



RESOURCE REPORTING

THE FIRST STEP IN SUSTAINABLE MINING

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BY

JOHN CLIFFORD

(DEPUTY CHAIRMAN CRIRSCO)

AND

NIALl WEATHERSTONE

(CHAIRMAN CRISCO)



Committee for Mineral Reserves International Reporting
Standards
www.crirSCO.com

ICMM
International Council
on Mining & Metals



THE OPTIONS

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- “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

However

- Without development of Europe’s resources we are condemning future generations to dependency on others to supply their needs.



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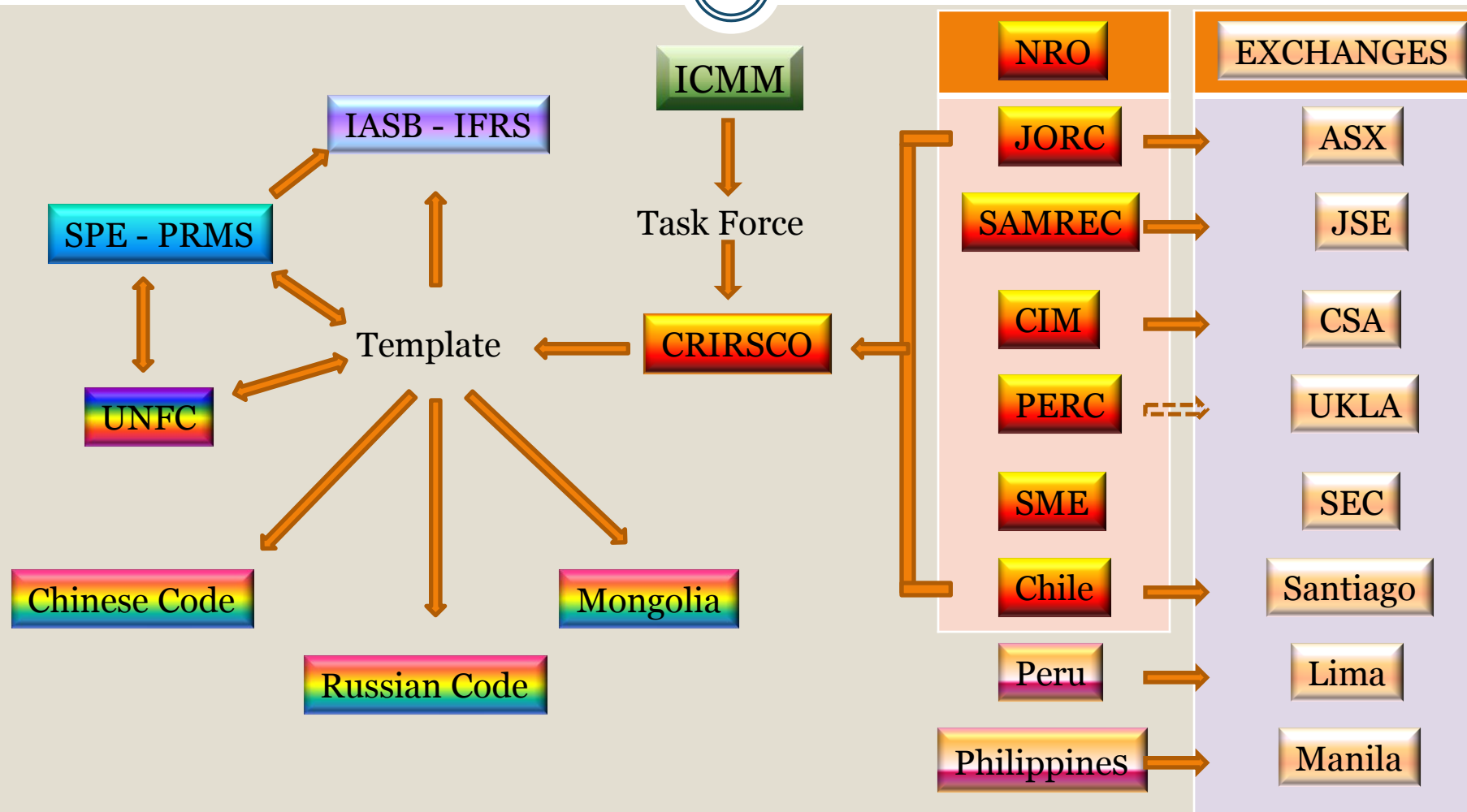
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ICMM and CRIRSCO

WHO ARE WE?



