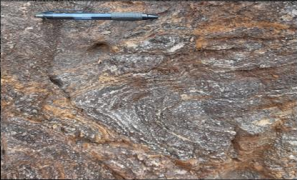



2

Importance of the ESG Aspects in Reporting of Mineral Resources




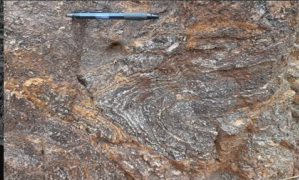
Presenter: Shameek Chattopadhyay, Director and Principal Consultant (Resource Geology)

Date: 21 December 2022, All India Geologists' Conference MEGECON 2022, Hosapete, India




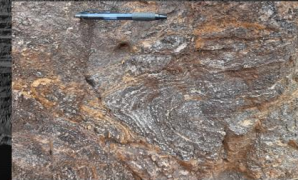
4

INTRODUCTION
About SRK Consulting
About the Presenter



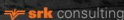
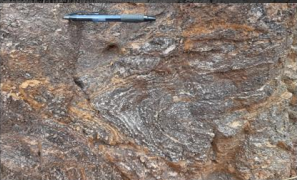
7

CONTEXT
Global Trends
What Do the Investors Want?
How Mining Industry is Responding?



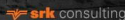
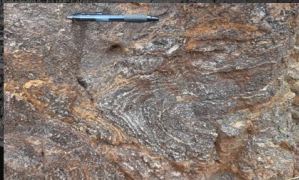
13

MINERAL RESOURCE REPORTING
Definition of Mineral Resource
The Concept of RPEEE
How ESG Aspects Fit into this?

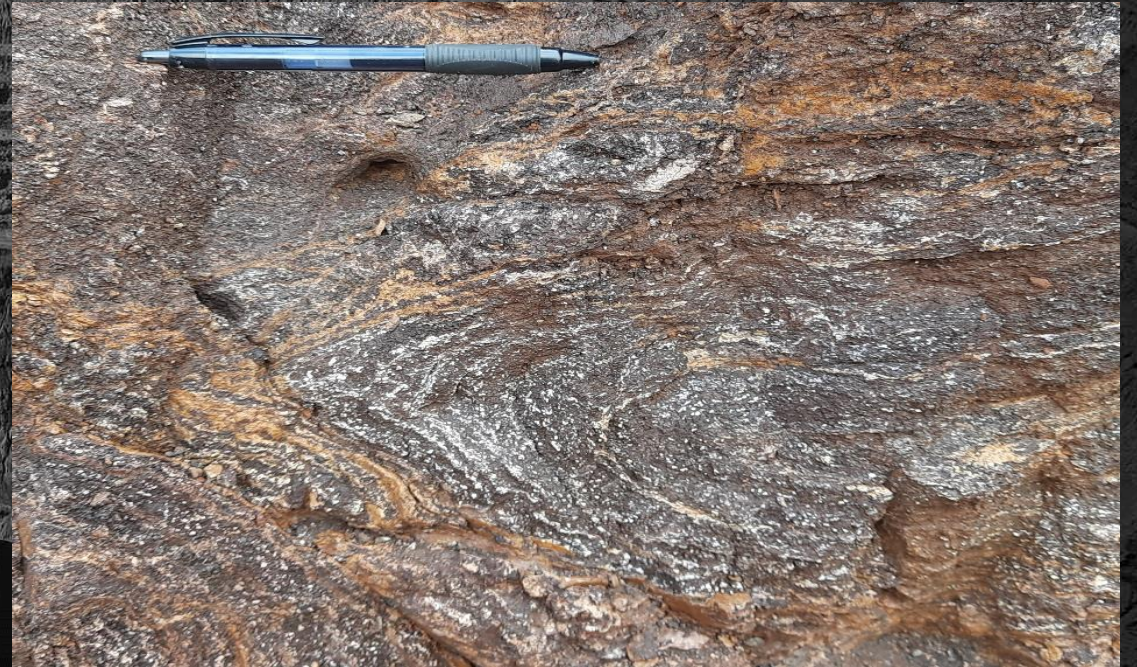


21

CONCLUDING REMARKS



Importance of the ESG Aspects in Reporting of Mineral Resources



Presenter: Shameek Chattopadhyay, Director and Principal Consultant (Resource Geology)

Date: 21 December 2022 All India Geologists' Conference MEGECON 2022, Hosapete, India

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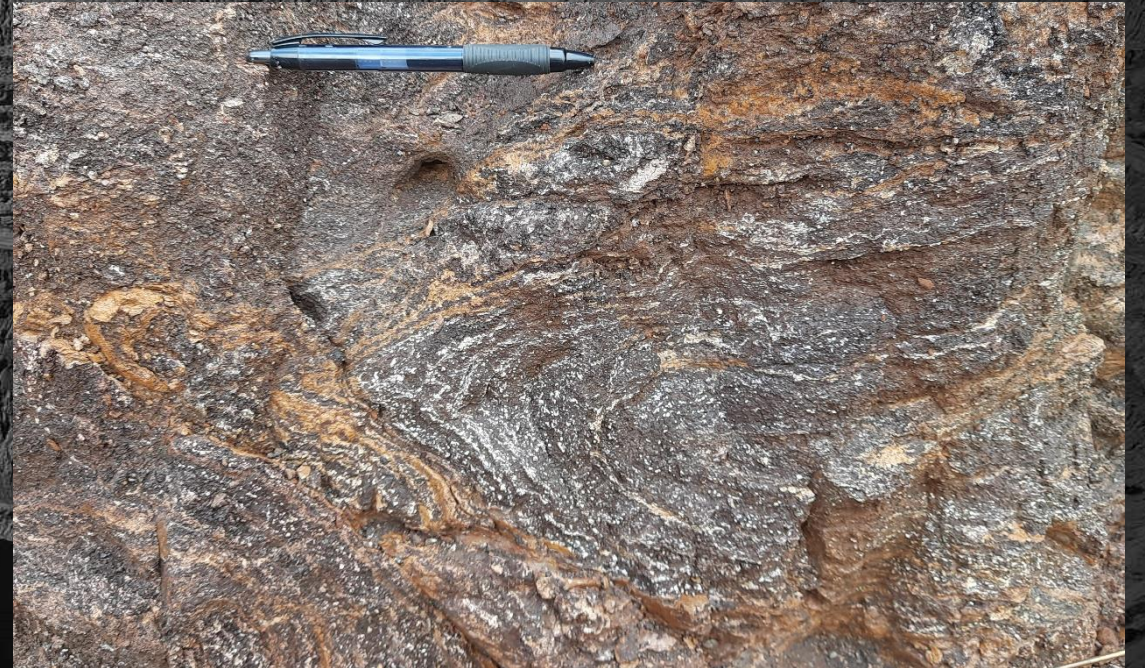
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INTRODUCTION

