Mining: Breaking the Stigma

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ASSOCIATION OF GEOLOGISTS AND
GEOLOGICAL ENGINEERS OF MAPUA

"FRONTIER: TRAVERSING GEOLOGY AND THE ENVIRONMENT"

16 NOVEMBER 2020

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- VP and Trustee, Philippine Mineral Exploration Association
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- Legal Committee, Petroleum Association of the Philippines
- Former Director, International Geothermal Association
- Former Lecturer, Asian Institute of Technology (Bangkok), UP National Institute of Geological Sciences
- Contributes articles on legal, regulatory and policy issues on resources and energy to Philippine Resources Journal http://www.philippine-resources.com/
- https://penarroyo.com/

LEARNING OUTCOMES

After the presentation, the participants are expected to:

- Acquire a knowledge of the legal and institutional framework of mineral development in the Philippines
- Understand the important laws in relation to mineral development particularly issues concerning environment protection, social license to operate, and economic impact
- Analyze the role of the geology profession in the industry and society
- Provide the facts in relation to misguided understanding and misconceptions about the industry

CONTENTS

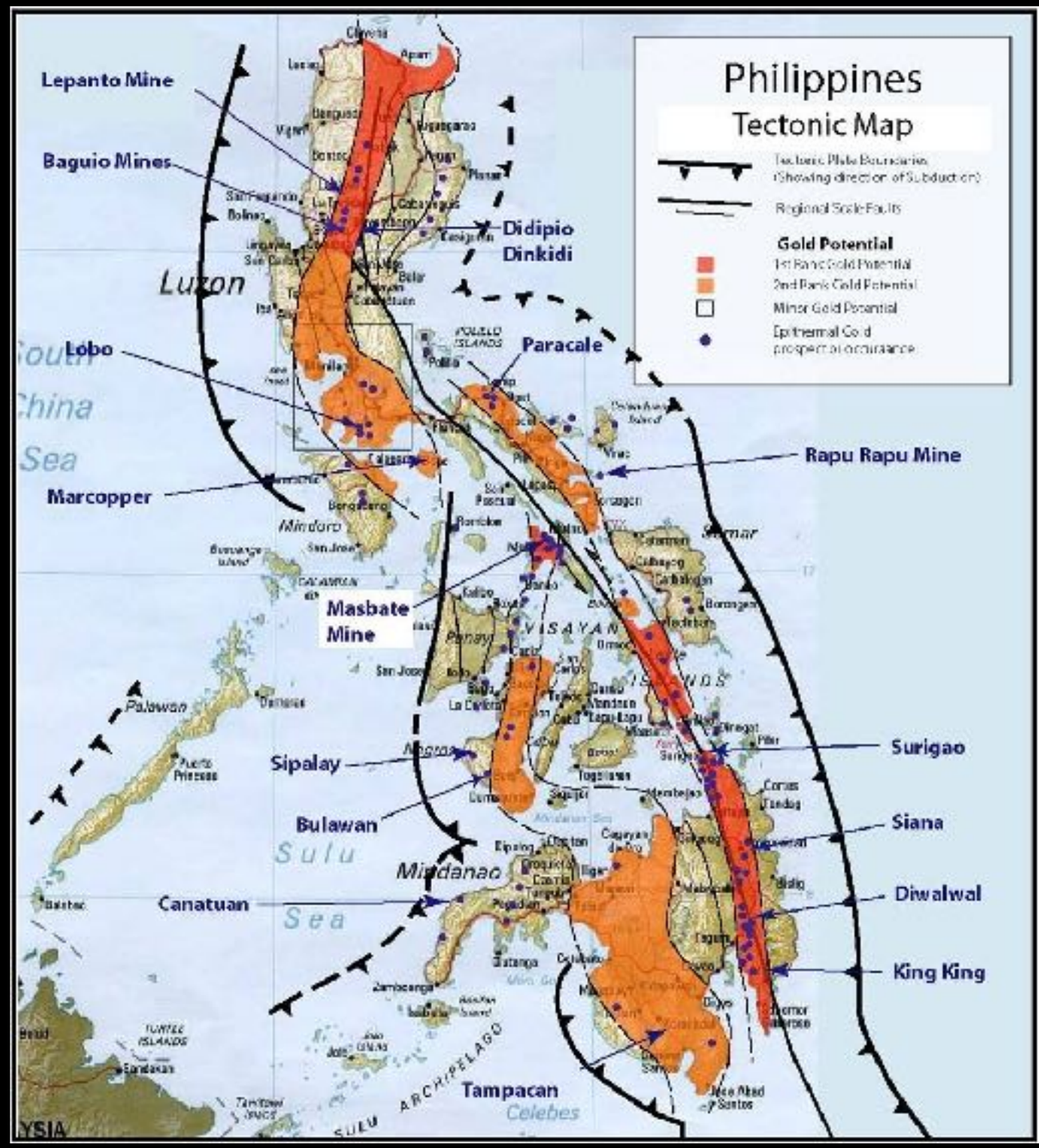
- **Legal and Institutional Framework**
- Philippine Mining Industry Update
- Issues Facing the Mining Industry
- Geology Profession Contribution
- Debunking the Myth
- Conclusion

LEGAL AND INSTITUTIONAL FRAMEWORK

- Constitution
- Mining Act of 1995
- Indigenous Peoples Rights Act
- Local Government Code
- Environmental Impact Statement System
- Executive Order No. 79
- Rules of Procedure for Environmental Cases

CONSTITUTION

- All lands of the public domain, water, minerals, coal, petroleum, and other mineral oils, all forces of potential energy, fisheries, forests or timber, wildlife, flora and other natural resources are owned by the state.
- The exploration, development and utilization of these natural resources are under the full control and supervision of the State.



CONSTITUTION

- The State has the option of entering into co-production, joint venture or production sharing agreements with Philippine citizens of Philippine corporations or associations.
- At least 60% of the capital of a corporation or association must be owned by Phil. Citizen to qualify as a Philippine corporation or association.

MINING
(Exploration, Development and Utilization of Mineral Resources)

DIRECT STATE PARTICIPATION
(thru the Philippine Mining Dev't Corp.)

Joint Venture/
Working Agreement/MOA
w/ Qualified Entity

PRIVATE ENTITY
(Qualified Person)

National Govt.
(DENR-MGB)

Various Mining
Tenements

Local Govt.
(Provincial/City Govt.)

Various Mining
Tenements

CONSTITUTION

- Exception to the nationality requirement: The Constitution authorizes the President to enter into agreements with foreign-owned corporations involving either financial or technical assistance, for large- scale exploration, development and utilization of minerals, petroleum and other mineral oils.

MINING ACT

- Exploration Permit
- Mineral Agreements
- - MPSA
- - Co-Production Agreement
- - Joint Venture Agreement
- Financial and Technical Assistance Agreement
- Mineral Processing Permits
- http://www.mgb.gov.ph/images/stories/RA_7942.pdf
- http://www.mgb.gov.ph/images/stories/CDAO-Final.pdf

Republic of the Philippines
Congress of the Philippines
Metro Manila

Republic Act No. 7942

AN ACT INSTITUTING A NEW SYSTEM OF MINERAL RESOURCES EXPLORATION, DEVELOPMENT, UTILIZATION AND CONSERVATION

CHAPTER I
INTRODUCTORY PROVISIONS

Section 1. Title. - This act shall be known as the Philippine Mining Act of 1995.

Section 2. Declaration of Policy. - All mineral resources in public and private lands within the territory and exclusive economic zone of the Republic of the Philippines are owned by the State. It shall be the responsibility of the State to promote their rational exploration, development, utilization and conservation through the combined efforts of government and the private sector in order to enhance national growth in a way that effectively safeguards the environment and protect the rights of affected communities.

Section 3. Definition of Terms. - As used in and for purposes of this Act, the following terms, whether in singular or plural, shall mean:

(a) "Ancestral lands" refers to all lands exclusively and actually possessed, occupied, or utilized by indigenous cultural communities by themselves or through their ancestors in accordance with their customs and traditions since time immemorial, and as may be defined and delineated by law.
(b) "Block" or "meridional block" means an area bounded by one-half (1/2) minute of latitude and one-half (1/2) minute of longitude, containing approximately eighty-one hectares (81 has).

EXPLORATION PERMIT

- Grant gives holder the right to conduct exploration for all minerals within a specified area
- Valid for 2 yrs, can be renewed for another two but cannot exceed 6 yrs
- If exploration results reveal economic mineral deposits and technically feasible for mining, holder can file a declaration of mining project feasibility (MPF)
- Approval of MPF shall grant the holder exclusive right to Mineral Agreement or FTAA

MPSA

- Contractor provides the financing, technology, management and personnel necessary for the implementation of the MPSA
- Valid for 25 yrs and renewable for another 25
- Government is entitled to a share in the gross production of the mining operation in the form of 4% excise tax

FINANCIAL AND TECHNICAL ASSISTANCE AGREEMENT ("FTAA")

- Pursuant to the Constitution, the Mining Act provides that the President may enter into an FTAA with 100% foreign-owned corporation for the large-scale exploration, development and utilization of mineral resources.
- Minimum investment of US$50M
- Not applicable to cement raw materials, marble, granite, sand and gravel, and construction aggregates

MINERAL PROCESSING PERMITS

- Under the Mining Act, mineral processing means the milling, beneficiation or upgrading of ores or minerals and rocks or by similar means to convert the same into marketable products.
- Valid for 5 yrs, renewable for like periods up to 25 yrs
- Can be 100% foreign ownership

SMALL-SCALE MINING

- PD 1899 “A Decree Establishing Small Scale Mining As a New Dimension in Mineral Development” allowed local government units to issue mining permits https://mgb.gov.ph/images/stories/PD_1899.pdf
- RA 7076 “People's Small-Scale Mining Act” (1991) mandates that all applications for small scale mining will now be under the approval of the Secretary of the DENR https://mgb.gov.ph/images/stories/DAO2015-03.pdf
- PD No. 1899 and RA No. 7076 shall continue to govern small-scale mining operations. For areas not declared as People’s Small-Scale Mining area (PSSMA) under RA No. 7076, the pertinent rules and regulations of PD 1899 shall apply.
- PMRB - Accepts, process and evaluate applications and determine administrative charges and fees for Quarry, Sand and Gravel, Small Scale Mining Permits

TYPES OF MINING PERMITS ISSUED BY PROVINCIAL GOVERNOR THRU THE PROVINCIAL MINING REGULATORY BOARD (PMRB)

- Quarry Permit
- Sand and Gravel Permits
  1. Commercial Sand and Gravel Permit
  2. Industrial Sand and Gravel Permit
- Gratuitous Permit
  1. Private Gratuitous Permit
  2. Government Gratuitous Permit
- Small Scale Mining Permit

  - Only one (1) small scale mining contract may be awarded at any one time

  - Area shall not exceed twenty hectares (20) per contractor

  - A contract shall have a term of two (2) years, renewable subject to verification by the Board for like periods

IMPORTANT LAWS RELATED TO RESOURCES DEVELOPMENT

- Indigenous Peoples Rights Act ("IPRA") https://www.officialgazette.gov.ph/1997/10/29/republic-act-no-8371/
- Environmental Impact Statement ("EIS") System http://eia.emb.gov.ph/wp-content/uploads/2016/06/PD-1586.pdf
- Local Government Code of 1991 https://www.officialgazette.gov.ph/downloads/1991/10oct/19911010-RA-7160-CCA.pdf
- National Integrated Protected Areas System Act ("NIPAS") https://www.officialgazette.gov.ph/1992/06/01/republic-act-no-7586/

INDIGENOUS PEOPLES RIGHTS ACT

INDIGENOUS PEOPLES RIGHTS ACT

- Preferential rights over ancestral domains/natural resources and exercise of customary laws

- Free and prior informed consent

  - right to self determination, respect for IP decision-making process, right to accept or reject projects on ancestral domain

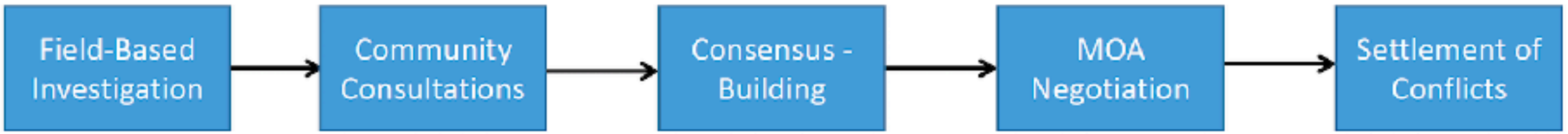
    - Identity of proper IPs

    - Royalty and right to benefits

- Rules on how to arrive at a decision making process of IPs

- FPIC for renewal of mining agreements

FPIC Process



1. **Certificate of Non-Overlap (CNO)**
   - is issued if the land involved in an energy project does not overlap an ancestral domain (AD)

2. **Certification Precondition (CP)**
   - Is issued when the land involved is within AD and the concerned Indigenous Cultural Communities/Indigenous Peoples (ICCs/IPs) gave their free and prior informed consent (FPIC)

Administrative Order No. 3, series of 2012 (April 13, 2012) http://ncipcar.ph/images/pdfs/ncip-ao-no-3-s-2012-fpic.pdf

Documents required to accompany application

1. Project profile/proposal showing the nature and purpose of the project and its duration;
2. Documents showing project location with an indicative map showing the names of sitios and/or barangays that will be affected;
3. Abstract of proposed project describing the size, pace, reversibility and scope;
4. Preliminary assessment of the likely economic, social, cultural and environmental effects, including potential risks and how these will be addressed;
5. Indicative budget;
6. Persons to be involved in implementation;
7. Operational Plan and activities; and
8. Profile of the applicant.

