

Tenke Fungurume Copper-Cobalt Mine

Lualaba Province, DRC

Chinese Financing for Transition Minerals



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A Research Lab at William & Mary

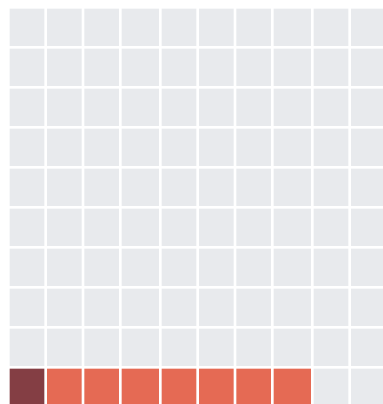
Tenke Fungurume Mining Site Overview

Location	Copper	Cobalt	Exploitation	Life of Mine
DRC	7.9 million	0.8 million	Open-pit	41 years
Lubudi Territory, Kolwezi District, Lualaba Province	Metric tons of reserves	Metric tons of reserves	Surface mining technique to extract ore from the site	Minimum anticipated years of production

Located in the Lualaba Province of the Democratic Republic of the Congo (DRC), Tenke Fungurume is one of the world's largest copper and cobalt mines, and the first mine in Africa to be awarded the prestigious "Copper Mark." In 2016, China Molybdenum (CMOC), backed by Chinese banks, acquired a controlling interest in the mine from American mining company Freeport-McMoRan. In 2017, CMOC arranged a deal with a private Chinese equity firm, enabling it to raise its total ownership stake to 80%.

Copper

Global Ore Reserves: 1,000 Mt

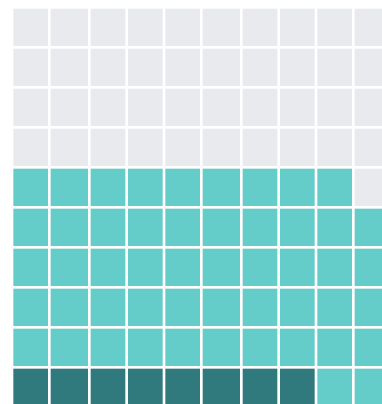


- ~10 million metric tons (Mt) per square
- DRC ore reserves (80 Mt)
- Tenke Fungurume ore reserves (6.7 Mt)

Source: USGS Commodity Summaries 2024

Cobalt

Global Ore Reserves: 11 Mt



- ~0.11 million metric tons (Mt) per square
- DRC ore reserves (6 Mt)
- Tenke Fungurume ore reserves (0.8 Mt)

What are ore reserves?

When we refer to the reserves of a certain type of mineral, we are describing the amount of mineral output that can be recovered in a way which is economically viable. Feasibility studies assess whether it is practical and profitable to extract ore reserves.

Reserves estimates change over time. They may decrease as mineral extraction activities deplete existing deposits, and they may increase as technological advancement makes additional mineral extraction feasible. As of 2024, the DRC held an estimated 8% of global copper reserves and 55% of global cobalt reserves.

Introduction

Sitting on one of the highest-grade copper-cobalt deposits in the world, the Tenke Fungurume mine is an active open-pit operation, boasting an annual production capacity of 450,000 tons of copper and 37,000 tons of cobalt. The mine covers an area of approximately 1,500 square kilometers and contains estimated reserves of 7.89 million metric tons (Mt) of copper and 0.82 Mt of cobalt, as of 2023. After two acquisitions in 2016 and 2017, China Molybdenum (CMOC) now holds an 80% ownership stake in the operating entity Tenke Fungurume Mining S.A. (TFM). The DRC's state-owned company La Générale des Carrières et des Mines (Gécamines) holds the remaining 20% stake. Since CMOC's acquisition, the mine has undergone legal action, to the point of a third-party operator being temporarily installed. However, it also became the first African mine and the first overseas Chinese-owned mine to be awarded the "Copper Mark," which means independent evaluators certified that TFM met its criteria for responsible copper production practices.

