UNEA Resolution 5/12

Environmental Aspects of Minerals and Metals Management

Background document to guide the intergovernmental regional consultations

March 2023

UN environment programme

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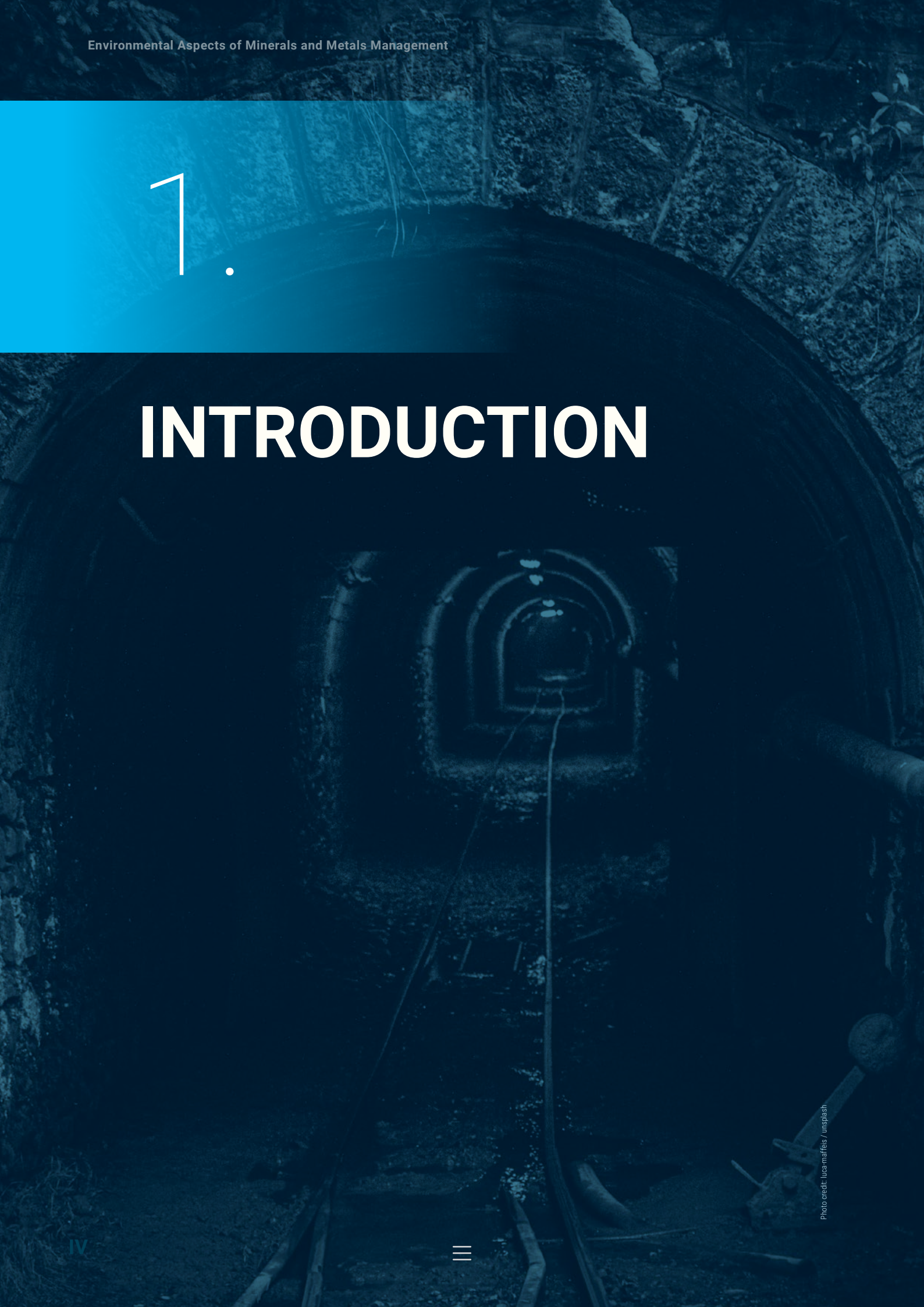
Glossary

- **Aggregate —** Granular material (natural or processed) used for construction e.g. sand, gravel.
- **Artisanal and small-scale mining —** Mining by individuals, groups, families or cooperatives with minimal or no mechanisation, often in the informal (and sometimes unregulated or illegal) sector of the market.
- **Backfill —** Using waste material to refill the crater created by mining an orebody.
- **Base metal —** Any non-precious metal, including: copper, lead, zinc, nickel, iron.
- **Bauxite —** A rock compound, from which can be extracted aluminium.
- **Circular economy —** An economic system in which products and materials are designed in such a way that they can be reused, remanufactured, recycled or recovered and thus maintained in the economy for as long as possible.
- **Cyanide —** A chemical, toxic to humans, used to dissolve gold and silver from ore.
- **Ecosystem services —** Functions and processes that ecosystems provide, which affect human well-being, including (a) provisioning services e.g. food, water, timber, and fibre; (b) regulation services, e.g. for climate, floods, disease, wastes, and water quality; (c) cultural services e.g. recreation, aesthetic enjoyment, and spiritual fulfilment; and (d) supporting services e.g. soil formation, photosynthesis, nutrient cycling.
- **Exploration —** Prospecting, sampling, mapping, drilling, scientific studies and other work involved in searching for ore, and examining the feasibility of a potential mine.
- **Lifecycle —** Series of stages through which an item or operation passes. For mining, the lifecycle is: (i) exploration and discovery, (ii) development (mine site planning and construction), (iii) production (mining), and (iv) mine closure and reclamation.
- **Mineral —** A naturally occurring inorganic substance formed naturally in the ground.
- **Ore —** A naturally-occurring deposit from which can be extracted minerals of value.
- **Overburden —** Rock or soil layer that needs to be removed to access ore being mined.
- **Processing —** Treating ore so as to separate the valuable minerals from the waste rock.
- **Rare earths —** A group of relatively scarce or hard to extract minerals, often used in high-tech applications. Examples include: europium, neodymium, niobium, terbium, yttrium
- **Reserves —** A calculated amount and grade of minerals that can be extracted profitably (usually classified as 'possible', 'probable' or 'proven' according to the level of data confidence).
- **Resource —** The calculated amount of minerals in a specific deposit (still in the ground).
- **Sand —** A mineral granular material of specified tiny particle size that does not stick together when wet and remoulded.
- **Sustainability —** Ways of living that maximise the chances that environmental and social conditions will indefinitely support human security, well-being, and health
- **Sustainable development —** Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- **Tailings —** Waste material that is a by-product of mining, left over after ore is processed to remove the valuable metals.

1.

INTRODUCTION



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1. INTRODUCTION

1.1 Objective and Outcome

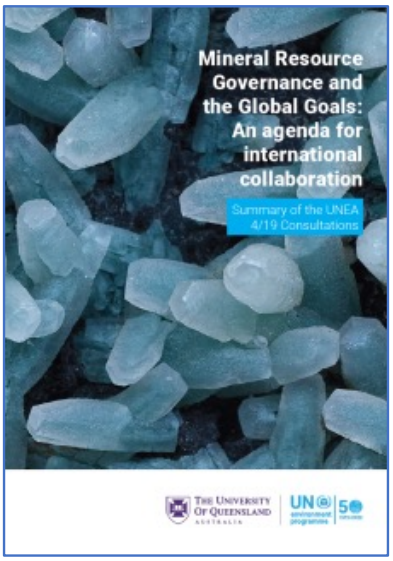
This background document supports the 2023 series of Intergovernmental Regional Consultations, administered by UNEP as requested by the United Nations Environment Assembly (UNEA)[1], on enhancing the environmental sustainability of minerals and metals along their full life cycle in line with the 2030 Agenda for Sustainable Development (see Table 1, Section 2 below). *The document aims to set the context, provide a stock-take of existing initiatives, and frame discussion questions, to inform deliberations at the regional consultations.*

These discussions recognize the importance of the mining issue globally. Mining and metals are the backbone of many industries, including construction, electronics, transport, and energy. As the global population rises, so too does the demand for minerals and metals: it is estimated that more than 150 billion tonnes of rock are mined each year, to produce around 65 billion tonnes of mineral product, 72 billion tonnes of overburden waste rock and 13 billion tonnes of mine tailings waste.[2]

The anticipated outcome from this intergovernmental process will be a series of non-prescriptive proposals from member States. These proposals will be reported to UNEA at its sixth session in 2024, including through a summary report of the consultations, and including and submissions provided by member States in writing.

1.2 UNEA Resolutions relating to Minerals and Metals

1.2.1 UNEA4 resolution



The fourth session of UNEA in 2019 adopted UNEP/EA.4/Res. 19 on Mineral Resource Governance: the first resolution on the topic of mining from UNEA. Resolution 4/19 requested UNEP to collect information on existing practices, knowledge gaps and approaches for sustainable management of metal and mineral resources. In 2020, UNEP virtually convened 23 consultative multistakeholder meetings, engaging 1,280 people, from 123 countries, with a further 111 written submissions received (from stakeholders from 61 countries). The outcomes of the process provided the basis upon which recommendations and suggested actions were presented in a report ['Mineral Resource Governance and The Global Goals: An Agenda For International Collaboration'] for consideration by the first part of the fifth session of the UNEA (UNEA 5.1), held virtually in February 2021.

1 UNEA is the world's highest-level decision-making body on environmental issues, established in 2012 by the United Nations General Assembly as the governing body of UNEP. UNEA has a crucial role in providing leadership, catalysing intergovernmental action on the environment, and promoting the environmental dimension of sustainable development. It brings together environmental ministers from all 193 UN member states, along with scientists, civil society representatives, and business leaders, to set priorities for global environmental policies and initiatives.

2 'Mineral Resource Governance and the Global Goals: An agenda for international collaboration' UNEP and the University of Queensland (2020)

1.2.2 UNEA5 resolution

More recently, UNEA at its resumed fifth session (UNEA 5.2 in 2022) adopted resolution UNEP/EA.5/12 on the environmental aspects of minerals and metals management. The resolution specifies the following:

1. Encourages Member States, and invites relevant stakeholders along the full life cycle of minerals and metals, from both the public and private sectors, to align their mining practices and their investments in mining with the 2030 Agenda for Sustainable Development and with their obligations and decisions under multilateral environmental agreements, as appropriate;

2. Requests the Executive Director, subject to available resources, to **convene transparent and inclusive intergovernmental regional consultations**, including with relevant international organizations, with regional and multilateral environmental agreements, and with relevant stakeholders acting as observers, to feed into a **global intergovernmental meeting**, with the aim of developing **non-prescriptive proposals to enhance the environmental sustainability of minerals and metals along their full life cycle**, in line with the 2030 Agenda for Sustainable Development;

3. Decides that the intergovernmental regional consultations will:

   (a) **Take stock of existing activities and actions** in the public and private sectors and by other relevant stakeholders to enhance the environmental sustainability of minerals and metals and identify, among other things, best practices, responsible business practices, standards, guidelines, technical tools, environmentally sustainable technologies and the use of renewable energy in mining;

   (b) **Identify opportunities for enhanced international cooperation**, including with a view to fostering capacity-building and technological, technical and scientific cooperation in the mining sector, in particular with developing countries;

   (c) **Identify possible ways forward** for consideration by the Environment Assembly at its sixth session, as appropriate;

4. Requests the Executive Director, through the Global Resource Information Database (GRID-Geneva), to strengthen scientific, technical and policy knowledge with regard to **sand**, and to support global policies and action regarding the environmentally sound extraction and use thereof;

5. Also requests the Executive Director, subject to the availability of resources, with the engagement of the secretariats of relevant multilateral environmental agreements, organizations and stakeholders, as appropriate, and bearing in mind the launch of the Global Industry Standard on Tailings Management, to compile a report on knowledge gaps in relation to the environmental aspects of **tailings** management;

6. Further requests the Executive Director to report to the United Nations Environment Assembly at its sixth session on the progress achieved in the implementation of the present resolution, including through a **summary report** on the consultations for consideration by the Environment Assembly at that session.

