

December 2nd 2005 John A Clifford

**RESOURCE – RESERVE CLASSIFICATION
&
REPORTING**

A GLOBAL PERSPECTIVE

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PRESENTATION OUTLINE

- Why this is an issue worth considering
- Who are the Principal Global Players
 - Users
 - Actors
- How the Current Classification & Reporting Systems Operate
- The Future - Integration of Systems

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Minerals Presentation

WHY

**USES OF MINERAL RESOURCE AND
MINERAL RESERVE ESTIMATES**

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WHY

- We operate in a global capital and commodity market

BUT

- We have diverse reporting standards and terminology

THIS

- Hampers information flow and makes compilation and analysis difficult

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WHO

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**Who Wants Uniform
Global Standards?**


- Companies
- National and International Planners
- Lenders/Investors
- Regulators/Accountants

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Resource – Reserve Classification USERS


- **INDUSTRY**
 - Mine planning
 - Investment/development decisions
 - Property and company valuations
 - Acquisitions and disposals of properties
 - Debt and equity raisings
 - Financial, e.g. depreciation, etc.



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Resource – Reserve Classification USERS



- **COUNTRIES**
 - Assessment of Mineral Endowment
 - State Mineral Policy
 - State Statistical Accounting
 - Strategic Planning

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CONSIDER EUROPE

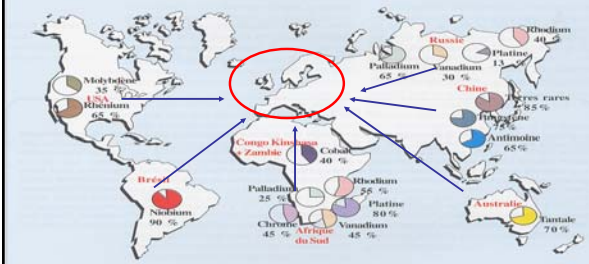
- European Union has a policy to become the most competitive and dynamic knowledge-based society in the world by 2010.

YET

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High Technology Minerals - EU dependency

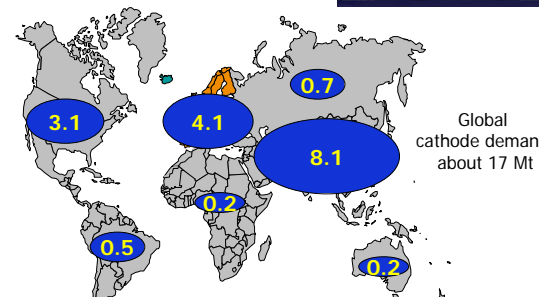


The metals to help make that a reality are imported

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Source: Dr. J Tesard BRGM, 2004

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Copper cathode demand by regions - 2004

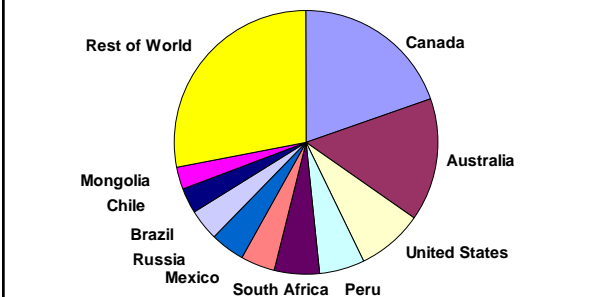


Global cathode demand about 17 Mt

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Source: Brook Hunt, September 2004

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2004 Mineral Exploration Investment



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Source: Minerals Economics Group

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Resource – Reserve Classification USERS

- FINANCIAL MARKETS
 - Investment Community
 - Investor Protection



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Mining Industry Capitalisation

Countries represented by CRIRSCO (excluding Chile, Peru, W Europe) account for >80% of mining industry stock exchange capitalisation. Figures at end-2004:

| | US \$M | % of World |
|--------------|---------|------------|
| UK | 151,578 | 35% |
| Canada | 76,936 | 18% |
| USA | 65,550 | 15% |
| South Africa | 37,240 | 9% |
| Australia | 12,154 | 3% |
| World | 429,638 | |

80%
of
World

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Resource – Reserve Classification USERS

INTERNATIONAL ACCOUNTING
STANDARDS BOARD



- Responsible for development of International Financial Reporting Standards (IFRS).
- As of 2005 general IFRR's are enforced in the European Union, Australia and South Africa.
- There is agreement with SEC to harmonise rules.
- Extractive Industry is on current Agenda.

