

Central Asia Metals

Accretive transaction boosts cash flow and dividend paying capacity

Central Asia Metals (CAML) has transformed itself from a single-asset copper producer to a significantly larger base-metal producer. The acquisition appears to have added a lot of value to the company and has added another low-cost base metal operation. QuotedData's model suggests that this could allow CAML to almost double its earnings per share (EPS), which in turn could allow it to maintain its dividend flow and yield.

The company completed the US\$402.5m acquisition of the Sasa lead and zinc mine, in Macedonia, on 6 November. The deal has meant that CAML has had to take on significant debt and issue a substantial number of new shares, but QuotedData's model suggests that the debt schedule is manageable and there is the potential a steady stream of dividends that could exceed those derived from QuotedData's model prior to the acquisition.

Furthermore, despite a significant increase in the number of shares issued, the modelled NAV for the company has increased from 268.5p in May 2017 to 300.5p today.

Year	Rev. (U\$m)	EBITDA (U\$m)	EBITDA margin	EPS (USc)	DPS (p)
2017f	105.3	71.0	67%	28.4	12.9
2018f	210.0	138.5	66%	51.8	17.9
2019f	208.8	136.8	66%	51.9	23.2

Source: Marten & Co Note: per share figures assume 176m shares post completion

It might be worth noting that the copper price has recently risen above the model's long term assumed level.

Valuation summary

The sum-of-the-parts NAV valuation for CAML from the model is 300.5p per share, implying that the company is currently trading at an 16.8% discount to net asset value (NAV).

Listed	LSE
Ticker	CAML LN
Base currency	GBP
Price (13/11/17)	250.00p
Daily volume	256k shares
1-year high	263.00p
1-year low	203.00p
1-month performance	-2%
3-month performance	15%
1-year performance	15%
Calendar YTD perf.	8%
Indicative yield	6.1%

Share price over two years

Time period: 08/10/2015 to 10/11/2017



Source: Bloomberg, Marten & Co

Net cash (30/6/17)	US\$42m
NAV/share	300.5p
P/NAV	83%
Market cap	£440m
Shares outstanding	176.0m
EV (13/11/17)	US\$730m
EV/EBITDA (f/c 2018)	4.6x

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Further information about CAML can be found on the company's website:

www.centralasiametals.com

Introduction

CAML is a dividend-paying, base-metal producer with operating assets in Kazakhstan and, most recently, Macedonia.

The company's primary focus is a low-cost, copper dump treatment operation associated with the Kounrad copper mine in Kazakhstan, from which it has produced copper metal since 2012.

On 6 November 2017, CAML completed the US\$402.5m acquisition of Lynx Resources (Lynx), which owned the producing lead-zinc Sasa mine, in Macedonia.

Elsewhere in Kazakhstan, the company is exploring a copper and gold prospect at Shuak.

The company completed an IPO on AIM in 2010, raising gross proceeds of US\$60m (net proceeds of £35m), all of which and more has been returned to shareholders through dividends.

CAML's corporate headquarters are in London, with operational management in Balkhash, Kazakhstan, and at the new mine site in Macedonia.

Key investment points

- With the acquisition of the Sasa mine, the company has transformed itself from a single-asset copper producer into a mid-cap, base-metal producer (see page 21 for details of the deal).
- There is information to suggest that the market fundamentals for all three metals that CAML now produces (copper, lead and zinc) could be positive for at least the next few years (see page 30).
- Although the deal means that CAML has had to raise significant debt for the first time in its existence, QuotedData's model suggests that the deal will be accretive to shareholders from day one.
- Furthermore, the model suggests that, providing the assumptions used are correct, the company will generate sufficient cash flow over the next few years to accommodate the loan-repayment schedule and the interest payments and may, in fact, be able to repay the debt well before its five-year term end.
- The model suggests that EPS for 2017 (with two months' of Sasa income), at US28c/share, may be slightly higher than the model's previous estimate for Kounrad alone and thereafter it is suggested that EPS have the potential to almost double to around the US50c/share level (see page 6). Similarly, the model suggests that EBITDA could rise significantly to US\$140m for 2018.
- The company recently paid an interim dividend of 6.5p/share, an 18% increase on the previous year. The model suggests that the total dividend payment for 2017 could exceed that for 2016, in US\$ terms. However, given the additional shares issued, the final dividend could be restricted to 6.4p/s, for 12.9p/s for the year (see page 8).
- In future years, the model suggests that the company could pay dividends at the upper end of its guidance of between 30% and 50% of net cash flow. This suggests that dividends of approximately 22-23p/share over the next few years could be possible (see page 8).
- Based on current production so far this year, CAML could achieve production towards the upper end of its copper-production guidance from Kounrad at about 14.0kt in 2017 (see page 11).
- The addition of the Sasa mine, CAML leads to a significant uplift in NAV from 268.5p per share in QuotedData's previous valuation (May 2017) to 300.5p per share today. (see page 11).
- CAML shares are currently trading at 16.8% discount to the model's calculated NAV.
- The model suggests an indicative EV/EBITDA ratio of 4.6x for 2018.
- CAML shares have risen 15% over the last 52-weeks.

QuotedData's model suggests the Sasa acquisition is positive for existing shareholders and potential investors. CAML has an implied dividend yield at present of 6%.

Investment case

An accretive acquisition sees diversification into growth metals

With the US\$402.5m acquisition of the Sasa mine, CAML has diversified by commodity and geographically

With the US\$402.5m acquisition of the Sasa mine, CAML has diversified its production base from just one metal to a suite of base metals as it adds lead and zinc to its existing copper operations.

It is arguably a good time to be producing these metals. The copper price has moved above the model's long-term level and the market fundamentals for lead and zinc also appear to positive.

Importantly for CAML shareholders, the company has acquired an active mine, thus short circuiting any lengthy period of capital investment for development and construction before the mine generates any revenue.

Furthermore, the mine is profitable and so these profits could translate immediately into an increase in earnings for CAML, in excess of what QuotedData's model had suggested prior to the acquisition.

The Sasa mine has a solid track record of consistent production of lead and zinc with low costs of production. Under Lynx management in H1 2017, C1 cash costs (see QuotedData's glossary on the website for an explanation of this and other industry jargon) averaged US29c/lb for lead and US39c/lb for zinc according to CAML, both comfortably within the lower half of worldwide industry costs. This reportedly low-cost underground mine produced 23,000t of zinc in concentrate and 29,000t of lead in concentrate in 2016 and has 20 years of resources.

Sasa reported revenue of US\$79m in 2016 with EBITDA of US\$30m.

Figure 1: Sasa revenue and EBITDA

	2014	2015	2016	H1 2017
Revenue (US\$M)	82.8	70.5	69.4	50.7
EBITDA (US\$M)	50.0	42.4	30.3	33.3

Source: CAML

A significant increase in forecast EBITDA and EPS

The earnings per share and EBITDA estimates, from QuotedData's model, for the enlarged company are shown below in comparison to QuotedData's May 2017 valuation, which considered the Kounrad asset only.

Figure 2: Forecast EBITDA and EPS comparison for CAML pre- and post-Sasa acquisition

	2017f	2018f	2019f	2020f	2021f
Old forecast					
EBITDA (US\$m)	46.6	49.4	54.3	53.8	52.3
EPS (USc/s)	27	29	32	31	30
New forecast					
EBITDA (US\$m)	71.0	138.5	136.8	131.0	124.4
EPS (USc/s)	28	52	52	50	48

Source: Marten & Co

In 2018, QuotedData's model estimate that lead and zinc sales will account for 59% of the company's total revenue.

What about the debt?

To fund the Sasa acquisition, CAML has had to take on a significant amount of debt for the first time in its history.

There are two components to the total debt package. The senior portion of US\$120m is a loan from metals trader, and offtake partner at Kounrad, Traxys. In addition, CAML will inherit an existing US\$67m loan that former owner, Lynx, took on in 2015.

Given that this is the first time that CAML has taken on any debt onto its balance sheet, shareholders may understandably be a little apprehensive that the burden of loan repayments and debt servicing may jeopardise the company's ability to extend its historic dividend stream and yield.

QuotedData's model suggests that the debt- repayment schedule and the interest calls are manageable and, all things being equal, the company's ability to continue to pay dividends should remain intact

The forecast company cash flows, from QuotedData's model, suggest that the debt-repayment schedule and the interest calls are manageable. and the company's ability to continue to pay dividends remains intact. QuotedData's model suggests that the company's dividend per share could actually increase above the level modelled when CAML was a single-asset company. The dividend estimates are discussed later (page 8).

Also, the model suggests that CAML could generate sufficient cash to enable it to repay the loans early, although this possibility has not been incorporated into the modelling process.

Other advantages

The model suggests that the Sasa acquisition could allow the company to grow dramatically, to the benefit of shareholders. In addition, there are other potential advantages that could improve the company's risk profile.

CAML will have two operating assets in two countries

By having two operating assets, the company has diversified and arguably reduced the risk that it had, as a one-asset company, in the event that that the operation had to cease or suspend working for any reason, which could have affected revenue and earnings potential.

By acquiring an operation in Macedonia, the company has also diversified geographically, ensuring some degree of protection against any possible interruptions to operations in either country.

CAML now has two long-life operating mines. At Kounrad, with the exploitation of copper resources in the Western dumps, the model suggests that CAML can maintain production of over 13kt/y for at least another 14 years until 2032. Meanwhile, the model suggests that Sasa has a projected mine life through to 2037.

Low cost of production

CAML recorded a profit in its first year of operation, 2012, and has remained profitable ever since.

The key to this profitability is the great advantage that CAML has at its Kounrad operation, in that it treats, through an electrowinning (SX-EW) process, copper-bearing material that has already been mined and dumped in heaps by a third party. As there is no mining involved, unit costs of production are very low.

In 2016, cash costs at Kounrad were just US43c/lb (US\$948/t), making the company one of the lowest-cost copper producers in the industry, well inside the top 4%.

With the acquisition of Sasa, the company should maintain its low-cost profile.

Figure 3: Forecast C1 cash costs for Kounrad and Sasa (USc/lb)

Metal	2017e	2018f	2019f	2020f	2021f
Copper (Kounrad)	47	48	50	52	53
Lead/zinc* (Sasa)	37	38	37	35	36

Source: Marten & Co * C1 costs on a zinc equivalent basis

Sasa reinforces CAML's low-cost profile

The model suggests that, because of its low cost of production, CAML could continue to generate profits even if metal prices were to fall back to the lows of the recent downcycle.

A consistent dividend payer with high yield

The company boasts an impressive stream of dividends since commencing operations (as shown in Figure 4); this is something of a novelty for a 'junior' mining company.