About SRK Consulting
About the Presenter



SRK CONSULTING

INDEPENDENT MINING SERVICES

500

CLIENTS

150

COUNTRIES

1500

PROFESSIONAL

100%

EMPLOYEE OWNED



ESTABLISHED

1974

RELIABLE,
INDEPENDENT
AND OBJECTIVE

ADVICE

20000

PROJECTS

SIGNIFICANT
GLOBAL
REACH

1 GOAL – TO SUPPORT OUR CLIENTS ON THEIR MINING JOURNEY!

In India

Since

2006

30

Professionals

500

Projects

Leading
Technical
Consultant

Shameek Chattopadhyay, MSc. MAusIMM, MMEAI
Director and Principal Consultant (Resource Geology)
SRK Consulting
schattopadhyay@srk.co.in



Shameek Chattopadhyay is a Director and Principal Consultant with SRK Consulting. With more than 20 years of experience in the mining industry, Shameek has a broad range of background, including planning and managing the advanced exploration projects, designing and implementing QAQC protocols, geological modelling using specialised software, geostatistical analysis, resource estimation and resource classification in accordance with the international reporting codes. Shameek has been involved with several resource estimation projects, different levels of Feasibility Studies, producing independent technical reports associated with Stock Exchange Listing, and strategic projects for different government departments in India and for the World Bank.

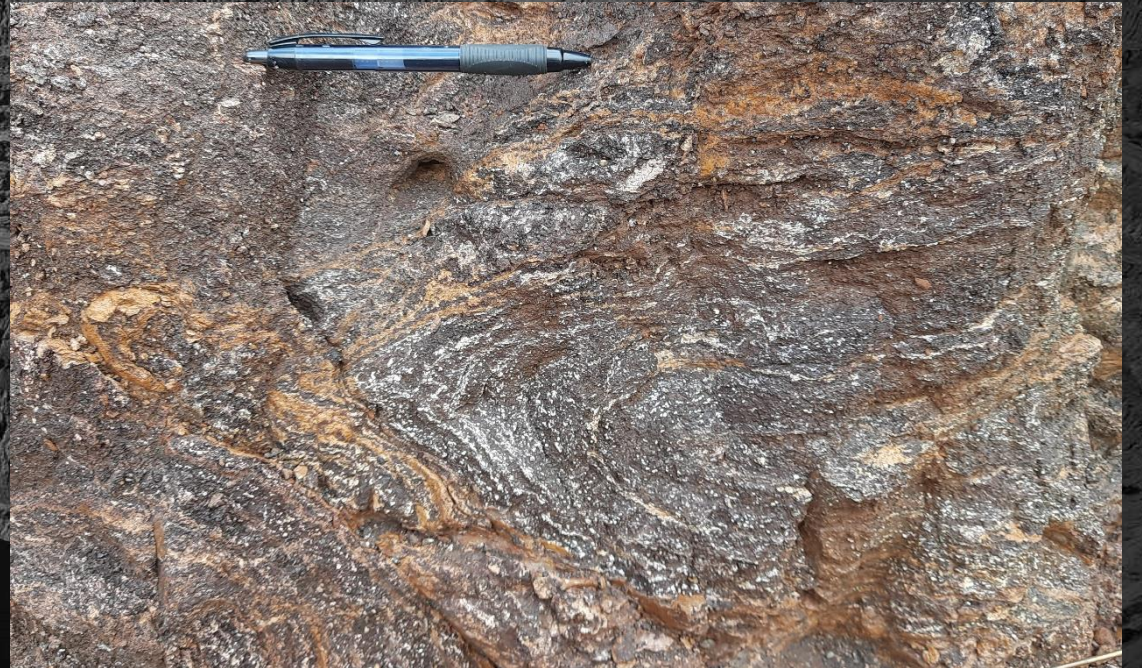
In addition to his works in India, Shameek has been involved in projects in more than 30 countries. Shameek is a life member of the Mining Engineers' Association of India (MEAI), the Australasian Institute of Mining and Metallurgy (AusIMM), the International Association of Mathematical Geoscience (IMAG) and a founding member of the National Committee for Reporting Mineral Resources and Reserves in India (NACRI).

CONTEXT

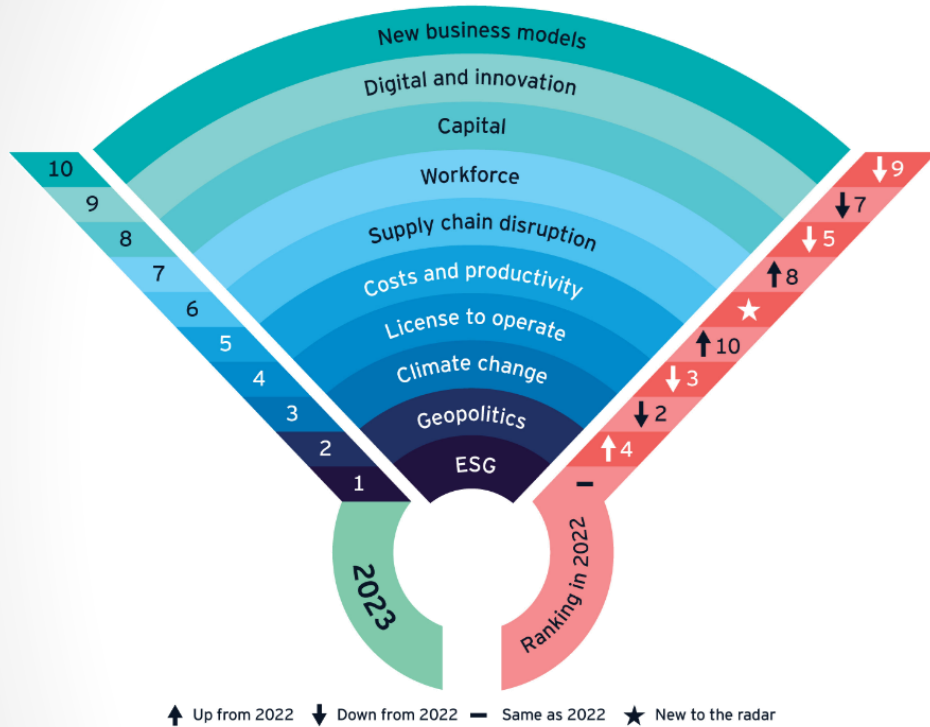
Global Trends

What Do the Investors Want?

How Mining Industry is Responding?

