



German
Economic
Team

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POLICY STUDY
ARMENIA

Overview of the metals and mining sector in Armenia

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Executive summary

- » ARM possesses **substantial reserves of iron, gold, magnesium, and copper**, with the largest reserves located in the northern and southern regions of Armenia
- » The mining sector plays a **vital role in Armenia's economy**, making significant contributions to gross value added, industrial production, and the state budget
 - 2023: sector accounted for 2.7% of GDP, with exports accounting for USD 2.8 bn or 37% of total ARM exports
- » ARM's mineral **exports primarily consist of copper ore, gold, ferroalloys, and molybdenum**. The export destinations are not very diversified
- » The **domestic market is rather concentrated**, with a few key companies. On the global market, ARM has a relatively small production share for all key metals
- » The **mining sector attracts significant foreign direct investments (FDIs) to Armenia**, as there are no restrictions for foreign investors to participate in the entire value chain
- » As of 2023, the **fiscal regime in ARM has undergone changes**. Export duties for copper, molybdenum, and ferromolybdenum have been eliminated, and the royalty formula has been adjusted to capture any excess profits
- ARM has a promising economic opportunity due to the increasing demand for copper and molybdenum (among others), particularly in energy transition technologies
- There is also potential to expand the domestic value chain and export processed metals with added value

Outline

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2. Overview of the mining value chain
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1. Introduction and rationale

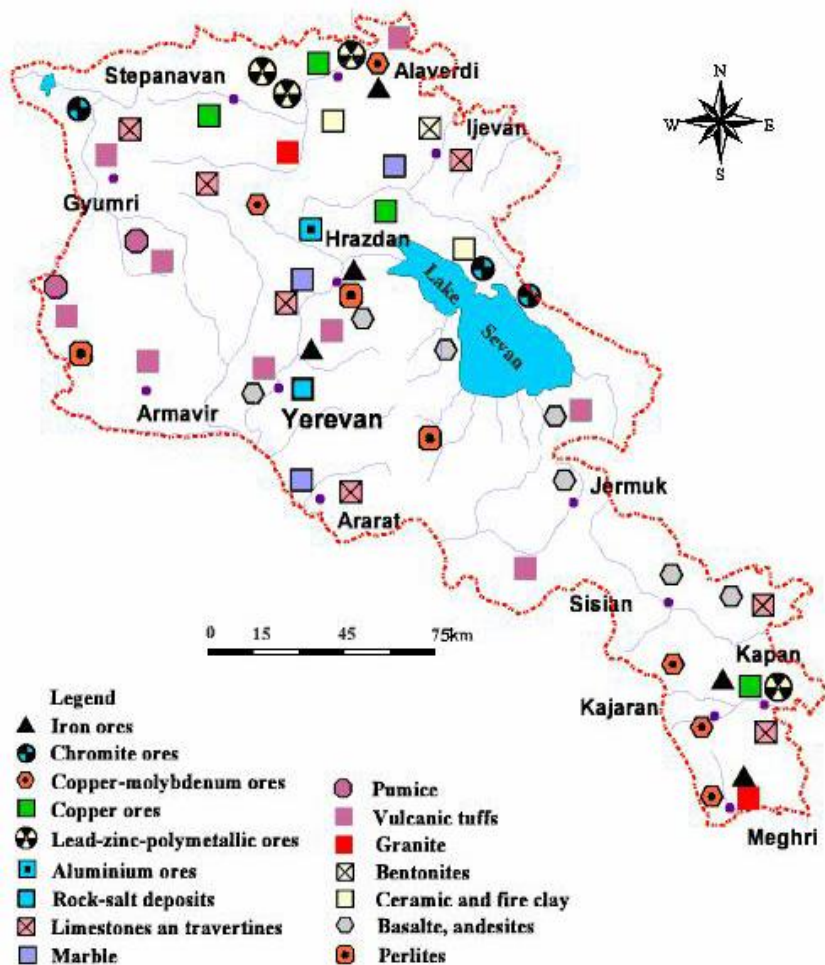
- » Armenia possesses significant metal and mineral reserves, with the mining sector contributing fundamentally to the economy
- » The mining sector is reliant on the exports of metal concentrates since ARM does not currently have full cycle processing (e.g. copper smelter)
- » Growing global demand for minerals for the energy transition and digital transformation creates an opportunity for higher exports volume and revenues, but also to possibly engage into value-added exports of metals
- » At the international scale, ARM has a rather small share of world production of most minerals, indicating its status as a price-taker
- » Recently, the Strategy for the sector's development was adopted to promote sustainable and responsible mining as well as address gaps in the legal framework

Goal of this study

- » Provide an overview of the metals and mining sector in Armenia covering the entire value chain, economic and regulatory aspects

2. Overview of mining value chain: reserves (1/2)

Map of mineral resources (2013)



Source: AUA Environmental Research and Management Center

Types of metal ore and minerals

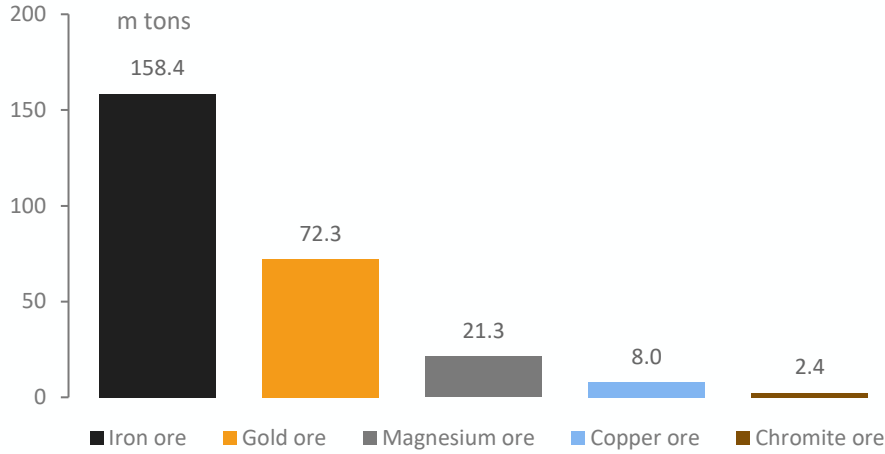
- » ARM possesses a range of metallic ore and mineral reserves
- » Largest confirmed metal ore reserves are iron, gold, magnesium, copper and chromite
- » Moreover: there are several confirmed metal minerals reserves (zinc, lead, molybdenum, etc.)

