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The Democratic Republic of Congo cobalt supply chain mapping report: labor rights traceability in context

The Global Trace Protocol project, FOA-ILAB-20-04
May 2025 (revised from 2022)

SLR Better Mining

GlobalTrace PROTOCOL

Funding is provided by the United States (U.S.) Department of Labor (DOL) under cooperative agreement number IL-35808-20-75-K. One hundred percent of the total costs of the project is financed with USG federal funds, for a total of $4.6 million dollars.

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ACRONYMS AND ABBREVIATIONS

ARECOMS	Agency for Regulation and Control of Strategic Mineral Substance Markets, DRC
ASM	Artisanal and Small-scale Mining
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe, German Geological Survey
CAP	Cobalt Action Partnership
CAHRA	Conflict-affected and High-risk Area
CCCMC	China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exports
CEEC	Center of Expertise, Evaluation and Certification, DRC
COTECCO	Combatting Child Labor in the Democratic Republic of the Congo's Cobalt Industry project
CTC	Certified Trading Chains
CTCPM	Technical Cell for Coordination and Mining Planning
DRC	The Democratic Republic of the Congo
EGC	Entreprise Générale du Cobalt
ESG	Environmental, Social and Governance
GBA	Global Battery Alliance
ICGLR	International Conference on the Great Lakes Region
LSM	Large-scale Mining
OEM	Original Equipment Manufacturer
OHS	Occupational Safety and Health
PE	Exploitation Permit
PR	Research Permit
PER	Tailings Exploitation Permit
RMAP	Responsible Minerals Assurance Process
RMI	Responsible Minerals Initiative
RCI	Responsible Cobalt Initiative
SAEMAPE	Department of Assistance and Supervision of Small-Scale Mining, DRC
SSA	Sub-Saharan Africa
SDG	Sustainable Development Goal
WFCL	Worst Forms of Child Labor

THE GLOBAL TRACE PROTOCOL PROJECT

The Global Trace Protocol project (GTP) is funded by the U.S. Department of Labor to help reduce child and forced labor in global supply chains through traceability. It is implemented by LRQA, a leading global assurance partner[1] with implementing partners SLR Consulting (formerly RCS Global) and its Better Mining program, the Responsible Mineral Initiative (RMI) and Diginex. The Project objective is to develop a tool and methodology that enables brands, suppliers and other stakeholders to trace products through the entire journey from production to final purchaser, with data on compliance regarding child and forced labor and other exploitative practices at each tier.

The Project developed a trace tool and methodology that were tested through a pilot in Pakistan's cotton sector and developed a beta version for the Democratic Republic of Congo's cobalt sector. Using lessons from these activities, the Project crafted an open-sourced commodity agnostic traceability version of the methodology and tool.

The aim is to ensure that the tool is:

- User-friendly and publicly available free as open-sourced software;
- Effective in applying labor rights *and* due diligence principles; and
- Sustainable by being cost-effective, interoperable, and usable by various stakeholders.

Supporting research, guidance, and Project background may be found at Global Trace - Addressing barriers in supply chain traceability | LRQA. After the first run of the Pakistan pilot, the Project produced The Pakistan Cotton Pilot: Results, Lessons Learned, and Next Steps for Sustainability Report (June 2024), which informed the second, improved test run in 2024-25. The Project also produced other supporting material, including the Traceability Glossary (January 2024) and will release an updated version of its Context Analysis Report: Global Supply Chains, Labor Rights and Traceability. The commodity agnostic tool with user guidance is available on the U.S. Department of Labor (USDOL) GitHub website.

In January 2025, USDOL granted the Global Trace Protocol project an extension to develop a cobalt version of the traceability tool, support the use of the tool with the EGC and DRC partners, help develop a coordination and cooperation plan, and transfer hosting to EGC and Gécamines. The software is available on USDOL's GitHub site for public use.

This report is authored by Jeff Wheeler, Project Director and Jon Ellermann, Technical Lead, with editorial support from Troy Johnson, Senior Project Manager

[1]The Cooperative Agreement was originally signed by ELEVATE Ltd., which was subsequently acquired by LRQA.

EXECUTIVE SUMMARY

The aim of this report, ***The Democratic Republic of Congo Cobalt Supply Chain Mapping Report: Labor Rights Traceability in Context***, is to help government, industry and civil society stakeholders identify and reduce child labor, forced labor and other exploitative practices in their supply chains through traceability in coordination with other due diligence approaches. The goal is not to simply *declare* there is no child or forced labor in the supply chain; rather, it is to help *demonstrate* compliance through a trustworthy process with valid and reliable data. To that end, this Report provides an explanation of the country and industry context and a mapping of the cobalt supply chain from its source in the DRC to the international market, along with an analysis of its child labor and forced labor risks.

Section 1 on Cobalt and the Mining Sector and 1.1 on Critical Cobalt explains the critical and growing role of cobalt broadly in global trade and technology and specifically in the DRC's economy, with global demand estimated to increase about 60% by 2030. The largest share of demand is for electric vehicle (EV) batteries at 43%, followed by portable electronics (smartphones, laptops) at 30%, with the remainder in superalloys, magnets and other uses.

Section 1.2 on the DRC Economy and Mining Workforce explains that the DRC makes up about 76% of global cobalt mine output (2024), exporting $5.99 billion worth (2022), with mining constituting 95% of the DRC's exports (2022). And yet, with about 78 million people, the DRC is one of the poorest countries in the world. China refines 78% of the world's cobalt, followed by Finland at 9% and Canada at 3%. A rough estimate is that ASM mining fluctuates greatly (due to few entry barriers) between about 10 to 30% of total production, employing about 150,000 to 200,000 miners out of about 2 million DRC ASM miners.

Section 1.3 on Mining Governance and Initiatives discusses how the U.S. Dodd Frank Act on "conflict minerals" spurred creation of the International Tin Supply Chain Initiative (ITSCI) for mine site traceability and due diligence for tin, tantalum and tungsten, which with mixed results, served as a foundation for cobalt traceability efforts. The DRC Mining Code (2002) sets forth regulations on mine licensing and miner rights and authorizes zones for artisanal exploitation (ZEA's). The *Traceability Procedures Manual for Mining Products* expanded coverage to cobalt and copper in 2014, Ministerial Decree No. 19/15 safeguarding artisanal mine activities was issued in 2019, and Ministerial Decree No. 548 regulating mine cooperatives and commercial enterprises was issued in 2023.

In terms of administration, the 2019 decree created the ***Entreprise Générale du Cobalt SA (EGC)***, as a subsidiary of the state-owned mining company ***Gécamines*** with the aim of centralizing and regulating ASM cobalt purchasing and export with a sourcing standard. Other key organizations include the Agency for Regulations and Control of Strategic Mineral Substance Markets (ARECOMS), *Service d'Assistance et d'Encadrement du Secteur Artisanale et à Petite Echelle* (SAEMAPE) (ASM mineral tagging and mine site support), and CEEC (evaluation and certification for export). The Musompo Trading Center in Kolwezi helps ensure that ASM mining meets the standards and that miners receive proper compensation.

In terms of external support, the **Fair Cobalt Alliance (FCA)** helps maintain ASM site management practices and Cobalt for Development (C4D) helps improve artisanal miners living and working standards. **SLR Better Mining (formerly RSC Global)** conducts mine-site assessments to improve standard conformance, the **Responsible Minerals Initiative (RMI)** manages the RMI Responsible Minerals Assurance Process (RMAP), and the **Global Battery Alliance (GBA)** aims to develop a sustainable battery value chain at all tiers including upstream operations.

Section 2 on Cobalt Supply Chain Tiers and Models explains the following tiers: (1) Battery, (2) Cathode, (3) Refiners, (4) Treatment Units and (5) LSM and ASM mines. It details the process at each stage, starting in reverse order with **Tier 5A, or LSM**, and **Tier 5B on ASM** under models that work in ZEA's, on an LSM concession, and through illegal waste rock gathering. Local ASM cobalt traders (*négociants*) operate at on and off-site depots, some on open markets. A common concern at depots is that miners are not fairly compensated.

At **Tier 4 for Treatment Unit/Crude Refiner**, the cobalt ore is converted into cobalt hydroxide for export. Some are conformant to the RMI Responsible Minerals Assurance Process (RMAP). Tier 4 models include approaches with and without external sourcing and due diligence.

Tier 3 for Fine Refiner, entails the processing of cobalt concentrates, intermediaries or recycled cobalt products into outputs

used for downstream manufacturing, including cathode manufacturers. Tier 3 models include approaches with and without due diligence and operations in or outside of conflict-affected and high-risk areas (CAHRAs).

Tier 2 for Cathode Manufacturer, entails the refined cobalt products processed into cathode material compositions as components in lithium-ion batteries.

Tier 1 for Battery Manufacturer, involves the production of batteries or battery cells in large factories that enable end to end production from raw material to the final products.

In Section 3 on Child and Forced Labor: Principles, Laws and Prevalence, the DRC's commitments to fundamental labor principles are discussed, including the DRC's ratification of the ILO conventions on the Worst Forms of Child Labor (C. 182) and Minimum Age (C. 138), Forced Labor (C. 29), and the Abolition of Forced Labor (C. 105). The DRC Constitution prohibits the maltreatment of children (Art. 41) and bans the use of forced labor (Art. 16).

Section 3.2 on Child Labor: Rights, Laws and Enforcement discusses the ILO child labor conventions in more detail, noting that, because of its inherent dangers, the ILO considers mining as hazardous work and one of the "worst forms" of child labor, with its digging, tunneling, crushing rocks, removing waste, and transporting of minerals and equipment. **Section 3.2.2** details the DRC child labor laws and regulations, including the Child Protection Code (16 minimum age for work), the Labor Code (18 is contract age, 16-18 for light work), the Children's Work Decree (prohibits worst forms), and the Mining Code (health & safety).

Section 3.3 discusses the DRC's institutional approach to children's rights. In its 2023 Findings on the Worst Forms of Child Labor, USDOL rated the DRC efforts as "Minimal Advancement – efforts made but continued practice that delayed advancement." The Ministry of Mines and other state agents are responsible for monitoring labor conditions at the mine sites, with little or no apparent connection to the Ministry of Employment, Labor and Social Welfare (MELSS), which is charged with enforcing the Labor Code and the Children's Work Decree and referring cases for prosecution, though effective application is often lacking.

Section 3.3.1 on Child Labor Prevalence notes that child labor is particularly concentrated in ASM, where children are subject to dangerous exposure to cobalt dust and hazardous conditions with little or no protective equipment, with estimates ranging up to 35,000 children out of a total workforce of about 255,000 cobalt miners.

Section 3.4 on Forced Labor Principles, Laws, Risks and Enforcement discusses the forced labor indicators and DRC Constitutional and Labor Code provisions prohibiting forced labor. It notes a 2023 study that estimated between 67,000 and 80,000 workers experience forced labor, including through deceptive recruitment, abusive overtime requirements, and movement restrictions. **Section 3.4.4** briefly summarizes the disclosure-based, due diligence and customs/trade-based legislation that creates a demand for traceability.

Section 4 on Cobalt Traceability describes the DRC traceability landscape, discussing the role of the Cobalt Refiner Due Diligence Standard in requiring systems of control and transparency to determine that a chain of custody is free from child and forced labor. The BGR's Certified Trading Chains (CTC) program provides a mine certification scheme.

Section 4.2 on Cobalt Traceability Solutions identifies assessment and traceability solutions that have been tested on a range of minerals in the DRC, including SLR Better Mining's Trace (critical minerals), RESOURCE (blockchain platform), and Circulor (Oracle-based digital ID). Global Trace is the only open-sourced traceability tool for addressing child and forced labor and other exploitative practices, available on GitHub.

Section 5 on Sustainable Traceability in the DRC identifies constraints such as regulatory enforcement and capacity needs. It also explains how key stakeholders can effectively plan, implement and coordinate traceability efforts in line with their roles and responsibilities.

Section 6 identifies leverage points for action and collaboration in regulatory enforcement, adapting lessons learned from traceability with other minerals with the OECD Due Diligence Guidance. **Section 7** provides a conclusion and summary of the Report's potential use.

Annex I provides examples of ASM traceability data points. **Annex II** identifies financial flows related to the cobalt supply chain. **Annex III** describes risks. **Annex IV** summarizes roles and outputs on the Global Trace pilot in DRC cobalt. **Annex V** includes a list of this Report's figures.

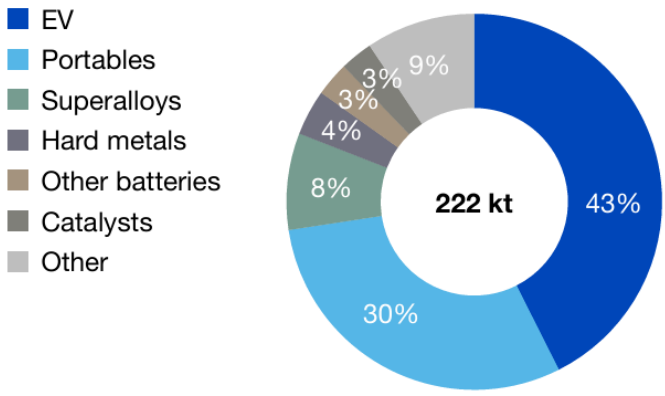
1. COBALT AND THE DRC MINING SECTOR

1.1 CRITICAL COBALT

Cobalt is critical to technology. It is used primarily as an input to cathodes in lithium-ion batteries in electric vehicles ("EV") and portable electronics, including smartphones, laptops, tablets and other energy storage systems (ESS), such as solar batteries.[2] In 2024, cobalt demand exceeded 200kt for the first time, with battery applications accounting for 76% of absolute demand,[3] up from 73% in 2023.[4] Between 2023 and 2024, the use of cobalt in EVs increased in absolute numbers, although the total market share dropped slightly because of a surge in demand for portable electronics.[5] Cobalt's value is that it significantly increases energy density and life span in batteries, adding stability to the charge.[6]

In 2024, the largest share of demand among products containing cobalt was for EV batteries at 43%, with a resurgence in plug-in hybrid electric vehicles (PHEVs) accounting for nearly 60% of global EV sales growth. Demand for portables rose from 26% in 2023 to 30% in 2024, with remaining cobalt demand for super alloys (increasing resistance to corrosion and wear), hard metals, catalysts and ceramics/colors, and other uses, such as magnets (see figure below).[7]

Figure 1: Cobalt Demand in 2024[8]



Data: Benchmark Mineral Intelligence – Cobalt Forecast.

The aerospace and defense industries depend on cobalt, which is used in samarium-cobalt (SmCo) magnets in aircraft, missiles, submarines and military ships.[9] In 2023, an increase in air travel (up 42% for international and up 30% in domestic), prompted an increase in aircraft production, which is dependent on super alloys. Although precise information is not available, it also appears that cobalt use in the defense industry increased for super alloys and magnets for a range of purposes,

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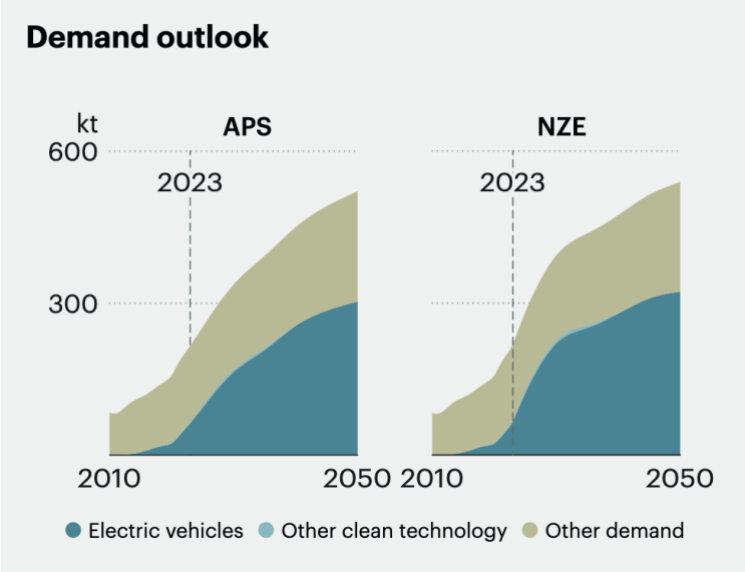
[2] For explanation of cobalt in ESS compared to battery energy storage systems (BESS), see GivEnergy: What is ESS: 3 Key Questions Answered.
[3] Cobalt Institute, Cobalt Market Report 2024, May 2025, p. 5.
[4] Cobalt Institute, Cobalt Market Report 2023, May 2024, p 3.
[5] Cobalt Market Report 2024, p. 5.
[6] See Stanford Advance Materials: What is Cobalt Used in Everyday Life. See also Gilgamesh, Why Cobalt in Batteries.
[7] Cobalt Institute, Cobalt Market Report 2024, p. 5-8.
[8] Cobalt Institute, Cobalt Market Report 2024, p. 5.
[9] Cobalt Institute, Cobalt Market Report 2024, p. 5. SmCo magnets operate better at higher temperatures and in more corrosive environments than "super-magnets" made from Neodymium (NdFeB) magnets, which have a much stronger magnetic field. See, e.g., BJMT/Ideal, Samarium Cobalt vs Neodymium Magnets.

including the production of drones.[10]

Efforts to build the "green economy" have resulted in an exponential increase in demand for cobalt and other raw materials. According to the International Energy Agency (IEA), the "shift to a clean energy system is set to drive a huge increase in the requirements for these minerals, meaning that the energy sector is emerging as a major force in mineral markets," including cobalt, as well as lithium, nickel, manganese and graphite.[11] The Cobalt Institute reports that mined cobalt supply surpassed 200 kt for the first time in 2023, rising 17% to 232 kt.[12] The IEA estimates demand for these minerals based on the Announced Pledges Scenario (APS) (current government commitments) and the Net Zero Emissions by 2050 (NZE) Scenario (UN Sustainable Development Goals).[13] In 2024, under both scenarios, the IEA forecasted a demand in cobalt rising from 215 kt in 2023 to 344 kt (60% increase) in 2030 to 40 kt in 2040 (111% increase).