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PROBLEM

- No common approach for mineral resource accounting
- No common disclosure for reserves and resources

BUT

- Resource measurement and disclosure vital for understanding a company's performance and value

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WHAT IASB WANT

Any reserve definition to be useful for financial reporting must reflect the following:

- Commerciality of reserves
- Likely future prices to be received for the reserves produced
- Quantities of production
- Timing of production
- Cost of production
- Taxes
- Discount rate
- Use of technology, existing and likely future

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IASB BOTTOM LINE

- The IASB have invited the “actors” to produce a global standard

OR

- They will produce one.

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ACTORS

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Resource – Reserve Classification ACTORS



Combined (Mineral) Reserves International Reporting Standards Committee

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Sponsoring Organisations

| | |
|-----------------------|--|
| Australia | Joint Ore Reserves Committee (JORC) |
| UK and Western Europe | IOM ³ Ore Reserves Committee |
| South Africa | South African Mineral Resource Committee (SAMREC) |
| Canada | Canadian Institute of Mining, Metallurgy and Petroleum (CIM) |
| Chile | Instituto de Ingenieros de Minas de Chile (IIMCh) |
| USA | Society for Mining, Metallurgy and Exploration (SME) |

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CRIRSCO Objectives

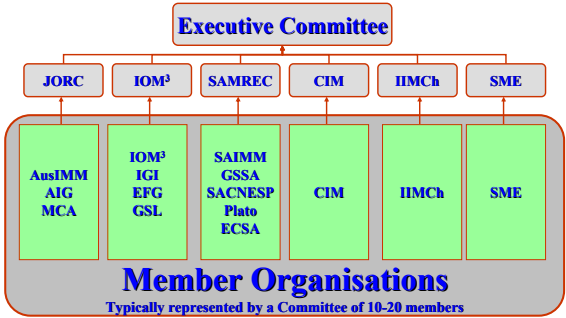
Promoting International Best Practice in the Reporting of Exploration Results, Mineral Resources and Mineral Reserves

- **Promote** uniformity, excellence and continuous improvement in national and international reporting standards through consultation, coordination and cooperation
- **Represent** the international minerals industry on resource and reserve reporting issues including discussions with international organisations, attending international meetings etc
- **Encourage** the continued development of international reciprocity of Competent/Qualified Persons through ROPO schemes
- **Facilitate** exchange of information and dialogue among CRIRSCO members and other stakeholders through the provision of an international reporting template.

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CRIRSCO Structure



Member Organisations
Typically represented by a Committee of 10-20 members

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Executive Committee

| | | |
|--------------------|----------------|----------------|
| Pat Stephenson | Australia | Joint Chairman |
| Niall Weatherstone | Australia/UK | Joint Chairman |
| Gordon Riddler | United Kingdom | Member |
| Ferdi Camisani | South Africa | Member |
| John Postle | Canada | Member |
| Edmundo Tulcanzana | Chile | Member |
| John Clifford | Ireland | Member |
| Jean Michel Rendu | USA | Member |

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Recognised Overseas Professional Organisations (ROPOs)

- A system for mutual recognition of professional bodies internationally
- Designed to enable Competent Persons to report internationally on Mineral Resources and Mineral Reserves
- Recognises the international nature of the mining business
- Many organisations now on the ROPO list with more being added

