

Alphamin Resources

Still leading the pack

Re-initiation of coverage

Metals and mining

4 September 2023

Price **C\$0.93**

Market cap **C\$1,186m**

C\$1.3557/US\$

Net cash (US\$m) at end-June 2023, including US\$9.3m in lease liabilities 10.9

Shares in issue 1,275.3m

Free float 42%

Code AFM

Primary exchange TSX-V

Secondary exchange JSE AIX

Alphamin Resources (AFM) offers rare exposure to a metal (tin) that both Rio Tinto and the MIT regard as the most likely to benefit from the electrification of the world economy. Having successfully ramped up its Mpama North mine at Bisie in the Democratic Republic of the Congo in 2019–20, when the tin price was enjoying one of its biggest bull markets in decades, AFM is now in a net cash position and is paying dividends at the same time as developing a second mine (Mpama South).

Year end	Revenue (US\$m)	PBT* (US\$m)	EPS* (US\$)	DPS (C\$)	P/E (x)	Yield (%)
12/21	353	132	0.04	0.03	17.0	3.2
12/22	391	185	0.08	0.06	8.6	6.4
12/23e	325	121	0.05	0.06	13.6	6.4
12/24e	580	274	0.13	0.13	5.4	14.5

Note: *PBT and EPS are as reported.

Demonstrating a track record of exploration success

In mid-2022, Alphamin announced that it had replenished three years of ore mined after only one year of drilling at Mpama North, while at Mpama South it initially declared a large tin resource after only 18 months of drilling, which it has now upgraded a further three times. As a result, it is pressing ahead with its development of a second mine at Mpama South, the cost of which will be largely covered by its existing cash balances and positive operational cash flows in FY23.

Investment offers 18.0% IRR on dividends payable

Since early 2021, Alphamin's share price has been trading very much in line with the tin price. However, once capex at Mpama South is expended and the mine is in production, we believe that the possibility exists for dividend payments to ordinary shareholders of Alphamin to be increased sharply. Based on maximum potential dividends payable by the company to shareholders, we calculate that an investment in Alphamin's shares at today's price of C\$0.93/share will provide investors with an internal rate of return (IRR) of 18.0% on their investment over 15 years, to 2038, in Canadian dollar terms.

Valuation: Prospective yield higher than its P/E ratio

Whereas in the past we have valued Alphamin as the sum of its two major assets, Mpama North (including cash) and Mpama South, in this report, for the first time, we have fully consolidated Mpama South into our full financial model. Using this approach, our consolidated valuation of Alphamin is US\$1.06/share, or C\$1.44/share, based on the present value of future dividends potentially payable to Alphamin shareholders. However, if exploration success extends the lives of both Mpama North and Mpama South indefinitely, we calculate that a valuation as high as C\$2.36/share (in 2023 money terms) is ultimately achievable. In any event, we are forecasting earnings to more than double in FY24, by which time we expect Mpama South to have reached steady-state production and the tin price to have reached its long-term equilibrium price of US\$31,651/t (cf US\$25,305/t currently). In this context, Alphamin's peers imply an AFM share price of C\$1.47 for FY23, followed by C\$2.76 for FY24 and C\$2.89 for FY25.

Share price performance



% 1m 3m 12m

Abs (11.7) 9.6 37.9

Rel (local) (11.7) 5.0 28.5

52-week high/low C\$1.09 C\$0.58

Business description

Alphamin Resources owns (84.14%) and operates the Bisie tin mine at Mpama North in the North Kivu province of the Democratic Republic of the Congo with a grade of c 4.5% tin (the world's highest). Accounting for c 4% of global mined supply, it is the second largest tin mine in the world outside China and Indonesia.

Next events

Q323 results November 2023

Mpama South commissioning Late 2023/early 2024

Q4/FY23 results March 2024

Analyst

Lord Ashbourne +44 (0)20 3077 5724

mining@edisongroup.com

[Edison profile page](#)

Alphamin Resources is a research client of Edison Investment Research Limited

World's highest-grade tin mine

Alphamin offers rare exposure to a metal that both Rio Tinto and the Massachusetts Institute of Technology (MIT) regard as the most likely to benefit from the electrification of the world economy. Having successfully ramped up its Mpama North mine at Bisie in the Democratic Republic of the Congo (DRC) to full production in 2019–20, at a time when the tin price was enjoying one of its biggest bull markets in decades, AFM is already debt free and making distributions to shareholders. Its second mine, at Mpama South, will increase AFM's output by c 50% in FY24 to approximately 6.7% of the world's total in a similarly non-energy-intensive fashion.

Valuation

Whereas in the past we have valued Alphamin as the sum of its two major assets, Mpama North (including cash) and Mpama South, in this report, for the first time, we have fully consolidated Mpama South into our full financial model. In the wake of this change, our consolidated valuation of Alphamin is US\$1.06/share, or C\$1.44/share, based on the present value of future dividends potentially payable to Alphamin shareholders over the life of operations (as currently perceived), discounted at a rate of 10% pa, notwithstanding DRC country risk. Of this total, approximately two-thirds of the full valuation may be attributed to Mpama North and approximately one-third to Mpama South. Within this, we are forecasting earnings to more than double in FY24, by which time we expect Mpama South to have reached steady-state production and the tin price to have reached its long-term equilibrium price of US\$31,651/t (cf US\$25,305/t currently). At Alphamin's current share price, this suggests a prospective P/E ratio falling to approximately 5.1x in FY24–30e. At Edison's valuation of the company (see Exhibits 18 and 19), it suggests a P/E ratio of 6.8x in FY24–30e, but that its current share price is low relative to its valuation for nine years until FY32. In the meantime, Alphamin is one of those rare companies that is profitable, but whose dividend yield is forecast to be higher than its P/E ratio. On a relative basis, Alphamin is priced at valuation multiples that are cheaper than the averages of its peers in 10 out of 12 (or 83%) of valuation measures. On a discrete basis, it is cheaper than its peers in 27 out of 30 (or 90%) of valuation measures.

Sensitivities

Edison's valuation of C\$1.44/share changes by $\pm 17.2\%$ (or C\$0.25/share) for every $\pm 10\%$ that the tin price moves from US\$31,651/t. Alternatively, Alphamin's share price of C\$0.93 can be said to discount a long-term real tin price of US\$25,165/t, which is 0.6% below the currently prevailing three-month price of tin of US\$25,305/t and 20.5% below Edison's long-term price of US\$31,651/t. In the event of exploration success extending the life of operations at Bisie indefinitely, our valuation of Alphamin rises to C\$2.06/share (currently), and to C\$2.36/share in FY27.

Financials

Net cash on Alphamin's balance sheet amounted to US\$10.9m as at end-Q223 (including lease liabilities). Over the course of the next two quarters, we estimate that (subject to the tin price) Alphamin should generate c US\$30m per quarter pre-tax from operations. It should then pay out c US\$11m in taxes and a further c US\$20m in capex. It will then have one further interim dividend payment of US\$28m in Q323 plus any dividends from the group to minorities. All other things being equal therefore, we estimate that Alphamin will move from a net cash position as at end-Q223 to a small net debt position of c US\$8.5m as at end-Q323, before recovering slightly to a near break-even position by the end of the year. Thereafter however, we expect Alphamin to be strongly cash generative – as before, but with the added benefit of production from Mpama South. In this context, we assume that Alphamin will wish to retain c US\$70m in cash on its balance sheet as at end-FY24 and US\$40m thereafter (which is the basis of our future dividend forecasts).

World's highest-grade tin mine

Alphamin owns (84.14%) and operates the Bisie tin mine in the North Kivu province of the DRC. Bisie comprises the Mpama North underground mine with an average resource grade of c 5.4% tin (the world's highest and equivalent to a 22.3g/t or 0.72oz/t gold grade) and the nearby Mpama South project, which is under construction. Accounting for c 4% of the world's mined tin supply, Mpama North is the second largest tin mine in the world outside China and Indonesia. Within the next year, its second mine, at Mpama South, will increase AFM's output by c 50% to approximately 20,000t of contained tin per year, or c 6.6% of the world's total, in a similarly non-energy-intensive way.

History

The tin-bearing gossan on the Bisie Ridge was discovered in 2002 whereupon it became the subject of widespread small-scale artisanal mining. Alphamin's interest began in 2011, when it acquired an initial 70% interest in the Bisie Tin Project from Kivu Resources, which it later increased to 100%.

Maiden resource and feasibility study

Prior to Alphamin's involvement there had never been a formal mineral reserve or resource delineated at Bisie. However, this changed when, in November 2013, the company reported a maiden NI 43-101 compliant inferred mineral resource of 4.0Mt at a 3.5% tin (Sn) grade containing 141,200t of contained tin (at a 0.25% Sn cut-off), with the best assay results occurring in the four deepest holes drilled. Copper, lead, zinc and silver were also present.

An initial definitive feasibility study (DFS) was completed in February 2016, which estimated that the project could produce 9,000t of tin per year over an estimated 10.5 years after an initial US\$119.2m in capital expenditure. The DFS was subsequently updated and optimised to reflect front-end engineering and design and control budget estimates, such that it ultimately projected production of 152,300t of tin over a 12-year life with payback in 17 months after an initial US\$126.1m in capital expenditure, resulting in a project NPV₈ of US\$402.2m and an IRR of 49.1%.

Financing and ramp-up

After a final investment decision, Alphamin secured an US\$80m senior secured, non-revolving credit facility in November 2017 with Sprott, Barak and Tremont, to be provided to Alphamin Bisie Mining (ABM) – the owner of Bisie. Construction at Bisie commenced later the same year and, after slightly more than a year's construction, plant commissioning commenced in early 2019. Just prior to plant commissioning however, it was decided to change the mining method at Mpama North to one of cut and fill, after a management review into the suitability of sublevel caving in the light of prevailing rock conditions. The change resulted in revised reserves and a revised mining schedule in addition to adjustments to operating cost assumptions, mined grades and metallurgical recoveries. Nevertheless, the mine declared commercial production later the same year, in Q319.

Teething problems overcome

While Bisie was ramping up to full production, on 30 October 2019, the logistically important Maiko Bridge at Waine-Rukula collapsed. Prior to the collapse, concentrate produced at Bisie was trucked over the Maiko Bridge en route to Kisangani and, from there, to Gerald Metals depots (based in Kampala, Uganda) and then on to Mombasa, Kenya. As a result, Alphamin incurred additional logistical costs in Q120 relating to the sale of concentrate plus additional costs (eg hiring a helicopter from South Africa to transport material across the Maiko river). In consequence, on 9 December 2019, the company accepted a trader advance of US\$12.6m from the company's offtake

partner, Gerald Metals, to assist with cash flow. The advance took the form of a spot contract for the sale of US\$20m of tin concentrate and was ostensibly extinguished in Q120 and then fully extinguished in Q320 after the delivery of the associated lots to the designated delivery point in Uganda.

On 15 May 2020, Alphamin concluded a private placement of US\$31m, which was applied to reduce its debt balance. Concurrently, it signed an amended and restated credit agreement with improved terms. Finally, in May 2020, it settled certain third-party indebtedness of ABM, the owner of the Bisie tin mine, by the issue of Alphamin shares in consideration for a temporary loan due by ABM. Subsequently, it secured the required board and shareholder approvals from ABM to convert this ABM loan into new shares of ABM, which increased Alphamin's equity ownership of ABM to 84.14%, with South Africa's Industrial Development Corporation's interest then being diluted to 10.86% and the government of the DRC's interest remaining at 5%.

Coronavirus pandemic circumvented

With the exception of some early logistical disruptions (eg along the trucking routes between Kenya and Uganda), it is worth noting that Africa, in general, and Alphamin, in particular, were barely affected by the coronavirus pandemic of 2020–22, with management reporting that East African countries reacted in a manner appropriate to the crisis that was proportionate to the risks and that the logistical supply routes between the DRC and Mombasa continued to operate in an orderly and efficient manner. As a result, mining at Bisie continued, to all intents and purposes, without disruption, allowing the company to become net cash positive in Q321 and to pay a maiden dividend to shareholders for FY21 early in FY22. It subsequently fell into a pattern of declaring interim and final dividends during FY22 (all of which have been at a level of C\$0.03/share to date).