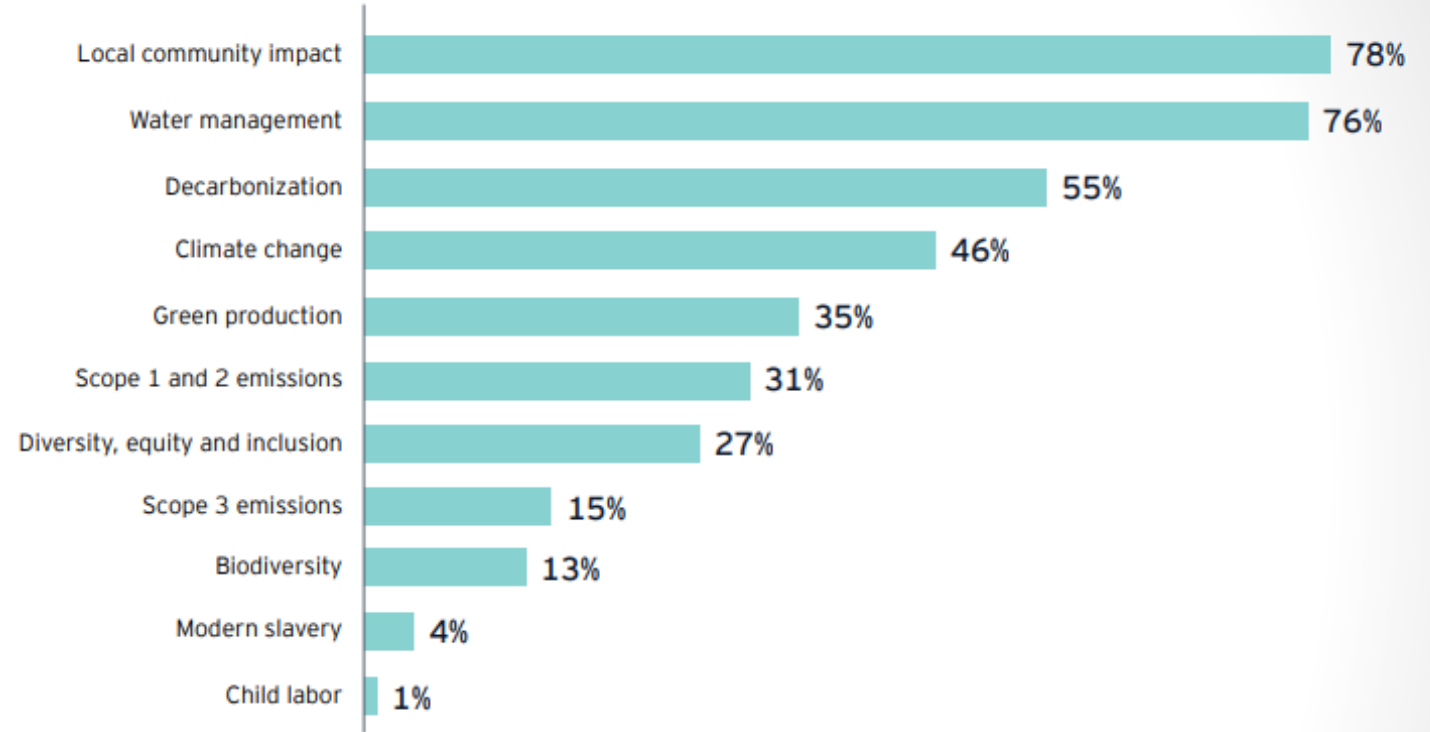


Top 10 business risks and opportunities for mining and metals in 2023



Source: EY Knowledge Analysis of the business risks and opportunities survey 2023.

Top ESG issues that the metals and mining sector will face the most scrutiny on from investors



Source: EY Knowledge analysis of the business risks and opportunities survey 2023.

Environmental, social and governance (ESG) remains the number one challenge.

Access to Capital = Meeting with the ESG targets.
Key priorities - increasing credibility through disclosure.

International Financial Reporting Standards Foundation (IFRS) has set up a separate organization - International Sustainability Standards Board (ISSB).

Consolidation with Climate Disclosure Standards Board (CDSB— an initiative of CDP) and the Value Reporting Foundation (VRF— which houses the Integrated Reporting Framework and the SASB Standards)



In November 2021, the General Requirements Prototype has been published

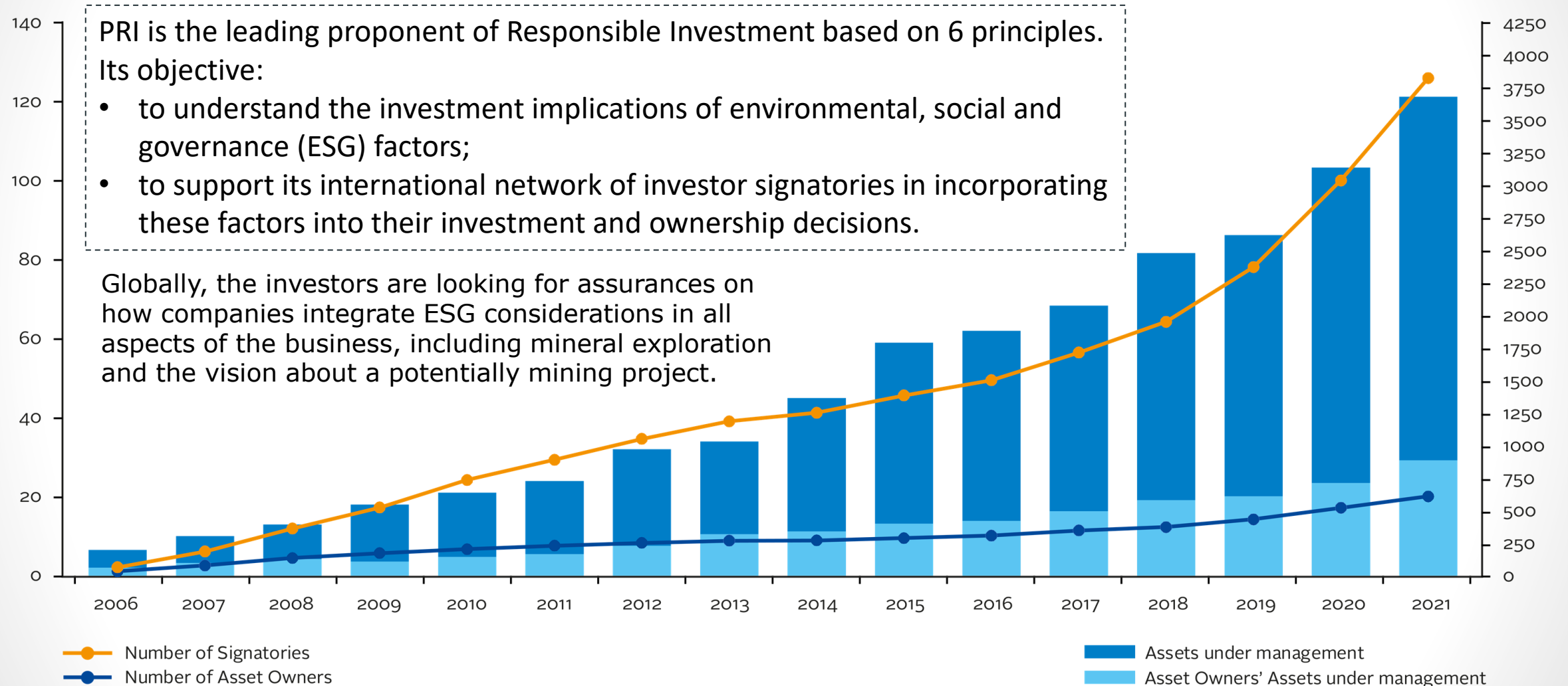
General Requirements for Disclosure of Sustainability-related Financial Information Prototype