Geography

The TFM concession area covers approximately 1,500 square kilometers in the Lualaba Province (formerly the Katanga Province) of the DRC in central Africa. It is near the town of Kolwezi, in a mining-rich region. TFM possesses six exploitation permits (PE123, PE159, PE4728, PE4729, PE9707, and PE9708) encompassing some of the world's largest copper-cobalt deposits—the Kwatebala, Goma, and Fwaulu ore bodies. CMOC also holds a controlling interest (71.25%) in the adjacent Kisanfu (KFM) copper-cobalt mine.

PRC Financing Summary

Between 2016 and 2017, six Chinese banks provided financing to support CMOC's acquisition of an 80% equity stake in the Tenke Fungurume copper-cobalt mine in the DRC. In 2016, four Chinese banks—Bank of China (BOC), China CITIC Bank, China Development Bank (CDB), and China Minsheng Banking Corporation Limited—provided a \$1.59 billion syndicated loan to CMOC DRC Limited to support the acquisition of a 56% indirect equity stake in Tenke Fungurume mine from Freeport-McMoRan.¹

In a January 2017 cooperation framework agreement between CMOC and BHR Newwood Investment Management Limited (BHR), a private Chinese equity firm, CMOC agreed to help BHR raise the funds that it would require for the acquisition of another 24% indirect equity stake in Tenke Fungurume mine from Lundin Mining Corporation. Under the terms of this agreement, CMOC would secure "protocol control" over BHR and its associated assets, meaning that BHR would functionally become a wholly-controlled subsidiary of CMOC. Then, after supporting BHR's acquisition of the equity stake in

¹ The four Chinese banks which extended the \$1.59 billion syndicated loan include state-owned BOC, China CITIC Bank and CDB, and privately-owned China Minsheng Banking Corporation Limited. Only the portion of financing extended by the three state-owned banks qualifies as official finance, as described in the [CFTM 1.0 methodology](#).

Tenke Fungurume mine, CMOC would have the exclusive option to formally acquire BHR in its entirety or the equity of Tenke Fungurume mine held by BHR. During the interim period before the formal acquisition, BHR shareholders would obtain investment returns through profit distributions by BHR.

Consistent with the terms of the cooperation framework agreement, two Chinese state-owned banks—China Construction Bank Corporation (CCB) and China Merchants Bank Co., Ltd.—provided a \$700 million syndicated loan to BHR in April 2017 to finance the acquisition of a 24% indirect equity stake in Tenke Fungurume mine from Lundin Mining Corporation. Through CMOC’s protocol control over BHR, CMOC gained indirect control of this 24% stake in Tenke Fungurume mine, which it formally acquired in 2019 through its acquisition of BHR. By way of these acquisitions, CMOC obtained 100% of the shares of TF Holdings Limited (TFHL) and the entire 80% interest that TFHL held in Tenke Fungurume Mining S.A. (TFM). CMOC thus now holds an 80% equity stake in Tenke Fungurume copper-cobalt mine, with Gécamines, a DRC state-owned company, holding the remaining 20% equity.

In total, between 2016 and 2017 Chinese banks extended \$2.68 billion of credit (in constant 2021 prices) for the Tenke Fungurume copper-cobalt mine acquisition, including \$2.48 billion from state-owned banks and \$207 million from a private sector bank, as represented in the flow-chart below. Other financial commitment values in the profile are represented in current prices (i.e., their values in the years when they were committed), but for the purposes of cross-year comparison, the values are deflated to constant 2021 prices to adjust for inflation and enable aggregation over time.