Contents of MoA

1. Detailed benefit-sharing provisions in accordance with rules and regulations [i.e. not less than 1% royalty under mining act];
2. Development projects based on the development priorities of the community;
3. Monitoring of the implementation MOA to be implemented by NCIP in partnership with LGUs and CSOs. This undertaking shall be paid for by the company;
4. Mitigation and resettlement plans for potential risks ;
5. Redress mechanisms;
6. Clause on the non-transferability of the MOA;
7. Clause for renegotiation of the economic provisions;
8. Whether the concerned ICCs/IPs shall require another FPIC to be conducted in case of merger, reorganization, transfer of rights, acquisition by another entity, or joint venture;

9. List of responsibilities of the company and the affected community

10. Inclusive dates/duration of agreement;

11. Other than what has already been granted by law, the benefits to be derived by the host ICC/IPs indicating the type of benefits, specific target beneficiaries as to sector and number, the period covered, and other pertinent information;

12. Detailed use of all funds to be received by the host ICC/IP communities, ensuring that a portion of such funds shall be allocated for development projects, social services and/or infrastructures in accordance with their development framework and the Guidelines on the Management of Royalty Share and Other Benefits promulgated by the Commission En Banc;

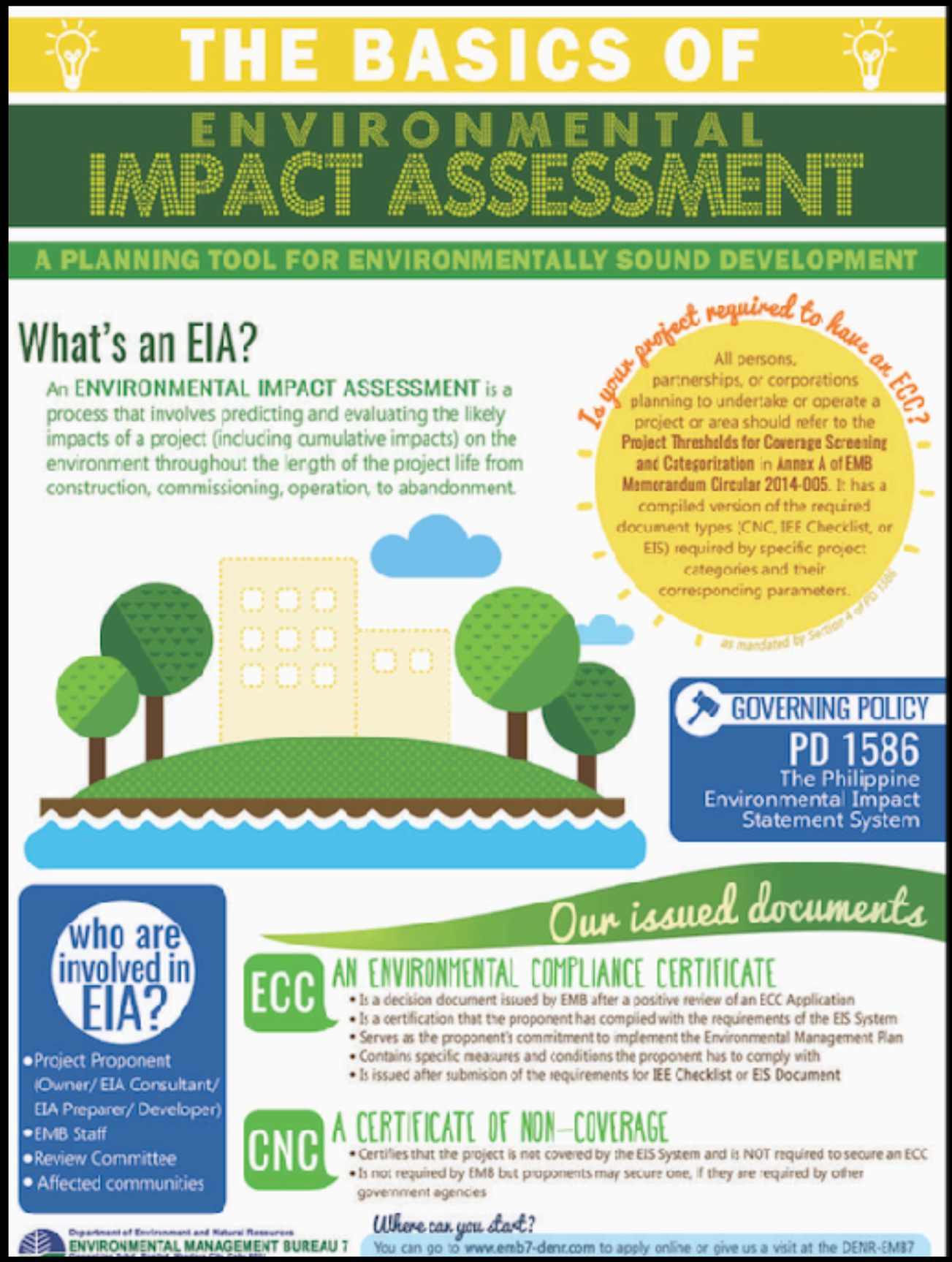
13. Transparency mechanism on transfer and disbursement of funds;

LOCAL GOVERNMENT CODE

LOCAL GOVERNMENT CODE

- Proponents applying for exploration applications intended for exploration activities are required to conduct consultation with all LGUs concerned, or the legislative councils (*sanggunian*) at the provincial, city/ municipal, and barangay levels.

ENVIRONMENTAL COMPLIANCE CERTIFICATE



EIS SYSTEM UNDER PRESIDENTIAL DECREE NO. 1586

- Project proponent of environmentally critical projects and projects within environmentally critical areas must obtain an environmental compliance certificate prior to commencement

- EMB/DENR as lead agency

- Revised Procedural Manual for DENR Administrative Order No. 30 Series of 2003 (DAO 03-30) Implementing Rules and Regulations of PD 1586, (Published August 2007) http://eia.emb.gov.ph/wp-content/uploads/2016/06/Revised-Procedural-Manual-DAO-03-30.pdf

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
EMB Building, DENR Compound, Visayas Ave. Diliman, Quezon City
Tel. 927-15-17/18, 925-4793 to 97, 920-2240 to 41

REVISED PROCEDURAL MANUAL

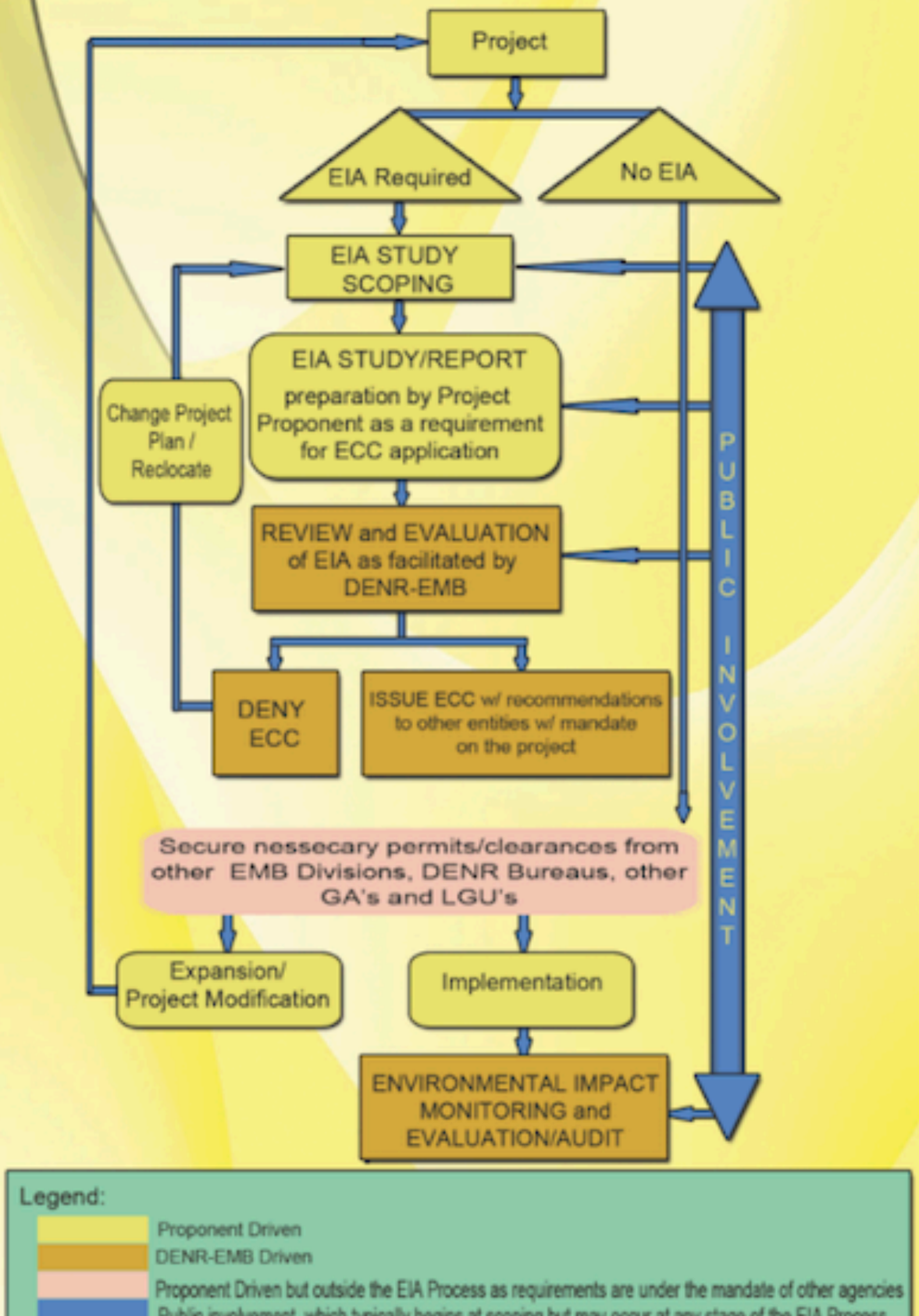
FOR

DENR ADMINISTRATIVE ORDER
NO. 30 SERIES OF 2003 (DAO 03-30)

(Implementing Rules and Regulations
of Presidential Decree No. 1586,
Establishing the Philippine
Environmental Impact Statement System)

EMB- Environmental Impact Assessment and Management Division (EIAMD)
www.emb.gov.ph/eia.htm

Summary Flowchart of the EIA Process



EXECUTIVE ORDER NO. 79

In October 2011, a mining study group was constituted, which included the Executive Secretary and several members of the Climate Change Adaptation and Mitigation Cabinet Cluster.

Input from different stakeholders were obtained, including those from the following: mining companies and allied industries and services; environmental CSO/NGOs; church groups; members of the academe; LGUs; different government agencies concerned with mining.

It sets the policy framework that will guide government and other stakeholders in the implementation and operationalization of mining laws, rules and regulations. It also provides concrete steps and solutions to major issues and concerns of the mining sector.

https://www.officialgazette.gov.ph/2012/07/06/executive-order-no-79-s-2012/

EXECUTIVE ORDER NO. 79

- Full enforcement of environmental standards in mining
- Review of existing mining operations
- Moratorium on the grant of new mineral agreements pending legislation - no moratorium on the issuance of EPs, FTAAs, and Mineral Processing Permits, only MPSAs
- Establishment of mineral reservations
- Imposition of competitive public bidding requirement
- Development of downstream industries

EXECUTIVE ORDER NO. 79

- Disposition of abandoned ores and valuable metals
- Creation of a Mining Industry Coordinating Council
- Measures on Small-Scale Mining Activities
- Consistency of local ordinances with national laws
- Creation of One-stop Shop for all Mining Applications
- Creation of a Centralized Database for the Mining Industry and Integrated Map System to include mining related maps
- Use of the Programmatic Environmental Impact Assessment

RULES OF PROCEDURE FOR ENVIRONMENTAL CASES

- Introduced new remedies for the "alleged" violation of environmental laws (April 13, 2010):
  - temporary environmental protection order;
  - writ of continuing mandamus; and
  - Writ of Kalikasan.
- Until the new policies and institutional safeguards are fully in place, the government should strictly apply the precautionary principle. The principle is public policy under the Climate Change Act of 2009, and was enunciated by the Supreme Court in issuing the Writ of Kalikasan.
- https://www.chanrobles.com/scdecisions/rulesofcourt/2010/am_09-6-8-sc_2010.php

PRECAUTIONARY PRINCIPLE

- A generally accepted international law principle – expressed by the Supreme Court in the Rules of Procedure for Environmental Cases (Part V, Rule 20):

  - Sec. 1. When there is a lack of full scientific certainty in establishing a causal link between human activity and environmental effect, the court shall apply the precautionary principle in resolving the case before it.

  - Sec. 2. In applying the precautionary principle, the following factors, among others, may be considered: (1) threats to human life or health; (2) inequity to present or future generations; (3) prejudice to the environment without legal consideration of the environmental rights of those affected.

WRIT OF KALIKASAN

- a legal remedy available to any natural or juridical person, entity authorized by law, people's organization, non-government organization, or any public interest group accredited by or registered with any government agency,
- on behalf of persons whose constitutional right to a balance and healthful ecology is violated, or threatened
- with violation by an unlawful act or omission of a public official or employee, or private individual or entity,
- involving environmental damage of such magnitude as to prejudice the life, health or property of inhabitants in two or more cities or provinces.
- Rules of Procedure for Environmental Cases A.M. No. 09-6-8-SC Rule 7, Sec. 1.

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MINING INDUSTRY UNDER DUTERTE

Policy Roadblocks - moratorium on new mining permits that has been in place since 2012 under Executive Order 79 and the ban on open pit mining

- DMO 2016-01, issued on 08 July 2016, mandated the audit of all operating mines and moratorium on new mining projects; The audit strictly covers the environmental, economic, social, legal and technical aspects of the mining operations.
- DAO 2017-10, issued on 27 April 2017, banning the open pit mining method for gold, silver, copper, and complex ores;
- Closure of 28 operating mines and the cancellation of 75 mineral production sharing agreements as they allegedly encroached on watersheds and destroyed marine ecosystems.