Process plant optimisation

To manage fine and ultrafine tin losses in circuit (identified at the time of the plant's commissioning in 2019), a decision was taken to install a fine tin recovery circuit in mid-2021, which acted to improve both the plant's metallurgical recoveries (by c 5.5 percentage points) and its throughput rate by up to 10% (in conjunction with a process of debottlenecking).

A second mine

In early March 2022, Alphamin announced a maiden resource at its second major exploration target after Mpama North, called Mpama South, plus the results of the preliminary economic assessment (PEA). The PEA indicated that a mine at Mpama South could produce 7,232t contained tin per year from 468kt ore processed at a grade of 2.21% and a metallurgical recovery of 70% for a capital outlay of US\$115.97m and an all-in sustaining cost (AISC) of US\$15,188/t (at a tin price of US\$40,000/t). Later that same month, Alphamin announced a resource upgrade at Mpama South and a decision to proceed with developing the new project.

Notwithstanding the near halving of the tin price in the second half of 2022, work commenced on the new mine. Underground development remains ongoing and on schedule and, as of August 2023, development progress is as follows:

- A total of 1,460m of underground development at Mpama South has been completed to date, of which 603m was achieved in Q223 (cf 418m in Q123). Development accelerated during Q2 as additional underground equipment arrived on site. During July 2023, the underground development connecting Mpama North and Mpama South reached the intersection point where the new Mpama South adit from surface will connect. Owing to a 6m wide area of extremely poor ground conditions, the Mpama South adit is now expected to connect with the Mpama South underground workings during November 2023, albeit this will still be in time for the tramming of ore to the new processing facility. Otherwise, year-to-date development metres are in line with the company's updated two-year underground mine plan to achieve the targeted tin

production expansion from FY24. This plan requires an additional c 2,000m of underground development at Mpama South during the six months ending December 2023, which should be achievable as additional development ends become available from Q323.

- In the meantime, the new processing facility is reported to be progressing well. Following completion of all procurement, design and engineering, fabrication, earthworks and substantially all civils, the focus has moved to plant erection and tracking of steel and equipment in transit. The fine tin plant structure, primary crusher structure and concentrate drying and storage building were erected during Q2 and the commissioning of the new processing plant remains on target to commence in December 2023, whereafter first ore is expected to be processed from late January 2024. Currently, the Alphamin project team, together with the existing site team, remains focused on operational readiness preparation, including the recruitment and training of personnel, expansion of the laboratory and accommodation facilities and infrastructure and increasing the supply chain in anticipation of additional production.

As such, the Mpama South development project remains forecast to be substantially complete within its budget of US\$116m and within its expected timeframe.

Geography

The Bisie Tin Project is located approximately 60km north-west of Walikale centre and 180km north-west of Goma, the capital of the North Kivu province, in the eastern DRC.

Among other things, the area is characterised by dense forest, deeply weathered soils and high rainfall.

Exhibit 1: Alphamin Bisie mine location



Source: Alphamin presentation

The operating environment in North Kivu

Bisie is the only commercial mine of scale in the North Kivu province. It is technically simple and occupies a small footprint. Out of necessity, it has to be self-reliant. Nevertheless, procurement to site has not proved to be a problem. In the rainy season (at its height in Q4), this can involve a three-month round trip; however, the average journey time is typically measured in days. Moreover, critical parts can be flown into the mine, if necessary, within seven days. Plant spares are typically sourced from South Africa and engineering spares from Sweden, while the jig (the essential gravity separating component of the plant) is made in Australia. Otherwise, the mine requires no bulk consumables and few reagents. Cement is sourced within the DRC and all other supplies from the Southern Africa region.

While there has been an upsurge of violence in the North Kivu region in the past 12 months – variously between the local population, M23 Tutsi-led rebels (largely seen as a proxy force backed

by Rwanda), East African Community (EAC) regional forces, the UN peacekeeping mission (MONUSCO) and regular Congolese forces (possibly backed by Russia's Wagner Group) – these problems are largely restricted to the border areas between the DRC, Uganda and Rwanda, some 300km to the east of Bisie as the crow flies (note: it is almost 1,000km via the only road that links the two through near impenetrable jungle) and in distinct 'hot spots' from which the mine is protected by its remoteness and obscurity, which, together with the region's lack of infrastructure, form a very effective security moat around it. Moreover, since tin concentrate has a much higher volume per unit value of metal contained than gold concentrate, it is relatively unattractive as a target for either rebel activity or smugglers. As a result, management reports that there have been no artisanal miners located on the property since being asked to leave by the provincial government. In addition, recent consumer protection and anti-foreign corruption legislation both in the United States and the wider world has made it significantly harder for smelters to accept ore from non-accredited or unofficial sources. As well as offering relatively low rewards and relatively high logistical hurdles therefore, tin concentrate is also increasingly hard for smugglers to sell into the official market.

Geology

AFM has conducted a detailed mapping exercise across the permits that includes geological and structural interpretations from an airborne geophysical campaign and full details of the geology at Bisie may be found in the NI 43–101 technical report lodged by Alphamin on Sedar.com on 13 February 2019.

In broad terms however, the mineralisation at Mpama North consists of a number of narrow veins, blocks or dispersions of cassiterite hosted in a chlorite schist. The tin mineralisation is also strongly associated with copper, introduced in late-stage fractures. For the purposes of its resources and reserves, the mineralisation is defined in three distinct vein systems, namely the Hanging Wall, Main and Footwall veins. The Main vein accounts for 95% of the resources at Mpama North and has thicknesses ranging from 2–22m. The Hanging Wall vein occurs 4–20m above the Main vein, while the Footwall vein occurs 2–12m below the Main vein. The Hanging Wall and Footwall veins are restricted to the northern and southern areas of the deposit, respectively.

Mining and processing

Mining

Mining at Bisie is fully mechanised and trackless, using a small fleet and remotely operated load, haul, dump (LHD) machines. Host rock is described as 'competent' or 'very competent', even in the shear zone, with the possible exception of where it is in contact with the hanging wall. It is also not a wet mine. The decision to transition from a sublevel caving (SLC) mining method to long-hole stoping (LHS) was made to improve safety and reduce the technical risks associated with SLC in the underground environment encountered at Mpama North as well as to increase volumes mined and improve the underground flow of material. The associated NI 43–101 technical report was compiled by Sound Mining Solutions. In general terms, the life of mine (LOM) schedule under the optimised 2019 mine plan (ie the one management is broadly following) brought forward the production of both ore tonnes and higher grades within the life of the mine, thereby improving cash flows (all other things being equal). A comparison of the two LOM plans (along with actual outcomes in the first three years of mining) is as follows:

Exhibit 2: Bisie 2019 LOM schedule cf 2017 LOM schedule and actual

	Yr 1*	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14
2017 LOM schedule														
Tonnes ROM (kt)	62.6	289.1	404.7	388.2	394.4	397.4	386.3	370.1	373.9	363.9	366.9	360.7	343.4	171.1
Grade Sn (%)	2.39	4.38	3.63	3.22	2.91	2.92	3.73	3.04	2.95	3.25	4.31	5.61	3.53	4.00
Contained tin in ore (kt)	1.5	12.7	14.7	12.5	11.5	11.6	14.4	11.2	11.0	11.8	15.8	20.2	12.1	6.8
2019 LOM schedule														
Tonnes ROM (kt)	172.0	332.8	385.0	393.5	377.3	362.2	386.6	339.8	361.8	307.8	250.8	236.8	85.3	35.1
Grade Sn (%)	5.30	4.06	4.14	4.21	4.23	3.96	4.47	3.68	4.89	2.67	2.59	2.99	6.56	8.91
Contained tin in ore (kt)	9.1	13.5	15.9	16.6	15.9	14.3	17.3	12.5	17.7	8.2	6.5	7.1	5.6	3.1
Cumulative tin in ore (kt)	+7.6	+8.5	+9.7	+13.8	+18.2	+21.0	+23.8	+25.1	+31.7	+28.1	+18.8	+5.6	-0.9	-4.6
Actual														
Tonnes processed (kt)	182.3	366.6	416.2	436.4										
Grade Sn (%)	5.15	3.96	3.60	3.82										
Contained tin (kt)	9.4	14.5	15.0	16.7										
Actual cf 2019 LOM schedule														
Tonnes processed (%)	+6.0	+10.2	+8.1	+10.9										
Grade Sn (%)	-2.8	-2.5	-13.0	-9.3										
Contained tin (%)	+3.1	+7.5	-5.9	+0.3										

Source: Alphamin. Note: *Corresponds to FY19 for the 2019 LOM schedule. ROM, run-of-mine.

Overall, the optimised 2019 LOM schedule was calculated to deliver cumulatively 28.1kt more tin contained in an equivalent run-of-mine (ROM) volume to the plant in the first 10 years of operation compared with the previous LOM schedule. It also included a portion of inferred resources (which the original 2017 LOM schedule did not), equating to 13.6% of total tonnes mined, albeit less than half of these tonnes were scheduled in the first eight years of operations. As a result, it had a longer 'tail' and lower volumes in the final years than the previous schedule. However, Alphamin management's plan is that production in these years would be augmented via exploration success at both Mpama North (underground) and Mpama South (see below).

In addition, in pursuit of further optimising overall tin processing recoveries to above the targeted level of 72%, the company installed a fine tin recovery circuit that is designed to improve recoveries by c 5.5 percentage points above that originally forecast over the life of the operation.

Processing

With a specific gravity of c 7 (akin to most metals in their elemental form and only slightly below that of pure tin itself), cassiterite has proved ideal for concentration via gravity separation and has been the principal source of tin ore since ancient history. In conception, the processing plant at Mpama North uses just such conventional gravity separation methods for the recovery of tin at Bisie into a c 60% concentrate. Originally constructed with a throughput capacity of 360ktpa, the plant was subsequently upgraded by a series of minor debottlenecking exercises to increase its capacity by c 10%.

The process starts with the crushing of the ore, with the coarse material accounting for 75% of the overall crushed material and the fine material accounting for 25%. The coarse material is then recovered using conventional jigs. Fine material is recovered via the fine tin recovery circuit down to a size of 10µm. The fine tin recovery circuit was commissioned in early to mid-2021 and uses Multi Gravity Separators, set up in rougher-cleaner configuration, to treat a 20tph process flow stream from the existing plant's tailings running at a grade of 0.8–1.1% tin. The circuit produces a concentrate containing 45–55% tin, which is then blended with the concentrates from the main gravity concentration plant to produce a final concentrate containing c 60% tin. The tin-rich concentrates are then thickened, filtered and exported to a smelter for refining.

Infrastructure

Power and water

Power at Bisie is supplied from a light fuel oil (LFO) diesel power station on site, which uses approximately 0.32 litres of LFO per kWh produced. Cables link the diesel power station to the process plant substation and an 11kV power line links the mine with the diesel power station.

The required water for the project is sourced from existing mine water supplemented by supply from nearby springs and rivers.

Infrastructure and logistics

In order to gain day-to-day access to the site, AFM constructed a 34km access road from the project area to the village of Logu through rugged terrain and dense forest to link Bisie to National Route 3 (N3), which runs between Kisangani and Walikale. In general, fuel is transported to site in standard fuel tankers, carrying 36,000 litres per trip, while concentrate is exported in sealed containers holding c 24t per container on standard tri-axle mechanical trailers.

Reserves, resources and mining schedule evolution

Formal reserves in mining comprise the proven and probable categories. For the purposes of the below analyses, Edison has resurrected a former category of resources, denoted 'possible', for the purposes of calculating the required conversion of existing resources into reserves in order to render Alphamin's most recent publicly disclosed mining schedule at Mpama North (in June 2022) and Edison's extended mining schedules at both Mpama North and Mpama South achievable. Readers should be aware that this 'possible' category of reserves no longer exists and has been used solely as a device for these purposes.