Hence, the UNEA resolution 5/12 requests UNEP to convene transparent and inclusive **intergovernmental regional consultations** (i.e. the process underway now, supported by this Background Paper) to feed into a global intergovernmental meeting, with the aim of developing **non-prescriptive proposals** to enhance the environmental sustainability of minerals. The scope of resolution 5/12 excludes mineral fuels and includes the full life cycle of minerals and metals, including extraction, on-site and off-site processing, refining, management of mining waste and tailings, rehabilitation of sites and closed or abandoned mines, manufacturing, and recycling.

What are non-prescriptive proposals?

In the context of this process, a non-prescriptive proposal is to be understood as a formal suggestion for enhanced international cooperation or possible ways forward (per paragraphs 3(b) and (c) of resolution 5/12). This may include, but is not restricted to, a proposal to encourage or work towards strategies, measures, options, recommendations, activities, principles, goals, agreements, or guidelines.

A non-prescriptive proposal can lead to shorter-term voluntary, creative and innovative solutions, while member States advance discussions towards multilateral solutions. Within the mandate of the UNEA 5/12 resolution lies the expectation that the proposals resulting from this process will be put forward for consideration by the UNEA at its sixth session.

Resolution 5/12 also requests UNEP to strengthen scientific, technical and policy knowledge with regard to **sand**, and to compile a report on knowledge gaps in relation to the environmental aspects of mine **tailings management**. These important topics will form the basis of discussions on day 1, which will constitute a technical workshop focused on tailings and sand.

Member States are encouraged actively to engage in the intergovernmental consultations, both through participation in the regional meetings and the global meeting, as well as through written submissions using the template attached at Annex IX, and sent to UNEA5.12@ggkp.org. Written submissions are requested to be received by **15 July 2023** for observers and **31 July 2023** for member States.

The UNEP Executive Director will report to UNEA at its sixth session on the progress achieved in the implementation of the present resolution, including through a summary report on the consultations.

1.3 Intergovernmental process

1.3.1 Regional Consultations – April to July 2023

UNEP, in implementation of resolution UNEP/EA.5/12, is convening a series of five 2-day **intergovernmental regional consultations** on the environmental sustainability of minerals and metals. The co-chairs of this process, as appointed by H.E. Ms. Leila Benali, President of UNEA-6 and Minister of Energy Transition and Sustainable Development of Morocco are:

- Ms. **Martine Rohn-Brossard**, Deputy Head of International Affairs Division of the Swiss Federal Office for the Environment, and
- H.E. Ms. **Saqlain Syedah**, High Commissioner and Permanent Representative of Pakistan to UNEP.

The five intergovernmental regional consultations will be held (in hybrid format), one for each UN regional group.

Meeting Date	Region	Meeting Location
24-25 April 2023	Eastern European States	Geneva, Switzerland
27-28 April 2023	Western European and Other States	Paris, France
17-18 May 2023	Latin American and Caribbean States	Santiago, Chile
15-16 June 2023	Asia Pacific States	Bangkok, Thailand
Week of 3 July dates tbc	African States	Dakar, Senegal

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1.3.2 Global Intergovernmental Meeting – September 2023

The global intergovernmental meeting to be held on 7-8 September 2023 in Geneva will draw from and be informed by the outcomes of the regional intergovernmental consultations. The expected outcome is a series of non-prescriptive proposals to enhance the environmental sustainability of minerals and metals, which will be reported to UNEA at its sixth session for consideration.

2.

GLOBAL TRENDS

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2. GLOBAL TRENDS

Mining and metals play a major role in the economies of many countries, providing employment to millions, and contributing significantly to GDP. But the industry operates against a backdrop of a triple planetary crisis of climate change, biodiversity loss and pollution. The mining industry itself contributes to environmental impacts, including greenhouse gas emissions, release of pollutants (including heavy metals and toxic chemicals) into the air, soil and water, and loss of biodiversity where habitats and ecosystems are disrupted by land disturbance and deforestation.[3]

When it comes to decarbonisation, the mining industry has a key role to play. Firstly, because the production and use of renewable energy and other 'green' technologies require metal; and secondly because new approaches to energy supply in the mining sector can help global efforts to reduce greenhouse gas emissions. The metals industry can also support 'circular economy' endeavours, aimed at designing for less use as well as reuse and recycling of materials.

Minerals underpin global development and are critical to the achievement of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs),[4] including from an environmental perspective, as described in the following table 1.

Photo credit: pexels-arthouse-studio-4581265

3 IGF's 'Guidance for Governments, May 2021: Environmental Management and Mining Governance' https://www.iisd.org/system/files/2021-05/igf-guidance-governments-environmental-management-mining-en.pdf

4 Ayuk, E.T., Pedro, A.M., Ekins, P., Gatune, J., Milligan, B., Oberle, B., Christmann, P., Ali, S., Kumar, S.V., Bringezu, S., Acquatella, J., Bernaudat, L., Bodouroglou, C., Brooks, S., Burgii Bonanomi, E., Clement, J., Collins, N., Davis, K., Davy, A., Dawkins, K., Dom, A., Eslamishoar, F., Franks, D.M., Hamor, T., Jensen, D., Lahiri-Dutt, K., Petersen, I., and Sanders, A.R.D., Nuss,P and Mancini, L. (2020). Mineral Resource Governance in the 21st Century: Gearing extractive industries towards sustainable development. International Resources Panel. United Nations Environment Program. February. 374p. https://bit.ly/32tN1fS; Franks, Daniel M. (2020). Reclaiming the neglected minerals of development. The Extractive Industries and Society. https://doi.org/10.1016/j.exis.2020.02.002; CCSI, UNDP, UNSDSN, WEF (2016). Mapping Mining to the Sustainable Development Goals: An Atlas. July. https://bit.ly/32slED0

Table 1. MINING AND THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT[5]

SDG	Mining's contribution	Mining's challenges
SDG1:No Poverty; and SDG8: Decent Work and Economic Growth	Mining contributes to economic growth and poverty reduction in developing countries, especially when local procurement and employment are maximised.[6]	… but biodiversity loss and pollution caused by mining can have an adverse effect on other sectors and livelihoods. There is also a need to equitably share benefits and opportunities of mining particularly to local communities most affected by mining activities.
SDG7 and 13: Affordable and Clean Energy, and Climate Action	The production of renewable energy technologies requires quantities of minerals and metals (e.g. copper, lithium, nickel)	… but the mining sector still relies heavily on fossil fuels for energy supply, causing significant emissions; and the push for critical metals can lead to frontier mining proposals (such as deep-sea mining) which raise new environmental concerns.[7]
SDG12 : Responsible Consumption and Production; and SDG 15 Life of Land	Efforts to improve land use planning, reduce waste and pollution, and improve energy and water efficiency in mining can contribute towards the achievement of SDG12 and 15.	…but the complex environmental and social impacts of mining, as well as metals in e-waste and end-of-life products, and low levels of metal recycling, are significant contributors to the very issues that SDG12 and 15 seek to address.
SDG16: Peace, Justice and Strong Institutions	Mining can involve consultative decision-making that respects the rights of local communities…	…but can also be associated with illicit financial flows, poor governance, human rights abuses, and conflict, which can lead to poor environmental outcomes.[8]

The extraction, processing, value-addition and use of mineral commodities contributes to the triple planetary crisis of climate change, biodiversity loss and pollution and can also provide significant social and economic opportunities, as well as be associated with challenges.

Photo credit: bart-van-dijk-DqGIaYOK08o-unsplash

5 Mining and the SDGs: A 2020 Status Update, Columbia Center on Sustainable Investment and the World Economic Forum (2020): https://scholarship.law.columbia.edu/sustainable_investment_staffpubs/143/

6 Geipel, J. 'Local procurement in mining: A central component of tackling the resource curse', The Extractive Industries and Society (2017) Volume 4, Issue 3,2017 https://doi.org/10.1016/j.exis.2017.07.001.

7 'Integrating Clean Energy in Mining Operations: Opportunities, Challenges, and Enabling Approaches' Technical Report, Joint Institute for Energy Analysis (2020), https://www.nrel.gov/docs/fy20osti/76156.pdf.

8 ICMM on SDG 16: https://www.icmm.com/en-gb/our-work/supporting-the-sustainable-development-goals/peace-and-justice-strong-institutions

► **Climate change and the renewable energy transition are driving new demand for minerals.** On the one hand, graphite, lithium and cobalt[9], are expected to experience significant production increases by 2050 to meet the demand created by renewable energy technologies.[10] On the other hand, thermal coal mined for the production of electricity is experiencing structural change and price declines, as well as mine closures in some regions.[11] Renewable energy is also becoming an important source of power for the large-scale metal mining industry and there is some evidence of emerging mitigation action by the large-scale metal mining industry to reduce emissions and strengthen climate resilience and adaptation.[12]

► **Urbanisation and infrastructure are creating substantial demand to supply aggregate** (sand, gravel and crushed stone) for the construction and land reclamation sectors, driving environmental change particularly where sand and gravel are sourced from natural waterways.[13] As much as 50 billion tonnes of aggregate are produced from quarries, rivers, lakes and the ocean each year.[14] Yet these activities often occur 'under the radar' and without effective policy, planning, regulation and management.[15] Climate change and disaster reconstruction are creating additional demand for construction materials, while the quarry sector is not sufficiently considered or involved in disaster planning as evidenced by frequent aggregate and cement shortages in hurricane and cyclone reconstruction.[16] Innovations around recycling of aggregates, or use of alternative materials to natural sand, have had low take-up in some countries.[17]

► **Global consumption is altogether driving increased demand for minerals.** Mineral exploitation has grown markedly over the past century with production of minerals and metals estimated at 65 billion tonnes per annum.[18] A shift in the mineral intensity of the global economy would enable to manage the required among of mineral resources to achieve the SDGs.[19] Consumption is pressuring the metals industry to expand into new domains (e.g. sea-bed mining; space mining; arctic mining).[20]

Photo credit: matthew-de-livera-4GF51uY0YQE-unsplash

9 Estimated production increase of 494% for graphite, 488 % for lithium, and 460% for cobalt.

10 Hund, K., La Porta, D., Fabregas, T.P., Laing, T., and Drexhage, J. (2020). Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition. Washington, D.C., World Bank Group. https://bit.ly/3dyYHCm; Arrobas, D.P., Hund, K.L., Mccormick, M.S., Ningthoujam, J, Drexhage, J.R. (2017). The Growing Role of Minerals and Metals for a Low Carbon Future. Washington, D.C., World Bank Group. https://bit.ly/2TioAhf; World Bank (2018). Mineral Demand Analysis of Energy Technologies Based on IEA ETP 2017 Scenarios. World Bank, September.