Geological activities

- » However: geological information is limited, not openly available and outdated
- » Recent geological activities (investments in exploration) roughly amounted between 2010 and 2022 to only USD 12 m
- » New mining strategy proposes to address this by creating data and information systems
- Armenia has a wide range of metal ore and mineral reserves across the country
- However, geological exploration efforts were limited in recent years

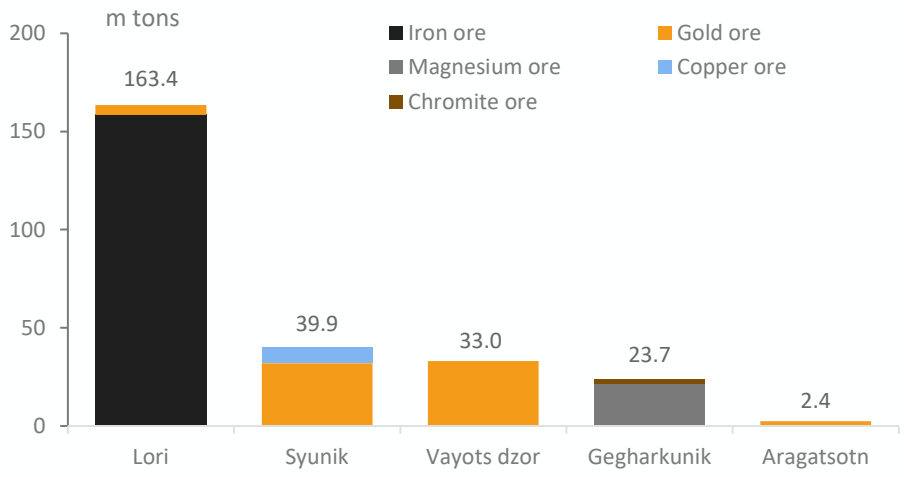
2. Overview of mining value chain: reserves (2/2)

Overview of confirmed reserves of metal ore (2011-2021)



Source: Extractive Industries Transparency Initiative

Confirmed reserves of metal ore by regions (2010–2021)



Source: Extractive Industries Transparency Initiative

Confirmed reserves and their location

- » Significant identified metal ore reserves are iron ore (158 m tons), gold ore (72.2 m tons) and magnesium ore (21 m tons)
- » Regions with largest volume of metal ore reserves are:
 - Lori (iron and gold)
 - Syunik (gold, copper and others)
 - Vayots dzor (gold)
 - Gegharkunik (magnesium and chromite)
- » Similar regional distribution in terms of metal minerals (sorted by size):
 - Lori (iron, silver and gold)
 - Syunik (silver, gold, zinc, lead and molybdenum)
 - Gegharkunik (magnesium and chromium oxide, gold)
 - Vayots dzor (silver, zinc, gold, lead)
- Iron ore and gold ore reserves are the largest, with most of them located in Lori and Syunik

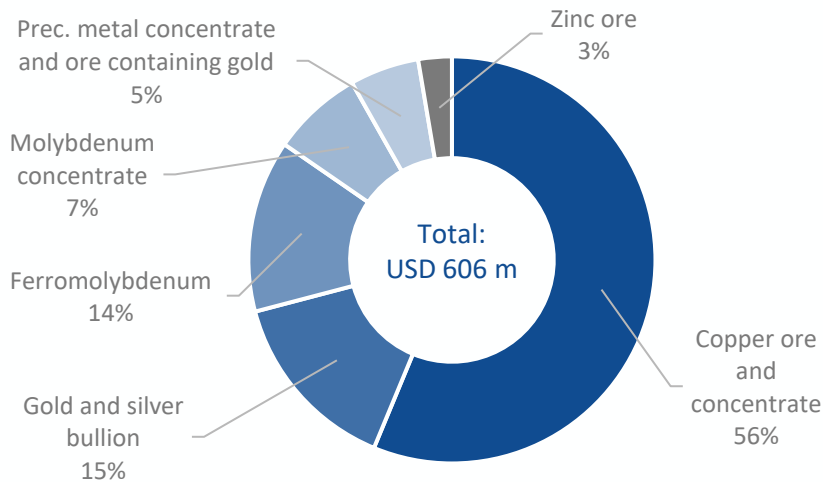
2. Overview of mining value chain: extraction (1/2)

Main ore types extracted by mine and region

Ore type	Volume (2021)	Mine	Region
Copper-molybdenum ore	19.2 m t	Kajaran	Syunik
Copper-molybdenum ore	7.8 m t	Teghout	Lori
Copper-molybdenum ore	4.5 m t	Agarak	Syunik
Copper	0.4 m wmt	Shamlugh	Lori
Copper and gold ore	0.2 m dmt	Lichkvaz-Tey	Syunik
Gold ore	1.7 m un	Sotq	Gegharkunik
Gold-containing ore	0.6 m dmt	Shahumyan	Syunik

Source: Extractive Industries Transparency Initiative

Main metal mining industry products by value (2021)



Source: Extractive Industries Transparency Initiative; own calculations

Mining of metal minerals

- » ARM has around 45 metallic mines (as of end of 2022), of which:
 - 26 gold and gold-polymetallic mines
 - 19 metal minerals mines (7 – copper-molybdenum, 3 – iron, 4 – copper, 2 – polymetallic, 1 – molybdenum, 1 – magnesium silicate and chromite, 1 – nepheline syenite)
- » Copper and copper-molybdenum ore amounted for most of the extraction volume
 - These ores also have a high concentration of gold and silver
- » Main ores extracted by value (2021) were copper ore and its concentrate (56%), followed by gold and silver bullions (15%)
- » Exploitation horizons based on average production volumes in the past are:
 - Copper-molybdenum ore: 100-120 years
 - Gold ore: 25-30 years
 - Lead-zinc ore: 20-25 years
- Copper and copper- molybdenum ore dominate the extraction in value and volume