Developed by the Technical Readiness Working Group, chaired by the IFRS Foundation, to provide recommendations to the International Sustainability Standards Board for consideration

November 2021

Assets under management (US\$ trillion)

N° Signatories



Source: PRI Report 2022

- CRIRSCO provides the International Reporting Template for the public reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves.
- The latest version is 2019.
- PERC 2021 – updated with the ESG aspects
- SAMREC 2016 – Introduced SAMESG in 2017
- JORC – updates are under review and expected in 2023.

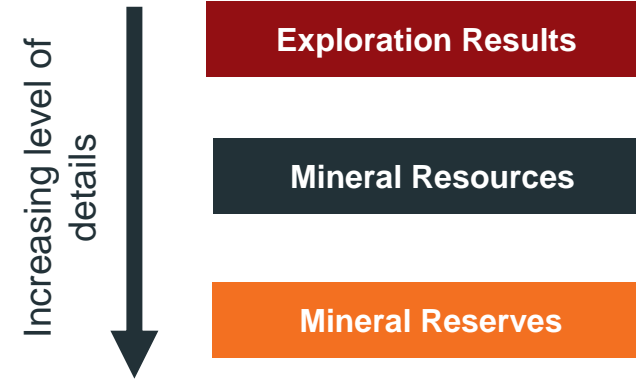
Consensus

All Public Reports of Exploration Targets, Exploration Results, Mineral Resources, Ore Reserves and Technical Studies must include the consideration and reporting of the ESG considerations and factors that could have a material effect on the outcome of the project or operation.

Region	Standard	Year of Last Update	CRIRSCO Template Version
Europe	PERC	2021	2019
Kazakhstan	KAZRC	2021	2019
India	IMIC	2019	2013
Colombia	ECRR	2018	2013
Turkey	UMREK	2018	2013
Indonesia	KCMI	2017	2013
USA	SME	2017	2013
Brazil	CBRR	2016	2013
South Africa	SAMREC	2016	2013
Chile	CRC	2015	-
Canada	CIM	2014	-
Mongolia	MRC	2014	2013
Russia	NEAN	2013	2013
Australasia	JORC	2012	2012 Definitions

SAMESG

9 components to be addressed on material ESG factors



Expectation from CP

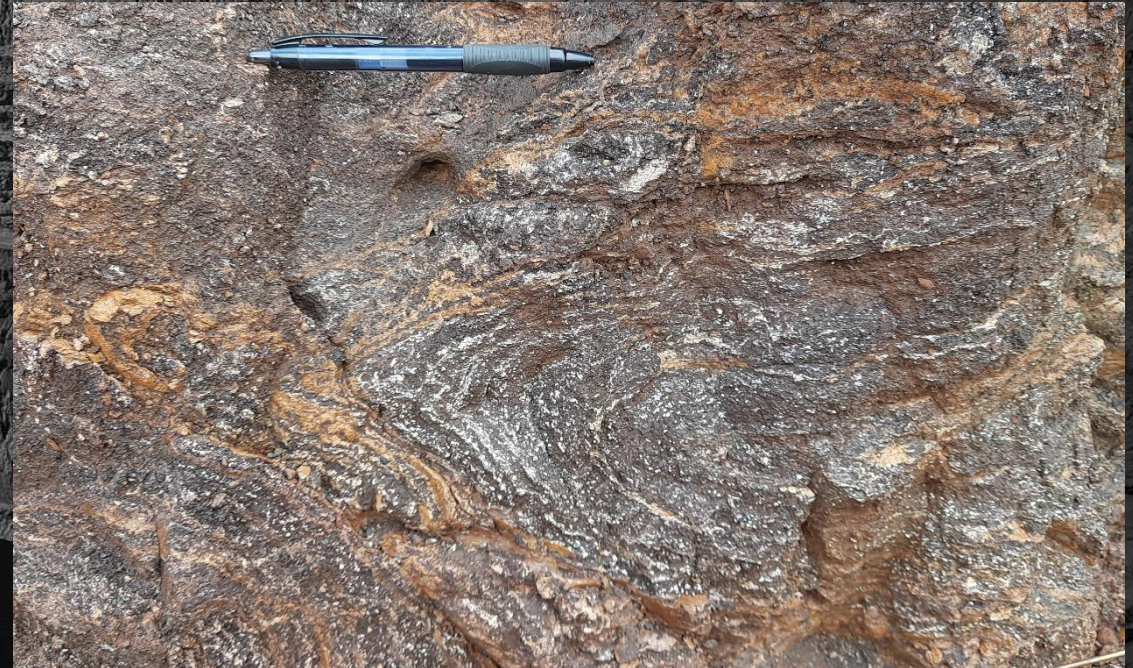
- The lead CP accepts overall responsibility of a Mineral Resource report
- Mineral Resource Estimation is often a team effort and therefore ESG experts can be brought in to the project to address the ESG aspects, which are often beyond the expertise of a geologist.
- Site Visit – should be undertaken by the CP(s) and appropriate members of the team – why not ESG expert?

MINERAL RESOURCE REPORTING

Definition of Mineral Resource

The Concept of RPEEE

How ESG Aspects Fit into this?



