

Ivanhoe Mines: Kamoa-Kakula Project

A UNICORN COPPER
MINING PROJECT



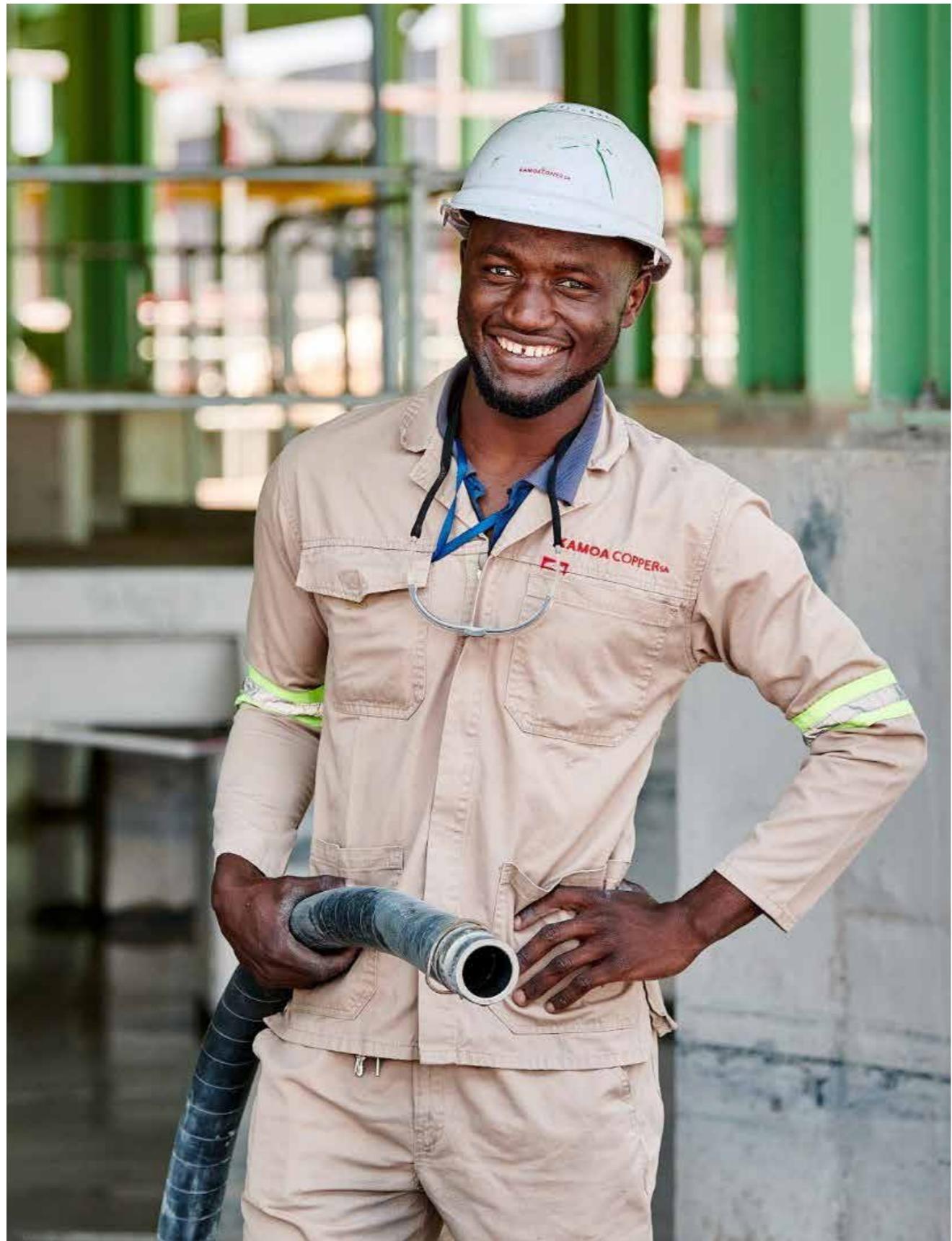


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RESEARCH BY *Eurides Lopes*



There's a very long and growing list of drivers for the global copper bull run over the past number of years, and the Democratic Republic of Congo (DRC) stands to be one of the big benefactors. While Chile understandably receives much of the coverage around copper deposits, all too often it is forgotten that the DRC and Zambian copper belts represent the second largest reserves in the world.

