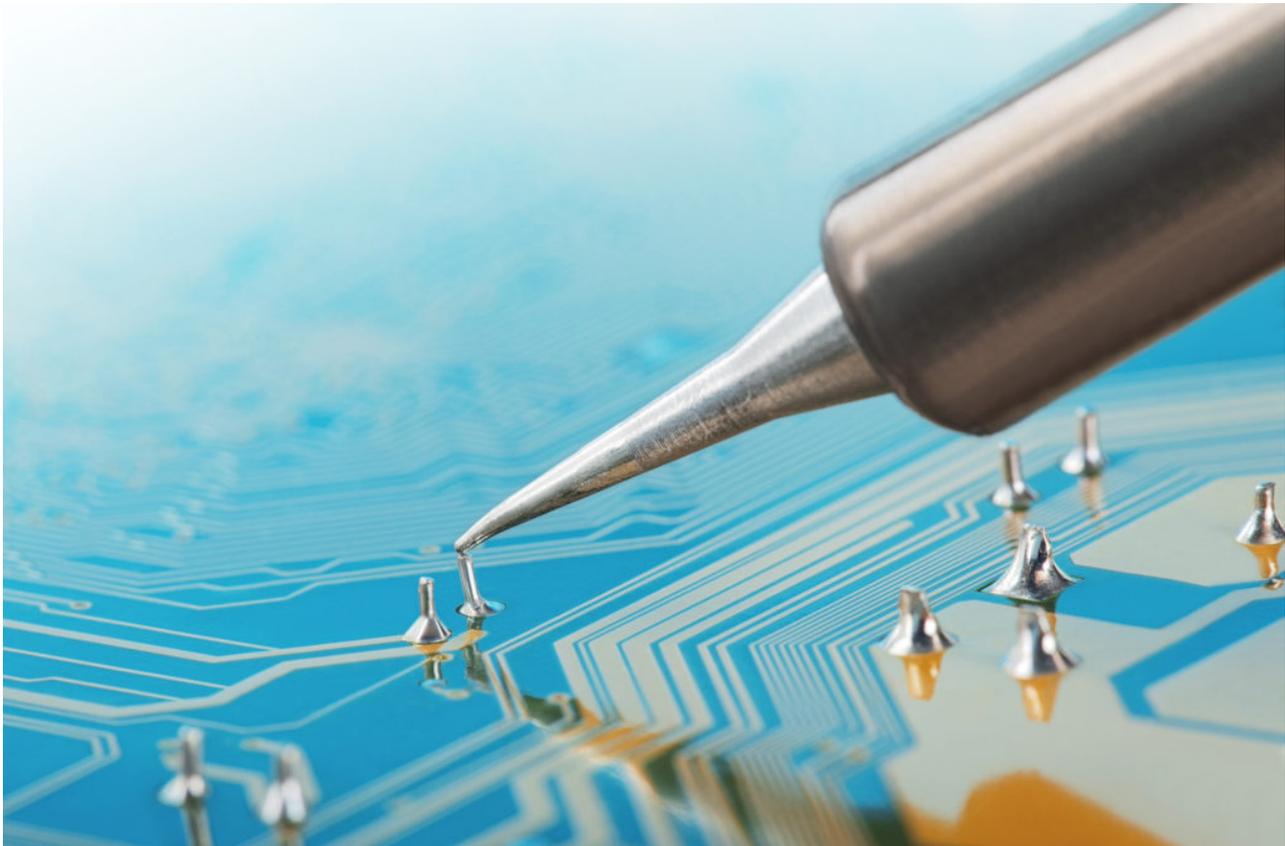


# Grade is Alphamin's ticket to the top

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With Covid-19 affecting most global operations, and on the back of a surging tin price, Alphamin's tin mine in the Democratic Republic of the Congo (DRC) is on track to become the richest tin mine in the world. Major operations in China, Indonesia and Myanmar have felt the brunt of the Covid-19 impacts, while production at Minsur's San Rafael mine in Peru, Metal X Limited's (ASX:MLX) Renison Bell in Australia and Taboca's Pitinga mine in Brazil have been dwindling, for several reasons, Alphamin's latest results show an increase in output of 29%.