Mpama North updated mineral reserve and resource estimates

As at end-June 2019, mineral resources at Bisie were estimated to be 220.8kt tin contained within 4.8Mt ore at a grade of 4.60%. Mineral reserves were updated as at 31 December 2019 to 133.38kt Sn contained within 3.33Mt ore at a grade of 4.01% to take account of the revised LOM plan following a change in mining method from the previous sublevel caving (SLC) mining method to open stoping with hydraulic backfill (LHS). The decision to transition from one to the other was made to improve safety and reduce technical risks associated with SLC in the underground environment at Mpama North. The LHS mining method has lower levels of dilution than the SLC mining method, which positively affects mined grades as well as reducing waste tonnes. However, it also requires more pillar support than SLC and thus has a lower extraction rate. As a result, a higher cut-off grade of 1.6% tin was used in the updated mineral reserves estimate, compared to 1.4% used in the 6 February 2017 estimate.

On 3 August 2022, Alphamin announced an updated resource estimate at Mpama North. A summary of the updated resource (dated June 2022) compared with its previously reported resource (dated June 2019) is as follows:

Exhibit 3: Mpama North updated reserves and resources of prior

	Resources*			Category	Reserves			Ownership (%)	Attributable	
	Tonnage (Mt)	Grade (% Sn)	Contained tin (kt)		Tonnage (Mt)	Grade (% Sn)	Contained tin (kt)		Resources (kt Sn)	Reserves (kt Sn)
Updated										
Measured	0.04	2.16	0.90	Proven	0	1.38	0.00	84.14	0.76	0.00
Indicated	3.09	5.02	154.90	Probable	2.62	4.64	121.30	84.14	130.33	102.06
Inferred	0.55	7.56	41.20	Possible**	0.61	5.44	33.20	84.14	34.67	0.00
Total	3.68	5.35	197.00	Total	3.23	4.78	154.50	84.14	165.76	130.00
Previous										
Measured	0.33	4.75	15.60	Proven	0.05	3.77	1.89	84.14	13.13	1.59
Indicated	3.99	4.59	183.40	Probable	3.28	4.01	131.49	84.14	154.31	110.64
Inferred	0.48	4.57	21.80	Possible**	0.52	4.00	20.82	84.14	18.34	17.52
Total	4.80	4.60	220.80	Total	3.85	4.01	154.2	84.14	185.78	129.75
Change (units)										
Measured	-0.29	-2.59	-14.70	Proven	-0.05	-2.39	-1.89	84.14	-12.37	-1.59
Indicated	-0.90	0.43	-28.50	Probable	-0.66	0.63	-10.19	84.14	-23.98	-8.58
Inferred	0.07	2.99	19.40	Possible**	0.09	1.44	12.38	84.14	16.33	10.42
Total	-1.12	0.75	-23.80	Total	-0.62	0.78	0.30	84.14	-20.02	0.25
Change (%)										
Measured	-87.9	-54.5	-94.2		-100.0	-63.4	-100.0		-94.2	-100.0
Indicated	-22.6	9.4	-15.5		-20.1	15.7	-7.8		-15.5	-7.8
Inferred	14.6	65.4	89.0		17.3	35.9	59.5		89.0	59.5
Total	-23.3	16.4	-10.8		-16.1	19.4	0.2		-10.8	0.2

Source: Alphamin Resources, Edison Investment Research. Note: *0.5% Sn cut-off grade for resources and 1.0% for reserves; mineral reserve reported in accordance with the requirements and guidelines of NI 43-101. Totals may not add up owing to rounding.
 **Archaic.

Material tin grade increase

While, at first glance, tonnages and contained in-situ tin have both declined since Mpama North's June 2019 mineral resource statement, the most notable feature of the update was the change in the tin grade. Overall, the tin grade of the resource increased by 16.4% since June 2019 (up 65.4% in the inferred category of resources), while the overall grade of reserves (excluding possible reserves) has increased by a comparable 15.7%, from an already high 4.01%, to 4.64% (equivalent, in terms of the value of contained metal, to a gold grade of 19.2g/t or 0.62oz/t).

June 2022 resources and reserves were (necessarily) stated net of mining depletion. In this case, we estimate that mining has extracted 1.15Mt of ore between June 2019 and June 2022 at a grade of 3.94% Sn. This would imply that Mpama North's resource tonnage is almost exactly where it would have been expected to be, but that its reserve tonnage has increased materially. Once again, however, the most striking feature of this analysis is the concurrent, and material, increases in both resource and reserve grades, as shown below:

Exhibit 4: Mpama North updated cf prior resources and reserves (incl depletion), June 2022 cf June 2019

	Resources*			Category	Reserves			Ownership (%)	Attributable	
	Tonnage (Mt)	Grade (% Sn)	Contained tin (kt)		Tonnage (Mt)	Grade (% Sn)	Contained tin (kt)		Resources (kt Sn)	Reserves (kt Sn)
Updated										
Measured	0.04	2.16	0.90	Proven	0	1.38	0.00	84.14	0.76	0.00
Indicated	3.09	5.02	154.90	Probable	2.62	4.64	121.30	84.14	130.33	102.06
Inferred	0.55	7.56	41.20	Possible**	0.61	5.44	33.20	84.14	34.67	27.94
Total	3.68	5.35	197.00	Total	3.23	4.78	154.50	84.14	165.76	130.00
Previous										
Measured	0.33	4.75	15.60	Proven	0.05	3.77	1.89	84.14	13.13	1.59
Indicated	3.99	4.59	183.40	Probable	3.28	4.01	131.49	84.14	154.31	110.64
Inferred	0.48	4.57	21.80	Possible**	0.52	4.00	20.82	84.14	18.34	17.52
Previous total	4.80	4.60	220.80	Total	3.85	4.01	154.2	84.14	185.78	129.75
Depletion	1.15	3.94	45.18		1.15	3.94	45.18			
Previous less depletion	3.65	4.81	175.62		2.70	4.03	109.02			
Change (units)	0.03	0.55	21.38		0.53	0.75	45.48			
Change (%)	0.7	11.4	12.2		19.5	18.6	41.7			

Source: Alphamin Resources, Edison Investment Research. Note: *0.5% Sn cut-off grade for resources and 1.0% for reserves; mineral reserve reported in accordance with the requirements and guidelines of NI 43-101. Totals may not add up owing to rounding. **Archaic.

As a consequence, Alphamin was able to update its prior LOM schedule for Mpama North, as follows:

Exhibit 5: Mpama North updated LOM schedule, June 2022 compared with December 2019

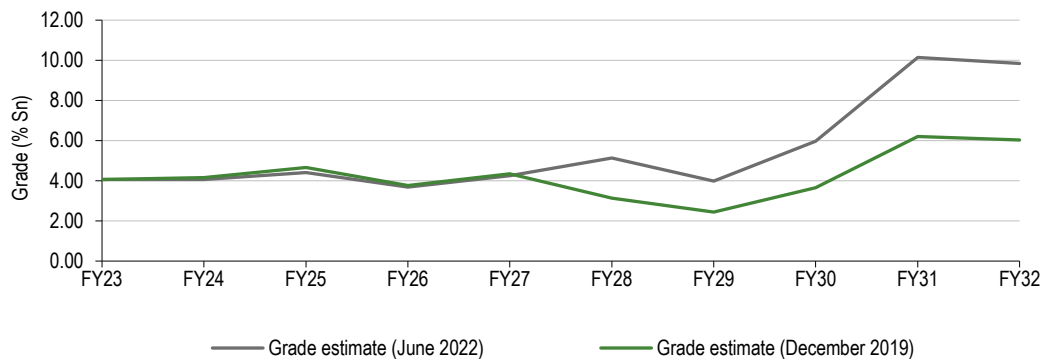
	Cut-off grade (% Sn)	Tonnage (Mt)	Grade (% Sn)	Contained tin (kt Sn)
June 2022	1.00	3.23	4.78	154.50
December 2019	1.60	3.85	4.00	154.20
Depletion*		0.99	3.94	39.03
December 2019 minus depletion		2.86	4.03	115.17
Change (units)	-0.60	-0.62	+0.78	+0.30
Change (%)	-37.5	-16.1	+19.5	+0.2
Change (units)**	-0.60	+0.37	+0.75	+39.33
Change (%)**	-37.5	+12.9	+18.6	+34.1

Source: Edison Investment Research, Alphamin Resources. Note: *Alphamin tonnage estimate. **Including depletion.

Two-and-a-half years of contained tin depletion replenished via the drill bit

Readers should note the reconciliation of the tonnage, grade and contained tin inventory expected to be mined under Alphamin's June 2022 mining schedule with the reserves calculated by Edison (including its 'possible' category) in Exhibits 3 and 4. Once again, although the headline tonnage to be mined appears to have fallen in June 2022 compared with December 2019, it has, in fact, increased on a like-for-like basis, once depletion has been taken into account. In this case, the increase in underlying tonnage to be mined of 0.37Mt equates to approximately one additional year of mining. However, the striking feature of this analysis is the extent to which the grade of the tin mined over the course of the whole schedule has increased. At the time, this caused us to increase our assumption of the grade of material to be mined over the life of the mine (relative to the 2019 plan) by a (simple) average of 30.5% from FY24, as shown, by year, in Exhibit 6, below.

Exhibit 6: Estimated life-of-mine grade schedule, June 2022 cf December 2019 (% Sn)



Source: Edison Investment Research, Alphamin Resources

While we forecast that the grade in the earlier years of operation would remain approximately unchanged relative to its December 2019 LOM plan, in the light of Alphamin’s updated June 2022 LOM schedule totals, we believed that it would be materially higher in the later years of operation as grade increases with depth, such that the average over the life of the mine would be 4.78%.

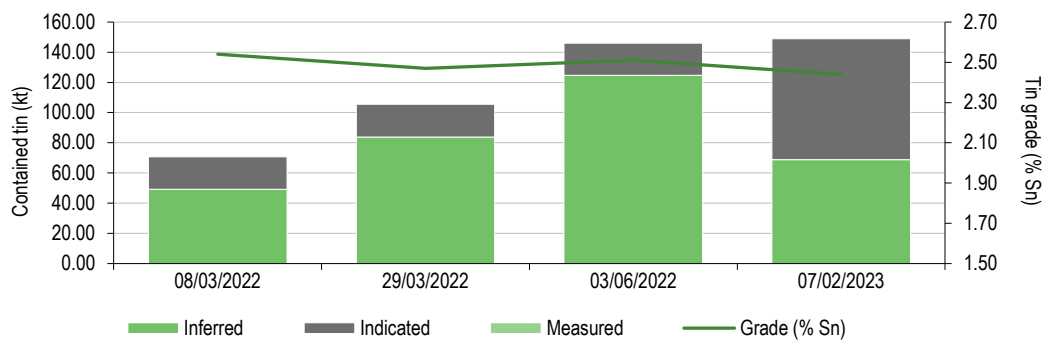
We note that, while the cut-off grade associated with the LOM schedule was reduced, the fact that this was not the source of the increase in mineable tonnage was attested to by the simultaneous increase in the grade of material to be mined. At the time, the difference between reported reserves (of 2.62Mt at 4.64% Sn) and the LOM schedule (3.23Mt at 4.78% Sn) could be rationalised on the assumption that 0.61Mt of resources in the inferred category (ie substantially all of the resources in the inferred category) were to be mined at a grade of 5.44% Sn (cf a resource grade of 7.56% Sn – see Exhibits 3 and 4).

Subsequently, in recognition of its recent exploration successes and the prospectivity of the region, we have opted to assume that Alphamin is capable extending its life of mine by an additional four years relative to its June 2022 mine schedule to FY36 (see Exhibit 12).

Mpama South mineral resources

Mpama South is located approximately 750m to the south of Mpama North. Alphamin declared a maiden resource at Mpama South in March 2022 and has subsequently upgraded it three times, in March 2022, June 2022 and February 2023. A graphical depiction of the evolution of Alphamin’s resource at Mpama South, by resource category, is provided below:

Exhibit 7: Development of resource at Mpama South, by categorisation and date



Source: Edison Investment Research (underlying data: Alphamin Resources)

Of note is the initial focus on expanding the resource (in terms of its size), followed by the subsequent upgrading of the resource (in terms of its categorisation, ie inferred resources upgraded into indicated ones), all achieved at essentially an unchanged overall tin grade.