11 Wamsted, D, and Schlissel, D (2019). Coal Outlook 2019. Institute for Energy Economics and Financial Analysis. March. https://bit.ly/3ccuc5m; International Energy Agency (2018). World Energy Outlook 2018. November.

12 Maennling, N and Toledano, P (2018). The Renewable Power of the Mine: Accelerating renewable energy integration. Columbia Centre on Sustainable Investment, BMZ & GIZ, Energy and Mines. December. https://bit.ly/2Tw2qsb

13 Peduzzi, P (2014) P. Environ. Dev. 11, 208–218; United Nations Environment Programme (2019). Sand and Sustainability: Finding New Solutions for Environmental Governance of Global Sand Resources. https://bit.ly/2uxyu6g; Bendixen, M, Best, J, Hackney, C, and Lønsmann Iversen, L. (2019). Time is running out for sand. Nature 571, 29-31 https://doi.org/10.1038/d41586-019-02042-4; Franks, Daniel M. (2020). Reclaiming the neglected minerals of development.

14 Sand and Sustainability: Finding New Solutions for Environmental Governance of Global Sand Resources, UNEP Grid-Geneva (2019) ; and Sand and Sustainability: 10 Strategic Recommendations to Avert a Crisis, UNEP Grid-Geneva (2022)

15 Franks, D.M. (2020). Reclaiming the neglected minerals of development; UNEP (2019). Sand and Sustainability.

16 Hailu, D., Ngonze, C. and Franks, D.M. (2019). Minerals in post-disaster reconstruction. United Nations Development Programme. https://bit.ly/2wQS0LW

17 Sand and Sustainability: Finding New Solutions for Environmental Governance of Global Sand Resources, UNEP Grid-Geneva (2019)

18 Ayuk et al (2020). Mineral Resource Governance in the 21st Century; Ekins, P, Gupta, J and Boileau, P. (Eds) (2019). Global Environmental Outlook GEO-6: Healthy Planet, Healthy People. Cambridge University Press. United Nations Environment. 708p. https://bit.ly/2T0bpCL

19 Franks, D.M., Keenan, J. & Hailu, D. Mineral security essential to achieving the Sustainable Development Goals. Nat Sustain 6, 21–27 (2023). https://doi.org/10.1038/s41893-022-00967-9

20 Ali, S., Giurco, D., Arndt, N. et al. (2017). Mineral supply for sustainable development requires resource governance. Nature 543, 367–372. https://doi.org/10.1038/nature21359

► Connecting large-scale mineral extraction in much of the developing world with the local community is an opportunity to take advantage of multiplier effects and stimulate the larger economy for economic transformation. [21] Further, there is a possibility to use mine waste to produce circular products that contribute to local buildings and construction. This will further expand the job creation opportunities provided by the minerals sector.

► The minerals sector, in particular artisanal and small-scale mining (ASM), is a large and under-recognised provider of employment and livelihoods in the developing world. [22] Despite its low productivity, ASM is an important source of minerals and metals, for example accounting for about 20 per cent of the global gold supply, and being a major producer of tantalum and other minerals indispensable for manufacturing popular electronic products, such as laptops and phones.[23] ASM is also a major source of pollution, creating waste containing toxic elements, such as cadmium, lead, arsenic and selenium.[24] A particular issue arises with the use of mercury and cyanide in extracting gold during ASM operations. Mercury-contaminated tailings from gold ASM are particularly difficult to clean up, and pernicious in the way they spread and accumulate in the ecosystem and food chain.[25]

► More than 50 countries have set restrictions or duties on raw material exports,[26] while a number of importing countries have initiated programs to track the supply risks of critical minerals and have applied import restrictions to ensure responsible and conflict-free production practices. Investment in clean resource processing in the developing world as part of green industrialisation could simultaneously encourage domestic value addition, assist the diversity of mineral supply, and support the structural transformation of mineral endowed economies.

► Ore grades are in decline for many commodities, meaning that more waste is produced for each unit of metal produced.[27] Declining ore grades could place significant pressure on the ability of the industry to safely manage tailings and other mineral wastes. Common issues include the generation of acid and metalliferous drainage and geotechnical failure of tailings facilities. Evidence suggests that while the overall number of tailings facility failures has decreased, the number of serious failures has increased. [28] Alternative safer tailings storage options, such as filtered tailings, do exist although uptake has remained low. There is an opportunity to develop and/or support incentives for innovation and technology in tailings management. There is also potential for tailings reprocessing to extract value and assist in the management and rehabilitation of mineral wastes.[29-30]

► Responsible production, conflict and supply security are the predominant thematic issues shaping supply chain due diligence approaches. Supply-chain due-diligence and certification initiatives are providing market information for consumers to consider ethical alternatives, for instance in the

21 Ayuk et al (2020). Mineral Resource Governance in the 21st Century;

22 World Bank. (2019). 2019 State of the Artisanal and Small-Scale Mining Sector. Washington, D.C.: World Bank.

23 IGF (2018) Global Trends in Artisanal and Small-Scale Mining: Review of Key Numbers and Issues: https://www.iisd.org/system/files/publications/igf-asm-global-trends.pdf

24 Velasquez, J et al (2022) 'Review of the environmental and health implications of recycling mine tailings for construction purposes in ASM communities' The Extractive Industries and Society, vol.9 https://doi.org/10.1016/j.exis.2021.101019.

25 UNEP, Global Mercury Partnership and Artisanal Gold Council (2012) 'Reducing Mercury Use in Artisanal and Small-Scale Gold Mining: A Practical Guide': https://www.unep.org/resources/report/reducing-mercury-use-artisanal-and-small-scale-gold-mining-practical-guide

26 OECD. (2019). Methodological note to the Inventory of Export Restrictions on Industrial Raw Materials. https://bit.ly/3cp0ZUh.

27 Mudd, G. (2007). Global trends in gold mining: Towards quantifying environmental and resource sustainability. Resources Policy 32(1-2):42-56; Franks, DM, Boger, DV, Cote, CM, Mulligan, DR. 2011. Sustainable Development Principles for the Disposal of Mining and Mineral Processing Wastes. Resources Policy. 36 (2): 114-122.

28 Bowker, L.N. and Chambers, D.M. (2016). Root Causes of Tailings Dam Overtopping: The Economics of Risk & Consequence. 2nd International Seminar on Dam Protection Against Overtopping. Ft. Collins, Colorado, USA, 7-9 September 2016

29 Franks, D.M, Baker, E, Stringer M.. (2020) Lessons from tailings facility data disclosures. Global Tailings Review Report. Chapter VII; also University of Queensland with Vale: Ore-sand: A potential new solution to the mine tailings and global sand sustainability crises – Final Report (uq.edu.au)

30 Ayuk, E.T., Pedro, A.M., Ekins, et al. (2020). Mineral Resource Governance in the 21st Century; Owen, J.R. and Kemp, D. (2013). Social licence and mining: a critical perspective. Resources Policy 38 (1) 29-35. https://doi.org/10.1016/j.resourpol.2012.06.016

31 Global Commission Investor on Mining Website https://mining2030.org/

jewellery industry, e-mobility, and the green energy transition, which seek to increase their responsible sourcing of minerals and metals. Investors have been active in pushing for reform of environmental, social and governance issues, including through the launch of a Global Investor Commission on Mining 2030.[31]

► Industry capacity has increased but may require further attention to effectively respond to environmental issues across large, medium, small and artisanal mining sectors. Some mining companies have strengthened commitments and employed sustainability professionals responsible for performance.[32] Frameworks for water accounting, water recycling, and energy efficiency have been supported at the site-level and industry-wide, while other issues and stakeholders may have progressed less.

► Trust of the minerals sector by the general public is low, with nearly half of the mining company executives questioned in a recent business survey identifying social acceptance as their top business risk.[33] Recent tailings failures and other cases of unsafe working conditions, environmental harm, social conflict, and human rights violations (such as child and forced labour) have furthered distrust of industry-led reform initiatives, and fuelled demands for multi-stakeholder governance, improved monitoring, stronger government oversight, and improved safeguards. Ethical investors have been active in pushing for reform of environmental, social and governance issues.

► Positive trends are evident with increasing prevalence of agreement-making between Indigenous Peoples and resource developers, including cases of substantial benefit sharing, involvement in environmental and cultural heritage management, employment, and business development. Increasing application of UN Declaration on Rights of Indigenous Peoples, ILO 169 and recognition of Indigenous land rights have supported these improvements. Opportunities remain to increase transparency and trust, such as co-development of plans, participatory monitoring, and participatory governance mechanisms.