With the tin price heading north of USD17,000/t (in fact, touching \$18,000/t recently) investors must surely be asking what they have missed. Tin (Sn) is a rather obscure metal, the production of which, for many years, have been dominated by several small players in China, Indonesia, and Myanmar.

## Grade trumps volume

The global tin market is surprisingly small, with a total of only 302,000t of tin in concentrate produced by global mines in 2019. Of the 302,000t, Alphamin produced more than 5,000t in its first few months of operation and could have delivered even higher volumes had it not experienced initial teething problems. Still, at current levels, Alphamin is the second largest producer outside of Asia.

Alphamin aims to produce more than 11,500t of contained tin per annum, 4% of the global tin demand.

Alphamin trumps all other producers in the world. The reason is its exceptionally high grades. Even in low grade areas, the mine churns out tin at an average of 4.1%, which is unheard of. Few other mines in the world can mine at grades higher than 1% or 2%. In Q2 of 2020, Alphamin mined tin at grades exceeding 4.3%, which is frightening considering that the company is only mining its first orebody, Mpama North.

## **Other exploration targets**

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Not that much is known about their other exploration targets, but there is reason to believe that these targets will show similar levels of mineralization. Their license area is immensely prospective, and the company aims to initiate various exploration initiatives. As such, Alphamin is considered a productive asset, highly profitable with massive blue-sky potential.

The significance of high-grade ore is that the quantity of a saleable product in a tonne of rock dictates the value that tonne is able to provide as revenue to the company, after adjustments for dilution, recovery, and other factors. The higher this grade value the greater the margin of error for the mining company. For Alphamin, this grade at current prices translates into about USD800 of tin in every tonne of ore. For most other mines, this value is at about USD200 to USD300.

Alphamin has a further advantage in that the tin mineralisation is in a coarse grained cassiterite, which makes for a relatively simple recovery process, leading to lower capex, opex and operating complexity than its competitors.

Investors often question why, at such superior grades, is the mine not the lowest cost producer in the world? The reality is that, despite its high grades, the energy, diesel, explosives, and other input consumables required to extract and process a tonne of ore from Alphamin, are the same as for other operators. However, the delivered unit costs of these inputs and other expenses required to operate effectively in such a remote region as North Kivu in the DRC translates into higher costs per unit. But the grade is sufficient to easily cover these costs and still place Alphamin in the lowest quartile of global tin producers. Moreover, logistics and other inputs are likely to be streamlined in the coming years, which will further reduce these costs.

## **Pre-Covid-19 decline in tin production**

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While Alphamin has been reasonably isolated from the full impacts of Covid-19, other tin mines have struggled. Although the full extent of the pandemic's impact is not yet known, global tin producers were in decline even before the onset of Covid-19. According to the International Tin Association, there were two high profile new entrants to the list of 14 top producing tin mines in the world in 2019. They were Alphamin and the Baiyinchagan mine in China.

In 2019, 14 mines (or groups of operations) produced more than 5,000 tonnes of tin-in-concentrate. Of the 14, eight were underground mines, two were open pit operations, and four were alluvial operations. But overall, tin mines in all regions have been in survival mode for the past few years.

## **China**

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Baiyinchagan made the list of 14 even though it was closed for most of 2019. The mine produced an estimated 7,000t of tin-in-concentrate in 2018. Yinman Mining, which owns the mine, has reportedly applied for a mining license following an accident in early 2019. The workforce has been re-employed, and the mine said in a statement last year that it is likely to recommence activities in mid-2020, although no update has been received since the outbreak of Covid-19. Other significant tin mines in China includes, amongst others, Huanlian's Yunnan mine, Southern Mines China's Linwu Sanshiliuwan mine, China Tin's Tongkeng mine and China Tin's Gaofeng mine.

## **Myanmar**

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Output from the Man Maw mining district in Wa, Myanmar, is reported as the collective production of seven large operations. All seven of these operations work the same deposit and use the same techniques. According to the International Tin Association the Man Maw mining district rapidly rose to prominence as the world's largest mining area in 2014. However, output has been declining since 2017. "When operations first began, small-scale miners operated open pit mines, but mining has now moved underground. The seven remaining companies are now extracting tin using heavy machinery, but this has seen costs increase significantly. Furthermore, the activity at depth comes with another issue: heat. Early operations were at the top of the mountains and exposed to the air; the hotter underground galleries make working conditions difficult."