Tenke Fungurume Copper-Cobalt Mine: Overview of Chinese Lending and Ownership

Loans	Lenders	Co-financing	Equity Holders	Ownership
\$2.7 billion	6	0%	1	80%
Provided between 2016-2017	Chinese state-owned and private banks	From non-Chinese lenders	Chinese state-owned enterprise owns a stake in the joint venture	Of the joint venture is Chinese-owned

Funding Sources

Constant 2021 USD Billions

■ Chinese State-Owned Bank

■ Chinese Private Sector

2016 Syndicated Loan – China Development Bank (CDB)

\$0.93

2016 Syndicated Loan – Bank of China (BOC)

\$0.53

2016 Syndicated Loan – China Minsheng Banking Corp Ltd (CMBC)

\$0.21

2016 Syndicated Loan – China CITIC Bank Corporation Limited

\$0.21

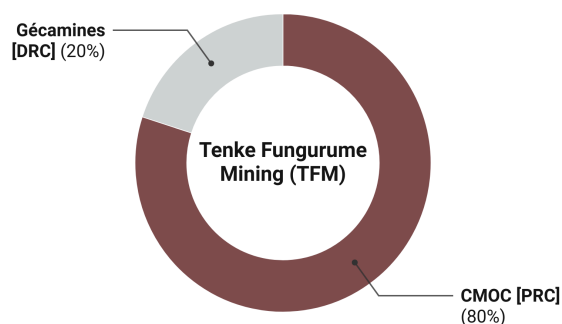
2017 Syndicated Loan – China Construction Bank Corporation (CCB)

\$0.69

2017 Syndicated Loan – China Merchants Bank Co., Ltd.

\$0.12

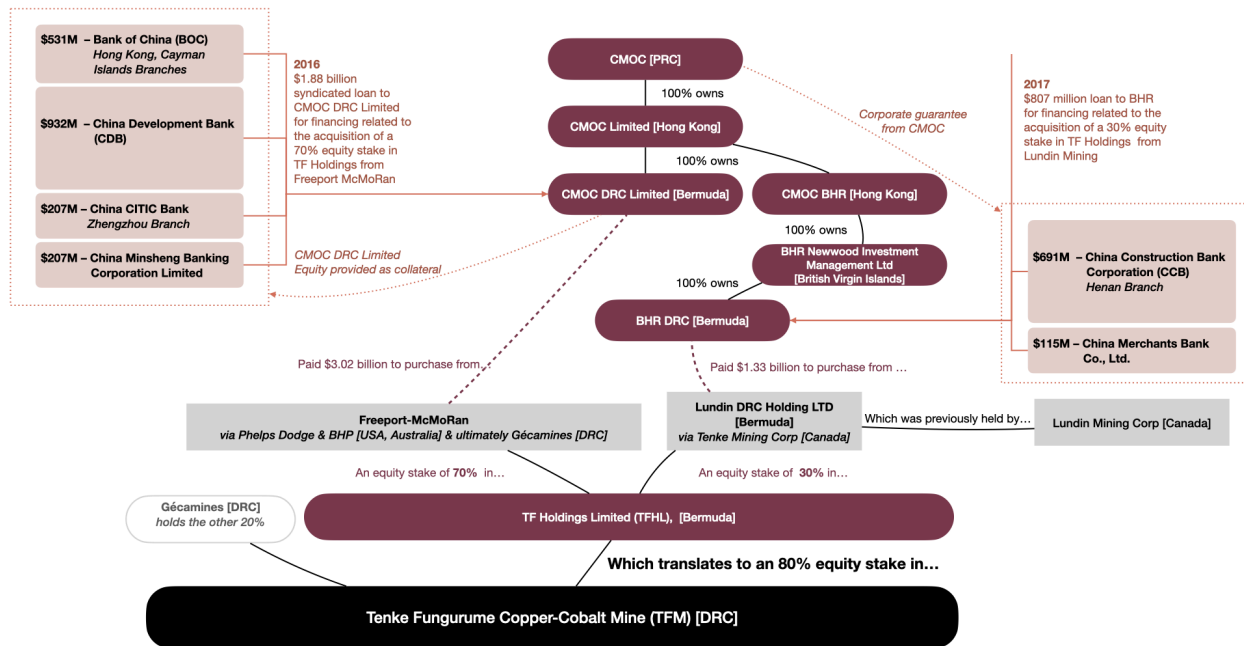
Ownership Structure as of 2017



CMOC first acquired a 56% stake in TFM in 2016, and later increased its stake to 80% in 2017 through a deal with BHR. For a more detailed overview, see the "PRC Acquisitions and Financing" visual on the subsequent page.