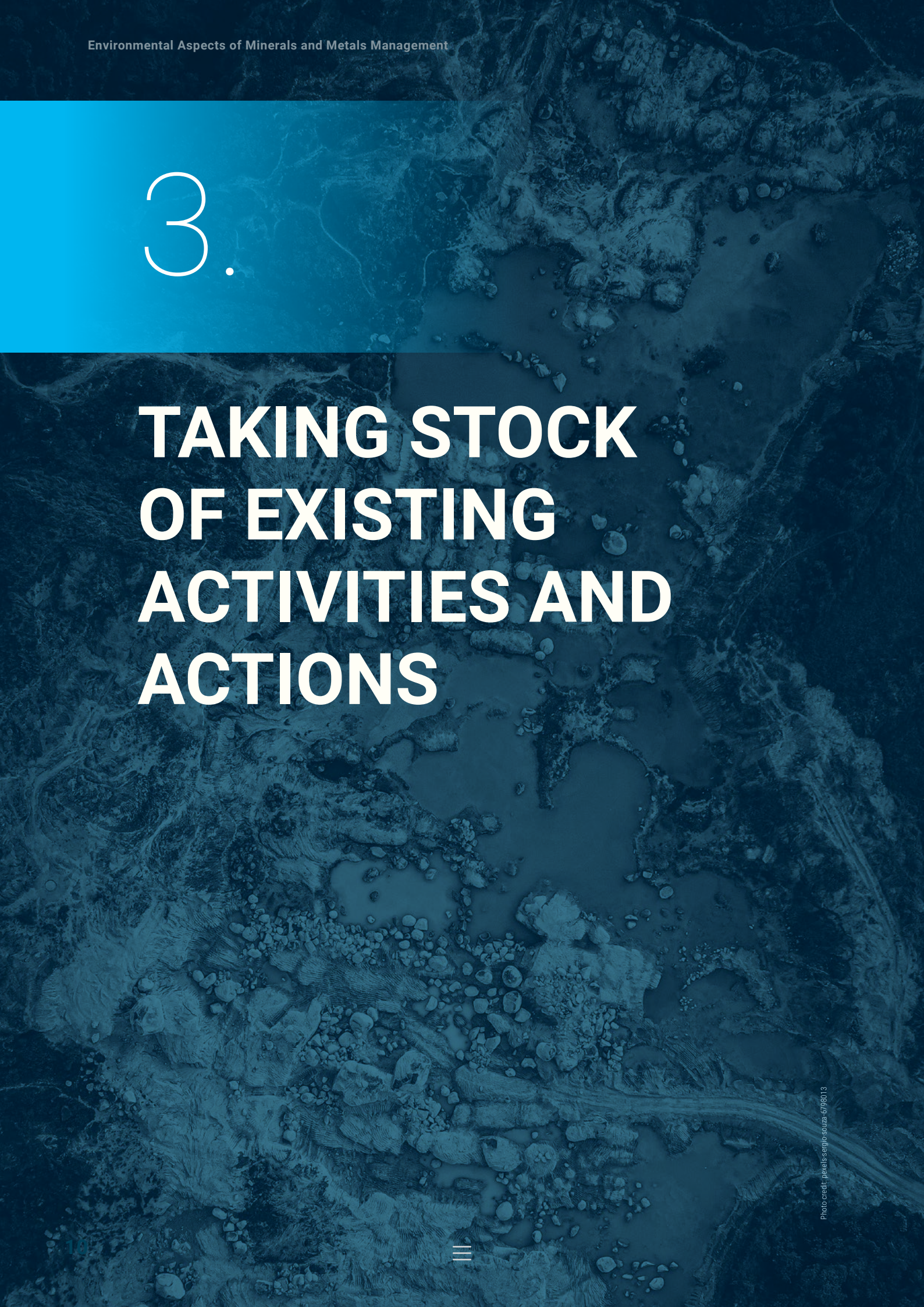
Photo credit: Christophe Menebœuf

32 Responsible Mining Foundation (2020). RMI Report 2020.

33 Mitchell, P, Downham, L and van Dinter, A. (2019) Top 10 business risks and opportunities – 2020. Ernst & Young Global. https://go.ey.com/39jdgbi

3.

TAKING STOCK OF EXISTING ACTIVITIES AND ACTIONS



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3. TAKING STOCK OF EXISTING ACTIVITIES AND ACTIONS

3.1 Addressing the risks and opportunities of the mining sector

Over the years, various efforts have been undertaken to manage the environmental aspects of mining and metals and to fully take advantage of its benefits. These include multilateral agreements, guidelines and initiatives, government and industry-led regulations, and voluntary actions. It is the right of a sovereign state to legislate and regulate mining activities within its borders.

Table 2 below[34] provides a summary of the common types of activities taken by the public and private sector, the way they work, and a few examples for reference. This is however not an exhaustive list and is designed to illustrate the wide range of possible actions that can be taken directly or influenced by national governments, as well as those led by industry, often in collaboration with national governments. These include both prescriptive and non-prescriptive initiatives.

Photo credit: dominik-vanyi-Mk2ls9UB02E-unsplash

34 UNEP 2020, Discussion Paper for Regional Consultations on the Implementation of the UNEA Resolution 4/19 on Mineral Resource Governance: https://d1bf23g64f8xve.cloudfront.net/sites/default/files/downloads/resource/Mineral%20Resource%20Governance%20Discussion%20Paper_UNEP.pdf

Table 2. COMMON TYPES OF ACTIVITIES AND ACTIONS BY PUBLIC AND PRIVATE SECTOR ACTORS [35]

Types	How do they work	Examples
International legal instruments/ norms, standards and frameworks	Legal instruments/norms: International legal instruments compel behavior through international law (commonly enforced through domestic law). Customary international law imposes obligations that arise from established international practices. International norms are non-legally binding and are adopted as a result of social pressure or peer expectation. Standards: An international standard setting organization develops a standard that is voluntarily or enforced through certification. Certification may influence consumer behavior, be required by law, or be a condition of membership of an association. Frameworks: International frameworks provide advice on effective or desirable policy and practice.	Legal instruments: International Labour Organization Indigenous and Tribal Peoples Convention; United Nations Declaration on the Rights of Indigenous Peoples, Convention on Biological Diversity, Convention on Long-Range Trans-boundary Air Pollution, Montreal Protocol, UN Framework Convention on Climate Change, Ramsar Convention, World Heritage Convention, Basel Convention, Espoo Convention on Environmental Impact Assessment in a Transboundary Context and its Protocol on Strategic Environmental Assessment, UNECE Convention on the Transboundary Effects of Industrial Accidents, the Minamata Convention on Mercury Standards: Extractive Industries Transparency Initiative; Kimberley Process Certification Scheme; Guiding Principles on Business and Human Rights; Voluntary Principles on Security and Human Rights; International Standards Organization guidance on social responsibility; International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide in the Production of Gold; Responsible Jewellery Council Code of Practices; and Initiative for Responsible Mining Assurance. Frameworks: Africa Mining Vision; Natural Resource Charter; United Nations Millennium Development Goals; United Nations Sustainable Development Goals; New Partnership for Africa's Development; Protect, Respect and Remedy; International Study Group on Africa's Mineral Regimes; Framework Classification for Resources; United Nations Resource Management System; and Global Compact; Kunming-Montreal Global Biodiversity Framework.
Government regulation	Government (national, provincial, local) uses law and policy to proscribe conduct (command and control), persuade (suasive instruments), or incentivize behavior (market-based instruments).	Queensland Sustainable Resource Communities Policy (Australia); Northern Contaminated Sites Program (Canada); African National Congress State Intervention in the Minerals Sector (South Africa); and Cardin-Lugar Amendment to the United States Dodd-Frank Wall Street Reform and Consumer Protection Act (United States).
Industry standards	An industry develops a standard (commonly led by a peak industry association) that is observed due to peer expectations or to maintain membership of an industry association. Industry associations develop guidance in support of the standards.	International Council on Mining and Metals Sustainable Development Framework; International Council on Mining and Metals Position Statement on Indigenous Peoples and Mining; The International Union for Conservation of Nature – International Council on Mining and Metals Memorandum of Understanding; and Global Industry Standard on Tailings Management; Towards Sustainable Mining (TSM); Initiative for Responsible Mining Assurance (IRMA)
Corporate standards and policies	Corporations adopt policies and standards to guide and direct company practices, employees or the supply chain.	Anglo American Social Way and Socio-Economic Toolbox; and Rio Tinto Biodiversity Strategy.

34 After Franks (2015), Mountain Movers.

Types	How do they work	Examples
Conditions on finance and share market activism	Conditions on finance: Investors impose standards to be followed by loan recipients to reduce the risk associated with investment and to achieve desired performance outcomes. Share market activism: Investors use their equity stake to influence management decisions through corporate governance processes.	Conditions on finance: International Finance Corporation's Environmental and Social Performance Standards; International Finance Corporation's Compliance Advisor Ombudsman; and The Equator Principles.
Social pressure/ social regulation	Social groups persuade, encourage or force change in the behavior of individuals, institutions, government or corporations. Levers include reputation, conflict and blockades, strikes, elections, agreements, and partnerships. Civil society groups may seek to mobilise public opinion through campaigns and networks.	Publish What You Pay; Fatal Transactions; The Birdlife International – Rio Tinto Partnership; and Western Cape Communities Co-Existence Agreement.
Litigation	A court of law imposes actions on a party to resolve a dispute.	Milirrpum v. Nabalco Pty Ltd (1971); and Mabo v. Queensland (1992).

3.2 Multilateral and relevant regional environmental agreements and instruments

The impacts of mining go beyond country boundaries. Supply chains are transboundary, and resources used for extraction such as water also often crosses borders[36]. There is, however, currently no global overarching treaty specifically addressing mining.[37]

Few international legal instruments play a significant role in the governance of the mineral industry,[38] though some have relevance to the environmental management of the sector, such as 1971 Ramsar Convention on Wetlands Convention focused on biodiversity conservation or the 2013 Minamata Convention on Mercury focused on the issue of mercury (See Annex II for a list of relevant MEAs and Annex III for regionally binding agreements). The1982 UN Convention on the Law of the Sea, and its 1994 Implementation Agreement includes provisions to establish legal rights for States to exploit minerals located on the seafloor, as well as obligations for the protection of the marine environment from the harmful effects of any such activities. Its Part XI is establishes a regime and governance structure for controlling seabed mineral activities beyond national jurisdiction. There are also **regional-level binding agreements** that may be relevant to metal and minerals management and these address important transboundary issues and facilitate collaboration across countries. One notable example is the Bamako Convention adopted by the Member States of the African Union to prevent the import of hazardous and radioactive waste into Africa.

The EU has also developed regional agreements. Recent examples include:

- The EU's work towards the **Critical Raw Minerals Act** and **Net Zero Industry Act** which aim to secure the supply of raw materials for the EU economy while promoting sustainable mining practices and reducing the environmental and social impacts of mining, including greenhouse gas emissions. The proposals include measures such as promoting exploration and innovation, including around net-zero technology products, improving access to finance, and supporting responsible sourcing and recycling.
- The **Mining Waste Directive**, which aims to prevent or reduce negative impacts on the environment or human health from mining waste, such as soil and water contamination, cover issues such as site selection, design, and operation of waste facilities, monitoring, reporting and closure requirements, and financial guarantees.

36 Luckeneder, S., Giljum, S., Schaffartzik, A., Maus, V., & Tost, M. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303. https://doi.org/10.1016/j.gloenvcha.2021.102303

37 There is however a global treaty that regulates deep-sea mining: the UN Convention on the Law of the Sea (UNCLOS). UNCLOS sets some obligations for domestic regulation within national jurisdiction, and for a more detailed regulatory framework for the management of deep-sea minerals within international waters, designated as 'common heritage of [hu]mankind'.

38 UNEP 2020, Discussion Paper for Regional Consultations on the Implementation of the UNEA Resolution 4/19 on Mineral Resource Governance: https://d1bf23g64f8xve.cloudfront.net/sites/default/files/downloads/resource/Mineral%20Resource%20Governance%20Discussion%20Paper_UNEP.pdf

There are also relevant regional policy instruments, such as the African Union's '**African Mining Vision**', supported by UNECA. Coordinated action by governments can assist to overcome the challenges faced by individual governments in isolation.

Finally, many individual countries have been recognised for their efforts in promoting sustainable mining practices via **national laws** and regulations. Although UNEP's 2020 consultation found that, despite significant work to strengthen domestic mineral laws and regulations, challenges can still be observed in enforcing those regulations and ensuring that mining practices are sustainable.[39] This may affect investment appetite, as weak governance can be a significant driver of business risk.