BAN ON OPEN PIT MINING HAS NO LEGAL BASIS AND SHOULD BE REVERSED

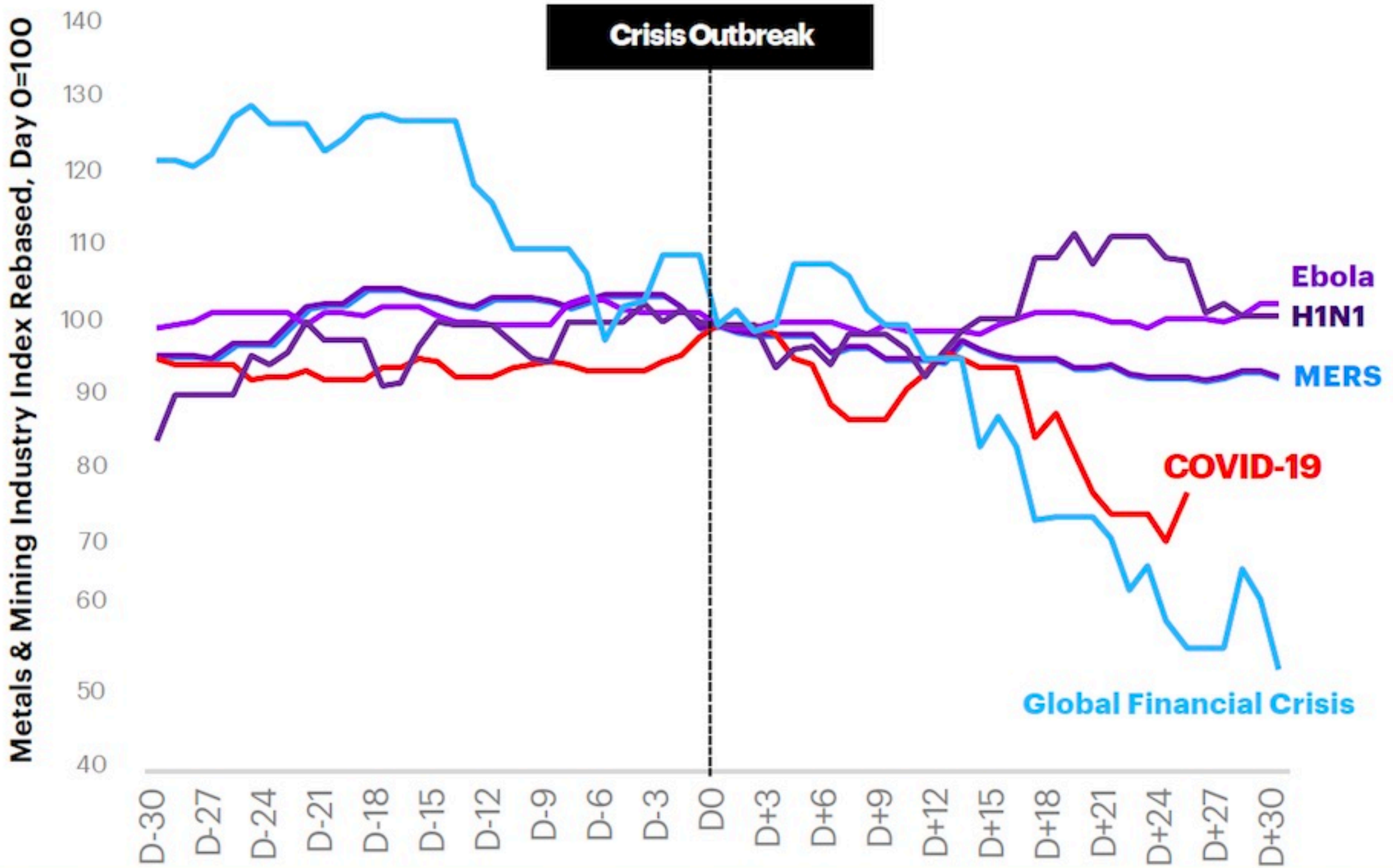
- Open pit mining should NOT be banned in the country. It is an internationally accepted method done in many countries of the world and has been repeatedly proven to be safe for miners, the community and the environment. While the environmental footprint may be visibly large, open pit mines can be successfully rehabilitated and converted into other land uses like agriculture, forestry, and even tourism.

- For shallow ore deposits, such as nickel, iron, coal, and copper, and for large non-metallic quarries, open pit mining is the only economically viable method extraction.

- An open pit mining ban will also have adverse impacts on our energy security, as coal mining is done in the country only through open pit mines.

BUSINESS UNUSUAL

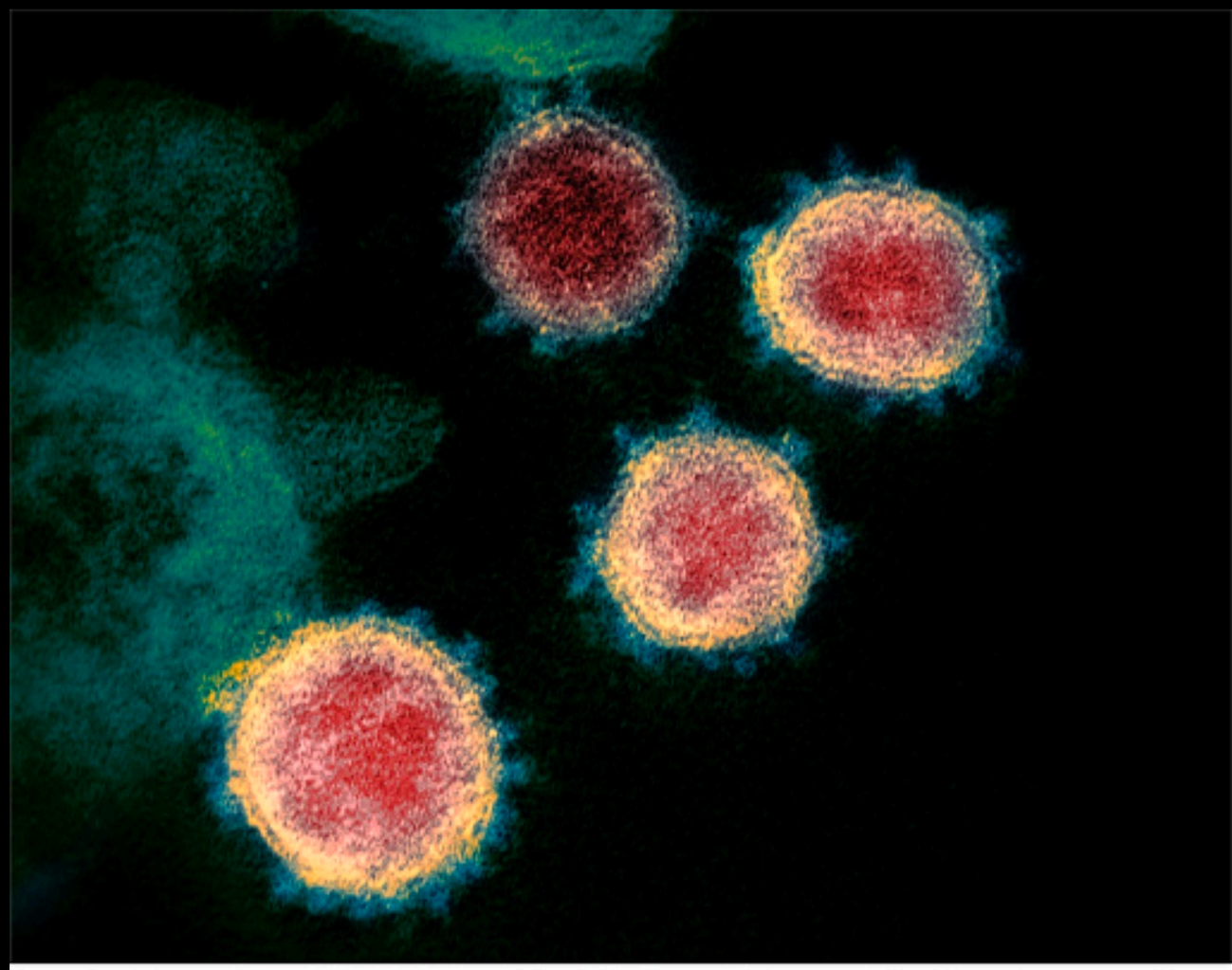
IMPACT OF CRISES ON THE METALS AND MINING INDUSTRIES



Source: Accenture Research analysis of metals and mining industry index sourced from Capital IQ.
S&P 500 Metals & Mining Industry Index Rebased D0 = 100 (the crisis outbreak date). The outbreak dates (D0) are as follows: COVID-19 = Feb 21, 2020; MERS = May 20, 2015; Ebola = Apr 10, 2014; H1N1 = Apr 17, 2009; Global Financial Crisis = Sep 15, 2008.

MINING OPERATIONS IN THE TIME OF COVID-19

- Metallic mineral production went down by 14.37% in 1H 2020
- Government issued several regulations:
  - **Realignment of Social Development and Management Program Budget raised PHP 402M for COVID-19 response**
  - Extension of deadlines
  - Protocols for the resumption of mining and mineral processing operations/workforce and working arrangements
  - Guidelines for shipment of minerals and mineral products

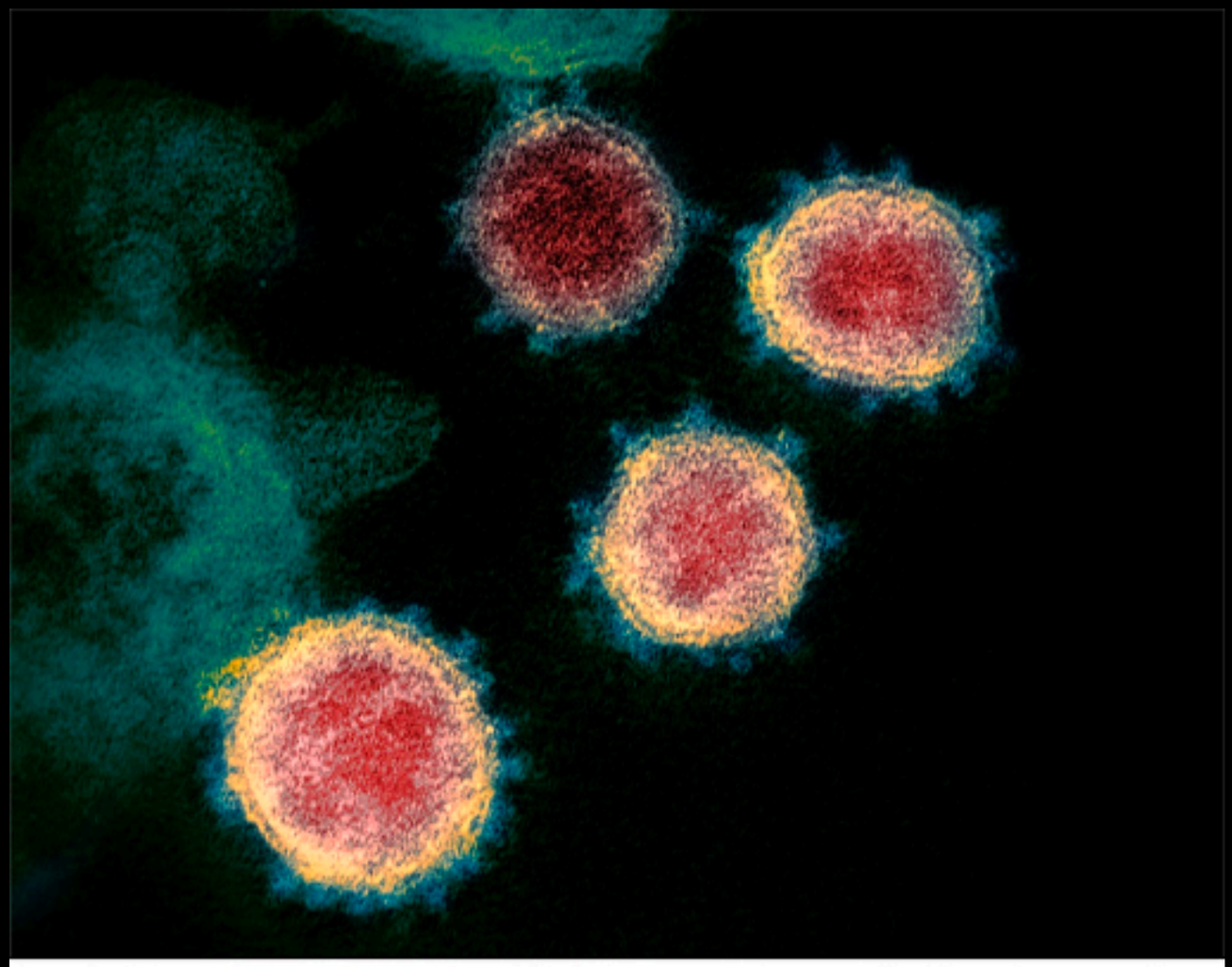


This undated electron microscope image made available by the U.S. National Institutes of Health in February 2020 shows the virus that causes COVID-19.

PHL MINING INDUSTRY IN THE TIME OF COVID-19

Mining sector is optimistic

- An export industry, it was allowed to continue operating but with precautionary measures
- Lifting of the moratorium on new permits is anchored on the passage of a new mining tax regime.
- Three pending copper developments: Philex's Silangan in Surigao del Norte, Indophil's Tampakan in South Cotabato, and St. Augustine's Kingking in Compostela Valley
- Indonesia's ban on nickel exports will be a boon to the Philippines
- Output and value of exports will recover once pandemic-related restrictions are lifted, & gov't encourage consumer demand and implement economic stimulus initiatives
- To cover mounting expenses to address the COVID-19 pandemic, the government is looking at privatizing some of its mining assets.



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"NO TO MINING!"