Figure 2: Cobalt Price Outlook

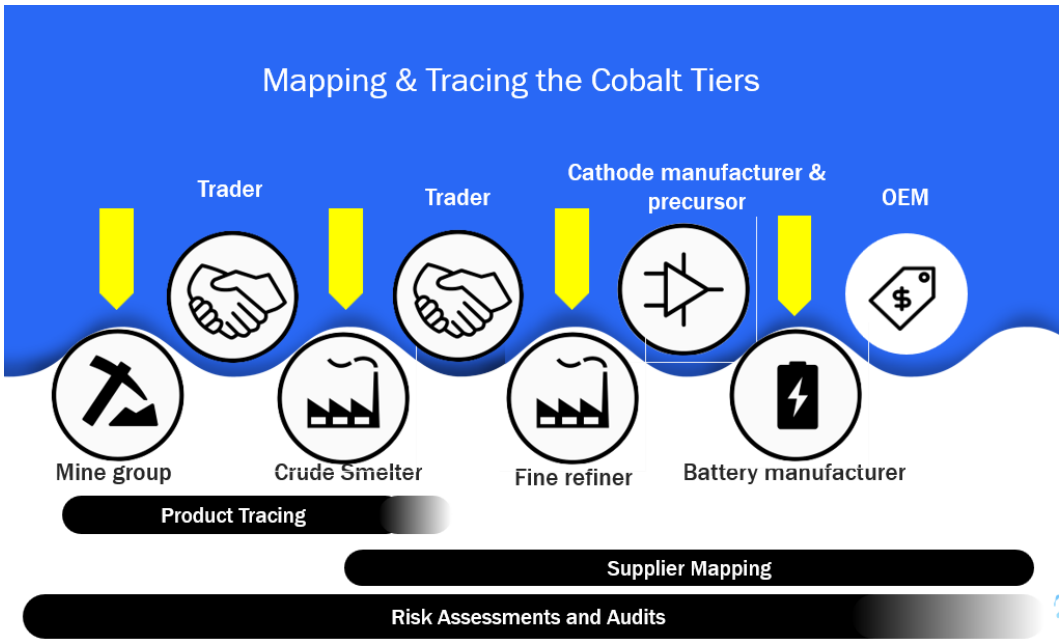


Cobalt demand is expected to increase at this rate despite a trend towards low-cobalt and cobalt-free batteries. For example, while Tesla has reduced its average cobalt use in its new car models, it has also signed a long-term deal with the world's largest mining company Glencore, for 6,000 tons of DRC cobalt a year.[14] Cobalt metal prices, however, have dropped because supply has been greater than demand.[15] Indeed, it has declined from a high of over $50,000 per kt in September 2022 to $30,000 per kt in December 2023. China's State Reserve Bureau (SRB), which maintains a strategic reserve, typically purchases cobalt at the bottom of the price cycle.[16]

Various cobalt supply chain tier maps present the movement of materials from the upstream, first mile', where raw material is mined, to the treatment unit, through to the original equipment manufacturer (OEM) (which includes brands) downstream, such as consumer-facing electric vehicle or consumer electronics brands, including the leading European and U.S. automotive brands (see Figure 3 below).

[10] Cobalt Institute, Cobalt Market Report 2023, May 2024, pp 19-20, 22.
[11] International Energy Agency (IEA), The Role of Critical Minerals in Clean Energy Transitions, 2021, p 5.
[12] Cobalt Institute, Cobalt Market Report 2023, May 2024, p 23.
[13] IEA, Global Critical Minerals Outlook 2024, p 14.
[14] Kara Norton, National Geographic, Cobalt Powers our Lives, December 21, 2023.
[15] IEA, Global Critical Minerals Outlook 2024, p 36.
[16] Cobalt Institute, Cobalt Market Report 2023, May 2024, p 21.

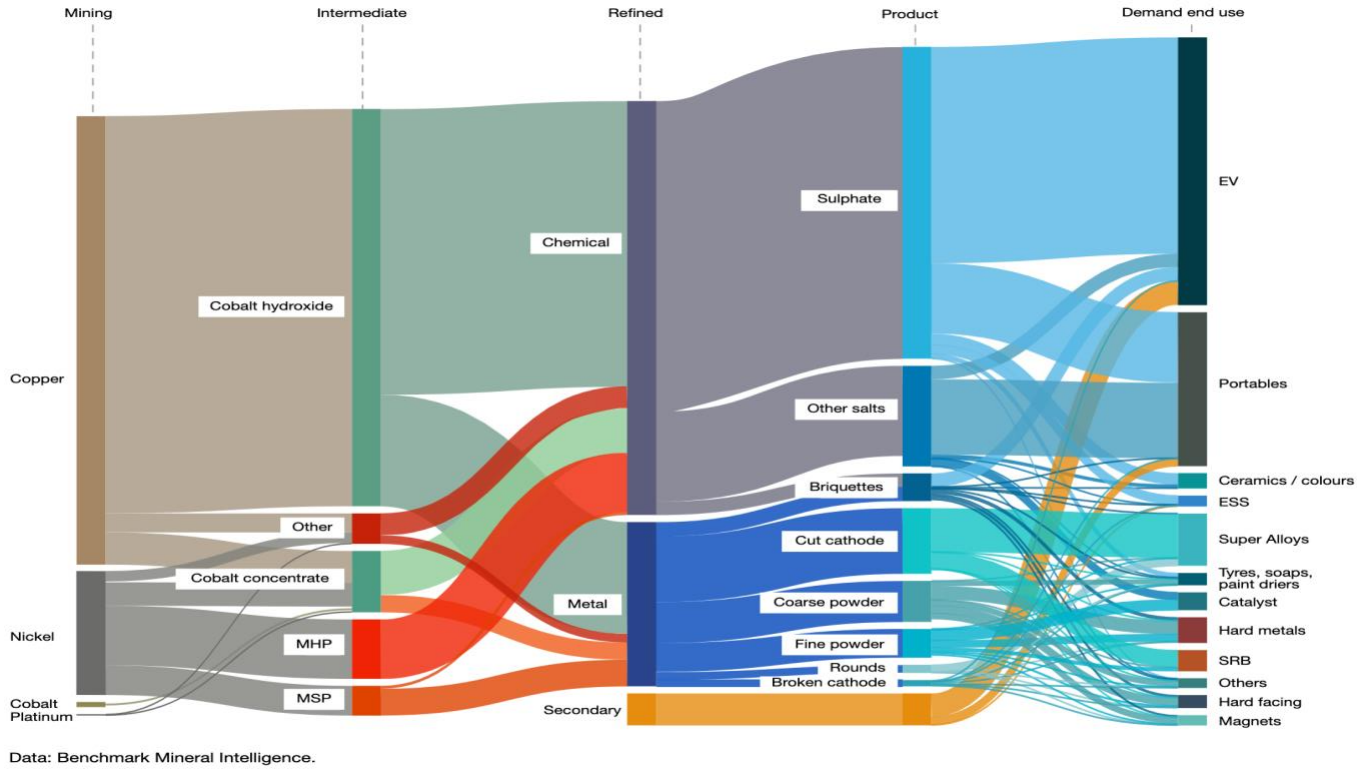
Figure 3: Mapping and Tracing Cobalt Tiers



The Cobalt Institute provides an active cobalt value chain map[17] and at least one free online tool – Cobalt Supply Chain Beta[18] – may be used to track the cobalt supply chain map of individual companies. Below is the Cobalt Institute's chart on cobalt, cobalt hydroxide and cobalt concentration (dry particles for fuel cells, solar and other applications). Most cobalt is mined as a by-product of copper and nickel mines.

[17] Cobalt Institute, Cobalt Value Chain Mapping.
[18] Resourcematters.org, Cobalt Supply Chain Beta.

Figure 4: Cobalt, Cobalt Hydroxide and Concentration Supply Chain Map[19]



The interactions between supply chain actors, including between artisanal and small-scale mining (ASM) and large-scale mining (LSM) are complex and interconnected. Cobalt ore is extracted by LSM and ASM operations, with ASM production often transported by local traders to open market depots. Initial processing, known as crude refining, takes place in the DRC, resulting in cobalt hydroxide. Cobalt hydroxide is exported to "fine" refining facilities where it is further processed into cobalt-containing chemicals or metals. These processing point treatment units and fine refiners are considered essential control points where materials are aggregated from multiple sources.

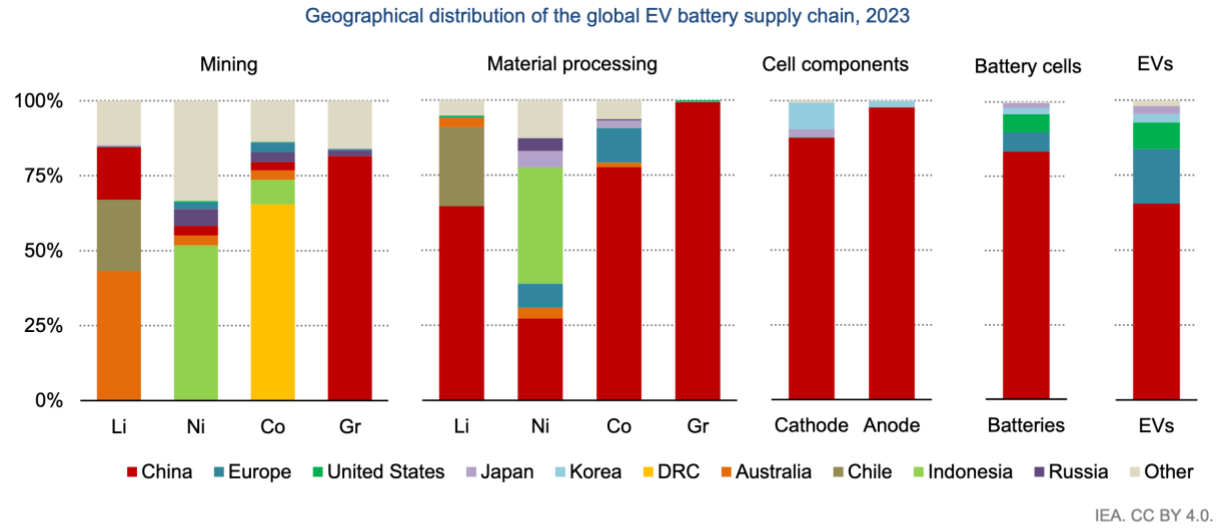
Control points (also referred to as choke points) are areas in the supply chain where chain of custody or traceability data may be aggregated or potentially lost. Control points are the key points of transformation of materials, serving as steps in the supply chain that process most material, or – in other words - the steps with visibility, control or leverage over mineral production and trade. In accordance with international norms and standards such as the OECD Due Diligence Guidance, independent third-party audits are required for treatment units and fine refiners.20

In the cobalt supply chain, treatment units and fine refiners are essential control points where material is aggregated from multiple sources. The open market depots where cobalt is often first sold in the ASM sector can also be considered points of aggregation making it difficult to trace material back to the specific mine site without the direct cooperation of the actors involved. In terms of the global EV battery supply chain, China dominates downstream and midstream mineral transformations, which poses challenges to tracing cobalt and other minerals through the supply chain (see figure 5 below).[21] In 2023, China produced 140 kt of refined cobalt, increasing their global share to 78%, with Finland accounting for 9% and

[19] Cobalt Institute, Cobalt Market Report 2023, May 2024, p 5. "MHP" is mixed hydroxide precipitate, a mixed chemical form of nickel and cobalt that may be cheaper to produce when nickel prices are low compared to production costs. "MSP" is mixed sulphide precipitate, another chemical process for mixed nickel and cobalt.
[20] Responsible Mineral Initiative, Cobalt Refiner Supply Chain Due Diligence Standard.
[21] IEA, Global Critical Minerals Outlook 2024, p 30.

Canada at 3%.[22]

Figure 5: Geographical Distribution of the Global EV Battery Supply Chain (2023)[23]



Notes: Li = lithium; Ni = nickel; Co = cobalt; Gr = graphite; DRC = Democratic Republic of the Congo. Geographical breakdown refers to the country where the production occurs. Mining is based on production data. Material processing is based on refining production data. Cell component production is based on cathode and anode material production capacity data. Battery cells are based on battery cell production capacity data. EVs is based on electric cars production data. For all minerals mining and refining shows total production not only that used in EVs. Graphite refining refers to spherical graphite production only.
Sources: IEA analysis based on EV Volumes; Benchmark Mineral Intelligence; BloombergNEF.

1.2 THE DRC ECONOMY AND MINING WORKFORCE

The DRC is the largest country by area in Sub-Saharan Africa (SSA) and one of the five poorest countries in the world when measured by income per capita. In 2023, it was estimated that 73.5% (approximately 78 million people) of the Congolese population, lived on less than $2.15 a day, with one out of six people living in extreme poverty.[24] Under the World Bank's Human Capital Index (2020), the DRC ranked 164 out of 174 countries, reflecting decades of conflict and fragility, and constraining development.[25] A modest ameliorating trend: after the average national income plummeted to a low of an equivalent of 1,288 Euros in 2001 (about $1,390 now), it has steadily risen to 2,224 Euros in 2023 (about $2400 now).[26]

The mining industry is integral to DRC's economic well-being, contributing to 81% of the government's revenues and 95% of exports in 2022.[27] In 2024, the DRC produced about 76% of the world's cobalt mine output.[28] In 2022, the DRC exported $5.99 billion worth of cobalt (21% of total exports), second only to refined copper which brought in $16.3 billion.[29] In 2023, the DRC exported about 170 kt of cobalt (totaling about 73% of the global market), which increased to 192 kt in 2024, compared to

[22] Cobalt Institute, Cobalt Market Report 2023, May 2024, p 31.
[23] IEA, Global Critical Minerals Outlook 2024, p 30.
[24] World Bank, Country Overview: Democratic Republic of the Congo.
[25] World Bank, The World Bank in DRC: Overview. The Index rated DRC's human capital development at 0.37 on a scale of 0-1, which is below the SSA average of 0.4. For the October 2024 country brief, see the Human Capital Index: the DRC (2024).
[26] The World Income Inequality Index, Evolution of Average Income: The DR of Congo 1950-2023. The average national income fell sharply from 4,970 Euros in 1974.
[27] Extractive Industries Transparency Initiative, Rapport - ITIE RDC 2022, p 11 (in French).
[28] Cobalt Institute, Cobalt Market Report 2024, p. 28. The DRC holds about 48% of known global cobalt reserves Al Barazi, S., et al, Cobalt from the DR Congo – Potential Risks and Significance for the Global Cobalt Market (2017), p 4.
[29] The Observatory of Economic Complexity, Democratic Republic of Congo. In 2022. "Cobalt Ore" (HS4 2605) exports totaled $208 million, with $175 million (84.1%) from the DCR, (thus a decrease from 2023 but ore?). China imported the majority at 63.4%, followed by Morrocco (12.3%), Finland (7.81%), Taiwan ("Chinese Taipei") (7.53%), and Spain (2.67%).

combined exports from all other countries totaling about 62 kt.[30]

Given DRC's dependence on cobalt exports, a surge in mine outputs can and has triggered a collapse in prices, choking off a vital source of income for many ASM miners. In early 2025, the DRC government imposed a 4-month suspension on cobalt exports to boost cobalt prices.[31] It is also considering stockpiling ASM cobalt, to continue providing income for those miners.[32]

Artisanal and Small-Scale and Large-Scale Mining

While large scale mining (LSM) involves established companies in the formal sector using heavy equipment and advanced science, artisanal and small-scale mining (ASM) takes a variety of forms involving groups of workers using hand tools and basic extraction methods. The OECD Due Diligence Guidance describes ASM as "formal or informal small-scale mining operations that use rudimentary tools and labor-intensive work with low financial investment for extraction, processing, and transportation.[33] In 2022, it was estimated that approximately 44 to 49.5 million people globally work in ASM with about 2 million of them in the DRC.[34] In the DRC, the ASM miners (usually men) are more aptly referred to as *creuseurs*, French for "diggers."[35] Women often work as *laveuses*, washing cobalt in preparation for the depots' evaluation of quality and price. Remuneration for tasks such as transporting, washing and handpicking are significantly lower than digging, although female ASM workers can perform other roles, such as pit sponsors or négociantes, which are relatively well remunerated.[36]

Roughly 150,000 to 200,000 people work on ASM mine sites across the DRC, with numbers fluctuating greatly based on demand and access.[37] In a low earnings economy, ASM may provide small but immediate income to poor and marginalized people because it requires little start-up costs with "generally no entry barriers."[38] ASM production typically accounts for roughly 10-20% of cobalt production in the DRC, with at least one estimate reaching as high as 30%.[39] Accordingly, there are about an average of 46,000 people working in ASM cobalt.[40]

While LSM in cobalt and copper is beset with significant environmental, social, and governance (ESG) risks,[41] child labor risks at the site level are much lower than in the ASM sector because of greater site controls and security. A field study published in 2021 presents data suggesting that the artisanal mining sector in the DRC had become less important in terms of size and economic relevance, as reflected in a reduction of active mines and artisanal miners between 2018 and 2020, though it also showed many mines still operating illegally or in legal grey areas.[42] The number of ASM mines has fluctuated greatly since then.