- ICMM is a CEO-led collaborative of 17 companies and 30 mining and commodity associations;
- It provides a means for joint action on sustainability related issues important to the mining industry
- With the objective of creating and maintaining an industry that is widely recognised as a key contributor to sustainable development





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THE RESOURCE BUSINESS

THE EXPLORATION PROCESS

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Concept



Budget



DATA ACQUISITION, VALIDATION, COMPILATION AND INTERPRETATION



Resource



RESOURCE
ESTIMATOR

ORDER OF
MAGNITUDE

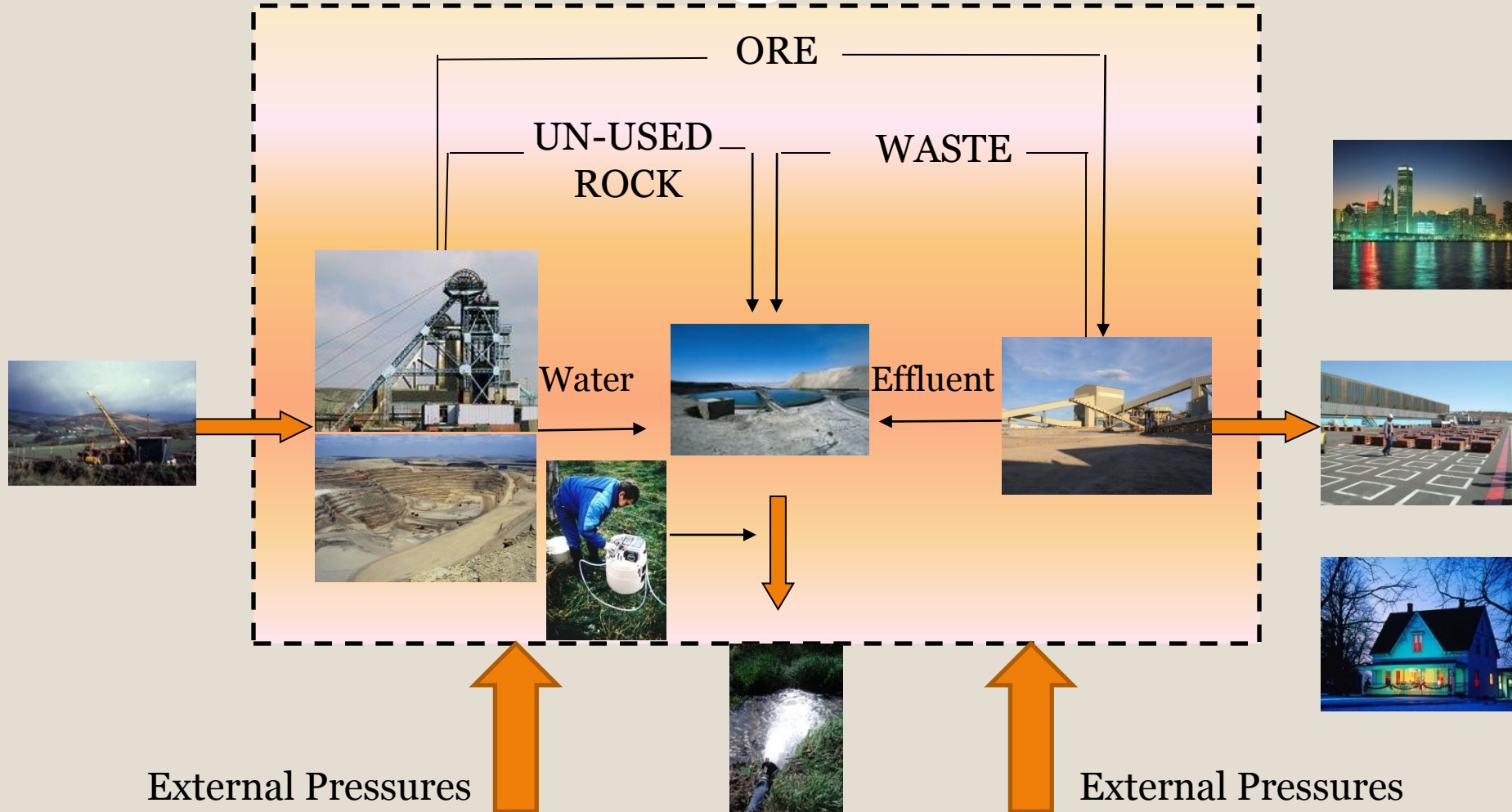
PRE-FEASIBILITY

FEASIBILITY