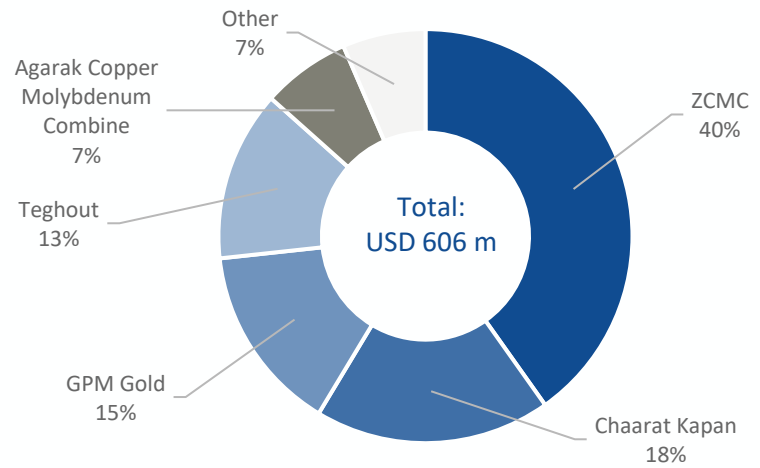
2. Overview of mining value chain: extraction (2/2)

Main ore types by extracted by value and companies

Ore type	Value (2021), USD m	Company name
Copper-molybdenum ore	129.2	ZCMC
Gold and silver bullion	88.8	Geopromining Gold
Ferromolybdenum	83.0	ZCMC
Copper-molybdenum ore	80.6	Teghout
Copper ore	55.7	Chaarat Kapan
Copper-molybdenum ore	37.3	Agarak Copper Molybdenum Combine
Molybdenum concentrate	31.2	ZCMC
Other	99.8	

Source: Extractive Industries Transparency Initiative; own calculations

Producers of main metal mining production (2021)



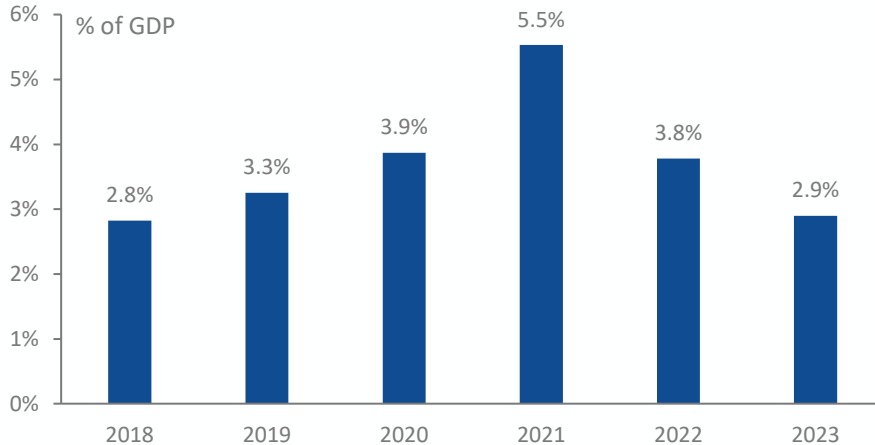
Source: Extractive Industries Transparency Initiative; own calculations

Main mining companies

- » Largest metals mining company is Zangezur Copper Molybdenum Combine (ZCMC)
 - Until Oct-23, 45% owned by Russian GeoProMining (GPM); entire stake sold due to Western sanction on RUS
- » Chaarat Kapan sold to Armenian Gold Mining Company in Aug-23 for USD 55 m
 - Owner of Gold Mining Company also owns Lichkvaz
- » GPM Gold is largest gold-mining company (73% of total production value in 2021)
 - Owns Agarak Copper-Molybdenum
 - Sotk mine operations were partially suspended due to the conflict with AZE
- » Lydian (USA/CAN company) was allowed to continue exploration of the 2nd largest mine, Amulsar, in 2024 (suspended from 2018)
- » ARM government also has shares of roughly 25% in ZCMC (which was partially gifted) and the recently acquired 12.5% in Lydian
- Ownership is moderately concentrated with the presence of RUS

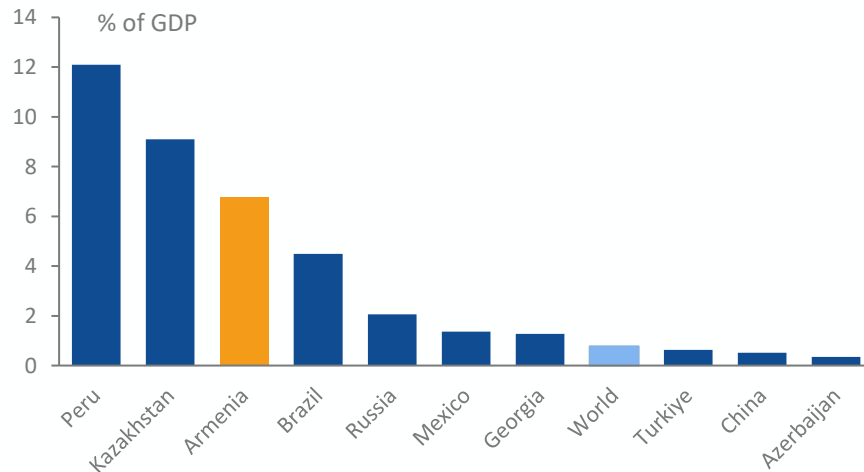
3. Economic aspects: gross domestic product

Size of the ARM mining and quarrying sector



Source: Armstat

Mineral rents* (2021)



Source: World Bank Group

* - tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate

Contribution to GDP

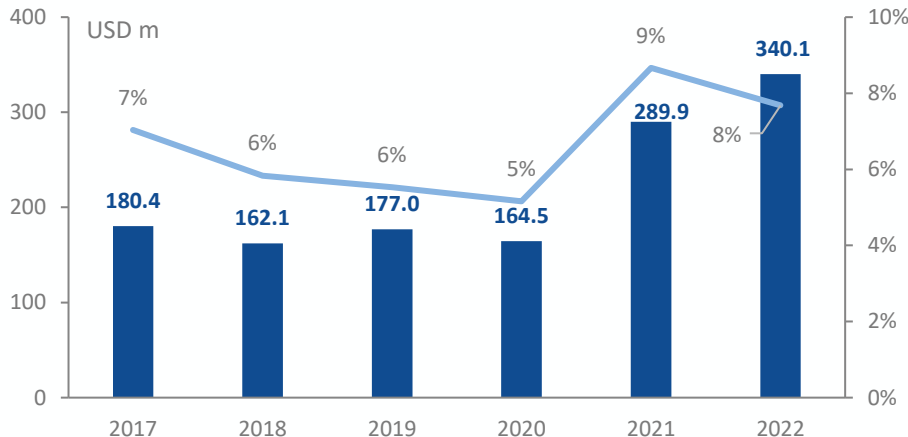
- » ARM mining and quarrying sector accounted for 3.7% GDP on average (2018-2023)
 - Mining and related manufacturing share in industrial production averaged 27%
- » 2022/2023: declining trend
 - ARM mining companies are highly connected to RUS and thus face problems due to sanctions
 - Operations of large mines, Sotk (gold) and Teghut (copper), suspended in 2022