Thus far, in total, CAML has declared dividends with a total value of US\$105m, far in excess of the funds it raised (US\$60m) in the 2010 IPO.

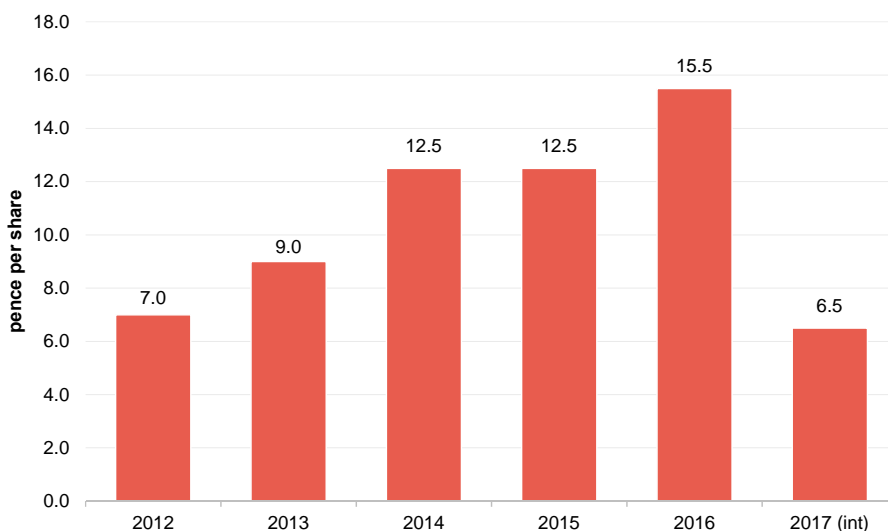
The company's policy has been to pay a minimum of 20% of revenue from Kounrad as dividends although it has paid dividends each year at a rate substantially higher than that minimum.

In 2016, the company paid an interim and a final dividend with a combined value of 15.5p/share, a 24% increase on the previous year and equivalent to 31% of gross revenue.

An indicative yield of 6%

Based on this annual dividend and the company's current share price, the indicative dividend yield is 6.1%.

Figure 4: Dividends paid (pence per share)



Source: CAML

The 2017 final dividend per share may be lower than 2016 as the company completes the Sasa acquisition, but...

The company has already paid an interim dividend of 6.5p/s this year, 18% up on the interim of last year. The model suggests that the total dividend payment for 2017 could exceed the total dividend for 2016, in US\$m terms. However, given the additional shares issued, the final dividend might be restricted to 6.4p/s, giving a total of 12.9p/s for the year.

The company has stated that, as from 1 January 2018, its target range for dividends will be between 30% and 50% of free cash flow (i.e. net cash generated from operating activities less capital expenditure).

Using an average dividend payout of 40% of free cash flow in 2018 and 50% thereafter, the model suggests that the total value of dividends could increase substantially, as shown in Figure 5.

Figure 5: Modelled dividend payouts (US\$m)

	2017f	2018f	2019f	2020f	2021f
Old forecast	22.7	22.1	30.3	30.3	30.3
New forecast	29.6	41.2	53.4	51.3	50.3

Source: Marten & Co

...thereafter dividends could modestly outperform QuotedData's previous estimate

Despite a 57% increase in shares issued on completion of the Sasa acquisition, the model suggests that CAML could exceed the model's previous dividends per share projections, as shown in Figure 6.

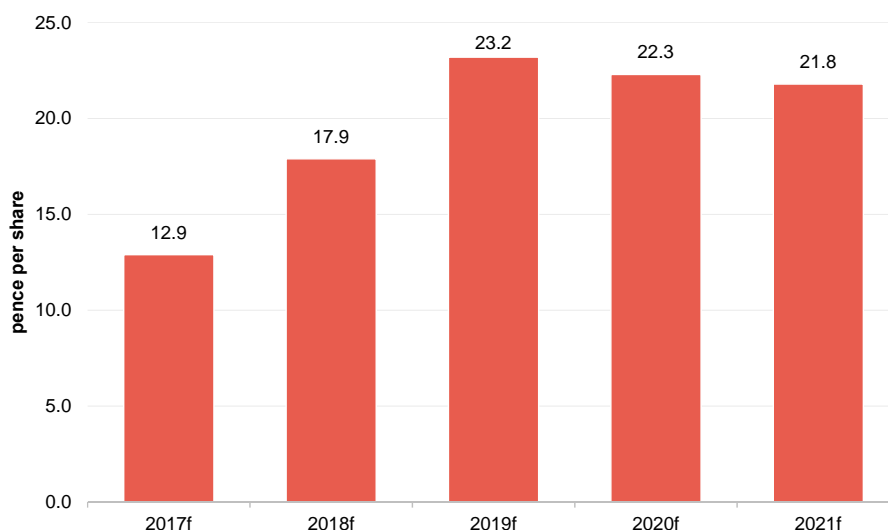
Figure 6: Modelled dividends per share (p/share)

	2017f	2018f	2019f	2020f	2021f
Old forecast	15.5	18.0	22.0	22.0	22.0
New forecast	12.9	17.9	23.2	22.3	21.8

Source: Marten & Co Dividends assume 40% of net cash flow in years 2017 and 2018, increasing to 50% thereafter

Figure 7 shows the model's dividend forecast graphically.

Figure 7: Modelled dividends



Source: Marten & Co Exchange rate £:US\$ 1.3

Exploration upside

With the acquisition of Sasa, the model suggests that CAML can achieve growth that was lacking within its core Kounrad operation. There could be an opportunity to

increase the production rate at the Kounrad copper plant through further investment, but with finite dump lives, it would appear that there is little other opportunity for organic growth beyond this.

The newly-acquired Sasa mine provides the company with a degree of exploration upside potential. There may be opportunities to increase the confidence and extent of resources and possible new deposits within the concession area.

The Kozja Reka deposit area, which is located between the Svinja Reka and Golema Reka resource areas and which was mined between 1966-1989, offers potential and former owner, Lynx, recently initiated a drilling programme there.

Shuak offers investors 'blue sky' exploration potential

It is the Shuak exploration project in Kazakhstan that represents the company's 'blue sky', with potential for both copper and gold production.

During a site visit earlier this year, QuotedData's analyst, Paul Burton, observed that:

- The licence area is large and in a geologically prospective region.
- There is high-grade copper at the old pit and in the stockpiles.
- CAML's test work has indicated that it can obtain high metal recoveries using its existing leaching technology.
- There has been extensive exploration work undertaken on site since the soviet days and CAML has access to some of the data. The scale of the project and the extent of geophysical anomalies and mineralisation is significant.

Following his visit, Paul concluded that Shuak has great potential to underpin further growth within the company. In the short to medium term, CAML says that it plans to investigate the potential to establish an oxide heap leach mining operation feeding a solvent extraction and SX-EW plant in a similar way to its well-established operation at Kounrad.

It says that the indications for proving up a sizeable, heap leachable resource, within the next 18-24 months, appear to be good. If all goes well, there is the potential that CAML could advance this part of the project to an evaluation stage quickly thereafter.

Longer term, the potential for discovery of a porphyry system (porphyry is a hard igneous rock containing crystals of feldspar) appears to be encouraging and there could be the potential for a gold component in the southern portion of the licence area. However, at this stage, the model places no value on Shuak.

Valuation

QuotedData's model values CAML on a sum-of-the-parts basis taking into consideration its net present value, as determined by a discounted cash flow analysis, of the Kounrad operation using a discount rate of 8% and the Sasa base-metal mine at 10%. The higher discount rate reflects a higher political and initial operational risk associated with the Sasa mine.

Given that the company has decided to sell its interest in the Copper Bay project, the model now treats it as an investment and values it at the cost of acquisition of CAML's 75% interest. As mentioned above, no value has been attached, at this stage, to the Shuak exploration property.

Based on the NPVs of Kounrad and Sasa (at 8% and 10% respectively), QuotedData's model suggests an NAV for CAML of 300.5p per share

Despite a significant increase in the number of shares issued, the model's NAV for CAML has increased from 268.5p in May 2017 to 300.5p today.

Prior to the Sasa acquisition, CAML had an EV/EBITDA ratio of 7.0 and although this ratio rises in 2017 with the significant increase in debt (without any commensurate increase in EBITDA as the Sasa deal was only concluded late in the year), the model suggests that, in 2018, the EV/EBITDA ratio could decline significantly to 4.6.

Figure 8 summarises QuotedData's NAV model for CAML.

Figure 8: Valuation model for CAML

	US\$M	£M	Pence per share
Kounrad NPV ^{8%*}	420.7	321.1	182.5
Sasa NPV ^{10%*}	419.5	320.3	182.0
Investments (Copper Bay)	6.2	4.7	2.7
Investments (Shuak)	0.0	0.0	0.0
Cash (post-completion)	35.3	26.9	15.3
Debt (post-completion)	(189.0)	(144.3)	(82.0)
NAV	692.7	528.8	300.5

Source: Marten & Co * net present value discounted at 8% or 10%. US\$1.31/£; shares outstanding 176.0 million

Mine models - inputs and outputs

Kounrad

Figure 9 below, lists the main inputs and assumptions that QuotedData modelled and the outcomes derived.

Figure 9: Kounrad model assumptions and parameters

Parameter	Value	Source
Resources		
Eastern dumps: indicated	89.7Mt @ 0.10% Cu	2017 resource update
Eastern dumps: inferred	79.6Mt @ 0.10% Cu	2017 resource update
Western dumps: indicated	275.4Mt @ 0.10% Cu	2017 resource update
Western dumps: inferred	169.4Mt @ 0.09% Cu	2017 resource update
Recoverable copper remaining (Eastern)	19.5kt	CAML
Recoverable copper remaining (Western)	175.0kt	CAML
LOM avg. PLS flow rate	1,000l/hr	Marten & Co
LOM avg. PLS grade	2.00m ³ /l	Marten & Co
LOM avg. plant recovery	74%	CAML
LOM avg. copper production	13.1kt	Marten & Co
LOM total copper production	200.0kt	Marten & Co
LOM avg. C1 cash cost	US\$0.61/lb	Marten & Co
Long term copper price	US\$6,600/t (US\$3.00/lb)	Marten & Co
LOM avg. sustaining capital	US\$2.0m	CAML
Kazakhstan taxation rate	20.0%	Marten & Co
LOM	16 years	Marten & Co

Source: CAML, Marten & Co Exchange rate £:US\$ 1.3

QuotedData's NPV for Kounrad assumes that the company continues to successfully bring the Western dumps into full operation as activities at the Eastern dumps wind down over the next few years.