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Current list of ROPOs

- Institute of Materials, Minerals and Mining
- Geological Society of London
- Institute of Geologists of Ireland
- European Federation of Geologists
- American Institute of Professional Geologists
- Engineering Council of South Africa
- South African Council for Natural Scientific Professions
- Geological Society of South Africa
- South African Institute of Mining and Metallurgy
- South African Council for Professional and Technical Surveyors
- Professional Engineers Ontario
- Association of Professional Engineers and Geoscientists of British Columbia
- Association of Professional Engineers and Geoscientists of Manitoba
- Association of Professional Geoscientists of Ontario
- Association of Professional Engineers and Geoscientists of Newfoundland
- Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories
- Ordre des Geologues du Quebec

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Resource – Reserve Classification

ACTORS



- United Nation Economic Commission for Europe

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Background

- The United Nations Framework Classification has been developed over the past decade, primarily to facilitate the integration of resource classification systems operating within the former Soviet Union and other centrally planned economies into the market economic system.

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PROBLEM

- Centrally planned economies had no concept of economics when considering resource development.
- Thus a rigid classification system was developed
- No history of individual responsibility – the “competent person”.

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OUTCOME

- Resolution 2004/233 of United Nations Economic and Social Council (ECOSOC) invited Member States of the United Nations to implement the United Nations Framework Classification.

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Resource – Reserve Classification ACTORS

- Society for Petroleum Engineers
 - Supports goal of unified petroleum Reserves Definitions
 - Recognizes need for a transparent governance structure and process.

- Agrees that alignment with UNFC and IASB critical to achievement of SPE objectives

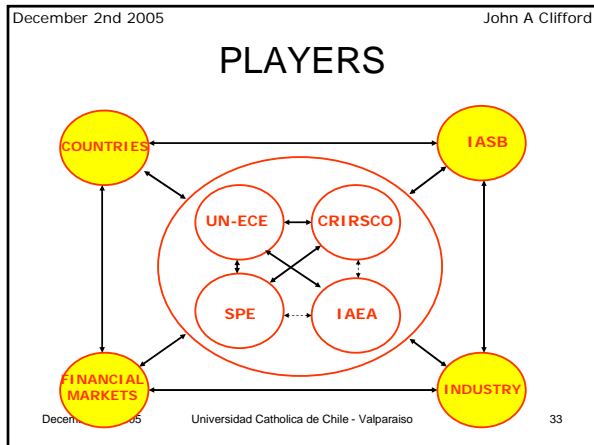
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Resource – Reserve Classification ACTORS

- International Atomic Energy Agency

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HOW

Current Resource Classification
&
Reporting Systems

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CRIRSCO

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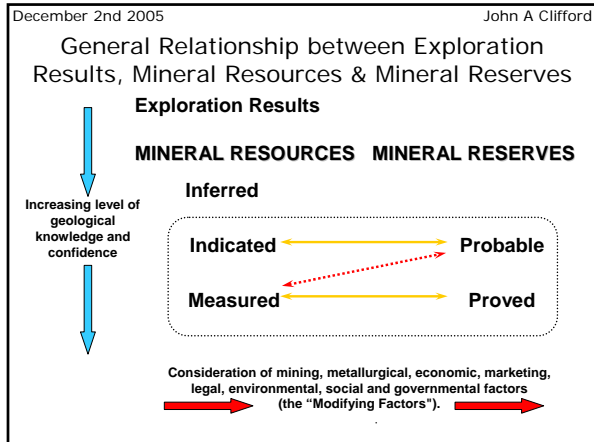
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Principles of CRIRSCO Code

CRIRSCO style reporting is targeted at the public, investors, banks, analysts etc rather than governments

- **Transparency**
 - clear and unambiguous presentation of information.
- **Materiality**
 - all the information reasonably required and expected
- **Competence**
 - public reports based on work undertaken by Competent Persons