International comparison

- » Mineral rents show a difference between value and cost of production (6.8% in ARM)
- » ARM mining sector has a quite high mineral rent, far above worldwide average (0.8%)
 - Neighboring countries (GEO, TUR and AZE) are also less reliant
- The sector is important for the economy, but faces challenges due to external shocks
- Mineral rent quite high in international comparison

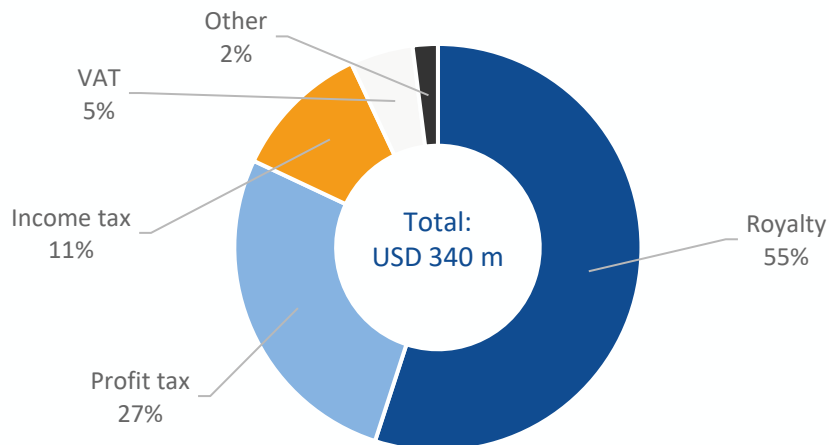
3. Economic aspects: state budget contribution

Taxes and payments to the state budget



Source: Extractive Industries Transparency Initiative, State Revenue Service

Taxes and payments to the state budget (2022)



Source: State Revenue Service, own calculations

Contribution to the state budget

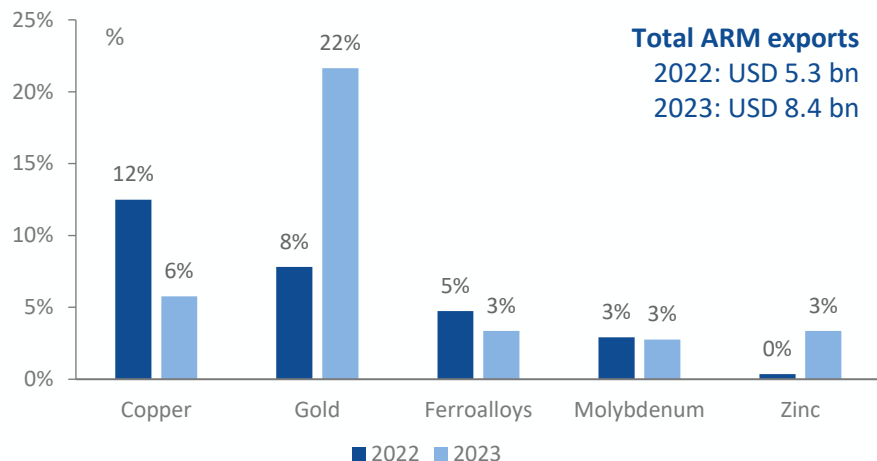
- » ARM mining sector contributed on average 7% of annual budget revenues (2017-2022)
- » Higher revenues in recent years (2022: 8% or USD 340 m) due to changes in taxation and higher metal prices (higher profits)
 - 2021: introduction of export duties for copper, molybdenum and ferromolybdenum to capture high metal prices
 - However: abolished once again in 2023; royalty formula was changed to capture excess profits (if any)
- » 2023: revenues likely to decline due to operational suspension of two main mines and declining metal prices

Structure of revenues

- » Royalty payments are the main contributor (55% of total payments), followed by the profit tax (27%) and income tax (11%)
- » ZCMC main taxpayer (2021: 68%)
- » Tax payments by the mining sector comprise considerable share of state revenues

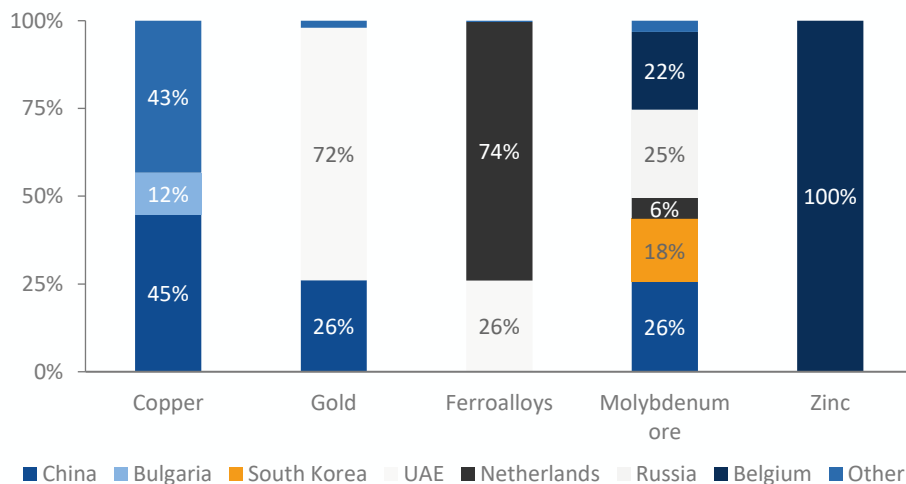
3. Economic aspects: exports

Share of main mining sector in total exports



Source: UN Comtrade

Main export destinations (2023)



Source: UN Comtrade

Contribution to exports

- » ARM mining sector is export-oriented due to lack of domestic processing capacities
- » Copper ore, gold, ferroalloys, molybdenum and zinc comprised 37% of total ARM exports (USD 2.8 bn) in 2023
- » Suspension of second largest mine, Teghut, resulted in copper production decline
- » Gold export value almost doubled in 2023 due to potential re-exports from RUS
 - Gold imports from RUS increased sharply (2023: USD 1.3 bn; +540%)