Geologists/Engineers

Further Exploration Planning
Engineering Decisions
(Typically Internal)

Company Management

Visibility, Business Case
Further Investment Decision
(Typically Internal)

Bank/Investors

Investment Decision
Risks and Opportunities
(Typically to access the capital)

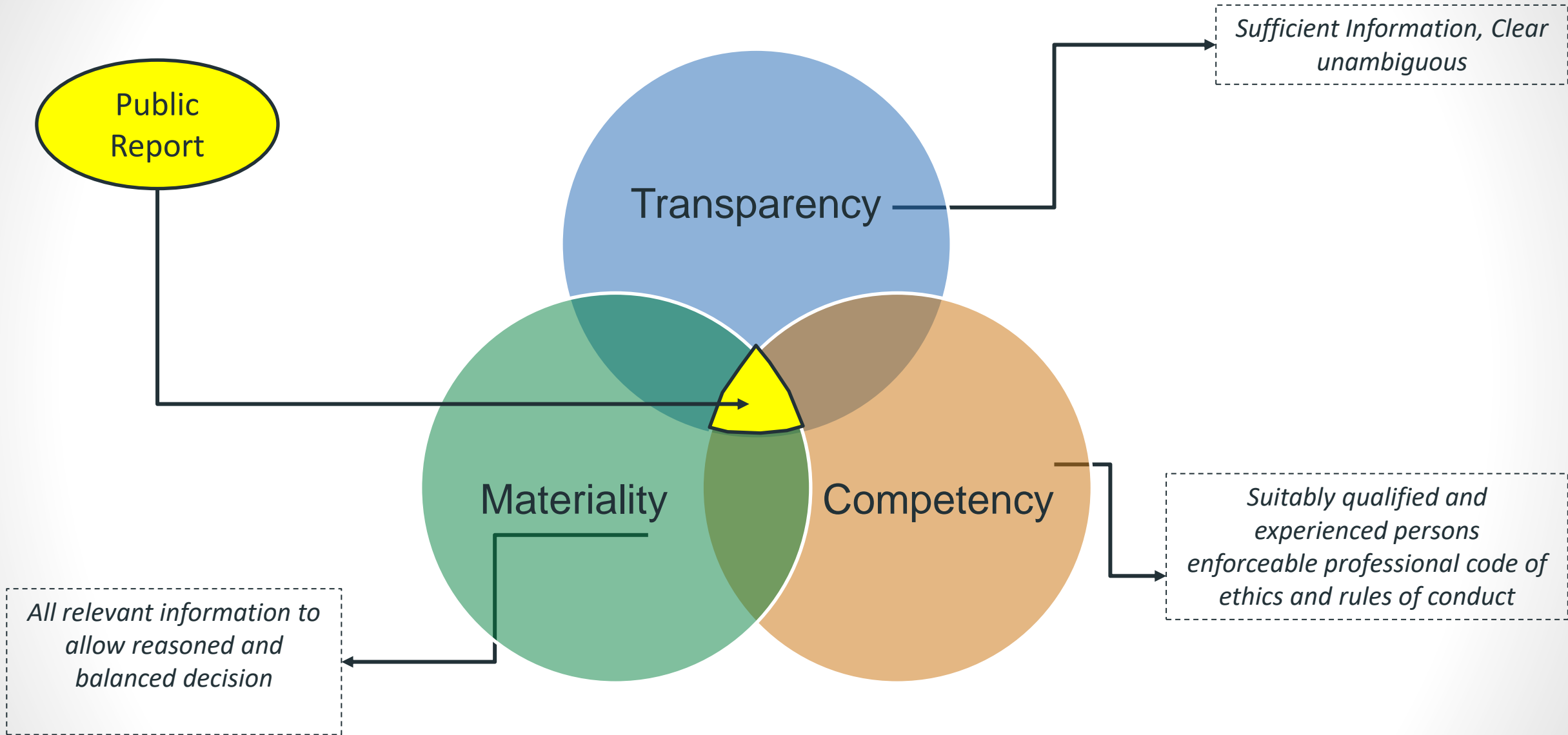
Government

Regulation, National Mineral Inventory
Strategic Importance
(Typically External – but not for accessing the capital)

In Auction Regime, the state is inviting mining companies to invest in certain mining project. Therefore, the report should be in accordance with the principles of public reporting.

Public Reports are prepared for the purpose of informing investors or potential investors and their advisers on Exploration Targets, Exploration Results, Mineral Resources or Mineral Reserves.

CRIRSCO type Public Reporting Templates provide the necessary platform to inform the investors enabling them to take informed investment decisions.



Exploration Results

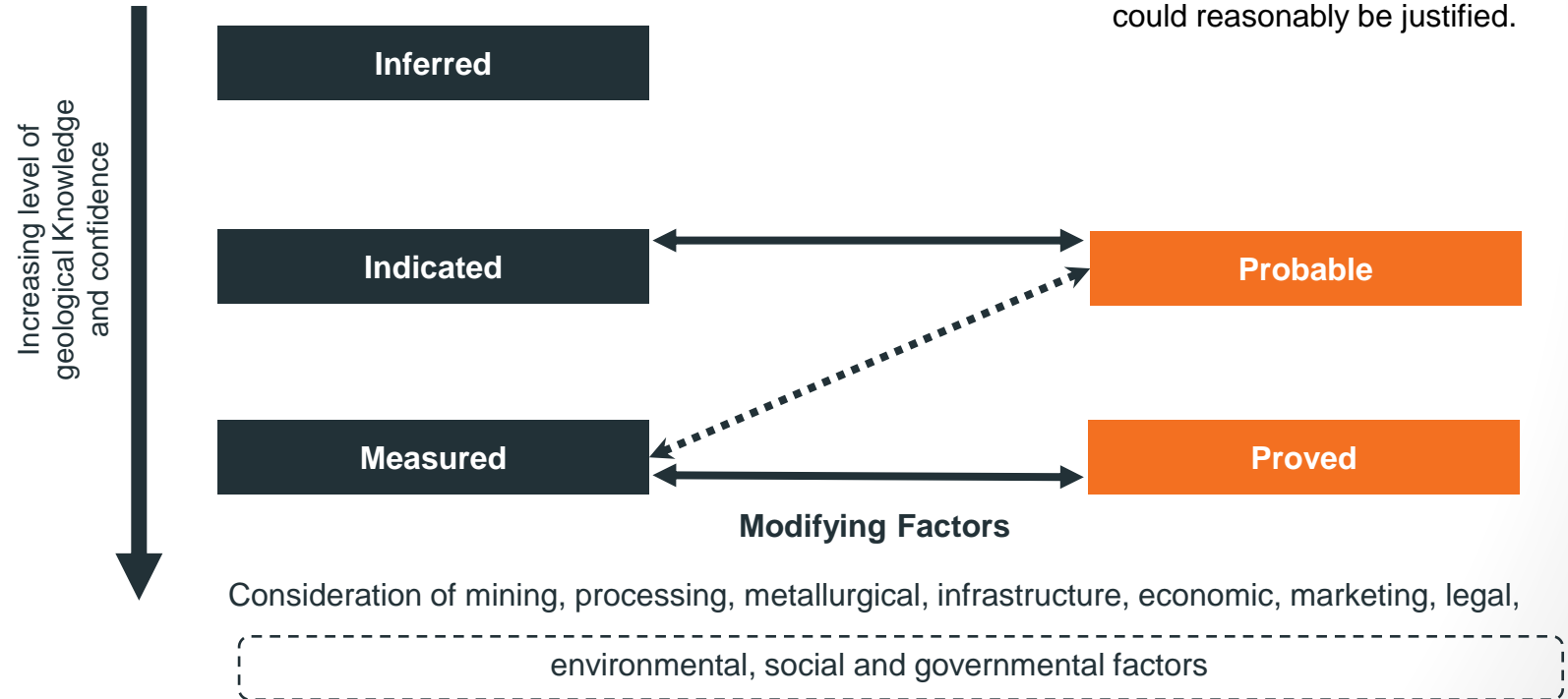
- Data and information generated by mineral exploration programmes that might be of use to investors, but which do not form part of a declaration of Mineral Resources or Mineral Reserves