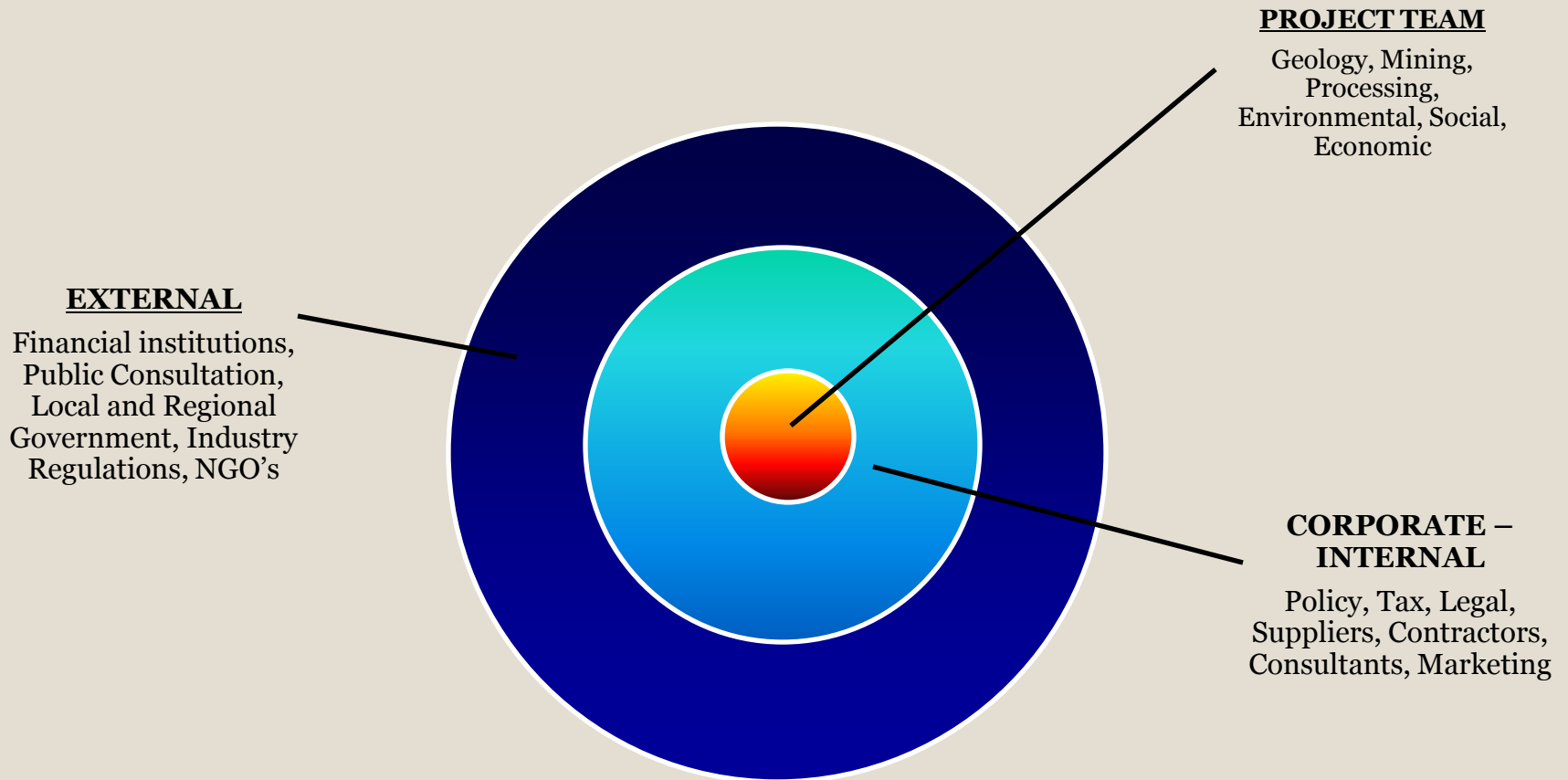
THE MINING BUSINESS

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ESTIMATION INFLUENCES

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ROLE OF RESOURCE ESTIMATOR

PERC CODE

THE COMPETENT PERSON

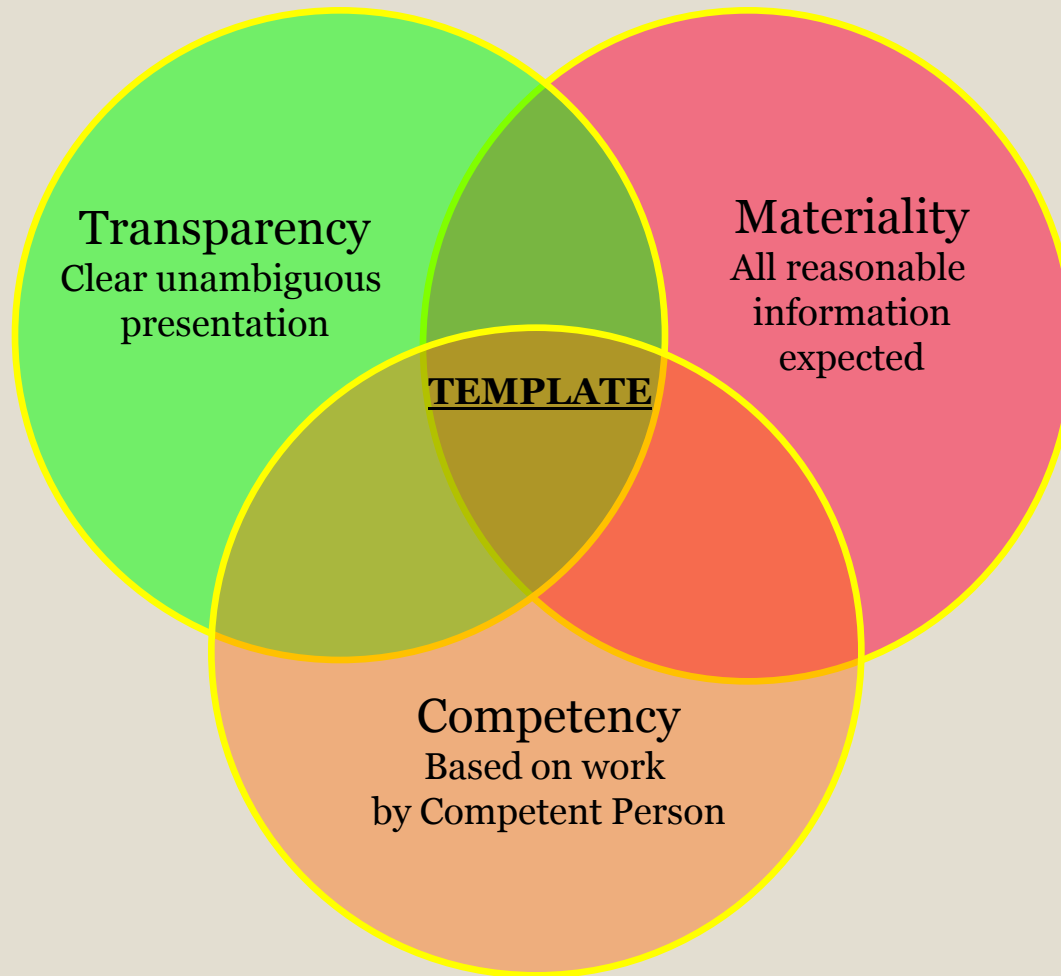
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Rules of Conduct and Guidelines

