



COMMITTEE FOR MINERAL RESERVES
INTERNATIONAL REPORTING STANDARDS



An overview of the CRIRSCO International Reporting Template and its
relationship with UNFC 2009

Roger Dixon

South Africa Representative, CRIRSCO

New Delhi Oct 30, 2013



Acknowledgements

Ministry of Mines Government of India

Ministry of Coal Government of India

Federation of Indian Mineral Industries (FIMI)



Jointly in association with;

United Nations Economic Commission for Europe



United Economic and Social Commission for Asia and the Pacific



World Bank

Presentation Agenda

- Overview of CRIRSCO
- CRIRSCO Members
- Potential Members
- International Reporting Template
- UNFC 2009
- Coal Reporting Specifics

CRIRSCO - Principle Objective

To promote best practice in the international public reporting of Mineral Exploration Results, Mineral Resources and Mineral Reserves.

CRIRSCO is an international advisory body without legal authority, relying on its constituent members to ensure regulatory and disciplinary oversight at a national level.

It recognises the truly global nature of the minerals industry and the agreed need for international consensus on reporting standards

Australasia:	JORC
Canada:	CIM
Chile:	Comisión Minera de Chile
Europe and UK:	PERC
Russia	NAEN
South Africa:	SAMREC
United States:	SME

Securities Exchange Recognition

ASX, NZX, PMSX Australasia:

JORC Code

CSA Toronto Canada:

NI-43101, CIM Standards

Santiago SX Chile:

The Code for the certification of
Exploration Prospects, Mineral
Resources and Ore Reserves

ESMA W Europe and UK:

All CRIRSCO aligned incl. (PERC)

AIM

CIM,IMMM, JORC, NAEN,
SAMREC, SME

Securities Exchange Recognition

- Hong Kong Exchanges (HKE) JORC, SAMREC NI 43-101
- NYSE and NASDAQ SEC Industry Guide 7
- SGX Singapore JORC, NI 43-101, PERC
- JSE South Africa: SAMREC Code
- Moscow, Russia NAEN Code

Argentina

Turkey

China

Scandinavia

Indonesia

Colombia

Mongolia

Spain

Peru

Philippines

INTERNATIONAL REPORTING TEMPLATE

for the public reporting of

EXPLORATION RESULTS, MINERAL RESOURCES AND
MINERAL RESERVES

JULY 2006

- Advisory only
- National Standards/Codes take precedence
- Model for development of new codes

- Reports prepared for investors or potential investors
- Annual Reports
- Quarterly Reports
- Information Memoranda
- Websites
- Public Presentations
- Stock Exchange Information Systems

- Materiality
- Transparency
- Competency

- Member or Fellow of professional body with enforceable code of ethics
- Five (5) years experience *relevant* to type of mineralization and deposit and the activity being undertaken

Team approach allowed but leader signs off.