LSM production of cobalt using mechanized methods in the DRC typically comes as a by-product of copper mining. Copper-

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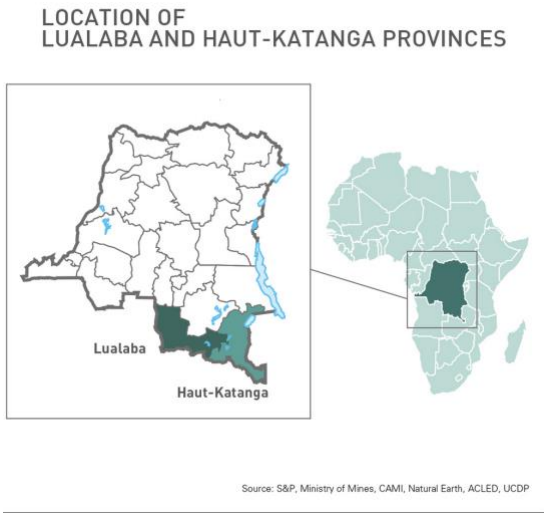
[30] Jaganmohan, M., Statista, Leading Cobalt Mine Production by Country, May 2024. The share of Indonesia produced cobalt is expected to grow substantially to constitute about 37% of global production by about 2030. See also, Cobalt Institute, Cobalt Market Report 2024, p. 38.
[31] Mining.com, Congo Suspends Cobalt Exports for Four Months amid Oversupply, February 24, 2025.
[32] Mining.com, Congo to Enforce Artisanal Cobalt Monopoly-after Export Halt, February 27, 2025.
[33] OECD, OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, 2016.
[34] Zandt, F., Statista, Where Artisanal and Small-scale Mining is Most Prevalent, February 1, 2022.
[35] Warneck F. NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy, The "Creuseurs" ("Diggers"), at the Center of the World's Push for EVs, are in Peril: Part One—The Precarious Reality of Artisanal Mines, 34(1), 2024, p 52-53.
[36] OECD, Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo, 2019, p. 24.
[37] Mining Technology. The Future of Artisanal Mining in the DRC. September 14, 2021.
[38] Communities and Small Scale Mining (World Bank supported), Mining Together: Large Scale Mining Meets Artisanal Mining, March 2009, p 10.
[39] See Cobalt Institute, Cobalt Mapping Report 2023, May 2024, p 27 (estimates about 10%). See also PACT, Artisanal and Small Scale Cobalt Mining and Importance Formalization: An Explainer, July 25, 2022 (estimates about 20-30%).
[40] International Institute for Environment and Development (IIED), Formalising Artisanal Cobalt Mining DRC - much work remains, July 25, 2023.
[41] See Mahelet G. Fikru, et al, The Extractive Industries and Society, ESG Ratings in the Mining Industry: Factors and Implications, Vol. 20, 2024. See also DomeShelter, Top 10 Risks in the Mining Industry, July 20, 2023.
[42] Bundesanstalt für Geowissenschaften und Rohstoffe, Mapping of the Artisanal Cobalt Mining Sector in the Provinces of Haut-Katanga and Lualaba in the Democratic Republic of the Congo, 2019, pp iii-iv and 36-45.

cobalt ore deposits are widely found across the Central African Copperbelt,[43] in contrast to nickel-cobalt deposits found in many other parts of the world, including Indonesia. The Copperbelt encompasses regions in northern Zambia and southeastern DRC, which includes Haut Katanga and Lualaba provinces, and in particular the towns of Likasi, Lubumbashi, and Kolwezi.

Figure 6: Lualaba and Haut-Katanga Provinces[44]



While the ASM sector is inundated with hazards and risks, the geographies where ASM cobalt production most often occur are not considered conflict zones, unlike Eastern DRC. Most ASM cobalt production is concentrated in two southeastern provinces: Lualaba and Haut-Katanga.[45] These provinces were previously part of the former Katanga Province which was separated into four smaller provinces during a 2015 partitioning. The former capital of the region, Lubumbashi, now the capital of Haut-Katanga Province, is the second largest city in DRC[46] and is known as a mining sector hub. Researchers highlight that many ASM workers in the cobalt sector originally migrated from the neighboring Kasai provinces.[47]

In-country processing of cobalt prior to export is required by DRC export regulations at treatment units (also known as crude refining and crude smelting). To stimulate production of refined cobalt and drive in-country value addition, the DRC's government announced an export ban on cobalt and copper concentrates on May 28, 2021. Previous bans were enacted and broadcasted in 2015, 2016, and most recently in 2019, though the DRC government has issued waivers to individual exporters to continue exporting concentrates because of the limited processing capacity of current treatment units.[48]

1.3 MINING GOVERNANCE AND INITIATIVES

The United States began a process of deeper mining scrutiny when in 2010, Congress passed Section 1502 of the Dodd-Frank Act, which required companies to conduct due diligence checks on their supply chain to disclose their use of "conflict minerals" (tin, tantalum, tungsten and gold) originating from DRC and neighboring countries and to determine whether those

[43] Science Direct, Production of Cobalt from the Copper–Cobalt Ores of the Central African Copperbelt, 2021.
[44] Global Business Reports, The Democratic Republic of the Congo.
[45] OECD, Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo, 2019.
[46] Crisis Group Africa, Katanga: Tensions in DRCs Mineral Heartland, 2016.
[47] Bundesanstalt für Geowissenschaften und Rohstoffe, Mapping of the Artisanal Cobalt Mining Sector in the Provinces of Haut-Katanga and Lualaba in the Democratic Republic of the Congo, 2019.
[48] Roksill, DRC Bans Copper and Cobalt Concentrates, 2021.

minerals may have benefited armed groups. The aim was to cut off the funds from illegal mining gained by armed groups.

This law helped motivate the governments of Burundi, DRC, Rwanda, and Uganda, in collaboration with industry and civil society, to create in 2010 The Mineral Certification Scheme of the International Conference on the Great Lakes Region (ICGLR).[49] It also led to the formation of the International Tin Supply Chain Initiative (ITSCI) (expanded to tantalum and tungsten), which conducts a traceability and due diligence program for mine sites in the region.[50] A 2023 independent assessment concluded that the ITSCI program is in "full alignment" with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals; and the Annual Report highlighted that ITSCI monitored 2,700 mines involving about 40,000 miners (many in ASM mining), recording 1,763 incidents.[51]

The ITSCI program has also been criticized on the grounds that it has not improved the lives of ASM miners, who are effectively bearing the cost of the due diligence program by paying for the right to sell their own resources to Western companies. The argument is that ITSCI and other efforts support policies focused on derisking supply chains and virtue signaling to consumers, rather than improving ASM miners' living conditions or addressing the conflict's root causes.[52]

While in prior years mineral due diligence has primarily focused on "conflict minerals," which do not include cobalt, in recent years, due diligence standards have expanded to explicitly include it. For example, the Global Electronics Council (GEC) has recently updated the Responsible Supply Chains Criteria for EPEAT – the preeminent purchaser standard for the IT sector – to include criteria on cobalt (7.2.2 and 7.2.4).[53]

Legal and Regulatory Framework

The mining sector is governed by the Mining Code, last amended in 2002, which defines the government's regulatory role, establishes the principle of "free access to mineral prospecting," sets forth the process for licensing mines, addresses the rights of miners, and establishes zones for artisanal exploitation (ZEA's), among other matters.[54] The Mining Regulation (2003) provides more detailed exploitation requirements, including on environmental mitigation plans.[55]

In 2019, the DRC government issued decree No. 19/15 to safeguard artisanal mining activities by improving working conditions and addressing environmental impacts and promote the economic value of cobalt and other strategic minerals. All strategic minerals requiring transformation (e.g., fine refining) for export would fall within a state monopoly framework and must be sold to the state-backed entity. It also provides that covered artisanal miners are required to respect environmental and social regulations that include the prohibition of child labor and the exploitation of vulnerable people.[56]

The Ministry of Mines and Ministry of Finance also issued the *Traceability Procedures Manual for Mining Products: From Extraction to Exporting*, which was expanded to cover cobalt and copper in 2014. The Manual details the regulatory authorities governing traceability at various stages, sets forth the relevant procedures, and provides useful definitions (in French) on key concepts.[57] In 2023, the Ministry of Mines further issued a decree regulating mineral traceability initiatives focusing on

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[49] See the ICGLR Regional Certification Mechanism Manual 2nd Ed. "As a procedural guide, the Requirements of the Manual aim at establishing responsible mineral supply chains from mine sites to export points taking into account intermediaries such as mines/miners, traders, transporters, processing entities and exporters of the four Designated Minerals."
[50] ITSCI, Homepage.
[51] ITSCI, 2023 Annual Review and Second Independent Alignment Assessment.
[52] Mélanie Gouby, Foreign Policy, The Problem with Conflict-free Minerals Traceability Schemes, May 22, 2024.
[53] Global Electronics Council (GEC), the Responsible Supply Chains Criteria for the Electronic Product Environmental and Social Responsibility Tool, EPEAT RSC (February 2025). These criteria are currently optional, as they are often when first introduced. Through a process of continuous improvement, such criteria are generally reviewed to determine if and when they should be converted to mandatory criteria.
[54] LOI N° 007/2002 DU 11 JUILLET 2002 PORTANT. For access to laws, regulations, policies and press releases, visit the DRC Ministry of Mines website.
[55] Réglement Minier de la RDC 26 Mars 2003.
[56] IEA, Ministerial Decree 19/15 Explained.
[57] DRC Ministère des Mines et Ministère des Finances, Manuel des Procedures de Traceabilite des Produits Miniers: de L' Extraction a L'Exportation, 2nd ed., 2014.

cooperatives and NGOs ("category a" entities) and commercial enterprises ("category b" entities).[58]

Administration

The implementation of digital traceability in DRC's cobalt and copper sector has been on a long timeline and has yet to be widely rolled out. An ASM traceability system requires the participation and approval of government approved technical services at mine sites, depots, crude refiners, and export points.

Entreprise Générale du Cobalt SA (EGC), created by decree No. 19/15, aims to centralize ASM cobalt purchasing for processing and transporting for export.[59] Supported by the multi-stakeholder work on the Cobalt Action Partnership's ASM Cobalt Framework,[60] the EGC launched its Responsible Sourcing Standard in 2021, which provides standards for mining cooperatives and buyers, including governance and management systems from mines to processing.[61]

After a period of inactivity in 2023 and 2024, EGC was reorganized under new leadership with the support of Gécamines and in 2024 given exclusive mining rights to five artisanal mining areas on Gécamines concessions.[62] Per new regulations signed by the prime minister and mines minister on February 21, 2025, the EGC is now the only entity with the legal authority to export artisanal cobalt.[63] The EGC aims to safeguard cobalt sourced from artisanal production by ensuring responsible due diligence.[64] Its objectives include:

- Improving artisanal miners' working conditions and protecting vulnerable populations;
- Increasing income from artisanal mining;
- Supporting traceability "to ensure the legality and compliance with the highest social, environmental, and financial standards"; and
- Strengthening the DRC's reputation for maintaining an ethical mining industry.[65]

The EGC Standard is aimed to align with DRC law as well as other standards deployed by the DRC's Agency for Regulation and Control of Strategic Mineral Substance Markets (ARECOMS), the Department of Assistance and Supervision of Small-Scale Mining (SAEMAPE) and the Center of Expertise, Evaluation and Certification of Precious and Semi-precious Mineral Substances (CEEC).[66]

SAEMAPE is the DRC government service that supports artisanal and small-scale miners, advising and tagging minerals at the mine sites.[67] The CEEC, created by Decree number 09/57 of December 03, 2009, is a Technical Public Service of the Ministry of Mines that regulates mineral substances. It controls the quantity and quality and manages the valuation of materials intended for export, and issues Certificates of Origin.[68]

To aid in the process, the Lualaba Provincial government and Sud South launched the Musompo Trading Center in Kolwezi to

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[58] See CPS-SK, Arrêté Ministériel n°00548/CAB.MIN/MINES/01/2023.
[59] See EGC website. EGC was launched with support from Trafigura SA, one of the largest global commodity traders.
[60] Cobalt Action Partnership, Report from stakeholder consultations on the ASM cobalt ESG management framework, 2021.
[61] EGC, EGC Responsible Sourcing Standards Eng., March 2021.
[62] Cobalt Institute, Cobalt Market Report 2023, May 2024, p 27.
[63] Mining.com, Congo to Enforce Artisanal Cobalt Monopoly-after Export Halt, February 27, 2025.
[64] EGC website.
[65] EGC website, About Us.
[66] Deberdt, Rapheal, Baseline Study of Artisanal and Small-Scale Cobalt Mining in the Democratic Republic of the Congo, 2021. ARECOMS is mandated to have oversight over the EGC but has not yet been operationalized. For a discussion of the challenges of coordinating traceability in LSM and ASM, see Huggins, Chris, Is collaboration possible between the small-scale and large-scale mining sectors? Evidence from 'Conflict-Free Mining' in the Democratic Republic of the Congo (DRC), The Extractive Industries and Society, Vol. 13, March 2023.
[67] ITSCI: Stories from the Field. In French SAEMAPE: Service d'assistance et d'encadrement des mines artisanales et de petit echelle.
[68] Welcome to the CEEC.

help ensure that ASM mining meets international and DRC standards, particularly to ensure miners receive proper compensation and that no child or forced labor is used. The Center, designed to receive and store cobalt from the mines, utilizes a lab for testing cobalt quality, and provides buyers with certified cobalt.[69]

External Expertise and Support

The **Fair Cobalt Alliance (FCA)** helps maintain and improve responsible mining practices at ASM sites by improving safety, minimizing environmental impact, and creating dignified working conditions. FCA engages with state agents and with cooperatives and assists in building capacity to fulfill these functions.[70]

Cobalt for Development (C4D) is a development project implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and funded by an industry partnership including BASF, BMW, Samsung Electronics, Samsung SDI and Volkswagen Group. It aims to improve living and working standards for artisanal cobalt miners by working with the miners through local cooperatives, authorities and civil society. C4D is piloting an effort to improve the conditions of artisanal miners and their communities in the Lualaba Province, seeking to improve the economic and social welfare of the whole community.[71]

SLR Better Mining[72] **(formerly RCS Global Better Mining),**[73] a GTP subaward partner, provides a range of services to support sustainable mining. As of December 2024, the Better Mining program covered about 29 ASM sites, including 5 producing cobalt, with both ESG risk monitoring and digital traceability implementation for the covered 3T mines. Their teams also work directly with cooperatives and state agents on site level compliance. Supporting the uptake of OECD Due Diligence Guidance, SLR Better Mining acts as an upstream assurance mechanism by monitoring ASM sites and value chains for conformance with relevant market access standards, most notably the RMI and CCCMC's Cobalt Refiner Standard. SLR Better Mining is accredited as a Level 1 Upstream Mechanism by the RMI.

The SLR Better Mining Risk Management Protocol outlines its process for identifying, managing, and measuring reported risks in accordance with the OECD Due Diligence Guidance, ensuring a responsible and sustainable mining sector. SLR Better Mining utilizes the ongoing presence of field agents on mine sites, digital traceability, and a high level of engagement with local stakeholders. Key actors from the full cobalt value chain - including OEMs, battery producers, and midstream entities - provide financial support to the initiative. Better Mining has worked with UNICEF and the German aid organization GIZ to address specific risk areas, including child labor.

The Responsible Minerals Initiative and Copper Mark have provided assessments for refined cobalt originating in the DRC. In 2024, 77% of the global refined cobalt supply was subject to RMI conformant due diligence practices (and 4% more in progress), with 83% of this supply originating from the DRC. The Copper Mark Assurance Process assessed about 12.7% with 19.4% reported as in progress.[74]

[69] The Musompo Trading Center was established in 2021 and launched in 2023. See SudSouth Responsible Mining, The Lualaba Province and Sud South join forces to transform artisanal mining in the D.R Congo, October 29, 2021.
[70] The Fair Cobalt Alliance, Homepage.
[71] Cobalt 4 Development, What is Cobalt for Development?
[72] SLR Consulting, SLR: Mining & Minerals.
[73] RCS Global, Better Mining.
[74] Cobalt Institute, Cobalt Market Report 2024, May 2025, p. 45.

The Responsible Minerals Initiative and SLR Better Mining Collaboration

The RMI's Responsible Minerals Assurance Process (RMAP) uses independent third-party assessments of smelter and refiner management systems and sourcing practices to validate conformance with the OECD Due Diligence Guidance and other international regulations.

RMAP conformant smelters/refiners source from sites participating in recognized Upstream Mechanism (UM) programs to meet these requirements or they can conduct due diligence on their own. UMs provides supply chain actors assurance that suppliers are compliant with OECD Due Diligence Guidance requirements for due diligence and chain of custody monitoring.

SLR Consulting (formerly RCS Global) and the RMI collaborate on the implementation of the SLR Better Mining program on ASM in the 3TG supply chains. SLR Better Mining digitally traces minerals from mine sites to the export point and through permanent on-site monitoring by field agents. Risk areas include human rights, working conditions, legality, community, environment, and chain of custody controls. SLR Better Mining uses an RMI approved risk reporting methodology.

With identified risks, SLR Better Mining recommends corrective action plans (CAPs), which are discussed with local stakeholders in monthly on-site meetings. SLR Better Mining monitors and reports on the measurable improvement of work site conditions. CAPs are complemented by product traceability data via the SLR Better Mining Trace app on 3TG supply chains.