In total, the region possesses over 70 economic deposits of copper/cobalt, and thanks to the bull run, these are increasingly becoming an opportunity for the DRC to attract international investors. One of the latest projects in this area is the Kamoakakula mine, projected to be the world's highest grade major copper mine. With phase

that everything significant in the country had already been discovered. How wrong they were. A few months of exploration work just outside of Kolwezi revealed the Kamoakakula mine; a project with an overwhelming upside, an high-grade copper orebody discovery almost the size of Manhattan in the first phase alone in a geologically beneficial setting, estimations expecting it to yield some 11 billion USD in five development phases over 40 years. The Initial production of copper concentrate at the Kakula Mine processing plant began on May 25, 2021 and commercial production began in July 1st 2021 - several months ahead of target.

Ivanhoe's co-chairperson Robert Friedland in a recent statement said "This is a historic moment for Ivanhoe Mines and the Democratic Republic of Congo, and Discovering and

"The Financial Times has said that, when finished, it could produce enough metal to satisfy over 5% of China's annual demand"

2 of development now underway, Business Excellence decided the time was right to take a closer look.

Background

Since the first rumblings of a project began, the Kamoakakula mine has generated a stir. Wood McKenzie has called it the biggest copper mine in African history, and the Financial Times has said that, when finished, it could produce enough metal to satisfy over 5% of China's annual demand. Remarkably, however, Kamoakakula wasn't even on mining companies' radar until just a few years ago.

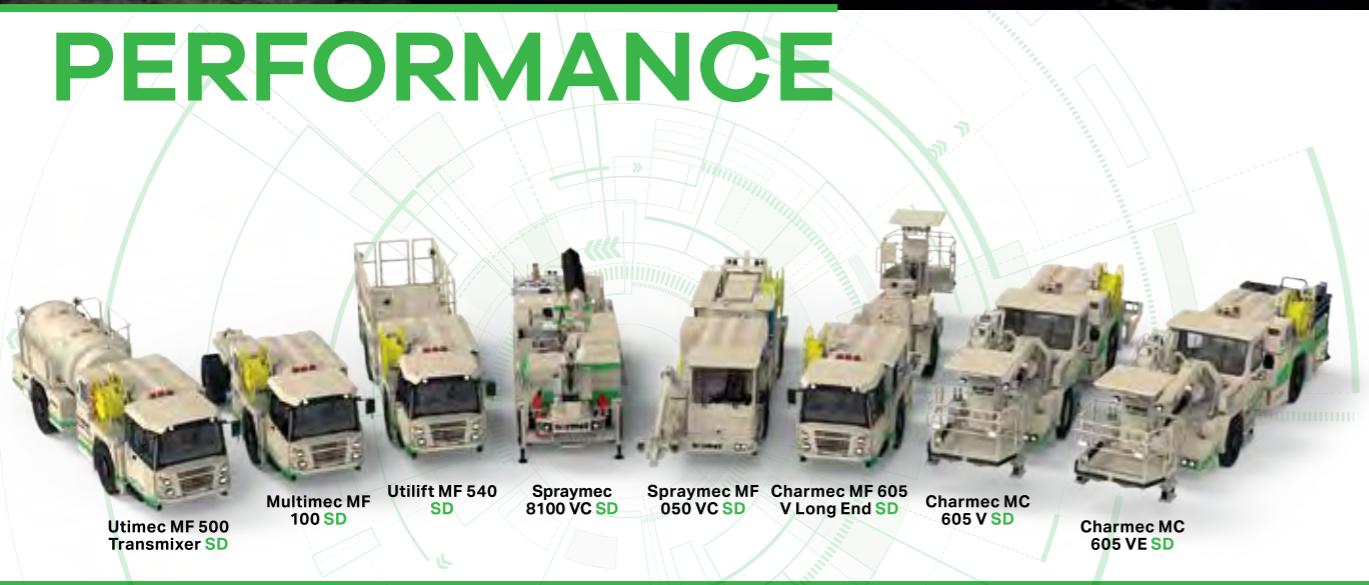
The Kamoakakula reserves were first discovered in 2007 when Ivanhoe Mines returned to the DRC after a few years away from the country. At that time, it was generally assumed