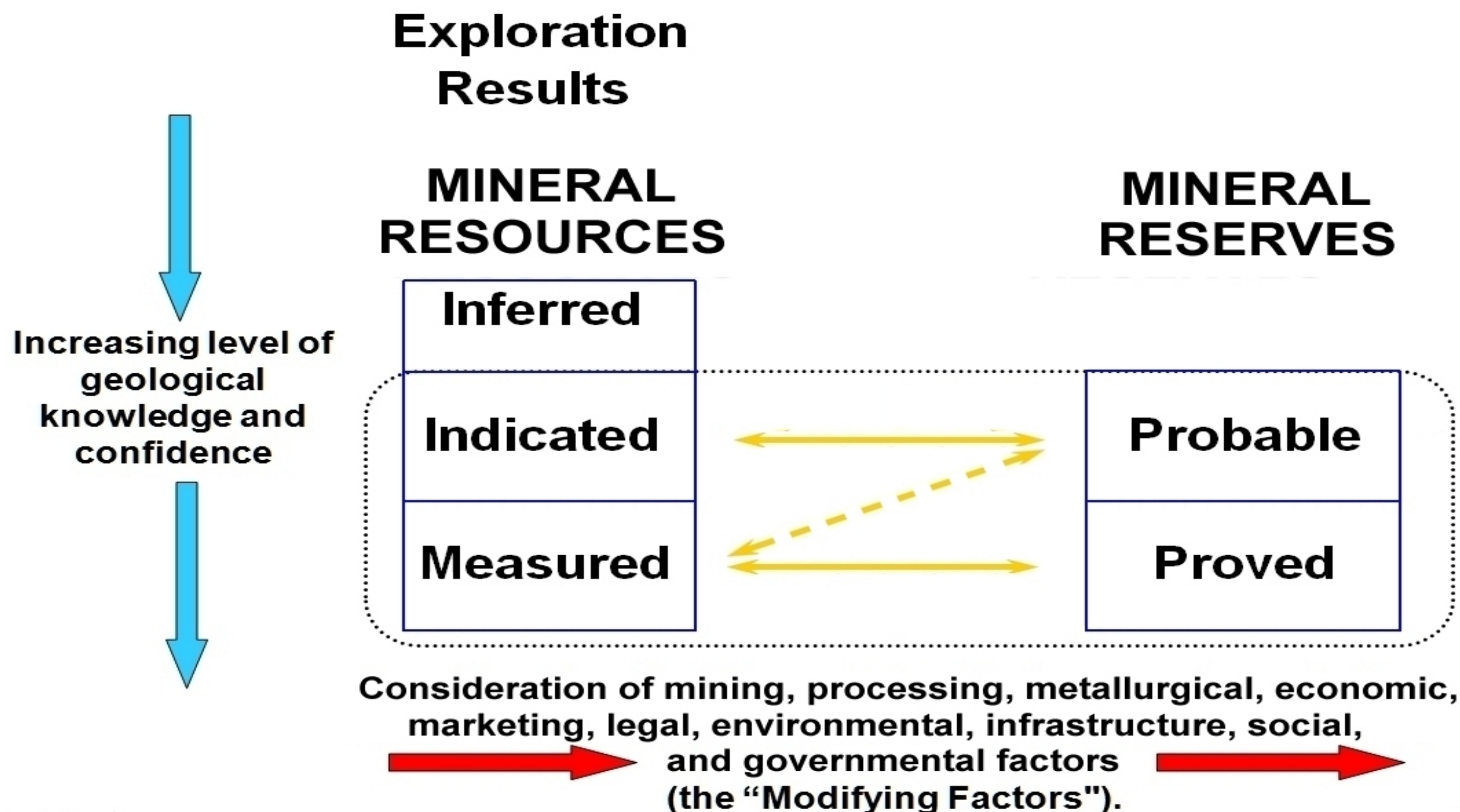
NB. Satisfied in own mind able to face peers and
demonstrate competence in the commodity, type of
deposit and situation.

Disciplinary Procedure

- Responsibility of National Reporting Organization (NRO)
- International agreements through Recognised Professional Organizations (RPO)

Australasian Institute of Mining and Metallurgy	AusIMM
Australian Institute of Geoscientists	AIG
Canadian Council of Professional Geoscientists	CCPG
European Federation of Geologists	EFG
The Geological Society	GS
Institute of Geologists of Ireland	IGI
Institute of Materials Minerals and Mining	IMMM
Mining and Metallurgical Society of America	MMSA
Society for Mining Metallurgy and Exploration	SME

Fundamental Framework



- Mining
 - **Processing**
 - Metallurgical
 - Economic
 - Marketing
 - Legal
 - **Environmental**
 - **Social**
- **Infrastructure**
 - Governmental