NO TO!!!..
•MINING
-LA FAYETTE
•KILLING OF OUR MOUNTANS
•KILLING OF OUR TREES
•KILLING OF OUR RIVERS
•KILLING OF OUR OCEAN
-KILLING OF OUR LIVES
•LA FAYETTE...
-YOU ARE VIPERS
-YOU ARE MURDERERS
-YOU ARE LIARS
SAGIP ISLA
TANDUAY

Opportunities and Responsibilities

The Opportunity to Create and Share Benefits to all Stakeholders

The Mining Company
Profitable long run investment

The Government
Income and economic growth

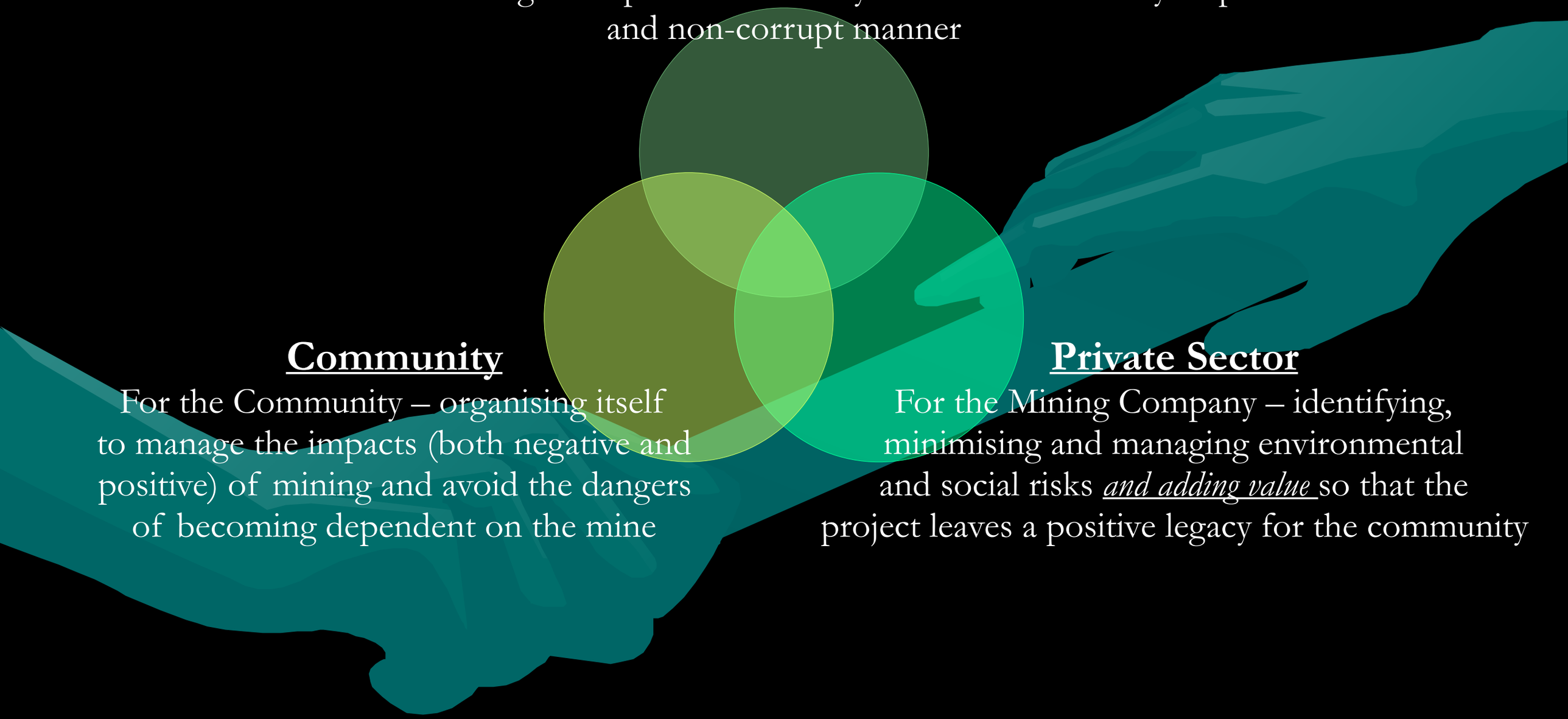
The Community
Employment, income,
Improved social services,
Infrastructure, spin-off businesses

Opportunities and Responsibilities

The Responsibility to Minimise and Manage Risks

Government

For the Government – setting the rules first, to establish a stable and attractive investment environment for mining to take place and, to ensure that mining takes place in a socially and environmentally responsible and non-corrupt manner



Community

For the Community – organising itself to manage the impacts (both negative and positive) of mining and avoid the dangers of becoming dependent on the mine

Private Sector

For the Mining Company – identifying, minimising and managing environmental and social risks *and adding value* so that the project leaves a positive legacy for the community

Legal and Regulatory Issues

Foreign ownership

- The government's ambivalence in opening the resources industry to foreign ownership is a test of its resolve and seriousness in attracting investments that will compete with established local companies.

CASE STUDY

OCEANAGOLD'S DIDIPIO MINE

OCEANAGOLD

Didipio Mine: The Renewal of the Philippines' First FTAA

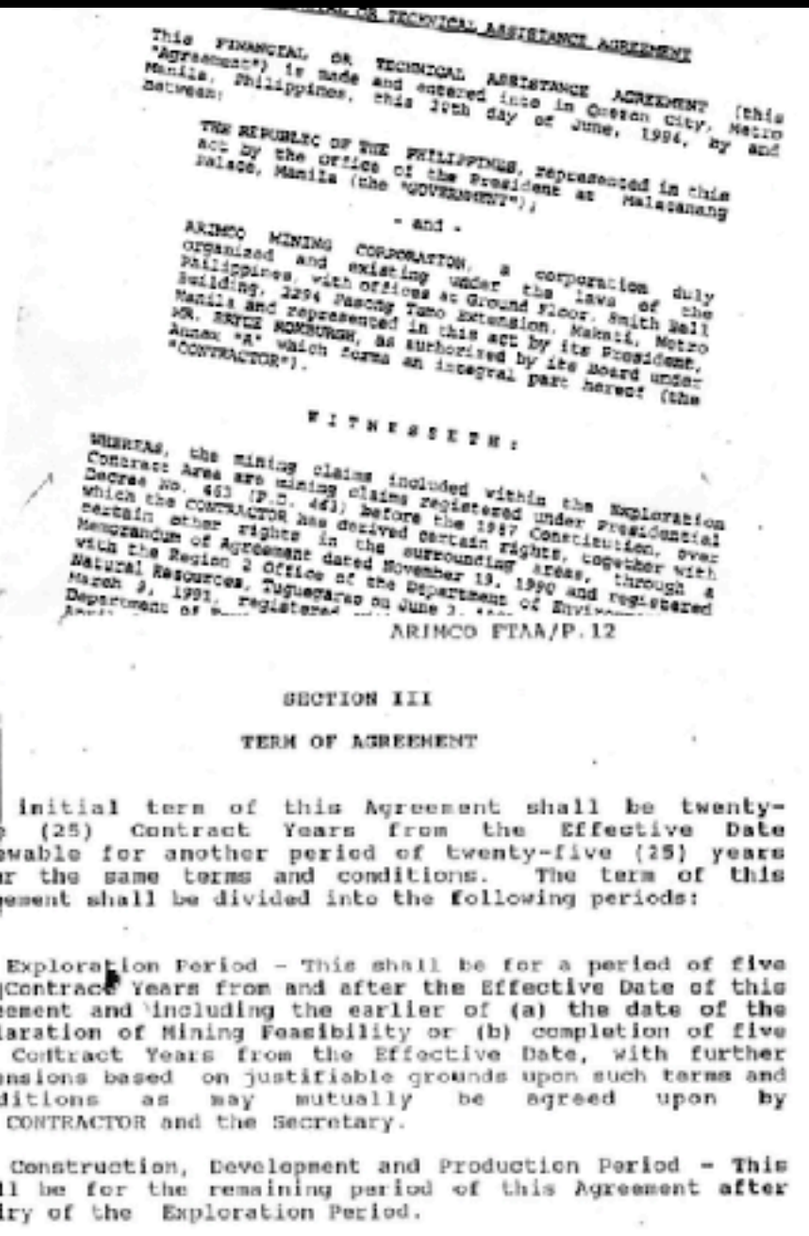
CASE STUDY

OCEANAGOLD'S DIDIPIO MINE

FTAA RENEWAL PROCESS

- OceanaGold lodged its application for its FTAA renewal with the Philippine Government in March 2018

OGPI is currently working with the National Government to complete the renewal.



FINANCIAL OR TECHNICAL ASSISTANCE AGREEMENT

This FINANCIAL OR TECHNICAL ASSISTANCE AGREEMENT (this "Agreement") is made and entered into in Quezon City, Metro Manila, Philippines, this 19th day of June, 1994, by and between:

THE REPUBLIC OF THE PHILIPPINES, represented in this act by the office of the President at Malacanang Palace, Manila (the "GOVERNMENT");

- and -

ARIMCO MINING CORPORATION, a corporation duly organized and existing under the laws of the Philippines, with offices at Ground Floor, Smith Bell Building, 2294 Pasong Tamo Extension, Makati, Metro Manila and represented in this act by its President, MR. BRUCE MCMURRAN, as authorized by its Board under Annex "A" which forms an integral part hereof (the "CONTRACTOR").

WITNESSETH:

WHEREAS, the mining claims included within the Exploration Contract Area are mining claims registered under Presidential Decree No. 463 (P.D. 463) before the 1987 Constitution, over which the CONTRACTOR has derived certain rights, together with certain other rights in the surrounding areas, through a Memorandum of Agreement dated November 13, 1990 and registered with the Region 2 Office of the Department of Natural Resources, Tuguegarao on June 3, 1991, registered Department of [illegible]

ARIMCO FTAA/P.12

SECTION III

TERM OF AGREEMENT

3.1 The initial term of this Agreement shall be twenty-five (25) Contract Years from the Effective Date renewable for another period of twenty-five (25) years under the same terms and conditions. The term of this Agreement shall be divided into the following periods:

(a) Exploration Period - This shall be for a period of five (5) Contract Years from and after the Effective Date of this Agreement and including the earlier of (a) the date of the Declaration of Mining Feasibility or (b) completion of five (5) Contract Years from the Effective Date, with further extensions based on justifiable grounds upon such terms and conditions as may mutually be agreed upon by the CONTRACTOR and the Secretary.

(b) Construction, Development and Production Period - This shall be for the remaining period of this Agreement after expiry of the Exploration Period.

Legal and Regulatory Issues

Local government outright refusal of consent

- declaration of mining moratoriums, ban of particular technologies like open pit mining and submarine tailings disposal, opposition to energy projects like coal-fired and hydro power plants, wind farms and geothermal exploration
- Other issues: local taxation; wastes, emissions and pollution; loss of agricultural land and subsequent livelihood; threat to water resources; relocation and right of way; and health and safety of workers and communities.
- The legal issue of local autonomy in relation to the exploration, development and utilization of natural resources vis a vis the power of control by the executive over LGUs will only be settled by judicial interpretation.

Legal and Regulatory Issues

Environment

- Government administrators must work doubly hard to address cognitive barriers, which relate to the low level of awareness, understanding and attention, afforded to the complex array of policy, regulatory, technical financing and organizational factors affecting resources projects and their wider economic and environmental benefits.

Legal and Regulatory Issues

Resource Nationalism

- Governments are now looking at different strategies to extract a greater share of the value from mining operations.
- Strategies include increasing taxes and royalties to restricting foreign ownerships.
- Requiring in-country processing or beneficiation prior to export is another form.
- Encouraging in-country processing can also be achieved indirectly by imposing export restrictions and increasing export levies on unrefined ores.
- **Continued resource nationalism from governments makes the countries less attractive for mining investment.**

Legal and Regulatory Issues

Climate Change

- There is a need to strengthen institutions in mainstreaming these issues into the resources industry.
- The industry is likely to sustain larger economic losses from climate change.
- Losses on productivity, health and safety, environmental damage to agriculture and ecosystems, and loss of social license to operate in the host communities may be larger than previously estimated.

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GEOLOGICAL SOCIETY OF THE PHILIPPINES

- Geological Society of the Philippines (GSP) is a 5,000 community of member geoscientists from the Philippines and the World working in the Academe, Industry and Government.
- GSP is a Professional Regulatory Commission - Accredited International Professional Organization that represent the Geology Profession.
- GSP serves the profession through Conferences, Scientific Meetings, Education and Outreach Programs, Public Policy and Government Affairs, Awards and Recognition, Publications, Continuing Professional Development (CPD) Programs and Competent Persons Accreditation (CPA) Programs
- GSP was organized in 1945 and incorporated in 1966.

GEOLOGICAL SOCIETY OF THE PHILIPPINES

Purposes

- To promote the science of geology and allied earth sciences;
- To foster the spirit of scientific research;
- To disseminate knowledge concerning the geology of the Philippines and the regions immediately surrounding it; and
- To protect and maintain a high professional and ethical standard in the practice of geology amongst its members.

GEOLOGICAL SOCIETY OF THE PHILIPPINES

The Philippines Geologist's Contributions

- Energy
- Water
- Mineral Resources
- Waste Disposal
- Natural Hazards
- Geotechnical
- Research and Development

Signing of Philippine Mineral Reporting Code Committee Memorandum of Understanding by GSP, PSEM, and SMEP

23 November 2018
CAP Convention Center, Baguio City

What is the PMRC ?