As at 7 February 2023, Alphamin's updated resource at Mpama South was as shown below:

Exhibit 8: Mpama South updated resource and required reserve conversion

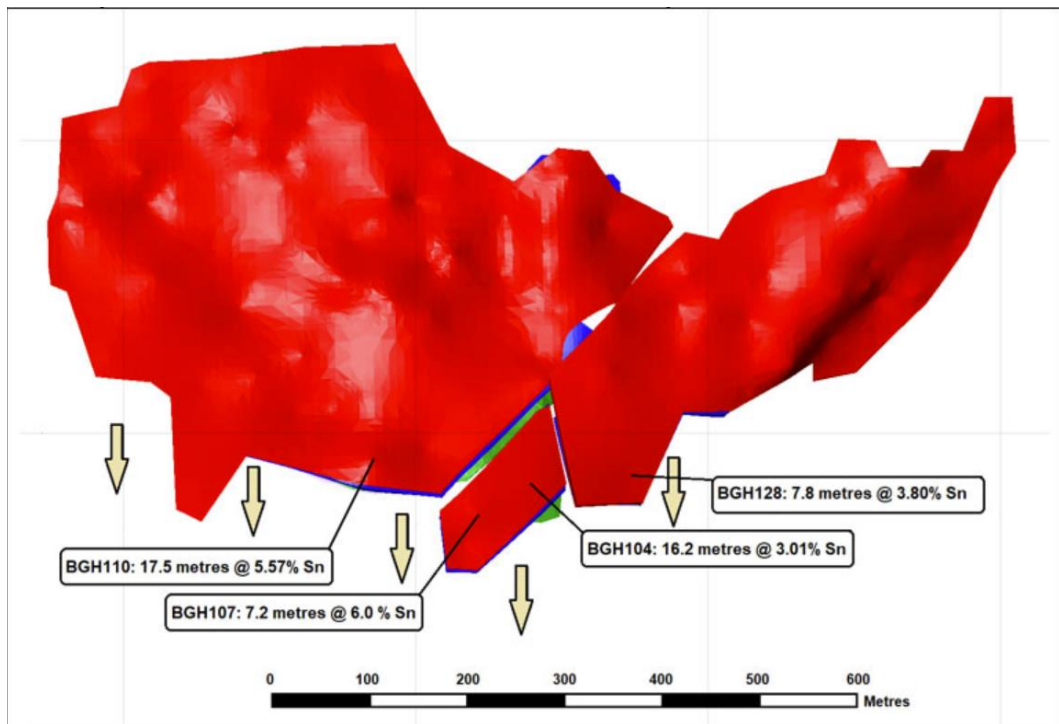
	Resources			Category	Reserves			Ownership (%)	Attributable	
	Tonnage (Mt)	Grade (% Sn)	Contained tin (kt)		Tonnage (Mt)	Grade (% Sn)	Contained tin (kt)		Resources (kt Sn)	Reserves (kt Sn)
Updated**										
Measured	0.00	0.00	0.00	Proven	0.00	0.00	0.00	84.14	0.00	0.00
Indicated	3.26	2.46	80.20	Probable	0.00	0.00	0.00	84.14	67.48	0.00
Inferred	2.84	2.42	68.70	Possible*	6.95	2.12	147.38	84.14	57.80	124.01
Total	6.10	2.44	148.89	Total	6.95	2.12	147.38	84.14	125.28	124.01
Maiden resource***										
Measured	0.00	0.00	0.00							
Indicated	0.83	2.58	21.52							
Inferred	1.95	2.52	49.12							
Total	2.78	2.54	70.64							

Source: Alphamin Resources, Edison Investment Research. Note: Mineral reserve reported in accordance with the requirements and guidelines of NI 43-101. Totals may not add up owing to rounding. *Archaic. **February 2023. ***March 2022.

At the time that it announced a maiden resource at Mpama South, in March 2022, Alphamin also disclosed a life of mine plan showing 2,068kt run-of-mine tonnes at an average grade of 2.21% Sn (see Exhibit 10, below). As such, run-of-mine tonnes equated to 74% of resource tonnes, while the average mined grade was 87% of the resource grade. Applying the same percentages to the updated resource at Mpama South (above) implies 4.5Mt of run-of-mine ore (ie 9–10 years of mine life) at an average grade of 2.12% Sn. However, the resource at Mpama South also remains open at depth with good disclosed intersections at the last drill line at depth. As such, we believe that it is valid to impute additional years of life to the mine at Mpama South and, in this case, we estimate an additional five years of life – to take the overall life of the operation to 15 years – is appropriate. We note that Alphamin's reserves will ultimately need to increase to very nearly the size of its current resource, in terms of contained tin (albeit at a slightly lower grade), in order to achieve this goal. However, in the light of Alphamin's recent exploration successes at both Mpama North and Mpama South, we believe that this should be achievable. In addition, it will have at least the initial 9–10 years of the life of the operation in order to achieve it. As at Mpama North, above, readers should note that the 'possible' category of reserves no longer exists and has been included in Exhibit 8 as a device for demonstrating the extent of exploration success required in order to reconcile with Edison's extended LOM production schedule at Mpama South (see Exhibit 12). Within this context, extensional drilling down dip and in the shallower northern and southern portions of Mpama South has the capacity to extend known mineralisation at Mpama South, which is still open in multiple directions. High-grade drillholes around the peripheries where mineralisation remains open are

highlighted in the exhibit below, which demonstrates the remaining prospectivity for resource expansion at Mpama South.

Exhibit 9 Mpama South resource showing direction in which mineralisation is open



Source: Alphamin Resources

However, for 2023, management's focus will primarily be directing mine construction and commissioning efforts, while exploration drilling will be curtailed and, instead, aimed at further field work campaigns to support future programmes. As a result, the focus for 2023 has been a regional greenfields campaign (see 'Regional exploration' below).

Mpama South preliminary economic assessment

At the same time as announcing its maiden resource (March 2022), Alphamin announced the results of a PEA at Mpama South. The PEA encompassed a number of mining, metallurgical, environmental and regulatory studies, which together demonstrated the potential to expand production at Bisie by leveraging the infrastructure at Mpama North (eg power, water, site access, underground infrastructure and personnel) to build a second mine and dedicated second lookalike processing plant and mine portal at Mpama South. The main findings of the PEA were as follows:

Exhibit 10: Mpama South initial PEA outcomes

Item	Value
Total run-of-mine ore processed	2,068kt
Average annual run-of-mine ore mined and processed	468kt
Average annualised run-of-mine grade	2.21%
Processing recovery	70.0%
Average annualised contained tin produced	7,232t
Average annualised AISC per tonne tin sold*	US\$15,188/t
Average annualised EBITDA*	US\$187.31m
Development capital	US\$115.97m
Construction timeline	20 months

Source: Alphamin Resources. March 2022. Note: *At US\$40,000/t tin price (cf a currently prevailing price of US\$26,594/t); 100% basis.

The PEA was necessarily preliminary in nature. It included, for example, a portion of the inferred mineral resource that ordinarily would be regarded as too speculative geologically to be considered mineral reserves. In this case, however, we calculated that the required conversion of contemporary

resources to reserves to achieve Alphamin's desired processing rate over the then seven years of operations was 65% (of contained tin).

Consolidated reserves and resources

Taken together, Alphamin's consolidated resources at Bisie (on a 100% basis) are as follows:

Exhibit 11: Mpama North and Mpama South consolidated resources and reserves (incl required conversion)										
Resources				Category	Reserves			Conversion		
	Tonnage (Mt)	Grade (% Sn)	Contained tin (kt)		Tonnage (Mt)	Grade (% Sn)	Contained tin (kt)	Tonnage (%)	Grade (%)	Contained tin (%)
Bisie Mpama North										
Measured	0.04	2.16	0.90	Proven	0	1.38	0.00	0.0	63.9	0.0
Indicated	3.09	5.02	154.90	Probable	2.62	4.64	121.30	84.8	92.4	78.3
Inferred	0.55	7.56	41.20	Possible*	3.01	4.01	120.82	547.6	53.1	293.1
Total	3.68	5.35	197.00	Total	5.63	4.30	242.07	153.0	80.3	122.9
Bisie Mpama South										
Measured	0.00	0.00	0.00	Proven	0.00	0.00	0.00			
Indicated	3.26	2.46	80.20	Probable	0.00	0.00	0.00			
Inferred	2.84	2.42	68.70	Possible*	6.95	2.12	147.38			
Total	6.10	2.44	148.89	Total	6.95	2.12	147.38	114.0	86.9	99.0
Bisie total										
Measured	0.04	2.16	0.90	Proven	0.00	0.00	0.00	0.0	0.00	0.0
Indicated	6.35	3.70	235.10	Probable	2.62	4.63	121.30	41.3	125.0	51.6
Inferred	3.39	3.24	109.90	Possible*	9.96	2.69	268.21	293.9	83.1	244.0
Total	9.78	3.54	345.90	Total	12.58	3.10	389.50	128.6	87.5	112.6
Mpama North (% of total)										
Measured	100.0	100.0	100.0	Proven	100.0	100.0	100.0			
Indicated	48.7	135.6	65.9	Probable	100.0	100.2	100.0			
Inferred	16.2	233.2	37.5	Possible*	30.2	149.1	45.0			
Total	37.6	151.4	57.0	Total	44.7	138.9	62.2			

Source: Alphamin Resources, Edison Investment Research. Note: Totals may not add up owing to rounding. *Archaic.

According to the International Tin Association's Tin Industry Review 2020, Mpama South's maiden resource grade of 2.54% (prior to upgrade) ranked as the second highest publicly reported CRIRSCO tin mineral resource grade globally and one of the largest in terms of contained tin.

Readers should also note that, at current prices, Alphamin's combined resources at Bisie are equivalent to an in-situ gold resource of 4.6Moz, which would be considered very large in the context of all but the largest gold majors.

Regional exploration

Drilling to date at Bisie has been designed to achieve three goals:

- To find a second large, world-class deposit – which Alphamin achieved with the discovery and delineation of a resource at Mpama South, which it subsequently upgraded with a PEA, in March 2022.
- To replenish resources and maintain a 10-year, rolling life of mine at Mpama North – which it achieved with its most recent resource update at Mpama North.
- To generate targets in search of additional tin deposits at Bisie.

Alphamin regards the whole of the 13km Bisie Ridge as being highly prospective and, over time, it has identified a number of targets there. The full length of the ridge was the subject of a follow-up geochemical investigation in 2021 confirming tin and other base metal anomalies over the majority of its length. Exploration intensified from Q322 to test highly anomalous soil, geophysical and structural targets identified the previous year, while a 10,000m Phase 1 diamond core programme has now effectively been completed. Six high-priority drill areas were initially identified with signatures similar to those of Mpama North and Mpama South. However, only a fraction (c 20%) of the ridge has been intensively drill tested to date. Moreover, only c 25% of assays from the Phase 1 diamond core programme have been returned from the independent laboratory to date. Once

received and analysed, assay results will support a fuller investigation into the regional setting, along with data from the ongoing geophysical downhole surveys, structural investigations and mapping, thereby enabling a re-focused exploration programme.

To date in FY23, execution of the extensive prospecting coverage has gathered momentum with the completion of first pass stream sediment sampling, grab sampling and geological mapping for the first time across the entirety of Alphamin's mining licence and two prospecting licences. Additionally, follow-up ionic soil sampling and bulk sampling (20kg samples) were completed over the most anomalous areas on the back of the first phase results. Certain areas warranted follow-up exploration efforts based on these results and the next phase of exploration will use more intensive methods like trenching and pitting over the identified anomalies. The trenching and pitting will in turn assist in directing future drilling efforts. Increased exploration activity and expenditure is planned for 2024, after the successful completion of the Mpama South expansion project.

In addition, the company has an ongoing programme of underground drilling at Mpama North to both expand and extend the current tin resource. Mpama North is open down dip, as well as along strike below Level 9. Development drilling in these areas has the potential to continue to increase the resource base, while in-fill drilling has the potential to upgrade inferred mineral resources into the indicated category and, from there, into reserves.