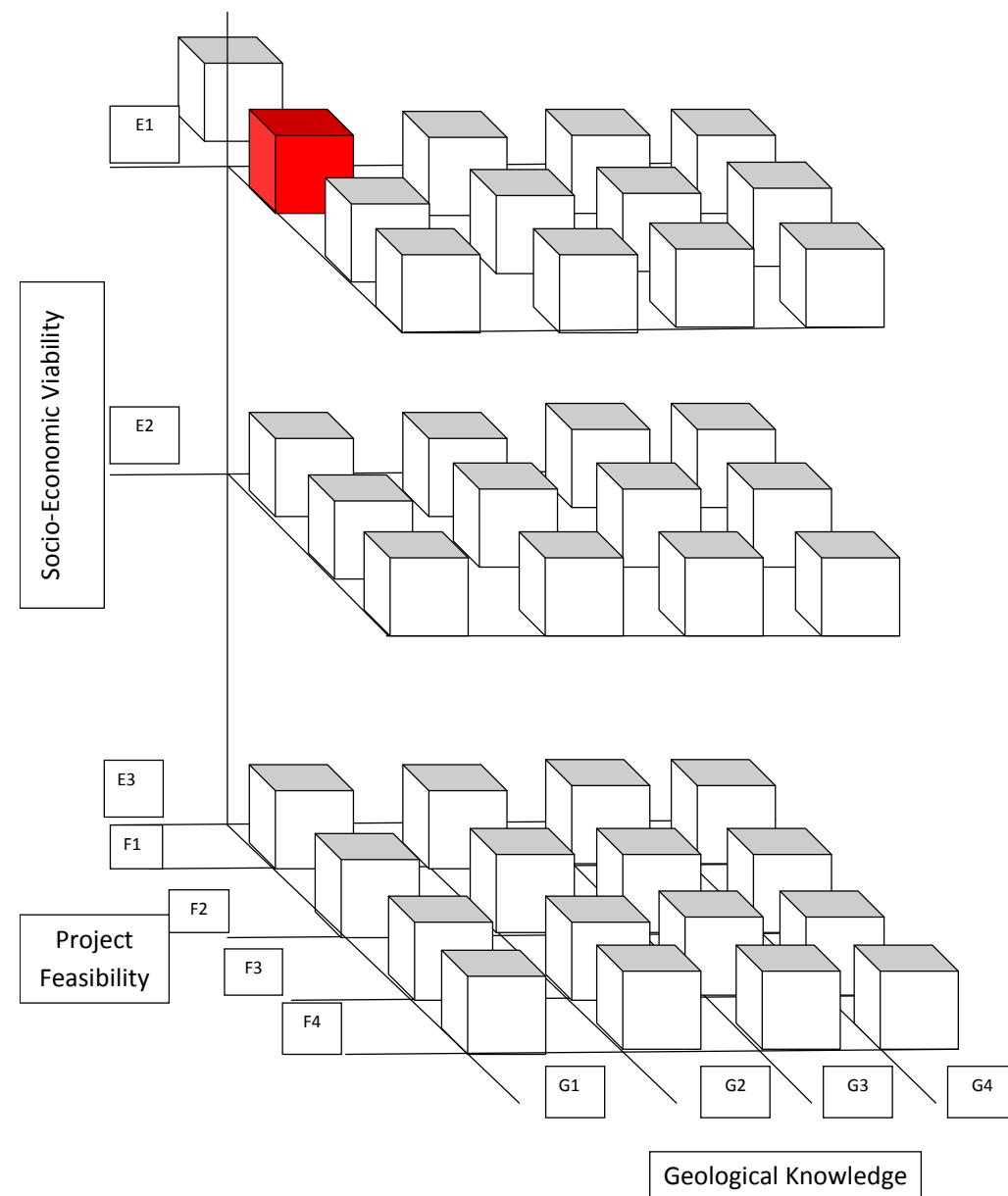
Concentration or occurrence of material of **economic** interest in or on the earth's crust in such form, quality and quantity that there are **reasonable** prospects for **eventual economic** extraction

Not an inventory of all mineralization!

- The **economically mineable** part of Measured and/or Indicated Mineral Resource
- Includes dilution and losses
- Appropriate assessments have been carried out and modifying factors have been considered
- Demonstrated at time of reporting extraction is reasonably justified
- Proven and Probable

The terms 'Mineral Resource(s)' and 'Mineral Reserve(s)', and the subdivisions of these as defined above, apply also to coal reporting, but if preferred by the reporting company, the terms 'Coal Resource(s)' and 'Coal Reserve(s)' and the appropriate subdivisions may be substituted

- ‘Marketable Coal Reserves’, representing beneficiated or otherwise enhanced coal product where modifications due to processing have been considered in addition to mining factors such as dilution, may be publicly reported in conjunction with, but not instead of, Coal Reserves.
- The basis of the predicted yield to achieve Marketable Coal Reserves **should be stated**.