Based on CAML's production so far, its target copper production of 14,000t for 2017 appears to be achievable

Based on year-to-date production of 10,900t of copper, the model assumes copper production of 14,100t for 2017 as a whole, which is just above CAML's guidance range of 13,000-14,000t for the year.

Thereafter, the model assumes that production falls slightly as a result of the different mineralogy of the Western dumps and longer leach times leading to lower pregnant leach solution (PLS) grades. The model assumes an average PLS grade of 2.0 g/l, which is lower than that achieved thus far from the Eastern dumps

Post 2017, the model conservatively estimates copper production running at a steady state of just over 13,000t/y until 2032. This estimate is unchanged from QuotedData's previous report in May 2017.

It is possible however, that the company could be able to achieve higher production than QuotedData's estimates because recoveries in this area may be higher than has been conservatively assumed. This is because, after decades of weathering, some of the material classed as sulphides may in fact be more amenable to acid leaching than the categorisation suggests.

A slight increase in cash costs is expected as operations transition to the Western dumps

On the cost side, H1 2017 C1 cash costs were US45c/lb, a 13% increase on the corresponding period of 2016, as a result of higher labour, electricity and reagent costs associated with the transition to the Western dumps. Overall, the model assumes that C1 costs rise about 10% in 2017 because of increased reagent consumption, owing to the different mineralogy, and greater power consumption, as the Western dumps are further from the processing plant than the Eastern dumps.

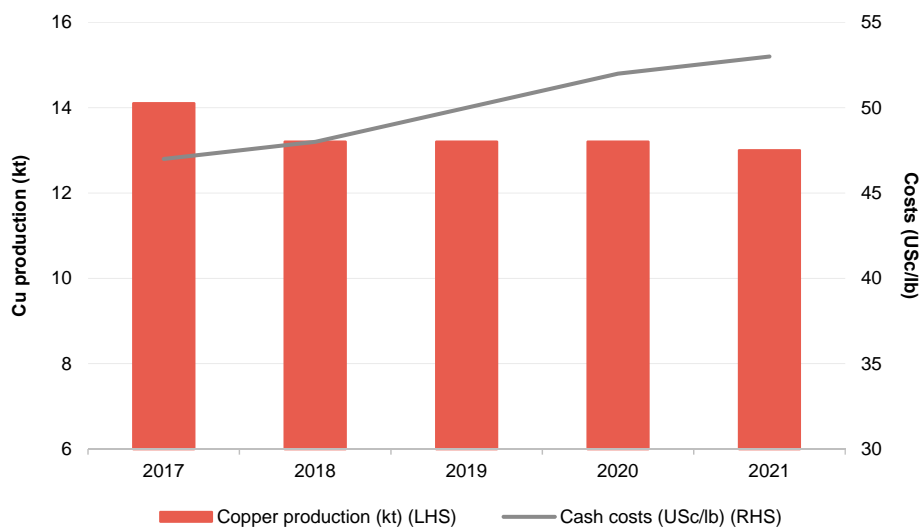
Kounrad sells the vast majority of its copper cathode output to metals trader, Traxys, in terms of an offtake agreement that runs until 31 December 2018. Under the terms of CAML's new debt arrangement with Traxys, this offtake agreement will extend to five years from completion and the model assumes that current terms will continue.

The short-term copper price forecasts used in the model have been amended to reflect the improved market conditions prevailing in 2017, and a slightly more conservative upward slope to the long-term forecast has also been assumed (see discussion on copper prices, page 31).

Copper prices have surged recently above the model's long-term price assumption

The model uses a copper price of US\$5,900/t (US\$2.68/lb) in 2017, US\$6,200/t (US\$2.81/lb) in 2018 and thereafter a long-term price of US\$6,600/t (US\$3.00/lb). After a recent surge, the London metal Exchange (LME) spot price is US\$7,140/t and the year-to-date average is approximately US\$5,900/t.

Figure 10: Forecast copper production and cash cost



Source: CAML, Marten & Co

Sasa

Figure 11 below lists the main inputs and assumptions that QuotedData modelled for Sasa and the outcomes derived.

Figure 11: Sasa model assumptions and parameters

Parameter	Value	Source
Reserves (Svinja)	10.9Mt @ 3.85% Pb, 3.08% Zn	SRK 2017 reserve estimate
Indicated resources (Svinja) (incl reserves)	13.3Mt @ 4.59% Pb, 3.68% Zn	SRK 2017 resource estimate
Inferred resources (Svinja & Golema)	10.1Mt @ 3.55% Pb, 1.67% Zn	SRK 2017 resource estimate
Life of mine (LOM)	20 years	SRK/CAML
LOM tonnes processed	15.8Mt	SRK/CAML
Avg. tonnes processed	780kt/y	SRK/CAML
Avg. lead head grade	3.72%	Marten & Co
Avg. lead recovery	95%	Marten & Co
LOM lead production	553kt	Marten & Co
Avg. zinc head grade	2.63%	Marten & Co
Avg. zinc recovery	85%	Marten & Co
LOM zinc production	403kt	Marten & Co
LOM avg. C1 cash cost	US\$766/t (US\$35c/lb)	Marten & Co
Long-term lead price	US\$2,300/t	Marten & Co
Long-term zinc price	US\$2,700/t	Marten & Co
LOM sustaining capital (incl. closure costs)	US\$162m	SRK/CAML
Macedonia taxation rate	10.0%	CAML

Source: CAML, SRK, Marten & Co Exchange rate £:US\$ 1.3

Indicated resources include reserves

QuotedData's NPV^{10%} of US\$420m assumes that the company continues to mine the Svinja orebody through the current sub-level caving method.

In its recent independent report on Sasa as part of the due diligence for the acquisition, consultant, SRK, deemed it a reasonable assumption that the mine will not only bring

inferred resources into the mine plan towards the end of the mine's life but will also be able to exploit the Golema deposit. Reflecting this, the model assumes that mining takes place from Svinja inferred resources from 2029 and from Golema from 2034, by which time the company may have increased the confidence level of resources in these areas.

The introduction of mining at Golema suggests that costs will rise because of the higher- cost cut-and-fill mining method used and revenue will dip on lower zinc grades in this deposit.

There is excess capacity within the existing plant, which could allow CAML to increase Sasa production

The model assumes a steady mining and processing rate of 780kt/y, which is more or less in line with recent past performance, but it should be noted that the plant has a capacity up to 850kt/y. This suggests that the company may be able to exceed the model's forecasts once it takes ownership and fully investigates the potential.

A company's ability to achieve forecast mining rates is partially dependent on the expertise of the mine management. The company says that it intends to retain the current mine general director, Neil Stevenson, which it believes should ensure continuity and significantly reduces any operational risk.

It is also noteworthy that two of the CAML board, executive chairman, Nick Clarke, and non-executive director, Roger Davey, are mining engineers with extensive mining experience.

Sasa produces lead and zinc at low cost

QuotedData's model assumes LOM forecast C1 costs average US38c/lb in 2017 terms.

In future, the model assumes that Traxys (already the offtake partner for Kounrad's copper and now providing CAML with the largest portion of debt financing for the Sasa acquisition) will take over the offtake agreements for the lead and zinc concentrates.

The model also assumes that the current streaming agreement for silver sales from concentrates remains in place.

LOM average lead and zinc production forecasts are 27,280t/y and 19,869t/y respectively. In addition, it is assumed that the mine will produce 7.3Moz of silver over 20 years, which is recovered from the lead concentrates.

Based on current concentrate treatment terms from traders and smelters, the model assumes the following parameters.

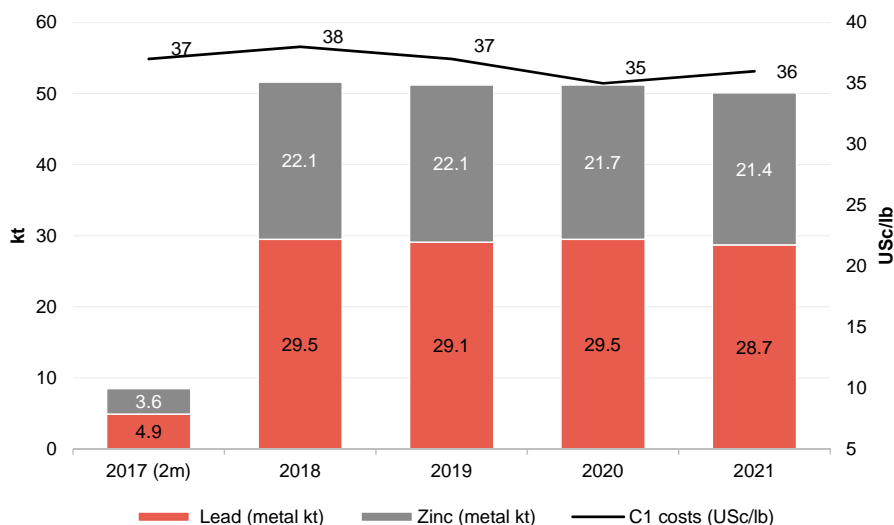
Figure 12: Treatment charges and freight costs

	Unit	Value
Lead		
Payability	%	95
Treatment charge	US\$/t	130
Freight	US\$/t	19
Zinc		
Payability	%	85
Treatment charge	US\$/t	100-110
Freight	US\$/t	19

Source: Marten & Co

Figure 13 shows the model's estimates for Sasa's metals production and unit costs. The model assumes that two months' production are attributable to CAML in 2017.

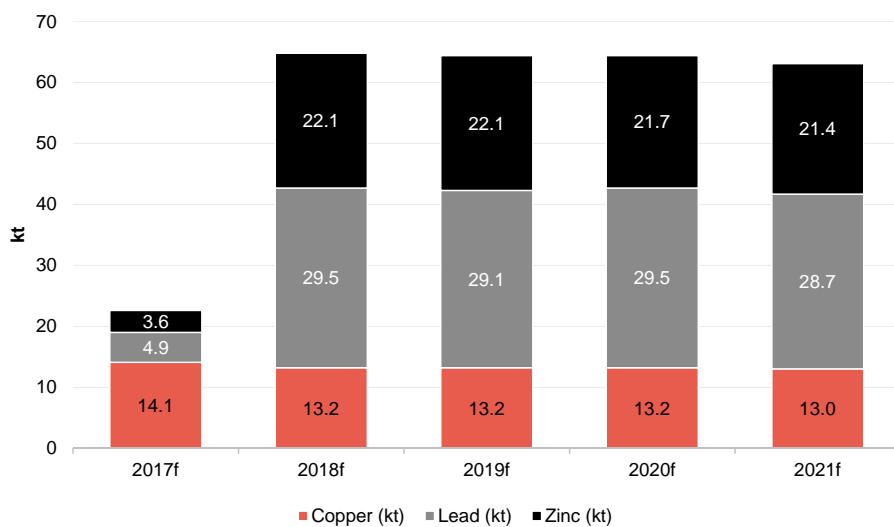
Figure 13: Sasa five-year metal production forecast and C1 costs



Source: Marten & Co, SRK, CAML

Figure 14 summarises the model’s estimates for CAML’s metal production.