Assumptions

Mine schedules

As stated previously, in recognition of its recent exploration successes and the prospectivity of the region, we have opted to assume that Alphamin is capable of extending its life of mine by an additional four years relative to its June 2022 schedule at both Mpama North and Mpama South, giving rise to the combined LOM schedule presented below:

Exhibit 12: Edison assumed Mpama North and Mpama South LOM schedules

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total
Mpama North																	
Tonnes ROM (kt)	397	400	388	361	390	306	371	400	400	400	400	400	400	400			*5,630
Grade Sn (%)	4.18	4.07	4.40	4.60	4.26	5.76	4.47	4.15	4.15	4.15	4.15	4.15	4.15	4.15			*4.30
Contained tin in ore (kt)	16.6	16.3	17.1	16.6	16.6	17.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6			*242.12
Mpama South																	
Tonnes ROM (kt)		400	468	468	468	468	468	468	468	468	468	468	468	468	468	468	6,952
Grade Sn (%)		2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12
Contained tin in ore (kt)		8.5	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	147.38
Combined																	
Tonnes ROM (kt)	400	800	856	829	858	774	839	868	868	868	868	868	868	868	468	468	12,582
Grade Sn (%)	4.14	3.09	3.16	3.20	3.09	3.56	3.16	3.06	3.06	3.06	3.06	3.06	3.06	3.06	2.12	2.12	3.10
Contained tin in ore (kt)	16.6	24.8	27.0	26.5	26.5	27.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	9.9	9.9	389.50

Source: Edison Investment Research. Note: *From June 2022.

Tin price

The tin price over the past three years has been heavily influenced by the COVID-19 pandemic and accentuated by speculative flows of funds. Initially, supply was hit and demand stimulated as key producers in South-East Asia were adversely affected by lockdowns at the same time as locked down populations worldwide spent lavishly on consumer electronic products. That pattern reversed in 2022 at the same time that investment fund positioning switched from a record long position on the London Metal Exchange in March 2022 to a record short position in October 2022.

Consequently, the tin price has declined by almost exactly 50% from its high of US\$48,865/t in early March 2022 to US\$25,305/t currently, as an environment of supply constraints, easy credit conditions, low interest rates and contained inflation has given way to one of inflation, rising interest rates and slowing economic growth worldwide, including China (see Exhibit 13, below).

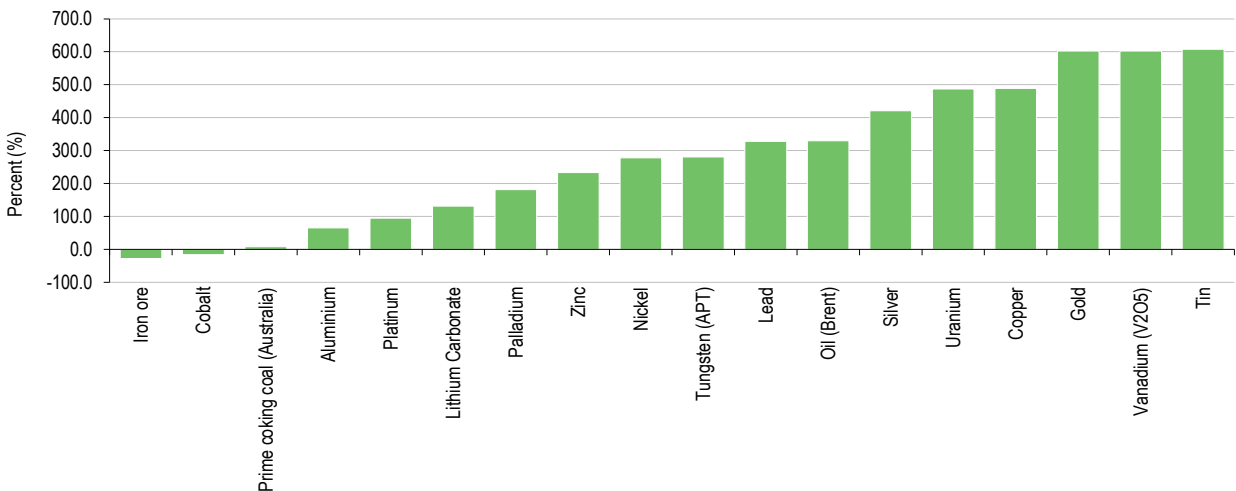
Exhibit 13: Three-month tin price (US\$/t), January 2020–present



Source: Refinitiv (21 August 2023)

Notwithstanding its recent declines, however, in the longer term, tin remains the best performing of 18 metals and minerals since 1 January 2002:

Exhibit 14: Tin price performance of other metals, January 2002 to present (underlying data in US\$)



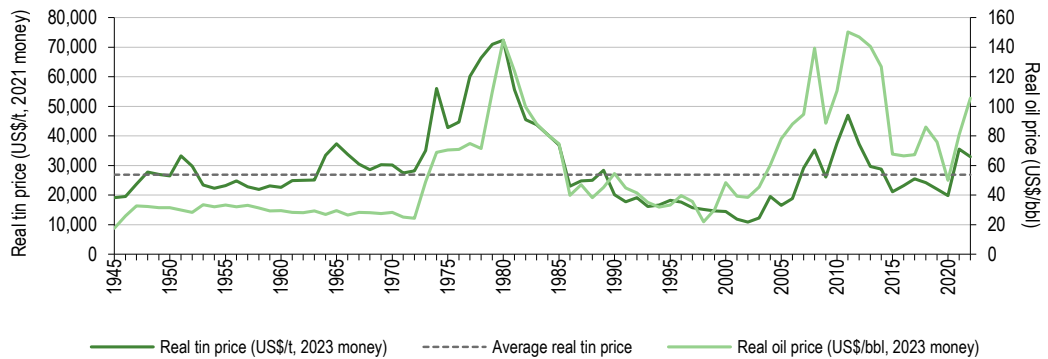
Source: Edison Investment Research, Refinitiv (21 August 2023)

However, while the tin price has seemingly stabilised at approximately current levels, we do not believe that it is sustainable at such low levels in the medium to longer term. In the short term, output from one of the world’s largest primary producers (the Wa state in Myanmar/Burma) has been curtailed in order to allow a major audit of all tin mining and processing operations with the aim of resolving the interlinked problems of resource depletion, environmental damage and worker discontent. While there are question marks over the effectiveness of the implementation of such a policy, China’s imports of tin concentrates from Myanmar fell by 33% over the first four months of 2023 relative to 2022 and its smelters are reported to be struggling with a shortfall of tin concentrates. As a result, refined tin production has suffered year-on-year with, among other things, Guangxi China Tin (the world’s sixth-largest tin producer) recently putting in place a 40–50 day maintenance break.

In the meantime, the threat of export restrictions to stimulate a higher value-added downstream industry remains in place in Indonesia, at the same time as China is trying to accelerate its purchases of ingots in order to pre-empt any changes in Indonesian economic policy. In the longer term, the International Tin Association estimates that the sector will require approximately US\$1.4bn in near-term investment to deliver an additional 50,000t more refined tin per year by the end of the decade (out of a refined tin market of c 380,000t globally per year, ie c 13%) if countries are to come remotely close to achieving their carbon reduction commitments.

Since 1945, the real price of tin has shown a statistically significant relationship with the real oil price (see Exhibit 15, below).

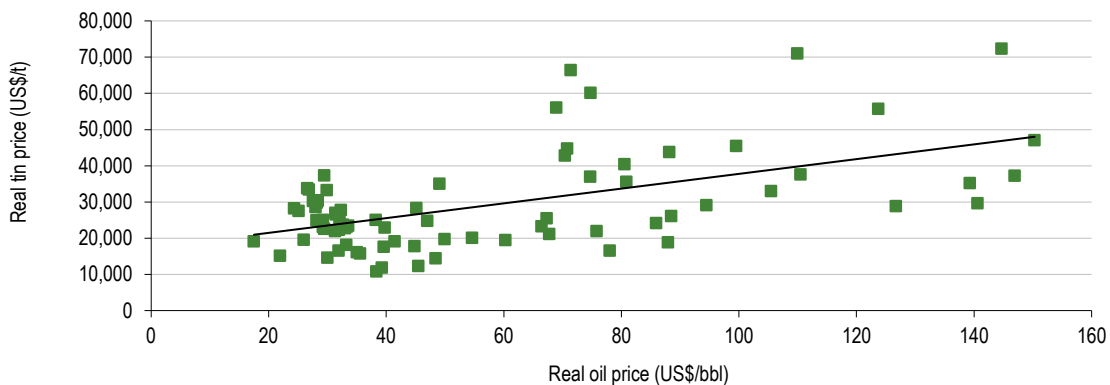
Exhibit 15: Real tin price, 1945–present (US\$/tonne)



Source: USGS, Independent Oil & Gas Association, US Bureau of Labor Statistics

The qualitative justification for the correlation relates to the energy intensity of the smelting and refining processes for tin, which tend to take the form of either electrolytic purification or, more typically, smelting in a traditional furnace. Hence, energy costs make up a large proportion of total costs and so determine the absolute level of the cost curve. Should metal prices deviate materially from their oil price correlation for material periods of time therefore, it results in smelters being exposed to either excessive profits or losses, which in the case of the former should result in an increase in investment, supply and/or substitution, and in the case of the latter should lead to business failures and a decrease in investment. As a result, between 1945 and 2022, the Pearson Product-Moment (correlation) coefficient between the real tin price and the real oil has been 0.55 (in a scale between -1 and +1), which is statistically significant at the 5% level for the number of data points employed in the analysis (ie there is less than a 5% probability that this correlation occurred by random chance):

Exhibit 16: Real tin price (US\$/t, 2023 money) versus real oil price (US\$/bbl, 2023 money), 1945–2022



Source: USGS, Edison Investment Research, US Bureau of Labor Statistics, Independent Oil & Gas Association

It should be noted that Alphamin itself is an exception to the generalisation about the energy intensity of tin production, given that its gravity and water-based concentration process is extremely efficient and not at all energy intensive. Nevertheless, based on a long-term real oil price of US\$70/bbl (which is currently being used by Edison’s oil and gas team), and in the aftermath of the recent price volatility, we have now adopted an updated long-term real tin price of US\$31,651/t (\pm US\$10,982/t) in line with the historical regression analysis.

Costs

A summary of Edison's cost assumptions for both Mpama North and Mpama South – including justifications – is shown below:

Exhibit 17: Mpama North and Mpama South cost estimates

Mine	Estimate	Comment
Mpama North opex	US\$397.47/t processed	Real terms (2024 money) average cost over the life of the mine. Costs based on original technical reports but inflated to reconcile with recent quarterly results and to reflect the effect on costs of tin achieving our assumed long-term price of US\$31,651/t in FY24. Compares to an equivalent figure of US\$352.69/t in Q223.
Mpama North capex	US\$12.0m pa	Sustaining capital expenditure only, estimated at US\$1,000/t Sn produced/sold.
Mpama South opex	US\$188.29/t processed	Real terms cost over the life of the mine. Fixed costs absorbed at Mpama North allow incremental production at Mpama South at a competitive marginal cost. March 2022 technical report outcomes based on a tin price of US\$40,000/t (inter alia). Inflationary pressures since March 2022 likely to have been offset by decline in the tin price (which acts to depress selling costs, in particular).
Mpama South capex	US\$116.0m + US\$6.7m pa	Development capex estimate of US\$115.97m uninflated since all procurement completed pre-inflation. US\$6.7m pa represents sustaining capital expenditure, estimated at US\$1,000/t.

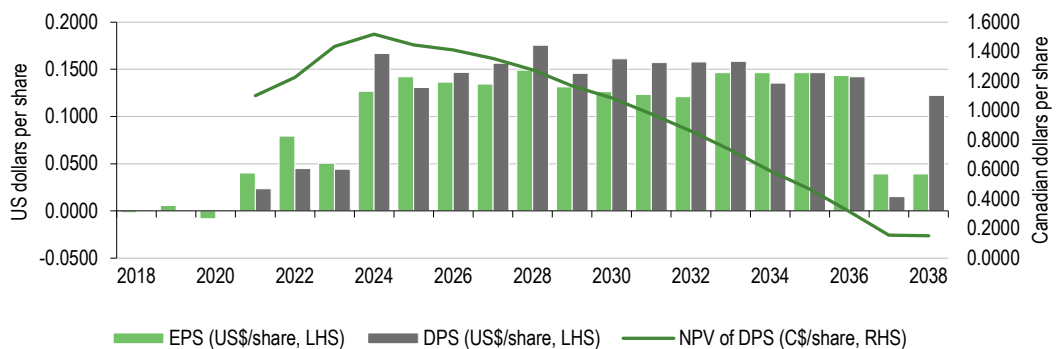
Source: Edison Investment Research

Absolute consolidated valuation

Whereas in the past we have valued Alphamin as the sum of its two major assets, Mpama North (including cash) and Mpama South, in this report, for the first time, we have fully consolidated Mpama South into our financial model.