delivering a copper province of this scale, grade and outstanding ESG credentials, ahead of schedule and on budget, is a unicorn in the copper mining business. This accomplishment reflects the outstanding cooperation of thousands of individuals, and all of our joint-venture partners at Kamoakakula"

Kakula is projected to be the world's highest-grade major copper mine, with an initial mining rate of 3.8 Mtpa, ramping up to 7.6 Mtpa in Q3 2022. Phase 1 is expected to produce approximately 200,000 tonnes of copper per year, and phases 1 and 2 combined are forecast to produce approximately 400,000 tonnes of copper per year. Based on independent benchmarking, the project's phased expansion scenario to 19 Mtpa would position Kamoakakula as the world's



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second-largest copper mining complex, with peak annual copper production of more than 800,000 tonnes.

The first truck loads of copper concentrates for export departed from the mine on 17 July 2021, destined for smelters outside of the country. All output from the mine's first-phase project will be sold through CITIC Metal Company Limited and China's Zijin Mining Group as per previously arranged

Construction works are progressing well for phase 2, and operations are projected to begin in the first half of 2022. As of late 2021, the focus is on earthworks and civil works, both of which are again, ahead of schedule - a testament to the 5,000-strong team involved in delivering the project.

Sustainability and Social Inclusion

Despite its enormous scale, the Kamo-Kakula mine benefits from being a latest

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PACE VALVES's strength lies in the ability to identify customers bottom line plant operational requirements, and to provide a 'fit-for-purpose' product package, no matter how diverse the plant specification may be. PACE VALVES has been working closely with Kamo Copper since 2018 and has developed a strong supplier relationship

with them. We have provided both technical and product support throughout the plant, on both high and low pressure applications. Our areas of expertise and product offering have particularly assisted Kamo in installing state of the art High Pressure Severe Service Valves to their Paste Backfill Processes.

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"The mine's sophisticated design enables it to incorporate the use of backfill, so that the tailings footprint will be significantly smaller than mines of a similar size built in the past"

generation mine with impressive credentials in sustainability. The mine is being powered by clean and renewable hydro-generated electricity, and is forecast to be one of the copper industry's lowest greenhouse gas emitters per unit of metal product. Furthermore, parent company Ivanhoe mines has committed to achieving net-zero operational GHG at Kamo-Kakula.

Furthermore, as an underground pit, Kamo-Kakula avoids most of the disruption that we tend to associate with open pits. The mine's sophisticated

design enables it to incorporate the use of backfill, so that the tailings footprint will be significantly smaller than mines of a similar size built in the past. Little wonder that as well as being the world's biggest producer of high grade copper, Kamo-Kakula now produces what industry analysts call 'the world's greenest copper.'

Outside of environmental concerns, the mine is also making serious strides. With around 7,800 people currently working on phase 1 and 2 combined, Kamo-Kakula is now the biggest employer in the area. Further,



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its 2020 sustainability report shows that 96 of these are involved in training programs aimed at promoting them from their roles, and that there are over 400 community beneficiaries in training programs of some kind led by the mine.

On the issue of community, the presence of the DRC government among the mine's major shareholders means that every Congolese national stands to benefit to some degree from the mine. Locally, too, the mine's management is keen to promote local empowerment and

has a number of business initiatives in the area to generate employment and income, including fish farming and business training opportunities for women.