Main export destinations (2023)

- » Exports were rather concentrated
 - Copper: CHN (45%), BGR (12%)
 - Gold: UAE (72%), potential RUS re-exports; CHN (26%)
 - Ferroalloys: NLD (74%), RUS (26%)
 - Molybdenum: CHN (26%), RUS (25%)
 - Zinc: BEL (100%)

- High share of mining products in total ARM exports; destinations are highly concentrated

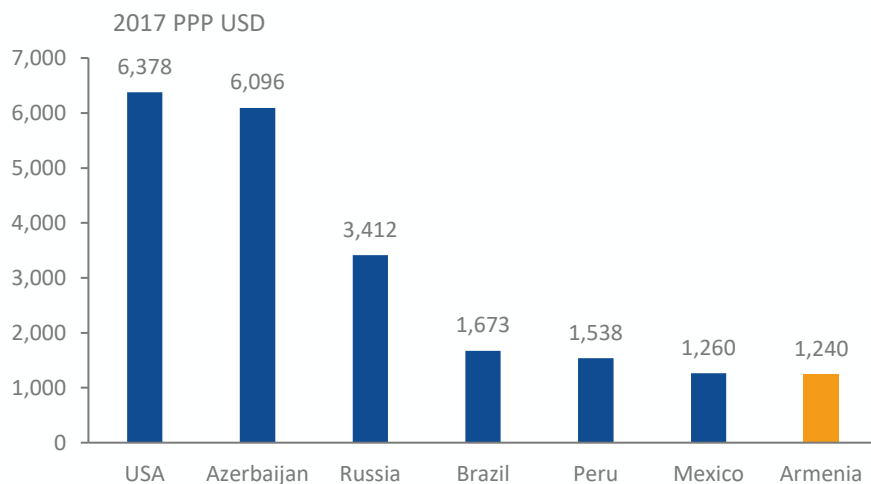
3. Economic aspects: indirect effects

Remuneration and employment (Dec-23)

		Total economy	Mining and quarrying
Average monthly wages	USD	848	1,907
Number of employed	Tsd.	742,941	11,940

Source: Armstat

Average monthly wages in mining and quarrying (2021)



Source: International Labour Organisation

Employment and wages

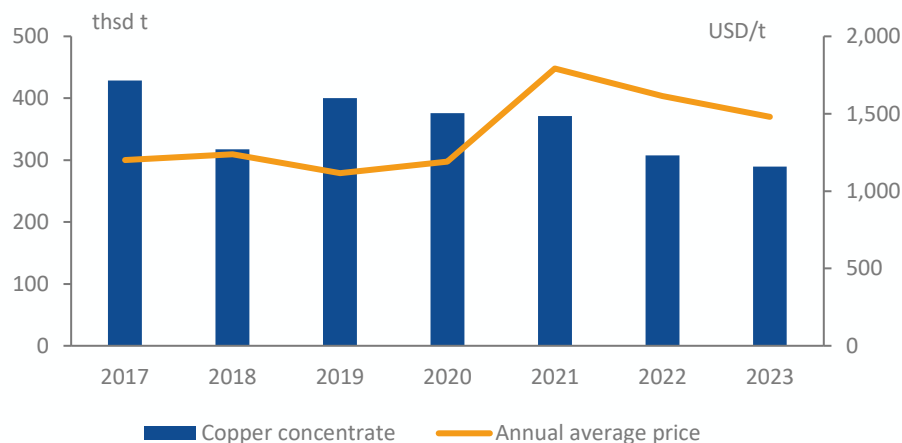
- » Salaries in mining and quarrying were more than twice as high as in the economy as a whole (Dec-23)
 - Total economy: USD 848
 - Mining and quarrying: USD 1,907
- » In terms employment, approx. 1.6% of the labour force works in the mining and quarrying sector
 - Notable share, but lower than the share of the sector in GDP (2023: 2.9%)

Wages in international comparison

- » Purchasing power adjusted monthly sectoral wages in ARM were USD 1,240 (2021)
- » Thus, relatively lower compared to other countries engaged in mining
 - Neighboring AZE: USD 6,096
- Wages in the ARM mining sector are much higher than in the overall economy, but still low in international comparison
- Share in employment below share in GDP

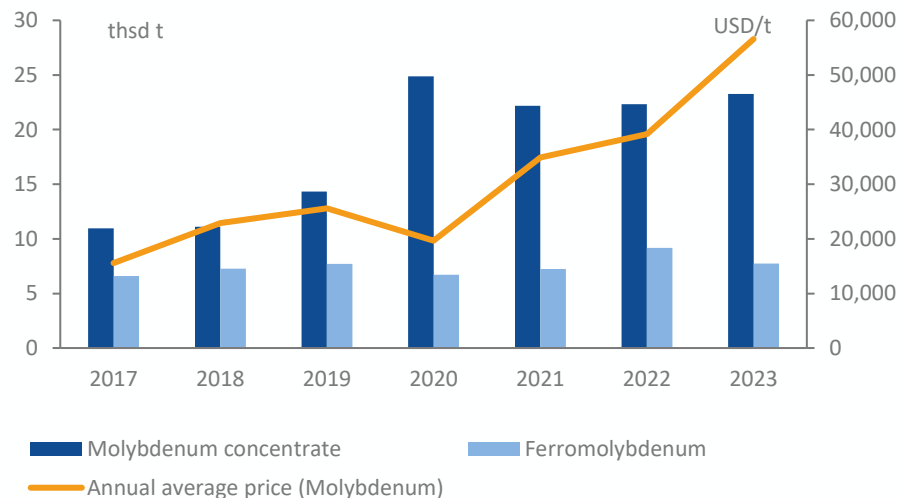
3. Economic aspects: recent dynamics for key metals