In geological terms, major new discoveries in the Man Maw area are necessary to maintain long-term production, but investment could stabilise short-term output. Some of the major companies are beginning to work together on joint infrastructure projects. This includes construction of a ventilation shaft to reduce heat in the mining galleries.

## **Indonesia**

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Resource depletion has long been a critical issue in Indonesia. The majority of PT Timah's offshore alluvial operations are carried out with a centrally managed bucket-line and cutter-suction dredges. PT Timah produced the fourth highest amount of tin in 2019 and has focused investment into expanding its tin resource to ensure the future stability of output from its mining areas. From 2017 to 2018, the company increased its resources by 31% and its reserves by 10% through exploration and by including marginal resources, though the grade is not provided which makes an assessment of the quality and economic viability of the resources impossible. These shallow water resources were previously inaccessible due to the design of cutter suction dredges. The

separation of the dredge from the washing equipment has been key, allowing the company to extract tin from water less than 5m deep (International Tin Association, 2019).

## **Bolivia**

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In Bolivia, operations at the state-owned mines, Huanuni and Colquiri, have continued to decline. Colquiri's production peaked in 2016, while Huanuni has been declining since 2009. Although the government has invested in upgrading the ageing processing infrastructure at both mines, the Lucianita plant (built in 2014) at Huanuni remains unused due to power and water supply issues.

Commissioning at Lucianita began in January 2019 but met with further problems. The construction contract for Colquiri's new infrastructure was awarded in April 2019, with work expected to take more than two years. Exploration is underway at Huanuni though, and the mining team has identified four new tin-containing veins which will increase production by more than 2,000 tonnes.

## **Australia**

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There are a handful of tin projects in Australia that are looking to play in the big league, but it is not known if their intentions have been stifled by the Coronavirus.

Nevertheless, most Australian tin is expected to come from Metal X's Renison Bell, where an expansion is underway. The mine said in a statement that the section in area 5, where the expansions are taking place, has significantly higher tin grades than the currently mined areas and the mine expects to increase tin production to around 10,000t of tin-in-concentrate over the next decade.

## **Africa**

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The International Tin Association predicts that in the longer-term, tin produced in Africa will increase significantly. "Several new mine projects have been touted in the region, with many close to, or in, development. This will add more than 10 000t of new tin-in-concentrate production by 2023." The two biggest players in Africa at the moment is Afritin, which operates a pilot-scale mine in Namibia and is unlikely to produce commercial quantities of tin, and Alphamin, in the DRC which dominates with respect to grade and potential scale.

## **Record-setting Q2 results**

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Despite challenges during the recent Covid-19 restrictions, Alphamin released record-setting Q2 results last week. According to a statement by Alphamin the recovery, subsequent to quarter-end, in the price of tin to about USD17,000/t "bodes well" for the company which recently restructured its balance sheet in order to break-even at a metal price of USD13,000/t. The record Q2 results were on the back of a tin price of USD15,351 resulting in a 32% EBITDA margin.

Recently, the tin price jumped to \$18,000/t which should boost already robust margins further.

Tin production over the quarter rose 29% to 2,739 tonnes q.o.q. Plant throughput increased 8% to 91,928 tonnes derived from a new mining method while mined volumes exceeded plant throughput by around 4,000 tonnes increasing the run-of-mine stockpiles.

According to Maritz Smith, CEO at Alphamin, the processing plant is performing well, and various initiatives aimed at achieving consistently higher throughput are underway. “The all-in sustaining cost-per-ton of payable tin sold reduced by 13% to \$10,849/t, mainly attributable to increased tin production. Additionally, the previous quarter’s costs were negatively affected by high arsenic penalties and exceptional logistical costs incurred while the national road bridge was under repair. EBITDA of USD12.9-million was recorded at an average tin price of \$15,359/t. This represents an EBITDA margin of 32% in a relatively low tin price environment,” says Smith.