Collaborative Supply Chain Efforts

In 2017, a public-private collaboration platform of 70 organizations established **The Global Battery Alliance (GBA)** to help develop a sustainable battery value chain. In 2020-21, the GBA convened a global stakeholder consultation process on the ASM Cobalt Framework as part of the Cobalt Action Partnership (CAP) to eliminate child and forced labor from the cobalt value chain, contribute to the sustainable development of communities, and respect the human rights of those affected (per GBA Principle #8 reflective of SDG #8 on Decent Work and Economic Growth). The CAP concluded that the elimination of child labor requires action on multiple fronts that should include establishing a common set of expectations for responsible cobalt across the value chain and developing a common monitoring and evaluation framework.[75]

UNICEF has acted as the in-country coordinator for GBA in the DRC and convened multi-stakeholder dialogues and events with the International Institute for Environment and Development (IIED). The GBA supports the "GBA Battery Passport" project, which seeks to create a "digital representation of a battery that conveys information about all applicable ESG and lifecycle requirements based on a comprehensive definition of a sustainable battery."[76]

In 2022, the U.S. signed an agreement with the DRC and Zambia "to facilitate the development of an integrated value chain for the production of electric vehicle (EV) batteries in the DRC and Zambia."[77] The MOU was widely perceived as a move to counter China's growing access to critical minerals in Africa.[78] Building on that effort, in 2024, the US and the EU launched the **Minerals Security Partnership (MSP)** to promote cooperation between mineral-consuming and mineral-producing countries "to accelerate the development of diverse and sustainable critical energy minerals supply chains through working with host governments and industry to facilitate targeted financial and diplomatic support for strategic *projects* along the value chain." The MSP also aims to facilitate targeted financial and diplomatic support for strategic mineral projects along the value

[75] Global Battery Alliance, Critical Minerals Advisory Group.
[76] Global Battery Alliance, Battery Passport.
[77] DRC Ministry of Mines, US DRC Zambia Battery MOU (2022).
[78] Center for Strategic and International Studies (CSIS), US Zambia DRC Agreement EV Batteries Production: What Comes Next, March 6, 2023.

chain, including cobalt.[79]

In collaboration with the Responsible Cobalt Initiative (RCI) and the Responsible Minerals Initiative (RMI), the FCA has developed a holistic Environmental, Social, and Governance (ESG) standard, called the ASM Cobalt Normative Framework to **establish best practices for structuring engagement and investment.** In addition, **the ASM Cobalt Normative Framework**, supported by the Responsible Cobalt Initiative, the Global Battery Alliance's Cobalt Action Partnership (CAP), and the Fair Cobalt Alliance (FCA), provides for comprehensive due diligence. The Framework (2023), includes baseline practices, progressive practices, and best practices. The Framework's goal is to "achieve measurable improvements of mine site workers' working conditions and livelihoods through a progressive approach, and to provide a globally recognized threshold for acceptability of cobalt by the entire value chain."[80]

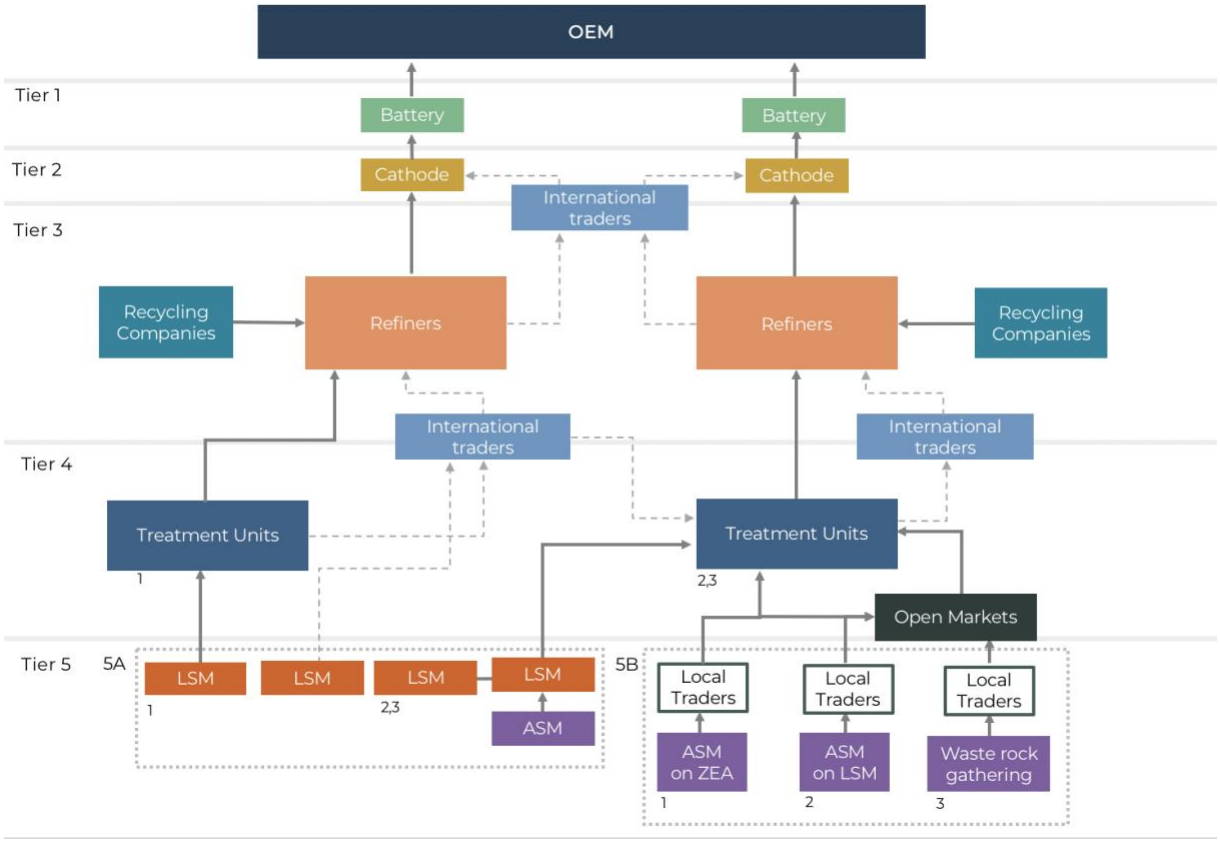
[79] U.S. Department of State, Minerals Security Partnership. MSP partners include Australia, Canada, Estonia, Finland, France, Germany, India, Italy, Japan, Norway, the Republic of Korea, Sweden, the United Kingdom, the United States, and the European Union (represented by the European Commission).
[80] Responsible Mineral Initiative, ASM Cobalt Framework.

2. COBALT SUPPLY CHAIN TIERS AND MODELS

2.1 TIER MAP

The map in Figure 7 presents the five main tiers found in the DRC cobalt supply chain from battery assembly to extraction starting from the perspective of an OEM (original equipment manufacturer of product components). Tier 5 differentiates ASM and LSM models with linkages between them.

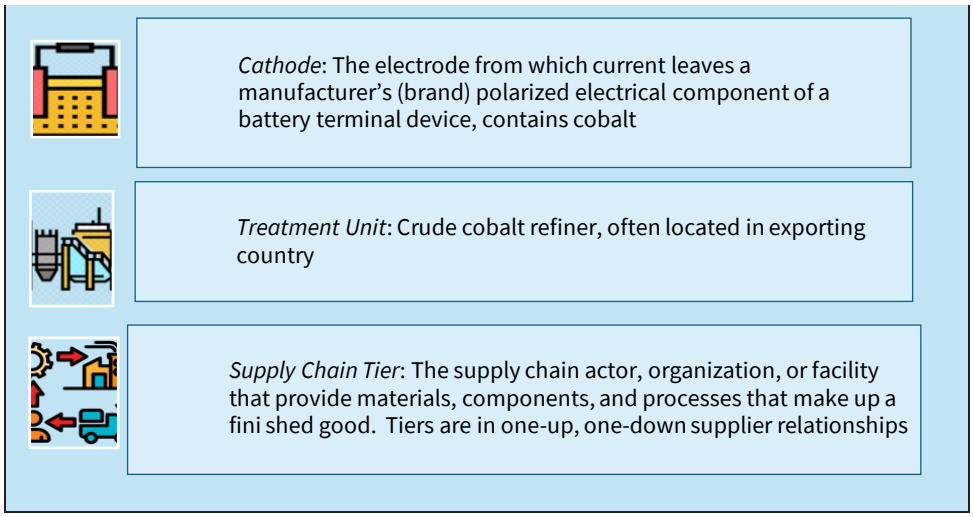
Figure 7: Cobalt Supply Chain Tiers



In the DRC, LSM cobalt ore is transported directly to treatment units ("crude refiners") while ASM cobalt ore is often transported by local traders to open market depots prior to initial processing. Crude refining produces cobalt hydroxide, which as processed cobalt is transported to "fine" refining facilities for further value-added processing. Many crude smelters are Chinese owned while most fine refineries are in China.

After fine refinery processing, intermediary chemical products are sold to component producers (cathode manufacturers) located largely in China, Japan, South Korea, or Europe. Cathode components are included as an essential part of batteries. The global battery market is expected to grow at approximately 30% a year until 2030.[81]

[81] Mckinsey & Company, Battery 2023: Resilient, Sustainable, Circular, January 16, 2023.



OECD Due Diligence Guidance for Cobalt

The OECD Due Diligence Guidance for Responsible Mineral Supply Chains presents a five-step, risk-based process to help companies respect human rights and avoid contributing to conflict through mineral purchasing decisions and practices. The OECD Guidance is widely used across the ASM minerals sector as the de facto responsible sourcing standard and is an important element of industry audit standards.[82] Many battery manufacturers have vertically integrated cathode and battery manufacturing capabilities. Batteries for the technology and automotive industries are delivered to downstream consumer brands, many key to EV markets, for assembly at global assembly plants.

2.2 EXPLAINING THE TIERS

Tiers are described below based on their position in the supply chain beginning upstream and moving downstream with different operational models that demonstrate the degree of formalization and the potential use of due diligence (see Figure 7).

2.2.1 TIER 5A: LARGE-SCALE MINING (LSM)

LSM is characterized by capital intensive, mechanized, or industrial-scale mining, with categorization based on whether the cobalt ore is obtained exclusively onsite or supplemented from other sites. The LSM site may also include ASM sourced cobalt. Various forms of concession agreements, ownership arrangements, and management structures are found among LSM operators. The DRC Mining Code and Mining Ordinance (*Règlement Minier*) require LSM operators to hold an exploitation permit (PE), exploration permit (PR), or tailings exploitation permit (PER). PEs are granted for 25 years with renewal periods up to 15 years and secure exclusive rights for the holder to conduct exploration, development, construction, and mining as indicated on the permit. PEs also give access to resources within a concession including water and forests, as well as the ability to process, transport, and market material produced on a concession.[83]

Exploration permits are granted for five years, renewable once, and allow the permit holder to carry out exploration for the mineral stated on the permit.[84] Tailing permits are granted for five years with renewal for five-year periods. PERs allow the license holder to mine and process tailings on a concession.[85] The most productive industrial cobalt sites in the DRC in 2023 were Tenke Fungurume Mining (CMOC), Kisanfu (CMOC), Kamoto Copper Company (Glencore), Mutanda Mining (Glencore),

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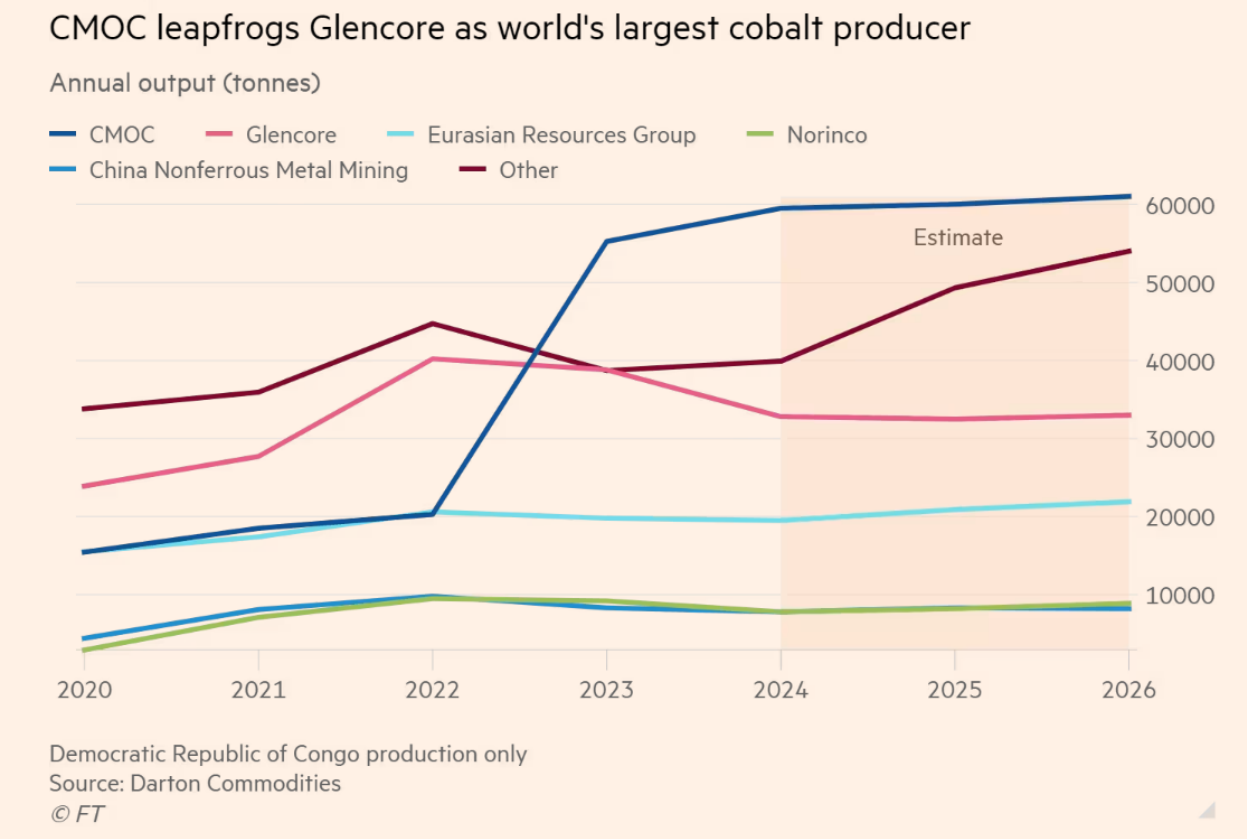
[82] OECD, OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas.
[83] DRC Ministry of Mines, Loi n°18/001 du 09 mars 2018 modifiant et complétant la Loi n°007/2002 du 11 juillet 2002 portant Code Minier, Article 30. See also OECD, Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo, 2019.
[84] Ibid.
[85] Ibid. See also KPMG Global Mining Institute, A Global Leader Serving the Mining Industry, 2024.

Metalkol (ERG), and Zhejiang Huayou Cobalt (CDM, Minière de Kasombo and SICOMINES) (see Figure 8).

Figure 8: CMOC Top Producer of DRC Cobalt[86]



Three common LSM models are described below. Due diligence requires operators to establish and implement a supply chain policy and management system in line with the OECD Due Diligence Guidance.[87]

Model 1: LSM with no external sourcing

LSM operators mine all cobalt-copper ore on-site. On some sites, LSM mines and treatment units are co-located.

Model 2: LSM with external sourcing from DRC with due diligence

LSM operators supplement their on-site operations with externally sourced material from other LSM mines and/or from ASMs. These operators conduct due diligence on their external suppliers.

Model 3: LSM with external sourcing from DRC without due diligence

LSM operators supplement on-site material with externally sourced material and do not conduct enhanced due diligence on

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[86] Financial Times, Cobalt market stung by record oversupply, March 1, 2024 (Source: Darton Commodities). See also Financial Times, China set to tighten grip over global cobalt supply as price hits 32-month low, March 12, 2023.

[87] Per the OECD Due Diligence Guidance for Responsible Business Conduct (p.21), due diligence should be commensurate with risk and appropriate to a specific enterprise's circumstances and context, the following section outlines measures: (1) to embed RBC into the enterprise's policies and management systems; to undertake due diligence by (2) identifying actual or potential adverse impacts on RBC issues, (3) ceasing, preventing or mitigating them, (4) tracking implementation and results, (5) communicating how impacts are addressed; and (6) to enable remediation when appropriate.

all or some of their external suppliers. The sourced material can be from another LSM and/or ASM operator.

2.2.2 TIER 5B: ARTISANAL AND SMALL-SCALE MINING (ASM)

Tier 5B covers common ASM production models. ASM miners work in informal groups often under cooperatives to extract cobalt-copper ore. The Uniform Act of 2010 requires artisanal mining to be approved by the Minister of Mining and conducted inside an artisanal mining area where artisanal miners are organized into cooperatives.[88]

On formalized ASM cobalt sites, cobalt ore is generally extracted from underground tunnels or open pits by miners using rudimentary tools and is loaded into 20-50kg bags. Workers transport material (*saliseurs*) manually or with electric pulleys, pulling the ore-filled bags from the pit to the surface. Once extracted, the ore is transported by foot or bicycle to a washing basin to be sorted and washed. Ore is then transported to on-site or off-site depots to be assessed for quality and sold.