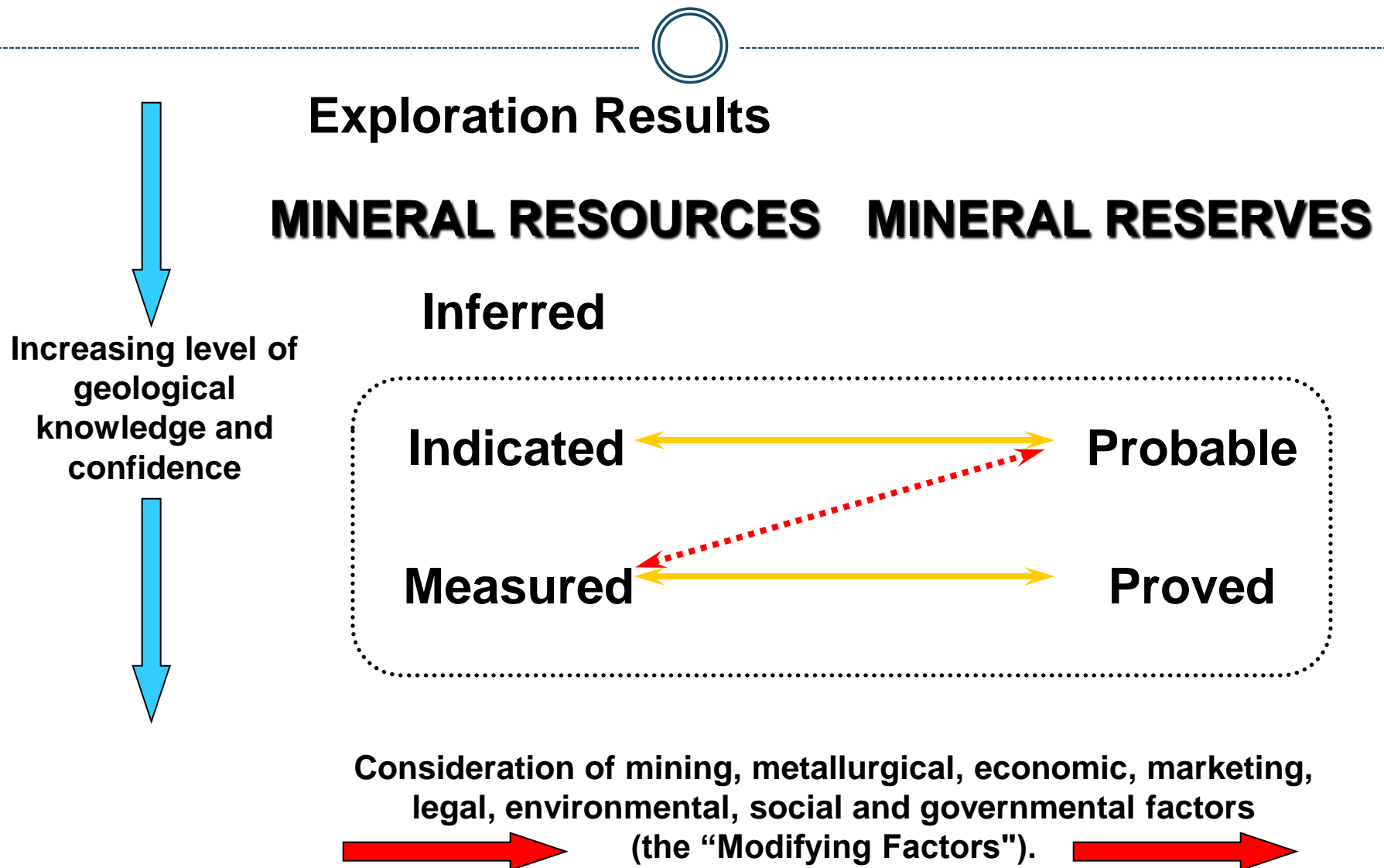
- Duty To:
 - The Public and Society;
 - The Profession, Employers and Clients;
 - Professional Bodies, Colleagues and Associates;
 - The Environment, Health and Safety

CRIRSCO STYLE CODES

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Relationship between Exploration Results, Mineral Resources & Mineral Reserves



MINERAL RESOURCE

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A Mineral Resource is an **estimate** of tonnage and grade for a mineralised body, based on sampling of that body.

The estimate represents a realistic inventory that, under assumed and justifiable technical and economic conditions, might, in whole or in part, have **reasonable prospects for eventual economic extraction**.

