




# **CLASSIFICATION OF SUBSOIL RESOURCES AND RESERVES**

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## **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				

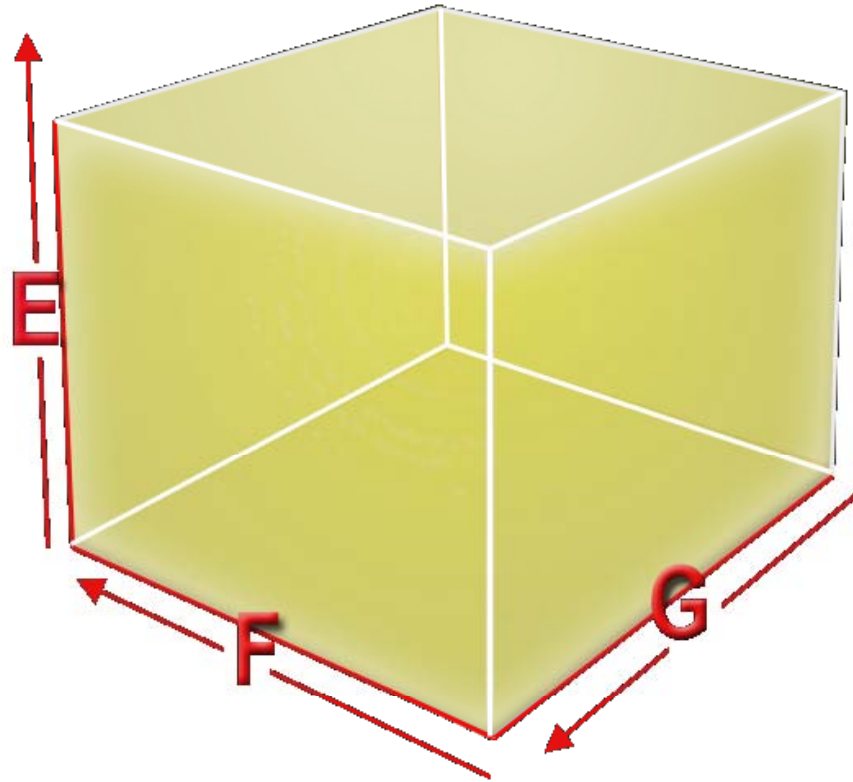
Though intuitively clear, but not supported by rigorous guidelines or codes for the various categories

Sources:

[http://www.unece.org/ie/se/pdfs/UNFC/nov05/9nov/Blystad\\_NorPetDirect\\_9Nov1.pdf](http://www.unece.org/ie/se/pdfs/UNFC/nov05/9nov/Blystad_NorPetDirect_9Nov1.pdf)  
or [http://www.ssb.no/ocg/blystad\\_unfc\\_oslocitygroup2006.ppt](http://www.ssb.no/ocg/blystad_unfc_oslocitygroup2006.ppt)

# METHODS OF MINERAL RESERVE AND RESOURCE CLASSIFICATION

UNFC (accepted by Governments);