After purchase, cobalt ore is sealed in trucks and transported to a treatment unit for further processing. Mine site production is often inconsistent and varies from month to month. Production may be disrupted by accidents or unsafe working conditions due to natural disasters, rainy season landslides, political motivations, or other reasons. Also, ASM miners may abandon cobalt when prices drop and mine more profitable minerals such as copper. The exact number of copper-cobalt producing mines fluctuates and is often hard to estimate, with numbers ranging from about 65 to 140 viable sites.[89]

Model 1: Government approved Artisanal Mining Zones (ZEA)

The DRC Mining Code requires approved cooperatives to manage ASM activities on government designated Artisanal Mining Zones (*Zone d'exploitation Artisanale* or ZEA), except in the case of authorized areas on LSM sites.[90] There are 92 ZEAs designated in the Copperbelt. ZEA licenses are requested by the *Service d'Assistance et d'Encadrement du Secteur Artisanale et à Petite Echelle* (SAEMAPE) and granted by the Mining Cadastre (tracks mineral titles and concessions). The Mining Division, a technical service agency within the Ministry of Mines, and SAEMAPE, supervises and inspects cooperatives on ASM sites.[91]

LSM mining is generally prioritized by the government over ASM, and it is rare that small-scale miners organized into cooperatives identify and obtain government approval to work at properly mineralized ZEAs. ZEAs are often located in unfavorable or undeveloped areas and ASM cooperatives often lack the financial or technical resources to adequately mine ore from these areas. Few government designated ZEAs are known to be "active" and legally producing ASM cobalt.[92]

Model 2: ASM on LSM Concessions

LSM operators hold permits to one or multiple concessions, each of which may encompass land holdings spanning several hundred square kilometers. However, the operational footprint of an LSM mine may be a small portion of the overall concession area. On some concessions, dormant areas attract artisanal miners while LSM companies are operating in a limited area.[93]

While the LSM permit holder may authorize ASM on the concession in specified areas in line with the Mining Code,[94] developing

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[88] Journal Officiel de la République Démocratique du Congo, Mining Code. Law n°18/001 Amending and Supplementing Law n° 007/2002 of 11 July 2002 on the Mining Code, 2002.
[89] A 2020 BGR survey found a total of 67 copper-cobalt producing artisanal mines in the DRC, down from a prior estimate of 102 sites. Bundesanstalt für Geowissenschaften und Rohstoffe, Mapping of the Artisanal Cobalt Mining Sector in the Provinces of Haut-Katanga and Lualaba in the Democratic Republic of the Congo, 2019 p iii-iv. A 2024 DRC Mining Ministry report lists the number at 140, with 65 viable for legal exploration.
[90] DRC Ministry of Mines, Loi n°18/001 du 09 mars 2018 modifiant et complétant la Loi n°007/2002 du 11 juillet 2002 portant Code Minier, Article 30.
[91] Ibid, Articles 109-115.
[92] For methodology on mapping ASM sites, see Bundesanstalt für Geowissenschaften und Rohstoffe, Mapping of the Artisanal Cobalt Mining Sector in the Provinces of Haut-Katanga and Lualaba in the Democratic Republic of the Congo, 2019.
[93] OECD, Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo, 2019.
[94] Bundesanstalt für Geowissenschaften und Rohstoffe, Mapping of the Artisanal Cobalt Mining Sector in the Provinces of Haut-Katanga and Lualaba in the Democratic Republic of the Congo, 2019.

them is still difficult. Where the parties agree, the LSM permit holder relinquishes control over the designated areas to the ASM miners, a rare arrangement partly because of permit holder fears that they will not be able to reclaim land once opened to ASM mining. As a result, most ASM activity on LSM concessions occurs without the concession holder's authorization, sometimes leading to conflict between mine site security providers, artisanal miners, and the local population.[95]

Model 3: Waste rock gathering on LSM concessions

Waste rock gathering, or "hand-picking," often occurs on active LSM sites, as persons gather mineralized ore on waste rock dumps or on haul truck routes. It is an illegal and particularly dangerous activity, both for the LSM company and people involved in the activity, with notable safety and human rights risks. These miners trespass into active industrial operational zones. LSM concession holders may respond by activating security services, which may lead to conflict with the miners.96

Local trader/négociants and the open market

Local traders or négociants are local buyers of ASM produced cobalt ore. Traders often have unofficial offtake agreements with miners or cooperatives to provide miners pre-financing, tools, or transport. By prefinancing and providing materials, local traders support mines to operate long term as they compensate for changing production levels and income for ASM miners. Although they play a key role, local traders are often criticized due to informal business arrangements and lack of transparency over transactions, leading miners to complain that they are often not fairly compensated for the quality of their cobalt ore.

Local traders work out of depots or buying stations where miners bring material to be sold. Depots can be located on site, or off-site in villages, towns, or larger cities. Like treatment units, depots are permitted to purchase ASM material from cooperatives, cooperative representatives, and intermediaries, but not from individual miners (Règlement Minier Article 25).

There are approximately 180 cobalt depots in southeastern DRC that sell ASM cobalt to the treatment units in the region through traders. According to interviews conducted in 2021 by a researcher from the University of British Columbia, most of these depots are owned and operated by Chinese, Indian, and Lebanese nationals, with direct links to crude refiners.97

A variety of purchasing scenarios may occur including but not limited to depots with a single buyer with exclusive rights and independent depots (sell to multiple buyers). When several depots or trading houses operate in one location it is often referred to as an open market. The open market heightens traceability and chain of custody risks due to the aggregation of material from multiple, sometimes unknown, sources. Buyers in open markets often do not verify the origin of minerals, which is why they are attractive for traders sourcing from high-risk and illegal sites.

2.2.3 TIER 4: TREATMENT UNIT/CRUDE REFINER

Treatment units, also referred to as crude refiners, convert cobalt ore into cobalt hydroxide in the DRC for export to refineries outside of the country. As mentioned earlier, in-country cobalt processing is required by DRC export regulations for value addition, however waivers are often granted due to the limited processing capacity of treatment units.

At the time of this report's original writing, there were 36 known treatment units operating in the DRC all located in the Haut-Katanga and Lualaba provinces. The largest are co-located at LSM mines controlled by Kamoto Copper Company (Glencore) and Tenke Fungurume (CMOC). Various audit programs, including but not limited to RMAP, can include these treatment units, with RMAP audited sites listed publicly on the RMI website. In March 2025, nine treatment units were listed as RMAP conformant and three more were listed as "active" with the RMAP program, though not yet conformant.[98]

Another audit program frequently used in the cobalt value chain is SLR Better Mining's (previously RCS Global) audit and mapping program which has audited over 500 entities, including most treatment units in the DRC, for conformance with OECD

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[95] OECD, Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo, 2019.
[96] OECD, Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo, 2019.
[97] Deberdt, R., Baseline Study of Artisanal and Small-Scale Cobalt Mining in the Democratic Republic of the Congo, 2021.
[98] RMI, RMI Active and Conformant Facilities Lists.

Due Diligence Guidance and additional ESG performance criteria. A multitude of information is available to businesses concerning the ESG performance of upstream treatment units and the cobalt value chain overall.

Model 1: Co-located LSM with no external sourcing

Treatment units co-located on LSM sites that do not source external material but are fed by material produced by one or more LSM mines within the same integrated company (or group of integrated companies).

Model 2: External sourcing within the DRC with due diligence

Treatment units co-located on LSM sites that source external material outside of the concession holder's site and conduct enhanced due diligence on the external suppliers. The sourced material can be from other LSMs and/or from ASMs.

Model 3: External sourcing within the DRC without due diligence

Treatment units are co-located on LSM sites that source external material and do not conduct enhanced due diligence on all or some of their external suppliers. The sourced material can be from other LSMs and/or from ASMs.

2.2.4 TIER 3: FINE REFINER

Fine Refiners process cobalt concentrates, intermediaries, or recycle cobalt products into outputs. These outputs, such as cobalt tetroxide and nickel cobalt manganese hydroxide, are essential chemical components for downstream manufacturing, including at the precursor and/or cathode producer tiers.[99] China produces more than three-quarters of total refined cobalt globally, with Finland and Canada as the distant second and third largest producers.[100]

In March 2025, 53 refiners were on RMI's List of Refiners conformant with requirements of the RMI Responsible Minerals Assurance Process (RMAP), excluding conformant treatment units. Other refiners have committed to becoming RMAP compliant refiners (called "active" refiners) but have not yet successfully completed the RMAP assessment.[101]

Cobalt refiners have made significant progress towards complying with OECD due diligence requirements since 2018, when due diligence expectations for the cobalt supply chain were newly established and cobalt assurance programs were not yet built or scaled. There has been significant uptake in independent third-party assurance systems, including the RMI's RMAP and SLR Mining's (formerly RCS Global) responsible sourcing audit programs.[102] Many refiners however still struggle with a lack of understanding of the OECD Due Diligence Guidance; limited engagement and leverage with upstream supply chain actors; and limited engagement with existing on-the-ground upstream assurance mechanisms, like Better Mining.

Model 1: Sourcing of inputs without due diligence

Fine refiners that do not implement due diligence on their feed from conflict-affected and high-risk areas (CAHRAs).

Model 2: External sources with due diligence on at least part of their supplies

Fine refiners that implement enhanced due diligence on at least part of their feed from CAHRAs.

Model 3: External sourcing with due diligence on their supplies

Fine refiners that implement due diligence on their feed from CAHRAs. At this time, only a few refiners worldwide conduct complete, enhanced due diligence with plans that are fully implemented and aligned with international standards.

International traders

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[99] Cobalt Institute. Cobalt Market Report 2023, May 2024, p 5.
[100] Cobalt Institute, Cobalt Market Report 2023, May 2024, pp 30-31.
[101] RMI, RMI Active and Conformant Refiner Lists.
[102] Based on GTP discussions with RMI and SLR Better Mining RCS.

International traders are intermediaries between treatment units, fine refiners, and downstream tiers. International traders source, store, and deliver cobalt hydroxide and other cobalt bearing products globally. They create market links between producers (i.e. mines and treatment units and refiners) and the downstream market, thereby servicing market needs with a large degree of flexibility. Annex II describes typical offtake agreements.

Two principal trader models:

Model 1: Vertical integration or exclusive offtake (with or without multiple sources of material)

Under this model, an international trader either a) offtakes material from a producer that is owned by the same company or group of companies as the international trader; or b) has an exclusive offtake agreement with a producer. These offtake relationships are sometimes publicly known. At the same time, the international trader may source material from other producers or depots.

Model 2: Multiple sources of material

Under this model, an international trader offtakes material from multiple sources, without vertical integration with a particular producer. International traders, for the most part, have not proactively disclosed due diligence details on their sources of material. Neither have international traders – for competitive business reasons – publicly disclosed all their product sources. Where traders attempt some form of due diligence, it is often hampered by limited disclosure of sources and verifiable due diligence activities, thus challenging the implementation of traceability and responsible sourcing.

2.2.5 TIER 2: CATHODE MANUFACTURER

Cathode manufacturers process refined cobalt products into cathode material compositions. Cathodes, critical components of lithium-ion batteries, are components of battery terminals that current flows out of during discharge.[103] Cathodes and anodes (electrodes that receive electrons during charge) are connected by an electrolyte to create an electrochemical cell, which is a small yet important component of the lithium-ion battery.[104] Anodes do not contain cobalt. Cathode manufacturers often source from multiple refiners.

Most cathode manufacturers are in China, the European Union, Japan, South Korea, and the United States, with the largest being Umicore, 3M, Mitsubishi Chemical Holdings, Johnson Matthey, POSCO, and Hitachi Chemical.[105] Cathode manufacturers implement due diligence on their supplying refiners to different degrees with some conducting due diligence on the refiners, and others conducting due diligence beyond the refiners.

2.2.6 TIER 1: BATTERY MANUFACTURER

Battery manufacturers may produce batteries or battery cells for a single use or a variety of uses. Cathodes are typically sourced from a few companies under long-term agreements. The construction of gigafactories and megafactories bring together multiple entities to enable end to end production from sourcing raw material to the final product, lithium-ion batteries, with output capacity measured in gigawatt hours (GWh). China is leading the way with 93 gigafactories that are producing batteries for electric vehicles and solar power.

As of early 2025, China produces over three-quarters of batteries sold globally, with average prices falling by nearly 30% to levels cheaper than in Europe and North America by over 30% and 20%, respectively. Many battery producers in Europe are postponing or cancelling expansion plans because of uncertainty about future profitability. After the adoption of producer tax credits, U.S. battery manufacturing capacity doubled since 2022, reaching over 200 GWh in 2024, with nearly 700 GWh of additional manufacturing capacity under construction. Korea and Japan have been major players in the global battery industry, with limited domestic battery production but with significant overseas investments. Korean companies lead in overseas manufacturing capacity, with nearly 400 gigawatt-hours (GWh), far surpassing Japan's 60 GWh and China's 30 GWh.[106] The impact of vast new US tariffs is not yet known, though industry experts have warned that they could have a

[103] Cobalt Institute, Cobalt Market Report 2023, May 2024, pp 12-14.
[104] Daniel, C., Journal of Minerals, Metals and Materials Society, Materials and processes for lithium-ion batteries, 2008, pp 43-48.
[105] Polaris Market Research, Lithium-ion Battery Cathode Market size worth $12.77 Billion by 2027, 2021.
[106] IEA, The Battery Industry has Entered a New Phase, 5, 2025.

highly negative impact on the U.S. electric vehicle industry,[107] with the U.S. importing $23.8bn worth of battery cells in 2024.[108]

[107] Automotive Dive, Zeta Warns Economic Risk Tariffs US Auto Industry Minerals, April 3, 2025.
[108] Argus, US Battery Costs Face Sharp Rise on Tariffs, March 4, 2025.

3. CHILD AND FORCED LABOR: PRINCIPLES, LAWS, AND PREVALENCE

3.1 THE DRC'S COMMITMENTS TO FUNDAMENTAL PRINCIPLES

The International Labor Organization's Declaration of Fundamental Principles and Rights at Work (1998) provides that all the ILO member states (including the DRC), are obligated to adhere to the protection and promotion of its enumerated rights, which include the prohibitions of child labor and forced labor. The other rights include freedom of association and collective bargaining, the prohibition of discrimination in occupation and employment and the right to a safe and healthy workplace, all of which are defined in the Fundamental Conventions.

The DRC has ratified the Worst Forms of Child Labor Convention, 1999 (No. 182); the Minimum Age Convention, 1973 (No. 138); the Forced Labor Convention, 1925 (No. 29); the Abolition of Forced Labor Convention, 1957 (No. 105); as well as the Freedom of Association Convention, 1948 (No. 87); and the Right to Organize and Collective Bargaining Convention (C. 98), all of which are included in the ILO Declaration on the Fundamental Principles and Rights at Work.[109] In 2022, the ILO added the right to a Safe and Healthy Working Environment to the Declaration.[110] In addition, regarding enforcement, the DRC ratified the Labor Inspection Convention, 1947 (No. 81) and the Labor Administration Convention, 1978 (No. 150). On social dialogue, the DRC ratified the ILO Convention on Tripartite Consultation, 1976 (C. 144), which sets forth the purpose, scope and principles of such dialogue.

In October 2023, the country signed its very first Decent Work Country Programme (DWCP 2022-2026), which prioritizes diversification of the economy and promotion of decent work and improvement of social protection and health and safety at work.[111]

The DRC has also ratified the UN Convention on the Rights of the Child and its Protocol on the Sale of Children, Child Prostitution and Child Pornography and the Palermo Protocol to Prevent, Suppress and Punish Trafficking in Persons Especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime. In 2017, the DRC ratified the African Charter on the Rights and Welfare of the Child.[112]

Although the Constitution of the Democratic Republic of Congo (2006) does not explicitly prohibit child labor, in the preamble it reaffirms the state's "adherence and attachment to" the United Nations Convention on the Rights of the Child and the Rights of Women, among others.[113] This Convention provides for "the right of the child to be protected from economic exploitation and from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development,"[114] The DRC Constitution provides that the implementation of international treaties and agreements has superior authority over national laws and allows national courts

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[109] ILO, DRC Ratification of ILO Conventions.

[110] ILO, A Safe and Healthy Work Environment is a Fundamental Right. For this right, the ILO references the Occupational Safety and Health Convention (No. 155) and the Promotional Framework for Occupational Safety & Health Convention (No. 187) as fundamental Conventions. While the DRC has not ratified these Conventions, by virtue of its membership in the ILO, it accepts this fundamental right in principle, while not formally obligated to adhere to the reporting requirement for ratified Conventions.

[111] ILO, Programme di Promotion du Travail Decent, The Program does not expressly detail an approach for child and forced labor.

[112] Africa Union, ACERWC Ratification Table.

[113] See Constitution de la République Démocratique du Congo (2006) (official French version) and Constitution of the Democratic Republic of Congo (dated 2005, adopted 2006) (English).

[114] United Nations Human Rights Office of the High Commissioner, Convention on the Rights of Children and the Rights of Women.

to enforce international mandates (Art. 215). It further provides that DRC courts and tribunals are authorized to apply international treaties, provided they are in accordance with the law (Art. 153).

The Constitution specifically provides that the abandonment and maltreatment of children is prohibited and punishable by law and that public authorities "have the obligation to ensure the protection of children in a difficult situation and to bring the authors of acts of violence against children and their accomplices to justice" (Art. 41).

The DRC Constitution further provides that the state has an obligation to respect and protect all individuals and that no one may be held in slavery or in a similar condition, subject to cruel, inhumane or degrading treatment, or submitted to forced or compulsory labor (Art. 16).

