



Worst Forms of Child Labour in the Democratic Republic of the Congo:
Cobalt Refiner Due Diligence Reporting



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Executive Summary

The Katanga Copper Belt stretches across two of the Democratic Republic of the Congo's (DRC's) southernmost provinces – Lualaba and Haut-Katanga – and features some of the largest deposits of cobalt ore in the world. “Artisanal mining” – or non-mechanized, informal mining – of this ore is widespread.

According to surveys and eye-witness reports, thousands of children are part of the current “cobalt rush” and continue to toil in the sector while being exposed to the worst forms of child labour, in contravention of national laws and international conventions. Children carrying heavy loads have a chance of becoming stunted, and children working in unsafe mine shafts face injury and even death. Children exposed to cobalt dust above certain thresholds are likely to develop permanent lung damage (“hard metal lung disease”) and/or lung cancer. Such work falls under the definition of hazardous child labor. Given the associated morbidity and mortality, such labour practices are considered to be the “Worst Forms of Child Labor” (WFCL) per ILO Convention 182.

Between 10% and 25% of the global cobalt supply has Congolese artisanal and small mining (ASM) origins, and the remaining DRC-originating cobalt is produced in LSM operations. Unless vertical integration or secure chain-of-custody demonstrates non-ASM provenance, it must be assumed that WFCL could have played a part in the extraction process. A company that purchases a material or product – situated wherever along the supply chain – is responsible for ensuring lawful and sustainable extraction/production practices.

Companies in the cobalt supply chain that aspire to align with the *OECD Due Diligence Guidance on Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas* (“DDG”) embrace the commitments as outlined in its ANNEX II Model Supply Chain Policy. Such policy includes, “when sourcing from, or operating in, conflict-affected and high-risk areas”, to “neither tolerate, nor by any means profit from, contribute to, assist with or facilitate the commission by any party of” serious abuses, including, as the third point, WFCL. Also the China Chamber of Commerce of Metals Minerals & Chemicals Importers & Exporters (CCCMC) has, in their due diligence guidance for Chinese companies, issued similar guidance, although the particular mitigative measures market actors should take are less prescriptive.

As the DRC qualifies as a Conflict-Affected and High-Risk Area (CAHRA), and in some cases its cobalt mining also involves WFCL, the mineral is automatically in-scope of the DDG. Companies adhering to the DDG, according to STEP 5 of the guidance, thus report on the particular adverse impacts as outlined in ANNEX II. This disclosure step forms the basis of this assessment, which hones in on the ultimate supply chain pinch point – the cobalt refiner level. Upon evaluating 42 cobalt smelting companies, we find a significant lack of meaningful and impactful WFCL due diligence being disclosed. A lack of accountability at the refiner level is apparent, evidenced by the general disregard for the due diligence guidance as per the OECD and CCCMC. Cobalt-based industries should ensure that appropriate oversight is present at the production level and at critical points along the supply chain to enable due diligence according to the OECD definition. Furthermore, systems need to be put in place to achieve WFCL risk mitigation and remediation.



Foreword by Dr. William Bertrand

With our planet in desperate need of carbon-neutral technologies, and the corresponding increasing appetite for cobalt-based batteries, the demand for cobalt is rising. While efforts to reduce global warming should be supported, we cannot rush to improve the environment and at the same time ignore human rights. The world community has been clear that the supply chain of elements that make our lives collectively better should be free of child labour in all forms.

The OECD recognised and codified the problem of further instability caused by indiscriminate mineral sourcing practices, and issued the due diligence guidance for industries with minerals in their products. Section 1 of the guidance' reproduced in Annex II specifically cites the *Worst Forms of Child Labor* and references ILO Convention 182 (work performed "*which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children*"¹). China, an increasingly important player in the world economy, has also recognised the issue, and issued its own due diligence guidance for sourcing minerals from conflict affected and high-risk areas.

The DRC has even been called *the Saudi Arabia of the electric vehicle age* due to its cobalt resources, which are essential to the lithium-ion batteries that drive electric vehicles. Few countries present such a stark contrast between mineral riches and abject poverty as the Democratic Republic of the Congo. The country's mineral wealth alone is estimated to exceed USD 24 trillion in reserves. Yet in the absence of stability, good governance, and an educated and secure population, the country's human and physical capital remains only a potential.

Any action that supports the current state of poverty, food insecurity, and conflict is inhumane. Our societies possess the technology and appropriate means of surveillance to trace the source of essentially all of the commodities used in global economic exchange.

This report signals the need for immediate attention to enforcing and correcting the lack of compliance with international conventions in the DRC. International Private and Public sector representatives need to join with Congolese public and private sector officials to find solutions to this documented problem. The richest societies in the world benefit from the minerals extracted in the DRC. We all need to be part of the solution to their issues of sustainable development while we solve our own. We have the technology, the regulatory structure and the capacity to implement rapid solutions to the abuse of children in the mineral sector in the DRC. We however lack the collective will to resolve this problem. This report represents another call to action that this problem needs to be solved, fast.

Dr. William Bertrand
Wisner Professor of Public Health
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Foreword by Julie Goffin

Studying the situation of the DRC via the prism of figures and statistics is likely to give anyone vertigo in view of the seemingly contradictory aspects of the country's data. Accurate assessment of the situation experienced by the populations of this amazing country is especially arduous due to the size of the country, the multiplicity of militias or armed groups operating on the territory, the level of poverty of its population, and the sheer number of victims of conflicts and displaced persons. Opportunistic incursions and policies from neighboring countries complicate the country's integrity. Furthermore, countless international actors that have influenced activities pertaining to the public authority within a failing state often offer shortsighted and counter-productive solutions towards improving the well-being of these populations and protecting their rights. Which are the most effective levers to operate? The multi-leveled impact on the targeted populations has often been misrepresented or not even considered.

Behind the numbers and the data collected, and beyond the collective aspect of the suffering represented by these figures and statistics, the real human impact reveals itself when focusing on the affected individual. Suitable and effective forms of support depend upon the establishment of a strong human bond throughout the process, from the collection and reflection of the population's individual experiences, the personal and most intimate sufferings of the victims, up to the moment when the individual is able to benefit and recognise the positive life-changing impact such tailored support is offering. The understanding of the peculiarities of the victims' suffering, trauma, as well as their hopes and successes, is paramount to ensure that the projects are developed to meet the victims' needs and offer them full support and recognition from the beneficiaries.

The present study specifically addresses the situation of children working in artisanally-mined cobalt mines in the Copper-cobalt belt, a phenomenon where the working conditions are as frightening as the magnitude of the financial benefits derived from this activity on a global scale. Here again, the definition and implementation of programs for the most vulnerable workers, specifically children, remains critical given the scale of violations and the complexity of the situations encountered. A protective legal framework both domestically and internationally proves to be ineffective in the presence of inaction on the part of authorities. This deadlock combined with the creation of an exploitation scenario, in which actors mutually reject the responsibilities for the abuses and atrocities, has permitted practices that some companies still dare to claim as not worrisome today.

Furthermore, a contextualized understanding of particularisms, such as the nuanced situations experienced by these children, the imprint of the traumas experienced by the recurring conflicts in the region, the nomadic nature of those populations in an attempt to flee war, and the diversity in family and community units will contribute to the awareness and implementation of relevant forms of support for these vulnerable people and children subjected to the worst forms of labour.



This report is a valuable tool for the practitioner engaged alongside victims as it analyzes the situation of children exploited in cobalt mines from various aspects and identifies the main refiners whose child labour policies are being analyzed.

The data collected opens a way for questioning the listed businesses about their shortcomings, as well as asking for explanations on situations which are viewed as unacceptable in the public opinion and some elements within the market. The exploitation of children in this area of mining activities is likely to mobilize the public opinion through the impression of proximity created between the worker and the consumer, whose conscience becomes jostled when informed about the conditions in which his mobile phone components are produced.

This awareness-raising lever may produce some effects on the policies developed by companies in terms of risk assessment and implementation of remedies. But in order for these policies not to remain unheeded, tools like this study have to be developed as they will be used by victim's lawyers and defenders to hold the business accountable and support access for those victims to all procedures which would demonstrate efficiency.

Julie Goffin

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I. Context

1. The DRC as a CAHRA

In the aftermath of the DRC's last civil war that officially ended in July 2003, the country has experienced protracted conflict involving warring militias and government security forces, especially in some provinces of the country including North Kivu, South Kivu, and Ituri. The most expensive peacekeeping operation in history costing well over US\$ 10 billion, MONUSCO is enforcing a delicate and volatile peace in the country.² From militia attacks, to targeted kidnappings and armed roadblocks, international peacekeepers struggle to contain outbursts of armed conflict and atrocities in the DRC.

The country is far from peaceful, and also state security forces remain a deadly threat. Between 2017 and 2018, 61% of the perpetrators of killings were in fact state agents (including 1,176 victims of extrajudicial killings), compared with 39% of killings perpetrated by armed groups.³ *Table 1* below lists the 10 conflicts home to the DRC, three of them classified as *limited wars* according to the Heidelberg University Conflict Barometer.

Table 1: conflict points and classification in the DRC as of 2018

<i>Name of conflict</i>	<i>Conflict parties</i>	<i>Conflict items</i>	<i>Start</i>	<i>Conflict intensity</i>
DR Congo (Bantu – Batwa)	Bantu militias vs. Twa militias	subnational predominance	2013	3
DR Congo (ex-M23)	ex-M23 vs. government	subnational predominance	2004	1
DR Congo (Ituri militias)	Ituri militias vs. government	subnational predominance, resources	1999	4
DR Congo (Kata Katanga)	Kata Katanga vs. government	subnational predominance, resources	2011	1
DR Congo (KN)	KN vs. government	subnational predominance	2016	3
DR Congo (Mayi-Mayi et al.)	Mayi-Mayi groups vs. Nyatura groups vs. Raia Mutomboki vs. APCLS vs. FDLR vs. government	subnational predominance, resources	2003	4
DR Congo (opposition)	CLC, Lamuka, CACH et al. vs. government	national power	1997	3
DR Congo – Rwanda	DR Congo vs. Rwanda	international power	1998	3
DR Congo, Rwanda (FDLR, CNRD)	FDLR vs. CNRD vs. DR Congo, Rwanda	national power, subnational predominance, resources	1994	3
DR Congo, Uganda (ADF)	ADF vs. DR Congo, Uganda	subnational predominance, resources	1995	4

Source: Heidelberg University, Conflict Barometer 2018 ⁴

More than 600 schools were attacked or destroyed between mid-2016 and mid-2017, affecting an estimated 1.5 million children.⁵ Eighty (80) mass graves were found in the diamond territory of Kasai, a region in which an estimated 3,383 people were killed in 2017.⁶ Not even UN investigators are safe: Michael Sharp and Zaida Catalan, members of a panel of six UN experts



authorized by the UN Security Council to investigate the atrocities, were kidnapped and killed in Kasai in March 2017.⁷

The humanitarian situation of the DRC is dire: between 2017 and 2018, there were 4.49 million Internally Displaced Persons (IDPs), 9.9 million people were food insecure, there were 523,850 refugees in the country (mainly from Rwanda, Burundi, Central African Republic, and South Sudan), 2.0 million children were suffering from severe acute malnutrition, and 621,700 Congolese refugees had fled to neighboring African countries.⁸

According to the Organisation for Economic Co-operation and Development's (OECD) Fragility Index, which applies a multidimensional framework that considers economic, political, societal, security, and environmental fragility, the DRC is identified as 'extremely fragile,' along with 5 other countries.⁹ Furthermore, the DRC ranks 47th out of 54 African countries according to the 2018 Ibrahim Index of African Governance.¹⁰

Given these facts, the DRC would clearly constitute a case of a conflict-affected and high-risk area (CAHRA) according to the OECD DDG definition,¹¹ and therefore companies sourcing cobalt from the DRC would be automatically subject to the OECD DDG.

2. Congolese cobalt and global supply chains

In a country where it is said that one can find every element of the periodic table – along with 3.6 million tons of cobalt (34% of the world's cobalt resources) – the Katanga Copper Belt features some of the largest deposits of cobalt ore in the world.¹² Situated in the Lualaba and Haut-Katanga provinces of southern DRC, this belt fans out from Kolwezi southwards to Lubumbashi, and from there follows the DRC's southern arm into Zambia (see *Figure 1*). There, the distinctive grey-green cobalt-copper ore comes to the surface in dolomitic rock.

The DRC currently produces 60% of the world's cobalt.¹³ Recognising the centrality of cobalt on the world stage, in 2018 the DRC increased the royalty rate of "strategic substances," including cobalt, up to 10% on cobalt mining as part of its new mining code.¹⁴

The majority of the DRC's cobalt – 60% to 83% – is extracted through mechanized, Large Scale Mining (LSM), often as a by-product of copper mining.¹⁵ ASM production in the DRC accounts for the remaining domestic production: 200,000 "artisanal" Congolese miners are responsible for "about 17 to 40 percent of production in the [DRC]", and an estimated "10 to 25 percent of the world's cobalt production."¹⁶

The demand for ASM cobalt, in particular, is related to the political economy of the in-region trade. Usually cheaper than industrial mines (as small-scale operations are not as capital intensive and/or operate informally) and not bound by formal contracting, when artisanal cobalt came online, "some international traders canceled contracts for industrial ores, opting to scoop up artisanal ones."¹⁷ Apart from generally lower prices as compared with LSM cobalt, the main reason buyers seek out artisanally mined cobalt is because of the pervasive informality of the



market: There are no contracts associated with transactions, which means they can effectively buy or not buy as they please, rather than being locked into long term pricing or other formal arrangements.