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What CRIRSCO Template Does

- Sets **minimum standards for public reporting** of Exploration Results, Mineral Resources and Mineral Reserves
- Provides a mandatory system for **classification** of tonnage/grade estimates according to geological confidence and technical/economic considerations
- Provides **definitions** for mineral resource and ore reserve classes that are compatible with international agreements
- Requires Public Reports to be based on work undertaken by a **Competent Person**; describes the qualifications and type of experience required to be a Competent Person
- Provides extensive **guidelines** on the criteria to be considered when preparing reports on Exploration Results, Mineral Resources and Mineral Reserves

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What CRIRSCO Template Does Not Do

- **Regulate the procedures** used by Competent Persons to estimate and classify Mineral Resources and Ore Reserves (methodology)
- **Regulate companies' internal classification** or reporting systems
- Deal with **breaches of the Code by companies** (This is a function for the Stock Exchanges)
- Deal with **breaches by individuals**, these are dealt with under code of ethics of the relevant professional association

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Comparison of Reporting Standards

Level of study:
 1 = Appropriate assessments and studies as determined by Competent Person
 2 = Pre-Feasibility study, expected (UK) or required (Canada)
 3 = Feasibility study for new projects

| | Australia | Canada | UK/Europe | S Africa | Chile | Peru | USA-SME | USA-SEC | UNFC |
|--|-----------|--------|-----------|----------|-------|------|---------|---------|------|
| CRIRSCO type standard | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | X |
| Recognised by National Regulator | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | ✓ | X |
| Competent Person requirement | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | ✓ |
| Reporting of Mineral resources allowed | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | X | ✓ |
| Inferred resources allowed in economic studies | ✓ | X | ✓ | ✓ | ✓ | ✓ | ✓ | X | ✓ |
| Level of study required for ore reserves | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 3 | 2/3 |
| Commodity price process specified by regulator | X | X | X | X | X | X | X | ✓ | X |
| Reciprocal recognition of professional organisations | ✓ | ✓ | ✓ | ✓ | X | X | X | X | X |

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UNITED NATIONS FRAMEWORK CLASSIFICATION

"UNFC"

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FORMER SOVIET UNION

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FSU CLASSIFICATION

| | | | |
|----------|-----------|----------|--------------|
| Measured | Indicated | Inferred | Unclassified |
|----------|-----------|----------|--------------|

A + B

C1

C2

P1

P2 + P3

- Complexity Category
 - Uniform
 - Non-uniform
 - Complex
 - Extremely complex
- Shape Category
 - Large, simple, uniform
 - Large, uneven
 - Smaller, uneven
 - Smaller, complex
 - Small, pockets

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UNFC – BASIC ELEMENTS

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United Nations Framework Classification

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Comparison of UNFC with CRIRSCO-Style Reporting Standards

| UNFC | CRIRSCO-Style |
|--|--------------------------------------|
| 3-dimensional | 2-dimensional |
| 41 possible categories* | 5 possible categories |
| Government + market reporting | Market reporting only |
| No Competent Person | Competent Person |
| Not commonly used by "Western" banks etc | Commonly used by "Western" banks etc |

* 5 JORC-style categories incorporated into UNFC for market-related reporting

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RUSSIAN CLASSIFICATION FOR MINERAL RESERVES

| Feasibility Assessment Stages | Economic Viability Groups | Reserves/resources of explored and preliminarily assessed deposits | | | |
|------------------------------------|---|--|---|---------------------|--------------------|
| | | A | B | C ₁ | C ₂ |
| | | Measured Resources | | Indicated Resources | Inferred Resources |
| Feasibility Study or Mining Report | Economic | PD | | | |
| | Subeconomic | | | | |
| Prefeasibility Study | Intrinsically Economic | PB | | PB | |
| Initial Geological/Economic Study | Undetermined Economic Viability (operative booking) | | | | |

PD Proved Reserves

PB Probable Reserves

Marginal Resources

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INTERNATIONAL ATOMIC ENERGY AGENCY