Copper concentrate production and average price per tone



Source: UN Comtrade, Armstat

Molybdenum concentrate production and average price



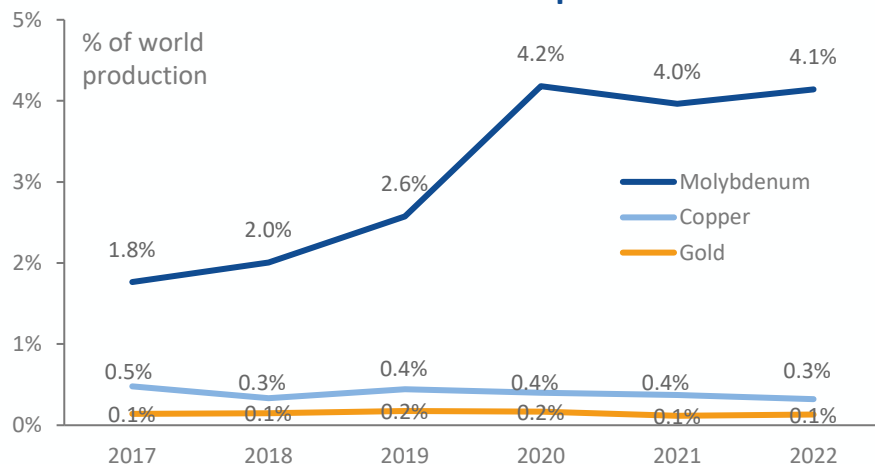
Source: Armstat, IMF

Copper and molybdenum are key metals

- » Copper is the main export item, while molybdenum is its by-product
 - Both are predominantly exported to CHN; policies for them are harmonised
- » 2021: prices went up due to global economic recovery, especially high 'green' demand for renewables and infrastructure
 - Government introduced temporary export ban and then export duty
- » Copper production declined in 2022/23 due to the closure of Teghut mine, owned by RUS bank under the sanctions
 - 2022: 308 m t; 2023: 290 m t
 - Despite this: molybdenum production remained relatively stable (2023: 31 m t)
- » Moreover: global prices declined due to lower industrial demand (esp. from CHN, the main export destination of copper)
 - Lower copper exports in 2023
- ARM is rather dependent on price developments in the global market

4. International landscape

Share of world mineral production



Source: World Mining Data

Position in the World's Mining Production Ranking (2022)

Product	ARM's rank	Top producers in the world
Molybdenum	6	CHN, CHL, USA
Copper	27	CHL, COD, PER
Silver	41	MEX, CHN, PER
Zinc	46	CHN, PER, AUS
Gold	56	CHN, RUS, AUS

Source: World Mining Data

Global market position of ARM

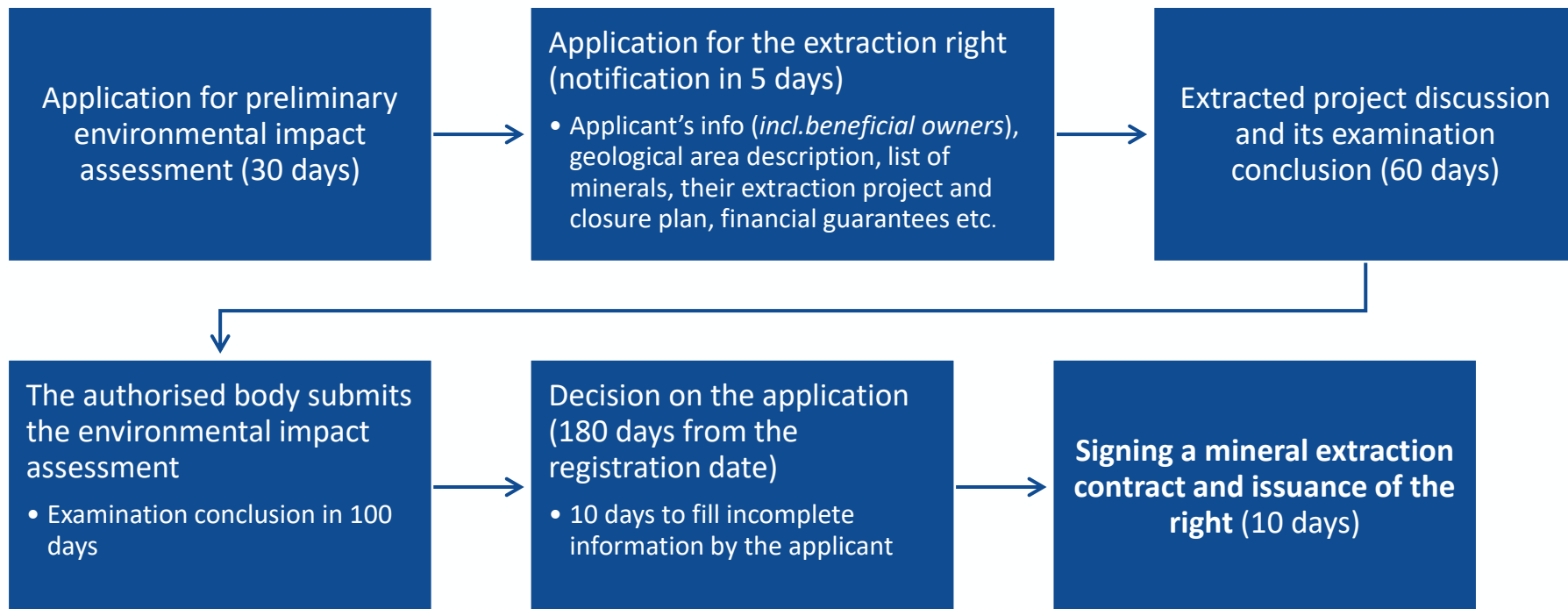
- » ARM holds a stronger position in the molybdenum production, but it has a rather weak position for other metals
 - ARM produced 4,1% of the world's molybdenum in 2022
 - Copper and gold production are less significant on a global scale: 0.3% and 0.1%, respectively (2022)
- » Accordingly, ARM does not hold a leading position in the global Mining Production Ranking (2022)
 - Rank 6 for Molybdenum and 27 for Copper; only rank 56 for gold
- » Market concentration for metal minerals across the globe are as follows:
 - Molybdenum market is moderately concentrated with China's share of 38%
 - Copper, silver, zinc, gold – competitive
- ARM has a significant position in global molybdenum production
- More of a price taker for other metals