Mineral Resources

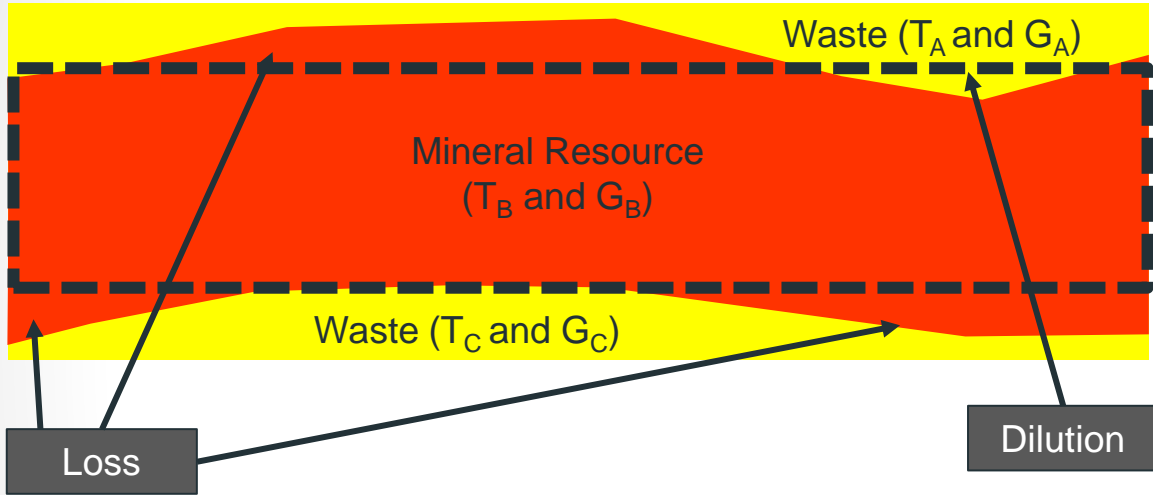
- Location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.
- Must have **reasonable prospects for eventual economic extraction**.

Mineral Reserves

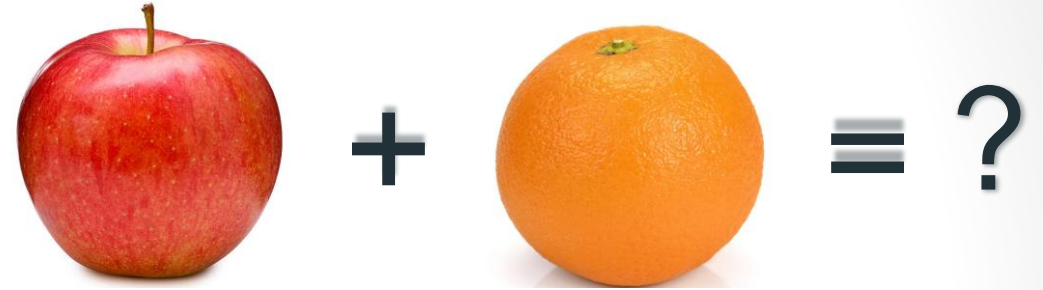
- Economically mineable part of a Measured and/or Indicated Mineral Resource.
- It includes diluting materials and allowances for losses,
- Either a Pre- Feasibility or Feasibility level of study must be undertaken to apply Modifying Factors and demonstrate that, at the time of reporting, extraction could reasonably be justified.



Mineral Resources ≠ Ore/Mineral Reserves



Therefore Mineral Resource and Mineral Reserves are two different things. One cannot add them up.



Still Struggling to Remember?

Quantity (Mineral Reserve) > Quantity (Mineral Resource)
 Grade (Mineral Reserve) < Grade (Mineral Resource)



It is the **Reserve** Bank of India **not** the **Resource** Bank of India!

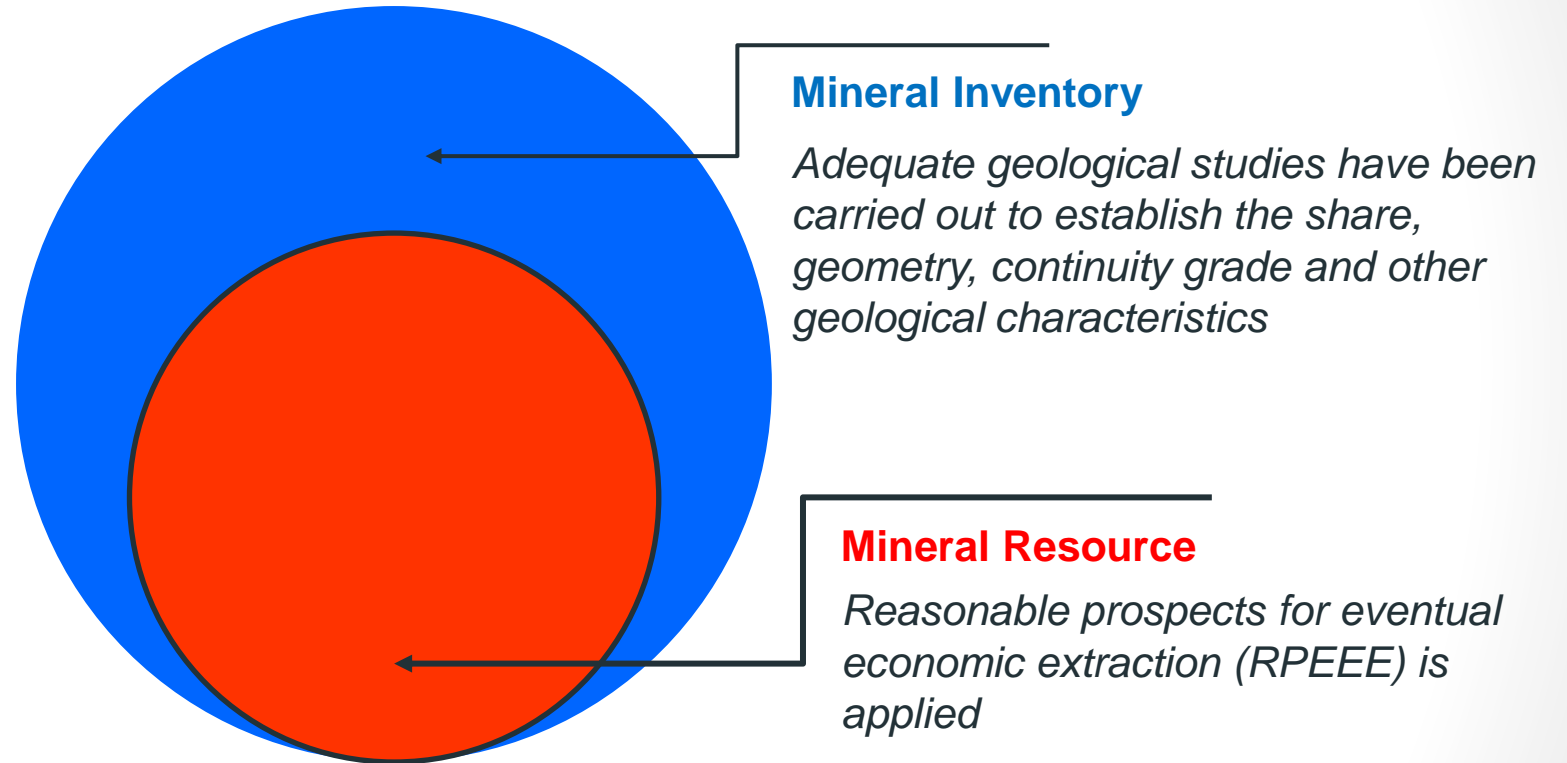
Mineral Resource is not an inventory of all mineralisation drilled or sampled, regardless of cut-off grade, likely mining dimensions, location or continuity.