Figure 14: CAML aggregate metal production forecast



Source: Marten & Co, SRK, CAML

Copper Bay

Given that CAML has decided not to proceed with the Copper Bay project and has put it up for sale, the project has been valued in QuotedData’s NAV analysis at the cost of CAML’s investment at US\$6.2m.

Shuak

As previously mentioned, Shuak is an exploration project and the model attaches no value to it at this early stage.

Sensitivity analysis

The sensitivity of the model's NAV estimate for CAML has been analysed with respect to changes in the key variables; metal prices and discount rate, as shown in Figure 15.

Figure 15: NAV sensitivity analysis

NAV (p/sh): discount rate	Metal price						
	-30%	-20%	-10%	Base	+10%	+20%	+30%
NAV @ 5%	128	203	278	396	428	504	579
NAV @ 8%	99	161	223	321	348	411	473
NAV @ 10%	83	139	195	283	306	362	418
NAV @ 12%	70	121	171	250	271	322	372

Source: Marten & Co Assumptions: US\$1.31/£; shares outstanding 176.0 million

NB Because different discount rates have been used for Kounrad and Sasa in the model, the base case value of 300.5p does not appear in the above table.

As an indication, if spot metal prices of US\$7,000/t for copper, US\$2,500/t for lead and US\$3,185/t for zinc are used, CAML's NAV rises to 364p/share.

This suggests that, due to its low cost of production, the company has some protection against downturns in copper, lead and zinc prices and could continue to generate free cash flow even at prices lower than have been seen in the recent seven-year lows.

H1 2017 operating and financial results

Following a strong performance in 2016, in H1 2017, CAML continued to report strong operational and financial results. The company's Kounrad operation sold 6,900kt of copper, 8% up on H1 2016, and with a 15% increase in the price of copper received, revenue rose 25%, to US\$38.6m. Fully inclusive cost of production was up 11%, to US\$1.08/lb, with C1 cash costs up 13%, to US\$0.45/lb as production commenced in the Western dumps. EBITDA rose 38% and EPS was up 41%, to US13.5c.

Figure 16: H1 2017 financial highlights

	US\$m	y-o-y
Revenue	38.6	+25%
EBITDA	24.0	+38%
Profit before tax	20.4	+36%
EPS (USc)	13.50	+41%
Cash at end	41.6	+39%
Interim dividend (pence)	6.5	+18%

Source: CAML

Strong operational and financial performance continued in H1 2017

The company would appear to be on course to achieve copper production at the upper end of its 13,000t-14,000t guidance range for 2017 after producing 3,842t in Q3. This takes the total for the year to date to 10,869t.

Since starting irrigation of the Western dumps in April 2017, the company has recovered 3,480t from the new area, with 2,179t recovered in Q3, accounting for 46% of total production.

Assets - Kounrad

Location

The Kounrad mine and surrounding dumps are located in the Balkhash area of south-central Kazakhstan, 15 km north of the town of Balkhash and 600 km northwest of the largest city, Almaty. Balkhash is on the northern bank of Lake Balkhash, which stretches 600 km in an east-west direction. The town has a flotation concentrator and smelter, which has treated Kounrad ore in the past.

The region is characterised by a semi-arid climate and typically flat topography, or steppe.

History

The Kounrad open-pit copper mine was state-operated from 1936 to 1992, and managed by copper-mining company, Kazakhmys, until 2006. Despite mining both oxide and sulphide material, the operation only treated the sulphide ore, which was amenable to its flotation technology. It discarded and stockpiled the oxide material (in the Eastern dumps) and the below cut-off grade sulphide material to the west of the open pit. It is this stockpiled material that CAML treats to extract copper.

The mine struggled over 2006-2007 with depleting grades and was consequently closed in late 2008, although Kazakhmys attempted limited mining again in 2011.

In October 2014, Kazakhmys was restructured with key and growth assets retained in the listed entity and rebranded KAZ Minerals plc. At this time Kounrad was transferred into private firm Cuprum Holdings along with several other mature assets, which were collectively rebranded as Kazakhmys Corporation.

The potential to treat the dumps using SX-EW technology to recover copper was first recognised in the 1960s by the Ural Research & Project Institute of Copper Industry (Unipromed Plc). Unipromed completed pilot plant scale tests over 1969-1970, which led to limited copper production between 1975 and 1992.

A joint venture in 1993 was established to build a commercial SX-EW plant but, having started building in 1995, work was terminated a year later and ownership of the dumps passed back into state hands. Jalyn Mining then tendered successfully for the rights over the Eastern dumps and designed an SX-EW plant. However, it pulled financing of the project in 2005, triggering the cancellation of the subsoil use contract (SUC) and allowing CAML to tender for the licence.

CAML completed a technical evaluation of a dump leach project in 2006 before winning the SUC in 2007 as a private company and then forming a joint venture to operate the project.

The company commissioned a pilot scale SX-EW plant near Dump 6 in 2008, which operated throughout 2009.

In November 2009, CAML commissioned the Beijing General Research Institute of Mining and Metallurgy (BGRIMM) to complete a feasibility study on a 10 kt/y commercial copper SX-EW plant.

After its 2010 IPO, CAML began constructing a SX-EW plant, plus the infrastructure required to irrigate the dumps and transport pregnant solution to the plant. It completed the plant in April 2012, at a cost of US\$39m, some US\$8m under budget.

Geology and mineralisation

The Kounrad copper deposit is located within the North Balkhash metallogenic belt, part of the much larger Central Asian Orogenic Belt that extends 7,000 km from west to east and from the Siberian Craton in the north to the Tarim Craton in the south. It is a prolific host of major porphyry copper deposits.

The primary Kounrad deposit is a typical copper porphyry associated with calc-alkaline magmas, formed in a Carboniferous age (327–312 Ma) subduction-related setting.

Kounrad is made up of unconsolidated sediments and granitic bedrock units. Weathering and supergene enrichment have produced a general zonation of mineralisation as follows:

- Oxidised cap: characterised by hematite, limonite, manganese oxyhydroxide, malachite, azurite, cuprite, native copper and chrysocolla mineralisation
- Leached zone: characterised by moderate oxidation in the upper part and destabilisation of sulphide minerals under acidic conditions in the lower parts
- Supergene blanket: characterised by chalcocite and covellite mineralisation
- Primary sulphide zone: characterised by disseminated and stockwork ore with pyrite, chalcopyrite, enargite and chalcocite mineralisation.

Resources

The dump resources are contained within the Eastern and Western waste dumps that have accumulated over some 70 years of open-pit mining and processing from the primary Kounrad porphyry.

In 2013, consultant Wardell Armstrong International (WAI) estimated total resources (indicated and inferred) containing 614 kt of copper, suggesting a potential mine life of well over 20 years during which it would extract some 230 kt of recoverable copper.

The following table summarises the 2013 resource estimate as updated by consultant WAI in June 2017 in accordance with the JORC (2012) code.

Figure 17: 2013 resource estimate (updated June 2017)

	Tonnes (Mt)	Grade (% Cu)	Contained copper (kt)
Indicated	389.0	0.10	372.5
Inferred	264.0	0.09	237.2
Total	653.0	0.09	609.7

Source: WAI

CAML has been exploiting the Eastern dumps for five years and the resources there have only a limited life remaining. In June 2017, WAI accounted for the material extracted and estimated the material remaining in resources, as shown in the table below.

Figure 18: Remaining copper in Kounrad dumps

	Copper contained (kt)
Eastern dumps	
Total resources	167.5
Recovered 2012-17	60.0
Remaining	107.5
Western dumps	
Total resources	446.7
Recovered 2017	1.3
Remaining	445.4

Source: Wardell Armstrong International

Figure 19 shows the location of the dumps relative to the open pit and the SX-EW plant.

Figure 19: Aerial view of Kounrad showing the extent of the Western dumps in the foreground

Source: Marten & Co

Processing

The Kounrad operation is essentially a processing operation with no mining necessary. The existing dumps are leached in situ and the resultant copper-containing solution is treated through an SX-EW process, which is an established route for dump leach projects around the world.

From the start of operations in 2012 until Q1 2017, CAML leached and extracted copper solely from the Eastern dumps. With those dumps now nearing exhaustion, the company is switching its focus to the larger Western dumps.

Leaching of the Western dumps started in 2017

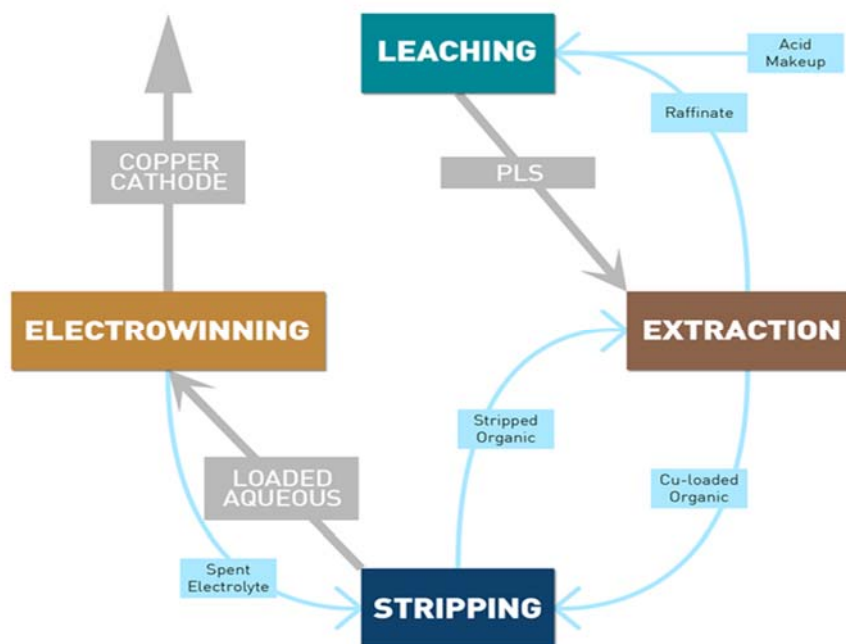
In Q2 2017, the company completed the construction of the infrastructure necessary to leach and transport PLS to the process plant, located close to the Eastern dumps.

CAML constructed and commissioned the self-funded infrastructure project at a cost of approximately US\$13.7m, around 30% below budget due to a combination of cost savings associated with the weaker local currency in 2016 and engineering efficiencies.