UNFC (2009)

E1; F1; G1

(III)

CRIRSCO Template		UNFC-2009 “minimum” Categories			UNFC-2009 Class
Mineral Reserve	Proved	E1	F1	G1	Commercial Projects
	Probable			G2	
Mineral Resource	Measured	E2	F2	G1	Potentially Commercial Projects
	Indicated			G2	
	Inferred			G3	
Exploration Results		E3	F3	G4	Exploration Projects

G Axis

2004 - Stage of Exploration plus level of confidence

2009 – level of confidence in the estimate only

F Axis

2004 - Reserves F1 or F2

2009 - Reserves F1

Feasibility or pre-feasibility definitions dropped in 2009

UNFC 2009

- Reconnaissance (STD 334) 334
- Inferred (STD 333) 223
- Indicated (STD 332) 222
- Measured (STD 331) 221

- **All Coal Resources must be classified** into Inferred, Indicated and Measured Resources categories.
- Classification **based solely on borehole spacing**, and in particular the translation of a best practice borehole spacing from one coalfield to another coalfield is **not competent**.

For instance the use of “JORC classification” (as per Aus. Guidelines), just to “*up the Measured and Indicated tonnages*”, in Southern African coal deposits is misleading.

The continuity and confidence in typical Australian Coalfields like the Bowen Basin, is an “order of magnitude” better than the coalfields in Southern Africa.

- Generic system - solid minerals and fossil energy
- Framework classification not a reporting standard
- Allows for non economic mineralization
- No competency requirement
- No Securities Exchange recognition

Important tool for harmonized generic terminology at a level suitable for global communication

Acknowledgements



ALL SLIDES

WWW.CRIRSCO.COM

- 1999 Geneva accord solid minerals only
- 2004 UNFC common definitions modified -oil and gas added
- 2004 CRIRSCO re-engaged
- Member ad hoc group of experts - Mapping UNFC 2004, PRMS
- Member EGRC - UNFC 2009 and Specifications task force II

Exploration Results include data and information generated by exploration programmes that may be of use to investors but is not part of a formal declaration of Mineral Resources or Reserves

Tonnage and grade not to be reported!

- CMMI 1994
- Denver Accord 1997
- UNECE agreement November 1999
- CRIRSCO formed in Cairns, Australia 2002
- Template initiated Reston VA 2003, published 2006