The DRC's cobalt is either bought directly from the miner/mine by foreign entities or by intermediaries. Yet mineral traders play a key role for both ASM and LSM supply chains. In addition to the ASM cobalt traders, which were notably featured in the Amnesty report, there are also larger players in the LSM arena such as Gerald Metals (Group). While the traceability of LSM operations is rather straight forward when they ship directly to smelters, due to logistical, hedging, or cash flow reasons also LSM operations sell to traders. This is a major issue for traceability as traders to date are generally not considered to be performing due diligence. LSM volumes aside, as up to 40% of the DRC cobalt output could be originating from ASM, there are large-scale logistical activities brought to bear by trading houses in order to handle this amount of minerals.

Figure 1: Katanga Copper Belt



Source: Nzuri Copper Ltd, [Kalongwe Copper-Cobalt Project \(DRC\)](#)

The largest export destination of cobalt is China: “The DRC exported 134,614 tonnes of ores and concentrates to China – the largest buyer of DRC-origin cobalt materials – in 2018, according to official but unconfirmed data from Fastmarkets’ sources. This equals roughly 13,000



tonnes of cobalt metal.”¹⁸ The largest cobalt refiner in China is Zhejiang Huayou Cobalt Company Co., Ltd.

To date, China remains the world’s leading consumer of cobalt, the bulk of its cobalt importation being of DRC provenance.¹⁹ The mineral is then largely fed into China’s rechargeable battery industry, accounting for over 80% of domestic cobalt consumption.

3. Artisanal mining in the DRC’s copper-cobalt belt

For over a decade, artisanal cobalt digging has taken place in the copper belt. These “creuseurs” – French for “diggers” – work without the benefit of industrial equipment, mine engineering, or safety precautions. Their tools are hammers, axes, shovels and bags, they prospect by identifying flora such as “la fleur du cobalt,” and dig unsafe shafts deep into the ground.

The town of Kasulo itself became a mine when, in 2014 a man in digging in his back yard unearthed cobalt ore.²⁰ As of 2015, an estimated two million artisanal miners worked in the DRC, of which around 200,000 were working copper-cobalt sector.²¹

The sheer scale of DRC artisanal cobalt output (estimated at 10% to 25% of the world’s cobalt production) is felt at the macro-economic level. The significance of artisanal mining as compared to industrial mining became abundantly clear in the period when ion-lithium battery demand shot up, as measured in battery volumes purchased, yet the price of cobalt fell. Over the same period, in comparison, the price of lithium, another key battery ingredient, skyrocketed.²²

The reasons why Congolese have – in droves – resorted to artisanal mining, and why also children are involved in the trade, include the following push and pull factors:

Push factors: The lack of alternative and viable economic opportunities for children and their families, as well as the inability of the state to enforce existing laws, are among the main factors accounting for the presence of children in mines. Given the country’s weak economic governance and pervasive poverty, the DRC ranked 176th out of 188 countries in the Human Development Index.²³ Furthermore, a downturn in the commodities market after the financial crisis of 2007/08 resulted in massive lay-offs (more than 13,000 jobs lost) in the formal mining sector, in addition to the general lack of viable work alternatives. Thus, many former Gécamines employees and/or their children resorted to artisanal mining.²⁴

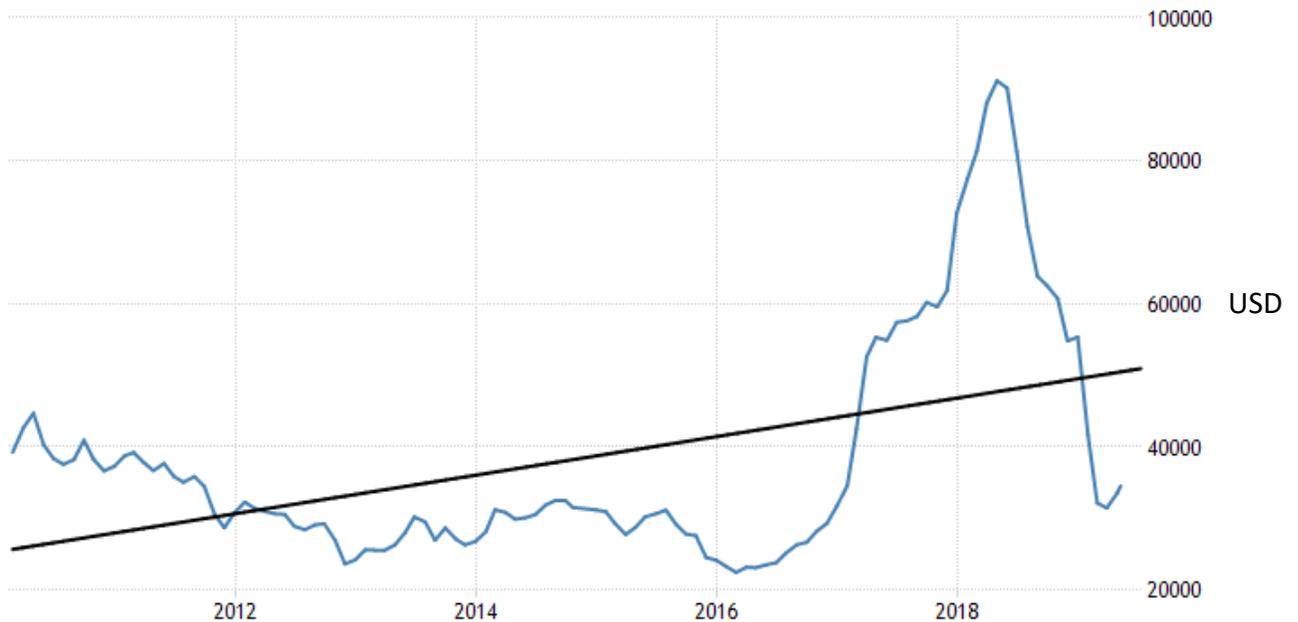
Pull factors: Given that the element is the most expensive raw material inside lithium-ion batteries, cobalt demand and prices have risen over the years (see *Figure 2*).²⁵ Climbing cobalt prices entice armies of artisanal miners to the region, e.g. digging near industrial mining operations for example owned by Glencore and Eurasian Resources Group.

Mining-driven displacement adds to the list of causes why Congolese fall into – or remain in – poverty. As recounted by SOMO in their investigation *Cobalt Blues*, in four separate cases, to



make way for large-scale cobalt-copper mines in DRC, “communities were relocated without adequate compensation, without being given new land and were sent to areas with poor soil. They [...] were relocated to areas without basic infrastructure or access to drinking water.”²⁶ It is not hard to imagine why the economic prospects of these communities deteriorated. A similar story is told by POM, a Congolese network of civil society organizations working on mining issues: 430 hectares of agricultural land owned by 600 farmers was expropriated by the Eurasian Natural Resources’²⁷ subsidiary Frontier (95% Eurasian; 5% Gécamines). Ever since their land was expropriated, the villagers of Sakania and Kimfumpa have been living in extreme poverty.²⁸

Figure 2: Price of refined cobalt (USD per metric ton)



Source: Trading Economics, [Cobalt](#)

The dynamic between the country’s security forces and artisanal miners is illustrated in a recent Reuters article “*Send in the Troops: Congo Raises the Stakes on Illegal Mining.*”²⁹ Congolese soldiers are reportedly clearing “tens of thousands of illegal informal miners from mining concessions”, often at the urging of mining companies “sitting on some of the world’s richest mineral deposits.”³⁰ Where these interventions were accompanied by injury and death, the UN has accused the Congolese army of human rights abuses.

4. Child labour in mining

In artisanal mining operations, traditionally the men work in mining shafts while the women and children crush the ore and wash and separate the copper and cobalt in water, carrying loads to and from collection points. While some children commonly carry out the work otherwise performed by women, they also mine cobalt ore in the shafts: “It is true, there are children in these mines,” Lualaba governor Richard Muyej commented in a recent interview.³¹



Vanbrabant et al. (2009) reported that “between 19,000 and 30,000 of children under 15 years of age, and 9,000 to 15,000 of children aged between 15 and 17 years are estimated to work in artisanal cobalt mines.”³² At the time, the authors estimated that ASM production accounted for 60% to 90% of total cobalt production in the DRC.

In 2012, UNICEF conducted a study encompassing “southern Katanga” as a whole, which estimated that 40,000 children worked in southern Katanga mines, about one third of the total number of workers.³³ Previously, in a 2010 Multiple Indicator Cluster Survey covering the country’s 11 provinces, UNICEF and partners found that approximately 25% of children do not attend primary school, and 42% of children between the ages of 5 to 14 are engaged in some form of labour.³⁴

The 2016 Amnesty International report *This is what we die for*³⁵ cast a spotlight on the conditions under which cobalt is extracted, and the extent to which human rights-based due diligence is conducted in the cobalt supply chains. Amnesty found that child labour – including the worst forms – in the copper-cobalt sector was widespread, due diligence for WFCL had yet to show fruit, and that cobalt of southeastern DRC origin was bought, on a massive scale, by five DRC subsidiaries of Zhejiang Huayou Cobalt Company Ltd.³⁶ A subsequent Amnesty report in 2017, *Time to recharge*,³⁷ assessed the policies and practices of 29 major companies using cobalt in their products and found that while there had been signs of progress in the way some companies’ source cobalt, few positive outcomes were apparent. In sum, Amnesty International warns of “significant risk of cobalt mined by children in the DRC ending up in the batteries of electric cars.”³⁸

A population-based survey, carried out by the University of Berkeley’s Center for Effective Global Action (CEGA) at the behest of corporate actors in 2017, identified a total of 426 cobalt mining communities, from which they took a randomly sample 150 study areas for data collection. Among the 90% of cobalt miners who worked as artisanal miners in the copper-cobalt belt, an estimated 4,714 children – 13% of the mining workforce – also toiled.³⁹ Many of the under-18s child laborers also worked the most dangerous of places – underground. The study also measured psychological outcomes, and found “that the typical survey respondent of a household who reports to have children working in mining-related activities experiences significantly higher levels of anxiety, as measured in a standard scale test with self-reported answers.”⁴⁰ The CEGA study, however, stopped short of applying an ILO-premised hazardous labour framework in order to identify which aspects of mining-related *child labour* – e.g. rock crushing, carrying heavy loads, and in-shaft mining – would constitute the *worst forms of child labour* as such practices may lead to injury, disease, stunting, and/or death.

The CEGA study also uncovered evidence of the presence of armed groups at cobalt mine sites: “armed security services, many of which are not supposed to be present at the mining sites, are quite active.”⁴¹ The authors furthermore observe: “18% of mines are secured by the secret service and 13% by the presidential guard. These organizations have been found to act as predatory networks for rent-extraction (Verweijen, 2013) and do not have a mandate for working at the mine.”



A statement by “Worker members” in a 2017 International Law Commission session⁴² highlighted the plight of child workers in the select regions of the DRC’s mining sector:

Children were also exposed to the worst forms of child labour in the mines of Katanga and East Kasai, where around 40,000 children were working under the oversight of military units on mineral extraction. They worked in mines for up to 12 hours a day, for US\$1 or \$2, in extremely hot temperatures, without the slightest protection and in contact with high concentrations of cobalt. The national legislation prohibited forced labour, but it was the absence of enforcement of the respective provisions that gave rise to problems, particularly in view of the ineffectiveness and incompetence of the labour inspection services. The national plan of action to combat the worst forms of child labour in mines by 2020, which had been adopted by the Government in 2015, had not resulted in progress in terms of the improvement of labour inspection and the number of children subject to forced labour practices. The penalties applicable for the use of forced or compulsory labour were weak and did not have a dissuasive effect. There were also many other structural problems, including decentralization, the lack of resources and poor coordination. The 2009 Act on the protection of children established the right to free and compulsory education for all children, but in the absence of public financing, most schools that had not been closed or destroyed continued to charge school fees.

5. Effects of cobalt on health

Widely dispersed in nature and necessary for human and animal health, only excessive exposure to cobalt (Co) and its compounds has been shown to induce adverse human health effects.

Exposure to trace amounts of cobalt is not a health hazard. In fact, as a constituent of vitamin B₁₂ or cyanocobalamin – cobalt is biologically essential for good health in animals and humans.⁴³ As cobalt also increases red blood cell production in healthy people at very high exposure levels, cobalt (0.16–1.0 mg cobalt/kg of body weight) has been used as a treatment for pernicious anemia – also a significant medical condition suffered by many Congolese, and an especially critical condition for pre-natal health.

Studies have shown that while cobalt does not readily enter the body through normal skin, it is readily ingested or inhaled. Once ingested, cobalt is distributed into all tissues, but mainly into the liver, kidney, and bones. The toxic effect of cobalt on vision has been documented.⁴⁴ Furthermore, elevated rates of premature births and babies born with severe birth defects (Anencephaly) have been reported in the copper-cobalt region of the DRC.⁴⁵ Ingestion can also occur, in the context of artisanal mining in the DRC, e.g. by drinking polluted water or indirectly by eating contaminated fish.

Yet the most dangerous form of exposure is through prolonged inhalation of airborne cobalt dust. The mildest health impacts include “respiratory irritation, wheezing, asthma,



decreased pulmonary function, pneumonia, and fibrosis,⁴⁶ and in one documented medical case, workers exposed to 0.005 mg cobalt/m³ in the air suffered such effects.⁴⁷ However, much more serious is a potentially fatal lung disease known as “hard metal lung disease.”⁴⁸ Such a condition is further linked to cobalt-related lung cancer. Cobalt has been shown to indirectly cause cancer notably by acting through three distinct mechanisms:

1. causing oxidative stress (the imbalance in detoxifying reactive oxygen species);
2. mimicking hypoxia (deficiency of oxygen);
3. inducing inflammation.