The company started to leach the Western dumps in April 2017 and recovered 1,301t of copper in Q2 and 2,179t in Q2, representing 46% of total Kounrad production over the period. By 2020, the model suggests that the Western dumps will be the sole source of copper production.

Figure 20 below shows the essential elements of the leaching and extraction process.

Figure 20: Schematic Kounrad SX-EW process flowsheet



Source: CAML

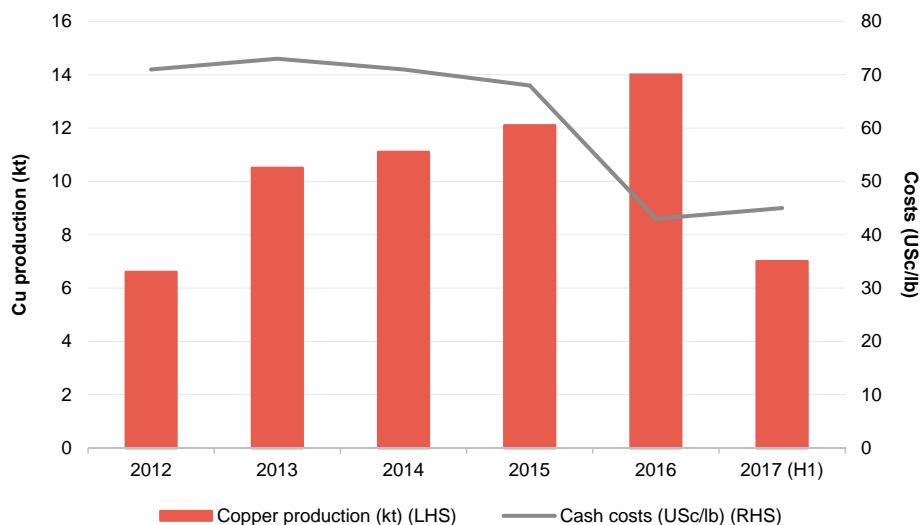
Product sales

CAML has an offtake agreement (an agreement between a producer and a buyer of a resource to purchase or sell portions of the producer's future production) with international commercial services group, Traxys, which is in force until the end of 2018, for the bulk (90%) of the copper cathodes produced. Pricing, on an ex-plant basis, is linked to the LME copper price, less set selling costs.

Under the terms of CAML's new debt arrangement with Traxys, this offtake agreement will extend to five years from completion and the model assumes that current terms will continue.

CAML also makes minor sales to local customers.

Figure 21: Historic copper production and C1 costs



Source: CAML

Assets – Sasa

The Sasa acquisition

On 6 November 2017, CAML completed the US\$402.5m acquisition of Lynx, which owned the producing lead-zinc Sasa mine, in Macedonia.

The acquisition is expected to be completed before the end of the year

Lynx is a Bermudan holding company set up explicitly to acquire the Sasa mine in 2015, and is co-owned by Orion Co-Investments III LP and Fusion Capital AG.

In terms of the deal, CAML paid US\$340.5m in cash on completion. To fund this, the company secured a US\$120m senior debt facility with metals trader Traxys (who already buys virtually all of CAML’s copper from Kounrad) at an interest rate of LIBOR plus 4.75% and with a five- year term. Additional debt is in the form of a rollover of an existing US\$67m facility from a Société Générale/Investec facility, which CAML will assume from Lynx. The debt attracts interest at LIBOR plus 5% and it extends for five years.

CAML is taking on US\$187m of debt and has raised US\$153.5m through new equity

To finance the remainder of the cash portion of the acquisition cost, CAML has placed 49.1m new shares and sold 10.6m existing shares held by a director of the company, through J.P. Morgan Cazenove and Peel Hunt, acting as joint bookrunners. The primary placing, completed on 22 September at a price of 230p/share, raised £113.0m (approximately US\$153.5m).

Figure 22: Aerial view of the Sasa mine



Source: CAML

Finally, CAML has distributed US\$50m worth of company shares (the consideration shares) to Orion and will also pay the sellers US\$12m of deferred consideration, payable in six equal monthly instalments, commencing on the first anniversary of completion.

The table below breaks down the funding elements.

Figure 23: Breakdown of funding sources for the acquisition

Funding	Amount
Cash for completion	
Primary raising	US\$153.5m
Senior debt (Traxys)	US\$120.0m
Rollover of existing debt	US\$67.0m
Total cash raised for completion	US\$340.5m
Additional funding	
Shares to Orion Mine Finance	US\$50.0m
Deferred cash payment	US\$12.0m
Total	US\$402.5m

Source: CAML

Location

The Sasa mine is located in north-eastern Macedonia, approximately 150km from the capital city of Skopje and 10km to the north of the small village of Makedonska Kamenica, which owes its existence to the presence of the mine.

The mine is located in the Osogovo Mountains of eastern Macedonia at the head of the deeply-incised Kamenica River valley, with an elevation range of approximately 975m

to 1,600m above sea level. The mine site is subject to continental and Mediterranean climatic influences, with hot dry summers and cold winters.

Figure 24: Location of the Sasa mine



Source: CAML

The mine-exploitation concession covers an area of 4.2 km² and the mining licence is valid until 28 September 2030, with the possibility of extending for another 30 years.

The exploration concession covers an area of 1.4 km² and expires on 13 December 2017. Lynx is currently in the process of applying to renew the exploration concession and has submitted a study detailing the results of exploration between 2013 and 2017 for review by the Geological Department of the Ministry of Economy.

History

Exploration in the area dates back to 1954 and in 1966 the state opened a mine to produce lead and zinc concentrates. However, the mine was shut in 2002 due to lack of capital and taken into bankruptcy and closed. The Solway Group purchased the mine and restarted operations in 2006.

Lynx acquired the mine in 2015 (through subsidiary Lynx Europe) by acquiring Rudnik SASA DOOEL, the entity that owned the Sasa mine after acquiring it through tender when the state-run mine went bankrupt in 2005.

Geology and mineralisation

Sasa mine comprises the Svinja Reka, Golema Reka and Kozja Reka lead-zinc-silver deposits, which lie within the Serbo-Macedonian Massif, a belt which extends through Serbia, Macedonia, Bulgaria and eastern Greece into Turkey and hosts a large number of lead-zinc deposits.

The deposits are located on the eastern flank of a tertiary intermediate intrusive complex and related porphyry copper-molybdenum system, within which a northwest striking stockwork alteration zone is developed.

Lead-zinc-silver mineralisation occurs as stratiform deposits hosted predominantly by quartz-graphite schist and marbles of Lower Palaeozoic age at Svinja Reka and by gneisses at Golema Reka. The mineralisation is considered to relate to the intrusion of tertiary volcanics.

High-temperature hydrothermal fluids and bedding-parallel faulting are responsible for metasomatism of the host sediments, producing skarn and base-metal mineralisation.

The well-defined, partially exploited, lenses of lead-zinc-silver mineralisation dip at approximately 35° to the southwest and typically range in true thickness from between 2m and 30m. The mineralised lenses are present in parallel sheets (typically two or three bodies, namely the hanging wall, central and footwall orebodies), separated by an interburden with thicknesses of 1m to 10m. The lenses pinch and swell along strike and down-dip.

The deposits are considered to be metasomatic skarn-hydrothermal deposits with replacement and bedding-parallel fault controlled mineralisation. The skarns occur in the form of replacement of marble, whereas the hydrothermal lead-zinc-silver mineralisation appears as replacements and as open-space fillings. The hydrothermal association, which is superimposed onto the skarn assemblages, contains argentiferous galena, sphalerite, pyrite and minor chalcopyrite and mineralisation varies from coarse to fine grained depending on the ore source. Silver is generally associated with the galena.

Reserves and resources

Resources at Sasa have been estimated a number of times in recent years by independent consultants applying JORC guidelines, including SRK in 2006, WAI in 2011 and MRA in 2015.

In addition, Sasa reports reserves in accordance with the Macedonian state reporting system every four years. The latest Macedonian reserves were completed in April 2015.

Independent consultants, SRK, produced a reserve and resource estimate (JORC 2012) in July 2017 after reviewing and verifying all the exploration data collected since 1954 on the property and conducting a number of check assays.

Sasa has a 20-year mine life based on resources

Reserves (all at the Svinja deposit) are 10.9mt at grades of 3.85% lead, 3.08% zinc and 18.4 g/t silver.

Figure 25: Sasa reserves and resources

	Tonnes	Grade	Contained metal				
	Mt	Pb%	Zn%	Ag g/t	Kt	Kt	Moz
Reserves	10.9	3.85	3.08	18.4	421	337	6.4
Svinja							
Indicated resources	13.3	4.59	3.68	22	611	490	9.4
Inferred resources	2.7	3.16	2.08	16.6	84	56	1.4
Golema - Inferred	7.4	3.69	1.52	18.6	273	112	4.4

Source: SRK, CAML

Indicated resources include reserves

SRK considers that the blocks with a net smelter return (NSR) value greater than US\$30/t at Svinja Reka and US\$35/t at Golema Reka can be reported as resources according to the definitions of the JORC Code (2012). In determining the NSR cut-off, SRK used a lead price of US\$2,550/t, a zinc price of US\$2,800/t and a silver price of US\$25/oz.

Resources are reported as undiluted using a minimum mining width of 3.5m.

The Kozja Reka deposit was not included in resources, although it has been mined in the past.

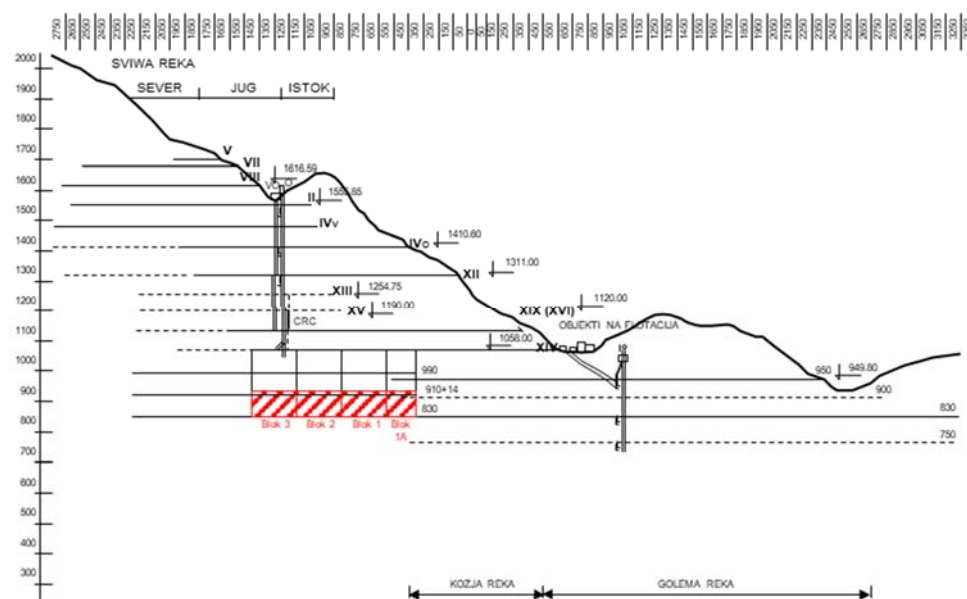
Mining

CAML will become an underground miner

The Sasa mine is an underground mine that produces lead, zinc and silver metals in concentrate.