3.3 Guidelines, Standards, and Industry Initiatives

Independent guidelines or standards such as those mentioned in Table 2 (see Section 1.3 above) aim to encourage responsible and sustainable mining practices by setting clear expectations and providing a framework for monitoring and reporting progress. Many of these guidelines are voluntary. For the mining sector, the Extractive Industries Transparency Initiative (EITI) is notable for being an inclusive system requiring participating countries and companies to disclose publicly detailed information on national revenues from the mining industry, which figures are then independently verified by a multi-stakeholder panel. The Equator Principles is also an impactful set of voluntary guidelines for financial institutions, applicable to projects with a total capital cost of $10 million, aimed to manage environmental and social risks in project financing. Other examples of standards are included in Annex IV.

Guidelines and standards are helpful in setting a baseline for ensuring that businesses that meet sustainability principles are competitive. This is crucial to spurring innovation among businesses and industry has been a key driver in the mining space. Industry leaders are behind new technology that have brought about circular initiatives such as zero waste mines and re-use of waste rock.

While such voluntary standards and frameworks have disseminated new norms and strengthened the oversight of the sector, it has been noted that their influence is not as deep, into the body of the industry, or as wide, across the diversity of entities that make up mining, as is necessary for truly transformative change. They are often narrow and selective in their focus, lack enforcement mechanisms, can distract away from a need for reform in government regulation, and the sheer number of schemes can cause 'initiative fatigue.[40]

There are also several guidelines, standards or certifications developed by industry associations for their members, or by independent third parties on social and environmental performance, with specific sectoral focus, such as aluminum, cobalt, or mercury. Examples of industry initiatives are included in Annex V. Examples of innovation from government and industry are in Annex VI. Annex VII provides a non-exhaustive list of organisations engaged in international cooperation on minerals and metals, with some selected references at Annex VIII.

Guiding Questions

- What other existing activities and actions by public and private sector actors and other relevant stakeholders exist in your region?
- In your view, what are opportunities and barriers to the management of the environmental aspects of minerals and metals?

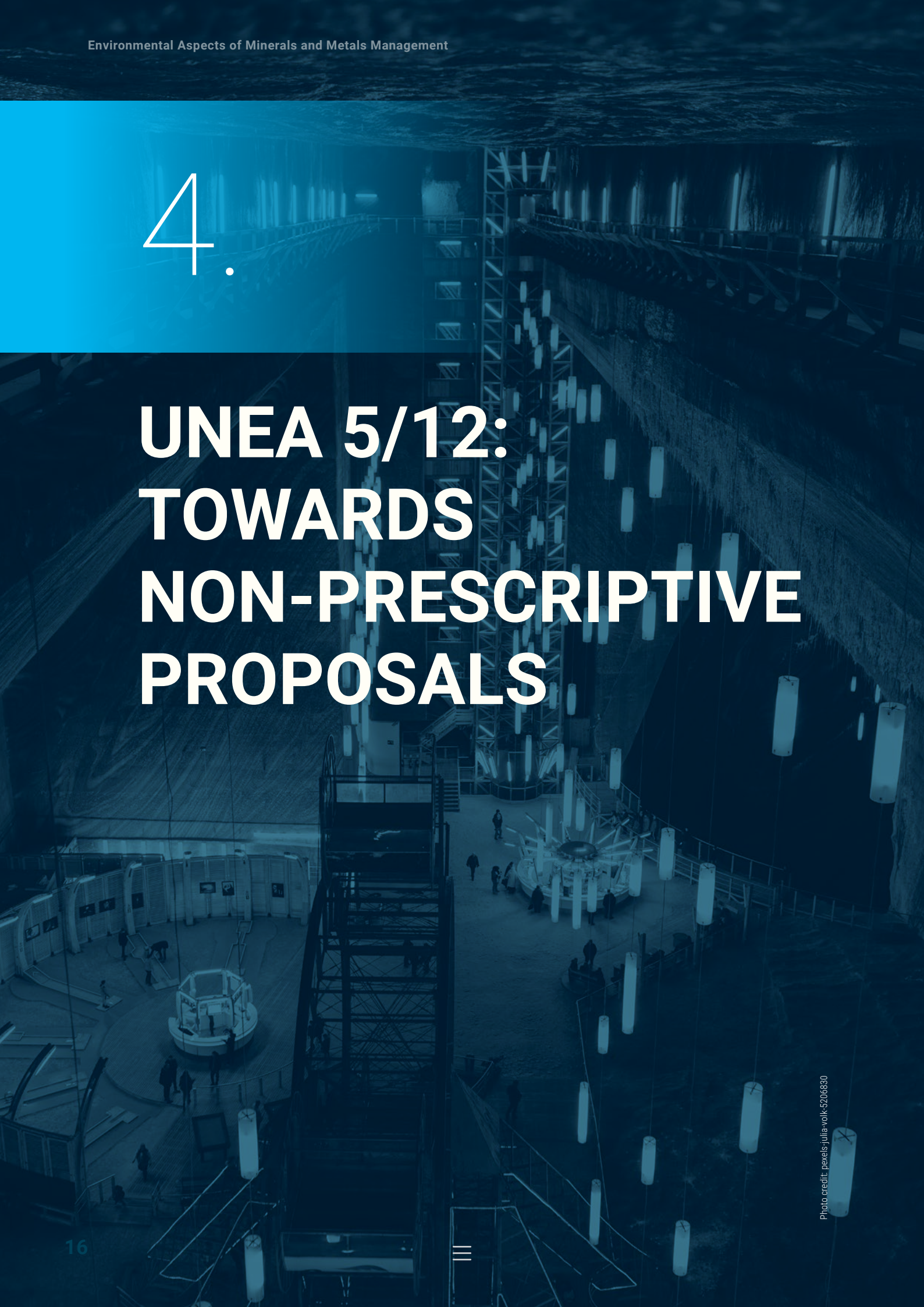
39 'Mineral Resource Governance and the Global Goals: An agenda for international collaboration' UNEP and the University of Queensland (2020)

40 UNEP 2020, Discussion Paper for Regional Consultations on the Implementation of the UNEA Resolution 4/19 on Mineral Resource Governance: https://d1bf23g64f8xve.cloudfront.net/sites/default/files/downloads/resource/Mineral%20Resource%20Governance%20Discussion%20Paper_UNEP.pdf

Photo credit: envato / davidpereiras

4.

UNEA 5/12: TOWARDS NON-PRESCRIPTIVE PROPOSALS



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4. UNEA 5/12: TOWARDS NON-PRESCRIPTIVE PROPOSALS

These regional consultations on UNEA Resolution 5/12 are key opportunities to discuss how to push even further the boundaries of innovation and management of environmental aspects of minerals and metals.

Member States and other participants in the regional consultations are invited to propose and consider others' suggestions for non-prescriptive proposals in relation to addressing the environmental impacts and enhancing the environmental sustainability of minerals and metals management. Member states are encouraged to send written submissions using the template in Annex IX. Proposals around resolution 5/12 may range from enabling policy or legal or institutional approaches; to business and industry value chain practices; to drivers such as finance, investment, procurement, consumption, technological and digital transformations, or skills and jobs.and .

While there are innovators and early movers within member States and business and industry, the wide range of guidelines or standards currently make the landscape complex. Rapidly growing transition sectors such as energy, e-mobility, digital, sustainable finance or sustainable fashion (jewellery) provide the innovation space where consideration of mining could help positively transform the landscape through some level of convergence and comparability.

Following the regional consultations, the global intergovernmental meeting on 7-8 September 2023 and the sixth session of the UN Environment Assembly 26 February-1 March 2024 are two other key milestones for member States to keep in mind. These are also opportunities towards advancing global dialogues and action on the environmental management of minerals and metals.

Guiding Questions

Identify opportunities for enhanced international cooperation

- What meaningful action(s) could be undertaken at a transboundary or international level to strengthen the environmental sustainability of minerals and metals management?
- How can Member States, business and industry, and civil society take leadership as well as be supported to advance sustainable management of minerals and metals?
- What role can international organizations play to improve environmental aspects of minerals and metals management?
- How can the multilateral system support a level playing field for market transformation with a life cycle approach?

Towards the development of non-prescriptive proposals

- From your perspective, what measures and by whom could prevent and reduce the environmental impacts across the life cycle of minerals and metals?

ANNEXES

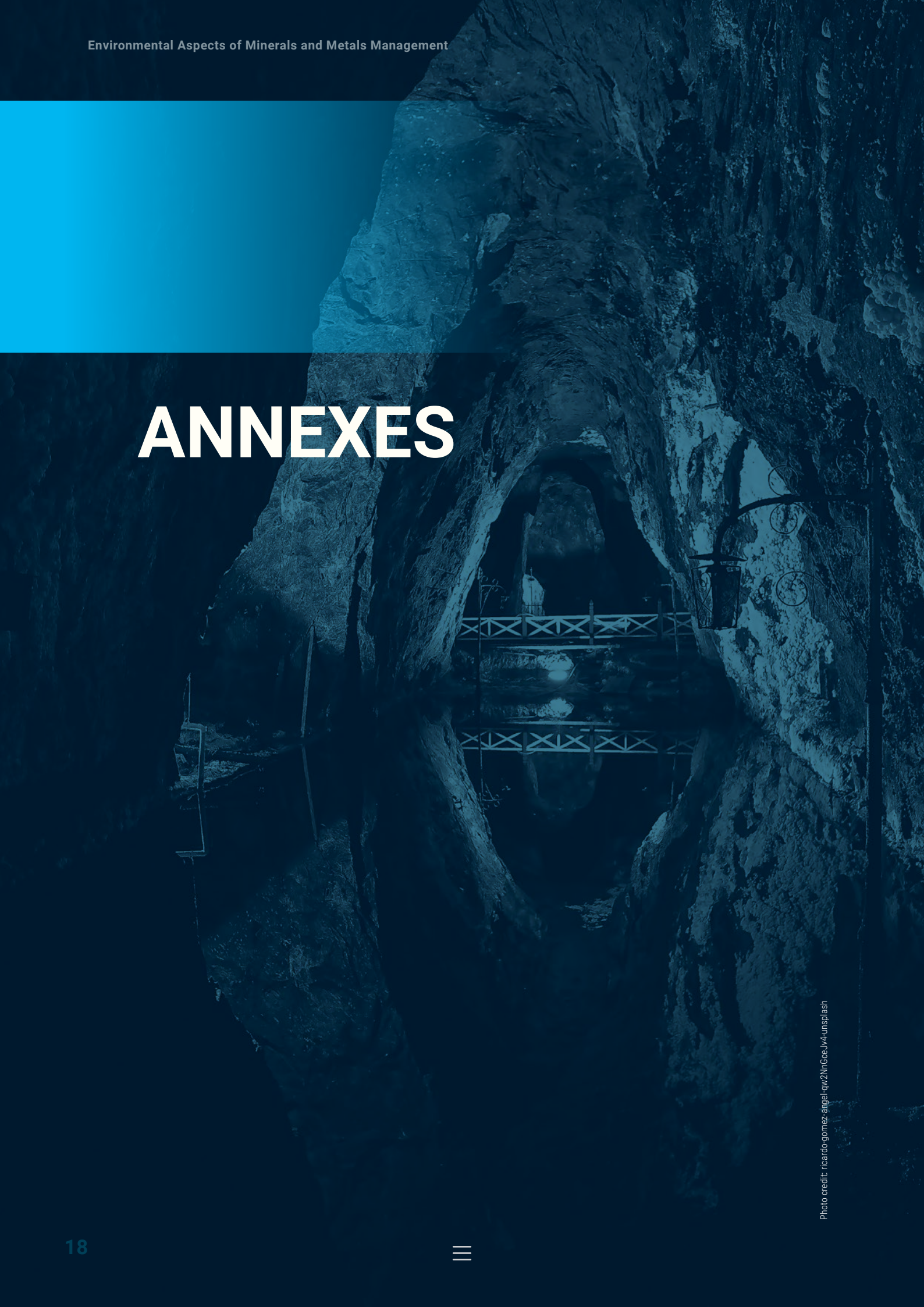

Photo credit: ricardo-gomez-angel-qw2NnGceJv4-unsplash

Annex I: Regional Summaries

The African Group of Countries

Africa is home to an estimated 30% of the world's mineral resources[41], and the mining industry is a significant contributor to the economy of many African countries, who produce more metals than they consume. Examples include:

• **Botswana** is a significant producer of copper and nickel.