Portions of a deposit that do not have reasonable prospects for eventual economic extraction are **NOT** Mineral Resources

RESOURCE ESTIMATION

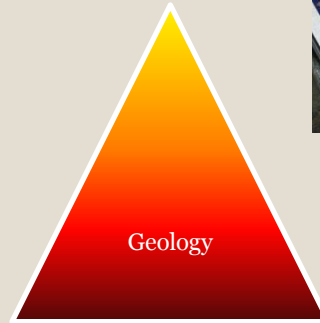
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- Geological Contacts
 - Lithological: Formation, Textural, Alteration, Metamorphic
 - Structural: Post- or Pre-mineral
- Geometallurgical Contacts: Density, Mineralogy, Metallurgy
- Grade Cut-off Contacts: Grade Continuity and Distribution

Mining Method



Geology



Processing Method



Geological Model: Continuity, Mineralogy, Grade

MINERAL RESERVE

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Economically mineable part of a Measured and/or Indicated Mineral Resource, **including additional material and losses** which may occur **when the material is mined**

Appropriately detailed technical/economic studies have been carried out which take into account **realistically assumed** mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors (the “**Modifying Factors**”)

These assessments demonstrate **at the time of reporting** that **extraction could reasonably be justified**

MODIFYING FACTORS

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Environmental Impact
Skills Required
Etc

Processing
Through
Put



Mining

Method, Dilution, Output

Mining

Geology

Geological Model: Continuity, Mineralogy, Grade

MODIFYING FACTORS

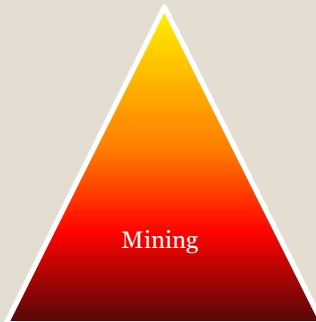
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EXTERNAL
ISSUES

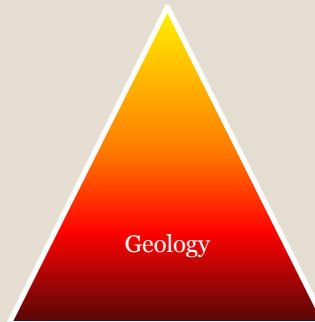


Disposal

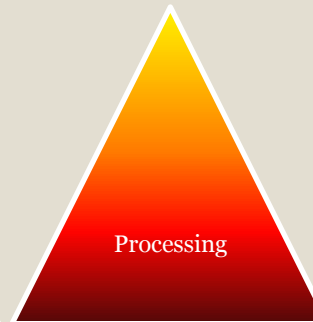
Mining
Method, Dilution, Output



Mining



Geology



Processing

Processing
Method, Recovery

Geological Model: Continuity, Mineralogy, Grade

MODIFYING FACTORS EXTERNAL ISSUES

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Social

Employment, Training, Community

Government

Regulations, Infrastructure

Mining

Method, Dilution, Output

Economic

Economic

Capital and Operating Cost

Marketing

Marketing

Product, Production Rate, Transport

Social

Environment

Environment

Emissions, noise, waste

Government

Legal

Legal

Title, Permitting

Mining

Geology

Processing

Processing

Method, Recovery

Geological Model: Continuity, Mineralogy, Grade



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THE BUSINESS CASE

MINERAL EXPLORATION INVESTMENT

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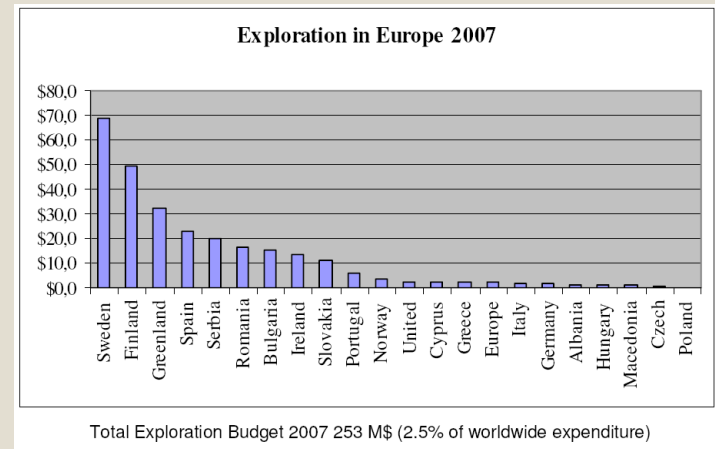
EUROPE