The mineral deposits consist of a shallow dipping, stacked, lead-zinc-silver lens system, which is mined using a sub-level caving method which takes advantage of the weak hanging wall to allow the rock to cave naturally into the void remaining after ore has been blasted.

Figure 26: Long section of the Sasa mine showing adits, shafts, decline and infrastructure



Source: CAML

Only the Svinja Reka deposit is currently being mined, although the Golema Reka deposit, which was mined up to 2009 but closed due to the low grades at the time using a cut and fill method, contains inferred resources.

The main access to the mine is through a number of adits at Svinja. The main adit into Svinja Reka is at an elevation of 1,058m located above the processing plant and other mine surface infrastructure.

Seventy percent of the current mine production (ore and waste) from Svinja is transported in 10t rail wagons through a 3.2km adit at the 830m level to the Golema Reka (4.1m diameter) vertical surface shaft where it is hoisted 180m to the processing plant at surface (1,010m level). The remaining 30% of the mined material is transported through a decline to the surface using 20t trucks.

The Svinja Reka deposit extends for a vertical interval of greater than 700m and the mine uses gravity transport of ore and waste through ore/waste passes from the production levels to the loading levels. Additional raises are used for ventilation and dewatering.

Drift dimensions are typically 3.0 to 3.5m in width and 3.0 to 3.5m in height.

The defined stope shapes extend from the 1,054m to a lowest elevation of 797m level on a level spacing of 7m, over a strike length of 835m. The main lower access of the existing mine development is an exploration decline ramp some 24m below the 830m level.

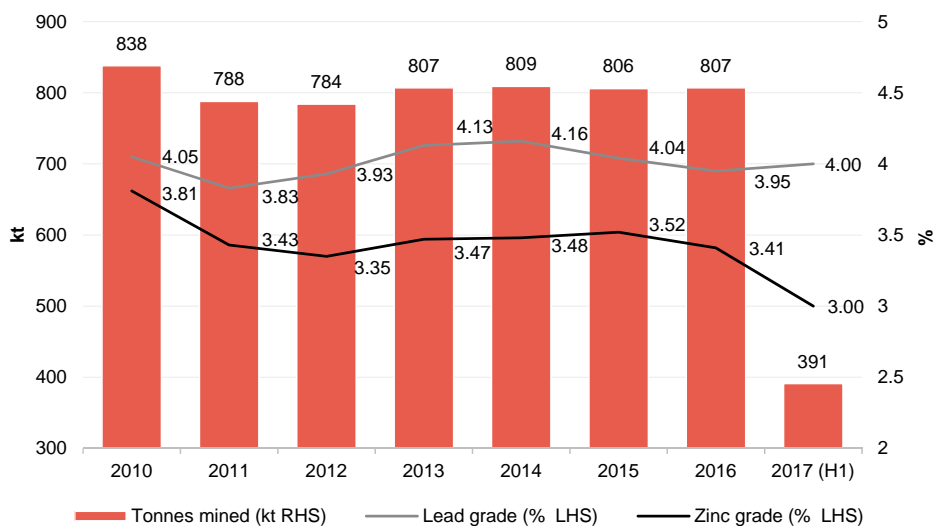
Figure 27: Jumbo drilling underground at Sasa



Source: CAML

Sasa underground mine, produced 23,000t of zinc in concentrate and 29,000t of lead in concentrate in 2016. The low-cost mine has 20 years of reserves.

Figure 28: Mining rates and head grades at Sasa



Source: CAML

Processing

A conventional process flowsheet will produce separate lead (with silver) and zinc concentrates

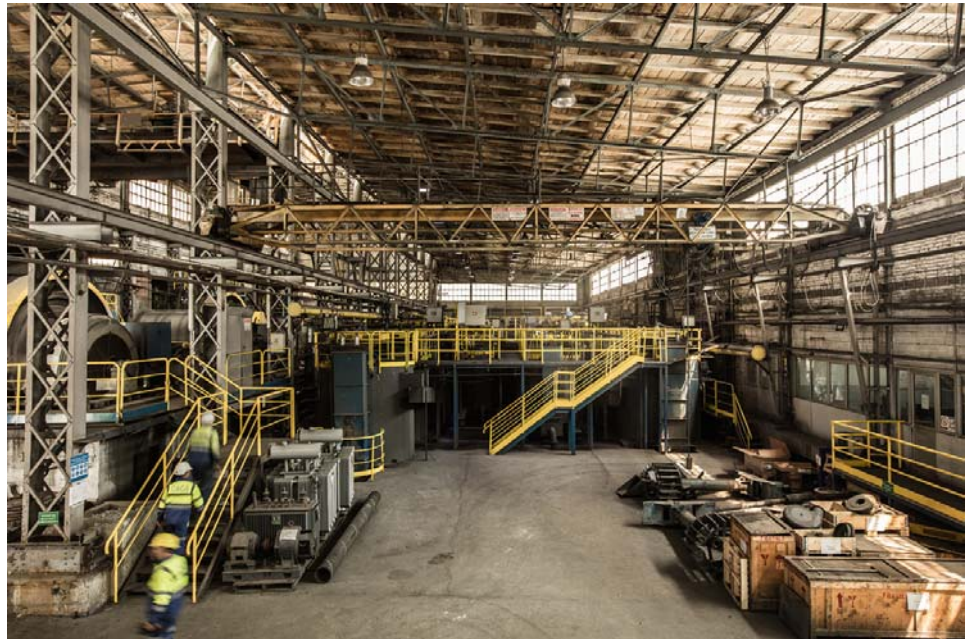
The process plant comprises a two-stage crushing circuit and a conventional lead-zinc concentrator utilising selective flotation. Separate lead and zinc concentrates are produced, with silver reporting to the lead concentrate, and dewatered by thickening and filtration for shipment by truck to smelters in the surrounding region.

The plant was upgraded in 2007 to a nameplate capacity of 850t/y of ore, although since the Golema mine stopped producing, the plant has been running at 750-780kt/y.

Lead recovery in concentrate has averaged 94% in recent years and silver in the lead concentrate approximately 80%. Zinc recovery has averaged 85-86% although with the introduction of a new zinc regrind circuit in Q4 2017, zinc recovery is expected to rise to 87.5%.

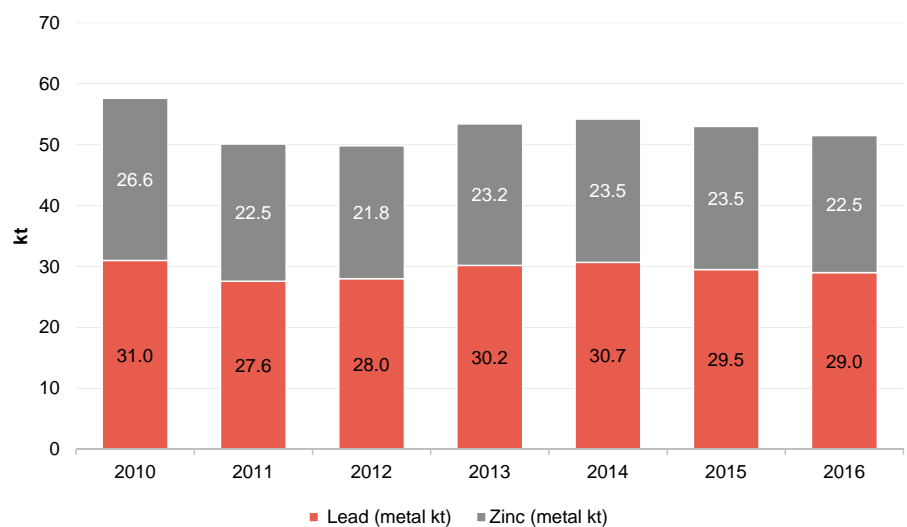
The lead concentrate has a grade of approximately 73% lead and 340g/t silver, and the zinc concentrate 49-50% zinc.

Figure 29: Inside the plant at Sasa



Source: CAML

Figure 30: Metal production history at Sasa



Source: CAML

Product sales

The Sasa plant produces two products – a lead concentrate, to which the silver reports, and a separate zinc concentrate. Currently, both are transported from the mine site by truck and sold to European smelters.

There is a lead/silver offtake agreement and two zinc offtake agreements in force. In each case the buyer pays for a percentage of the payable metals (i.e. lead, zinc and silver) minus a treatment charge for lead and zinc, and a refining charge for the silver.

The silver is sold to Lynx Metals in terms of a September 2016 silver streaming agreement. In return for an upfront payment of US\$22m from Lynx Metals, Sasa sells its silver to Lynx Metals at a set price of US\$5/oz.

In future, the model assumes that Traxys (already the offtake partner for Kounrad's copper and now providing CAML with the largest portion of debt financing for the Lynx acquisition) will take over the offtake agreements for the lead and zinc concentrates.

Sasa reported revenue from concentrate sales of US\$79m in 2016 with EBITDA of US\$30m.

Tailings disposal

Tailings from the plant are currently stored in a tailings storage facility (TSF 3.2) located within the steep-sided valley of the Kamenica River. The river is diverted around the TSF.

A new TSF is currently being built

TSF 4 is currently under construction, immediately downstream of the current facility. This facility should be completed by May 2018 and operational from October 2018 to 2026. A contractor is currently extending the river diversion structure and the company is awaiting approval for a modification to the dam structure.

Additional TSFs will be needed after TSF4 to cope with tailings through to the end of the mine's life in 2037. TSF 5 is planned to be constructed during 2025 and 2026 to provide an additional eight years' storage. A smaller TSF 6 is to be built and used after 2034.

Mine closure

Within the mine licence area, there is historical contamination arising from the old mine workings and the associated mine residues (waste rock and tailings), in addition to that arising from a tailings emission in 2003, when the mine was under state ownership.

According to SRK and CAML's due diligence, the current operators are not liable for any historical contamination.