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IAEA Classification

| | | | | | |
|-----------------------------|--------------------|--|---|--|------------------------------|
| Exploitable at costs | \$130 - \$200/kg U | Reasonably Assured Resources | Estimated Additional Resources I | Estimated Additional Resources II | Speculative Resources |
| | \$80 - \$130/kg U | Reasonably Assured Resources | Estimated Additional Resources I | Estimated Additional Resources II | Speculative Resources |
| | Up to \$80/kg U | Reasonably Assured Resources (Reserves) | Estimated Additional Resources I | Estimated Additional Resources II | |

Decreasing confidence in the estimates →

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THE FUTURE

INTEGRATION OF SYSTEMS

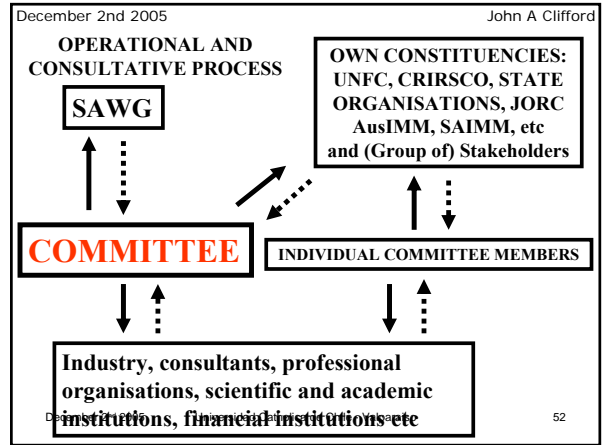
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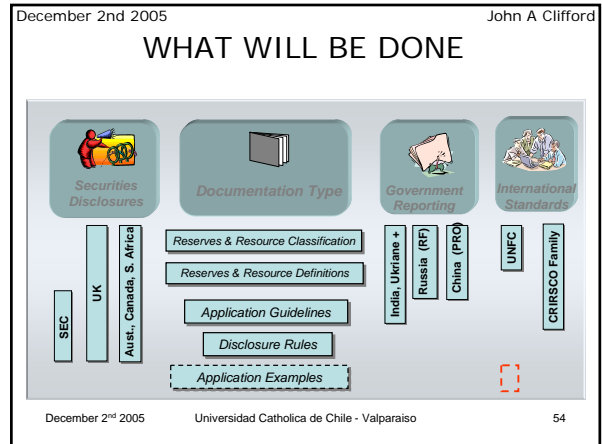
CRIRSCO – UN-ECE JOINT COMMITTEE

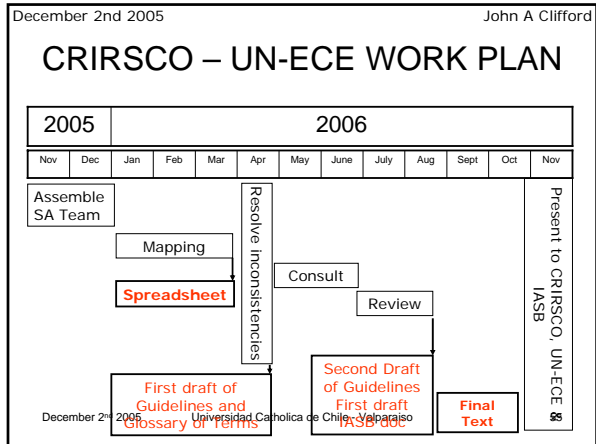
2005 - 2006
DRAFT WORK PLAN

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- ## DELIVERABLES
- Classification and Guidelines Document on the Main Framework System
 - Glossary of Terms
 - IASB “High Level” Summary Document
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For Further Information

- JORC (Australasia) www.jorc.org
- IMMM (UK) www.iom3.org
- CIM (Canada) www.cim.org
- SAIMM (South Africa) www.saimm.co.za
- SME (USA) www.smenet.org
- SEC (USA) www.sec.gov
- CRIRSCO www.crirSCO.com
- Chile www.minmineria.cl
- Peru www.bvl.com.pe
- EFG (Western Europe) www.eurogeologists.de
- IGI (Ireland) www.igi.ie

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