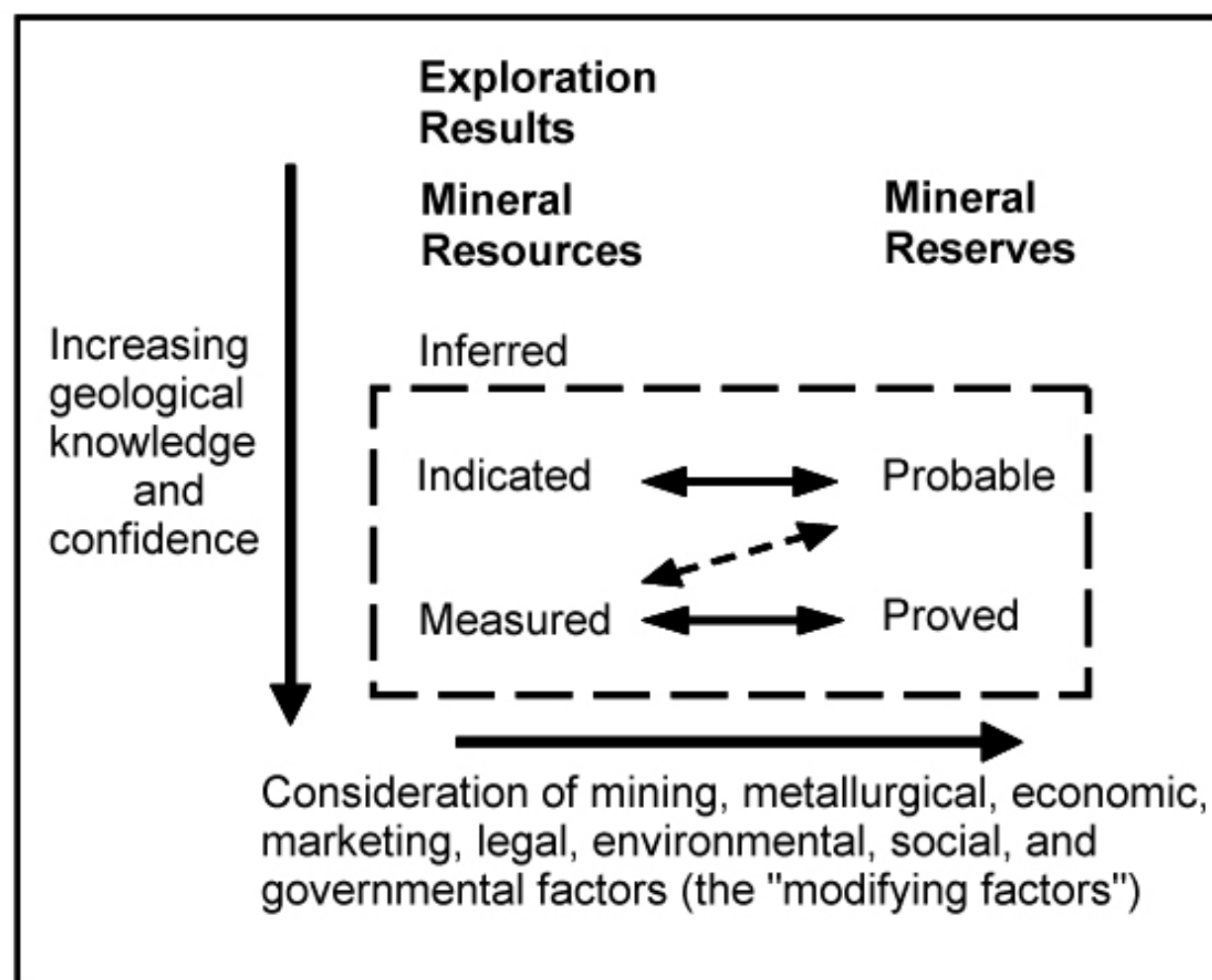
Mineral Resources/Reserves

- Must be clearly stated Mineral Resources are ***inclusive or exclusive*** of Mineral Reserves
- Two should never be added together
- If inclusive relevant details of unmodified resources should be reported