In the light of the assumptions considered above, our consolidated valuation of Alphamin is US\$1.06, or C\$1.44/share, based on the present value of future dividends potentially payable to Alphamin shareholders, discounted at Edison's customary rate of 10% per year. Approximately two-thirds of the full valuation may be attributed to Mpama North (including cash) and approximately one-third to Mpama South.

Exhibit 18: Alphamin estimated future EPS, (maximum potential) DPS and valuation, LOM

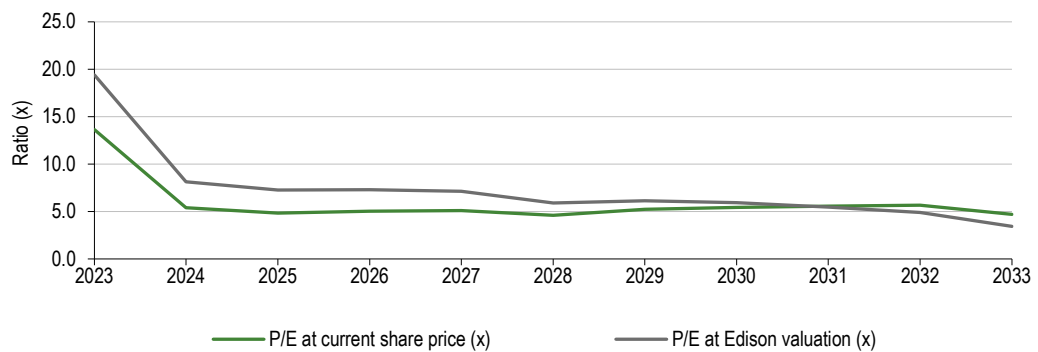


Source: Edison Investment Research

Of note, in the context of the overall valuation, is the sharp increase in both earnings and potential dividends from FY24 (as shown in the exhibit above), by which time we expect Mpama South to have reached steady-state production and the tin price to have reached its long-term equilibrium price of US\$31,651/t.

As a result, we are forecasting earnings to more than double from FY22 to FY24 and Alphamin's maximum potential dividend to in excess of 10 US cents per share. At Alphamin's current share price, this suggests a prospective P/E ratio falling to approximately c 5.1x in FY24–30e. At Edison's valuation of the company (see Exhibit 18, above), it suggests a P/E ratio of approximately 6.8x in FY24–30e and that Alphamin's current share price is cheap relative to its valuation for nine years until FY32, as shown below (where the two lines cross).

Exhibit 19: Alphamin P/E ratio at current share price and Edison valuation, FY23–33



Source: Edison Investment Research

Valuation sensitivities

Tin price sensitivity

Edison's valuation of C\$1.44/share changes by $\pm 17.2\%$ (or C\$0.25/share) for every $\pm 10\%$ that the tin price moves from US\$31,651/t. Alternatively, it can be stated that Alphamin's share price of C\$0.93 essentially discounts a long-term real tin price of US\$25,165/t, which is 0.6% below the currently prevailing three-month price of tin of US\$25,305/t and 20.5% below Edison's long-term price of US\$31,651/t.

Discount rate sensitivity

Edison's central (absolute) valuation of C\$1.43/share is conducted at a discount rate of 10% per year to reflect general equity risk. Variations from this central rate are considered in the table below:

Exhibit 20: Alphamin LOM valuation (C\$/share) sensitivity to discount rate (%)

Discount rate	0%	5%	10%	15%	18.0%	20%	25%	30%
Valuation (C\$/share)	2.93	2.00	1.44	1.08	0.93	0.85	0.68	0.56

Source: Edison Investment Research

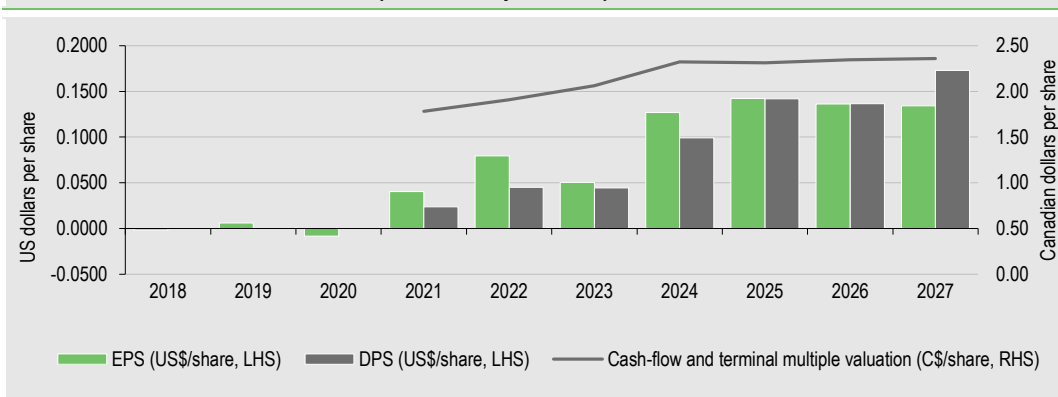
Based on maximum potential dividends payable to shareholders therefore, we calculate that an investment in Alphamin's shares today at a price of C\$0.93/share would offer investors an IRR of 18.0% on their investment over 15 years in Canadian dollar terms.

Exploration and mine life extensions

A key sensitivity for Alphamin is its exposure to exploration success. For the purposes of this valuation, we have assumed an ongoing exploration commitment at Alphamin of c US\$15m pa, as Alphamin looks for its third tin deposit after Mpama North and Mpama South as well as replenishing reserves and resources to keep the existing mine operating at full capacity.

In the light of the most recent resource updates at both Mpama North and Mpama South, we now assume that production at Mpama North will continue at near full capacity until 2036 and that production at Mpama South will continue until 2038. However, in the event of exploration success extending the life of operations indefinitely, our valuation of Alphamin could rise to C\$2.06/share (currently) and to C\$2.36/share in FY27:

Exhibit 21: AFM estimated EPS, (maximum potential) DPS and ad infinitum valuation, LOM



Source: Edison Investment Research

Quarterly results

Alphamin's operating results over the past 10 quarters are summarised in the table below:

Exhibit 22: Alphamin operating results, Q121–Q223

	Q121	Q221	Q321	Q421	FY21	Q122	Q222	Q322	Q422	FY22	Q123	Q223
Tonnes processed	93,997	105,294	108,901	107,981	416,173	105,565	112,569	112,179	106,087	436,400	95,751	99,035
Tin grade (%)	3.8	3.2	3.5	3.9	3.57	3.7	3.7	3.9	4.0	3.82	4.4	4.2
Contained tin (t)	3,572	3,369	3,812	4,211	14,964	3,924	3,176	4,375	4,243	16,652	4,194	4,169
Overall plant recovery (%)	74	72	75	75	74	78	77.3	72.0	73.0	75.0	76.0	76.0
Actual payable tin produced (t)	2,611	2,412	2,832	3,114	10,969	3,061	3,180	3,139	3,113	12,493	3,187	3,151
Payable tin sold (t)	3,351	2,404	2,710	3,056	11,521	3,336	3,229	3,080	3,119	12,764	3,161	3,068
Tin price achieved (US\$/t)	23,083	28,308	33,704	38,084	30,629	43,813	35,345	22,380	21,436	30,636	26,432	25,587
AISC (US/t Sn sold)	12,162	15,112	14,765	15,117	14,173	15,782	14,677	13,089	13,439	14,237	13,915	13,987

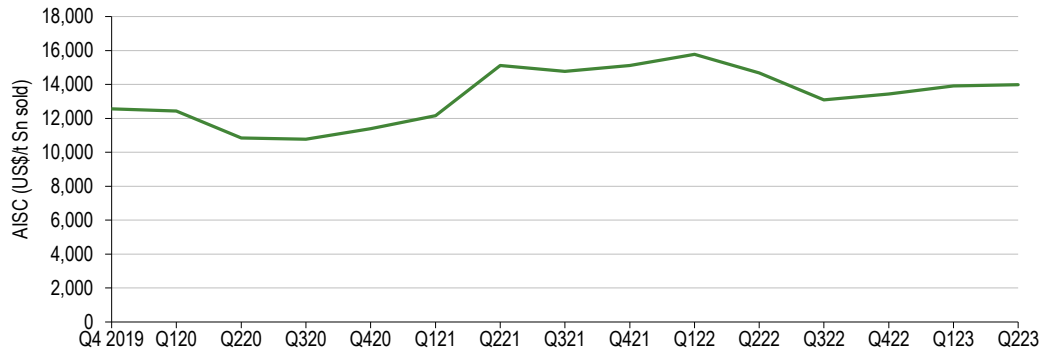
Source: Alphamin Resources. Note: As reported.

A number of features of Alphamin's performance over the course of these past 10 quarters are noteworthy:

- Production and sales both exceeded guidance for the FY22 financial year of 12,000t. Production and sales both exceeded pro rata guidance for Q123 and Q223.
- The generally rising trend in plant throughput over the period, albeit with the exception of the fourth quarter in each year, when operations are traditionally disrupted by the seasonal rains in North Kivu.
- Since Q221, a generally rising trend in the tin grade mined as a result of significantly improved underground mining practices since mid-July 2021, relating to stope planning, delineation and blasting.
- A peak metallurgical recovery rate of 78%, indicating that a 5.5 percentage point improvement in recoveries as a result of the installation of the fine tin plant is achievable.
- As a result of the above, the generally rising trend in tin production over the whole two and a half year period.
- A tendency for production to exceed sales in the fourth quarter of any particular year, on account of logistical constraints on transport infrastructure during the rainy season. Inventories built up in the fourth quarter as a result of the disruptions are then typically unwound in the first quarter of the following year.
- AISC has risen by only 11.3% in the 14 quarters since the quarter after the mine declared commercial production in Q319, to US\$13,987/t – equivalent to a compound rate of increase of just 3.1% per year. This increase is despite a 54.4% increase in the price of tin over the same

time frame, which directly affects costs in the form of royalties, marketing fees and export duties, etc.

Exhibit 23: Mpama North treatment, transport and selling and mine operating costs (US\$/t)



Source: Edison Investment Research. Note: Underlying data, Alphamin Resources.

- A record level of run-of-mine and crushed ore stockpiles as at end-Q223, amounting to 27,439t at an average tin grade of 6.74% (cf 15,011t at 5.98% as at end-Q123).

With the caveat that the quarterly results of mining companies can demonstrate material volatility relative to both historical results and analysts' forecasts, our quarterly estimates for Alphamin for FY23 are provided in the table below. At the time of writing, the three-month price of tin is US\$25,305/t and, for the purposes of forecasting, we have assumed this price will prevail for the remainder of the year.