It is a realistic inventory of mineralisation, which, under assumed and justifiable technical and economic conditions, may, in whole or in part, become economically extractable.

Evaluate whether the mineralised body has Reasonable prospects for eventual economic extraction (RPEEE).

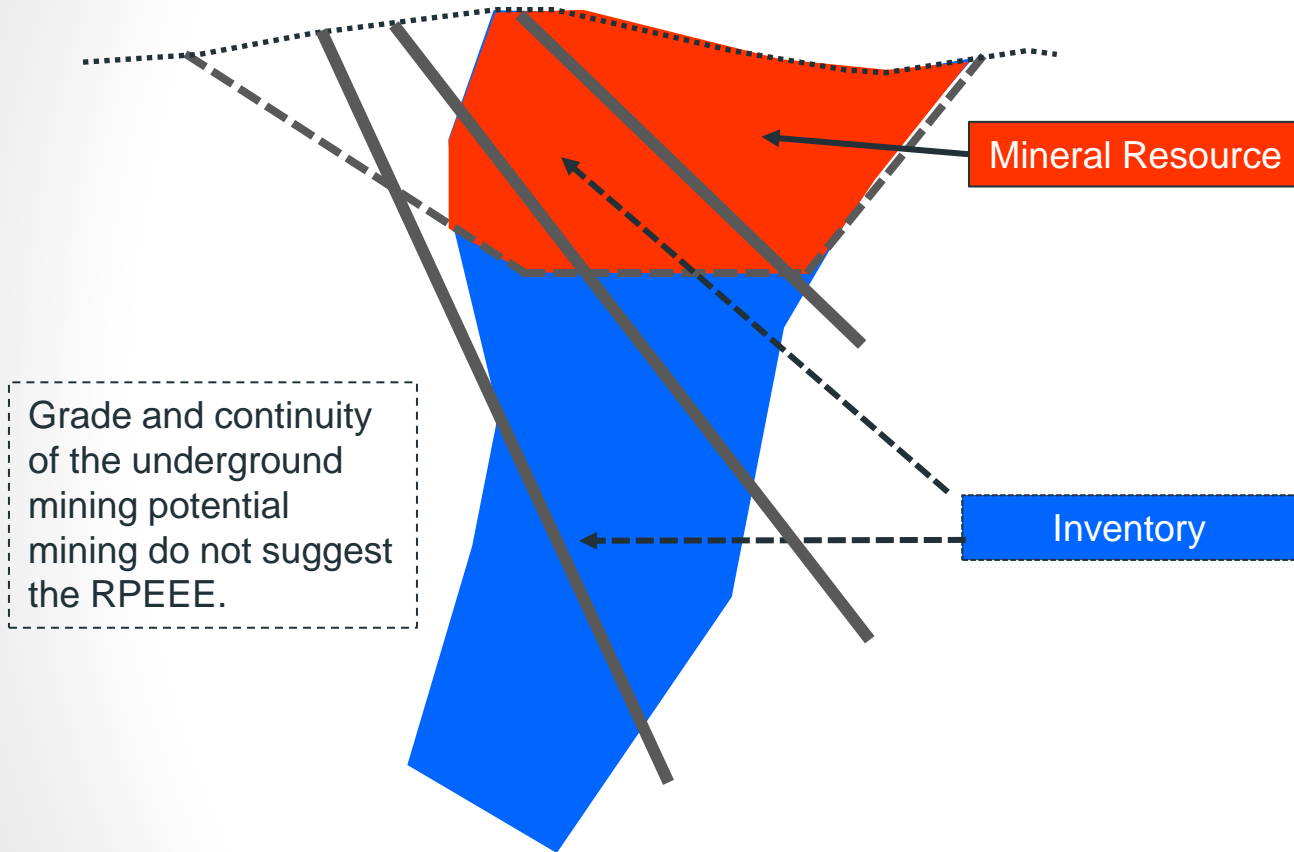
RPEE' implies a judgement (albeit preliminary) by the Competent Person in respect of all Modifying Factors. Should be justifiable and defensible.

The Term "Inventory" is not a defined term in the CRIRSCO Template, and such quantities may not be disclosed in a Public Report, but it is common that the same is used for other purposes (such as government's database for National Inventory).