Covid-19 and its (Minimal) Impact

Let us recall for a moment that work on phase 1 of Kamo-Kakula was delivered ahead of schedule, and that phase 2 is currently running ahead of schedule. These statistics are impressive on their own, but are eye-opening in the context of the ongoing



Covid-19 pandemic. This effort began with large-scale testing and focused preventative measures, ensuring that positive cases were quickly identified, isolated and treated.

The mine also secured an initial supply of 1,000 dosages of the AstraZeneca vaccine for its employees, contractors, and high-risk members of local communities. The company has also developed an on-site Covid-19 isolation facility, allowing at-risk employees to isolate, test, and receive treatment. And of course, the company has implemented the strictest procedures around wearing face masks, frequent hand washing, and contact-tracing measures.

Supply Partners

Partnership is written in the DNA of the Kamoakakula project - it could not have gotten off the mark without the participation of several players, both local and international. The parent



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“The mine also secured an initial supply of 1,000 dosages of the AstraZeneca vaccine for its employees, contractors, and high-risk members of local communities”

company's shareholder structure is composed of Ivanhoe Mines (39.6%), Ivanhoe Mines (39.6%), Zijin Mining Group (39.6%), Crystal River Global Limited (0.8%) and the Government of the Democratic Republic of Congo (20%).

To begin with, the extensive range of underground mining equipment employed on site is provided by well-known Epiroc (Sweden) and Sandvik. Astruct (Australia) handled the fabrication, Normet contributed its battery electric vehicles contributing to the mines safety and sustainability goals, T3 Projects was tasked with the provision of electrical, control and instrumentation works for the concentrator and backfill plant.

PACE Valves -Process and Allied Contracting Equipment (South Africa) added state of the art High Pressure Severe Service Valves to Kamo's Paste Backfill Processes. Nerin Engineering (China) was awarded the basic engineering contract for a direct-to-blister flash smelter, and Metso Outotec (Finland) is responsible for its environmental smelter technology. Finally, the EPCM contract went to Enfi Engineering Corp. (China) and DRA Global (Australia) was awarded the contract to conduct basic engineering services for the mine. And Standard Bank (South Africa) served as the lead arranger of funding for the project as well.



“Even Ivanhoe Mining’s CEO admits that he’s excited about where the unexplored territories that remain in the DRC might lead the company”



Did you know?

Partnership is written in the DNA of the Kamoa-Kakula project - it could not have gotten off the mark without the participation of several players, both local and international. The parent company's shareholder structure is composed of Ivanhoe Mines (39.6%), Ivanhoe Mines (39.6%), Zijin Mining Group (39.6%), Crystal River Global Limited (0.8%) and the Government of the Democratic Republic of Congo (20%).



Other notable partners include Kongo River who has been providing civil works and bulk earthworks on the mine. Sotrafer SARL, Cegelec RDC, African Mining Service, Mining Contracting Services Congo, JTC Building Systems, Tractafrik Equipment, Rare Congo SARL, Minequip and Golder Associates Africa just to mention a few.

The Future

The future for Kamoa-Kakula is hard to project - in the best possible sense. Even Ivanhoe Mining's CEO admits that he's excited about where the unexplored territories that remain in the DRC might lead the company. Nobody predicted the wealth of copper that Kamoa-Kakula would yield. Perhaps a good place to start here is finishing Phase 2 in H1 2022, and then beginning work on Phase 3 shortly afterwards.

One of the key takeaways here, though, is not that Kamoa-Kakula is yielding so much copper. It is that it is doing so on a much more sustainable basis than would have been possible even a decade ago. All too often, this part of the world is castigated for its continued use of coal to generate power. Through its use of hydro power, Kamoa-Kakula exhibits at first hand the commitment by the DRC government to create a more sustainable future for its people. **BE**

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KAMOA-KAKULA PROJECT

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