Exhibit 24: Edison forecast of Alphamin income statement, Q123–Q423e (US\$ unless otherwise indicated)

	FY22	Q123	Q223	Q323e	Q423e	FY23e
Tons processed (t)	436,400	95,751	99,035	101,233	101,233	397,252
Tin grade (%)	3.82	4.4	4.2	4.1	4.1	4.18
Contained tin (t)	16,652	4,194	4,169	4,120	4,120	16,604
Overall plant recovery (%)	75.0	76.0	76.0	78.2	78.2	77.0
Actual payable tin produced (t)	12,493	3,187	3,151	3,223	3,223	12,784
Payable tin sold (t)	12,764	3,161	3,068	3,223	3,223	12,675
Tin price achieved (US\$/t)	30,636	26,432	25,587	26,451	25,153	31,461
Revenue	391,052,402	82,970,874	75,742,307	85,253,785	81,071,502	325,038,468
Cost of goods sold	(146,983,044)	(36,530,700)	(34,928,937)	(36,612,405)	(35,738,661)	(143,810,703)
Depreciation	28,805,673	7,924,411	7,922,153	8,284,364	8,646,576	32,777,504
Gross profit	215,263,685	38,515,763	32,891,217	40,357,016	36,686,265	148,450,261
General and administrative	(24,797,002)	(5,435,301)	(5,975,676)	(5,975,676)	(5,975,676)	(23,362,329)
Operating profit/(loss)	190,466,683	33,080,462	26,915,541	34,381,340	30,710,589	125,087,932
Other						
Warrants	(482,351)	0	0	0	0	0
Profit on foreign exchange	(498,897)	(354,436)	2,168,870	0	0	1,814,434
Loss on write off of assets	(1,379)	0	0	0	0	0
Interest expense	(4,912,360)	(1,541,257)	(1,299,842)			(2,841,099)
Interest income	92,050	336,277	1,948			338,225
Net interest	(4,820,310)	(1,204,980)	(1,297,894)	(1,298,920)	(1,846,683)	(5,648,477)
Profit before taxes	184,663,746	31,521,046	27,786,517	33,082,419	28,863,906	121,253,889
Current income tax expense	(66,091,150)	(11,430,696)	(10,189,775)	(12,075,083)	(10,535,326)	(44,230,880)
Deferred tax movement	3,158,139	(198,205)	167,804			(30,401)
Total tax	(62,933,011)	(11,628,901)	(10,021,971)	(12,075,083)	(10,535,326)	(44,261,281)
Effective tax rate (%)	34.1	36.9	36.1	36.5	36.5	36.5
Net profit/(loss)	121,730,735	19,892,145	17,764,546	21,007,336	18,328,581	76,992,608
Attributable to:						
Shareholders	100,925,048	16,406,623	14,667,031	17,675,573	15,421,668	64,170,894
Non-controlling interests	20,805,687	3,485,522	3,097,515	3,331,764	2,906,913	12,821,713
Minority (%)	17.09	17.5	17.4	15.86	15.86	16.65
Total	121,730,735	19,892,145	17,764,546	21,007,336	18,328,581	76,992,608
Weighted average number of shares in period	1,271,652,570	1,273,797,231	1,273,978,169	1,275,343,813	1,275,343,813	1,274,615,757
Derivatives	11,646,582	10,646,583	10,465,644	9,100,000	9,100,000	9,100,000
Fully diluted weighted average number of shares in issue	1,283,299,152	1,284,443,813	1,284,443,813	1,284,443,813	1,284,443,813	1,283,715,757
Headline earnings	100,925,048	16,406,623	14,667,031	17,675,573	15,421,668	64,170,894
Headline earnings (excl. warrant charge)	101,407,399	16,406,623	14,667,031	17,675,573	15,421,668	64,170,894
EPS (US\$/share)	0.0794	0.0129	0.0115	0.0139	0.0121	0.0503
Diluted EPS (US\$/share)	0.0786	0.0128	0.0114	0.0138	0.0120	0.0500
HEPS* (US\$/share)	0.0794	0.0129	0.0115	0.0139	0.0121	0.0503
Diluted HEPS (US\$/share)	0.0786	0.0128	0.0114	0.0138	0.0120	0.0500
Headline EPS excl. warrant charge (US\$/share)	0.0797	0.0129	0.0115	0.0139	0.0121	0.0503

Source: Alphamin, Edison Investment Research. Note: Company presented basis. *Headline earnings per share: a South African reporting requirement based entirely on operational, trading and capital investment activities and excluding profits or losses from the sale or termination of discontinued operations, fixed assets or related businesses or from any permanent devaluation or write-off of their values.

A number of features of Alphamin's financial results are also noteworthy:

- Since the exercise of all remaining warrants in January 2022, there has been no warrant charge recorded by Alphamin since Q122.
- Alphamin's effective tax rate of 34.1% in FY22 was in line with the corporate income tax rate for mining companies in the DRC of 30%. Its rates of 36.9% in Q123 and 36.1% in Q223 were, to date in FY23, slightly above the corporate rate.
- Q223 was also notable for Alphamin's operating subsidiary in the DRC paying US\$67m in cash taxes during the quarter, comprising a final FY22 payment of US\$56m plus an US\$11m payment as the first of four instalments towards provisional FY23 taxes. This had the effect of substantially reducing current accounts payable by US\$48m (almost all attributable tax

liabilities). Together with capex, it was also largely responsible for reducing Alphamin's cash on its balance sheet by US\$68m in the first six months of the year. In consequence, the company secured a US\$40m short-term facility with its banker in the DRC as bridging finance towards the unusually high tax payments in 2023 (US\$26m of the facility was utilised in Q223).

Relative valuation

Profitable, listed tin producers are relatively rare, even globally, and producers of tin concentrate even rarer. Below is a table of companies that Edison believes reasonably represents Alphamin's closest peers, together with a series of commonly used prospective valuation multiples (where available):

Exhibit 25: Alphamin valuation relative to three tin peers

Company	Comment	Mkt cap (US\$m)	P/E ratio (x)			EV/EBITDA (x)			Yield (%)			P/CF (x)		
			Yr 1	Yr 2	Yr 3	Yr 1	Yr 2	Yr 3	Yr 1	Yr 2	Yr 3	Yr 1	Yr 2	Yr 3
Alphamin		874.9	13.6	5.4	4.8	4.8	2.4	2.2	6.4	14.5	20.7	17.8	3.2	4.0
Yunnan Tin	Chinese refined tin producer	3,233.7	11.7	9.3	8.1	10.2	8.7	8.0	2.8	3.4	4.0	5.6	5.9	5.2
PT Timah	Indonesian refined producer plus logistics	437.4	20.1	16.5	11.7	9.1	7.9	6.4	0.0	2.0	2.4			
Malaysia Smelting	Malaysian refined tin producer	202.4	8.2	7.8	7.2	5.3	4.9	4.5	2.7	2.8	2.9			
Average			13.3	11.2	9.0	8.2	7.2	6.3	1.8	2.7	3.1	5.6	5.9	5.2
Implied AFM share price (C\$)			0.94	1.92	1.74	1.40	2.44	2.38	3.27	4.16	7.34	0.36	1.51	1.42

Source: Edison Investment Research, Refinitiv. Note: Priced at 21 August 2023.

Of note, in this context, is that Alphamin is priced at multiples that are cheaper than the averages of its peers in 10 out of 12 (or 83%) of valuation measures. On a discrete basis, it is cheaper than its peers in 27 out of 30 (or 90%) of valuation measures.

Alternatively, we calculate that the average Alphamin share price implied by the average multiples of its peers is C\$1.47 for FY23 (year 1), followed by C\$2.76 for FY24 (year 2) and C\$2.89 for FY25 (year 3).

Financials

In the first six months of FY23, Alphamin generated US\$60.5m in pre-tax operational cash flow, before paying US\$67.3m in cash taxes, investing a further US\$58.4m in capex and paying a US\$27.7m dividend to result in a net cash outflow before financing items of US\$92.9m and cash on its balance sheet reducing by US\$68.0m, from US\$119.4m as at end-December to US\$51.4m as at end-June. Excluding leases and unamortised fees, net cash reduced from US\$115.0m to US\$20.2m.

Given the one-off nature of its tax charge, however, a more representative 'underlying' pattern of short-term cash flows (subject to the tin price) is that Alphamin is generating c US\$30m per quarter pre-tax from operations. It should then pay out c US\$11m of this in taxes and a further c US\$20m in capex (being approximately half of the remaining US\$41m in capex at Mpama South outstanding). It will then have one further interim dividend payment of US\$28m in Q323 plus any dividends from the group to minorities.

As a result of its unusually large tax payment in H123, Alphamin secured a US\$40m short-term facility with its banker in the DRC as bridging finance towards the unusually high tax payments in 2023 (US\$26m of the facility was utilised in Q223).

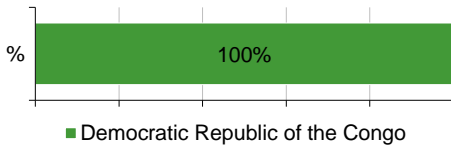
It is not Edison's practice to forecast net debt or net cash on a quarterly basis. However, given its commitments for the remainder of the year, we estimate that Alphamin will move from a net cash position of US\$20.2m (excluding leases) as at end-Q223 to a small net debt position of c US\$8.5m as at end-Q323, before recovering slightly to a near break-even position by the end of the year.

Thereafter, however, we expect Alphamin to be strongly cash generative – as before, but with the added effect of meaningful production from Mpama South. Within this context, we assume that Alphamin will wish to retain US\$70m in cash on its balance sheet as at end-FY24 and US\$40m thereafter and our future dividend forecasts are calculated on this basis.

Exhibit 26: Financial summary

Accounts: IFRS, Yr end: December, USD 000s	2019	2020	2021	2022	2023e	2024e	2025e	2026e
Income statement								
Total revenues	27,221	187,445	352,883	391,052	325,038	580,210	630,733	611,352
Cost of sales	(7,915)	(119,554)	(138,217)	(146,983)	(143,811)	(239,035)	(254,280)	(244,973)
Gross profit	19,306	67,892	214,666	244,069	181,228	341,174	376,453	366,379
SG&A (expenses)	(14,526)	(17,238)	(19,754)	(24,797)	(23,362)	(23,362)	(23,362)	(23,362)
Exceptionals and adjustments	(3,673)	(7,649)	(3,680)	(2,885)	(387)	0	0	0
Depreciation and amortisation	(7,927)	(25,471)	(26,632)	(28,806)	(32,778)	(43,253)	(45,521)	(47,995)
Reported EBIT	(3,147)	25,182	168,279	190,467	125,088	274,559	307,569	295,021
Finance income/(expense)	(6,330)	(15,614)	(8,358)	(4,820)	(5,648)	(217)	0	0
Other income/(expense)	(4)	(1,518)	(874)	(499)	1,814	0	0	0
Exceptionals and adjustments	6,850	(8,776)	(26,922)	(484)	0	0	0	0
Reported PBT	(2,632)	(725)	132,126	184,664	121,254	274,342	307,569	295,021
Income tax expense (includes exceptionals)	7,755	(7,141)	(68,558)	(62,933)	(44,261)	(82,303)	(92,271)	(88,506)
Reported net income	5,123	(7,866)	63,568	121,731	76,993	192,039	215,298	206,515
Basic average number of shares, m	845	1,066	1,195	1,272	1,275	1,275	1,275	1,275
Basic EPS (US\$/sh)	0.01	(0.01)	0.04	0.08	0.05	0.13	0.14	0.14
DPS (C\$/share)	0.00	0.00	0.03	0.06	0.06	0.13	0.19	0.19
Adjusted EBITDA	8,453	58,302	198,592	222,157	158,252	317,812	353,091	343,016
Adjusted EBIT	526	32,831	171,959	193,352	125,475	274,559	307,569	295,021
Adjusted PBT	(5,809)	15,699	162,728	188,032	121,640	274,342	307,569	295,021
Adjusted EPS (C\$/sh)	0.01	(0.01)	0.05	0.10	0.07	0.17	0.19	0.18
Adjusted diluted EPS (US\$/sh)	0.00	(0.01)	0.04	0.08	0.05	0.13	0.14	0.14
Balance sheet								
Property, plant and equipment	255,125	239,103	227,720	263,041	313,156	304,655	279,552	251,347
Other non-current assets	10,632	15,882	27,088	27,548	42,548	57,548	72,548	87,548
Total non-current assets	265,757	254,985	254,808	290,589	355,704	362,203	352,099	338,895
Cash and equivalents	5,941	6,559	90,640	119,389	48,103	96,828	40,000	40,000
Inventories	27,755	21,866	20,674	24,814	27,810	31,792	34,561	33,499
Trade and other receivables	1,486	7,601	47,626	27,819	28,153	41,330	44,929	43,548
Other current assets	17,633	6,710	7,402	27,491	27,491	27,491	27,491	27,491
Total current assets	52,815	42,736	166,342	199,513	131,558	197,442	146,981	144,538
Non-current loans and borrowings	78,229	34,821	0	0	50,000	25,000	0	0
Other non-current liabilities	9,641	8,872	31,258	32,394	13,739	12,150	11,236	11,236
Total non-current liabilities	87,870	43,693	31,258	32,394	63,739	37,150	11,236	11,236
Trade and other payables	22,544	16,034	10,582	21,284	19,700	32,745	34,833	33,558
Current loans and borrowings	16,339	25,810	17,035	4,422	0	0	0	0
Other current liabilities	17,233	14,253	51,541	64,597	27,123	71,461	34,589	20,856
Total current liabilities	56,116	56,098	79,158	90,303	46,823	104,206	69,422	54,414
Equity attributable to company	145,215	171,735	274,727	320,425	328,171	363,164	363,277	362,739
Non-controlling interest	29,371	26,196	36,007	46,980	48,528	55,124	55,145	55,044
Cashflow statement								
Profit before tax	(2,632)	(725)	132,126	184,664	121,254	274,342	307,569	295,021
Net finance expenses	5,456	15,616	8,359	4,912	0	0	0	0
Depreciation and amortisation	7,927	26,504	26,634	28,806	32,778	43,253	45,521	47,995
Share based payments	403	471	681	265	0	0	0	0
Other adjustments	(6,851)	8,842	26,985	711	0	0	0	0
Movements in working capital	(6,710)	(20,281)	(43,636)	18,833	(4,914)	(4,114)	(4,279)	1,168
Interest paid / received	(3,092)	(11,378)	(6,758)	(3,597)	0	0	0	0
Income taxes paid	0	(843)	(2,196)	(47,966)	(100,000)	(36,376)	(128,229)	(102,239)
Cash from operations (CFO)	(5,498)	18,205	142,194	186,627	49,118	277,104	220,583	241,945
Capex	(22,720)	(7,448)	(22,516)	(53,447)	(97,892)	(49,752)	(35,418)	(34,790)
Acquisitions & disposals net	0	0	0	0	0	0	0	0
Other investing activities	(46)	(96)	(3,014)	(19,312)	0	0	0	0
Cash used in investing activities (CFIA)	(22,766)	(7,544)	(25,531)	(72,759)	(97,892)	(49,752)	(35,418)	(34,790)
Net proceeds from issue of shares	11,936	10,010	19,852	2,513	0	0	0	0
Movements in debt	0	(18,735)	(45,198)	(13,552)	45,578	(25,000)	(25,000)	0
Dividends paid	0	0	(5,552)	(71,517)	(67,698)	(150,450)	(215,165)	(207,155)
Other financing activities	5,165	(1,319)	(1,685)	(2,563)	(390)	(3,176)	(1,828)	0
Cash from financing activities (CFF)	17,100	(10,044)	(32,582)	(85,119)	(22,511)	(178,627)	(241,993)	(207,155)
Currency translation differences and other	0	0	0	0	0	0	0	0
Increase/(decrease) in cash and equivalents	(11,164)	617	84,081	28,749	(71,286)	48,725	(56,828)	0
Currency translation differences and other	0	0	0	0	0	0	0	0
Cash and equivalents at end of period	5,941	6,559	90,640	119,389	48,103	96,828	40,000	40,000
Net (debt) cash	(88,627)	(54,073)	73,605	114,966	(1,897)	71,828	40,000	40,000
Movement in net (debt) cash over period	(24,836)	34,554	127,678	41,361	(116,864)	73,725	(31,828)	0