Note: The financial commitment amounts represented in the infographic are deflated to constant 2021 prices, which adjusts for inflation and enables aggregation over time. Other financial commitment values in the profile are represented in current prices (i.e., their values in the years when they were committed).

Tenke Fungurume Copper-Cobalt Mine: PRC Acquisitions and Financing



Financial values have been deflated to constant 2021 USD.

Note: The financial commitment amounts represented in the above visual are deflated to constant 2021 prices, which adjusts for inflation and enables aggregation over time. Other financial commitment values in the profile are represented in current prices (i.e. their values in the years when they were committed).

PRC Financing Details

On November 15, 2016, CMOCC DRC Limited—a special purpose vehicle and indirect wholly-owned subsidiary of CMOCC that is legally incorporated in Bermuda—signed a \$1.59 billion (RMB 11 billion) syndicated loan agreement with Bank of China (BOC), China CITIC Bank, China Minsheng Banking Corporation Limited, and China Development Bank (CDB) to partially finance its \$2.65 billion acquisition of a 56% indirect ownership stake in the Tenke Fungurume copper-cobalt mine in the Democratic Republic of Congo (DRC). The loan consisted of three tranches: a \$450 million tranche from the Hong Kong Branch and Cayman Islands Branch of Bank of China (known as “Tranche A”), a \$350 million tranche from the Zhengzhou Branch of China CITIC Bank and the Luoyang Branch of China Minsheng Banking Corporation Limited (known as “Tranche B”), and a \$790 million tranche from China Development Bank (known as “Tranche C”). Tranche A carried a 7-year maturity and an interest rate of 3-month LIBOR plus a 1.7% margin; Tranche B carried a 7-year maturity and an interest rate of 3-month LIBOR plus a 2.2% margin; and Tranche C carried a 7-year maturity and an interest rate of 3-month LIBOR plus a 2.2% margin. The borrower was responsible for repaying the loan between March 15, 2018 and November 15, 2023. CMOCC pledged its 100% equity stake in CMOCC DRC Limited to the lenders as a source of collateral; it also issued a corporate guarantee in support of the loan.

CMOC DRC Limited completed the acquisition of the 56% indirect equity stake in the Tenke Fungurume copper-cobalt mine from Freeport-McMoRan on November 17, 2016. CMOC DRC Limited purchased Freeport-McMoRan's 70% ownership stake in TF Holdings Limited (TFHL), a Bermuda-based holding company that owned an 80% ownership stake in Tenke Fungurume Mining S.A. (TFM).

On January 20, 2017, CMOC and BHR entered into a cooperation framework agreement, in which CMOC agreed to support BHR in its acquisition of a 24% indirect equity stake in Tenke Fungurume mine from Lundin Mining Corporation. At the time of signing of the agreement, CMOC assumed "protocol control" over BHR, meaning that it functionally became a wholly-controlled subsidiary of CMOC, although the agreement allowed BHR shareholders to still receive investment returns (via profit distributions) from BHR. The two parties agreed that CMOC would have the exclusive option to formally acquire BHR in its entirety or the equity of Tenke Fungurume mine held by BHR at an unspecified later date. Then, on April 6, 2017, BHR and CMOC signed a \$700 million syndicated loan agreement with the Henan Branch of China Construction Bank Corporation (CCB) and the Shanghai Branch and Tianshan Sub-branch of China Merchants Bank Co., Ltd. to partially finance its \$1.15 billion acquisition of a 24% indirect ownership stake in the Tenke Fungurume copper-cobalt mine. CCB served as the mandated lead arranger, bookrunner, and security agent and contributed \$600 million to the loan syndicate, while China Merchants Bank contributed the remaining \$100 million. The loan carried a 7-year maturity and an interest rate that ranged between 3-month LIBOR plus a 2.5% margin and 3-month LIBOR plus a 2.64% margin. The borrower was responsible for repaying the loan between July 6, 2019 and April 6, 2024. CMOC issued a corporate guarantee in support of the loan.