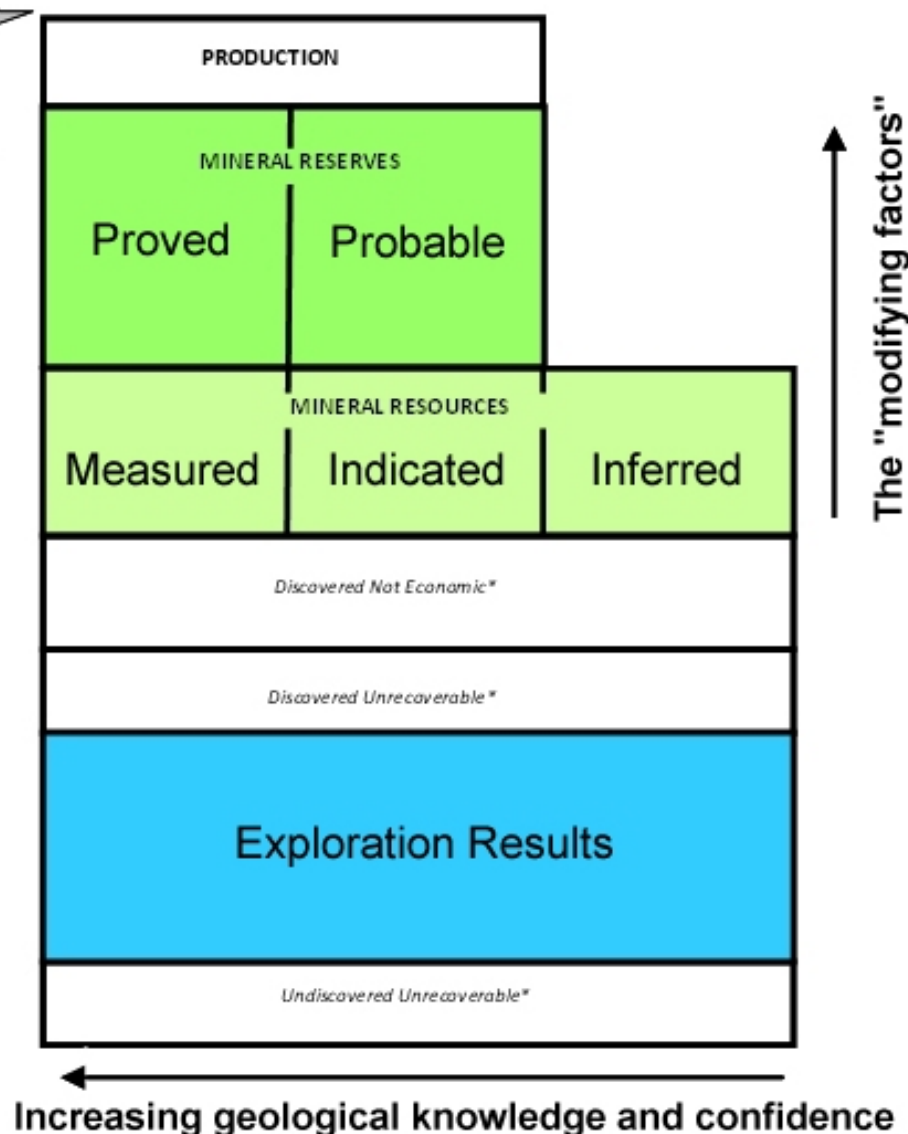
- 1999 Geneva accord solid minerals only;
- 2004 UNFC common definitions modified to include oil and gas;
- 2004 CRIRSCO re-engaged;
- Member ad hoc group of experts - Mapping UNFC 2004, PRMS
- Member EGRC - UNFC 2009 and Specifications task force II