Source: Company data, Edison Investment Research

<p>Contact details</p> <p>c/o Adansonia Management Services Ltd, Suite 1 Perrieri Office Suites, C2-302, Level 3, Office Block C La Croisette, Grand Baie 30517 Mauritius +230 269 4166 alphaminresources.com</p>	<p>Revenue by geography</p>  <p>■ Democratic Republic of the Congo</p>																		
<p>Management team</p> <p>CEO: Maritz Smith</p> <p>Alphamin's CEO since August 2019, Maritz has over 20 years' experience in African mining and corporate finance. Prior to joining Alphamin, he was CEO of Denham Capital's African mining platform, COO of Pangea and CFO of Metorex. He was educated at the University of Johannesburg and is a member of the South African Institute of Chartered Accountants.</p>	<p>CFO: Eoin O'Driscoll</p> <p>Eoin is a chartered accountant and, prior to joining Alphamin in April 2015, was with KPMG Ireland. He has been involved in the DRC mining industry for nine years and has extensive experience in the gold mining sector.</p>																		
<p>Non-executive chairman: Charles Needham</p> <p>In addition to being chairman of Alphamin Resources, Charles is also chairman of Ruashi Mining and sits on the board of 12 other companies. In the past, he has held the positions of group manager-finance at Rand London Corp, chairman of Kinsenda Copper Co and CEO of Metorex, where he spent 31 years at its mining operations in Namibia, South Africa, Zambia and the DRC. He was educated at Michaelhouse in KwaZulu-Natal, South Africa.</p>	<p>Managing director: John Robertson</p> <p>John has c 30 years of experience mining in countries across Francophile and Anglophone Africa. He has significant surface and underground mine management experience in both base and precious metals and a strong background in compliant resource and reserve exploration techniques, definition, reporting, conversion and extraction. In the past, he has managed sites of up to 3,000 people and is fluent in French.</p>																		
<table border="1"> <thead> <tr> <th data-bbox="148 828 1129 862">Principal shareholders</th> <th data-bbox="1129 828 1442 862">(%)</th> </tr> </thead> <tbody> <tr> <td data-bbox="148 862 1129 896">Tremont Master Holdings</td> <td data-bbox="1129 862 1442 896">57.17</td> </tr> <tr> <td data-bbox="148 896 1129 929">Fidelity International</td> <td data-bbox="1129 896 1442 929">0.89</td> </tr> <tr> <td data-bbox="148 929 1129 963">Adansonia</td> <td data-bbox="1129 929 1442 963">0.80</td> </tr> <tr> <td data-bbox="148 963 1129 996">K.P. Eckoff Esq</td> <td data-bbox="1129 963 1442 996">0.52</td> </tr> <tr> <td data-bbox="148 996 1129 1030">S.N. Naylor Esq</td> <td data-bbox="1129 996 1442 1030">0.38</td> </tr> <tr> <td data-bbox="148 1030 1129 1064">Aegis Financial Corp</td> <td data-bbox="1129 1030 1442 1064">0.27</td> </tr> <tr> <td data-bbox="148 1064 1129 1097">C.D.S. Needham Esq</td> <td data-bbox="1129 1064 1442 1097">0.18</td> </tr> <tr> <td data-bbox="148 1097 1129 1131">D. Stevens Esq</td> <td data-bbox="1129 1097 1442 1131">0.16</td> </tr> </tbody> </table>		Principal shareholders	(%)	Tremont Master Holdings	57.17	Fidelity International	0.89	Adansonia	0.80	K.P. Eckoff Esq	0.52	S.N. Naylor Esq	0.38	Aegis Financial Corp	0.27	C.D.S. Needham Esq	0.18	D. Stevens Esq	0.16
Principal shareholders	(%)																		
Tremont Master Holdings	57.17																		
Fidelity International	0.89																		
Adansonia	0.80																		
K.P. Eckoff Esq	0.52																		
S.N. Naylor Esq	0.38																		
Aegis Financial Corp	0.27																		
C.D.S. Needham Esq	0.18																		
D. Stevens Esq	0.16																		

General disclaimer and copyright

This report has been commissioned by Alphamin Resources and prepared and issued by Edison, in consideration of a fee payable by Alphamin Resources. Edison Investment Research standard fees are £60,000 pa for the production and broad dissemination of a detailed note (Outlook) following by regular (typically quarterly) update notes. Fees are paid upfront in cash without recourse. Edison may seek additional fees for the provision of roadshows and related IR services for the client but does not get remunerated for any investment banking services. We never take payment in stock, options or warrants for any of our services.

Accuracy of content: All information used in the publication of this report has been compiled from publicly available sources that are believed to be reliable, however we do not guarantee the accuracy or completeness of this report and have not sought for this information to be independently verified. Opinions contained in this report represent those of the research department of Edison at the time of publication. Forward-looking information or statements in this report contain information that is based on assumptions, forecasts of future results, estimates of amounts not yet determinable, and therefore involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of their subject matter to be materially different from current expectations.

Exclusion of Liability: To the fullest extent allowed by law, Edison shall not be liable for any direct, indirect or consequential losses, loss of profits, damages, costs or expenses incurred or suffered by you arising out of or in connection with the access to, use of or reliance on any information contained on this note.

No personalised advice: The information that we provide should not be construed in any manner whatsoever as, personalised advice. Also, the information provided by us should not be construed by any subscriber or prospective subscriber as Edison's solicitation to effect, or attempt to effect, any transaction in a security. The securities described in the report may not be eligible for sale in all jurisdictions or to certain categories of investors.

Investment in securities mentioned: Edison has a restrictive policy relating to personal dealing and conflicts of interest. Edison Group does not conduct any investment business and, accordingly, does not itself hold any positions in the securities mentioned in this report. However, the respective directors, officers, employees and contractors of Edison may have a position in any or related securities mentioned in this report, subject to Edison's policies on personal dealing and conflicts of interest.

Copyright: Copyright 2023 Edison Investment Research Limited (Edison).

Australia

Edison Investment Research Pty Ltd (Edison AU) is the Australian subsidiary of Edison. Edison AU is a Corporate Authorised Representative (1252501) of Crown Wealth Group Pty Ltd who holds an Australian Financial Services Licence (Number: 494274). This research is issued in Australia by Edison AU and any access to it, is intended only for "wholesale clients" within the meaning of the Corporations Act 2001 of Australia. Any advice given by Edison AU is general advice only and does not take into account your personal circumstances, needs or objectives. You should, before acting on this advice, consider the appropriateness of the advice, having regard to your objectives, financial situation and needs. If our advice relates to the acquisition, or possible acquisition, of a particular financial product you should read any relevant Product Disclosure Statement or like instrument.

New Zealand

The research in this document is intended for New Zealand resident professional financial advisers or brokers (for use in their roles as financial advisers or brokers) and habitual investors who are "wholesale clients" for the purpose of the Financial Advisers Act 2008 (FAA) (as described in sections 5(c) (1)(a), (b) and (c) of the FAA). This is not a solicitation or inducement to buy, sell, subscribe, or underwrite any securities mentioned or in the topic of this document. For the purpose of the FAA, the content of this report is of a general nature, is intended as a source of general information only and is not intended to constitute a recommendation or opinion in relation to acquiring or disposing (including refraining from acquiring or disposing) of securities. The distribution of this document is not a "personalised service" and, to the extent that it contains any financial advice, is intended only as a "class service" provided by Edison within the meaning of the FAA (i.e. without taking into account the particular financial situation or goals of any person). As such, it should not be relied upon in making an investment decision.

United Kingdom

This document is prepared and provided by Edison for information purposes only and should not be construed as an offer or solicitation for investment in any securities mentioned or in the topic of this document. A marketing communication under FCA Rules, this document has not been prepared in accordance with the legal requirements designed to promote the independence of investment research and is not subject to any prohibition on dealing ahead of the dissemination of investment research.

This Communication is being distributed in the United Kingdom and is directed only at (i) persons having professional experience in matters relating to investments, i.e. investment professionals within the meaning of Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the "FPO") (ii) high net-worth companies, unincorporated associations or other bodies within the meaning of Article 49 of the FPO and (iii) persons to whom it is otherwise lawful to distribute it. The investment or investment activity to which this document relates is available only to such persons. It is not intended that this document be distributed or passed on, directly or indirectly, to any other class of persons and in any event and under no circumstances should persons of any other description rely on or act upon the contents of this document.

This Communication is being supplied to you solely for your information and may not be reproduced by, further distributed to or published in whole or in part by, any other person.

United States

Edison relies upon the "publishers' exclusion" from the definition of investment adviser under Section 202(a)(11) of the Investment Advisers Act of 1940 and corresponding state securities laws. This report is a bona fide publication of general and regular circulation offering impersonal investment-related advice, not tailored to a specific investment portfolio or the needs of current and/or prospective subscribers. As such, Edison does not offer or provide personal advice and the research provided is for informational purposes only. No mention of a particular security in this report constitutes a recommendation to buy, sell or hold that or any security, or that any particular security, portfolio of securities, transaction or investment strategy is suitable for any specific person.