5. Regulatory aspects: Mining Strategy 2035

- » In May 2023, the Mining Strategy 2035 was adopted. Following issues and sectoral problems are addressed:
- 1) **Development and implementation of a methodology for resource assessment and geological studies** (their promotion via tax exemptions or similar), including the practical difficulties in application of international standards (JORC) as well as lack of unified and accessible database on mineral reserves
 - 2) **Addressing the gaps and overly general provisions in the legal, normative and institutional framework** related to environmental protection, socio-economic development and technical safety of mining infrastructure (design, construction, maintenance and closure)
 - 3) **Harmonisation and simplification of the regulations on land acquisition, use restrictions and forced resettlement**
 - 4) **Introduction of classification for ore, concentrate, smelting and other** related terms in the legislation, esp. for taxation purposes (currently based on the exported value only)
 - 5) **Consideration to create a state fund from the mining revenue streams** to contribute to socio-economic development such health insurance, creation of schools in remote communities or other purpose
 - 6) **Development of mechanisms to promote transparency and accountability**, for example, reporting on sustainability, environmental monitoring or extraction

5. Regulatory aspects: mining rights (1/2)

- » The subsoil is considered to be an exclusive state property (priority of granting mining rights/ its limiting by state decision is proposed in the Strategy)
- » The sector is regulated by the Codes on Subsoil, Land and Water as well as Laws on Payments for Nature Protection and Nature Usage, Wastes, Environmental Protection (proposed to unify all mining-related permits, e.g. water, emissions etc, into a single package)
- » Mining right comprises of mineral extraction permit, extraction contract, mining deed and the project:



Source: Own illustration from Code on Subsoil

5. Regulatory aspects: mining rights (2/2)

- » *Permits on mining exploration and extraction* are issued by the Ministry of Territorial Administration and Infrastructure on the first come, first served basis (preference may be given to the holder of geological exploration permit)
 - Permit for geological exploration is issued for the period up to 3 years (can be extended by 2-year periods maximum 3 times)
 - Permit for extraction is issued for the entire duration of extraction project, but no longer than 50 years (possibility of extension)
 - All mining licenses and contracts are publicly available from 2018
- » *Contract* includes information about mineral types allowed for extraction, mining allotment coordinates, its term, stages/schedule of extraction, conservation management plan, confirmation on deposit reserves, procedure for submission of required reports, provisions on calculation and payment of state fees, mine closure provisions
- » *Extraction project* shall include information about methods for exploitation of the deposits, infrastructure set-up, expected usage duration of the deposit, environmental and natural impact assessment, social impact assessment, storage of the removed soil layer, safety rules and standards for employees, nature and environment, restoration of the land.

5. Regulatory aspects: foreign direct investments (1/2)

Open and foreign investment-friendly environment

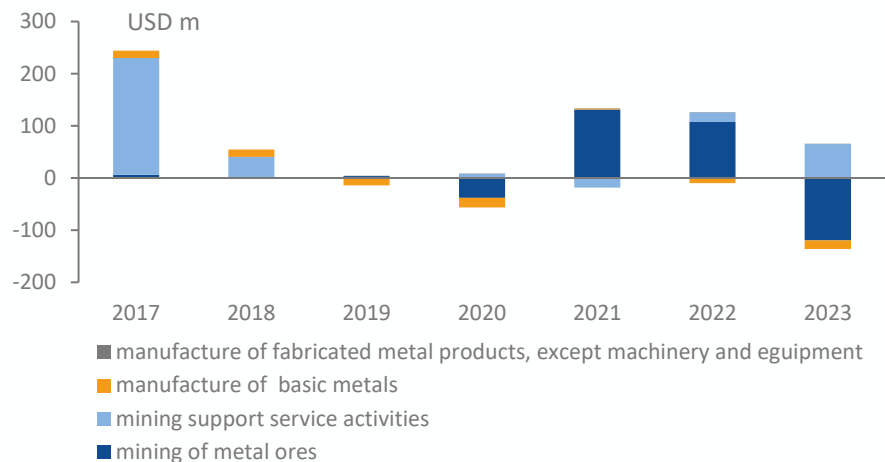
- » Armenia adheres to an “open door” policy
- » The general regulation of foreign direct investments (FDIs) is carried out via the Law “On Foreign Investments” and contains the following provisions:
 - Equal treatment of local and foreign investors
 - Investment permits are generally not required
 - Unrestricted access to most sectors and geographic location, *including all parts of mining value chain* (exceptions are media and commercial aviation)
 - Five-year guarantee against legislative changes
 - No restrictions on profit repatriation or personnel recruitment
- » Armenia has bilateral investment treaties with 44 countries (incl. Germany) that stipulate equal conditions for investors
 - A member of Eurasian Economic Union with Belarus, Kazakhstan, Kyrgyzstan and Russia
 - Entered into a Comprehensive and Enhanced Partnership Agreement with the EU to align the regulatory system

Free economic zones are in place, but do not cover mining activities

- » Benefits are provided for residents of free economic zones (Meghri Free Economic Zone), yet the list of economic activities allowed does not include extraction activities

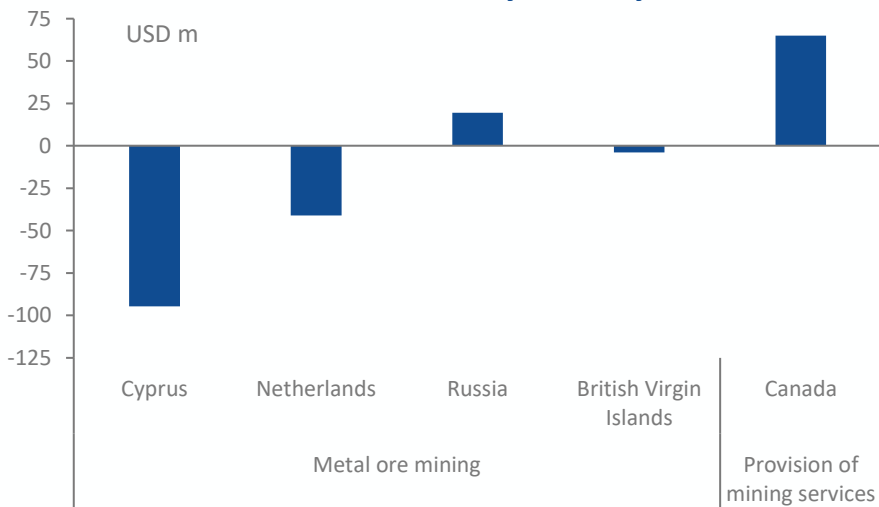
5. Regulatory aspects: foreign direct investments (2/2)