Thus, all physical forms of cobalt metal have been classified as ‘*Presumed to have carcinogenic potential for humans*’ (Carc.1B; H350i, inhalation route only) according to the UN GHS Self-Classification,⁴⁹ and five cobalt substances have received the same classification according to the EU CLP Classification.⁵⁰

Minimal Risk Levels (MRLs) have also been derived for cobalt based on empirical studies, thresholds above which an exposed individual is likely not to be safe.⁵¹

a. Inhalation:

An MRL of 0.0001 mg cobalt/m³ has been derived for chronic-duration inhalation exposure (>365 days) to cobalt.

b. Oral:

An MRL of 0.01 mg Co/kg-day has been derived for intermediate-duration oral exposure

c. External Isotopes Exposure:

An MRL of 400 mrem (4.0 mSv) has been derived for acute-duration external exposure to ionizing radiation (14 days or less).

An MRL of 100 mrem/year (1.0 mSv/year) has been derived for chronic duration external ionizing radiation (365 days or more).

Where the particular MRL is overstepped, e.g. through anthropogenic activity, health impairment is likely. Such is commonly the case in the context of ASM cobalt mining in the DRC. There are two notable activities in which cobalt dust is produced at the mine site: at the mining level in the mining shaft, which commonly has poor air circulation, and at the rock-breaking stage, commonly carried out with crude implements, by hand, on the ground. In the DRC, children have been documented to perform both these tasks. In addition, people inhale mining debris dust that is thrown up by heavy trucks traveling on unsurfaced roads.

6. Relevant DRC laws, policies and actions

Inheriting a complicated colonial legacy, the DRC has experienced decades of compounding problems, during which most key government functions have not been fully operational. With few exceptions, this chronic lack of capacity in the public sector has created an environment where no public and few private organizations have the luxury of a stable budget



that is generated internally. The lack of a functional educational sector means that the younger generations are hardly equipped to tackle the country's many issues.

While the DRC has significant legal protections for children embodied in its national legislation, much of its legislation has not been implemented and little is enforced. One of the principle challenges in the protection of children is the training and funding of government personnel to implement already existing legislation.

In January 2009, the DRC passed the Child Protection Code (*Code de Protection de l'Enfant*), which, according to international observers, represents a significant increase in the rights of children.⁵² Among other protections, the Child Protection Code mandates that the government provide compulsory and free primary education to all children, increases the minimum age of criminal responsibility to 14, and obliges the state to provide special protection for, among others, children who have been abandoned, sexually abused, or accused of witchcraft.⁵³ Yet in spite of the law, the majority of schools continue to charge fees as state funding remains insufficient.

The Child Protection Code furthermore establishes the minimum age for work to be 16. Without the express permission of a judge, children are forbidden from working at night or for more than four hours a day, and requires that any work performed by children less than 18-years-old be light and healthy. These protections are significantly more stringent than the minimal protections established by ILO Conventions 138 and 182. Notwithstanding these protections, child labour is widespread, including in hazardous professions such as mining.

Additional provisions for the protection of children can be found in the Constitution (2006), which also guarantees children the right to a free education. The Labor Code (2002) sets the minimum age to engage in contractual work at 16 years of age (unless the child is 15 years and has the expressed consent of his/her parent or guardian), and also addresses the worst forms of child labour.⁵⁴ Observers note, however, that many of these legal instruments have not yet been implemented and that few of the protections are consistently enforced.

On the international level, the DRC has ratified a number of treaties protecting the rights of children, including the UN Convention on the Rights of the Child and the Optional Protocol to the same, the African Charter on the Rights and Welfare of the Child, ILO Convention 182 on the Prohibition and Immediate Action for Elimination of the Worst Forms of Child Labour, and ILO Convention 138 on the Minimum Age for Admission to Employment.

The 2006 Constitution grants international treaties' constitutional hierarchy greater than national laws and permits national judicial organs to directly apply treaties, which has occurred in limited instances.⁵⁵ As with national legislation, observers note a lack of implementation of policies mandated by treaties and compliance with treaty obligations.

The DRC has a number of government agencies whose work addresses child safety and welfare. The National Council for Children (*Conseil National de l'Enfant*) is formally charged with implementing the Convention on the Rights of the Child, although it notes that it has not been



given adequate power to do so. Since 1998 the government also has a National Children’s Council and a National Women’s Council. As in many cases of ministry-level outreach, funding is inadequate, training is poor, and many challenges exist to arriving at the point of truly protecting the growing number of children in the country – whose lives are not consistent with the current international norms of the rights of the child.

In 2015, the DRC adopted a national action plan to eliminate the worst forms of child labour by 2020. One objective was to support the Ministry of Labour to deploy inspectors and ensure that school was free and obligatory for children under the legal working age. Yet to date this plan has not been sufficiently financed and implemented.⁵⁶

The DRC governmental organization Service d’Assistance et d’Encadrement de l’exploitation Minière à Petite échelle (SAEMAP), formerly the Service d’Assistance et d’Encadrement du Small Scale Mining (SAESSCAM), is charged with regulating the ASM sector. It also supports the formation of mining cooperatives, seeks mining investment, and negotiates the sale of minerals. Yet a number of reports point to SAEMAP’s shortcomings in executing its more comprehensive missions.⁵⁷ The organization lacks the financial resources and thus the basic capacity to monitor the thousands of artisanal miners in the country with respect to WFCL. A 2013 PricewaterhouseCoopers audit was critical of SAESSCAM/SAEMAP’s performance. It found that the organization lacked a strategic plan, as well as human and logistical resources. Furthermore, the operational priority seemed to be collecting taxes.⁵⁸

Underlining the stated goal of “‘Zero’ presence of children in the mineral supply chain in DRC by 2020,” the mission of the “DRC inter-ministerial commission to stop child labour in mining by 2020”⁵⁹ is to:

1. “Ensure the coordination and facilitate the actions of the different initiatives to put an end to child labour in mines and on mine sites in DRC;
2. Work as the government advisor, follow-up and monitoring body alongside competent Ministries and Services in charge of issues regarding child labour in mines and on mine sites;
3. Conduct advocacy work among third parties (OECD, CCCMC, UNICEF, ILO (International Labour Organization and International Labour Office), CFSI, etc. ...).”

The commission has five stated objectives, of which the third – “3. *Strengthen the application of measures to remove children from mineral supply chains, with priorities being within the 3T and Copper and Cobalt sectors*” – targets exposed children. It is comprised of the following DRC organizations and partners:

1. Ministry of Mines
2. Ministry of Employment, Labour, and Social Planning
3. Ministry of Gender, Family and Children
4. Ministry of Social Affairs
5. National Committee for the fight against the worst forms of child labour (CN-PFTE)
6. Provincial authorities and their provincial governments
7. Inter-ministerial Commission/Child labour monitoring
8. Chamber of mines/Congo Business Federation (FEC)



In the way of a path forward, the *Triennial Action Plan of the Interministerial Commission responsible for addressing the issue of child labour in mines and on mine sites in DRC (2017-2020)* was issued. This plan of action has, however, yet to be officially adopted by the government. Furthermore, as 2020 approaches, the DRC government has pushed back the pledge to end child mining to 2025.

A pragmatic approach was put forward by Richard Muyej, the governor of the Lualaba province. The province is regulating some of the informal activity by cordoning off a mining area, allowing only adult men into the mining zone. In Kolwezi, the capital of Lualaba province, “each morning, miners line up at security gates, where officials check their identity and provide some basic safety gear.”⁶⁰ The province was reportedly planning to scale up this model with 12 more sites. However, in spite of valiant efforts to cordon off mining areas for safety reasons and to “keep out” children, thousands of children work in the cobalt sector outside of these “green” zones.

In its amended form, revised in 2018, the Mining Code also makes provisions for companies to support community development projects with a minimum of 0.3% of the turnover per the financial year.⁶¹

7. Past due diligence performance and disclosure

After the 2016 Amnesty International report *This is what we die for* was released, the cobalt sector woke up to the fact that the issue was now solidly in the public domain. When interviewed, some companies pleaded ignorance:

When asked in September 2016, Chen Hongliang, the president of Congo Dongfang Mining International (CDM) parent Huayou Cobalt, told the Washington Post that his company had never questioned how its minerals were obtained, despite operating in Congo and cities such as Kolwezi for a decade. “That is our shortcoming,” Chen said in an interview in Seattle, in his first public comments on the topic. “We didn’t realize.”⁶²

Yet such “blind” purchasing practices did not go unnoticed – even within the market. Following news reports on the procurement practices of Zhejiang Huayou Cobalt, its customer Yantai Cash was under scrutiny. Fellow members of the London Metal Exchange (LME) raised the alarm that untraced cobalt originating from DRC mining operations that employed children was undercutting the market of “clean” cobalt.⁶³ Subsequently, the LME launched an investigation of Huayou’s cobalt links to child labour. Liu Xiaohan, manager of the international trade department at Yantai Cash, stated at the time that the company has “just started to set up a responsible management system and has not yet completed supply chain traceability.”⁶⁴

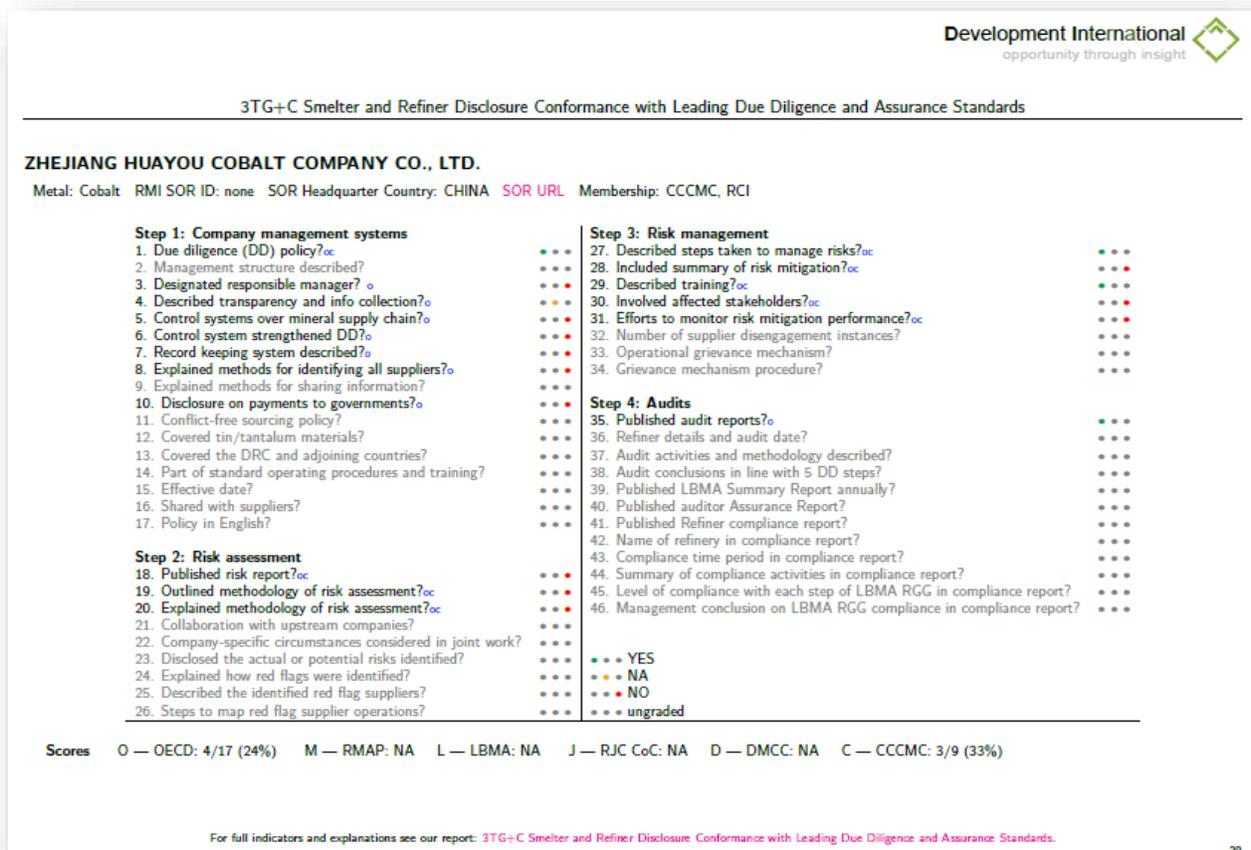
The degree to which the world’s 38 largest cobalt refiners conformed to the OECD and CCCMC due diligence frameworks in 2017 was revealed in a 2018 Development International e.V. assessment.⁶⁵ The study notably found that:



1. There was insufficient enforcement through the assurance mechanisms on the part of leading standard-setting bodies;
2. Very few refiners had adhered to the *OECD DDG*;
3. With few exceptions, refiners did not report controlling for salient risks, including WFCL, in their supply chains.

Individual scorecards for each assessed cobalt refiner were also issued by Development International e.V., one example thereof the scorecard of cobalt refiner *Zhejiang Huayou Cobalt Company Ltd*, replicated in *Figure 3*. Their combined OECD conformance score was 24%, having only met four of the seventeen disclosure criteria, and their combined CCCMC conformance score was 33%, having met one third of that standard’s disclosure criteria.