BHR completed the acquisition of the 24% indirect equity stake in the Tenke Fungurume copper-cobalt mine from Lundin Mining Corporation on April 20, 2017. BHR purchased Lundin Mining Corporation's ownership stake in Lundin DRC Holdings Ltd., a Bermuda-based holding company that held a 30% interest in TFHL, which in turn held an 80% interest in TFM. Through CMOC's "protocol control" of BHR, CMOC gained indirect control of the 24% stake in TFM. Then, on September 27, 2019, CMOC formally acquired BHR and its 24% indirect equity stake in TFM.

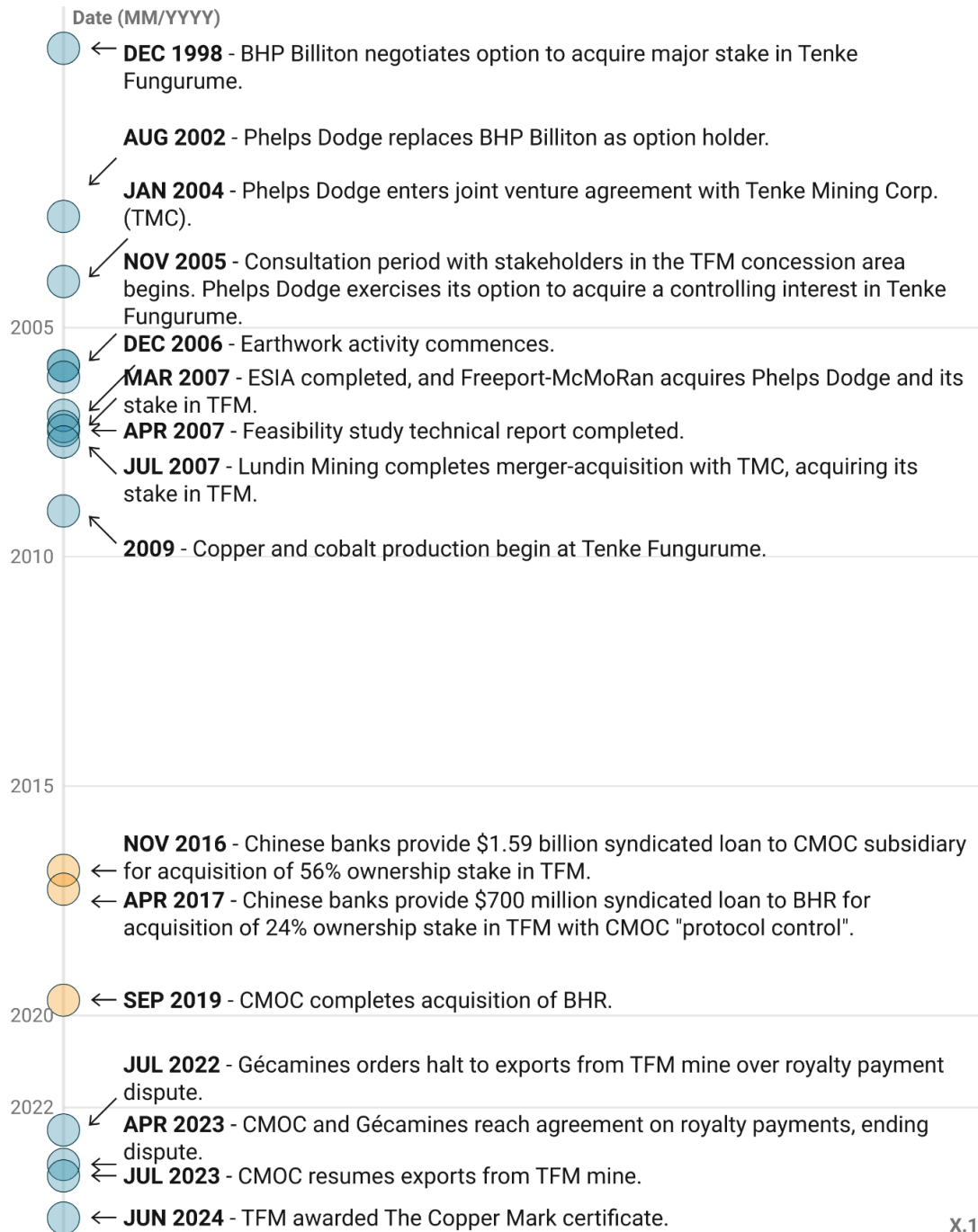
By way of these acquisitions, CMOC obtained 100% of the shares of TFHL and the entire 80% interest that TFHL held in TFM. CMOC thus now holds an 80% equity stake in the Tenke Fungurume copper-cobalt mine.