• **Democratic Republic of Congo** is one of the world's largest producers of cobalt, a significant producer of copper, and also has significant reserves of gold, tin, and coltan.

• **Ghana** is the largest producer of gold in Africa, and a significant source of bauxite and manganese.

• **Guinea** has a significant bauxite industry

• **South Africa** is a major exporter of gold, platinum, and palladium, and a significant producer of chromium, manganese, and iron ore.

• **Tanzania** is significant producer of gold.

• **Zambia** is a major producer and exporter of copper and cobalt.

Other countries such as **Angola, Mali, Namibia, Zimbabwe**, also have significant mineral resources and are major producers and exporters of various minerals. The continent is also a notable producer of strategic minerals such as cobalt, platinum, and tantalum, which are critical for the manufacture of high-tech products like smartphones and green tech like electric vehicles.

Despite abundant reserves, the African region is responsible for producing a relatively small proportion of the world's mineral worth (5.5% of the total 17.9 billion tonnes of minerals extracted in 2019)[42]).

Artisanal and small-scale mining (ASM) is common in Africa, with estimates placing 5-20% of the total regional population as directly dependent on ASM across 40 countries, with 40-50% of the workforce being women.[43]

The mining industry in Africa is an important source of foreign investment and contributes significantly to government revenues through taxes, royalties, and other payments. According to the African Development Bank, mining-related foreign investment in Africa increased from US$6.9 billion in 2000 to US$29.4 billion in 2018. Ghana alone saw construction of a $850 million gold mining facility and a $436 million cement factory by foreign companies, in 2021.[44]

A regional summary for Africa of mineral resource governance challenges, good practice examples and future action, derived from UNEP's 2020 consultations with member States, can be found here.

The Asia-Pacific Group of Countries

Some Asian countries are major metal consumers, such as China, Japan and India. According to 2019 statistics, Asia was also the largest region for mineral production, accounting for 59 percent of the world's total production valued at $1.8 trillion. [45] For example:

• **China** is the world's largest producer (and also consumer) of metals, including gold, lead, tin, copper, nickel, steel aluminium, and zinc, and also has significant reserves of rare earth minerals.

• **India** is a significant producer of iron ore, bauxite, zinc and manganese. The country is also produces chromite, used in the production of stainless steel, and has gold and silver reserves.

41 https://www.unep.org/regions/africa/our-work-africa

42 The World Mining Congress: https://www.world-mining-data.info/wmd/downloads/PDF/WMD2021.pdf

43 https://www.iied.org/sites/default/files/pdfs/migrate/G04266.pdf

44 https://unctad.org/system/files/official-document/wir2022_en.pdf

45 https://www.world-mining-data.info/wmd/downloads/PDF/WMD2021.pdf

• **Indonesia** is a significant producer of nickel, tin, and copper and has gold and silver reserves.

Other countries in Asia, including **Kazakhstan, Mongolia, Pakistan** and **the Philippines**, also have significant mineral resources and are important producers of various minerals. Some other Asian countries, such as **Saudi Arabia** and the **United Arab Emirates**, have made foreign investments in the global mining sector.

Artisanal and small-scale mining is also prevalent in Asia, e.g. **Indonesia, the Philippines, Pakistan**, and with an extremely high number of 9 million workers estimated in **China** in particular. [46]

Mining activities in Pacific Island countries are relatively limited due to the region's small land area and limited mineral resources. However, some Pacific Island countries have significant mining activities, including:

• **Papua New Guinea** has a significant mining industry, with large deposits of gold and copper.

• **Solomon Islands** has small-scale mining activities for gold, bauxite, and nickel.

• **Fiji** has small-scale mining activities for gold, copper, and zinc, and potential deposits of titanium.

• **Vanuatu** has small-scale mining activities for gold, silver, and other minerals.

Kiribati, Nauru, Tonga, and **Cook Islands** have no inland metal mining activities, but are all engaged with deep-sea mining exploration, either in international or national waters (or both), where conversely Pacific nations of **Federated States of Micronesia, Fiji, Palau, Samoa** and **Vanuatu** have called for a moratorium on this new industry. Asian countries such as **China, India, Japan, Korea** and **Singapore** have also been at the forefront of deep-sea mineral exploration.

Regional summaries for Asia-Pacific of mineral resource governance challenges, good practice examples and future action, derived from UNEP's 2020 consultations with member States, can be found here and here.

The Eastern European Group of Countries

Mining is an important industry for some Eastern European countries. For example,

• **Russia** mining industries account for around 8% of national GDP [47], including nickel, platinum, and palladium.

• **Kazakhstan** is one of the world's largest producers of uranium, also producing copper and gold.

• **Bulgaria** has significant reserves of copper, gold and silver.

• **Czech Republic** has significant reserves of uranium, lead and zinc.

• **Poland** has a long history of mining and metallurgy and is a significant producer of copper and silver.

• **Romania** has significant reserves of copper, gold and silver.

• **Ukraine** also have significant mining industries.

In some Eastern European countries (e.g. Bulgaria, Czech Republic, Romania), national mining industries have undergone significant restructuring in recent years, including some state-owned mines being privatised.

A regional summary for Europe of mineral resource governance challenges, good practice examples and future action, derived from UNEP's 2020 consultations with member States, can be found here.

46 https://www.iied.org/sites/default/files/pdfs/migrate/G04266.pdf

47 https://tradingeconomics.com/russia/gdp-from-mining

The Group of Latin American and Caribbean Countries

Mining is a significant contributor to the economies of mineral-rich Latin American region. For example:

• **Argentina** is a significant producer or lithium, copper and gold, as well as silver.

• **Brazil** is a major producer of iron ore, as well as gold, bauxite, and copper.

• **Chile** is the world's largest copper producer, and also has lithium and molybdenum industries.

• **Colombia** produces gold and nickel, and has known reserves of copper, silver and other minerals.

• **Cuba** is a significant source of nickel, and also cobalt and copper.

• **Mexico** is a significant producer of silver, gold, copper, lead and zinc.

• **Peru** is the world's second-largest copper producer, whilst also being a significant producer of gold, silver, lead, zinc and other minerals.

• **Venezuela** produces iron ore, bauxite and gold, amongst other minerals.

According to UNCTAD, mining-related foreign investment in Latin America and the Caribbean stood at $134 billion in 2021. [48]

Artisanal and small-scale mining is also found in the region, and particularly in **Brazil** and **Colombia**. [49]

Mining is not generally such a major industry in the Caribbean, as the region has relatively limited mineral resources compared to other regions of the world. However, there are some Caribbean countries that have significant mining activities. One of the main mineral resources in the Caribbean is bauxite, which is used in the production of aluminium. **Jamaica** is one of the largest producers of bauxite in the world and has been a major producer of the mineral for many decades. Other Caribbean countries that have bauxite reserves include **Guyana**, **Suriname**, and **Haiti**. Additionally, some Caribbean countries have small-scale mining activities for gold, silver, and other minerals. For example, the **Dominican Republic** has a small gold mining industry, while **Haiti** has some gold and copper deposits that are currently being explored.

A regional summary for GRULAC of mineral resource governance challenges, good practice examples and future action, derived from UNEP's 2020 consultations with member States, can be found here.

The Western Europe and Others Group of Countries

Western Europe relies heavily on imports of metals, as it lacks many of the minerals and metals necessary for industrial production. The European Union (EU) is the world's largest importer of metals, including iron, steel, aluminium, copper, and nickel, as well as rare earth elements, essential for many high-tech industries. The EU, interested to address this dependency, has policies focused on diversifying sources of raw materials, as well as promotion of responsible mining practices and new technologies. The WEOG region is also host to some of the major investors in the global mining sector. Many of the world's largest mining companies and investors are headquartered in **Australia**, **Canada**, **Germany**, **Switzerland**, **USA**. **UK** hosts the London Metals Exchange, a major bidding market for base metals.

Mining production is not as significant to the economies of Western European countries as it is to some other regional groupings. However, there are some countries where mining plays an important role in their economy. For example, **Sweden** is one of the largest producers of iron ore and base metals in Europe, and has recent discoveries of rare earths deposits. Other countries such as **Finland**, **Norway**, **Spain**, and **Portugal** also have mining industries.

Conversely the 'other' States in WEOG include major mineral producing nations, where mining contributes significantly to the economy and job market. **Australia** is one of the world's largest mining countries and a major exporter of minerals, including iron ore, gold, and copper. The mining industry accounts for around 10% of national GDP [50] and employs hundreds of thousands

48 https://unctad.org/publication/world-investment-report-2022

49 https://www.iied.org/sites/default/files/pdfs/migrate/G04266.pdf

50 https://tradingeconomics.com/australia/gdp-from-mining

of people. **Canada** is also a major mining country, producing gold, nickel, copper, zinc, and diamonds. The mining industry accounts for around 7% of GDP.[51] As well as being a significant consumer of metals such as aluminium, copper, nickel and zinc, the **USA** is also one of the world's largest producers of copper, gold, and other minerals, with mining contributing around 1.7% of GDP[52] and indirectly supporting over 1.4 million jobs. **New Zealand** has a smaller mining industry, primarily focused on gold, and iron ore.