Figure 3: Scorecard of Cobalt Refiner Zhejiang Huayou Cobalt Company Ltd, published in 2018



Source: Development International e.V., [SOR Scorecards](#)



8. Examples of upstream responsible cobalt production initiatives

ERG's Clean Cobalt Framework:

The Eurasian Resources Group's (ERG)⁶⁶ new greenfield, tailings re-treatment project located near Kolwezi (named the *Metalkol RTR project*) aims to “reprocess cobalt and copper tailings previously deposited in the Kingamyambo Tailings Dam and Musonoi River Valley,” which, at full capacity, “will supply 24,000 t/y of cobalt to the global market, volumes sufficient to power more than 3 million electric vehicles per year.”⁶⁷ In a bid to produce cobalt “responsibly and to address risks associated with human rights infringements and unethical business practices, in particular child labour,” ERG developed the Clean Cobalt Framework.⁶⁸

Levin Sources, which supports ERG in this work, characterizes the Framework as a “forward-looking, achievable mission and vision for the sustainable production of cobalt and aims to deliver positive outcomes by pursuing seven goals.” To this end, “Levin Sources helped develop a Chain of Custody (CoC) procedure and the selection of a data management system which enhances data management for each material batch and reassures customers that standards are upheld. Levin Sources also updated Metalkol RTR's ASM Management Plan which helps advance ERG's commitment that it does not source from ASM.” In addition, ERG plans to pilot a blockchain-based solution to trace cobalt originating from the Democratic Republic of the Congo (DRC).⁶⁹

Trafigura / Chemaf Responsible Sourcing:

Chemaf is a mineral exploration, mining and processing company in DRC that is receiving support through its customer Trafigura “in building the company's ability to manage social and environmental impacts across its operations.”⁷⁰ Specifically, in developing its “Mutoshi concession, initially through the appointment of an artisanal and small-scale mining (ASM) contractor, Trafigura engaged internationally respected NGO PACT in January 2018, to support Chemaf in the ongoing maintenance of a Responsible Mineral Sourcing programme in line with Trafigura's standards.” Prior to that, in exploring a commercial partnership with the company, Trafigura had, in July 2017, initiated a review of Chemaf “conducted by third-party assessor Kumi Consulting, examining Chemaf's operations against Trafigura's Responsible Sourcing standards. The review examined Chemaf's operational facilities on the outskirts of Lubumbashi, and incorporated Mutoshi, a then dormant mine in Kolwezi, that Chemaf sought to develop.”



9. Collective action responses

A. Cobalt due diligence initiatives

Responsible Minerals Initiative (RMI):

In 2017, alongside its work and tools in the 3TG space, the Responsible Minerals Initiative (RMI) added cobalt as a dedicated focus area, providing tools and resources to enable companies to conduct due diligence on cobalt supply chains.

To support companies' efforts to map their cobalt supply chains, through ongoing research the RMI identifies "crude" and "fine" cobalt refiners.⁷¹ The list of fine cobalt refiners is publicly available and is updated regularly.⁷² The list of crude refiners is available to RMI members only.

To help companies identify the refiners in their supply chain, the RMI has published the Cobalt Reporting Template (CRT),⁷³ which mirrors the widely used Conflict Minerals Reporting Template (CMRT). The CRT, in turn, is supported by other 3rd party vendors such as iPoint's Conflict Minerals Platform.

In 2018, the RMI, together with CCCMC and the Responsible Cobalt Initiative (RCI), developed the Pilot Cobalt Refiner Supply Chain Due Diligence Standard.⁷⁴ The standard was designed to align with the OECD Due Diligence Guidance and includes minimum requirements for fine refiners, crude refiners ("treatment units"), artisanal as well as mechanized mining sources. Using this Standard, the RMI has added cobalt refiner assessments to the scope of the Responsible Minerals Assurance Process (RMAP).⁷⁵ Applying its RMAP process, the RMI has started the cobalt assessments on fine refiners, to date with one (1) conformant and eight (8) active refiners participating. Cobalt fine refiners" that are actively participating in the RMAP assessments undergo the independent third-party audit against the Cobalt Refiner Supply Chain Due Diligence Standard and are publicly listed.⁷⁶

Cobalt is furthermore integrated in the RMI's Risk Readiness Assessment (accessible to members only), where cobalt refiners complete a self-assessment on their performance across 31 social, environmental and governance issue areas.⁷⁷

In its *e-learning Academy*, the RMI offers webinars on cobalt supply chains and how to conduct due diligence for cobalt.⁷⁸ The organization also provides member tools for conducting outreach to cobalt crude and fine refiners in the supply chain.

Initially developed for tin, tantalum, tungsten and gold (3TG), the RMI is also in the process of integrating cobalt in its 2019 Risk Management Protocol. This protocol is geared towards helping companies identify, assess and mitigate specific incidents and risks in their supply chains.



Cobalt Institute (CI):

The Cobalt Institute (CI) is a non-profit trade association comprising 20 major LSM cobalt producers that represent over 70% of mined production globally. CI members sign a code of conduct featuring 7 principles that promote human health, the environment, and upholding human rights. According to their website, “Downstream companies purchasing cobalt products from a CI member company have the assurance that these products are produced with the highest ethical standards. Company policies and codes of conduct stress a zero tolerance policy for child, forced or compulsory labour.”⁷⁹

In addition, the CI launched the Cobalt Industry Responsible Assessment Framework (CIRAF), in which participants assess whether nine (9) potential risks are material to their cobalt operations and supply chain where applicable, and demonstrate, through annual public reporting, the presence of a policy and due diligence management system as well as existing responsible production / sourcing standards they are applying.⁸⁰ Child labour is featured as one of the nine risk areas.

Responsible Cobalt Initiative (RCI):

In response to the identified issues in the cobalt-based supply chains, the Responsible Cobalt Initiative (RCI) was launched in November 2017 at the UN Forum on Business and Human Rights in Geneva.⁸¹ The initiative is currently chaired by the China Chamber of Commerce of Metals, Minerals & Chemicals Importers & Exporters (CCCMC) and at present has one corporate member.

The RCI has stipulated three goals:

- Goal 1: Align downstream and upstream companies’ supply chain policies to OECD/CCCMC Guidelines to increase transparency in the cobalt supply chain and improve supply chain governance capacity;
- Goal 2: Take and/or support actions on the ground based on the risks found in the supply chain to address adverse impacts;
- Goal 3: Develop a communication strategy to communicate progress and results effectively to impacted communities, miners, and the public; to harmonize working objectives and plans with other stakeholders.⁸²

Specifically concerning child labor, the RCI declared: “As a priority, the RCI intends to address the issues of the worst forms of child labor.”⁸³

The RCI also participated in the jointly developed audit standard along with RMI and CCCMC used for cobalt refiner assessments. Designed to align with the OECD Guidance, relevant audit criteria include that cobalt refiners conduct risk assessment “on all cobalt material sourced” and that they avoid cash transactions where practicable.⁸⁴ Meanwhile, RCI, in partnership with



the NGO PACT, reportedly provided support to the "DRC inter-ministerial commission to stop child labour in mining by 2020."

Global Battery Alliance:

Worth \$65 billion in 2015, and instrumental in the fourth industrial revolution, the Global Battery Alliance hones in on the battery supply chain, and lithium-ion batteries in particular.⁸⁵ Its mission is to catalyse, accelerate and scale-up action and public-private collaboration towards an inclusive, innovative, and sustainable battery value chain. At the time of writing, the Alliance comprised 43 partners, including governmental, corporate, civil society, and academic members.

B. Monitoring and audit initiatives

Formalized, legal supply chains have a multitude of positive effects on a country's governance and economic performance. In order to demonstrate legality, audits, permanent mine site monitoring (for ASM as per RMAP standard) and determination of origin and/or traceability are integral.⁸⁶

Audits remain, generally speaking, at the core of supply chain engagement. For example, upon significant media attention,⁸⁷ as of 2017 Apple has treated cobalt as a "conflict mineral" – although the mineral has not been linked to conflict *per se* – in the sense that the company applies the same due diligence processes to cobalt as it does to 3TG. Apple also reports that 100% of its cobalt refiner partners are now participating in independent third-party audits.⁸⁸ SDI Samsung reports it also has a cobalt refiner audit policy, and that 21% of cobalt refiners in its supply chain have performed such audits, while another 16% planned to do so in 2017.⁸⁹ A number of downstream companies including SDI Samsung, Apple, Sony, BMW, and Dell have also made public a list of cobalt refiners in their respective supply chains.

There are pilot projects that aim to control access to ASM sites. For example, Congo Dongfang Mining International (CDM), a subsidiary of Huayou Cobalt, claimed they sourced child labour-free cobalt from "model mines" by principally by operating a cordoned-off cobalt mining area (inside the "Muyej Wall" in Kasulo). Access control is a key determinant to successfully run a controlled ASM site where working conditions can be measured. Such cases include CDM's Kasulo site and Chemaf's Mutoshi site, which were fenced off to allow ASM to occur in a controlled environment.⁹⁰

While these efforts represent steps forward, one must consider the sourcing practices of the companies outside of the confines of these efforts. For example, CDM also simultaneously bought non-certified artisanally-mined cobalt *en masse*, as was featured in a CNN documentary.⁹¹ Hardly any controls exist over the myriad purchasers of cobalt in the DRC's open market where most of the tainted cobalt is sold.



RCS Global:

RCS Global serves as a supplier of audits and Corrective Actions Plan (CAP) manager in the cobalt ecosystem, and operates audit teams at every key point of the cobalt mine to market supply chain (i.e. DRC, China/Asia, Europe, and the US). Supported by industry associations and individual downstream and upstream companies, the audit program is currently the principal form of assurance applied throughout supply chains, from OEMs to mine. Covering all *Drive Sustainability*⁹²-designated high-risk minerals and metals, it adds value particularly in battery metals relevant to the EV battery supply chain.⁹³ RCS Global's audit program is testament to an increasing amount of downstream companies looking beyond tier 1, with leading companies applying their assurance frameworks all the way to the mine site.

Better Mining (formerly Better Cobalt):

In support of *continuous improvement* of ASM sites in the DRC, RCS Global established the Better Mining mine monitoring program (launched as Better Cobalt in cobalt, now scaled to 3TG mine monitoring). It employs technology and trained field agents to monitor the working and living conditions in and around ASM sites. The program collects and shares with its data subscribers time-relevant risk data, including on child labor, along with risk mitigation recommendations in the form of monthly Corrective Action Plans (CAPs). The CAPs, in turn, are monitored for implementation.

In cobalt, Better Mining was launched in-country in June 2018 with the support of the Lualaba province government.⁹⁴ After a 6-month pilot phase, the project was extended by a further 18-month term with the support of Huayou Cobalt, Volvo Cars, and other downstream companies.⁹⁵ The Better Mining digital monitoring system is currently deployed to eight (8) key ASM sites, three of which are cobalt ASM sites.⁹⁶ It has furthermore conducted a sector-wide mapping of ASM sites to inform scaling of the program. As such, it is not offering traceability services but rather fulfils risk mitigation and impact ends.

C. Cobalt traceability: chain-of-custody solutions

Knowing the provenance of a material is the first step towards due diligence. A distinct caveat concerning traceability schemes, however, is the risk that they could be seen as a market access/domination tools. In fact, to some Congolese observers, the very “introduction” of the child labour issue is a cover for western interests to interfere in the Chinese cobalt procurement.⁹⁷

While solutions such as blockchain enable supply chain traceability, they rely on chain-of-custody and monitoring system in the upstream supply chain, for example, in the form of a “tag-and-bag” system. Not having a robust on chain-of-custody system in place leaves one vulnerable for manipulation, or produces GIGO (garbage in, garbage out).⁹⁸ Most existing “tag-and-bag” systems focus on ASM supply chains. Major LSM actors rely on their own systems, e.g. Umicore,



which uses a pen & paper system that has been in place since the company exported Copper and Cobalt out of the DRC over 100 years ago.

MineralTrace (Industrial):

A technological chain-of-custody solution for cobalt traceability from mine to Smelter/Refiner (SOR) is offered through MineralTrace (Industrial), which addresses both types of production: ASM and LSM.

1) The ASM implementation supports digital secured tags which are not subject to simple falsification as they include digital signatures. The offline support function is a critical feature in remote areas. Another particular benefit of this system is that it incorporates official bodies such as the local government which increases their tax base and leads to a better governance regime in the areas as they are better funded and can benefit from ASM mining activities. This solution has been implemented for Gold in Kampene, Maniema province, through a BGR project.⁹⁹ Since, this solution has also been extended to cover cobalt.

2) The LSM implementation, MineralTrace (Industrial), provided by ibes¹⁰⁰ and iPoint-systems, focuses on industrial mining companies exporting minerals from CAHRAs. This chain-of-custody system covers the complete upstream supply chain, mine to smelter. The combination of hardware-based traceability, including digital bagging technology and GPS tracking, with analytical software including incident management, anomaly detection such as weight or truck route deviation, monitoring and reporting capabilities with reports (e.g. on the OECD Annex II for smelters and customers or tax reports for Provincial Ministry of Mines) contributes to the implementation of the OECD DDG.

D. Cobalt traceability: blockchain solutions

As a secure and distributed digital ledger, blockchain technology has garnered much attention and initial traction also in the context of cobalt traceability.¹⁰¹ While the application indeed holds promise, (a.) such systems are only as good as the data that enters the blockchain, (b.) they are subject to market demand, and (c.) are constrained by the capacity of upstream market actors.

Responsible Sourcing Blockchain Network (RSBN):

RCS Global and IBM launched the Responsible Sourcing Blockchain Network (RSBN),¹⁰² which offers mine-to-market traceability and validation in the LSM space, along with responsible sourcing practices verification.¹⁰³ Starting “with a pilot focused on cobalt, the project will “explore the creation of an open, industrywide blockchain platform that could ultimately be used to trace and validate a range of minerals used in consumer products.”¹⁰⁴ Participating companies



include Volkswagen AG, Ford Motor Company, Huayou Cobalt, IBM, and LG Chem, and is open for further participation.¹⁰⁵

SustainBlock:

Piloted in a tungsten supply chain originating in Rwanda, yet generally applicable to minerals, SustainBlock demonstrates the value of blockchain in mineral traceability. “Led by supply chain sustainability systems provider iPoint-systems, the project implements the BetterChain framework [...] to unlock value from upstream due diligence data and generate incentives for responsible procurement of minerals from CAHRAs.”¹⁰⁶

E. Population-based interventions

On-the-ground efforts with a focus on child labour include the following initiatives.