The Philippine Mineral Reporting Code (PMRC) sets out the minimum standards, recommendations and guidelines for Public Reporting in the Philippines of Exploration Results, Mineral Resources and Ore Reserves

- required for all listed mining and mineral exploration companies in PSE or when applying for listing with the PSE

Formulation of the Code

PMRC PROPONENTS

- Philippine Mineral Development Institute, Foundation (PMDIF)
- Philippine Stock Exchange (PSE)
- Mines and Geosciences Bureau of the Department of Environment and Natural Resources (MGB-DENR)
- Chamber of Mines of the Philippines (COMP)
- Philippines- Australia Business Council (PSBC)
- Board of Investments of the Department of Trade and Industry (BOI)

The formulation of the technical provisions of the code

- Geological Society of the Philippines (GSP)
- Philippine Society of Mining Engineers (PSEM)
- Society of Metallurgical Engineers of the Philippines (SMEP)

International Compatibility of the PMRC

- The PMRC Code (2007), when implemented in 2008 by PSE, was compatible with the major global mineral reporting standards

  - Australasian JORC Code (2004)
  - CRIRSCO Template (2006)
  - IRR has elements of Canada's NI 43-101 (2005)

- However, PMRC 2007 is no longer compatible with the current CRIRSCO Template (2019) & the major global mineral reporting codes

- In coordination w/ PSE, the PMRC Committee, is upgrading the PMRC now based on

  - CRIRSCO Template (2019), and
  - JORC (2012)

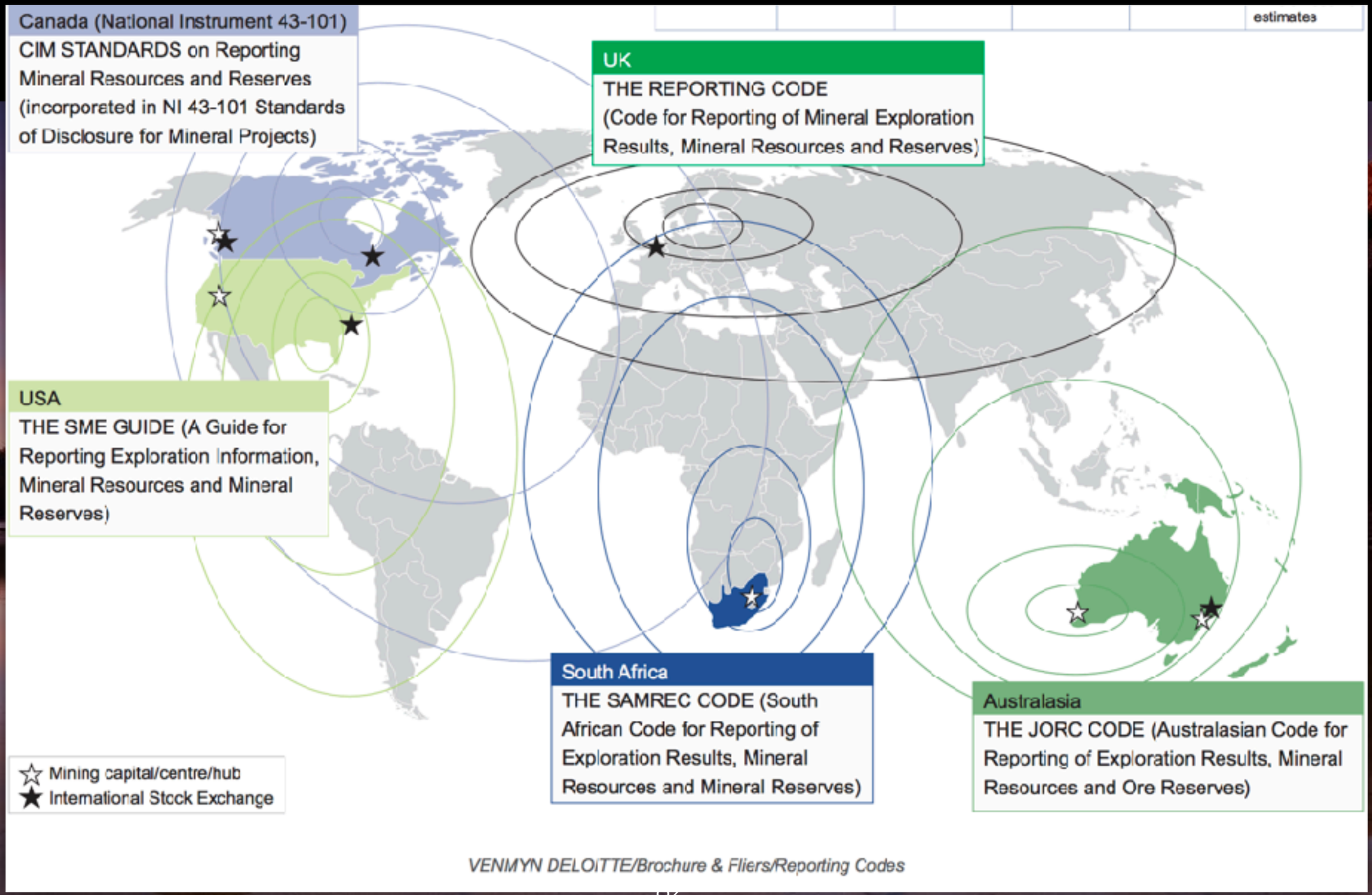
Why is there a need for a Reporting Standard in the Mineral Industry?

- To protect investors in mineral exploration and mining
- To protect the capital markets from fraudulent practices
- To promote a common understanding in reporting mineral assets

➢ Bre-X's Busang Mining Fraud of 1997

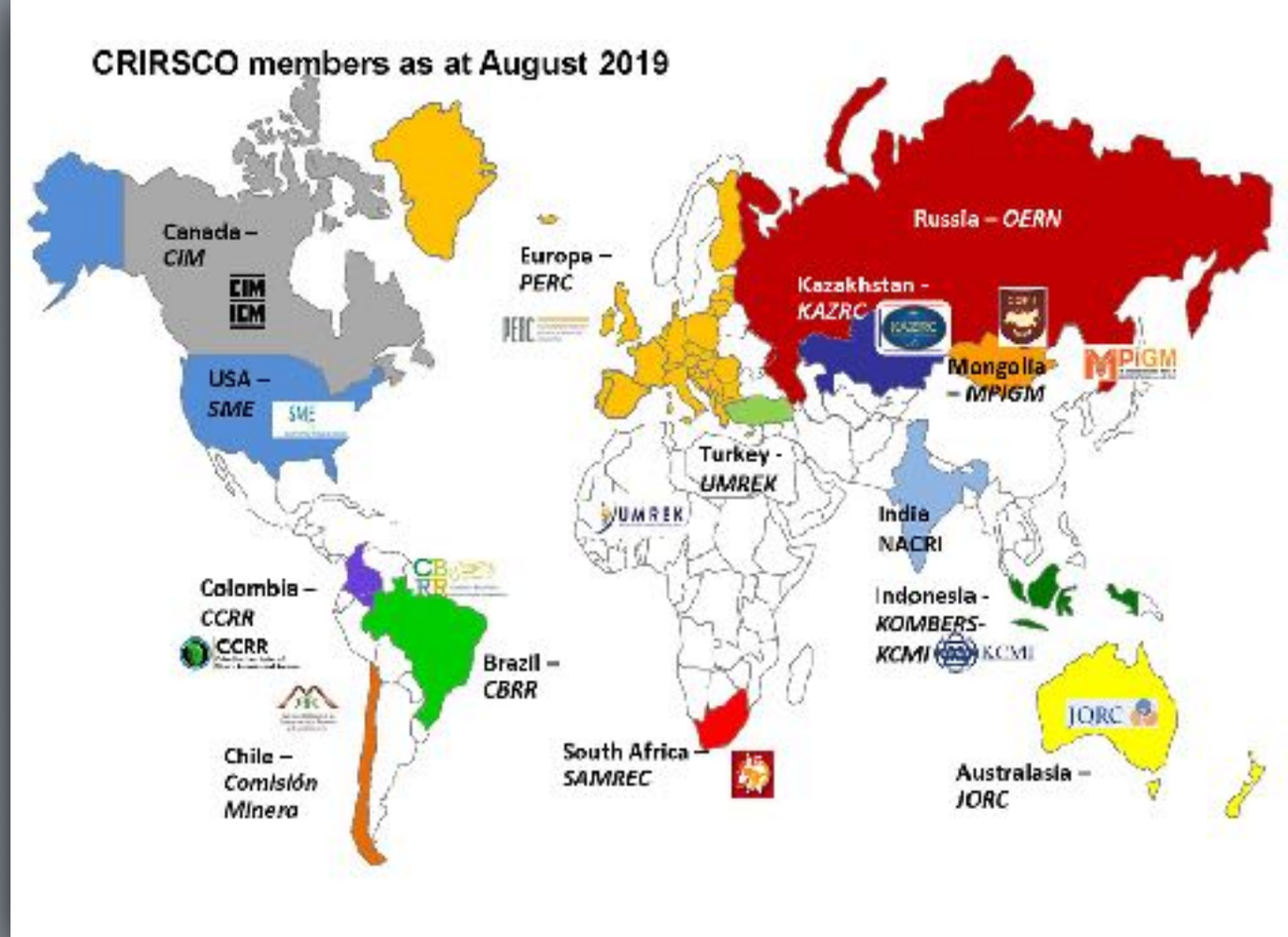
"Single Event" that fast tracked mineral reporting standards

REPORTING CODES



14 Members
CRIRSCO “Family of Codes”

Australasia - JORC
Canada - CIM
South Africa - SAMREC
USA - SME
Europe - PERC
Chile - CM
Brazil - CBRR
Russia - NAEN
Kazakhstan - KZCRA
Mongolia - MPIGM
Indonesia - KCMI
Turkey - UMREC
Colombia - CCRR
India - NACRI
PHL is in the process of lodging its application



Committee for Mineral Reserves International Reporting Standards

CRIRSCO

Task Force of International Council for Mining & Metals (ICMM)

What does the PMRC do ?

- Sets out minimum standards for public reporting in the Philippines of Exploration Results, Mineral Resources and Ore Reserves, as may be required as a listed company in PSE or when applying for listing with the PSE
- Applicable to all solid minerals, including industrial minerals and coal. Provides a mandatory system for classification of tonnage/grade estimates according to geological confidence, technical, economic & other considerations (“Modifying Factors”)
- Requires public reports to be based on work undertaken by Competent Person(s)
- Provides extensive guidelines in the preparation of PMRC compliant reports

PMRC TECHNICAL REPORTING BY COMPETENT PERSONS

Exploration Results	**Geologists**
Mineral Resources	**Geologists**
Ore Reserves	**Mining Engineers**
Metallurgy	**Metallurgical Engineers**

What the PMRC does not do?

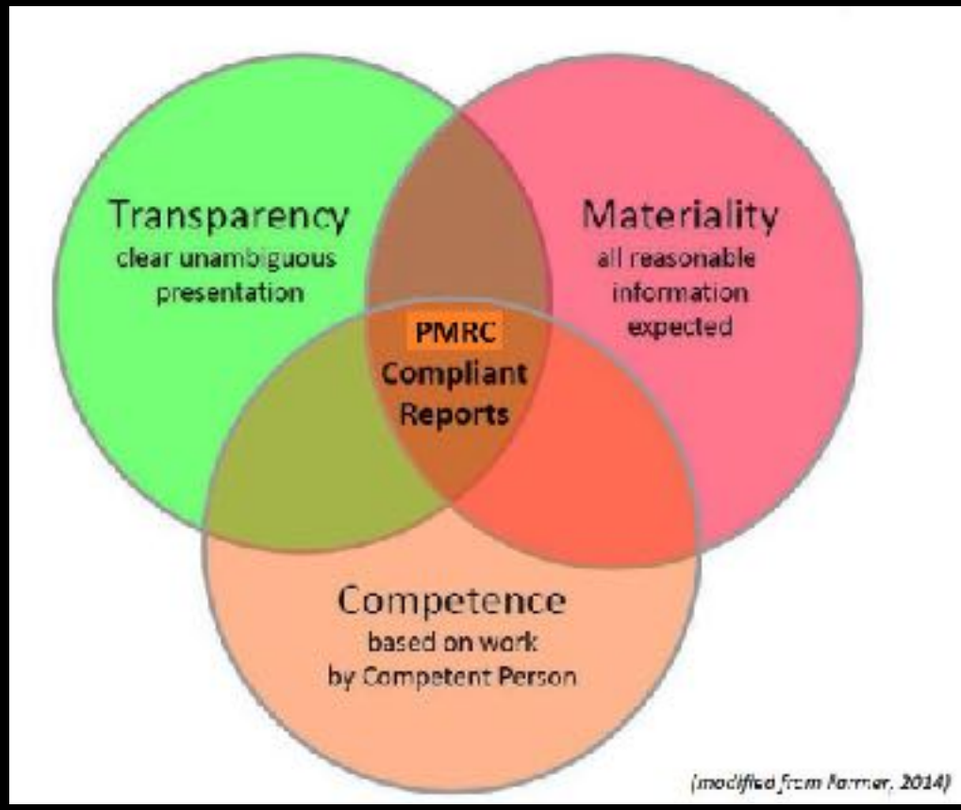
- It does not impair the practice of Geology, Mining and Metallurgy in the Philippines
- It does not compel geologists, mining engineers and metallurgists with relevant experience to become CPs
- It does not regulate the procedures used by CPs to estimate and classify Mineral Resources and Ore Reserves
- It does not regulate Companies' internal classification or reporting systems
- It does not deal with breaches of the Code

Governing Principles of the PMRC

- Transparency requires that the reader of a Public Report is provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and is not misled.

- Materiality requires that a Public Report contains all the relevant information which investors and their professional advisers would reasonably require, and reasonably expect to find in the report, for the purpose of making a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Ore Reserves being reported.

- Competence requires that the Public Report be based on work that is the responsibility of suitably qualified and experienced persons who are subject to an enforceable professional code of ethics.



CONTENTS

- Legal and Institutional Framework
- Philippine Resources Industry Update
- Issues Facing the Mining Industry
- Geology Profession Update
- **Debunking the Myths**
- Conclusion

"NO TO MINING!"


SALAMAT SA
SUSPENSION
HINIHINTAY NAMIN
ANG
CLOSURE
DAPAT IPATUPAD
AGAD ANG
CLOSURE
WAKASAN
ANG PAGHIHIRAP!
IKANSELA ANG MGA
MINING AGREEMENTS:
MPSA AT FTAA
IKANSELA
ANG MGA MINING
ENVIRONMENTAL
COMPLIANCE
CERTIFICATE
DESAMA

Mining is environmentally destructive

- Mining is not “green” or environmentally friendly.

Fact: Have any of the people who believe this ever reviewed the regulations and licensing requirements for a mine to operate? That’s not to mention the ongoing checks, reports and submissions to a variety of government departments. Obviously there are always companies that could have done a better job from an environmental perspective in the past, but in the Philippines, operations are governed by regulations and legislation – and most companies not only comply, but are very keen to do the right thing by the environment.