3.2 CHILD LABOR: RIGHTS, LAWS AND ENFORCEMENT

3.2.1 THE ILO ON CHILD LABOR, THE WORST FORMS OF CHILD LABOR AND MINING

The ILO's Worst Forms of Child Labor Convention, 1999 (No. 182) defines a "child" as any person under 18 years old. It also provides that the prohibited worst forms of child labor include work which, by its nature or the circumstances in which it is carried out, "is likely to harm the health, safety, or morals of children."[115] Through social dialogue with employer and worker organizations, states are to identify specific types of work and circumstances that fall within this category.

The ILO Minimum Age Convention, 1973 (No. 138) sets the general minimum working age at 15 years of age. The minimum working age for light work is 13 years of age, with an allowance for children at 14 years of age to work where the country's economy and education facilities are insufficiently developed. However, 18 is the minimum age for hazardous work.[116] Because of its inherent dangers, the ILO considers mining and quarrying as hazardous work and one of the worst forms of child labor with its digging, tunneling, crushing, removing waste, and transporting minerals and equipment.[117]

3.2.2 DRC CHILD LABOR LAWS AND REGULATIONS

DRC law provides for the protection of children and the regulation of their work in the Child Protection Code (2009) (minimum age), the Labor Code (2002,[118] amended 2016) (work hours, conditions, employment contracts), the Decree Establishing the Conditions for Children's Work (2018) (worst forms of child labor) ("Children's Work Decree"), and the Mining Code (2002, amended 2018) (mine exploitation, health & safety).

The 2009 Child Protection Code,[119] sets the minimum age for work at 16 and restricts children from night work or engaging in light work for more than 4 hours a day. This Code mandates free primary education and requires the government to provide protection for vulnerable or abused children.[120] The Labor Code (2016 amendment) sets the capacity to contract age generally at 18 and provides that persons aged 16-18 may be engaged in service only for the purpose of "carrying out light and healthy work" per order of the Minister responsible for work and security (Art. 6).[121]

The Child Protection Code (Art. 74), identifies a long list of bodies responsible for the social protection of children, including: 1) the National Children's Council; 2) guidance counselors; 3) social workers; 4) the Special Child Protection Brigade; 5) Labor Inspectors; 6) the education system; 7) the National Committee to Combat the Worst Forms of Child Labor; 8) civil society

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[115] ILO, Worst Forms of Child Labour Convention (Number 182). The other Worst Forms include: all forms of slavery or practices similar to slavery, such as the sale or trafficking of children, debt bondage and serfdom, or forced or compulsory labor, including the forced or compulsory recruitment of children for use in armed conflict; the use, procuring, or offering of a child for prostitution, for the production of pornography, or for pornographic purposes; the use, procuring, or offering of a child for illicit activities.

[116] ILO, Minimum Age Convention 1973 Number 138.

[117] ILO, Child Labour in Mining and Global Supply Chains, 2009, p 3.

[118] Journal Officiel de la République Démocratique du Congo, Code Du Travail, 2002.

[119] International Committee of the Red Cross, National Practice - Law on the Protection of the Child, 2009

[120] See U.S. Department of Labor, Findings on the Worst Forms of Child Labor. Democratic Republic of Congo, 2019.

[121] Journal Officiel de la République Démocratique du Congo, Code du Travail 2016.

organizations helping children; 9) Parliament and its children committees.

The Children's Work Decree prohibits persons under 18 years old from working more than eight hours a day.[122] It also prohibits engaging children (under age 18) in the worst forms of child labor, consistent with ILO C. 182 (Art 1 and Art. 8), including those likely to "harm the health, safety, dignity or morality of children" (Art. 8 d). The Decree also provides that the authorized labor inspector may identify prohibited work that is dangerous or unhealthy for children (Art. 13 sec. 17).

Particularly pertinent to mining, the Children's Work Decree prohibits children from working underground and in confined spaces (Art. 13 sec. 13). The Decree further identifies specific tasks or qualities of work that are prohibited for children, including work that "exceeds a child's strength" (Art. 8 sec. 2), entails the use of dangerous tools and/or heavy loads (Art. 9; Art. 13 sec.), and involves exposure to an unhealthy environment presented by hazardous processes and environmental conditions (Art. 13 sec. 15). The Mining Code provides that "the exploitation and trade of products is illegal from a site where a contravention of the laws on the protection of human rights, human rights of the child, or of women's rights" (Art. 299).[123]

The National Sectoral Strategy to Combat Child Labor in Artisanal Mines and Artisanal Mining Sites (2017-2025), developed by the Ministry of Mines, aimed to eradicate the prevalence of child labor in ASM by 2025, working with the Public Private Alliance for Responsible Minerals Trade.[124] Through the Strategy, the DRC government has sought to improve the implementation of existing laws, strengthen data collection, build on child protection initiatives, promote responsible sourcing, and engage relevant stakeholders. It established an inter-ministerial approach in collaboration with the Ministries of Labor, Education and Women, Gender and the Family.[125]

3.2.3 DRC CHILD LABOR LAW ENFORCEMENT AND PROTECTION

While the DRC government has established institutional mechanisms for the enforcement of laws and regulations on child labor, they are hindered by limitations and gaps within the operations of enforcement agencies, including civil inspection and criminal enforcement.

The Ministry of Employment, Labor, and Social Welfare (MELSS) is charged with enforcing the Labor Code, the Children's Work Decree, and other similar instruments and investigating child labor cases, including the worst forms, and referring them to the Department of Justice for prosecution.[126] In March 2023, the DRC government announced plans to reform the General Labor Inspectorate's framework and structure and recruit 2,379 labor inspectors, controllers, and administrative agents with the requisite skills. These reforms began with the establishment of the Ministry's Thematic Reform Unit, followed by organizational audits, mission statements and organizational restructuring.[127] However, there seem to be no recent reports on these officials' performance regarding child protection or inspection findings.

The Ministry of Justice (MOJ) enforces criminal laws related to child labor, overseeing juvenile courts in Kinshasa and UNICEF-funded child protection courts throughout the country. The Ministry of Interior investigates allegations of human trafficking rings and refers child labor cases to the MOJ for prosecution. The Ministry of Justice has been reported as lacking "the resources to rapidly, fully, and consistently carry out investigations and prosecutions."[128]

Previously, the USDOL Report on the Worst Forms of Child Labor reported that the Labor Inspectorate had only about 217 labor inspectors in 2022-23. The Report noted that the Ministry of Labor increased its budget in 2022 to $19.6 million, up from $13 million in 2021, and had plans to substantially increase the number of inspectors. However, at that time, it was reported that the Labor Inspectorate lacked its own budget, had no government issued computers or mobile phones, had poorly equipped offices, and irregular electrical power, Based on this and other information, USDOL found in the 2023 Report that the DRC government's efforts had resulted in "Minimal Advancement – Efforts Made but Regression in Practice that Delayed

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[122] Journal Officiel de la République Démocratique du Congo, Arrêté ministériel n° 12/CAB.MIN/TPSI/045 /08 du 08 août 2008 fixant les conditions de travail des enfants.
[123] Parliament of the Democratic Republic of the Congo, Code Minier.
[124] U.S. Department of Labor, Findings on the Worst Forms of Child Labor. Democratic Republic of Congo, 2019.
[125] For a discussion of the 2017-2025 Strategy, see Amnesty International's Observations sur la stratégie. 2017. For the 2012-2020 plan, see Plan d'action national (pan) de lutte contre les pires formes de travail des enfants.
[126] U.S. Department of Labor, Report on the Worse Forms of Child Labor, 2020.
[127] See Radio Okapi, Ministry of Employment Call for Applications, March 17, 2023.
[128] U.S. Department of Labor, 2023 Report on the Worst Forms of Child Labor – Democratic Republic of the Congo.

Advancement."[129] In 2024, it was reported that the labor inspectors had not been paid for a lengthy time and therefore were not working.

Efforts have been underway to improve enforcement, including through the Support the Promotion of Labor Standards in the Democratic Republic of Congo (DRC) project, which aims to "promote greater compliance with labor law and standards for acceptable conditions of work, including occupational safety and health, hours of work, and wages in the DRC's mining, distribution, and construction/public works sectors" (USDOL funded ILO project, December 2021 - April 2025).[130] Similarly, the Combatting Child Labor in the Democratic Republic of the Congo's Cobalt Industry (COTECCO) project, implemented by ILO and PACT, worked with key stakeholders to develop and implement strategies to reduce child labor and improve working conditions in artisanal and small-scale mines. COTECCO developed the Child Labor Monitoring and Operating System (CLMS), providing the DRC government with a mechanism for remediation of child labor cases, removing children from the mines and providing them education and skills training in a safe environment. [131]

As noted in section 4, Cobalt Traceability, the DRC government established the *Entreprise Générale du Cobalt* (EGC) to safeguard ASM cobalt sourcing and ensure that ASM mining complies with social, economic and environmental standards.[132]

EGC has pledged to ensure responsible due diligence of the supply chain resulting from artisanal cobalt mining.[133] The Ministry of Mines manages the Service for Assistance and Supervision of Artisanal and Small-Scale Mining (SAEMAPE, responsible for ASM regulation and training) and the Division of Mines (oversees large-scale mining) and enforcement of the Mining Code.

In collaboration with the United Nations Children's Fund (UNICEF), the National Labor Council launched the National Action Plan to Combat the Worst Forms of Child Labor (2012-2020) in 2012. The Action Plan establishes universal primary education and monitoring and evaluation efforts to strengthen coordination between stakeholders and awareness raising among communities to end WFCL. In 2021, UNICEF and RCS Global (now SLR Consulting) began a cooperative effort to roll out a toolkit to prevent and counteract child labor by mitigating wider child rights abuses in ASM communities in the DRC.[134]

3.2.4 CHILD LABOR PREVALENCE

Child labor and forced labor are prevalent throughout the DRC's ASM sector, including in, but not limited to, the cobalt sector. Within the cobalt supply chain, the risk of child labor is particularly concentrated in ASM. Child labor, fatal accidents, and violent clashes between artisanal miners and security personnel of large mining firms are recurrent.[135] There is a higher risk of child labor and forced labor on ASM sites close to settlements or urban areas as well as on sites with little control over entry.[136] Further downstream activities such as smelting, refining, and assembling require technical skills which reduce the risk of child labor.

Several studies have documented the pervasiveness of child labor in the ASM cobalt sector in the DRC. In 2016, a groundbreaking Amnesty International report revealed violations in working conditions and human rights on cobalt ASM sites. "This is what we die for: Human rights abuses in the Democratic Republic of Congo power the global trade in cobalt" was one of the first accounts published covering widespread child labor and human rights abuses linked to artisanal cobalt mine sites in the DRC. The report found child labor, including the worst forms of child labor (WFCL), prevalent across mine sites. At the time of their research in 2016, due diligence efforts to prevent or mitigate child labor were significantly lacking. In addition to child labor, children working on mine sites reported physical abuse by security guards on LSM concessions and health

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[129] U.S. Department of Labor, Findings on the Worst Forms of Child Labor. Democratic Republic of Congo, 2019.
[130] U.S. Department of Labor, DRC Labor Standards Project.
[131] See U.S. Department of Labor, DRC COTECCO Final Evaluation Infobrief. And, COTECCO Final Evaluation Report, July 2022 (project extended to May 2024).
[132] See EGC website, Home page.
[133] In July 2024, EGC officials signed a Memorandum of Understanding with the GTP Project and RCS Global to test the GTP traceability methodology and tool. On March 27, 2025, however, USDOL cancelled all ILAB funded projects, including GTP, thus terminating the pilot that was underway.
[134] UNICEF, RCS Global and UNICEF Announce Collaboration to Tackle Child Rights Infringements in Artisanal Mining, August 30, 2021.
[135] Ibid.
[136] RCS Global, Blockchain for Traceability in Minerals and Metals Supply Chains: Opportunities and Challenges, 2017.

problems related to exposure to cobalt ore or dust.[137]

In 2017, a follow up Amnesty International report analyzed 29 major companies purchasing and using cobalt in their products. Amnesty concluded that child labor risks remain high, and cobalt mined through child labor is finding its way into global supply chains.[138]

Factors contributing to the risk of child labor include the absence of alternative economic opportunities for ASM cobalt mining communities and the lack of implementation of existing laws and regulations regarding child labor.[139] There is considerable risk that treatment units in the DRC source ore produced with child labor from ASM, as many treatment units have limited due diligence or controls. While estimates of children working in the DRC cobalt sector range significantly, reports suggest the number to be in the thousands. A 2017 population-based survey of 426 cobalt mining communities in southeastern DRC found that roughly 13% of ASM workers were children (estimated 4,717 children).[140] Some reports suggest the number to be higher, estimating "as many as 35,000 of the DRC's 255,000 artisanal cobalt miners being children."[141] According to a BGR study in 2019, children were observed working (handpicking, washing, sorting, transporting material, and working in tunnels) on 20% of sampled mine sites. In addition to working at mines, children were seen selling food or goods to miners on sites.[142]

In 2023, a US Department of Labor study noted that DRC had made minimal advancements in eliminating the worse forms of child labor. That year, the DRC government's Child Labor Monitoring and Remediation System, still under pilot at the time, registered 5,346 children who were found to be working at 10 ASM cobalt sites. The study also noted that DRC's military was actively providing support to armed groups know to recruit and use child labor; that the government had not published labor or criminal law enforcement data; and that law enforcement failed to ensure that children are not incarcerated, penalized, or physically harmed for unlawful acts committed as a result of their exploitation in the worst forms of child labor.[143]

Children in the DRC are subjected to other forms of the worst forms of child labor, including in the forced mining of gold, tin ore (cassiterite), tantalum ore (coltan), and tungsten ore (wolframite), and are used in armed conflict, sometimes from forcible recruitment or abduction by non-state armed groups. The government did not publish labor or criminal law enforcement data. Access to education remains a challenge in DRC, leaving work as the only alternative.

3.3 FORCED LABOR PRINCIPLES, LAWS, RISKS AND ENFORCEMENT

3.3.1 FORCED LABOR PRINCIPLES AND LAWS

The DRC has ratified the ILO Forced Labor Convention, 1925 (No. 29), which defines forced labor as "all work or service exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily."[144] It also ratified the ILO Abolition of Forced Labor Convention, 1957 (No. 105), which prohibits the use of any form of forced or compulsory labor.[145] The ILO has provided guidance by delineating and explaining the 11 indicators of Forced Labor (see Figure 9).[146]

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[137] Amnesty International, This is What we Die for: Human Rights Abuses in the Democratic Republic of the Congo Power the Global Trade in Cobalt, 2016.
[138] Amnesty International, Time to Recharge: Corporate Action and Inaction to Tackle Abuses in the Cobalt Supply Chain, November 15, 2017.
[139] Bayer, C., and Cooper A., Worst Forms of Child Labor in the Democratic Republic of the Congo: Cobalt Refiner Due Diligence Reporting, 2019.
[140] Faber, B., Krause, B., and Sánchez de la Sierra, R., Center for Effective Global Action Policy Report, UC Berkeley, Artisanal Mining, Livelihoods, and Child Labor in the Cobalt Supply Chain of the Democratic Republic of Congo, 2017.
[141] Kara, S., The Guardian, Is your phone tainted by the misery of the 35,000 children in Congo's mines? October 12, 2018.
[142] Bundesanstalt für Geowissenschaften und Rohstoffe, Mapping of the Artisanal Cobalt Mining Sector in the Provinces of Haut-Katanga and Lualaba in the Democratic Republic of the Congo, 2019.
[143] U.S. Department of Labor, Democratic Republic of the Congo Brief, 2023.
[144] ILO, Force Labour Convention 1930 Number 29.
[145] ILO, Abolition of Forced Labour Convention 1957 Number 105.
[146] ILO, Eradicating Forced Labour: What Works in Practice. For a detailed explanation, see ILO Indicators of Forced Labour.

Figure 9: 11 Indicators of Forced Labor

Similarly, the DRC Constitution provides that the state has an obligation to respect and protect all individuals and that no one may be held in slavery, servitude or in a similar condition, subject to cruel, inhumane or degrading treatment, or submitted to forced or compulsory labor (Arts. 16 and 61). Because human trafficking can be done for the purpose of subjecting persons to forced labor, the DRC ratification of the Palermo Protocol to Prevent, Suppress and Punish Trafficking in Persons Especially Women and Children (supplementing the UN Convention against Transnational Organized Crime) is pertinent.