CRIRSCO classification

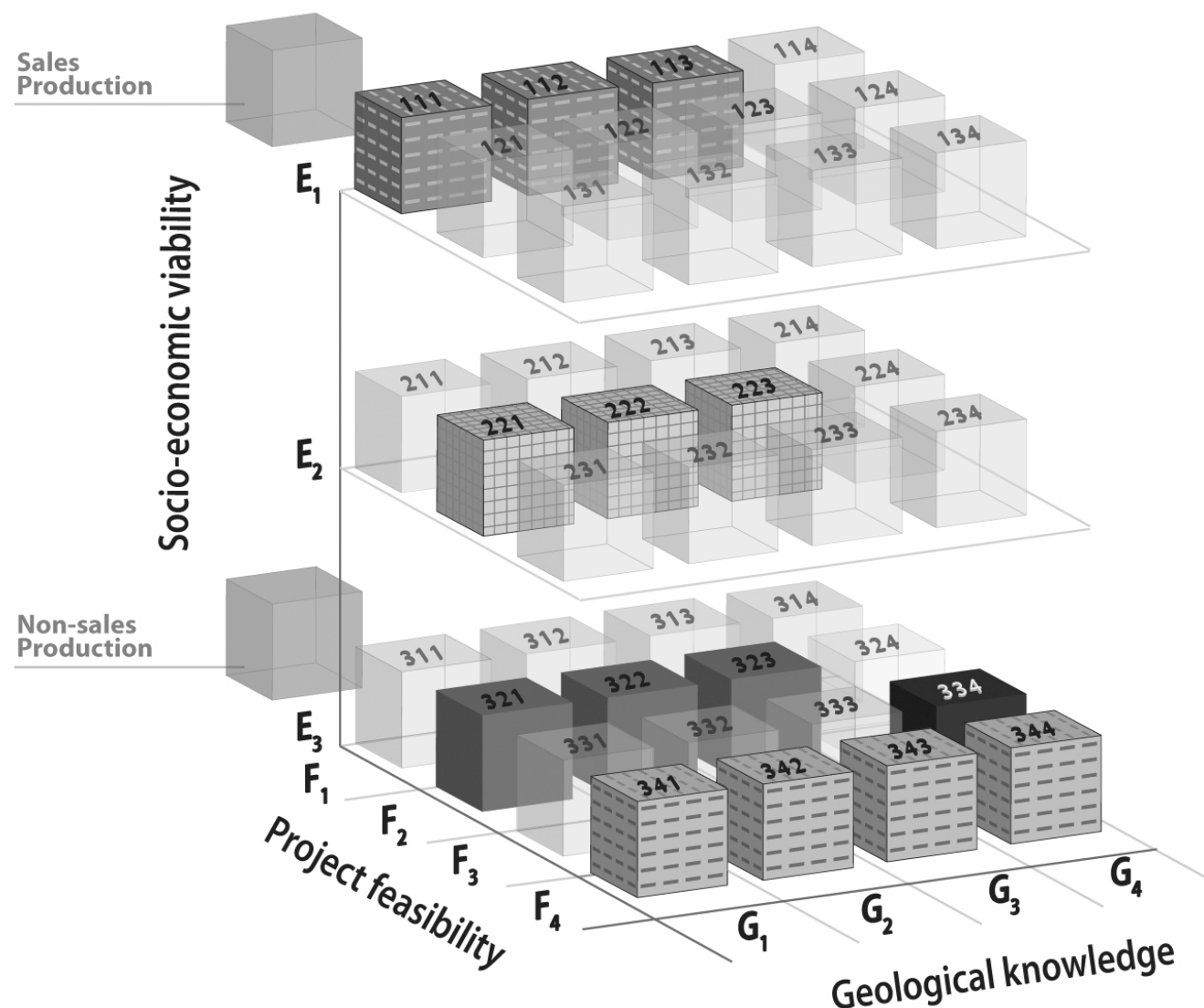
Re-oriented to align with Petroleum and UNFC



(a)



(b)



Generic, Principle based

3 Axis

Economic,

Feasibility,

Geological

Numerical code

Applied directly or as harmonizing tool

Total commodity initially in place	Production	Sales Production			
		Non-sales Production			
		Class	Categories		
			E	F	G
	Future recovery by commercial development projects of mining operations	Mineral Reserves	1	1	1,2
	Potential future recovery by contingent development projects or mining operations	Mineral Resources	2	2	1,2,3
		Discovered Not Economic	3	2	1,2,3
	Discovered Unrecoverable		3	4	1,2,3
	Potential future recovery by successful exploration activities	Exploration Results	3	3	4
	Undiscovered Unrecoverable		3	4	4

Compliance Issues

- Gross Tonnes In Situ is the only tonnage reported
- Mineability is not discussed, in terms of expected mining method and selectivity;
- the cut-offs are not applied and are not presented;
- Raw Coal Quality is not reported
- Theoretical Yield and Target Quality are not reported;
- Target Products and Markets are not discussed.
- Reasonable and realistic prospects of eventual economic extraction are not adequately motivated;

Compliance Issues

- Appropriate **Modifying Factors** have not been applied;
- Appropriate Coal Processing Modifying Factor **discounts** have not been applied to the Saleable Product;
- **Infrastructure Constraints** are not addressed;
- Coal Reserves are not based on a scheduled **Life of Mine Plan**;
- **Economic Model** has not been applied to the Life of Mine Plan;
- Coal Reserves must contain both **ROM** and **Saleable tonnage estimates** as well as the expected **Product Qualities**;

Coal Resource is in fact not a Coal Reserve