Copper – Zinc Consumption: 20 – 25%

Mine Production: 5%

Exploration Expenditure: 2.5%

Ref: Boliden 2008



Source: Fraser Institute

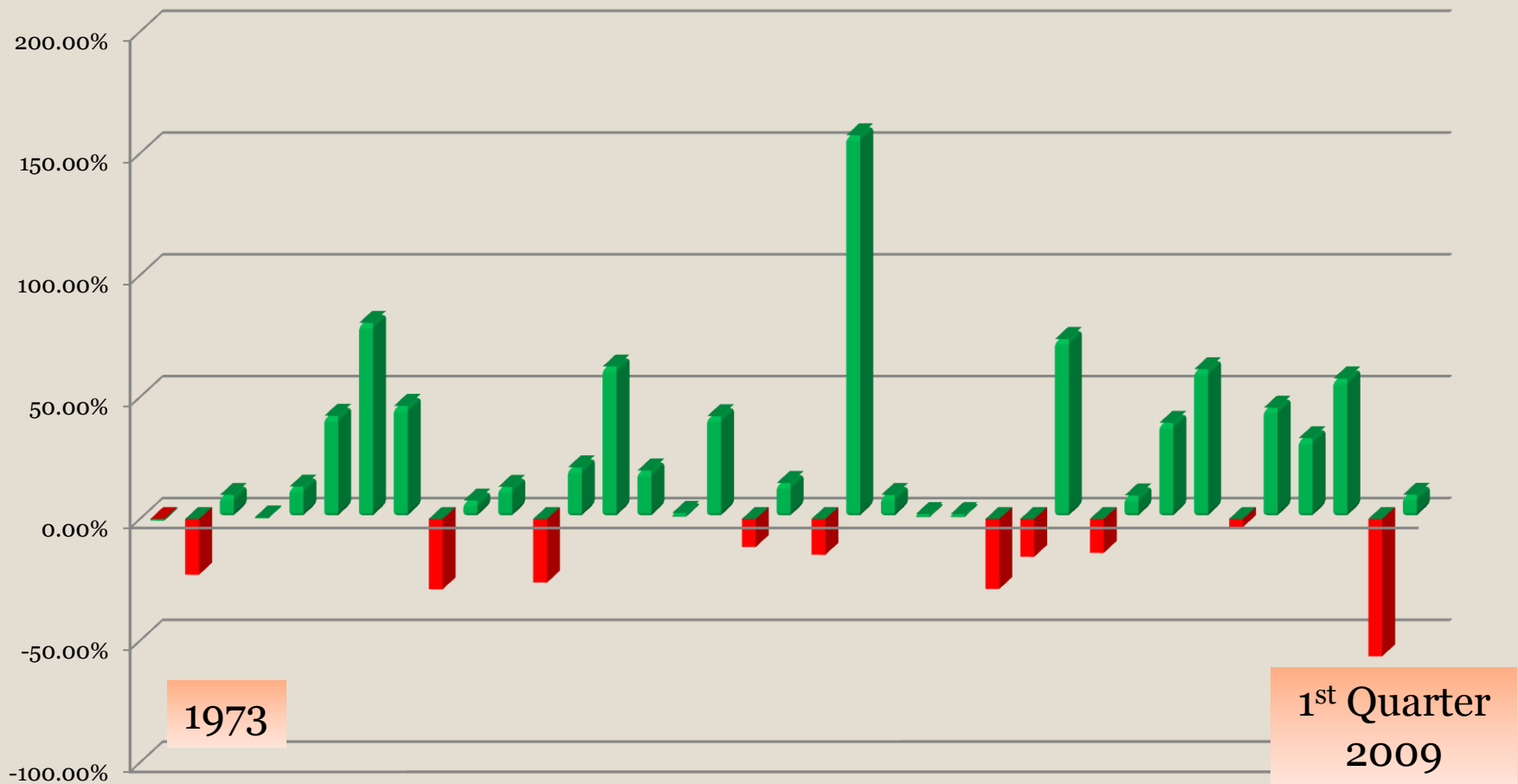
THE BUSINESS CASE

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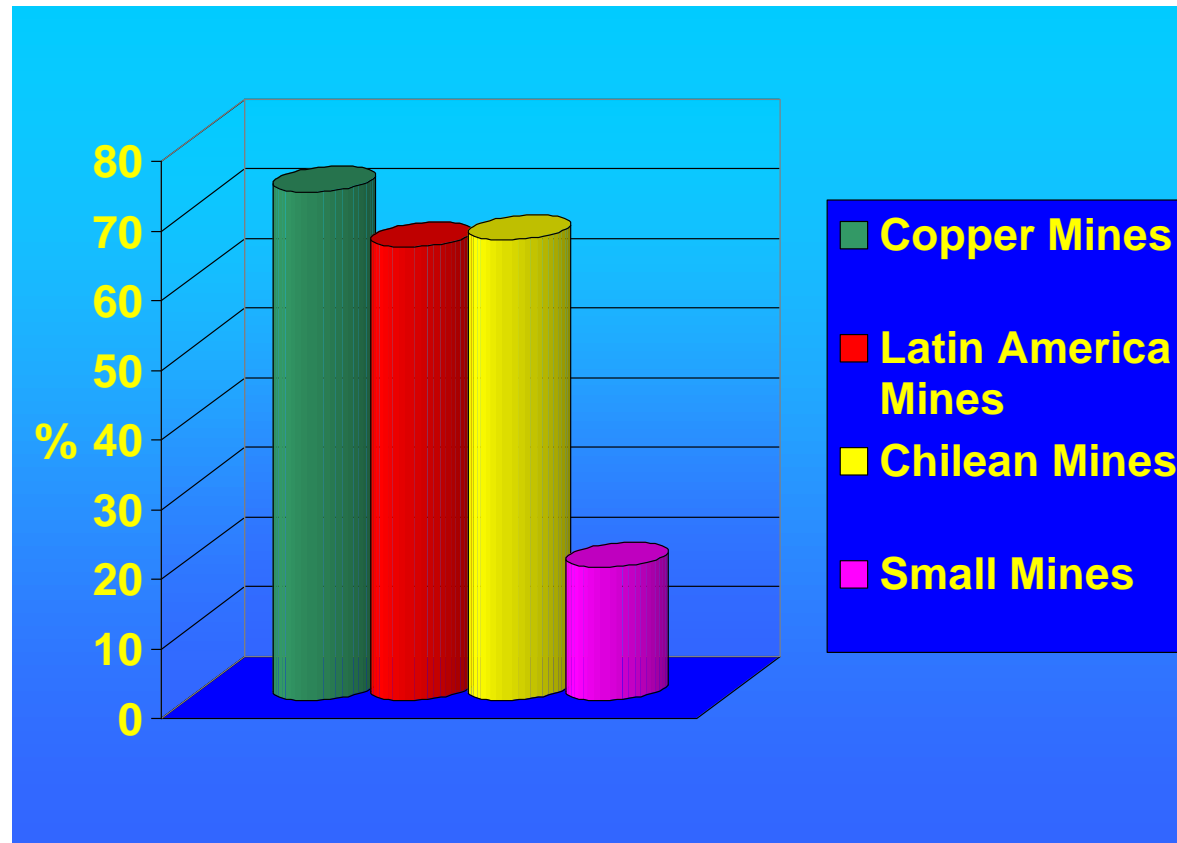
- The Equator Principles
 - Review & Categorization of Environment – Social Impact;
 - Social & Environmental Standards;
 - Action Plan & Management System of Impacts, Risks and Mitigating Actions;
 - Consultation & Disclosure;
 - Grievance Mechanism;
 - Independent Review;
 - Covenants to Comply, Report and Decommission;
 - Independent Environment and/or Social Expert;
 - Annual Reporting
- Applies to about 80% of world-wide project financing greater than US \$10M

ANNUAL SHAREHOLDER RETURN

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PROJECT SUCCESSES





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CONCLUSION

KEY POINTS



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SUSTAINABLE DEVELOPMENT IN MINING REQUIRES

- **REALISTIC AND RELIABLE MINERAL RESERVE ESTIMATES**
- **TO GENERATE ECONOMIC BENEFITS;**
- **TO JUSTIFY INCREASINGLY EXPENSIVE INVESTMENTS**
- **TO MANAGE RISKS AND EXPECTATIONS**
- **TRANSPARENT COMMUNICATION**



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FURTHER INFORMATION

Thank You

- ICMM

www.icmm.com

- CRIRSCO

www.criresco.com

- PERC

www.percreserves.com