Tenke Fungurume Copper-Cobalt Mine in the DRC

Estimated closure: Initial plans for 2027-2028 closure phase, with processing of stockpiled ores expected to continue for another 20 years thereafter.

Milestones

■ Funding Events involving Chinese Official Financing
 ■ Operation Milestones



X.1

Implementation

Tenke Fungurume (TFM) is an open-pit mining operation which, according to China Molybdenum (CMOC), is the world's fifth-largest copper mine and the world's second-largest cobalt mine. As of 2023, TFM had a production capacity of 450,000 tons of copper and 37,000 tons of cobalt, and actual production levels reached 280,300 tons of copper and 21,600 tons of cobalt during the year. According to 2023 estimates, TFM has 7.89 million metric tons (Mt) of copper reserves with an average grade of 2.84% and 0.8 Mt of cobalt reserves. The mineral extraction operations at the mine use an agitated leaching process, which involves crushing ore, mixing it with sulfuric acid, and then agitating the mixture to dissolve the copper and cobalt. This process is then followed by solvent extraction (SX) and electrowinning (EW) to produce high-purity copper cathode and cobalt hydroxide.

GRD Minproc completed the feasibility study for the TFM project and was awarded an Engineering, Procurement, and Construction Management (EPCM) contract in April 2007. At the time, GRD Minproc was an Australian mining company, although it was later acquired by the British company AMEC in 2009. Earthwork activity commenced at the site near the end of 2006, and Tenke Fungurume reached commercial production during the first half of 2009. Phase II expansion works (to increase production capacity) commenced near the end of 2011 and were completed in 2013.

The ownership of the Tenke Fungurume copper-cobalt mine changed several times between 1998 and 2007, before CMOC acquired its majority stake in 2016 and further increased its stake in 2017 through the deal with BHR. In December 1998, BHP Billiton (an Australian mining company) secured from Gécamines the option to acquire a controlling interest in the Tenke Fungurume project. The project was initially planned to be a joint venture between BHP, Phelps Dodge (an American mining company), and Tenke Mining Corp. (TMC, a Canadian mining company). In August 2002, Phelps Dodge replaced BHP as the option holder, and in January 2004, Phelps Dodge and TMC entered a joint venture agreement to establish TF Holdings, incorporated in Bermuda. Phelps Dodge held a 70% interest in TF Holdings, while TMC held a 30% interest. In November 2005, Phelps Dodge exercised its option to acquire a controlling interest in the Tenke Fungurume project. TF Holdings acquired an 82.5% stake in Tenke Fungurume Mining S.A. (TFM) alongside Gécamines, which held a 17.5% stake.

In 2007, while construction of the mine was underway, the controlling interest in the project changed hands. Freeport-McMoRan (an American mining company) acquired BHP in March 2007, and in turn acquired its 70% stake in TF Holdings, which translates to a 57.75% indirect stake in the Tenke Fungurume project. Then, in July 2007, Lundin Mining (a Canadian mining company) completed a merger-acquisition with TMC, in turn acquiring its 30% stake in TF Holdings, which translates to a 24.75% indirect stake in the Tenke Fungurume project.