WEOG countries have also been amongst pioneers in the nascent deep sea mineral industry, with the EU funding large-scale deep-sea research projects; **France**, **Germany**, and **UK** sponsoring seabed mineral exploration contracts in international waters[53]; and Norway indicating its intention to open national ocean space to prospective miners in the near future.[54]

Conversely, **Spain**, **Portugal**, **Canada**, **New Zealand**, and even pioneer investors **France** and **Germany**[55] – have announced national positions in favour of a deferral on deep-sea mining within international waters, until scientific knowledge, institutional capacity and regulatory rules are better developed in order to manage the industry within acceptable environmental parameters.

Regional summaries for Europe and North America of mineral resource governance challenges, good practice examples and future action, derived from UNEP's 2020 consultations with member States, can be found here and here.

Photo credit: pexels-lucia-barreiros-silva-12598625

51 https://tradingeconomics.com/australia/gdp-from-mining

52 https://tradingeconomics.com/australia/gdp-from-mining

53 https://www.isa.org.jm/exploration-contracts/polymetallic-nodules/

54 https://www.npd.no/en/facts/seabed-minerals/

55 https://savethehighseas.org/moratorium_2022/ and https://www.canada.ca/en/natural-resources-canada/news/2023/02/statement-on-seabed-mining.html

Annex II: List of Relevant Multilateral Agreements

- 1971 **Ramsar Convention on Wetlands of International Importance:** provides the framework for conservation and wise use of wetland biomes Implementation of the Ramsar Convention should identify and protect these most productive and biodiverse ecosystems on Earth. from adverse environmental impacts of mining.
- 1972 **UNESCO's Convention Concerning the Protection of the World Cultural and Natural Heritage:** defines the duties of states in identifying potential sites for inclusion in the World Heritage List, and obligations for protecting and preserving those sites (including from mining impacts).
- 1979 **Bonn Convention on the Conservation of Migratory Species of Wild Animals:** provides a framework within which parties act to conserve and protect migratory species and their habitats.
- 1987 **Montreal Protocol on Substances that Deplete the Ozone Layer:** concerns the use of ozone-depleting substances, which may be used in mining (as coolants, foam agents, cleaning fluids).
- 1989 **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal:** mining and metals processing has the potential to generate a variety of hazardous waste, from tailings containing heavy metals, to acid mine drainage, chemicals and asbestos; this treaty imposes restrictions on how such waste can be moved and stored.
- 1989 **International Labour Organisation Convention (No. 169) Concerning Indigenous and Tribal Peoples in Independent Countries:** while not an environmental agreement, this treaty recognises the link between global environmental change and the rights of indigenous peoples, and the close relationship between indigenous peoples' cultural and economic situations and their environment.
- 1992 **United Nations Convention on Biological Diversity 1992 (CBD):** the mining and metals industry can have significant impacts on biodiversity, and the CBD provides a framework for protecting and restoring ecosystems, including those affected by mining activities.
- 1992 **United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol:** The mining and metals industry is a significant contributor to greenhouse gas emissions, and the UNFCCC provides for the adoption of renewable energy and energy efficiency measures designed to reduce global emissions. At the same time, minerals are need for the renewable energy.
- 1994 **United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (UNCCD):** this global agreement encourages policies to promote sustainable land use practices, and to address land degradation, and water depletion – both issues that can be caused or exacerbated by mining.
- 2013 **Minamata Convention on Mercury:** this treaty establishes controls on the use of mercury, which is used particularly in artisanal and small-scale gold mining.

Annex III: List of Regional Binding Agreements

- **Bamako Convention:** treaty adopted by the member states of the African Union to prevent the import of hazardous and radioactive waste into Africa, and to promote environmentally sound management of such wastes within the continent.
- **HELCOM Convention:** sub-regional agreement between nine coastal countries of the Baltic Sea and the EU, that aims to protect the marine environment of the Baltic Sea.
- **OSPAR Convention:** sub-regional agreement of 15 member states and the EU, aimed to protect the marine environment of the North-East Atlantic, addressing issues such as marine pollution, biodiversity conservation, and the sustainable use of marine resources.
- **Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean:** also known as the Escazú Convention, and supported by UNECLAC, this treaty aimed to secure the rights of access to environmental information and public participation in environmental decision-making, and access to justice in environmental matters, had 24 Latin American and Caribbean signatory countries as of March 2023.
- **UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters:** also known as the Aarhus Convention with 46 State parties, this is an important agreement for promoting transparency, accountability and democracy in decision-making that affects the environment.
- **UNECE Convention on Environmental Impact Assessment in a Transboundary Context:** treaty aimed to prevent or minimise adverse environmental impacts from proposed activities in one country that may have significant effects on the environment in other countries.
- **UNECE Convention on Long-Range Transboundary Air Pollution:** with various protocols, a treaty that aims to reduce specific types of air pollution (sulphur dioxide, nitrogen oxides, particulate matter, and persistent organic pollutants) that can cause harm to human health and the environment across national boundaries.
- **UNECE Convention on the Transboundary Effects of Industrial Accidents:** this European agreement aimed to prevent and mitigate the effects of industrial accidents that could have transboundary effects, which apply to the mining industry in certain circumstances.
- **UNECE Water Convention**, managed jointly by WHO, this treaty provides a legal framework aimed to promote sustainable management and protection of transboundary water resources, such as rivers, lakes, and groundwater aquifers, across Europe and Central Asia.

Annex IV: List of Guidelines and Standards

- **Equator Principles:** a set of voluntary guidelines for financial institutions, applicable to projects with a total capital cost of $10 million, aimed to manage environmental and social risks in project financing (based on the IFC standards, listed below).
- **Extractive Industries Transparency Initiative (EITI):** a system requiring participating countries and companies to disclose publicly detailed information on national revenues from the mining industry, which figures are then independently verified by a multi-stakeholder panel.
- **Global Industry Standard on Tailings Management:** 15 principles and 77 requirements for industry, developed by the ICMM, UNEP and the Principles for Responsible Investment (PRI) to provide a framework for the safe and responsible management of large-scale mine tailings facilities.
- **Global Reporting Initiative:** a framework for sustainability reporting that includes indicators specific to the mining industry.
- **International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability:** a set of eight standards designed to ensure that IFC-funded projects are environmentally and socially sustainable. IFC uses compliance with the standards as a key criterion for financing decisions.
- **Initiative for Responsible Mining Assurance (IRMA):** a certification standard for responsible mining practices, covering environmental, social, and governance aspects.
- **Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) Mining Policy Framework:** a comprehensive but adaptable approach to mining policy development providing guidance and tools for governments to assess their mining policies and practices, identify areas for improvement, and develop a customized action plan to address priority areas.
- **UNECE Framework Classification System for Resources:** a system for classifying and reporting natural resources consistently.
- **UNECE Resource Management System:** a flexible and adaptable voluntary framework for States, of principles, guidelines, and tools for managing natural resources, including minerals.
- **UNECE Safety Guidelines and Good Practices for Tailings Management Facilities:** guidelines, for governments and industry, on tailings facilities, including site selection, dam construction, monitoring and inspections, emergency preparedness, and post-closure management.
- **UN Guiding Principles on Business and Human Rights (UNGP):** a framework for companies to respect human rights in their operations, relevant to the mining industry, given its potential for significant social and human rights impacts on local communities.
- **World Bank Environmental and Social Framework:** ten environmental and social standards that apply to all World Bank funded projects, aimed to ensure their sustainability.

Annex V: List of Industry Initiatives

- Aluminium Stewardship Initiative: collaboration between producers, users, and civil society organisations for a voluntary audited certification programme for aluminium producers.
- Alliance for Responsible Mining's 'Fairmined standard': certification system that sets social, environmental, and economic criteria for responsible artisanal and small-scale mining practices for gold and other associated precious metals.
- Fair Cobalt Alliance: a partnership between NGOs, IGOs and private sector with the aim to promote cobalt mining practices that respect human rights and contribute to sustainable development.
- Global Battery Alliance: a public-private partnership with the mission to accelerate the transition to a low-carbon, circular economy by promoting the development of sustainable battery technologies and supply chains, including via a flagship 'Battery Passport' certification programme.
- Global Mercury Partnership: initiative in 2005, this UNEP-supported project with other 200 partners from governments, IGOs, NGOs, industry and academia, focuses on raising awareness to enhance effective implementation of the Minamata Convention on Mercury.
- International Council on Mining and Metals (ICMM): industry association (representing 30% of the global mining industry) that works to promote sustainable mining practices, including via statements of position, performance expectations and principles, with which members are expected to align.
- International Cyanide Management Code: certification standard for the safe management of cyanide in mining operations.
- Mining Association of Canada's 'Towards Sustainable Mining': a set of mandatory guiding principles and performance indicators for mining companies to improve their environmental and social performance. The programme requires companies to set measurable targets, publicly report on their performance, and undergo independent verification of their progress, and has now been adopted by national chambers of mines across several countries globally.
- PlanetGold: a partnership between governments, private sector and local communities, aimed to make small-scale and artisanal gold mining safer, cleaner (mercury-free) and more efficient.
- Responsible Jewellery Council Code of Practices Standard: a code of conduct and chain of custody standard for responsible sourcing of precious metals and gemstones, covering ethical, social, and environmental aspects.
- Responsible Minerals Initiative: global multi-stakeholder initiative including over 400 companies across the mineral supply chain, that offers risk-readiness assessment, due diligence standards and an assurance process focused on responsible sourcing of minerals.
- Responsible Steel Standard: an independently audited certification scheme, aimed to promote sustainable practices in the steel industry, by establishing a framework for measuring and verifying the ESG performance of steel producers.
- World Gold Council: an industry association for gold, which promotes 10 'Responsible Gold Mining Principles', developed through a multi-stakeholder process, under which are a series of specific expectations, capable of independent third-party audit.