DRC law also provides that "forced or compulsory labor is forbidden" (Labor Code Art. 2).[147] Forced labor of children is prohibited through child labor laws and decrees. The 2002 DRC Labor Code provides that all forms of forced labor are prohibited and punishable by imprisonment of up to six months or fines. Implementation and enforcement remain a challenge because forced labor is difficult to identify through audits, and its enforcement requires financial resources to build the capacity of enforcement officials. The risk of corruption stands as another potential barrier to good practice implementation.[148]

3.3.2 FORCED LABOR PREVELANCE AND RISKS

A 2023 study conducted by ICF Macro for ILAB found that an estimated 67,000 to 80,000 workers, are subjected to forced labor, with indicators including deceptive recruitment, abusive overtime requirements, and restrictions of movement.[149] Prior to this study, instances of coercion,[150] forced labor,[151] abusive conditions, excessive overtime, restricted movement, and isolation were found[152] at various tiers of the supply chain. In the ASM sector, forced labor may occur in the form of debt bondage at the mining and potentially the treatment tiers. Miners may take on debt from intermediaries to purchase food, supplies, tools, and equipment, often at high interest rates, which may accumulate and force them to work until they are paid. This dynamic

[147] Journal Officiel de la République Démocratique du Congo, Code du Travail, 2016.
[148] U.S. Department of State, Trafficking in Persons Report: Democratic Republic of the Congo, 2020, p 113.
[149] ICF Macro, Inc., DRC-FL-Cobalt-Report
[150] ILO, Child Labour in Mining and Global Supply Chains, 2019.
[151] ILO, The Cost of Coercion: Global Report under the follow-up to the ILO Declaration on Fundamental Principles and Rights at Work, 2009, p 15.
[152] Rights and Accountability in Development (RAID) and the Centre d'Aide Juridico-Judiciaire (CAJJ), The Road to Ruin? Electric Vehicles and worker's rights abuses at DR Congo's industrial cobalt mines, 2021.

is particularly problematic where a miner is not digging enough cobalt to reduce the debt, which may keep compounding.[153]

The 2024 ILAB study found workers experience a combination of involuntariness, marked by the inability to refuse hazardous tasks, excessive overtime, and deceptive recruitment practices, and coercion, which includes movement restrictions, threats of dismissal, and withheld wages. Forced labor may also occur in the LSM sector and treatment units because companies have different levels of commitment to, or disregard of, due diligence and human rights. Many companies do not have regular oversight, which has been exacerbated by the lack of regulatory access to many companies during the Covid-19 pandemic.

Per the Global Slavery Index based on 2021 data, on any given day, an estimated 407,000 workers were living in modern slavery in the DRC, including in the agriculture, domestic and mining sectors. Also, in 2021, The DRC government reported identifying 155 victims of forced labor.[154] In 2020 Human Rights Watch reported incidents of forced labor throughout the Copperbelt on industrial mine sites, with union representatives and workers reporting that companies were forcing workers to stay on site during the pandemic and threatening to terminate those who attempted to leave. Workers said they were forced to work beyond the maximum daily hours without additional pay and received little to no communication about the lockdown timeframe.[155]

3.3.3 FORCED LABOR IMPORT BANS & DUE DILIGENCE REQUIREMENTS

Governments are increasingly applying and enforcing international standards on labor throughout global value chains through:

1. Disclosure-based legislation, such as the UK Modern Slavery Act, the California Transparency in Supply Act and the Canadian Fighting Against Forced Labour and Child Labour in Supply Chains Act. [156]

2. Due Diligence legislation, such as the EU Corporate Sustainability Due Diligence Directive (CSDDD), and national laws, such as those found in France, Germany and Norway.

3. Customs trade based legislation: the U.S. Tariff Act of 1930 (19 U.S.C. 1307), Sec. 307, the U.S. Uyghur Forced Labor Prevention Act, and the EU Regulation on Prohibiting Products Made with Forced Labour on the Union Market.[157]

In particular, the Tariff Act, enforced by U.S. Customs and Border Protection, prohibits the importation of "goods, wares, articles, and merchandise mined, produced, or manufactured wholly or in part" by forced labor. Such merchandise is subject to exclusion and/or seizure and may result in criminal investigation of the importer.[158] European due diligence requirements cover the ILO fundamental rights, including the prohibitions of child labor, forced labor, and the worst forms of child labor. In short, the growing legislation requiring disclosure, due diligence and customs requirements creates a demand for traceability and defines the kind of information traceability should collect and evaluate.

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[153] Alliance for Responsible Mining, Addressing Forced Labor in Artisanal and Small-Scale Mining (ASM): A Practitioner's Toolkit, 2014. And U.S. Department of State, Trafficking in Persons Report: Democratic Republic of the Congo, 2020.
[154] Walk Free. Global Slavery Index, Global slavery in the democratic Republic of the Congo.
[155] Human Rights Watch, DR Congo: Mine Workers at Risk During Covid-19, 2020.
[156] See AIM Progress, Ropes & Gray, LLP CSR Legislation: A Summary of Selected Instruments, Aug/Sept 2024.
[157] News. European Parliament, Products made with forced labour to be banned from EU Single Market, April 23, 2024.
[158] U.S. Customs and Border Patrol, United States Code Section 307 of the Tariff Act of 1930 (19 U.S.C. § 1307).

4. COBALT TRACEABILITY

4.1. THE DRC TRACEABILITY LANDSCAPE

Traceability requirements are present in DRC mining regulations, in recognized smelter assurance programs, and as part of due diligence guidelines. The DRC Manual of Traceability Procedures for Mining Products from Extraction to Export requires agents to conduct paper-based traceability at various points throughout the upstream supply chain to establish chain of custody for artisanal mined cobalt.[159] The regulations lay a foundation for the implementation of a traceability solution in the cobalt sector.

The key market access standard for cobalt is the Cobalt Refiner Due Diligence Standard created by RMI and the China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exports (CCCMC).[160] It was designed to support due diligence and responsible production and sourcing efforts by companies, as well as enable companies to comply with the London Metal Exchange (LME) requirements. Adhering to RMI Standards is necessary to pass refiner level audits when sourcing cobalt from Conflict Affected High Risk Areas (CAHRAs), such as the DRC.

The Standard ensures that treatment units and refiners comply with the OECD Due Diligence Guidance and other frameworks such as the London Metal Exchange's responsible sourcing requirements. It also requires refiners to show evidence that they conduct due diligence on their upstream supply chains. For compliance, refiners must establish strong "systems of controls and transparency" to determine that the chain of custody of material from suppliers is free of child and forced labor. When sourcing from CAHRAs, refiners must identify the origin – to the specific mine site – of all mined material regardless of the extraction process. The 2021 updated Standard requires the location(s) and name(s) of mines where cobalt is extracted and details about processing events, including where cobalt is consolidated, blended, crushed, milled, smelted and/or refined. Information on the weight, assay results, and dates across these stages in the supply chain are also to be included. Better Mining, as an upstream assurance mechanism, is a key mechanism enabling treatment units (smelters and refiners) to demonstrate whether and how they are implementing due diligence and chain of custody monitoring in conformance with the Standard.

Additional requirements related to traceability in the DRC are outlined in the Enterprise Générale du Cobalt SA (EGC) Responsible Sourcing Handbook for the ASM cobalt sector. EGC allows minerals from ZEAs, or designated artisanal mining areas, to be extracted, prohibiting blending or aggregating from other sources. Mining cooperatives must ensure there is no contamination from minerals outside of the designated areas in EGC supply chains and all ASM cooperatives are encouraged "to keep an inventory and transaction record of the weights, volumes, ore grades, dates and buyers for all production held on-site and/or transferred to EGC buying stations."[161]

Another approach and set of requirements related to traceability is the Certified Trading Chains (CTC) program, a certification scheme for responsibly mined and traded minerals developed by BGR. CTC audits cover six principles. Principle 1 requires "good government, transparency, traceability and due diligence in accordance with the OECD Guidance."[162] Traceability requirements include proof of compliance with steps and procedures outlined in the DRC Manual of Traceability Procedures and the absence of contaminated minerals from other supply chains.[163] Audited mining companies are provided recommendations for improving traceability.

4.2. TRACEABILITY SOLUTIONS

Some traceability solutions have been tested, at least for part of the supply chain in the DRC, including SLR Better Mining's Trace, the RESOURCE project Circulor, the Responsible Sourcing Blockchain Network's (RSBN) solution, and GTP's Global

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[159] RMI, RMI and RCI Publish Revised Cobalt Refiner Supply Chain Due Diligence Standard: Collaboration Refines Tools That Support Ethical Cobalt Value Chains Globally, August 19, 2021.
[160] RCI and RMI, Cobalt Refiner Supply Chain Due Diligence Standard (Version 2.0), published 2021, effective 2022.
[161] Enterprise Générale du Cobalt, Responsable Sourcing Standard, March 2021.
[162] Bundesanstalt für Geowissenschaften und Rohstoffe, Certified Trading Chains webpage.
[163] DRC Ministry of Mines, Certification Handbook "Certified Trading Chains" (CTC) for gold, copper-cobalt, tin, tantalum, tungsten and coloured gemstones from artisanal and small scale mining operations in the Democratic Republic of the Congo, Version 01, October 23, 2019.

Trace tool. As of 2024, the Global Battery Alliance was leading ten international pilots for cobalt traceability, but none had claimed DRC provenance for the cobalt traced during the pilots. The GBA pilots are meant to support stakeholders across the supply chain in meeting the due diligence requirements of the EU Batteries Regulation, which include traceability requirements, as part of the "battery passport" requirements.[164] The GBA aims to roll out the Battery Passport product certification scheme by 2027 which will require extensive data sharing and interoperability of data between traceability solution providers.

4.2.1 SLR BETTER MINING'S TRACE

The SLR Better Mining (formerly RCS Global Better Mining) program, implemented in partnership with the RMI and 19 corporations from mine to market in the electronics and battery value chain, has developed SLR Better Mining Trace, a proprietary digital traceability methodology and solution. Global Trace is currently used in tin, tantalum and tungsten (3T), and is expected to expand to cobalt and copper in 2024-25. SLR Better Mining Trace is used to track mineral shipments from 3T ASM mines in the Better Mining program to the treatment unit (smelter or refiner), allowing upstream and midstream industries to meet regulatory and market requirements for traceability. SLR Better Mining Trace follows the flow of material at each business step and point of transport collecting key data.

The system is fully digital and easily adaptable, with a quick set up time on new sites. All data collected is verified by international systems teams while on the ground teams support local stakeholders with traceability and due diligence implementation.

4.2.2 RESOURCE

RESOURCE is a blockchain-driven traceability platform developed by mining giants Glencore, Eurasian Resources Group (ERG), and China Molybdenum (CMOC), with support from Umicore and Tesla. RESOURCE aims to link all users of the supply chain and provide reliable real-time data on the origins of the minerals and sustainability performance data across the supply chain. It was piloted in 2021 in the LSM sector and is being rolled out since 2022 from mines in the Democratic Republic of the Congo (DRC) to the EV producers.[165]

4.2.3 CIRCULOR

Circulor, a traceability company, utilizes Oracle, Amazon Web Services, and its own proprietary applications. It creates a digital identity for physical material at its origin in the supply chain and connects it with inputs and outputs from downstream manufacturing processes to track the material. The system collects data on material flows, elapsed time, mass balance calculations, compliance with responsible standards, and energy use. Data collected is posted on a public ledger. Circulor is being piloted in Volvo's supply chain.[166]

4.2.4 GLOBAL TRACE

The Global Trace Protocol project has created the only open-sourced traceability software and a protocol for its use. The Global Trace tool is designed to improve capacity to identify and address incidents and risks of child and forced labor and other exploitative practices by being effective in the application of labor rights and due diligence principles. It has also been designed to be sustainable by being cost-effective, interoperable, and usable by various stakeholders. The software is available on GitHub and guidance and resources can be found at https://www.eiq.com/global-trace-protocol/. GTP developed a cobalt version of the trace tool that it planned to transfer to EGC with training in the summer of 2025. USDOL, however, announced the cancellation of all ILAB funded projects in March 2025.

[164] European Commission, Energy, Climate Change, Environment: Batteries webpage.
[165] Re-Source, About Us webpage.
[166] Circulor, Home page.

5. SUSTAINABLE TRACEABILITY IN THE DRC

5.1. CONSTRAINTS AND OPPORTUNITIES

The dynamic trade and regulatory environment poses both constraints to and opportunities for traceability. In prior years, mineral due diligence primarily focused on "conflict minerals," which include tin, tantalum, tungsten, and gold but not cobalt. In recent years, however, cobalt has received greater attention for its mining in high-risk and conflict risk areas, its use of child and forced labor and its broader impact on due diligence and customs requirements. As a result, coverage has grown to cover cobalt in standards such as the IT sector's 2025 Responsible Supply Chains Criteria.[167]

As global demand for critical minerals grows, it will be important to anticipate and address the potential risks in mining and metals in an even more complex and dynamic environment. In April 2025, the new U.S. Administration introduced, partly pulled back and partly reinstated a wide range of tariffs that directly or indirectly effects the sourcing, pricing and availability of cobalt and other critical minerals. China, which controls much of the global cobalt trade, responded by restricting the export of critical minerals and magnets.[168] While the full impact of tariffs cannot be determined, it is highly likely that labor standard enforcement tools will be instrumental to the U.S.'s stance on China and countries receiving inputs from China. Thus, it seems likely that enforcement will be increased or least maintained for the Uyghur Forced Labor Protection Act[169] and the Tariff Act.[170]

Despite some international companies making progress, due diligence practices in the cobalt sector remain inadequate. According to a recent Amnesty International report, a significant shortfall in effective human rights due diligence remains across the battery metal supply chains.[171] Traceability is just one aspect of due diligence, but the reported shortfall in due diligence practices may have resulted in a lack of investment in scalable cobalt traceability solutions.

Moreover, few treatment units in the DRC have undergone RMAP Cobalt Refiner Due Diligence Standard audits, which verify the units' ability to trace materials back to the mine site. While downstream supply chain actors and refiners have commissioned independent responsible sourcing audits of treatment units outside of RMAP, many control points in the cobalt supply chain are demonstrating the ability to implement traceability to mine sites in their supply chain.

Traceability efforts require collaboration between companies, governments, civil society, and international organizations backed by reliable verification and secure data-sharing protocols for systems that are "fit for purpose and aligned with the realities of global supply chains." Indeed, such a system should also "serve clear objectives rather than become an end in itself: policy makers and practitioners should adopt a measured approach, progressively deploying mechanisms where necessary while allowing for inclusive participation and access to markets and investment."[172]

5.2. DRC TRACEABILITY ROLES AND RESPONSIBILITIES

In the DRC, active leadership and participation by the government is essential for a cobalt traceability system to be successful in coordination with other key stakeholders. Effective action requires planning for trace tool implementation, coordination among organizations involved in monitoring and approvals, sharing of data, and sustainable use of the trace tool in

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[167] Global Electronics Council (GEC), the Responsible Supply Chains Criteria for the Electronic Product Environmental and Social Responsibility Tool, EPEAT_RSC (February 2025) (secs. 7.2.2 and 7.2.4).

[168] New York Times, China Halts Critical Exports As Trade War Intensifies, April 13, 2025. "China has suspended exports of a wide range of critical minerals and magnets, threatening to choke off supplies of components central to automakers, aerospace manufacturers, semiconductor companies and military contractors around the world." Although most cobalt is mined in the DRC, most cobalt is refined in China.

[169] See the regularly updated dashboard for UFLPA enforcement at U.S. Customs and Border Protection (CBP), Uyghur Forced Labor Prevention Act Statistics.

[170] See CBP, Withhold Release Orders and Findings.

[171] Amnesty International, Recharge for Rights, 2024.

[172] OECD, The role of traceability in critical mineral supply chains, February 28, 2025.

coordination with other due diligence and regulatory efforts.

The DRC government and stakeholders would benefit from a plan of coordination and cooperation among the regulatory organizations and state agents that clarifies their roles and responsibilities for mapping, tracing and tracking the flow of ASM (as well as LSM) cobalt from the mine site to depots and then to crude refiner treatment centers and export ports for transport overseas to fine refiners and manufacturers. In collaboration with the EGC, SLR Consulting, the Fair Cobalt Alliance (FCA), and Diginex, LRQA's Global Trace Protocol project developed a framework for implementing cobalt traceability in the DRC with defined roles and responsibilities (see Annex IV).

The *Entreprise Générale du Cobalt SA (EGC)*'s role should be enhanced for them to use, maintain and sustain the Global Trace tool or other trace tools to help ensure compliance with the EGC Responsible Sourcing Standard. Gécamines would likely host and maintain the software and hardware. State agents, such as SAEMAPE, play an important role in ensuring compliance at the mines and treatment centers, while CEEC plays an essential role in ensuring that cobalt standards are met for export. The mining cooperatives play a pivotal role in protecting the rights of miners and their communities.

Ideally, these parties will collaborate with the Ministry of Employment, Labor, and Social Welfare (MELSS), which is charged with enforcing child labor and other employment laws. With the ILO's assistance, MELSS operates the Child Labor Monitoring and Operating System (CLMS), which provides a process for identifying working children and providing remediation, which can include moving them into safe education and training programs. The FCA can provide further assistance by helping to ensure correction action is taken on a wide range of due diligence non-conformances at mine sites. The Responsible Mining Initiative (RMI) can help ensure alignment with global industry standards and SLR Consulting's Better Mining program can help ensure such efforts are effective.[173]

[173] Note: although USDOL cancelled the Global Trace Protocol project prior to the transfer of the cobalt version of Global Trace to EGC, the commodity agonistic version of the tool remains available on DOL's GitHub site.

6. TECHNICAL LEVERAGE POINTS

Interrelated leverage points for advancing traceability in the cobalt sector include:

- DRC's national manual on traceability requires state agents to record data about mined cobalt at various business steps. The regulation lays a foundation for the implementation of a traceability solution in the sector.[174]

- Significant engagement with the DRC government on traceability has occurred and the government is familiar with traceability in the 3TG sector. Current initiatives, such as Better Mining, have laid the groundwork for engagement on Cobalt traceability. The GTP Project can inform and gain the support of the key mining service agencies within the Ministry of Mines for the pilot project and inform CEEC that the traceability configuration will be managed according to the DRC Mining Code and the Certified Trading Chains (CTC) program.

- Step 4 of the OECD Due Diligence Guidance requires third party audits for smelter/refiners sourcing from CAHRAs.[175] There is, therefore, an incentive for upstream and downstream actors to participate in the pilot and in traceability more generally. The pilot will give offtakers the opportunity to market fully-responsibly sourced cobalt, while providing brands tools to identify and address exploitative labor practices in their cobalt supply chains, demonstrate conformance with the OECD Guidance, and show market leadership. In addition to alignment with the OECD Due Diligence Guidance, traceability is increasingly required by good practice frameworks for international markets.