In October 2010, the mining contract was amended to increase Gécamines' share in TFM from 17.5% to 20%. TF Holding's share in the project was thus reduced from 82.5% to 80%. Consequently,

Freeport-McMoRan's indirect stake in the Tenke Fungurume project was reduced to 56%, and Lundin Mining's indirect stake in the project was reduced to 24%.

Between 2016 and 2017, CMOC wholly-acquired TF Holdings. CMOC first acquired Freeport-McMoran's 70% interest in November 2016. CMOC then supported BHR's acquisition of Lundin Mining's 30% interest in April 2017 after assuming "protocol control" over the company, meaning that CMOC indirectly controlled the additional 30% stake in TF Holdings. CMOC later formally acquired BHR and its stake in TF Holdings in September 2019. By acquiring 100% of TF Holdings, CMOC thus became the 80% shareholder of Tenke Fungurume Mining S.A. alongside Gécamines, which retained its 20% share.

CMOC has channeled significant investments in its DRC mines during the past few years in a bid to become one of the world's top 10 copper producers. CMOC announced in 2021 its plans to invest over \$2.5 billion to double copper and cobalt production at Tenke Fungurume by 2023. In 2023, TFM commissioned two new ore processing plants, and in 2024 CMOC completed a plant extension project to further increase production capacity. In 2024, CMOC announced plans to more than double its copper outputs from the Tenke Fungurume and Kisanfu mines to meet growing global demands for the metal, with goals to reach a production capacity of between 800,000 to 1 million tons by 2028.

Environmental, Social, and Governance Risks and Mitigation Measures

During the TFM project's planning phase, the Canadian consulting company Golder Associates completed an Environmental and Social Impact Assessment (ESIA), which was published in March 2007. The process for the ESIA included consultations with the surrounding community and other stakeholders. The ESIA consultants developed a stakeholder database, which included 530 organizations and individuals from local communities, enterprises, non-governmental organizations, political authorities, politicians, media, religious groups, and military officers. This early consultation with relevant stakeholders has helped to mitigate social risks associated with the mine development and operations. However, evaluators from the Copper Mark in 2024 identified that TFM should implement certain improvements in regards to stakeholder engagements. Evaluators found that the grievance procedure was not explicitly aligned with UN guiding principles and noted that the grievance process may not be consistently applied.

The mining contract between Gécamines and other controlling shareholders—Phelps Dodge/Freeport McMoRan and TFM/Lundin Mining prior to 2016/2017, and subsequently CMOC—has been the subject of scrutiny, and the DRC has negotiated to receive greater benefits over time in terms of equity, tax rates, royalties, and other payments to the DRC. In 2003, after the DRC revised its mining code in 2002 to strengthen its rights, Gécamines initiated renegotiations for the original mine development rights contract. This negotiation process concluded in 2005, the same year Phelps Dodge exercised its option right to acquire a controlling stake in Tenke Fungurume mine. The resultant benefits for Gécamines in

2005 included further payments to Gécamines as mine development and production milestones were reached (totaling \$100 million over several installments), the financing of community programs with 0.3% of net revenues from production, and additional commitments to further develop the mine. Then, in November 2007, the DRC and a coalition of nongovernmental organizations undertook a review process of 60 mining contracts in the country to assess the scope and scale of benefits for the Congolese government. This review determined that concessions made by Gécamines during the 2005 TFM contract negotiation process—including decreasing its stake in the operating company from 45% to 17.5% and financial compensation to Gécamines being reduced from \$250 million in concession to \$100 million—were unfair. As a result, in October 2010, DRC authorities reviewed and renegotiated Tenke Fungurume’s mining contract. Officials found that the TFM contract was in good standing, but negotiated increased benefits to the host country. The 2010 modifications increased Gécamines’ equity stake by 2.5%, provided new royalties for additional reserves identification, and allowed Gécamines to have a greater role in selecting and removing TFM management.

