contingent Resources		2	2	Potentially Economic, Contingent Development Project.	
			Economic	Development Pending	1	1.3	Economic, Uncommitted ² (project in inventory)
				Development On Hold	2.1	2.1	Marginal Economic, Under Investigation
			2.1		2.2.1	Marginal Economic, On Hold ³	
			2.2		2.2.2	Marginal Economic, Unclarified ³	
	Sub-Economic	Development Not Viable	2.2	2.3	Sub-marginal Economic, Not Viable		
	Unrecoverable			3.3	3	Unrecoverable, Project Undefined	
Undiscovered	Potentially Commercial	Prospective Resources		3	3	Intrinsically Economic, Project Undefined ⁴	
			Prospect	3.2	3	Undetermined, Project Undefined ⁴	
			Lead	3.2	3	Undetermined, Project Undefined	
			Play	3.2	3	Undetermined, Project Undefined	
	Unrecoverable			3.3	3	Unrecoverable, Project Undefined	

Source: SPE. 2006. SPE/AAPG/WPC/SPEE *-progress report*. Geneva, and Camisani-Calzolari, F. personal communication.


RECOMMENDATIONS AS TO WAY FORWARD

- Industry (CMMI) has decided upon a way to classify minerals (CRIRSCO-template)
- Supported by various countries' own systems (SA = SAMREC-code)
- Countries are standardising on this code (also multi-nationals)
 - Industry = data providers
- UNFC & CRIRSCO has done much work under what has been called the “convergence” process
- Petroleum & gas, “convergence” process is moving forward
 - It is possible to map the two systems



RECOMMENDATIONS AS TO WAY FORWARD

- For StatsSA:
 - Get data from SAMREC as per CRIRSCO-template and convert to UNFC and publish info according to both methods jointly with SAMREC/Chamber of M.

 - For London-group:
 - Interact with UNFC & CRIRSCO (next joint meeting October, Geneva)
 - The SA board member of CRIRSCO is Ferdi Camisani-Calzolari. Camisani also chairs the Joint UNFC/CRIRSCO Committee at the UN (Geneva) and is one of the vice-presidents of the Ad-Hoc Group of Experts on Harmonisation of Reserve classification and terminology (AHGE), the UN body empowered to compile the UNFC. Sigurd Heiberg of SATOIL (Norway) is the chairman of AHGE.
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CONCLUSION

- South Africa has several natural resource accounts, but in various degrees of quality and finalisation (minerals, water, forestry, energy)
- There is no environmental quality account (an account that focuses on emissions and/or effluent)
 - But we have good supply&use tables
- But need to work on the integration of all these accounts and the up-scaling of it to be of use to the public, science community and policy-makers
- Though we've done some very exciting work on integrating modeling combining the SA SAM & the various accounts, further work is required

CONCLUSION

- As for mineral classification: Much work has been done on standardisation
- There appear to be “convergence” as to how to deal with minerals
 - Petroleum and gas is busy with the process
 - StatsSA to become member of SAMREC
- London-group to attend and participate at the next joint UNFC/CRIRSCO meeting

Thank you!!

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