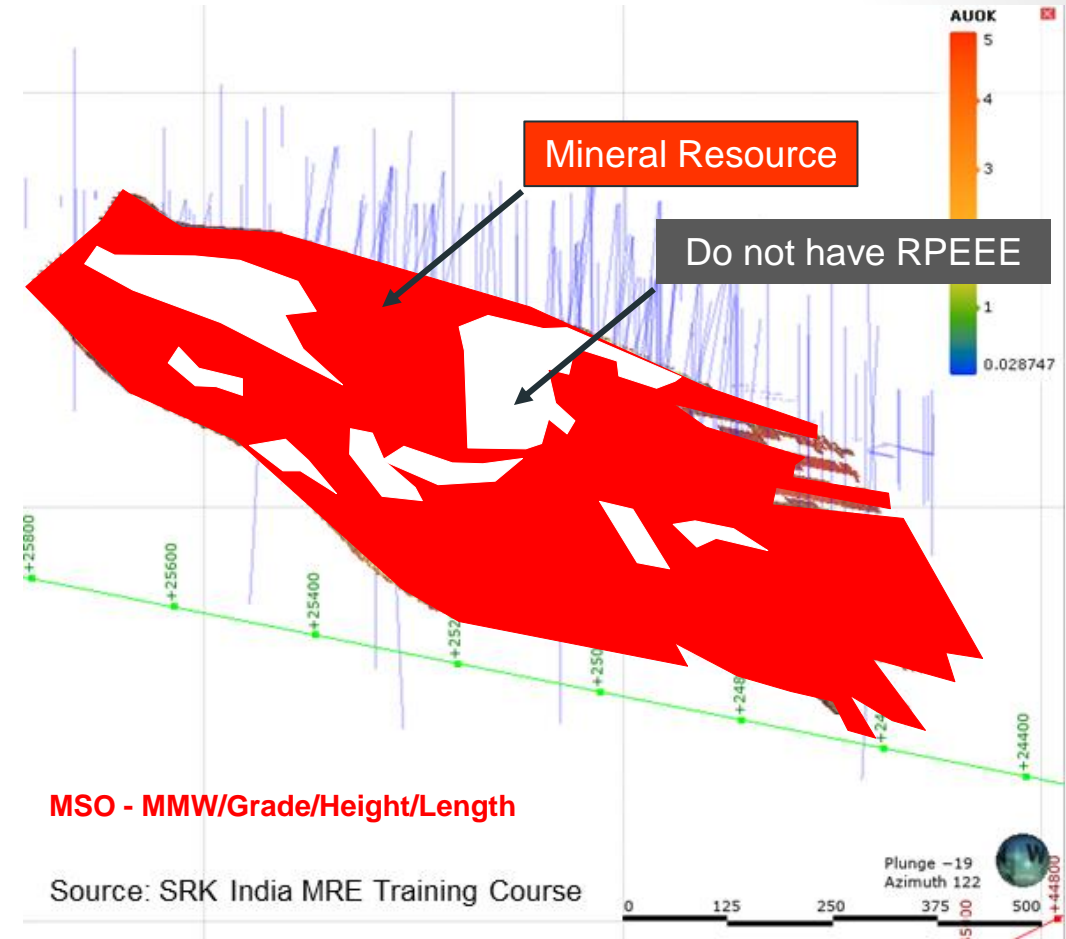


Investments are made based on the Mineral Resource and Mineral Reserve.
Not on the basis of Mineral Inventory.

Open Pit Project



Underground Project



Typical Key Technical Considerations to disclose the RPEEE

- Long-term price forecast
- Geotechnical Parameters
- Likely mining techniques
- Assumptions on mining loss and recovery
- Likely recovery and yield
- Assumptions of mining cost
- Assumptions of processing cost
- Other costs
- CoG

Which of the above information is material that could impact the eventual economic extraction?

Could there be other factors that impacts the RPEEE?

Other factors that could potentially impact on the RPEEE

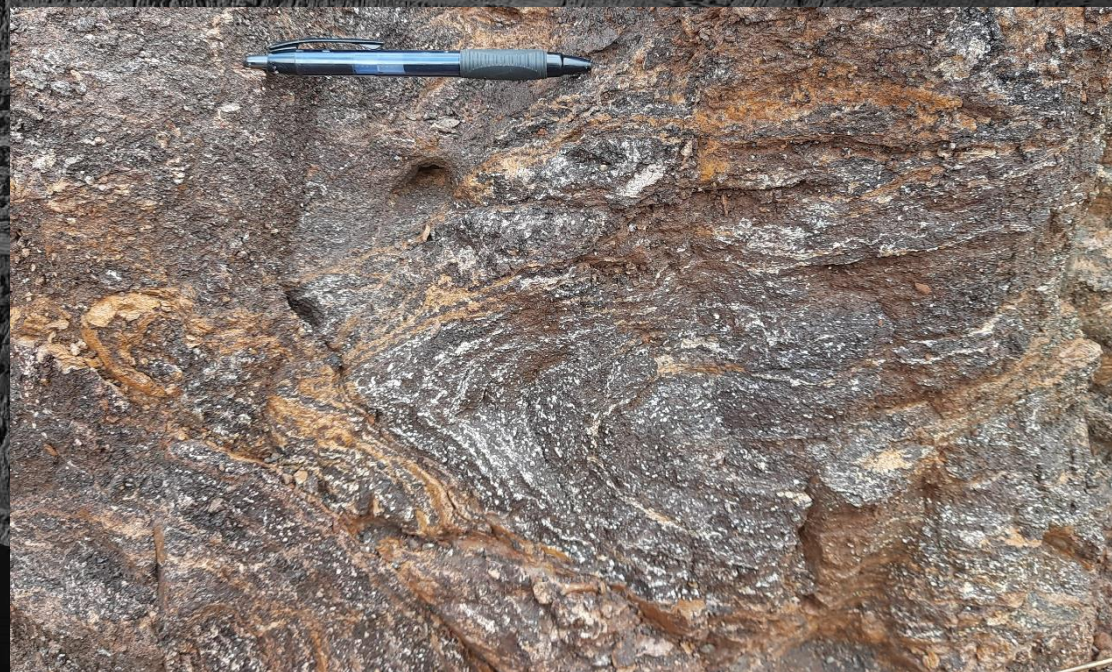


Is the geologist qualified/experienced to address these aspects?

Is the person commenting on the ESG aspects have adequate understanding of the local issues?

What are the minimum level of disclosures on the ESG aspects should be part of the Mineral Resource Reports?

CONCLUDING REMARKS



- Globally there is a growing awareness on the ESG aspects.
- Investors are demanding more disclosures regarding ESG. Several initiatives are being taken by the investors to protect their investments and
- Globally, the public reporting codes are being updated to address the ESG aspects.
- Reporting on the ESG aspects is expected even at the early-stage exploration projects leading to Exploration Results.
- For Reporting of the Mineral Resources, more careful assessment of the RPEEE is solicited and the factors should include the ESG aspects.
- Knowledge of the local issues and their impacts on the projects is highly solicited.
- Bringing ESG experts early into a project would add a lot of value and ensure that the principles of materiality, transparency and competency is adhered.
- As a geologist we must follow the code of ethics in regard to the well-being of the community, the natural environment and the reputation of the international minerals industry.

Thank you for your attention

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Director and Principal Consultant (Resource Geology)



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Any Question?