Glencore / KCC / Katanga / Mumi:

The companies Kamoto Copper Company (KCC), Katanga and Mumi, partially owned by Glencore, have funded economic diversification projects. Run by local cooperatives, these projects assist families, through alternative livelihood programmes, to generate incomes required to pay school fees for children and provide acceptable living conditions such that the children are not compelled to work in mines. “The projects include developing skills in agriculture, welding, carpentry and catering,” which, in 2018, “provided training and business development to over 4,000 people.”¹⁰⁷ Katanga and Mumi work also organise a summer camp for children each year, which prevents idleness that also drives them into the mines. “In 2018, over 9,000 children participated in the camps and there was a notable drop in the number of children participating in ASM activities.”¹⁰⁸

Cobalt For Development:

Implemented by the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) and funded by BMW, BASF, and Samsung SDI, a pilot project targeting one ASM mine over three years aims to “improve working and living conditions in areas where cobalt is extracted using manual labor.”¹⁰⁹ Through the professionalization of ASM and support to ASM communities, the project “seeks to contribute to identifying workable solutions that lead to better working conditions at the mine site.”¹¹⁰

Combatting Child Labor in the Democratic Republic of the Congo’s Cobalt Industry:

An initiative addressing child labour in DRC ASM cobalt mining, the USDOL-funded, PACT-implemented project “supports key stakeholders to develop and implement strategies to reduce



child labor and improve working conditions in artisanal and small-scale mines as well as in the broader cobalt supply chain.”¹¹¹ More specifically, it “works to reduce child labor in the cobalt supply chain by supporting efforts to raise awareness of the challenges and opportunities to combat child labor, build the enforcement capacity of government and other relevant stakeholders, and improve private sector monitoring and remediation of child labor violations in the cobalt supply chain.”¹¹²

Education to counter child labor:

In addition to its own Human Rights Respect System (a risk-based audits and improvement measures programme that seeks to avoid human rights violations in its supply chains), until 2022 Daimler is funding a community-level project in Kolwezi DRC that fosters school attendance and economic livelihoods.¹¹³ Implemented by Good Shepherd International Foundation (GSIF, also known as Bon Pasteur), the joint project rests on five pillars:

1. “The creation of alternative livelihoods, especially for women, e.g. by creating sustainable agriculture projects or work as seamstresses or tailors.”
2. “Bon Pasteur creates safe spaces in the communities for young girls and women, where they are protected from violence and exploitation and have access to educational programs and health care.”
3. “Another focus of the project is to encourage children to give up working in the mines and attend school. They are cared for through age-appropriate programs lead by social workers, teachers, psychologists and nurses.”
4. “The fourth pillar of the project aims to strengthen local communities for greater cohesion among the local population.”
5. “The fifth pillar assists the personnel and material resources of GSIF-Bon Pasteur in Kolwezi, so as to implement the project effectively and monitor changes on a sustainable basis.”¹¹⁴

Previously, in 2017, the Bon Pasteur Alternative Livelihood Programme in Kolwezi, DRC, had been supported by ERG.¹¹⁵

II. Due Diligence Standards

OECD:

The first supply chain due diligence standard applicable to the mining context to emerge after an extensive public consultation process was produced by the OECD, first released in 2011. The 5-step due diligence framework “OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas”¹¹⁶ has since become a fulcrum in the mineral-trading business sector. It was, for example, cited by the U.S. Security and Exchange Commission (SEC) in its Final Rule¹¹⁷ pursuant to Dodd-Frank Section 1502. To date it remains the only internationally recognised due diligence framework with which public companies issuing



stock in the U.S. need to carry out mandated due diligence for the so-called “conflict minerals” gold, tin, tantalum and tungsten.¹¹⁸ Section 1 of Annex II (Model Supply Chain Policy) specifically calls out WFCL as one of five “serious abuses” and references ILO Convention 182 (work performed “*which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children*”).¹¹⁹

CCCMC:

Starting with an MOU – “China-OECD Medium Term Vision and Action Plan for 2015-2016” – the CCCMC and OECD reached an accord to develop Chinese due diligence guidelines, culminating in the “Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains”¹²⁰ issued in 2016 (hereafter Chinese DDG). Inspired by the OECD due diligence guidance, the Chinese DDG applies “to all Chinese companies which are extracting, trading, processing, transporting, and/or otherwise using mineral resources and their related products and are engaged at any point in the supply chain of mineral resources and their related products.”¹²¹ The guidelines identify serious risks in the minerals markets, and stipulate due diligence procedures, transparency, and assurance measures for all SORs. Included in “Type 1 Risks” – *Risks of contributing to conflict and serious human rights abuses associated with extracting, trading, processing, and exporting of resources from conflict-affected and high-risk areas* – are the worst forms of child labour.¹²²

The Chinese DDG further explains in the section VI. *Warning Signs* (page 25):

Companies are encouraged to stay engaged in conflict-affected and high-risk areas and engage suppliers to manage or mitigate risks. If in the process of doing their supply chain due diligence “warning signs” emerge, and/or risks have been identified at any point along a supply chain there are several options available to companies to help them manage or mitigate these risks with the suppliers. These options include:

- 1. continuing trade throughout the course of risk mitigation efforts,*
- 2. temporarily suspending trade while pursuing ongoing risk mitigation,*
- 3. disengaging with a supplier either after failed attempts at mitigation or where the company reasonably deems mitigation not feasible or the risks unacceptable.*

With respect to public reporting, the Chinese DDG stipulates that companies publicly report on the following items:

1. "their supply chain due diligence policies"
2. "their supply chain due diligence practices"
3. "identified risks"
4. "steps taken to mitigate these risks"¹²³

The CCCMC has, in its due diligence guidance for Chinese companies, thus issued similar guidance to that of the OECD, however being less prescriptive about what particular mitigation measures market actors should take, and being less detailed about specific disclosure items that would be made public.



III. Methods

1. Study design

This research conducted a cross-sectional evaluation of the 52 largest industrial cobalt refiners in the world at a specific point in time. These companies, not differentiating between crude or fine cobalt refining operations, are listed in Appendix B.

2. Data

The data collected in this study were drawn from publicly-available sources, collected between April 15, 2019, and June 6, 2019. Each cobalt refiner's website was individually accessed (where available) to retrieve the disclosures as per the OECD DDG and CCCMC. For the purposes of this assessment, the investigation looked for specific mentions of "child labour" (or "child labor") on the websites themselves, including PDFs and other content.

3. Evaluation framework

The *OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas* (DDG) is an internationally-recognised due diligence framework and serves as the principle standard for other guidance, e.g. that of the CCCMC.¹²⁴ The Evaluation Framework applied in this study – copied in Appendix C – is based on the disclosure charge as stipulated in Annex I Step 5,¹²⁵ and further laid out in "STEP 5: REPORT ANNUALLY ON SUPPLY CHAIN DUE DILIGENCE" of the Gold Supplement, as well as the 3T Supplement.¹²⁶ For the purposes of this study, we assess whether the following items exist, as per the DDG, in each cobalt refiner's public information:

1. a policy that addresses child labour or WFCL (OECD DDG STEP 1);
2. a risk discussion vis-à-vis child labour (OECD DDG STEP 2); and
3. information about the manner with which it addresses this risk (OECD DDG STEP3).

4. Definition of key terms

Child labour

For the purpose of statistical measurement, as per ILO,¹²⁷ children engaged in child labour include all persons aged 5 to 17 years who, during a specified time period, were engaged in one or more of the following categories of activities:

1. Worst forms of child labour,
2. Employment below the minimum age, and
3. Hazardous unpaid household services.



WFCL

Based on Article 3 of ILO Convention No. 182,¹²⁸ the *worst forms of child labour* comprise:

1. All forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom, as well as forced or compulsory labour, including forced or compulsory recruitment of children for use in armed conflict;
2. The use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances;
3. The use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in relevant international treaties; and
4. 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.

5. Research team, competing interests statement

The research was conducted by Anthony Cooper, with Dr. Chris N. Bayer serving as the study's Principal Investigator. The data were collected solely by this evaluation team. The evaluation team was remunerated by Development International (DI), a wholly independent, not-for profit organization registered in Germany.

The study's Principal Investigator and research team declare that they have no competing interests, nor conflict of interests, in their execution of this evaluation. They do not knowingly own stock or other forms of equity in any evaluated company or in the entities making up the study's Stakeholder Forum. Neither DI nor the project team members provide services to any of the due diligence programs evaluated. In sum, they had no known vested interests vis-à-vis the findings of this study.

6. Peer review

The Stakeholder Forum of the study functions as a peer review mechanism that offers critique of the study's draft report. The Forum, however, had absolutely no involvement in data collection or evaluation. Findings, conclusions, and any errors are fully DI's responsibility. Furthermore, participation in the Stakeholder Forum is not an endorsement of the report or its findings.

The following nine individuals served as peer reviewers on the study's Stakeholder Forum, in addition to two anonymous reviewers:

Elise Groulx Diggs	Doughty Street Chambers
Gregory Mthembu-Salter	Phuzumoya Consulting
Katie Boehme, PhD	iPoint-systems gmbh



Lawrence Heim	Elm Sustainability Partners
Lew H. Diggs	Business Integrity & Partners
Maroye Marinkovic	CircularTree
Mike Loch	Responsible Trade LLC
Nene Morisho	Pole Institute
Sebastian Galindo	iPoint-systems gmbh

IV. Findings

1. In-scope cobalt refiners

This study included in its sample frame the world’s main industrial cobalt refiners. As a first inclusion criterion we selected cobalt refiners that are party to a recognised standard-setting body and/or assurance system. Secondly, we consulted lists of cobalt refiners, including that published by the RMI,¹²⁹ the *Global and China Cobalt Industry Report, 2017-2021*,¹³⁰ the LME.¹³¹ Additional large cobalt refiners were identified through a desktop review of other information. Cross-referencing the lists, we established a set of 52 cobalt refiners (both fine and crude cobalt refiners as per the RMI taxonomy) which we consequently assessed. Of those 52 cobalt refiners, websites were located for 48 of 52 cobalt refiners, though one of those 48 websites (for Zhuhai Kelixin Metal Materials Co., Ltd.) was located but appears inoperative ('website broken').

Further, some of these refiners appear to be connected under one umbrella company. Those include a grouping of Mopani (Zambia), with ties to Chambishi, also in Zambia. The Jinchuan group, including Jinchuan Group Co Ltd., Jinchuan Nonferrous Metals Corp., and Lanzhou Jinchuan Advanced Materials Technology Co., Ltd. Further, the Belgian refiner Umicore is connected to Ganzhou Yi Hao Umicore, while Norilsk Nickel Harjavalta Oy is a subsidiary of the Russian company PJSC MMC Norilsk Nickel. That results in 42 unique legal entities with available websites that were consequently evaluated. The countries in which the cobalt refiners are located are listed in *Table 2* below. Thirty cobalt refiners are located in China.

Table 2: Country of cobalt refiner location

<i>Country of cobalt refiner</i>	<i># of refiners</i>
Australia	2
Brazil	1
Belgium	1
Canada	2
China	30
Democratic Republic of Congo	3
Finland	2
India	1



Japan	1
South Korea	2
Morocco	1
Norway	1
Russia	1
Uganda	1
United States	1
Zambia	2

2. OECD DDG Step 1: WFCL-related policies

Companies aligning themselves with the OECD DDG will have “Set out the company’s supply chain due diligence policy,”¹³² which, given the presence of an ANNEX II adverse impact, would necessitate the inclusion of a discussion regarding the issue of WFCL in ASM.

Based on a review of their public reporting, there were six (6) companies in total with policies referencing child labour (that either reference child labour in their code of conduct, or have a labour policy which mentions prohibitions on child labour):

1. Ganzhou Tengyuan Cobalt New Material Co., Ltd.
2. Ganzhou Yi Hao Umicore Industry Co.
3. Glencore Xstrata Plc.
4. Guangdong Jiana Energy Technology Co., Ltd.
5. Vale Canada Ltd.
6. Zhejiang Huayou Cobalt Company., Ltd.

Two other refiners located in China reflected some understanding about human rights in their operations and supply chains, but neither makes explicit mention of child labour. The Jinchuan group of companies discusses the health and safety of workers and even includes a fatigue policy,¹³³ yet fails to discuss child labour.

Lastly, a cobalt refiner located in the DRC (Shalina Resources Ltd) made no explicit mention of child labour, yet has a conflict mineral policy that approaches OECD guidelines. However, that policy makes explicit mention of Tantalum, Tungsten, and Tin while failing to make mention of Cobalt.

3. OECD DDG Step 2: Disclosure of actual or potential risks

According to the DDG, companies in minerals supply chains are to “disclose the actual or potential risks identified” (OECD p. 112) and to “Publish the risk assessment with due regard taken of business confidentiality and other competitive concerns” (OECD p. 52).¹³⁴ We therefore assessed whether the in-scope companies disclosed the actual or potential risks identified vis-à-vis WFCL in ASM.



Of the 42 cobalt companies reviewed, two (2) specifically discussed child labour in the body of their websites, namely Ganzhou Yi Hao Umicore Industry and Glencore Xstrata. They however stopped short of linking their own supply chain to the specific risk at hand, or describing this risk with specificity. In fact, no evaluated company disclosed the actual or potential risk of child labour or WFCL in their supply chains.

Whether the lack of transparency is also a lack of substantive awareness and action taken on the issue is not conclusively discernable, but it correlates with the lack of governance over – and subsequently accountability of – refiners sourcing cobalt from the DRC.