LEGAL REQUIREMENTS UNDER THE MINING ACT AND ITS IRR

- Technical and financial qualifications to engage in large-scale mining in the Philippines;
- The area being applied for is open and available for mining activities and is not located within any of the areas where mining is prohibited;
- An approved ECC, showing that the impacts of mining in the area can be mitigated and/or remediated through proper environmental protection measures;
- An approved Project Feasibility Study, showing that the mine has enough ore reserves to operate profitability, and can give government a fair share in revenues.
- The endorsement/approval of the local government units (Province, Municipality/City, and Barangays) that will be impacted by the proposed mining activity;
- The endorsement/approval of the indigenous peoples, if the area being applied for is within their ancestral domains.
- Requirements under EO 79 IRR - https://mgb.gov.ph/images/stories/DAO_2012-07.pdf

OTHER LAWS RELATED TO RESOURCES DEVELOPMENT

- Ecological Solid Waste Management Act https://www.officialgazette.gov.ph/2001/01/26/republic-act-no-9003-s-2001/
- Toxic Substances and Hazardous and Nuclear Wastes Control Act https://www.officialgazette.gov.ph/1990/10/26/republic-act-no-6969/
- Clean Air Act https://emb.gov.ph/wp-content/uploads/2015/09/RA-8749.pdf
- Clean Water Act https://emb.gov.ph/wp-content/uploads/2015/09/RA-9275.pdf
- 1976 Philippine Water Code defines the extent of the rights and obligations of water users https://www.officialgazette.gov.ph/1976/12/31/presidential-decree-no-1067-s-1976/
- 1998 Philippine Fisheries Code provides for the sustainable development of fishery and aquatic resources https://www.officialgazette.gov.ph/1998/02/25/republic-act-no-8550/
- Pollution Control Law http://r12.emb.gov.ph/wp-content/uploads/2016/04/presidential-decree-no984.pdf
- National Environmental User's Fee of 2002 https://mgb.gov.ph/images/stories/DAO_2002-16.pdf
- Palawan Council for Sustainable Development http://extwprlegs1.fao.org/docs/html/phi19797.htm
- Incentives granted by the Board of Investments (BOI) pursuant to Executive Order No. 226, otherwise known as the Omnibus Investments Code of 1987 https://boi.gov.ph/wp-content/uploads/2018/02/EO-226-omnibus-investments-code.pdf

OTHER DENR PERMITS AND FEES

- TREE CUTTING PERMIT - Cutting of trees within road right of way, mining area, building site. Fee is PHP 300.00 per tree cut
- WASTEWATER DISCHARGE PERMIT
- PERMIT TO OPERATE Air Pollution Device for the generators
- HAZARDOUS WASTE GENERATOR ID together with inspection clearance of its hazardous waste storage
- MINE WASTES AND TAILINGS FEE – may be increased to PHP 0.10 per MT of mine wastes and PHP 0.15 per MT of tailings

Mining is environmentally destructive

- Nearly all of the Philippines is covered with applications and titles for mining.

Fact: Mineral titles only apply to 2.42% of the Philippine total land area, a figure that has remained steady for more a long period of time because of the mining application moratorium. Only a tiny proportion is actually disturbed by exploration activities and eventually ends up as an operating mine. However, it should be emphasized that said area is still subject to the mandatory relinquishment by contractors provided by law.

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

MINES AND GEOSCIENCES BUREAU

MINERALS INDUSTRY AT A GLANCE

Philippine Total Land Area

30 Million has.

High Mineral Potential

9 Million has.

727,372.1818 has.

or ONLY 2.42%

of the Philippine total land area
is covered by mining tenements
as of May 31, 2020

OPERATING MINES AND QUARRIES 2020

50 metallic mines
54 non-metallic mines
5 processing plants
3,389 LGU Issued Permits

Mining is environmentally destructive

- Nowhere is sacred. Nowhere is safe.

Fact: Mining operations cannot happen in areas identified under the law. Every project is subject to a detailed assessment under the Environmental Impact Statement System under PD 1586 and if they don't meet the strict criteria set out to minimize any impacts on the environment then they are not approved.

Areas for Mining under the Mining Act of 1995

Areas Open to Mining Operations

- all mineral resources in public or private lands, including timber or forestlands as defined in existing laws

Areas Closed to Mining Operations

a. In military and other government reservations, except upon prior written clearance by the government agency concerned;

b. Near or under public or private buildings, cemeteries, archeological and historic sites, bridges, highways, waterways, railroads, reservoirs, dams or other infrastructure projects, public or private works including plantations or valuable crops, except upon written consent of the government agency or private entity concerned;

c. In areas covered by valid and existing mining rights;

d. In areas expressly prohibited by law;

e. In areas covered by small-scale miners as defined by law unless with prior consent of the small-scale miners

f. Old growth or virgin forests, proclaimed watershed forest reserves, wilderness areas, mangrove forests, mossy forests, national parks provincial/municipal forests, parks, greenbelts, game refuge and bird sanctuaries as defined by law and in areas expressly prohibited under the National Integrated Protected Areas System (NIPAS) under Republic Act No. 7586, Department Administrative Order No. 25, series of 1992 and other laws.

EXECUTIVE ORDER NO.79

Areas closed to mining applications – In addition to the areas declared Mining Act and NIPAS Act, the EO disallows applications for mineral contracts, in:

- prime agricultural lands, in addition to lands covered by the Comprehensive Agrarian Reform Law of 1988, including plantations and areas devoted to valuable crops;

- strategic agriculture and fisheries development zones, fish refuge and sanctuaries declared as such by the Secretary of the Department of Agriculture;

- tourism development areas as identified in the National Tourism Development Plan; and

- other critical areas, island ecosystems, and impact areas of mining as determined by current and existing mapping technologies, that the DENR may identify pursuant to existing laws, rules, and regulations, such as but not limited to the NIPAS Act.

LAND CONVERSION CERTIFICATE

- Required if a project structure such as road or building falls on agricultural or public land outside of the MPSA/FTAA area.
- Filed with the CENRO
- Filing fee of PHP1,000 and inspection fee of PHP10,000

Mining is environmentally destructive

- Water supplies should not be put at risk by mining.

Fact: Impacts on water are a central element of the assessment of mining projects by the government. All mining proposals are required to prepare detailed water studies that are independently assessed by government agencies and scientists. Mineral exploration drilling involves the same or very similar techniques to water bore drilling. All drilling requires government licenses, which include specific requirements to protect aquifers.

NATIONAL WATER RESOURCES BOARD PERMIT UNDER PD 1067

- Authorizes water extraction from surface and groundwater sources
- Application should define the projected annual consumption and source/s of water and competing uses
- Application fee is PhP 7,200 per permit / well / surface extraction point
- Annual water charges is PhP5,000 plus a fee ranging from P12.30 to P30.55/liter/second

Mining is environmentally destructive

- Land is useless when mining is finished.

Fact: Before any mine is started a rehabilitation plan must be submitted and approved by the government. All disturbance must be rehabilitated and environmental funds created and lodged to ensure all rehabilitation is completed to specified standards.

UNDER THE MINING ACT, COMPANIES ARE REQUIRED TO FUND/DEPOSIT TO THE FOLLOWING ENVIRONMENTAL PROTECTION MEASURES:

- Environmental Protection and Enhancement Program
- Annual Environmental Protection and Enhancement Program
- Contingent Liability and Rehabilitation Fund
- Monitoring Trust Fund
- Rehabilitation Cash Fund
- Environmental Trust Fund
- Mine Waste and Tailings Fees Reserve Fund
- Final Mine Rehabilitation and Decommissioning Fund

Environmental Fund

Environmental Protection and Enhancement Program (EPEP)

- http://www.mgb.gov.ph/images/stories/DAO_2015-02.pdf
- **equivalent to 10% of Total Project Cost**
- the operational link between the environmental protection and enhancement commitments under the Mining Act revised implementing rules and regulations as well as those stipulated in the ECC and the Contractor's plan of mining operation
- describes the expected and considered acceptable impact and shall set out the life-of-mine environmental protection and enhancement strategies, including final mine rehabilitation and/or decommissioning, based on best practices observed in environmental management in mining

Environmental Fund

Annual Environmental Protection and Enhancement Program (AEPEP)

- based on the approved EPEP
- to implement its AEPEP, FTAA holder must allocate annually **3%-5% of its direct mining and milling cost** depending on the environment/geologic condition, nature and scale of operations and technology employed in the FTAA Area.

Environmental Fund

Contingent Liability and Rehabilitation Fund (CLRF)

- Monitoring Trust Fund (MTF)
  - must be in cash and in an amount to be determined by the Mine Rehabilitation Fund (MRF) Committee which shall **not be less than the amount of PHP50,000.**
  - covers the maintenance of and other operating budget incurred by the Multipartite Monitoring Team (MMT) that will monitor the operations within the mining area. The MMT comprises representatives from the government, the affected community, contractors, indigenous people/indigenous cultural community, and relevant nongovernment organizations.
  - **Replenishment of this amount must be done monthly**

Environmental Fund

Contingent Liability and Rehabilitation Fund (CLRF)

- Rehabilitation Cash Fund (RCF)
  - established to ensure compliance with the approved rehabilitation activities and schedules for a specific mining project phase, including research programs as defined in the EPEP and/or AEPEP
  - **equivalent to 10% of the total amount needed to implement the EPEP or PHP5 million, whichever is lower**. The RCF must be deposited as a Trust Fund in a mutually agreed-on government depository bank

Environmental Fund

Contingent Liability and Rehabilitation Fund (CLRF)

- Environmental Trust Fund (ETF)
  - consists of a **replenishable amount of at least PHP50,000**
- Mine Waste and Tailings Fees Reserve Fund (MWTRF)
  - mine waste and tailings fees collected semiannually based on the amounts of mine waste and mill tailings generated for the said period.
  - fees collected will accrue to a MWTRF and deposited in a gov't depository bank to be used for payment of compensation for any damage caused by mining
  - **PHP0.05/MT of mine waste produced and PHP0.10/MT of mill tailings generated from the mining operations**

Environmental Fund

Contingent Liability and Rehabilitation Fund (CLRF)

- Final Mine Rehabilitation and Decommissioning Fund (FMRDF)
  - mining contractor must make **annual contributions** to an FMRDF in accordance with the contractor's mandatory Final Mine Rehabilitation and Decommissioning Plan (FMRDP) and must contain cost estimates, taking into consideration expected inflation, technological advances, the unique circumstances faced by the mining operation, among others.
  - the estimates based on the cost of having the decommissioning and/or rehabilitation works done by third-party contractors. The estimates, on a per year basis, over a 10-year period.
  - deposited as a trust fund in a government depository bank and must be used solely for the implementation of the approved FMRDP
  - Annual cash provisions must be made to the FMRDF, based on the formula:
    - **Annual Provision = Cost of Implementing the Approved FMRDP x Percentage Required (in accordance with the IRR)**

Local communities do not benefit from mining

- Mining companies don’t pay enough taxes.

Fact:

PhP15.47 Billion - Amount of national and local taxes, fees and royalties that the minerals industry generated and contributed to the Philippine economy in 2019.

190,000 - Workers currently employed in the minerals industry in 2019. While estimates vary, it is conservatively assumed that for every job in the industry, about four indirect jobs may be generated in the upstream and downstream sectors.

Fiscal framework of the mining industry

- RA 7942 or the Mining Act of 1995, and its Implementing Rules and Regulations;
- DENR AO 2007-12, providing for the revised guidelines establishing the fiscal regime of the FTAA;
- FTAA/MPSA terms and conditions;
- National Internal Revenue Code;
- Tariff and Customs Code of the Philippines; and
- Other laws, rules, and regulations in relation to taxes and incentives governing mining activities.

Fiscal Regime of MPSAs

Total government share in an MPSA shall be the excise tax on mineral products

- on metallic minerals, the excise tax based on the actual market value of the gross output at the time of removal will be as follows:
  - for copper and other metallic minerals except gold and chromite – 4%
  - for gold and chromite – 4%
- on nonmetallic minerals and quarry resources – 4% based on the actual market value of the annual gross output thereof at the time of removal.

"Gross output" means the actual market value of the minerals or mineral products from each mine or mineral land operated as a separate entity, without any deduction for mining, processing, refining, transporting, handling, marketing or any other expenses.

- CIF deducted; highest market price prevailing in the locality;

- Before any sale or shipment of mineral product is made, existing and future marketing contracts/sales agreements must be submitted to the MGB Director and the MGB Regional Director for registration.

Fiscal Regimes Applicable to Both MPSAs and FTAAs

- Environmental Fund
- Social Fund
- Royalties
- Indigenous Peoples/Indigenous Cultural Communities
- Small-scale Miners
- Mineral Reservations
- Tax Regime under the NIRC
- Local Government Taxes

Local Government Taxes

LGUs entitled to 40% of the excise tax (Barangay - 35%; Municipal - 45%; and Province - 20%)

- Annual Occupation Fees
  - PHP50.00/hectare (outside mineral reservations)
  - PHP100/hectare (inside mineral reservations)
- Local Business Tax - rates vary depending on the LGUs, max of 2% of gross receipts
- Real Property Tax - rates vary LGUs depending on LGUs, max of 2% of assessed value, mobile equipment is not subject to tax
- Special education levy - 1% of the assessed value of the property
- Registration fees - rate depends on the activity to be registered
- Community tax - max of PHP 5,000 for individuals and PHP 10,000 for establishments per year
- Other local taxes - type of taxes depend on local government concerned at maximum of 2% based on gross sales/receipts

Participation in the Extractive Industries Transparency Initiative (EITI), thereby enhancing the implementation of policy on Transparency and Good Governance

- EITI is a global standard for transparency in the mining and petroleum sector that involves the reconciliation of company payments with government receipts by an independent administrator (civil society) and disclosure of that information to the public for increase accountability and transparency.
- EITI is a voluntary, multi-stakeholder initiative launched in 2002; the process is managed by government, company and civil society stakeholders who must be involved in the process.

Local communities do not benefit from mining

- Land owners have no rights.

Fact: Mining companies can’t compulsorily acquire property (there are no provisions in any legislation that allow for this). Land owners can refuse mining on the surface of their land where it contains agricultural land or other significant improvements. Land owners can negotiate the terms of exploration on their land. Their land cannot be accessed for exploration before an agreement between explorers and landholders is reached. This also applies to ancestral land and domains of indigenous peoples.