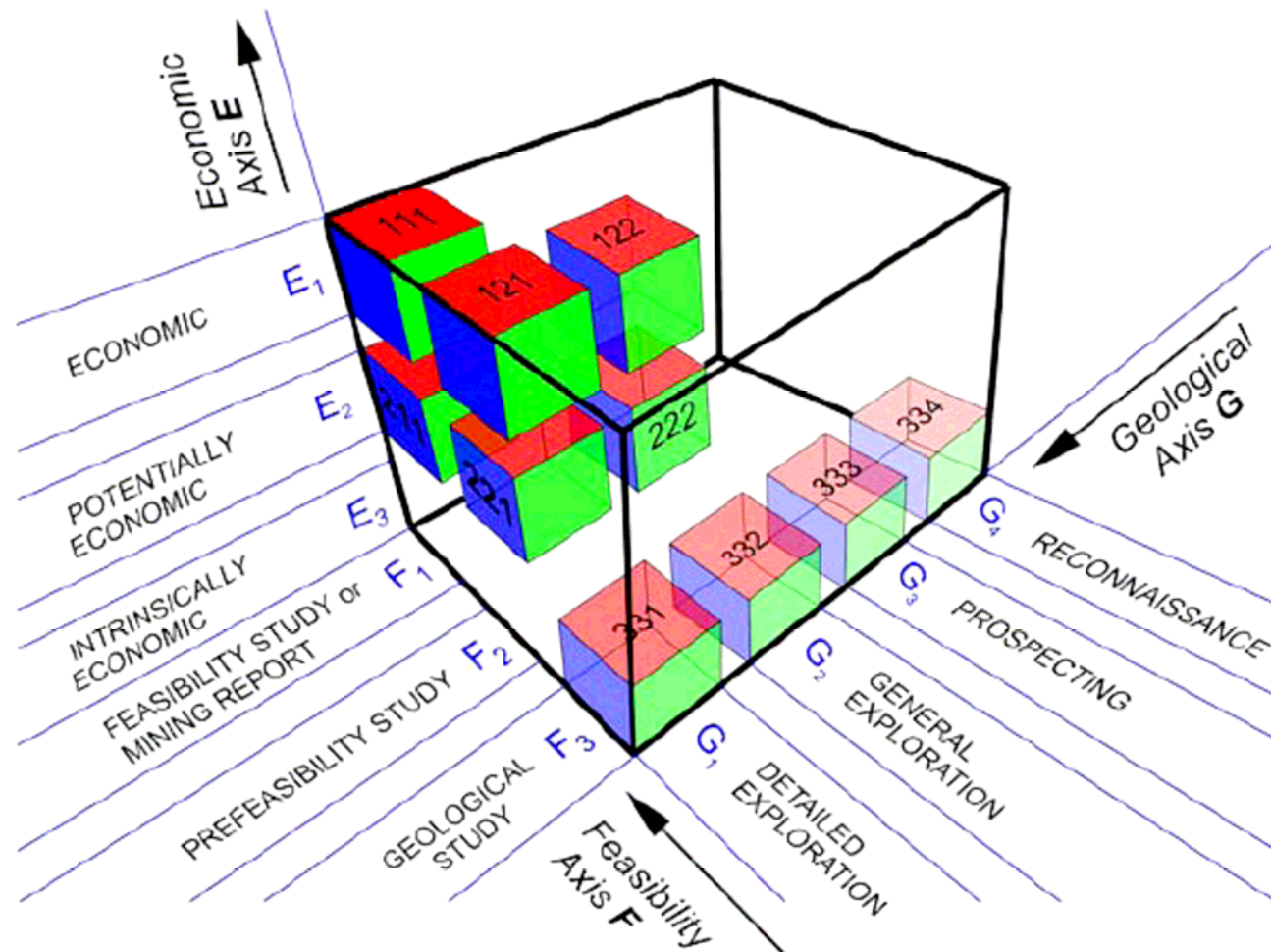


economic and commercial viability ( $\bar{E}$ );  
field project status and feasibility (F);  
geological knowledge (G)



# METHODS OF MINERAL RESERVE AND RESOURCE CLASSIFICATION

UNFC cont.