Table 3: Number of companies that reference “child labour” in their websites

<i>Country of cobalt refiner</i>	<i>Child labour referenced in body of website</i>
Australia	0/2
Brazil	0/1
Belgium	0/1
Canada	0/2
China	1/30
Democratic Republic of Congo	0/3
Finland	0/2
India	0/1
Japan	0/1
South Korea	0/2
Morocco	0/1
Norway	1/1
Russia	0/1
Uganda	0/1
United States	0/1
Zambia	0/2

4. OECD DDG Step 3: Description of steps taken to manage risks

The DDG further stipulates that adhering companies “Describe the steps taken to manage risks,” as well as include “a summary report on the strategy for risk mitigation in the risk management plan” (OECD p. 52, p. 112).

However, not one of the 42 cobalt companies had such relevant reporting concerning child labour in the cobalt sector in line with the OECD DDG, namely, going beyond a statement against Child Labour, and describing steps taken to manage the risks of child labour.



While Ganzhou Yi Hao Umicore Industry Co. and Glencore Xstrata make explicit mention of child labour on their websites, the former goes no further than committing to eradicate child labour from its supply chain, without putting forward a mitigation plan or manner with which this objective is to be realised. Glencore does no better, stating numerous times that they are opposed to child labour, even going so far as to reference their various international commitments, and recognising that child labour exists in artisanal mining. Yet a robust policy and plan for mitigating this risk is not provided.

Four other cobalt refiners, three located in China (Zhejiang Huayou Cobalt Company Co., Ltd., Ganzhou Tengyuan Cobalt New Material Co., Ltd., and Guangdong Jiana Energy Technology Co, Ltd.) and one in Canada (Vale Canada Ltd. / Vale Inco Ltd.), have labour policies linked on their websites that each contain statements regarding the prohibition of child labour. However, again, there is no description of the steps taken to manage risk.

V. Recommendations

Until certification standards become more robust, and large-scale interventions are taken to significantly reduce WFCL from artisanal mining, the human rights crisis is ongoing, and should be considered severe.

1. Measurement of hazardous child labour in the cobalt sector

Evidence-based policy, informed by quality research, must guide relevant interventions in the DRC's two main cobalt-producing provinces. The DRC requires support in scientifically and longitudinally measuring the nature and extent of the issue at hand (the only scientific survey to date was conducted by a U.S. university). To that end, capacity building to roll out future rigorously-designed population-based studies applying the definitions of ILO Convention 182 to the context of cobalt mining is needed. Furthermore, the measurement of the various types of hazardous labour and workplace exposure – which the CEGA study did not undertake – may lead to the setting of national guidelines for children in the mining context, as it did e.g. in Ghana and Côte d'Ivoire in the cocoa sector. Further applied monitoring may also take into account the public health ramifications of cobalt mining.

2. On-the-ground, industry-led WFCL-control measures in cobalt production

While the *Interministerial Commission responsible for addressing the issue of child labour in mines and on mine sites in DRC* was created, and various projects have been implemented e.g. by PACT and Good Shepard, many years have passed since the full-scale emergence of the DRC's ASM cobalt without systematic, coordinated, child-focused interventions that have gone to scale. Cobalt stakeholders would be well served to learn from cost-effective anti-WFCL enforcement as carried out in other developing countries, in particular those which leveraged largely existing resources and mobilized stakeholders for targeted interventions. Community-based child-labour



monitoring systems (CLMS) leverage existing skills, capacity, and social capital towards the mitigation of WFCL (e.g. as was practiced in controlling for WFCL in the cocoa sector of Ghana).¹³⁵ Such systems are also envisioned for WFCL in cobalt mining communities. Furthermore, the intensity of WFCL – through the application of a WFCL index measure – detects warning signs of extreme exposure and can be used to trigger WFCL withdrawal interventions.

3. Independently verified certification and traceability schemes

While there are established initiatives that monitor the health and safety of cobalt workers and report child labor, e.g. Better Cobalt or the Chemaf Responsible ASM pilot project, monitoring is far from scaled or systematically covering the necessary geography. Resources are required to take existing models to scale by expanding capacity and coverage. Monitoring tools including incidence reporting and resolution, as well as the promotion of miner health and safety, apply to ASM cobalt mining.

4. Meaningful and impactful WFCL due diligence on the part of cobalt refiners

With regard to supply chain due diligence, promising third party initiatives include the CI launching CIRAF, CCCMC establishing the RCI, and RMI providing due diligence information and tools. However, this assessment reveals a lack of performance at the cobalt refiner level, notably evidenced by the general disregard for the due diligence guidance as per the OECD and CCCMC. If the OECD's Due Diligence Guidance and the CCCMC guidance was being followed, cobalt refiners would be reporting, as per STEP 5, on their due diligence and risk mitigation vis-à-vis child labour in cobalt production. The cobalt-based industries would do well to ensure that independent oversight is situated at the production level and at critical points along the supply chain. Furthermore, a full embrace of robust due diligence systems and practice of WFCL risk mitigation are strongly advised.

5. Clarification on cobalt classification as per the OECD DDG

Clarification, on the part of OECD Secretariat, whether cobalt should be treated under the Gold or the 3T Supplement of its Due Diligence Guidance, would be helpful for cobalt refiners aspiring to be OECD DDG conform.

6. LSM engagement of ASM

Large scale cobalt mining has the larger market share compared to ASM, yet the entire cobalt industry now suffers from the associated reputational risk. Therefore, it could be in the self-interest of also the LSM cobalt industry to contribute resources and solutions to the issue at hand. As an example of what can be done, Huayou reportedly checks the issue of child labour at its old industrial sites, where artisanal miners must receive permits to operate. LSM operators



would do well to consider their CSR's obligations (community engagement, acquiring a social license to operate), their legal obligations (adhering to the new mining code, i.e. paying 0.3% of turnover for community development projects) as well as their legitimacy obligations (meeting OECD guidelines).



Appendix A: List of Acronyms

3TG	Tin, Tungsten, Tantalum and Gold
ASM	Artisanal and Small-scale Mining
BSP	Better Sourcing Programme
CAHRA	conflict-affected and high-risk area
CAP	Corrective Action Plan
CCCMC	China Chamber of Commerce of Metals Minerals & Chemicals Importers & Exporters
CDM	Congo Dongfang Mining International
CEGA	Center for Effective Global Action
CFSI	Conflict-Free Smelter Initiative (now RMI)
CI	Cobalt Institute
CIRAF	Cobalt Industry Responsible Assessment Framework
CLMS	Child Labour Monitoring System
CoC	Chain-of-Custody
CRT	Cobalt Reporting Template
DRC	Democratic Republic of the Congo
EPRM	European Partnership for Responsible Minerals
GIGO	garbage in, garbage out
GIZ	Gesellschaft für Internationale Zusammenarbeit
GSIF	Good Shepherd International Foundation
IDPs	Internally Displaced Persons
ITSci	ITRI Tin Supply Chain Initiative
LME	London Metal Exchange
LSM	Large-Scale Mining
ILO	International Labour Organization
MoU	Memorandum of Understanding
MRL	Minimal Risk Levels
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
OEMs	Original Equipment Manufacturers
RCI	Responsible Cobalt Initiative
RMI	Responsible Minerals Initiative (formerly CFSI)
RSBN	Responsible Sourcing Blockchain Network
SAESSCAM	Service d'Assistance et d'Encadrement du Small Scale Mining (now SAEMAP)
SAEMAP	Service d'Assistance et d'Encadrement de l'exploitation Minière à Petite échelle (formerly SAESSCAM)
SEC	U.S. Security and Exchange Commission
SOMO	Centre for Research on Multinational Corporations
SOR	Smelter or Refiner
UNGPs	United Nations Guiding Principles
UNICEF	United Nations Children's Fund
USD	United States Dollars
USAID	United States Agency for International Development
WFCL	Worst Forms of Child Labour



Appendix B: List of Assessed Cobalt Refiners

COMPANY NAME	COUNTRY OF REFINER	WEBSITE
BEIJING EASPRING MATERIAL TECHNOLOGY	CHINA	http://test1.bgrimm.cn:5908/pub/dskjyw/
CHAMBISHI METALS PLC	ZAMBIA	http://www.zccm-ih.com.zm/copper-cobalt-gold/chambishi-metals/
CHENGDU HUAZE COBALT&NICKEL MATERIAL CO., LTD	CHINA	not found
COSMO ECOCHEM CO., LTD.	KOREA	http://www.cosmochem.co.kr/eng/company/pr/pr_ci.jsp
CTT - COMPAGNIE DE TIFNOUT TIRANIMINE	MOROCCO	http://www.managemgroup.com/Cartographie
EURASIAN NATURAL RESOURCES GROUP	DRC	https://eurasianresources.lu/en/home
FREEMOUNT COBALT OY (KOKKOLA)	FINLAND	https://www.freemountcobalt.com/
GANZHOU YI HAO UMICORE INDUSTRY CO.	CHINA	http://csm.umicore.com/en/
GANZHOU HIGHPOWER TECHNOLOGY CO., LTD.	CHINA	https://www.highpowertech.com/
GANZHOU TENGYUAN COBALT NEW MATERIAL CO., LTD.	CHINA	http://www.tycogz.com/
GUANGXI YINYI ADVANCED MATERIAL CO., LTD.	CHINA	http://www.gxyy.com.cn/English/About.aspx?ColumnID=29
GUANGDONG JIANA ENERGY TECHNOLOGY CO., LTD.	CHINA	http://www.jiana.com/en/index.php/Page/list/8.html
GLENORE XSTRATA PLC	NORWAY	http://www.glenore.com/
GLOBAL TUNGSTEN & POWDERS CORP.	USA	https://www.globaltungsten.com
GRUPE FORREST INTERNATIONAL S.A. (ENTREPRISE GÉNÉRALE MALTA FORREST)	DRC	http://www.forrestgroup.com/en/gtl-stl.html
HANRUI COBALT	CHINA	www.hrcobalt.com
HUNAN BRUNP RECYCLING TECHNOLOGY CO., LTD.	CHINA	http://en.brunp.com.cn/about/i=39&comContentId=39.html
HUNAN YACHENG NEW MATERIALS DEVELOPMENT CO., LTD.	CHINA	http://www.yarcher.com
HUNAN ZOOMWE NEW ENERGY SCIENCE & TECHNOLOGY CO., LTD.	CHINA	http://www.hnhxya.com/en/index.html
JIANGSU COBALT NICKEL METAL (KLK)	CHINA	http://www.jsklk.com/en/
JIANGSU XIONGFENG TECHNOLOGY CO., LTD.	CHINA	http://www.xiongfeng.net.cn/en/about.asp
JIANGXI JIANGWU COBALT CO., LTD.	CHINA	https://jiangxijiangwu.b2b.hc360.com/shop/show.html
JINCHUAN GROUP CO LTD	CHINA	http://www.jinchuan-intl.com/en/
JINCHUAN NONFERROUS METALS CORP.	CHINA	http://www.jinchuan-intl.com/en/
JINGMEN GEM CO., LTD.	CHINA	http://en.gem.com.cn/index.php/quanzizigongsi/2017/11-24/2103.html
KASESE COBALT COMPANY LIMITED	UGANDA	http://www.kccl.co.ug/
LANZHOU JINCHUAN ADVANCED MATERIALS TECHNOLOGY CO., LTD.	CHINA	http://www.jinchuan-intl.com/en/



兰州金川新材料科技股份有限公司		
MINARA RESOURCES PTY LTD.	AUSTRALIA	http://www.minara.com.au/
MOPANI COPPER MINES	ZAMBIA	http://www.zccm-ih.com.zm/copper-cobalt-gold/mopani-copper-mines/
NANTONG XINWEI NICKEL & COBALT HIGHTECH DEVELOPMENT CO., LTD.	CHINA	http://www.xinweinico.com/en/index.asp
NEW ERA GROUP ZHEJIANG ZHONGNENG CYCLE TECHNOLOGY CO., LTD.	CHINA	http://www.newhailong.com/
NINGBO YANMEN CHEMICAL CO., LTD.	CHINA	http://ningboyanmen.globalchemmade.com/
NICOMET INDUSTRIES LTD.	INDIA	http://www.nicomet.com
NORILSK NICKEL HARJAVALTA OY (SUB OF RUSSIAN COMPANY)	FINLAND	http://nornickel.fi/
PJSC MMC NORILSK NICKEL	RUSSIA	https://www.nornickel.com
QUEENSLAND NICKEL PL	AUSTRALIA	not found
RAMU NICO MANAGEMENT (MCC) LIMITED	CHINA	http://www.ramunico.com/index_en.php
SHAANXI HUAZE NICKEL & COBALT METAL	CHINA	http://xuegang0911.cn.zj123.com/
SHALINA RESOURCES LTD	DRC	http://www.shalinaresources.com/
SHANDONG JINLING MINING	CHINA	http://sgilkvjx.qiyegu.com/introduce
SHENZHEN GREEN ECO-MANUFACTURE HI-TECH CO., LTD.,	CHINA	http://szsglm.d17.cc/
SHERRITT INTERNATIONAL	CANADA	http://www.sherritt.com/English/Home/default.aspx
SICHUAN NI AND CO GUORUN NEW MATERIALS	CHINA	not found
SUMITOMO METAL MINING CO., LTD.	JAPAN	http://www.smm.co.jp/E/
SUNGEEL HIMETAL CO., LTD.	KOREA	http://www.sungeel.com/?lang=en
TIANJIN MAOLIAN SCIENCE & TECHNOLOGY CO., LTD.	CHINA	http://www.tjmaolian.com/
UMICORE (OLEN REFINERY)	BELGIUM	http://www.umicore.be/en/about/our-sites/olen/
VALE CANADA LTD. / VALE INCO LTD.	CANADA	http://www.vale.com/canada/EN/Pages/default.aspx
VOTORANTIM METAIS SA	BRAZIL	http://relatoriovmetais.com.br/2016/en/
YANTAI CASH INDUSTRIAL CO LTD	CHINA	not found
ZHEJIANG HUAYOU COBALT COMPANY CO., LTD.	CHINA	http://en.huayou.com/
ZHUHAI KELIXIN METAL MATERIALS CO., LTD.	CHINA	http://en.zhklx.com/ (appears broken)