Royalties

Free and Prior Consent of Indigenous Peoples/IndigenousCultural Communities (IPs/ICC) for Mining Operations within Ancestral Domains

- **not less than 1% of the value of the gross output** of minerals sold in favor of IPs/ICCs if mining operations are conducted within ancestral lands/domains

Small-scale Miners

- over areas covered by small-scale miners, the contractor shall pay royalties to the concerned small-scale miners upon utilization of the minerals **depending on the agreement with small-scale miners**

Landowners/mining tenement owners

- Mining operations within private property are **subject to negotiations** between the landowner/tenement holders and the mining companies

Local communities do not benefit from mining

- Mining companies don't care about their social impact.

Fact: The last 10 years have been a time of social revolution and seen the rise of a 'social license to operate' for all businesses. There is now an expectation on mining companies to demonstrate social responsibility in a whole range of ways, beyond just providing employment and paying taxes. It is expected that local and indigenous communities, most impacted by mining activities, derive direct and sustainable benefits from their mineral wealth. Positive social outcomes from mining include increased employment for local people, support for local businesses, training and educational initiatives for local communities, and co-creation and collaboration on community development projects.

Social Funds

- Contractor will allot annually a minimum of **1.5% of the operating costs** necessary to implement the foregoing:
  - Social Development and Management Program - **1.125% (75% of 1.5%)**;
  - Development of Mining Technology and Geosciences - **0.150% (10% of 1.5%)**; and
  - Information, Education, and Communication Program - **0.225% (15% of 1.5%)**.
- "Operating cost" means the specific costs of producing a sellable product on a commercial scale incurred in the calculation of the net income before tax. This includes costs and expenditures related to mining/extraction and treatment/processing (inclusive of depreciation, depletion and amortization), exploration activities during operation stage, power, maintenance, administration, excise tax, royalties, transport and marketing, and annual progressive/environmental management.

Mining is a sunset industry

- Renewable energy means the end of mining.

Fact: The transition to renewable energy production and the need to reduce greenhouse gas emissions is effecting the introduction of new clean coal mines, but other areas of mining are set to reap substantial benefits. The move to renewable energy sources presents opportunities for mining and the production of minerals used in the technologies associated with clean energy production.

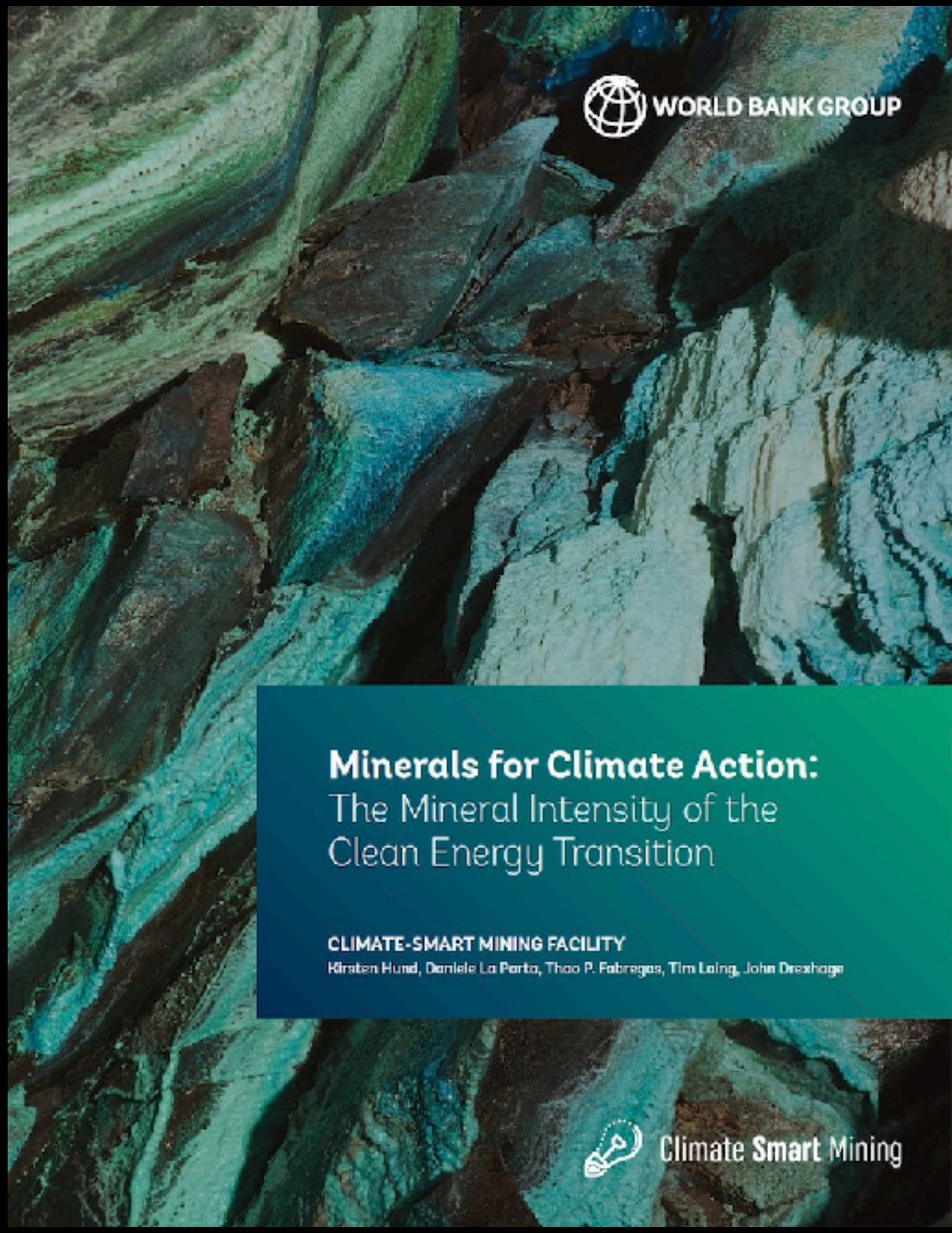
MINERAL PRODUCTION AND CLEAN AIR TECHNOLOGIES

- Production of minerals, such as graphite, lithium and cobalt, could increase by nearly 500% by 2050, to meet the growing demand for clean energy technologies.

- Low-carbon technologies, particularly solar photovoltaic (PV), wind, and geothermal, are more mineral intensive relative to fossil fuel technologies.

- Recycling and reuse will have a role in meeting future mineral demand, but primary mineral demand from mining will still be needed.

- **Over 3 billion tons of minerals and metals will be needed to deploy wind, solar and geothermal power, as well as energy storage, required for achieving a below 2°C future.**



Mining is a sunset industry

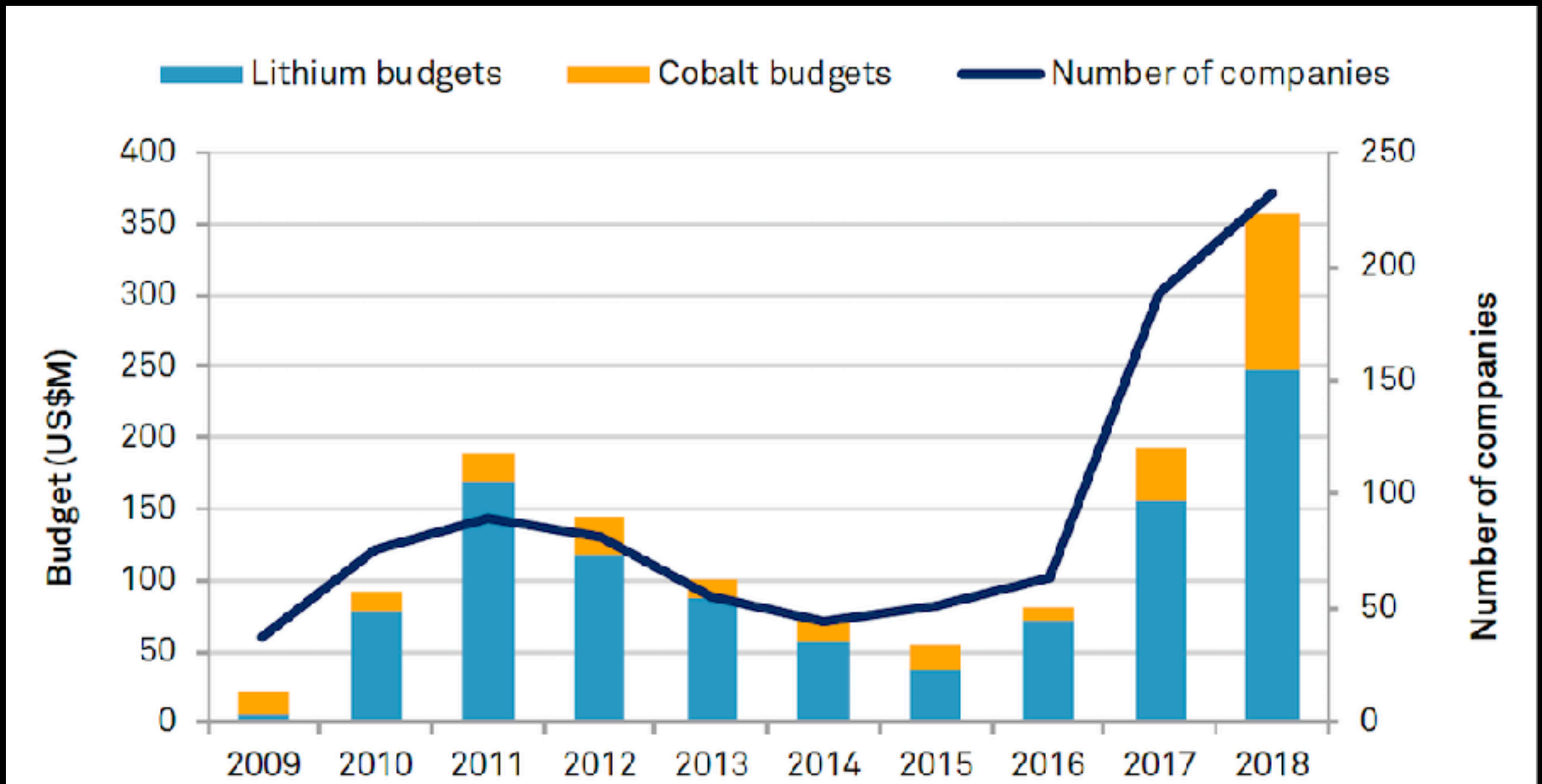
- Mining doesn't help the sustainability of the planet.

Fact: Thanks to the growth in popularity of electric vehicles (EV) and renewable energy, there is a rising demand for batteries to power EVs and/or used to store energy. These batteries are made with a significant amount of nickel, copper, lithium and cobalt. Making and storing energy in this way will reduce the reliance on and use of fossil fuels, resulting in sustainable power generation for a cleaner planet.

NEW ECONOMY MINERALS

- Digital technologies have resulted in a change in commodity demand for critical minerals such as cobalt, lithium and copper. These minerals are required to manufacture energy conversion and storage equipment needed to supply the renewable energy industry.
- The rise of electric vehicles and the production of an ever-growing variety of high tech and green technologies, from batteries, smart phones and laptops to advanced defense systems have also boosted demand and competition for new world commodities.

LITHIUM AND COBALT EXPLORATION BUDGETS 2009-2018



Data as of Jan. 18, 2019.
Source: S&P Global Market Intelligence

ROLE OF GEOSCIENCE IN RENEWABLES

- Decarbonization will involve geoscience at every level from straightforward low carbon generation (e.g. geothermal), to energy storage to counteract renewables intermittency (e.g. compressed air energy storage, heat storage), to emissions abatement of fossil fuel generation and industry (e.g. carbon capture and storage).
- Siting of renewable energy projects from hydro electric power or storage to wind farms, both onshore and offshore, is based fundamentally on conditions created by geology.
- New resources required to manufacture the energy conversion equipment needed to supply renewable energy on a global scale will place new demands for resources which already is beginning to constrain and shape the commercial solutions.

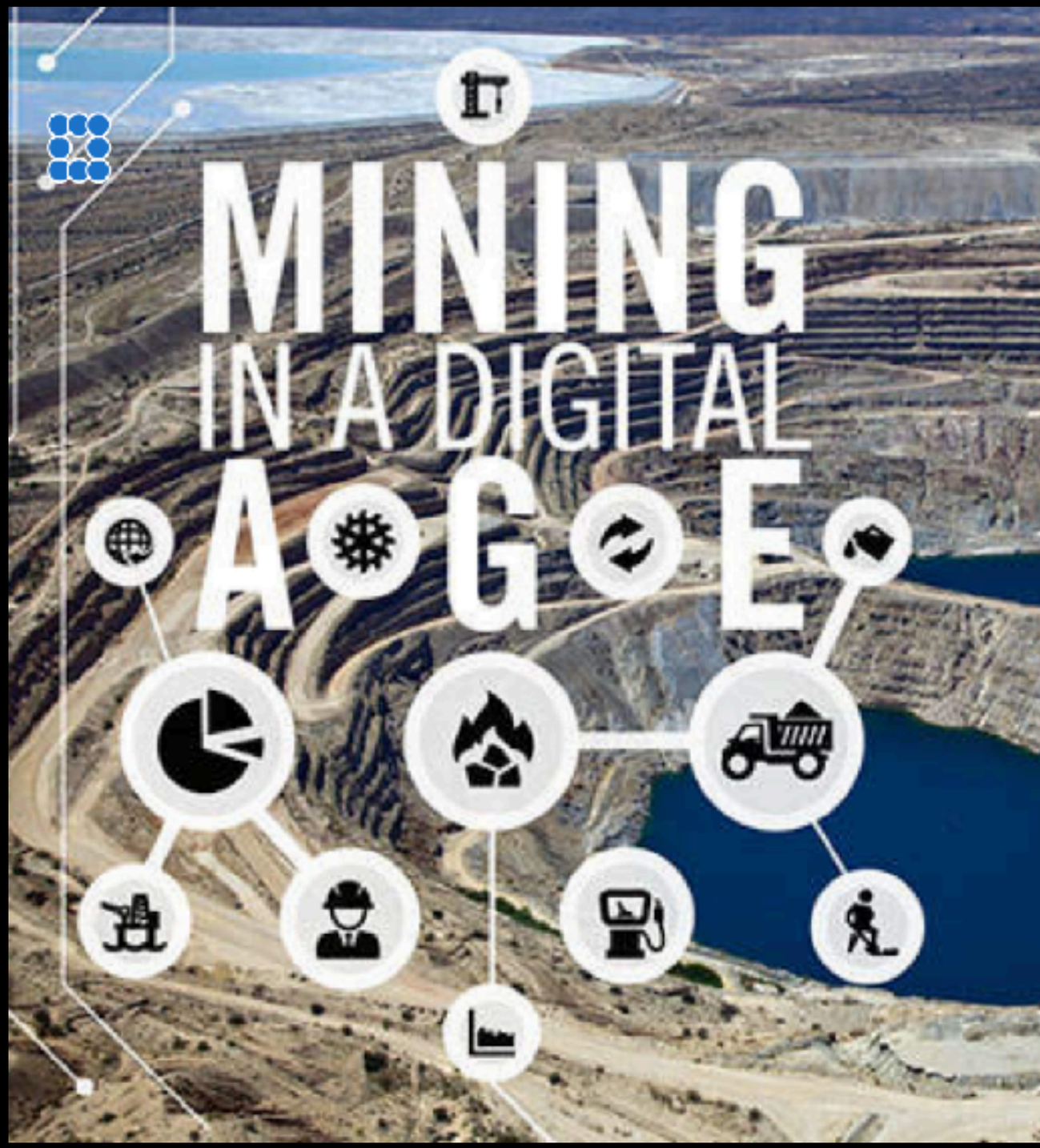
There will be no more jobs in the mining industry

- The mining boom is over; mining jobs are scarce and unstable.