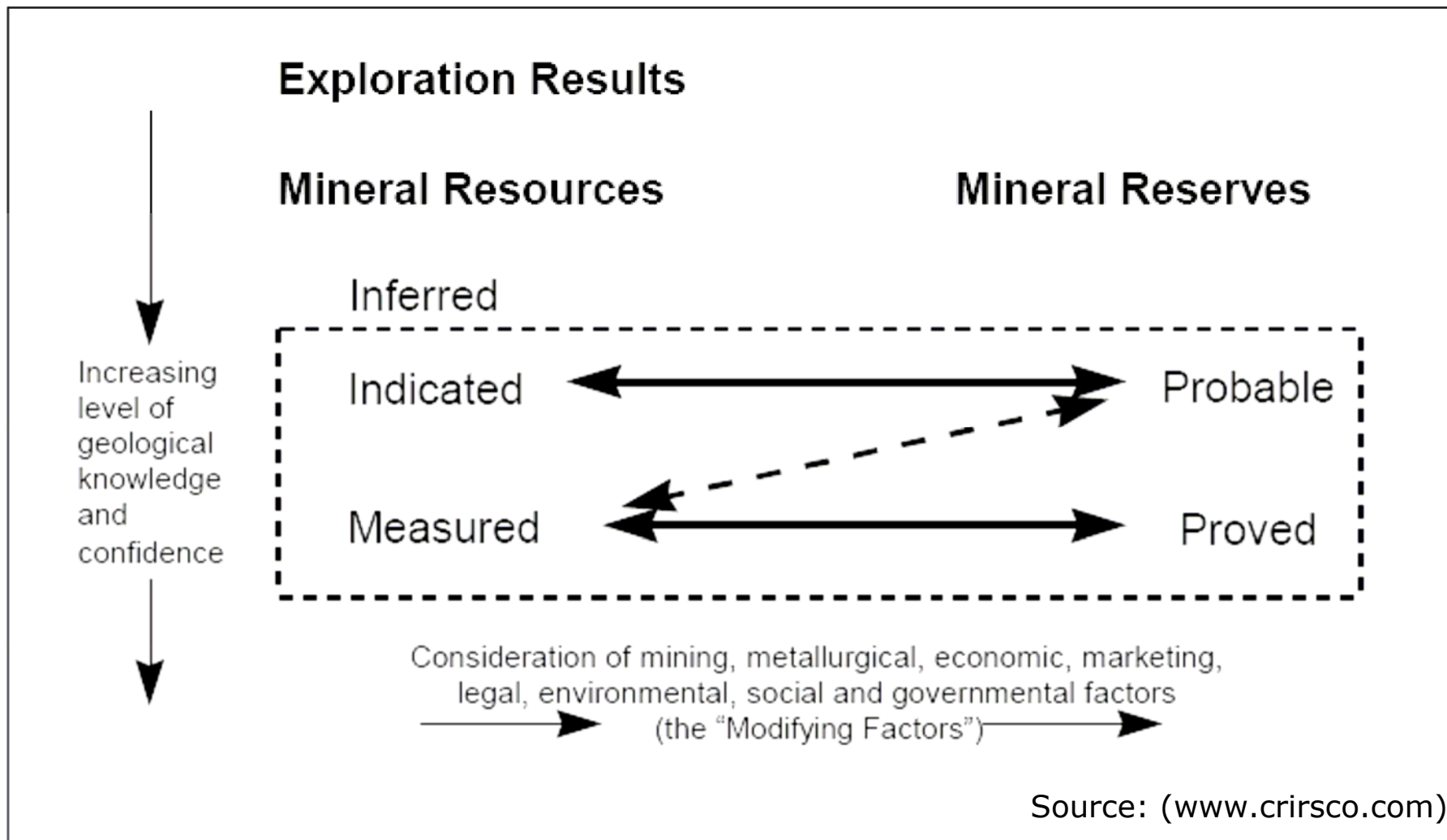


Source: <http://www.unece.org/ie/se/reserves.html>

# METHODS OF MINERAL RESERVE AND RESOURCE CLASSIFICATION

CRIRSCO-template (accepted by industry - CMMI)

(Committee for Mineral Reserves International Reporting Standards)