Net flows of foreign direct investments in 2017-2023



Source: Armstat

Distribution of net FDI by country in 2023



Source: Armstat

FDI

- » Net FDI stock was at USD 1.2 bn (22% of the total investment stock; 5% of GDP) in 2023
- » Overall, the share of net FDI into the mining sector comprised 14% of the total gross FDI in 2023
- » There were some significant net FDI flows between 2014-2023 into the mining sector
 - Especially into mining of metal ores and support service activities
 - 2021/2022: mostly reinvested earnings
- » However, there were also some outflows:
 - in 2020 - COVID pandemic and the war in Nagorno Karabakh conflict zone
 - In 2023 - the sector's exposure to the Russia's economy and the impact of sanctions
- FDI into mining sector comprises significant share of total FDI

5. Regulatory aspects: taxes and fees (1/2)

Main tax types paid by the mining companies are as follows (see Annex for the full list):

» **Profit tax:** 18%

Positive difference between total income and total deductible expenses

» **Royalties*:** $R_1 - 4\%$ for B_1 , $R_2 - 12.5\%$ for B_2 , and $R_3 - 15\%$ for B_3 (if positive only)

The tax base calculation is complex and depends on many variables creating transparency difficulties:

$$B_3 = B_2 - FE - (B_1 \times R_1) - (B_2 \times R_2) - (B_1 \times 0.1),$$

B_1 – sales turnover of any final product during the reporting period

B_2 – profit before taxation as the positive difference between B_1 and deductions

B_3 – profit before taxation calculated via this formula

FE – financial expenses

» **Value added tax:** 20%

Monetary value of goods, including amount of the environmental tax

» **Export duties*** – abolished from 2023

* - ARM carries out a fiscal mining regime changes: the revision of the royalty system (addition of new formula component B_3 to tax the income of a mining company exceeding certain threshold) and termination of export state duties on copper, molybdenum and its concentrate

5. Regulatory aspects: taxes and fees (2/2)

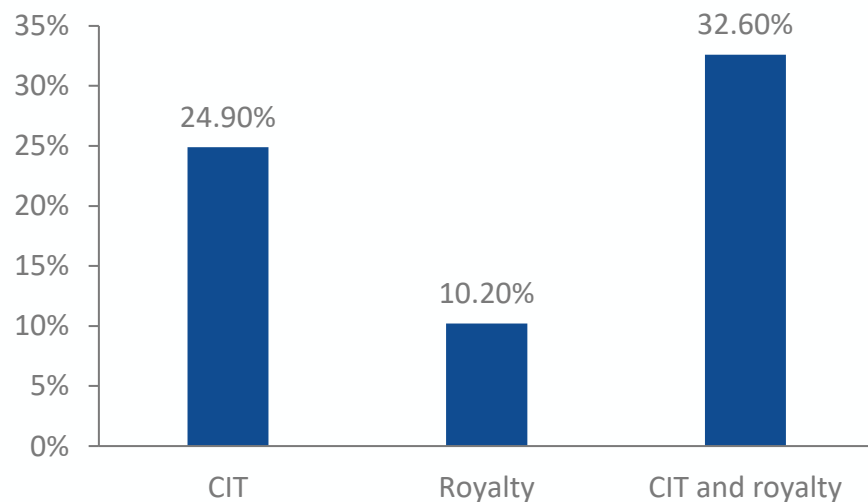
Tax burden as % of sales for 2016-2021*

	Average total rate*	Corporate income tax	Royalty
Zangezur PMC CJSC	19%	6%	16%
Geopromining Gold LLC	18%	8%	12%
Chaarat Kapan CJSC	28%	2%	19%
Teghut CJSC	48%	4%	10%
Agarak PMC CJSC	8%	0%	10%
Akhtala CJSC	12%	3%	8%
Meghradzor Gold LLC	18%	0%	6%

* - both state and municipal taxes for 2016-2020; ** - averages include omitted data

Source: Strategy for the development of the mining sector, 2023

CIT charge and royalty ratios in 2021



Source: International Council on Mining and Metals and PwC, 2022

Total tax burden on companies

- » Tax burden on mining companies vary from year to year; the average total tax burden ranges from 8 to 48% of sales

Corporate income tax (CIT) and royalty

- » In ARM, average CIT rate is 3% and royalty – 12% for 2016-2021; from 2023, the royalty rate will increase given formula change
- » ICMC Members' tax contributions in 2021 are 24.9% CIT and 10.2% royalty
- » ZCMC is at the top of major taxpayers

Base Erosion and Profit Shifting 2.0 impact

- » Multinational companies can be affected by new international tax as of 1 January 2024
 - A global minimum tax of 15% (*effective rate*) – if a host country does not collect this rate in a given year, another country has a right to claim the difference
- Tax rates in ARM are comparable to international levels
- Implementation of BEPS 2.0 could improve tax collection

5. Regulatory aspects: ESG

- » To carry out mining activities, a positive conclusion on the environmental impact assessment is required at the application stage
- » The mining contract stipulates the social and economic development commitments to the communities via either financial (the amount of investment) or non-financial obligations (the product or service and its value assessment)
- » Quarterly and annual reports on monitoring for the prevention of environmental losses, degradation and irreversible impact to the Ministry of Environment (MoE)
 - Includes impact on soil, atmosphere, surface and ground waters, flora and fauna
 - Every 5 years, companies are required to review and approve with the MoE the activity plan and monitoring indicators

In November 2022, ZCMC presented the first ESG report in the sector

- **The regulations mainly cover environmental aspects, but no guidelines on them as well as no regulations/guidelines on social aspects**

About the German Economic Team

Financed by the Federal Ministry for Economic Affairs and Climate Action, the German Economic Team (GET) advises the governments of Ukraine, Belarus*, Moldova, Kosovo, Armenia, Georgia and Uzbekistan on economic policy matters. Berlin Economics has been commissioned with the implementation of the consultancy.

**Advisory activities in Belarus are currently suspended.*

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Implemented by



Annex: Full list of taxes and fees

» The following taxes, fees and payments are paid in the course of mining activities:*

State Revenue Committee

- Profit tax
- Nature utilisation fee/Royalties
- Income tax
- Value added tax
- Excise tax
- Environmental tax
- Customs fines and duties
- State duties for the issuance of licenses and permits

Ministry of Environment

- Environmental protection fund payments
- Fee for impact assessment on the environment and expertise
- Monitoring fees

Ministry of Territorial Administration and Infrastructure

- Real estate tax
- Vehicle tax
- Land acquisition
- Subsoil contract obligations on socio-economic development of local communities