In June 2017, SRK prepared a conceptual closure plan, which envisages two options for the diversion of surface water flows upstream and in the catchment of the TSFs.

At this early stage the model assumes a cost of US\$15m for implementing Option 1.

CAML has an 80% interest in this highly prospective copper/gold project

Assets - Shuak

Shuak is an exploration prospect in Kazakhstan in which CAML has an 80% interest. It represents the company's first venture beyond its Kounrad copper dump retreatment operation in the country.

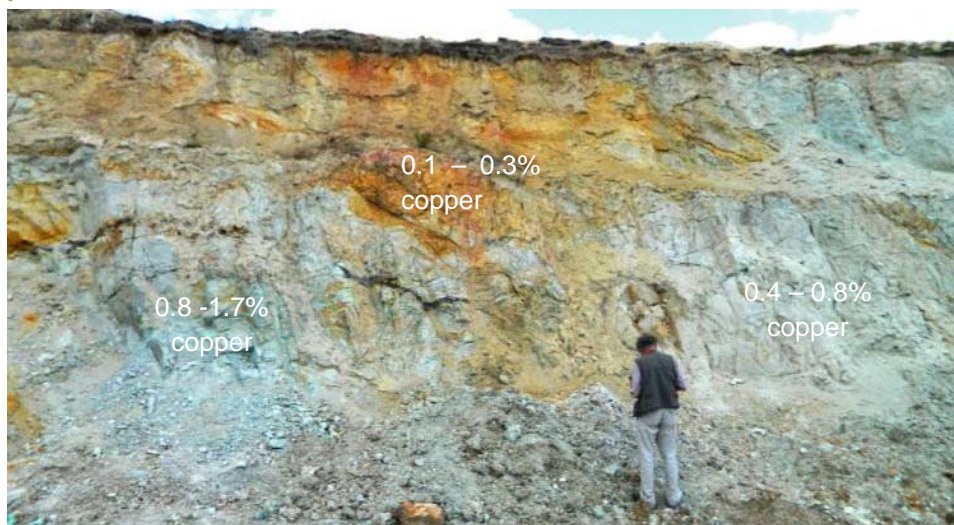
In September 2016, CAML incorporated Shuak BV to hold the Shuak SUC and in February 2017 transferred 20% of the company to local partners, Aksu-Esil. In August 2017, the SUC was transferred to CAML.

The 197km² licence area hosts a copper and gold exploration project in the Akmola Oblast region of north Kazakhstan, approximately 300km north of the capital city, Astana.

There are two identified mineralisation styles on the property - near-surface saprolite-hosted oxide copper and a deeper copper porphyry.

In the short term, CAML is particularly interested in three targets, with the priority area being Mongol V that hosts a non-JORC resource of approximately 327kt of contained copper at a grade of 0.66% copper.

Figure 31: Copper mineralisation in weathered granodiorite in the Mongol V open pit at Shuak



Source: CAML

The company has already achieved recoveries in excess of 90% in column leach tests on the material at the Kounrad plant.

In 2017, the company completed a TEM-FAST geophysics programme, aimed at ascertaining the depth and extent of saprolite weathering horizon. The partners also completed a 4,700m diamond drilling programme and a 7,000m core hydrotransport drilling campaign.

To retain its 80% interest, CAML must spend US\$2m on exploration within five years. This should be readily achievable - the 2017 exploration programme had a budget of US\$1.8m.

Assets - Copper Bay

CAML owns a 75% interest in Copper Bay Limited (Copper Bay), which has evaluated a project to process beach-deposited copper tailings at Chañaral, in northern Chile.

Copper Bay is up for sale

In January 2017, CAML released the results of an independent definitive feasibility study but despite a positive result, the company has decided not to go ahead with the project and intends to sell its interest.

Metal prices

Copper price

Mined copper is mainly shipped as a concentrate to a smelter and then a refiner (the two are often integrated operations). Thereafter it is sent to a fabricator, also known as a 'first user' of copper, who forms wire, rod, tube, sheet, plate and strip for downstream industries, such as construction, electrical and transport.

Copper prices fell to a near seven-year low of US\$4,138/t in mid-January 2016. After trading in a sideways pattern for most of 2016, the price moved sharply higher in Q4 2016 and touched US\$6,000/t in Q1 2017 before settling back comfortably to over US\$5,800/t.

The LME copper price rose through US\$7,000/t in October

In July 2017, the price moved above US\$6,000/t and then accelerated past US\$7,000/t in mid-October.

Figure 32 shows the extent of the decline in the benchmark LME spot copper price over the past four years and the recent recovery.

Figure 32: LME spot copper price (US\$/t)



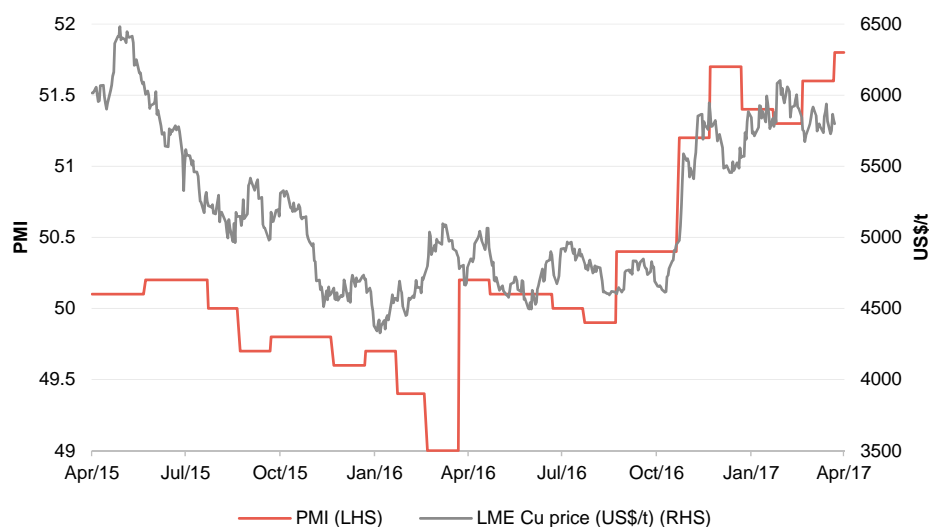
Source: Bloomberg

The decline to the beginning of 2016 appears to have been caused by a combination of supply increases, with the advent of new production, and concern on the demand side because of a slowing down of Chinese economic growth.

The significant turnaround in prices in late 2016, as a result of optimism about US infrastructure spending following President Trump's election victory, gained further support in early 2017 as a result of disruption to production at two of the world's largest copper mines.

There has been positive news from the demand side as the Chinese Purchasing Managers' index (PMI) is climbing. PMI is a forward-looking index that is a measure of future economic activity and it has climbed to the highest level for five years. Arguably reflecting the fact that copper is a key commodity, its price has historically shown a good correlation to the PMI.

Figure 33: LME copper price plotted against Chinese PMI



Source: Bloomberg, Marten & Co

It seems that in the near term the demand-supply fundamentals remain broadly balanced assisted by spending on China's power grid and US housing construction.

Longer term, demand forecast is strong from consumer, industrial and electrical sectors, particularly in China, with some analysts predicting demand to far exceed supply by 2025.

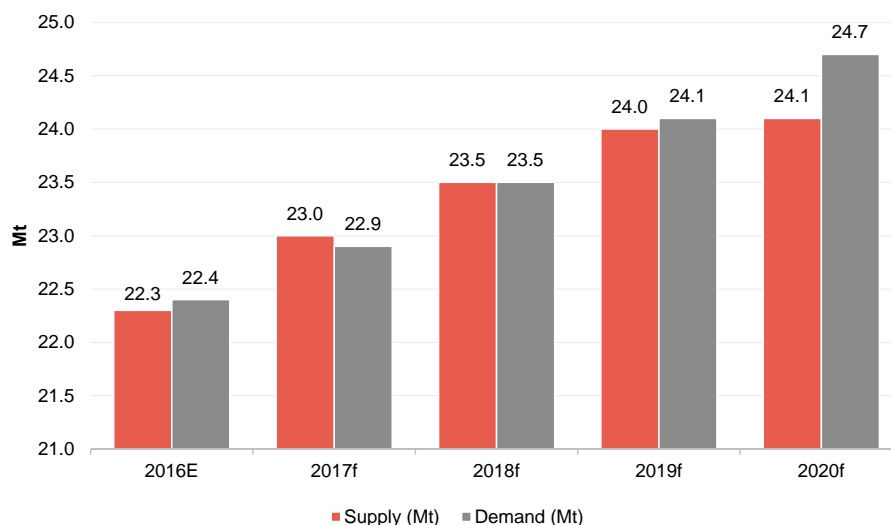
On the demand side, economic growth, which drives copper consumption, is expected to be strong in Asia (particularly China), with the market forecast to grow by over 30% over the next 10 years.

In the longer term, production from existing mines is expected to decline by 17% over the next 10 years, meaning that any shortfall will have to be met by new projects

Although there are a number of projects scheduled to come onstream over the next five years, many analysts believe that projects will be deferred, or at least delayed, because of difficulties in arranging finance (head grades are falling and capital intensity increasing); problems securing adequate water supplies; and increasingly stringent permitting conditions, resulting in a shortfall in production targets.

As a result, there is some doubt at this stage about the ability of new projects to fill the gap between demand and supply, which could be as large as 8-10Mt.

It seems plausible that, should demand accelerate away the market could react through the price mechanism. This could encourage new production to be fast-tracked where possible. A more conservative assumption could be that production will struggle to satisfy any structural deficit over the next 10 years.

Figure 34: Forecast copper supply and demand

Source: Wood Mackenzie, ICSG, RBC Capital Markets, Marten & Co

Reflecting the above considerations, the model's short-term copper price assumptions have been modified to reflect the improved conditions this year and introduced a slightly more conservative upward move to the long-term forecast.

The assumption is that the price will move up modestly until 2019 when the supply/demand balance is assumed to become more favourable and copper prices are then assumed to recover to the level of the model's long-run price forecast.

The model uses a copper price of US\$5,900/t (US\$2.68/lb) in 2017, US\$6,200/t (US\$2.81/lb) in 2018 and thereafter a long-term price of US\$6,600/t (US\$3.00/lb).

As far as copper sales are concerned, CAML has an offtake agreement with international commercial services group, Traxys, which extends through until the end of 2018.

Management has the ability to offset downside price risk by hedging up to 30% of annual copper production.

Lead price

The major demand for lead is in lead-acid batteries (85%) where the biggest use is to power e-bikes but the automobile sector is also a major consumer. China is the largest consumer of lead (with 41% of demand), accounting for 93% of total refined lead-demand growth during the past 15 years.