The mine ownership changes over time have also been the subject of scrutiny, with Gécamines voicing concerns over the stakeholders’ lack of consultation with Gécamines prior to the acquisitions. In August 2016, Oxfam reported that the DRC government was not made aware of Freeport-McMoran selling its 56% stake in TFM to CMOC until after it had been finalized. In October 2016, Gécamines opposed both the Lundin-BHR and the Freeport-CMOC deals in a Paris court, with the goal of pressuring both companies to restructure their deals. The lawsuit sought to require that amendments to the indirect ownership structure of the joint venture be authorized by the DRC. The case was dropped in January 2017, when some involved parties reported that Gécamines would receive a total of \$100 million in financial compensation to allow the deal to go through. It was reported that Freeport-McMoRan contributed at least \$33 million to the settlement deal, though the total breakdown of contributions was not officially disclosed.

The selling of international stakes in TFM has raised questions about the benefits that host governments such as the DRC derive from mining concessions in their borders. These questions ultimately led to an investigation of TFM management in August 2021. The DRC’s President Felix Tshisekedi named a commission to investigate allegations that CMOC might have withheld royalty payments from the Congolese government by misrepresenting the true scale of output from TFM. By December, DRC mining authorities temporarily removed CMOC from its leadership role at the mine, installing a third-party operator. In early 2022, Gécamines suspended its court case against CMOC. The dispute led to significantly lower levels of production in 2022. In April 2023, as part of the resolution, the stakeholders agreed to an increase in royalties and a settlement in which CMOC would pay \$800 million to Gécamines in installments from 2023 to 2028.

In addition to this highly-publicized dispute between CMOC and Gécamines, mining operations on the ground have presented various ESG challenges in recent years. In the DRC, it is not uncommon for artisanal miners to intrude on large-scale mining operations and attempt to remove ore and sell it on the

black market. Given the size of Tenke Fungurume, it has been a target for this kind of illegal exploitation. Amnesty International reported that in July 2019, armed DRC military personnel removed artisanal miners from the site. Furthermore in May 2024, the Tenke Fungurume mine was accused of pollution causing illnesses in the Mano-Mapia community near the mine.

Nonetheless, in the spring of 2024, the Tenke Fungurume mine became the first Chinese-owned mine globally and the first mine in Africa to be awarded the Copper Mark. The Copper Mark is an independent framework to ensure responsible copper production practices. Similar peer awards include the Nickel Mark, the Zinc Mark, and the Molybdenum Mark. The Copper Mark is based on 32 ESG criteria, including Stakeholder Engagement, Occupational Health and Safety, Greenhouse Gas Emissions, Mine Closure and Reclamation, Community Health and Safety, and Transparency and Disclosure. However, receiving the award does not mean that a mining site fully meets all 32 criteria, and the Tenke Fungurume mine had 15 partially met categories. Where the Copper Mark identified gaps, TFM will have 2 years to close them before the award is revoked, though the site has a comprehensive improvement plan.

Tenke Fungurume's official website indicates several safeguard measures in place regarding external auditing today. In addition to its recent award of the Copper Mark, the TFM website touts its external Responsible Minerals Assurance Process (RMAP) audit in 2023 and recurring external review process for safety, health, and environmental quality standards.

The insights in this profile are derived from [AidData's Chinese Financing for Transition Minerals Dataset, Version 1.0](#) (CFTM 1.0), and the sources referenced therein. The dataset captures \$56.9 billion of official sector financial commitments that China provided to 19 low- and middle-income countries between 2000 and 2021 for projects involving the extraction or processing of copper, cobalt, lithium, nickel, and rare earth elements. An accompanying report, [Power Playbook: Beijing's Bid to Secure Overseas Transition Minerals](#), analyzes the dataset and provides evidence about the nature, scale, and scope of the PRC's overseas financing for the extraction and processing of energy transition minerals.

There are 5 records in the dataset which detail financing for the Tenke Fungurume mining site from 2000-2021. The unique record IDs are as follows: 91890, 91895, 91897, 91899, and 91902.

For any questions or feedback on this profile, please email china@aiddata.org.

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