Appendix C: Evaluation Instrument

OECD DDG Step 1:

<i>indicator</i>	<i>DDG supplement (3T or G)</i>	<i>OECD DDG citation</i>
Supply chain due diligence policy?	both	“Set out the company’s supply chain due diligence policy...” (OECD pp. 52, pp.111)

OECD DDG Step 2:

<i>indicator</i>	<i>DDG supplement (3T or G)</i>	<i>OECD DDG citation</i>
a. Published risk assessment (3T) or risk reporting (G)?	both	“Publish the risk assessment with due regard taken of business confidentiality and other competitive concerns” (OECD pp. 52) ¹³⁶
b. Disclosed the actual or potential risks identified?	G	“disclose the actual or potential risks identified” (OECD pp. 112)

OECD DDG Step 3:

<i>indicator</i>	<i>DDG supplement</i>	<i>OECD DDG citation</i>
a. Described steps taken to manage risks?	both	“Describe the steps taken to manage risks” (OECD pp. 52, pp. 112)
b. Included summary of risk mitigation?	both	“including a summary report on the strategy for risk mitigation in the risk management plan” (OECD pp. 52, pp. 112)



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- ¹¹ As per the definition of the OECD DDG (p. 66), *Conflict-affected and high-risk areas* (CAHRAs) are: "Areas identified by the presence of armed conflict, widespread violence, including violence generated by criminal networks, or other risks of serious and widespread harm to people. Armed conflict may take a variety of forms, such as a conflict of international or non-international character, which may involve two or more states, or may consist of wars of liberation, or insurgencies, civil wars. *High-risk areas* are those where there is a high risk of conflict or of widespread or serious abuses as defined in paragraph 1 of Annex II of the Guidance. Such areas are often characterised by political instability or repression, institutional weakness, insecurity, collapse of civil infrastructure, widespread violence and violations of national or international law."
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²⁵ The price of cobalt is expected to rise 45 percent by 2020 owing to demand for electric vehicles as cobalt sulfate is one of the key materials used to produce lithium-ion nickel-cobalt-manganese (NCM) and nickel-cobalt-aluminum (NCA) batteries. Yet the future demand for cobalt -- and thus the price of cobalt -- depends on a number of factors:

1. *cobalt's ratio of ingredients used to produce batteries*: given cobalt's unique physical and chemical properties, especially its energy density, it is not easily replaced by other elements. Nevertheless, companies such as Tesla (and its partner Panasonic) seek to minimize the proportion of expensive ingredient in its batteries.
2. *recycling of cobalt in used batteries*: the prospect of recovering raw material inputs of ion-lithium batteries after their first life-cycle, e.g. by dis-assembling and smelting the battery, has prompted a flurry of research.
3. *additional, non-DRC cobalt deposits*: large cobalt deposits lie, e.g., also in Russia.
4. *innovation in battery technology*: continuous R&D explore alternatives such as dry batteries or hydrogen batteries will potentially require different raw materials.

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²⁶ Fleur Scheele, Esther de Haan, Vincent Kiezebrink (2016). *Cobalt blues*. SOMO. April 1, 2016. <https://www.somo.nl/cobalt-blues/>

²⁷ The Eurasian Natural Resources Corporation PLC – a formerly publicly-listed (now privately held), London-headquartered, Luxemburg-incorporated mining company – was under criminal investigation by the U.K.'s Serious Fraud Office ("SFO"), which began in late April 2013, focusing "on allegations of fraud, bribery and corruption in two foreign jurisdictions." See court document: *The Honourable Mrs Justice Andrews DBE, High Court of Justice, Queen's Bench Division, between: The Director of the Serious Fraud Office (Claimant) - and - Eurasian Natural Resources Corporation Ltd (Defendant)* [http://www.bailii.org/cgi-bin/format.cgi?doc=/ew/cases/EWHC/QB/2017/1017.html&query=\(enrc\)#disp80](http://www.bailii.org/cgi-bin/format.cgi?doc=/ew/cases/EWHC/QB/2017/1017.html&query=(enrc)#disp80)

²⁸ Plateforme des Organisations de la Société Civile Intervenant Dans le Secteur Minier (POM). *Gagnons ensemble, Lubumbashi*. November 2015. <http://www.pomrdc.org/wp-content/uploads/2016/09/POM-Rapport-sur-le-suivi-des-Obligations-environn%C3%A9mentales-et-sociales-de-l'entreprise-mini%C3%A8re-Frontier-SA.pdf>

²⁹ Reuters. *Send in the Troops: Congo Raises the Stakes on Illegal Mining*. July 17, 2019.

³⁰ Ibid.

³¹ CNN. *CNN discovers child labor in cobalt trade*. May 2, 2018.

<https://edition.cnn.com/videos/world/2018/05/02/cnn-freedom-project-electric-cars-cobalt-elbagir-pkg.cnn>



³² Vanbrabant, Y.; Goethals, H.; Bulet, C.; Thys, T.; De Putter, T.; Decrée, S., (2009). TRACE (TRACeability of hEterogenite) Project Report.

³³ Cornelia Walther. *In DR Congo, UNICEF supports efforts to help child labourers return to school*. 13 June 2012. https://www.unicef.org/childsurvival/drcongo_62627.html

³⁴ Ibid.

³⁵ 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.

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³⁷ Amnesty International. *Time to Recharge: Corporate Action and Inaction to Tackle Abuses in the Cobalt Supply Chain*. November 15, 2017. Index number: AFR 62/7395/2017.

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³⁹ Benjamin Faber, Benjamin Krause, Raul Sanchez De La Sierra. *Artisanal Mining, Livelihoods, and Child Labor in the Cobalt Supply Chain of the Democratic Republic of Congo*. CEGA. May 6, 2017.

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⁴⁰ Ibid.

⁴¹ Ibid.

⁴² See: Worker Statement, Individual Case (CAS) - Discussion: 2017, Publication: 106th ILC session (2017), Worst Forms of Child Labour Convention, 1999 (No. 182) - Democratic Republic of the Congo (Ratification: 2001),

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⁴⁶ EPA. *Cobalt Compounds*. January 2000. <https://www.epa.gov/sites/production/files/2016-09/documents/cobalt-compounds.pdf>

⁴⁷ See:

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⁴⁹ United Nations, 2017. GHS (Rev.7) (2017) *Globally Harmonized System of Classification and Labelling of Chemicals (GHS)*. Seventh revised edition.

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⁵⁰ Cobalt. <https://echa.europa.eu/substance-information/-/substanceinfo/100.028.325>

⁵¹ Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for Cobalt*. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1992.

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⁵³ Child Protection Code. <http://www.leganet.cd/Legislation/JO/2009/L.09.001.10.01.09.htm>

⁵⁴ See Article 6, Chapitre III: DE LA CAPACITE DE CONTRACTER.

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⁵⁵ See Art. 215 and 153 of Constitution for hierarchy and applicability of treaties. In 2006, a judge in the Magistrate Court of Kinshasa/Assossa cited the African charter on Rights and Welfare of the Child in holding the 18 was the minimum age of criminal liability.

⁵⁶ Commission d'experts pour l'application des conventions et des recommandations de l'OIT, Observation adoptée en 2014 et publiée lors de la 104e session de CIT (2015), Convention (n°138) sur l'âge minimum (1973), République démocratique du Congo,

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⁵⁷ See, for example:

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3. Nicolas Tsurukawa et al. *Social impacts of artisanal cobalt mining in Katanga, Democratic Republic of Congo*. Öko Institut. 2011. p. 16. <http://www.oeko.de/oekodoc/1294/2011-419-en.pdf>

⁵⁸ Ministère des Mines - Unité d'exécution du projet PROMINES, Audit du cadre institutionnel et organisationnel régissant le secteur des mines. http://www.prominesrdc.cd/fr/Rapport/Rapport_Orga_saess.pdf

⁵⁹ Samsung SDI (2017). *2016 Progress Report On Responsible Cobalt Supply Chain*. April 2017.

https://www.samsungsdi.com/upload/download/sustainable-management/Samsung_SDI_-_2016_Progress_Report_on_Responsible_Cobalt_Supply_Chain_V12.pdf

⁶⁰ Bloomberg / William Clowes and Thomas Wilson. *Never Mind the Mines. In Congo, There's Cobalt Under the House*. March 28, 2018.

<https://www.bloomberg.com/news/features/2018-03-28/never-mind-the-mines-in-congo-there-s-cobalt-under-the-house>

⁶¹ "Article 258 bis : De la dotation pour contribution aux projets de développement communautaire
Le titulaire de droit minier d'exploitation ou d'autorisation d'exploitation des carrières permanente est tenu de constituer, en franchise de l'impôt sur les bénéfices et profits, une dotation pour contribution aux projets de développement communautaire dont le montant minimal est égal à 0,3 % du chiffre d'affaires de l'exercice au cours duquel elle est constituée."

See: Loi n°18/001 du 09 mars 2018 modifiant et complétant la Loi n° 007/2002 du 11 juillet 2002 portant Code minier. <http://www.leganet.cd/Legislation/Droit%20economique/Code%20Minier/Loi.18.001.09.03.2018.html>

⁶² Ibid.

⁶³ As reported in a 2017 Financial Times feature: "The two traders said concerns arose this summer when metal produced by Yantai Cash Industrial, a Shandong-based producer, appeared on the exchange. They said many market participants believe Yantai Cash sources some of its unrefined cobalt from artisanal DRC mines that carry a higher risk of using child labour. Concern they might receive Yantai Cash metal has recently caused cobalt on the LME to price at a discount to other sources, traders said. While LME metal must meet certain quality standards, buyers cannot choose the source of the material, which is delivered from the exchange's own warehouses."

See: FT Exclusive. *LME probes cobalt supplies after complaints over child labour links*. 2017.

<https://www.ft.com/content/14a52d88-cec9-11e7-b781-794ce08b24dc>

⁶⁴ Reuters / Pratima Desai and Tom Daly. *Exclusive: China's Nanjing Hanrui can't be sure its cobalt did not involve child labor*. December 11, 2017. <https://www.reuters.com/article/us-lme-cobalt-yantai-exclusive/exclusive-chinas-nanjing-hanrui-cant-be-sure-its-cobalt-did-not-involve-child-labor-idUSKBN1E522V>



⁶⁵ Bayer, C. et al. *3TG+C Smelter and Refiner SOR Disclosure Conformance with Leading Due Diligence and Assurance Standards*. Development International. March 5, 2018.

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⁶⁶ ERG is linked with the Eurasian Natural Resource Group, and both operate under “ERG Africa”.

⁶⁷ Levin Sources. *Developping ERG'S Clean Cobalt Framework*.

<http://www.levinsources.com/projects/developping-clean-cobalt-framework-erg>

⁶⁸ ERG. *ERG Clean Cobalt Framework*. December 2018.

<https://eurasianresources.lu/uploads/1/files/ERG%20Clean%20Cobalt%20Framework.pdf>

⁶⁹ Mining technology. *ERG to pilot blockchain-based solution to trace cobalt in DRC*. 23 January 2019.

<https://www.mining-technology.com/digital-disruption/erg-blockchain-trace-cobalt-drc/>

⁷⁰ Trafigura Group. *Responsible sourcing*.

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⁷¹ The RMI defines a Fine Refiner as: “An entity that processes cobalt concentrates, intermediates or recycled feed and produces a cobalt product for direct use in a downstream manufacturing process.” A prior link in supply chains is a crude refiner: “An entity that processes cobalt ore or concentrates to an intermediate cobalt product that requires further processing by a fine refiner prior to use in a downstream manufacturing process.” As of now, RMI’s list includes only Fine Refiners, although a Crude Refiner list is reportedly forthcoming. Private correspondence with Michèle Brühlhart. June 18, 2019.

⁷² RMI. *Cobalt Standard Smelter list*. <http://www.responsiblemineralsinitiative.org/responsible-minerals-assurance-process/exports/cmrt-export/>.

⁷³ RMI. *Cobalt Reporting Template*. <http://www.responsiblemineralsinitiative.org/emerging-risks/cobalt-reporting-template/>

⁷⁴ RMI. *Audit Standards*. <http://www.responsiblemineralsinitiative.org/standards-development/audit-standards/>

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⁷⁶ RMI. *Export the Smelter Reference List for the Cobalt Reporting Template*.

<http://www.responsiblemineralsinitiative.org/responsible-minerals-assurance-process/exports/cmt-export/>

⁷⁷ RMI. *Risk Readiness Assessment (RRA)*. [http://www.responsiblemineralsinitiative.org/emerging-risks/risk-readiness-assessment-\(rra\)/](http://www.responsiblemineralsinitiative.org/emerging-risks/risk-readiness-assessment-(rra)/)

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<https://responsibleminerals.litmos.com/account/login/>

⁷⁹ Cobalt Institute. *Responsible Mining of Cobalt*.

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⁸¹ Responsible Cobalt Initiative (RCI). *Facing challenges, sharing responsibility, joining hands and achieving win-win*. November 14, 2016. <http://www.cccmc.org.cn/docs/2016-11/20161121141502674021.pdf>

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⁸⁴ CCCMC. *Public consultation on CCCMC Draft Cobalt Refiner Standard*. April 10, 2018.