Fact: Job vacancies have recently been increasing as more companies invest in exploration, develop projects and expand existing mining operations. There remains behind a lucrative and vibrant industry which continues to be productive for many years. This productivity and the use of technology that amplifies efficiencies is seeing some exciting times in the mining industry. Mining is alive and well. There are plenty of opportunities ahead!

NEW DIGITAL TECHNOLOGY

- **Mobile access in the mine site**. Mobile technology connectivity between workers and management facilitates communication in the mines, which is vital in ensuring a safe and productive working environment.
- **Data-driven decisions**. Mining companies are revolutionizing how they collect data in the field with the help of the Internet of Things (IoT), which are smart data solutions that help management to relay important data such as water pressure, temperature, concentration of gases and other information.
- **Cloud technology** allows management and employees to quickly access and alter essential information, wherever and whenever needed.
- **Robotics** allow more autonomous vehicles and machinery to make operations smoother resulting in better safety, greater efficiency and cheaper running costs. In engineering industries which require hard labour intensive tasks, robots will be able to take over and do things faster and more efficiently than humans ever could.

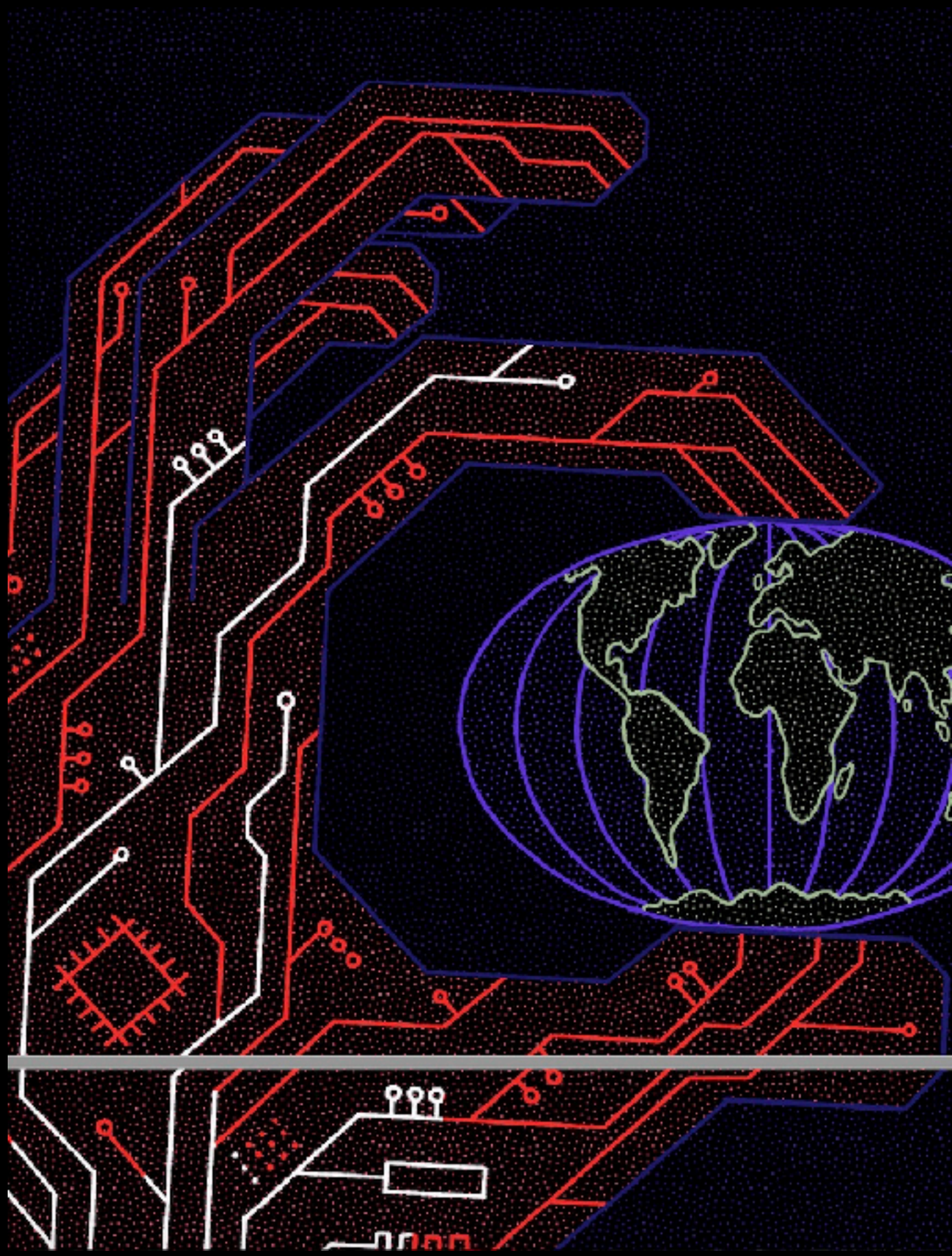


NEW MINERS

- With the advent of digital technology and rising demand for new world commodities, the business of mineral exploration, development and production will not be conducted solely by traditional mining houses and junior companies.
- Technology companies may become direct or indirect investors as a way of shoring up and securing supply. With scarce new world commodities supply like cobalt and lithium and other rare earth minerals, cash-rich technology companies will venture into mining to ensure that they can continue to produce their products.
- Using blockchain technology, new technology entrants can engage in mining without owning any mines or distribution infrastructures in the same way that Uber does with no cars and Airbnb, with no real estate listings.

TECH GIANTS EMERGING FROM CORONAVIRUS CRISIS STRONGER THAN EVER

- Amazon, Apple, Facebook, Google and Microsoft are aggressively placing new bets as the coronavirus pandemic has made them near-essential services.
  - Combined, they are sitting atop about $557 billion, enabling them to maintain a pace of acquisitions and investments.
  - They have been among the top corporate spenders on research and development for most of the last decade.
- Without any pushback from regulators, big tech companies would almost unquestionably come out of the pandemic more powerful.
- **Tech giants are on the hunt for investment opportunities in the mining sector, in a push that is destined to change the landscape of the resources industry.**



There will be no more jobs in the mining industry

- Technology is replacing jobs.

Fact: Automation and remote-control operations are becoming prevalent throughout the mining industry especially in developed countries. As with any industry, changes in technology require a shift in the type of people being employed. New technologies are changing the face of mining and creating opportunities for graduates. Far from replacing jobs, the technology shift is reshaping the mining industry and requires intelligent, innovative geologists and engineers to help mining take advantages of these changes.

NEW WORKFORCE

- While automation and data analytics technologies may increase efficiency, these will require a workforce that is skilled in data science, analytics, predictive modeling and mechatronics.
- Current workforce will also need retraining as knowledge resources and will be required to possess a new set of skills needed to operate new machinery and technology, or work along-side and support automated systems.
- Universities and data science companies that develop innovations could gain an edge in exploration.
- Mining companies will employ more PhD-level data scientists with geology and mining engineering background.

Mining industry is an inclusive employer

- Mining is just for geologists and engineering types.

Fact: Mining is a business like any other. It needs everything from accountants, lawyers, administration staff, contract officers, payroll, human resources, safety, health and wellness roles to roles in information technology, robotics and automation, data processing, analytics, financial modeling, corporate communications and many other areas! Technology, innovation, and above all great people, are the backbone of the industry.

Mining industry is an inclusive employer

- Only men succeed in mining.

Fact: While the mining industry still has a long way to go to achieve full gender equity, encouraging progress has been made. In some mines, a good percentage of the workforce is female and some are in senior or management positions. The industry actively supports improvements to the industry's gender ratio by finding innovative ways to attract and retain more females into mining e.g. offering paid parental leave, options to work flexibly and a focus on learning and development to maximize opportunity.

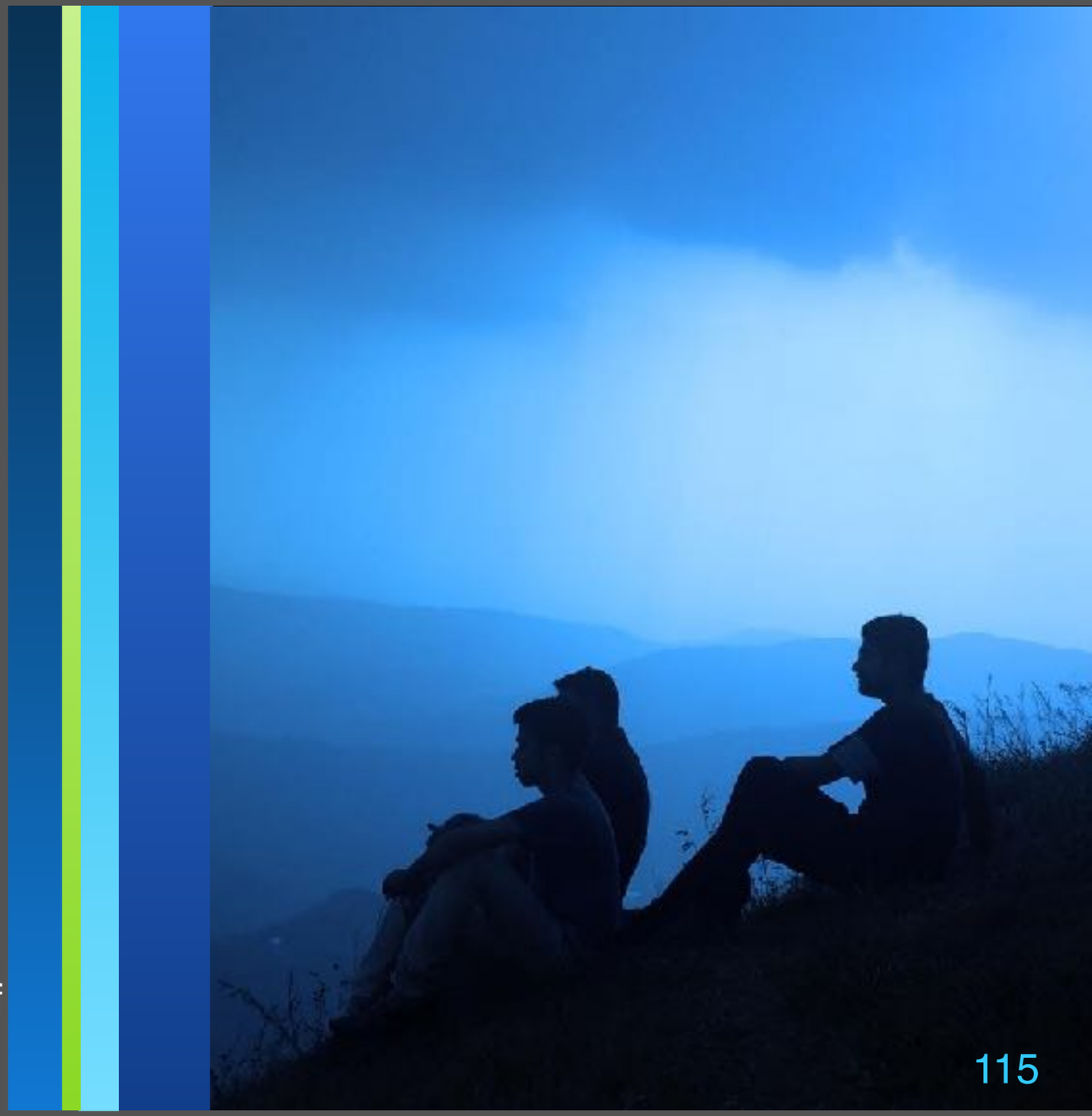
CONTENTS

- Legal and Institutional Framework
- Philippine Resources Industry Update
- Issues Facing the Mining Industry
- Geology Profession Update
- Debunking the Myths
- **Conclusion**

Conclusion

"The future belongs to knowledge-based societies."

- Mining industry will continue to remain relevant in this era of digitization and sustainability.
- **Demand for new world commodities** is going to increase as they become central to the production of an ever-growing variety of high tech and green technologies.
- **Ethical Sourcing of Minerals** for Tech Companies - Smarter and Greener?
- In the age of digital technology and renewables, **tech companies will invest in if not dominate the resources industry**.
- Redesigned traditional occupations in **geoscience and mining engineering will continue to have a role** to play in the age of digital technology and renewables.
- Can the Philippine mining industry adapt to the "new world economy"?



THANKS!
ANY QUESTIONS?

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