- The DRC Ministry of Mines engages with initiatives to mitigate child labor in cobalt mining including the Cobalt Action Partnership (CAP). In 2020, the former Minister of Mines joined CAP's steering committee in showing support for the goals of the initiative. The CAP collaborates with the Global Battery Alliance to promote responsible cobalt value chains; to improve working conditions, safety, and gender equality; and to address human rights abuses such as child labor and forced labor.[176]

- Downstream members of the RCS Global Better Mining program have expressed interest in receiving material from Better Mining monitored ASM sites where the RCS Trace solution is in place. Better Mining is supported by several leading downstream companies to implement its risk management solutions globally and across minerals.

- There is a broad network of organizations working on labor issues in cobalt. This includes the ILO, Fair Cobalt Alliance, Cobalt for Development, UNICEF, GIZ, The Global Battery Alliance, and the stakeholders from EGC, in addition to the project consortium led Better Mining program.

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[174] Democratic Republic of Congo, Manual of Traceability Procedures for Mining Products from Extraction to Export, 2nd Edition, 2014.
[175] OECD, Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas Third Edition, 2016.
[176] UNICEF, DRC Minister of Mines Joins Action Partnership, 2020.

7. CONCLUSION

The aim of this report is to help key stakeholders identify and reduce child labor, forced labor and other exploitative practices in supply chains through traceability. To that end, it provides an analysis of the country and industry context, including the DRC economy and the ASM mining workforce, the regulatory and industry environment, and the supply chains tiers for LSM and ASM sourced cobalt. It analyzes the principles, laws and enforcement efforts related to child and forced labor in the DRC as well as the data on their prevalence. The Report further analyzes the DRC cobalt traceability landscape and various efforts to implement it, including Global Trace.

Finally, it identifies constraints and opportunities for promoting sustainable traceability in cobalt supply chains with a primary focus on the critical mining, transport, crude refining and export stages in the DRC. It provides suggestions for effectively implementing traceability in the DRC with collaboration and coordination between key stakeholders. As discussed, traceability is an important tool for integrating data on origin, evolution, and ownership of minerals and evaluating data on environmental, social and governance standards, particularly when used as part of a wider risk-based due diligence process. To work effectively, traceability systems must be tailored to the industry and the key stakeholders' mandates and capacities.

The Report provides an integrated view of the cobalt industry and trade, labor rights and traceability, with recent information from a wide range of sources to serve as a foundation for continued research, dialogue and testing. A caveat and caution: because the cobalt trade, industry, due diligence technology, and regulatory environment are rapidly evolving, it is important to regularly revisit concepts, facts and trends discussed herein. Attempting to build capacity in DRC governance is very difficult, time-consuming, and requires building relationships with key actors but may be possible with patience and a narrow pragmatic focus.

Promoting worker rights is not simply a means of achieving compliance with laws and standards, but a means of ensuring that trade and development rests on a respect for basic human dignity and enhances the lives of the people toiling to create the technological tools on which the world depends.

Annex I: ASM Traceability Data Points Examples

The table below shows draft traceability data points for an ASM cobalt supply chain.[177]

Tier/Process	Critical Tracking Events	Key Data Elements		Transport
ASM Mine Site	1. Extraction	• Date and time the mineral is extracted	• DRC state agent name	Bicycle Truck
	2. Blending	• Mineral weights and grade (assay results)	• Trader ID	
		• Locations where material was blended, processed, or milled	• Payment details	
		• Local Transportation (bicycle, truck, etc.)		
Local Trader	1. Packing	• Date and time	• Trader names and ID	Truck
	2. Unloading	• Mineral weights	• Truck ID	
Treatment Unit	1. Arrival	• Locations where material was consolidated, blended, and milled	• DRC state agent name	Truck
	2. Blending	• Date the mineral is processed, concentrated, smelted/refined	• Transportation details	
	3. Export	• Mineral weights and grade (assay results)	• Payment details	
		• Exporter ID		
International Trader	1. Arrival	• Date of shipment	• Transportation details	Ship Rail
	2. Export	• Shipment weight		
Refiner	1. Arrival	• Date of mineral arrival, refining, and export	• Payment history of all transactions relating to previous business steps	Truck Ship
	2. Refining	• Mineral weights and grade (assay results)		

[177] Responsible Mineral Initiative, Responsible Cobalt Initiative, and The China Chamber of Commerce of Metals, Minerals & Chemicals Importers & Exporters (CCCMC), Guidelines for Cobalt Smelters Supply Chain Due Diligence. And RCS Global, Blockchain for Traceability in Minerals and Metals Supply Chains: Opportunities and Challenges, 2017.

	3. Outgoing shipment	• Transportation details		
Cathode Manufacturer	1. Arrival	• Date and time of incoming material	• Payment details	Truck Ship
	2. Processing	• Mineral weights and grade (assay results)	• Batch number/ID	
	3. Export	• Transportation details	• Exporter ID	
Battery Manufacturer	1. Arrival	• Date and time of incoming materials	• Transportation details	Truck Ship
	2. Processing	• Material weight	• Payment details	
	3. Export	• Batch number/ID		

Annex II: Financial Flows

The table below shows the financial flows of the cobalt supply chain originating from DRC including the cobalt product and type of transaction.

Tier/Process	Cobalt Product	Typically Sell To	Financial Transaction Options
ASM Mine	1. Cobalt-Copper Ore	1. Traders	1. Spot Commodity Sales (cash)
		2. Open-Market Trading	2. Off-take agreement
		House (Depot)	
		3. Treatment Unit	
Open-Market Trading House (Depot)	1. Cobalt-Copper Ore	1. Traders	1. Spot Commodity Sales (cash) as percentage of estimated purity
		2. Treatment Unit	
		3. Large-Scale Mine	
Large-Scale Mine	1. Cobalt-Copper Ore	1. Trader	1. Long-term offtake agreements of two to 20 years
	2. Cobalt-Nickel Ore	2. Treatment Unit	2. Short contracts
	3. Cobalt Chloride	3. Fine Refiner	3. Single cargo spot contracts
	4. Crude Cobalt hydroxide		4. Royalty agreements
	5. Cobalt Salts		5. Streaming agreements
Treatment Unit	1. Crude cobalt hydroxide	1. Trader	1. Feed purchase contracts
	2. Cobalt carbonate	2. Fine Refiner	2. Toll Agreements
	3. Cobalt-bearing alloys		
International Trader	1. Crude Cobalt hydroxide	1. Fine Refiner	1. Off-take agreement
	2. Cobalt Carbonate		2. Spot Commodity Sales
	3. Cobalt-bearing alloys		
Refiner	1. Cobalt Sulfate	1. Pre-cursor	1. Feed purchase contracts
	2. Cobalt Acetate	2. Cathode Manufacturer	2. Toll Agreements
	3. Cobalt Carbonate		

	4. Cobalt Chloride		
	5. Cobalt Metal		
	6. Cobalt Nitrate		
Precursor/Chemical		1. Cathode Manufacturer	1. Contracts
			2. Toll Agreements
Cathode	1. Lithium cobalt oxide	1. Battery Manufacturer	1. Contracts
	2. Lithium Manganese Oxide		
	3. Lithium Iron Phosphate		
	4. Lithium Nickel Manganese Cobalt		
	5. Lithium Nickel Cobalt Aluminum Oxide		
Trader/Market	1. Cathodes (broken or cut)	1. Pre-cursor	1. Market contracts
	2. Ingots, briquettes, rounds or coarse grain powder	2. Cathode Manufacturer	2. Spot Commodity Sales
		3. Other traders	
Battery	1. Lithium Nickel Cobalt	1. Auto	1. Long-term Battery Supply Agreements
	2. Aluminum Oxide – NCA	2. Tech	2. Sales contracts
	3. Lithium Cobalt Oxide	3. Aerospace	
	4. Lithium Manganese Oxide		
	5. Lithium Nickel Manganese Cobalt Oxide		
	6. Lithium Iron Phosphate		

Annex III: Risks Per Supply Chain Tier

The Global Trace Protocol project team (LRQA, SLR Consulting, and RMI) created risk scores based on direct experience, based on a standard 25-point risk matrix, which is commonly used to evaluate child and forced labor risks at various cobalt supply chain tiers.[178] The "Likelihood," that a labor violation could occur and the severity of a "Consequence" for a violation is scored between 1 to 5 (from negligible to catastrophic for stakeholders). These two scores are multiplied for a total score between 1 to 25 with 25 the riskiest (see figures A and B). A more advanced risk model could be developed based on the Better Mining monitoring results from the pilot traceability site and a risk ranking for each indicator.

Figure A: Risk Definitions for Child Labor and Forced Labor

Risk	Site Level Risk Definition
Extreme Risk (Score 15-25)	Events can have catastrophic consequences with an almost certain likelihood of occurring (5). For example, a WFCL event rated as catastrophic (5) at a site where this risk is almost certain to occur (5) would result in a score of 25. Also may be an event with moderate consequences (3) that is of almost certain likelihood (5), resulting in a risk score of 15.
High Risk (Score 8-14)	These events range from an unlikely possibility (2) of a catastrophic event (5) resulting in a risk score of 10, to the almost certain possibility (5) of a minor consequence event (2), results in a risk score of 10.
Medium Risk (Score 4-7)	These scores range from a rare likelihood (1) of a serious consequence event (5), to a negligible consequence event (1) with high certainty of likelihood (5). In these scenarios it is still possible for child labor or forced labor events to occur.
Low Risk (Score 1-3)	They can include the rare likelihood (1) of moderate consequence events (3), to possible likelihood (3) of events with negligible consequence (1). Under this score category, no worst forms of child labor or forced labor would be expected.

Figure B: Tier Risk Scoring

MODEL	Risk of Site Level Child Labor	Risk of Site Level Forced Labor*	Risk of Source Inputs Produced w/ Child Labor	Risk of Source Inputs Produced w/ Forced Labor
ASM Model 1 on ZEA	High	Medium	NA- No External Source Inputs	NA- No External Source Inputs
ASM Model 2 on LSM	Extreme	High	NA- No External Source Inputs	NA- No External Source Inputs
ASM Model 3 Waste Rock	Extreme	High	NA- No External Source Inputs	NA- No External Source Inputs
LSM Model 1 LSM w/ no External Sourcing	Low	Medium	NA- No External Source Inputs	NA- No External Source Inputs

[178] Kaya, G.K., Standard Risk Matrix Source, March 2018.

LSM Model 2 LSM w/ External Sourcing and Input Due Diligence	Low	Medium	High	Medium
LSM Model 3 LSM w/External Sourcing and no input Due Diligence	Low	Medium	Extreme	High
Open Market House with No Due Diligence	Medium	Medium	Extreme	High
Treatment Unite Model 1 Co-located at LSM, Due Diligence on External Inputs	Low	Medium	High	Medium
Treatment Unit Model 2 Independent Facility w/ Due Diligence on Inputs	Low	Medium	High	Medium
Treatment Unit Model 3 Independent Facility, no Due Diligence on Inputs	Low	Medium	Extreme	High
Cathode and Battery Manufacturing[179]	Low	Low	High	Medium

*Risk scoring based on limited data sets related to the 11 indicators of forced labor.

Figure 10 ranks the risks of child labor and forced labor at each tier in a supply chain (two left hand columns). The "input level" (two right hand columns) refers to the risk that sourcing inputs at a specific facility/tier were produced with child labor or forced labor. Input level risks are correlated with the maturity of a due diligence management system at a facility, and the likelihood that a facility received inputs from production with forced labor or child labor.

Input level is included to highlight the fact that the trade of cobalt products produced with child labor or forced labor typically pass through multiple actors, including essential control points. It is common for control points to accept material tainted by forced labor or child labor. Formalizing due diligence controls at these control points is critical for ending forced labor and child labor in the cobalt supply chain.

[179] Downstream manufacturers must conduct full traceability from certified mining sources and implement robust due diligence management systems to avoid a "high risk" that inputs in their products come from a source where child labor occurs.

Annex IV: Global Trace Pilot Roles and Outputs

Organization	DRC Traceability Proposed Pilot Roles
EGC	Ownership of mine site formalization process and overall timeline Feedback on data collection and tool – KDEs, roles & responsibilities Help facilitate the pilot test Implement Sustainability Plan
LRQA	Fund and manage tool development and future modifications Training on trace tool use Protocol for tool use
SLR Consulting Better Mining	Support on the-ground-data collection by Better Mining team & send to EGC Provide feedback to refine tool application in DRC cobalt Participate and manage trainings
Diginex	Develop and refine Global Trace software Participate in training around system administration Lead transfer of tool hosting to EGC
FCA Project	Integrate traceability into EGC sustainability plan and ATI project Facilitate sustainable use Support training effort

Global Trace outputs in the DRC	
Traceability Tool	• Design a traceability tool and methodology that supports EGC bringing cobalt to market • Obtain EGC/DRC stakeholder review, feedback and refinement • Modification and improvements to software after testing
Training	• Design training plan and program • Obtain feedback from EGC on the plan • Conduct trainings and evaluate results
Tool Test	• Tombolo site tool test and shadowed visit • Results reviewed and finalized
Tool Transfer	• Transfer software to EGC servers • Training on System Management and database maintenance
Sustainability	• Develop plan for sustainability based on EGC staffing and needs – personnel and hard/software • Facilitate roles of mining services in plan and access CEEC, DivMines, SAEMAPE, etc. • Public reporting plan and stakeholder dialogue

Annex V: List of Figures

EiQ by LRQA

Find out more about The Global Trace Protocol Project and addressing the barriers in supply chain traceability →

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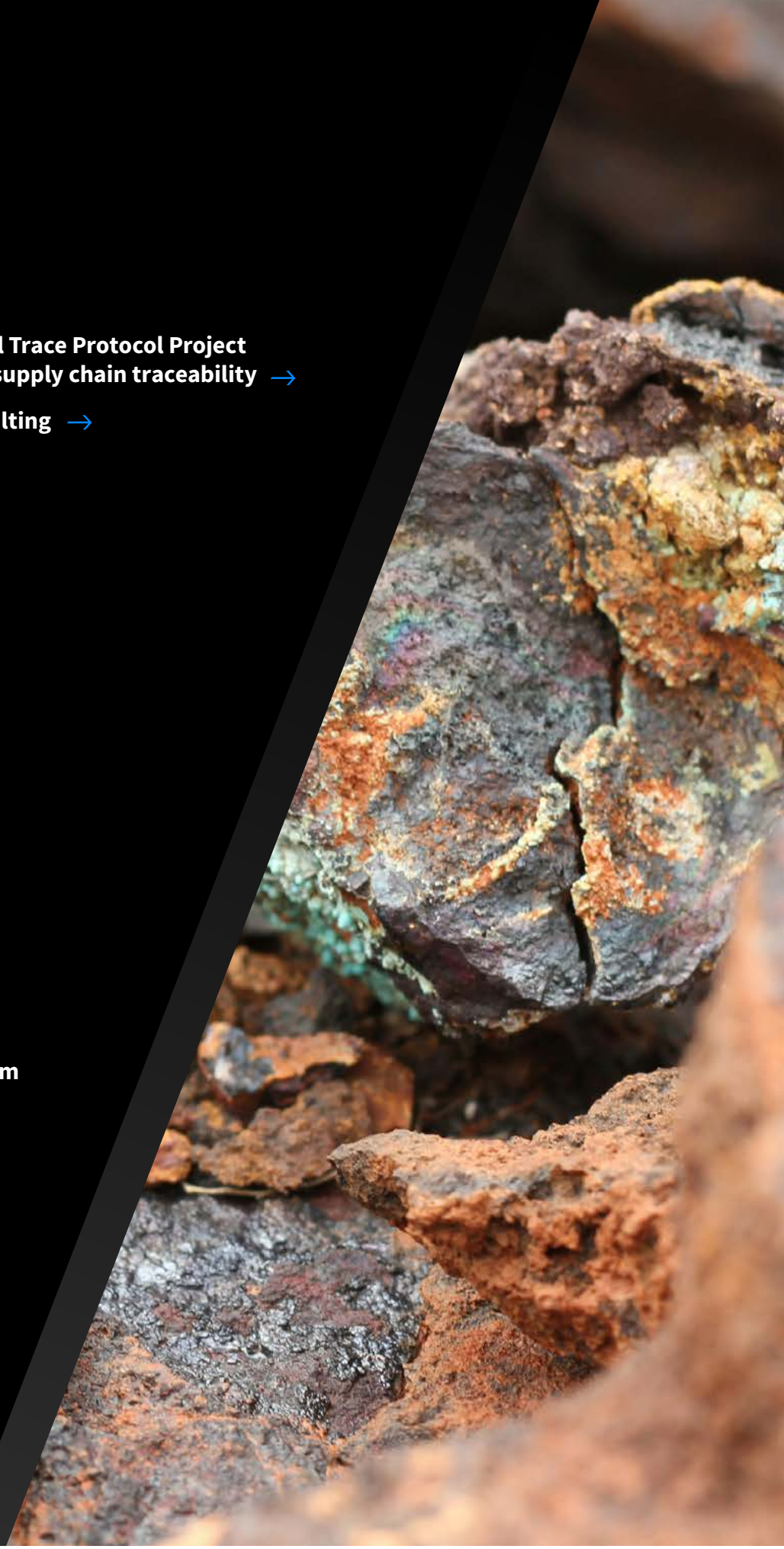

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