Annex VI: Examples of innovation

Zero waste mine, re-use of waste rock and tailings, dry tailings production, and benign mine tailings with reduced environmental risks	Zero waste: **At a Brazilian mine, a modification of the production process resulted in the elimination of waste generation, producing secondary products for agricultural application. These products generated 12% of the unit's revenues in 2018.**
Reductions in mine site water demand and uptake of water accounting frameworks	**Water consumption:** A uranium mine in Namibia has committed to an overall reduction of water consumption by 35% from 2008 levels. It will achieve this though a range of initiatives including improved efficiency, water accounting, and desalination. There are plans to share excess desalinated water with regional communities and other industrial sites. [56]
Shared infrastructure for water, power, rail, ports	**Water infrastructure:** After consulting with a local water users' committee, a mine in Chile agreed to co-finance water infrastructure in the mine's region to improve the local population's access to potable water, sewerage, and manage river water supply. The company also used a portion of the treated water for a mine expansion. [57]
Mined land rehabilitation, closure and re-purposing of post-mined landscapes	**Policy:** APEC published a "Mine Closure Checklist for Governments" to assist regional governments work through the steps required for a successful mine closure and identify gaps in existing mine closure policy frameworks. [58] **Biodiversity partnerships:** Nature After Minerals (NAM) partnership programme is a collaboration between conservation and minerals associations in the UK. The programme works with mineral planners, industry, statutory bodies, conservation organisations and local communities to make substantial contributions to priority habitat creation and boost priority species populations, while providing nature rich places for people to enjoy. [59]
Alignment between landscape-level planning processes and mineral licensing regimes	**Policy alignment:** Portugal updated its Policy and Regulatory Framework on Mineral Resources to ensure that the legislative frameworks at national, regional and local levels complement each other. This framework enables land-use planning to integrate the various natural resource uses. [60]
Participatory decision making and partnerships with communities and civil society	**Industry-Community Dialogue:** Finland has established a 'Network for Sustainable Mining' to improve dialogue between the mining industry and other stakeholders. [61]
Community-led impact assessment and participatory monitoring of mining projects	**Disclosure of environmental monitoring:** A mine in Chile publicly reports real time data on air and water quality via the use of smart censors. [62]
Mines owned and operated by Indigenous Peoples	**Indigenous ownership:** The first Indigenous owned and operated mine in Australia opened in 2017. The bauxite mine will provide employment for 65-100 people, and the associated training college will enable skills development. [63]

56 https://www.icmm.com/website/publications/pdfs/water/water-management-in-mining_case-studies

57 https://www.igfmining.org/the-power-of-partnership/

58 https://www.igfmining.org/wp-content/uploads/2019/04/218_MTF_Mine-Closure_Checklist-for-Governments-1.pdf

59 https://ec.europa.eu/environment/nature/natura2000/management/docs/NEEI%20case%20studies%20-%20Final%20booklet.pdf

60 https://www.min-guide.eu/sites/default/files/project_result/MIN-GUIDE_D2%202%20policy%20governance%20frameworks_final_0.pdf

61 https://www.min-guide.eu/sites/default/files/project_result/MIN-GUIDE_D2%202%20policy%20governance%20frameworks_final_0.pdf

62 https://www.igfmining.org/why-social-innovation-is-crucial-in-mining/

63 https://gulkula.com/

Renewable energy generation at mine sites	Policy: Several large mining companies in Chile have responded to the government's "Energia 2025" power policy target for 20 percent of all Chilean energy to come from renewable sources by 2025. Major companies have signed agreements for up to 100% of their energy to be supplied by third-party renewable companies, while some have built their own solar and wind projects. [64]
Regularisation and formalisation of artisanal and small-scale mining	ASGM: The National Bank of Ethiopia encourages miners to sell gold to the bank at 105% of the LBMA. The higher price aims to draw ASM gold into the formal market by out-competing alternate buyers and providing financial and non-financial support for miners. [65]
Representation and support of women artisanal miners through mining associations	Women: TAWOMA – the Tanzania Women Miners Association – was established in 1997 to support women's health and welfare, and provide a range of supports to improve environmental safety and commercial performance. [66]
Local benefit sharing and agreement making with Indigenous Peoples	Local Development Funds: Ivory Coast, Burkina Faso, Senegal and Mali have introduced institutional mining funds for local development (MFLDs). MFLDs collect income directly from mining companies and/or as a share of central revenues, and allocate funds to local communities with the aim of improving development outcomes for communities close to mining operations. [67]

Photo credit: wirestock / envato

64 http://ccsi.columbia.edu/files/2018/12/3418-CCSI-RE-and-mining-report-09-lr-reduced-optmized-07-no-links.pdf

65 https://pubs.iied.org/pdfs/16610IIED.pdf

66 https://www.iisd.org/sites/default/files/publications/igf-women-asm-challenges-opportunities-participation.pdf

67 https://www.igfmining.org/impact-of-the-mining-sector-on-local-development-will-institutional-mining-funds-for-local-development-be-a-game-changer/

Annex VII: Non-exhaustive list of organisations engaged in international cooperation on minerals and metals

- **UN Secretary General's Working Group on Transforming the Extractives Industries for Sustainable Development** was announced in 2021 following the publication of the UN Secretary General's Policy Brief on Transforming Extractives Industries for Sustainable Development (2021). [68] The objective of the Working Group is to (i) coordinate extractives-related work across the UN and beyond through joint work, planning and collaboration; (ii) serve as an information and knowledge hub to scale up and replicate good practices; (iii) provide policy advice and technical assistance to stakeholders in the sector; (iv) assist in integrating the extractive industries' work into other UN-wide initiatives. The Working Group is coordinated by UNDP, UNEP and the UN Regional Economic Commissions.

- **Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development** (IGF) is a global policy forum established by the UN in 2005 to promote sustainable development in the mining sector. IGF provides a platform of support and knowledge exchange for member countries, that includes: in-country assessments, capacity building initiatives, technical assistance projects, guidance documents, and intergovernmental conferences.

- **African Minerals Development Centre** (AMDC) is an institution of the African Union supporting member states with sustainable development of their mineral sectors, via provision of research, technical assistance, policy advice, training, knowledge sharing services to African governments.

- **Organisation for Economic Co-operation and Development** (OECD) is an intergovernmental agency comprising 38 member countries, including many of the world's largest economies. OECD provides policy analysis, data and statistic and capacity-building and technical exchange programmes focused on promoting responsible business conduct in the mining sector, as well as technical assistance to developing countries in terms of management of their mining sectors.

- **African Development Bank** (AfDB) and **Asian Development Bank** (ADB) offer technical assistance and capacity-building to African and Asian states, respectively, in areas such as mining policy and regulatory frameworks, institutional strengthening, and community engagement.

- **International Seabed Authority** (ISA) is the intergovernmental agency mandated to manage and control seabed mineral activities beyond national jurisdiction. The ISA has initiated various programmes of training and knowledge exchange about deep-sea minerals, focused on developing country nationals, including regional projects for Pacific Island states, and for African countries.

- **International Labour Organization** is a tripartite UN agency, since 1919, the ILO brings together governments, employers and workers of 187 Member States , to set labour standards, develop policies and devise programmes promoting decent work for all women and men.

- **World Bank**, as well as financing investments related to mining, provides policy and legal advice to governments on how to design and implement mining laws and policies that promote sustainable development, and also more technical training in areas such as geological mapping, and mineral resource assessment.

- **Commonwealth Secretariat** is an intergovernmental organisation of 56 member states, which includes a technical assistance function for natural resources. Legal, economic and environmental advisors can support countries bilaterally upon request, in developing policies and regulations for their mining sectors.

- **International Monetary Fund** is an international organsiation established to facilitate international trade, and which now provides technical assistance and policy advice to member countries on sustainable mining practices, usually with a fiscal focus.

68 https://www.un.org/sites/un2.un.org/files/sg_policy_brief_extractives.pdf

Annex VIII: Selected Bibliography (containing hyper-links)

- Voluntary Responsible Mining Initiatives: Review, World Economic Forum and RESOLVE Solutions Network (2015)
- Mapping mining to the SDGs: an Atlas, World Economic Forum and UNDP (2016)
- Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, OECD (2016)
- Mine Tailings Storage: Safety is No Accident, UNEP/GRID-Arendal (2017)
- Alignment assessment of industry programmes with the OECD minerals guidance, OECD (2018)
- Global Trends in Artisanal and Small-Scale Mining, International Institute for Environment and Development (2018)
- State of Sustainability Initiatives Review: Standards and the Extractive Economy, International Institute for Sustainable Development (2018)
- Monitoring Impact of Mineral Sustainability Standards to Align with the Sustainable Development Goals, Centre for Social Responsibility in Mining (2018)
- Mosi-oa-Tunya Declaration on Artisanal and Small-scale Mining, Quarrying & Development (2018)
- A Roadmap for Improved Mine Waste Management, UNEP (2018)
- Due Diligence Guidance for Responsible Business Conduct, OECD (2018)
- Global Resources Outlook, International Resource Panel (2019)
- Sand and Sustainability: Finding New Solutions for Environmental Governance of Global Sand Resources, UNEP Grid-Geneva (2019)
- Guidance for Governments: Improving Legal Frameworks for Environmental and Social Impact Assessment and Management, IGF (2020)
- Mining and the SDGs: A 2020 Status Update, Columbia Center on Sustainable Investment and the World Economic Forum (2020)
- Sustainability Reporting in the Mining Sector – Current Status and Future Trends, UNEP (2020)
- Mineral Resource Governance in the Twenty-First Century: Gearing Extractive Industries towards Sustainable Development, UNEP (2020)
- Guidance for Governments: Environmental Management and Mining Governance, IGF (2021)
- Mineral Resource Governance and the Global Goals: An agenda for international collaboration University of Queensland and UNEP (2021)
- The Role of Critical Metals in Clean Energy Transitions, International Energy Agency (2022)
- Harmful Marine Extractives: Deep-Sea Mining, UNEP Finance Initiative (2022)
- Responsible Mining Index 2022, Responsible Mining Foundation (2022)
- Sand and Sustainability: 10 Strategic Recommendations to Avert a Crisis, UNEP Grid-Geneva (2022)
- Mineral Resource Governance & the Global Goals: agenda for international collaboration, UNEP (2022)
- Responding to Illegal Mining and Trafficking in Metals and Minerals – A Guide to Good Legislative Practices, UNODC (2023)
- Net Zero Roadmap for Copper and Nickel Value Chains, and Technical Report, IFC (2023)

Annex IX: UNEA 5/12 Intergovernmental Consultations: Template for Written Submissions

The template below is intended to provide guidance to Member States and observers in structuring written submissions to the mandates set by UNEA Resolution 5/12, paragraphs (1)-(3).

Written submissions will inform the secretariat in the preparation the global intergovernmental meeting to be held 7-8 September 2023 in Geneva, Switzerland as well as the report to the United Nations Environment Assembly at its sixth session on the progress achieved in the implementation of the present resolution.

The template is divided into four sections:

I. General information

II. Existing activities and opportunities for enhanced cooperation

III. Non-prescriptive proposal(s)

IV. Additional input

All written submissions must be sent to UNEA5.12@ggkp.org. All written submissions received will be compiled and made available on the UNEA 5/12 webpage.

Please note that it is not required for all fields to be answered in the template for submission.

Deadline for submissions:

- 15 July 2023 for written submissions from observers.
- 31 July 2023 for written submissions from Members States.

Template for submissions

I. General information

Name of country (for Members of the committee)	
Name of organization (for observers)	
Contact person, title/position and contact information for the submission	
Date	

II. Existing activities and opportunities for enhanced cooperation

1. Existing activities to enhance the environmental sustainability of minerals and metals including, best practices, responsible business practices, standards, guidelines, technical tools, environmentally sustainable technologies and the use of renewable energy in mining;

Title/Objective Brief description of activity:

III. Non-prescriptive proposal(s)

1. Existing activities to enhance the environmental sustainability of minerals and metals including, best practices, responsible business practices, standards, guidelines, technical tools, environmentally sustainable technologies and the use of renewable energy in mining;

Title/Objective Brief description: Rationale/justification: Text of the non-prescriptive proposal(s): Please list co-proponent(s) – if any – including names/organization and contact details:

IV. Additional input

Please provide any other relevant proposals or priorities here, including further information, sources, references, etc.

UN environment programme