<http://en.cccmc.org.cn/news/cccmcinformation/77704.htm>

⁸⁵ World Economic Forum. *Global Battery Alliance*. <https://www.weforum.org/projects/global-battery-alliance>

⁸⁶ Determination of origin (provenance) may be more desirable than traceability, as the latter commonly involves a bag and tag system that is cumbersome, costly, and prone to leakage in or out. For example, the RMAP draft standard for treatment units / crude smelters in the DRC rather emphasises permanent mine site monitoring as a requirement for ASM sourcing over actual traceability.

⁸⁷ Fortune / Don Reisinger. *Child Labor Revelation Prompts Apple to Make Supplier Policy Change*. March 3, 2017.

<http://fortune.com/2017/03/03/apple-cobalt-child-labor/>

⁸⁸ Apple (2016). *Smelter and Refiner List*. December 2016. <https://images.apple.com/supplier-responsibility/pdf/Apple-Smelter-and-RefinerList.pdf>

⁸⁹ “Whenever smelters cannot provide substantial and credible evidence of the chain of custody, nor of the traceability documentation, or of the risk assessment and management policies for red flagged Cobalt sources, we



urge and support them to undergo a full third party audit. If failing to undergo a full third party audit as recommended, SDI will start waving flags for possible termination of contracts, as per our internal policy.” See: Samsung SDI. *Progress Report on Responsible Cobalt Supply Chain*. April 2017.

[https://www.samsungsdi.com/upload/download/sustainable-management/Samsung SDI - 2016 Progress Report on Responsible Cobalt Supply Chain V12.pdf](https://www.samsungsdi.com/upload/download/sustainable-management/Samsung_SDII_-_2016_Progress_Report_on_Responsible_Cobalt_Supply_Chain_V12.pdf)

⁹⁰ The Financial Times. *Congo, child labour and your electric car*.

<https://www.ft.com/content/c6909812-9ce4-11e9-9c06-a4640c9feebb>

⁹¹ CNN. *CNN discovers child labor in cobalt trade*. May 2, 2018.

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⁹² *Drive Sustainability* is an automotive partnership, facilitated by CSR Europe, which “aims to drive sustainability throughout the automotive supply chain by promoting a common approach within the industry and by integrating sustainability in the overall procurement process.” Its members currently comprise: African Development Bank Group; Amara Raja Group; Audi; BASF; Cadenza Innovation; China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exporters; ClimateWorks Foundation; Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ); Enel; Envision Group; Eurasian Resources Group (ERG); Everledger; Fairphone; Good Shepherd International Foundation; International Energy Agency; International Justice Mission (IJM); Johnson Controls; Mitsubishi Corporation; National Physical Laboratory (NPL); NEC; Organisation for Economic Co-operation and Development (OECD); Pact; Pure Earth; RCS Global; RESOLVE; Responsible Battery Coalition; Responsible Business Alliance; Royal DSM; Saft; SAP; Signify; Stanley Black & Decker; Stern School of Business, New York University; Trafigura Group; Transport & Environment (T&E); Umicore; United Nations Children’s Fund (UNICEF); United Nations Environment Programme (UNEP); Volkswagen Group; Volvo Group; White & Case; World Bank; World Economic Forum.

See: *Drive Sustainability. Driving Change Since 2013*. Progress Report. April 2019.

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⁹³ RCS. *RCS Global Group side session*. OECD conference. April 2018.

⁹⁴ Better Cobalt. *Upstream Data*. <https://www.rcsglobal.com/upstreamdata/>

⁹⁵ Ibid.

⁹⁶ Data which is also offered in a Blockchain-ready format, helping to solve the so-called “first mile” issue.

⁹⁷ “The real problem about these sites, especially for Kasulo is not that the women and children presence to dig copper and cobalt ores, but something else...” “For western lobbyists with medias and NGOs face, the serious issue and real problem is rather the presence of the Chinese of CDM (Congo Dongfang Mining) and others in the cobalt mines that causes the fury. See: Franck Fwamba, *DR Congo’s artisanal cobalt miners, Chinese companies and international trader*. 2018. <http://www.miningnewsmagazine.org/?p=1083>

⁹⁸ AK Rohstoffe. AK Rohstoffe Newsletter #25.

<http://ak-rohstoffe.de/ak-rohstoffe-newsletter-25-fokus-auf-blockchain/>

⁹⁹ Bundesanstalt für Geowissenschaften und Rohstoffe / Martin Neumann, Bali Barume, Benoît Ducellier, Alain Ombeni, Uwe Näher, Philip Schütte, Ulrike von Baggehufwudt, Désirée Ruppen, Yannick Weyns. *Traceability in Artisanal Gold Supply Chains in the Democratic Republic of the Congo – Lessons Learned from the Kampene Gold Pilot Project*. March 2019.

https://www.bgr.bund.de/DE/Themen/Min_rohstoffe/Downloads/studie_traceability_in_artisanal_gold_DR_Congo_2019.pdf?_blob=publicationFile&v=9

¹⁰⁰ ibes AG. <https://www.goodgovernance.africa/#mineraltrace>

¹⁰¹ Blockchain technology is a public electronic ledger that can be openly shared among disparate users. It creates a permanent record (a block) of their transactions, each one time-stamped and linked to the previous one. Its unique properties include, most notably, its ability to create a consensus around a unique digital twin, unique identity, and immutability. In addition, “smart contract” technology, a part of some blockchains, can support “built in incentives” for certain transactions – such as, for example, additional payments, or incentives, upon “proof of clean cobalt.” While the application indeed holds much promise, (a.) such systems are only as good as the data that enters the blockchain, (b.) they are subject to market demand, and (c.) are constrained to the capacity of upstream market actors. Since the data are only as good as the humans that entered it, there are mechanism designs, and exploration in this area, to combine independent auditors, 3rd parties, with actual ASM miners, so the data comes from several streams, and discrepancies are flagged. Furthermore, blockchain is as much about governance as it is about (software) systems, and appetite for the requisite minimum transparency must therefore exist in the market both from the demand as well as the supply side.



¹⁰² Reuters /Barbara Lewis. *Ford and IBM among quartet in Congo cobalt blockchain project*. Sustainable Business. January 16, 2019.

<https://www.reuters.com/article/us-blockchain-congo-cobalt-electric/ford-and-ibm-among-quartet-in-congo-cobalt-blockchain-project-idUSKCN1PA0C8>

¹⁰³ IBM. *Ford Motor Company, Huayou Cobalt, IBM, LG Chem and RCS Global Launch Blockchain Pilot to Address Concerns in Strategic Mineral Supply Chains*. Armonk, N.Y. January 16, 2019.

<https://newsroom.ibm.com/2019-01-16-Ford-Motor-Company-Huayou-Cobalt-IBM-LG-Chem-and-RCS-Global-Launch-Blockchain-Pilot-to-Address-Concerns-in-Strategic-Mineral-Supply-Chains>

¹⁰⁴ Ibid.

¹⁰⁵ Volkswagen. *Volkswagen Group Joins Responsible Sourcing Network*. <https://www.volkswagen-newsroom.com/en/press-releases/volkswagen-group-joins-responsible-sourcing-network-4876>

¹⁰⁶ EPRM. *Blockchain-based traceability and data reporting system*.

<https://europeanpartnership-responsibleminerals.eu/blockchain-based-traceability-and-data-reporting-system>

¹⁰⁷ Glencore. *Payments to Governments Report 2018*.

[https://www.glencore.com/dam:jcr/c9cea7dd-9fe6-4f9b-bd6a-e82f72672075/Glencore Payments to governments report 2018--.pdf](https://www.glencore.com/dam:jcr/c9cea7dd-9fe6-4f9b-bd6a-e82f72672075/Glencore%20Payments%20to%20governments%20report%202018--.pdf)

¹⁰⁸ Ibid.

¹⁰⁹ Reuters. *BMW joins project to improve conditions for cobalt mining in Congo*. November 29, 2018.

<https://www.reuters.com/article/us-bmw-cobalt-congo/bmw-joins-project-to-improve-conditions-for-cobalt-mining-in-congo-idUSKCN1NY1UQ>

¹¹⁰ Ibid.

¹¹¹ U.S. Department of Labor. *Combatting Child Labor in the Democratic Republic of the Congo's Cobalt Industry*. Bureau of International Labor Affairs. <https://www.dol.gov/agencies/ilab/combating-child-labor-democratic-republic-congos-cobalt-industry>

¹¹² Ibid.

¹¹³ Daimler. *Education to counter child labor*. Stuttgart. March 2, 2019.

<https://media.daimler.com/marsMediaSite/en/instance/ko.xhtml?oid=42790538>

¹¹⁴ Ibid.

¹¹⁵ ERG. *Eurasian Resources Group partners with the Good Shepherd Sisters to support the Bon Pasteur Alternative Livelihood Programme*. January 19, 2017.

<https://www.eurasianresources.lu/en/news/eurasian-resources-group-partners-with-the-good-shepherd-si>

¹¹⁶ The third edition of the guidance was published in 2016, clarifying that the Guidance does not only apply to

3TG. See: OECD (2016). *OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas*. Third Edition. OECD Publishing. Paris. <http://dx.doi.org/10.1787/9789264252479-en>

¹¹⁷ Government Publishing Office. *Conflict Minerals; Disclosure of Payments by Resource Extraction Issuers; Final Rules*. 17 CFR Parts 240, 249, and 249b, Securities and Exchange Commission. Federal Register, Vol. 77, No. 177, Part II. <https://www.gpo.gov/fdsys/pkg/FR-2012-09-12/pdf/2012-21153.pdf>

¹¹⁸ The extent to which U.S.-listed public companies applied this OECD framework was documented in two consecutive years, reporting year 2015 and reporting year 2016 in Development International's Dodd-Frank Section 1502 compliance benchmarking studies. See, e.g.,: Chris N. Bayer, Jesse H. Hudson, *Dodd-Frank Section 1502 – RY2016 Filing Evaluation*. July 26, 2017.

https://docs.wixstatic.com/ugd/f0f801_9502a3a2a8f143a7b5d863792a01318a.pdf

¹¹⁹ International Labour Organization (ILO). *Worst Forms of Child Labour Convention (No. 182)*.

http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C182

¹²⁰ CCCMC. *Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains*,

<http://www.cccmc.org.cn/docs/2016-05/20160503161408153738.pdf>

¹²¹ See CCCMC guidance, page 10, III. Scope of Application.

¹²² See point 5.1.1.3. This point, in turn, is related to Clause 2.5.1 of the Chinese Responsible Mining Guidelines.

¹²³ Page 31 of the CCCMC states: "7.5 Report on process and results of supply chain risk management. Companies should publicly report on their supply chain due diligence policies and practices, including on identified risks and steps taken to mitigate these risks, and may do so by expanding the scope of their sustainability, corporate social responsibility or annual reports to cover additional information on mineral resource supply chain due diligence."

¹²⁴ OECD (2016). op. cit.

¹²⁵ "Report on supply chain due diligence. Companies should publicly report on their supply chain due diligence policies and practices and may do so by expanding the scope of their sustainability, corporate social responsibility



or annual reports to cover additional information on mineral supply chain due diligence." OECD (2016), op. cit. (p. 19).

¹²⁶ As there is no specific Cobalt supplement, STEP 5 reporting requirements under the Supplement for Gold, as well as the Supplement for the 3Ts were considered. The relevant Gold guidance begins on page 111. For 3T, the section "A.1. SPECIFIC RECOMMENDATIONS – for all upstream companies", starting on page 52, applies. SORs are included in the OECD's definition of upstream: "For the purposes of this Supplement, "upstream" means the mineral supply chain from the mine to smelters/refiners. "Upstream companies" include miners (artisanal and small-scale or large-scale producers), local traders or exporters from the country of mineral origin, international concentrate traders, mineral re-processors and smelters/refiners."

¹²⁷ ILO (2008). *Report III: Child Labour Statistics*. 18th International Conference of Labour Statisticians. Geneva. (November 24 – December 2008).

¹²⁸ International Labour Organization (ILO). *Worst Forms of Child Labour Convention (No. 182)*. http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C182

¹²⁹ RMI. *Cobalt Standard Smelter list*. <http://www.responsiblemineralsinitiative.org/responsible-minerals-assurance-process/exports/cmrt-export/>.

¹³⁰ Research and Markets (2017), *Global and China Cobalt Industry Report, 2017-2021*, April 2017, https://www.researchandmarkets.com/research/ngrctv/global_and_china

¹³¹ London Metal Exchange (2018), *Approved Cobalt Brands*, accessed January 20, 2018, <https://www.lme.com/Metals/Minor-metals/Cobalt/Approved-brands>

¹³² OECD DDG, op. cit., p. 52, p.111

¹³³ "Fatigue Management Policy as follows: Chibuluma Mines Plc identifies that fatigue is an internal precondition for unsafe acts because it negatively affects the human operators' internal state. The Company will strive to maintain and enhance safety, performance and productivity in the operational and manage the risk of fatigue in the work place."

¹³⁴ "Business confidentiality and other competitive concerns means price information and supplier relationships without prejudice to subsequent evolving interpretation. All information will be disclosed to any institutionalised mechanism, regional or global, once in place with the mandate to collect and process information on minerals from conflict-affected and high-risk areas." (p. 52)

¹³⁵ Bayer, C. *The Effects Of Child Labor Monitoring On Knowledge, Attitude And Practices In Cocoa Growing Communities Of Ghana*. Dissertation. Tulane University. March 31, 2014. <https://digitallibrary.tulane.edu/islandora/object/tulane%3A27805/datastream/PDF/view>

¹³⁶ "Business confidentiality and other competitive concerns means price information and supplier relationships without prejudice to subsequent evolving interpretation. All information will be disclosed to any institutionalised mechanism, regional or global, once in place with the mandate to collect and process information on minerals from conflict-affected and high-risk areas." (OECD DDG, op. cit., p. 52)