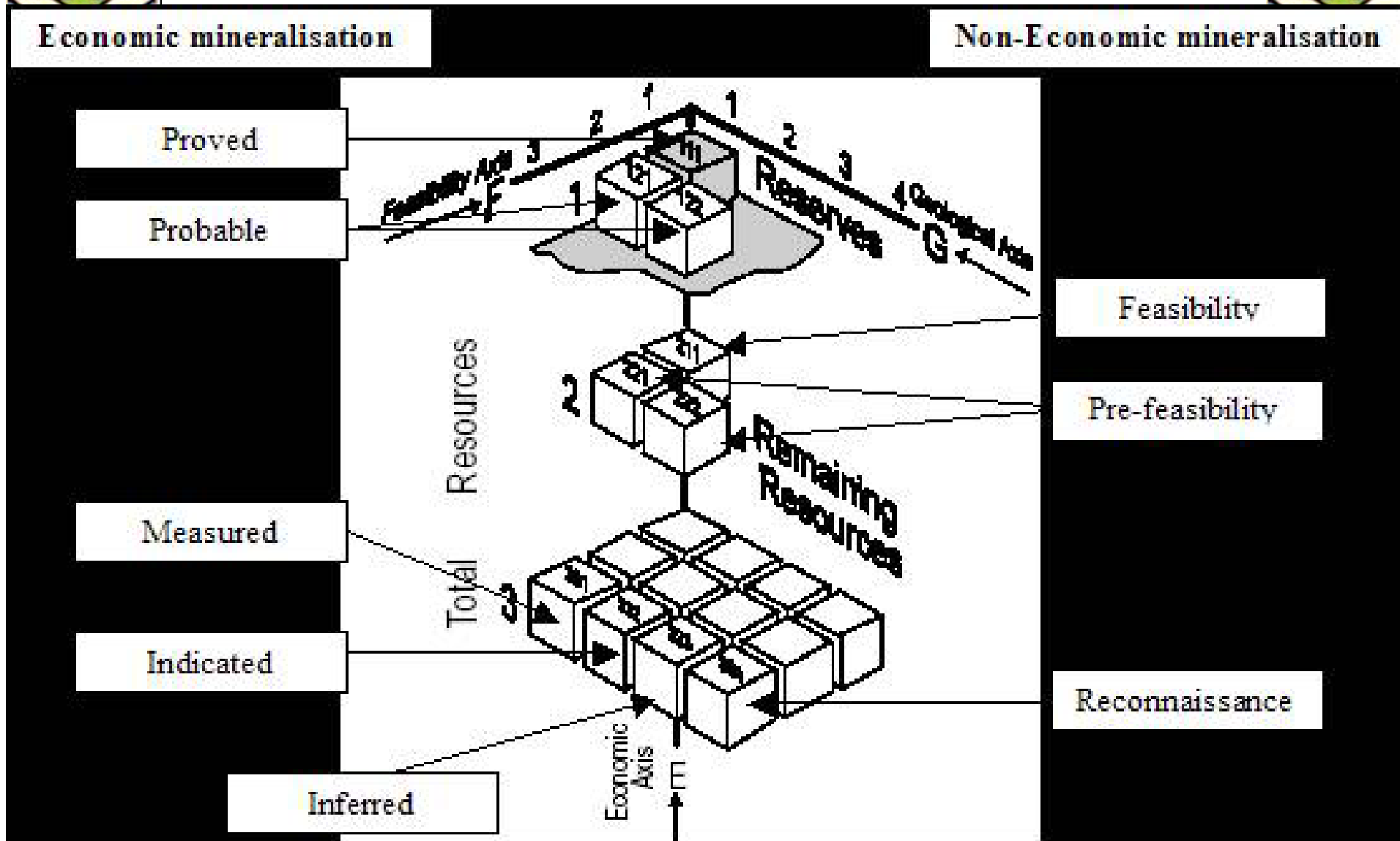
Source: ([www.criusco.com](http://www.criusco.com))

# COMPARISON

Economic materialisation		Non-Economic materialisation		McKelvey Box equivalent
CRIRSCO	UNFC	CRIRSCO	UNFC	
<b>Mineral resources</b>				<b>Mineral resources</b>
- inferred	333	- reconnaissance	334	- sub-marginal resources
- indicated	332	- pre-feasibility	221+222	- para-marginal resources
- measured	331	- feasibility	211	- para-marginal resources
<b>Mineral reserves</b>				<b>Recoverable reserves</b>
- 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	On Production	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 <sup>1</sup> (under development)
					1	1.2.3	Economic, Committed <sup>1</sup> (planned for development)
	Sub-commercial	Contingent Resources			2	2	Potentially Economic, Contingent Development Project.
			Economic	Development Pending	1	1.3	Economic, Uncommitted <sup>2</sup> (project in inventory)
					2.1	2.1	Marginal Economic, Under Investigation
					2.1	2.2.1	Marginal Economic, On Hold <sup>3</sup>
			Sub-Economic	Development Not Viable	2.2	2.2.2	Marginal Economic, Unclarified <sup>3</sup>
					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 <sup>4</sup>
			Prospect		3.2	3	Undetermined, Project Undefined <sup>4</sup>
			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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