Although secondary supply plays a major role in the lead market, representing almost 50% of global production, warehouse stocks in 2017 were low, with demand driven by industrial growth, although Chinese consumption seemed to be muted. After 2018, Chinese demand is expected to resume growth. Reflecting the balance of these considerations, the model assumes a modest growth in demand in future years.

On the supply side, it is difficult to predict how much new lead may be mined as lead production is most often dependent on zinc production as the two metals are usually found and mined together.

Figure 35: LME spot lead price (US\$/t)



Source: Bloomberg

Zinc price

According to the International Zinc Association, the main use for zinc is in galvanized steel (60% of consumption). Thereafter, approximately 15% goes into the production of zinc base alloys, mainly to supply the die casting industry, and 14% goes into the production of brass and bronze.

These first-use suppliers then convert zinc into in a broad range of products which are used extensively in the construction (45% of demand) and automotive (25%) industries. Consumer electrical and electronic appliances account for a further 23% of demand.

Demand from the construction and automotive industries has been robust on the back of stronger economic growth and sentiment. Stocks have been declining throughout 2017, leading to a tight market, which has boosted prices. The price has risen from US\$2,600/t at the beginning of the year to over US\$3,300/t in October.

Figure 36: LME spot zinc price (US\$/t)



Source: Bloomberg

Glencore, the world's largest producer outside China, predicts that approximately 3mt of new zinc production will be needed over the next five years. Chinese production has been constrained and Glencore has mothballed production capacity, stating that it will be cautious in bringing it back on-stream.

Although there are projects expected to come on stream over the next few years, they may not be large enough to fill any demand/supply gap.

In conclusion, it would appear that demand could be strong for zinc on the back of increased demand for galvanized steel in China. Most analysts are bullish on the price as a likely deficit looms over the next five years and mine deficit can only be partially covered by stocks.

Investment in new capacity would appear to be needed but this may not happen before 2020 and the market could remain in deficit at that time. Thereafter, the model assumes that mine production will expand, though perhaps not enough to match demand. The model forecasts production of 17.7mt in 2025.

Global zinc consumption is forecast to grow at a compound average annual rate of 1.7% and as importantly, per capita zinc consumption is expected to increase by 15% over the period 2017-2035.

Risk factors

Exchange-rate exposure

CAML reports financial results in US dollars, but most costs are denominated in Kazakhstan tenge or Macedonian denar (which is linked to the euro), so it is exposed to variations in the exchange rates between those currencies. Furthermore, CAML declares its dividends in sterling.

The tenge experienced a massive depreciation against the dollar in August 2015 of 85% (which benefitted Kounrad costs), but stabilised in 2016.

CAML's operating costs benefitted from this movement in 2016 as approximately 60% of the total cost base in Kazakhstan is denominated in tenge (70% of C1 cash costs) and inflationary pressures on costs incurred at Kounrad have been small by comparison.

The net effect was the tenge being worth an average 35% less in US-dollar terms in 2016 in CAML's income statement compared to 2015.

Political

Kazakhstan's president, Nursultan Nazarbayev, has been in office since Kazakhstan became an independent sovereign state in 1991. Under President Nazarbayev's leadership, the foundations of a market economy have taken hold, including privatisation of state assets, liberalisation of capital controls, tax reforms and pension-system development.

The Kazakh government has, however, maintained a strong state-influence and its hold over its mineral resources has been enforced through state-owned miners, as well as government-private joint ventures enforced as part of mining-right issuances.

The tenge has stabilised against the US\$ after significant depreciation in 2015-16

Kounrad should not be subject to any pre-emptive rights

Clearly, if there is a change in president, for whatever reason, there is a risk that policies towards mining companies may be changed.

Under the current Subsoil Law, the State has waived its statutory pre-emptive right to any subsoil use contract (established before 2015) and today the pre-emptive right only applies to strategic assets. Although CAML management believes the prospect of an imposition of pre-emptive right for any of the transactions it has entered into in the past, and for which waivers have not been obtained, is low, it does remain.

In addition, there are changes to the Subsoil Law which will come into force in early 2018, which may impact on the status of the Kounrad subsoil contract, although Kounrad has not been designated as of 'strategic importance' by the government, and so in theory should remain exempt.

The transfer of the Shuak SUC to CAML was completed in August 2017. CAML reports that the previous holder of the Shuak SUC could not achieve full compliance with its contractual and regulatory obligations and advises that the Kazakhstan authorities retain full discretion to terminate the Shuak SUC for breaches committed by the previous holder of the contract.

The political risk in Macedonia is relatively high. According to CAML, Macedonia has been involved in political turmoil in recent years, cumulating in anti-government protests in 2015, 2016 and 2017.

An early election was held in December 2016, as part of an EU-mediated multiparty agreement, in order to break a year-long parliamentary deadlock and maintain the country on a path towards formal EU accession talks. However, the election produced an indecisive election result and on 2 March 2017 President Gjorge Ivanov decided to block the opposition Social Democratic Union (SDSM) leader, Zoran Zaev, from forming a government. On 31 May 2017, Zoran Zaev (with the President's consent) formed a coalition between his own party, the Democratic Union for Integration and the 'Alliance for the Albanians' coalition in order to serve as the official government.

Fiscal

CAML has noted that the taxation and fee regulations in both Kazakhstan and Macedonia are constantly developing. The interpretation and application of tax laws, fee laws and regulations are evolving. This significantly increases the risks with respect to mining and subsoil use operations, and investments in Kazakhstan and Macedonia in comparison with more developed tax systems.

The company says that it manages any tax risk by complying locally with all corporate tax regulations (paying monthly) and ensuring that its local accounting staff are adequately trained. CAML also receives tax advice on local issues from its tax advisers. It may be interesting to note that the two key tax regulations that apply to CAML - the levels of corporate taxation and mineral extraction tax (MET) - have remained constant for a number of years. The company says that it maintains a strong local presence at every level throughout the group including the board.

In 2016, the company recovered US\$3.5m in outstanding VAT from the Kazakhstan authorities. As at 30 June 2017, a total of US\$2.7m of VAT receivable was still owed to CAML.

CAML is working closely with its advisors to recover the remaining portion. The planned means of recovery will be through a combination of the local sales of copper cathode to effectively offset VAT liabilities and by a continued dialogue with the authorities.

Kazakhstan's new tax code is expected by the end of the year

The Kazakhstan government has been developing the new tax code, which reportedly must be finalised by the end of 2017, and there is no assurance that new tax code will not introduce a tax burden adversely affecting CAML's business.

In Macedonia, the Minerals Law establishes regulatory formalities which have to be obtained when selling and purchasing an exploitation concession and/or selling shares in companies owning exploitation concessions in Macedonia.

CAML's legal advice is that its acquisition of Lynx does not require the approval of the Ministry of the Economy or that it be subject to a fee of 7% of the value of the exploitation concession. There is a risk that the Macedonian government may take a different position, in which case there could be a delay to completion and a considerable fee payable.

Technical

The Kounrad operation is now in its fifth full year of production from the dumps on the eastern side of the open pit (Eastern dumps) and has outperformed expectations each year.

CAML appears to have a good understanding of how the Kounrad ore in the dumps behaves in the SX-EW process and has operating expertise in scheduling leaching cycles and managing flow rates to achieve production targets, despite having to operate in extremely low temperatures (down to -40°C) in winter.

There is some risk associated with treating the Western dump material as it has different characteristics, which may affect processing rates and operational performance. Thus far production from the Western dumps seems to be in line with company plans, but given the long leaching period, it could be well into 2018 before a fuller picture emerges.

However, countering the operational risk is the potential that recoveries in this area could be higher than has been assumed in the model because after decades of weathering, some of the material classed as sulphides may in fact more amenable to acid leaching than the categorisation suggests.

There is some technical/operational risk at Sasa as CAML takes over running of the mine

At Sasa, the transfer of operational management presents a risk that production may not reach forecast levels.

Capital structure

CAML now has 176m shares issued

Following the share issue in October 2017 for the Sasa acquisition, and the issue of US\$50m worth of shares to Orion, the company has 176.0m shares issued (plus 0.5m in treasury), which closed at 250.00p per share on 13 November, giving it a market capitalisation of £440m.

As part of the equity raising process, non-executive director, Kenges Rakishev, sold 10.6m shares at a price of 230p/share, taking his interest in the company down from 19.1% to 6.0%.

There are 2.3m options outstanding with expiry dates out to May 2025.

The remainder of the shareholder base is largely institutional, as shown in Figure 37.

Blackrock has increased its interest in CAML to 7.9%. Non-executive director, Kenges Rakishev, has reduced his shareholding from 19.9% to 6.0%. Orion is now the second largest shareholders with 8.7%

Figure 37: Major CAML shareholders (post-completion of the Lynx deal)

Shareholder	%
Canaccord Genuity (Hargreave Hale)	10.1
Orion Co-Investment III	8.7
Blackrock Investment	7.9
FIL Investment International	7.3
Majedie Asset Management	6.3
Kenges Rakishev	6.0
JO Hambro Capital Management	4.9
Commonwealth American Partners	3.6
Miton Asset Management	3.0

Source: CAML (as at 6 November 2017)

Directors and management

The CAML board includes directors with the requisite engineering, metallurgical and financial experience who have a successful track record of financing, constructing and operating the Kounrad plant.

Nick Clarke is executive chairman and a director. He is a chartered engineer with 40 years' mining-industry experience, 16 of which were spent in senior posts managing production and technical services in Africa and Saudi Arabia.

Nick was formerly managing director of AIM-listed Oriol Resources Plc until it was sold to Mechel OAO of Russia in 2008 for US\$1.5bn. From 1992-2004, he was the managing director of mineral consultancy Wardell Armstrong International Ltd, where he managed numerous multidisciplinary mining projects in Kazakhstan, Kyrgyzstan, Uzbekistan, Romania, Macedonia and Tajikistan. Nick is a non-executive director of Wolf Minerals Limited.

Nigel Hurst-Brown is deputy chairman and a director. He is a Fellow of the Institute of Chartered Accountants in England and Wales and was formerly chairman of Lloyds Investment Managers (1986-1990), a director of Mercury Asset Management and more recently, managing director of Merrill Lynch Investment Managers.

Nigel is currently chief executive of Hotchkis and Wiley (UK) Ltd and a non-executive director of Borders & Southern Petroleum Plc.

Nigel Robinson is chief financial officer and a director. He is a member of the Institute of Chartered Accountants in England and Wales and a former Royal Navy officer in the Fleet Air Arm.

He qualified with KPMG on exiting the military and spent three years with the firm before leaving to work in commerce. Nigel spent six years in various management roles with British Airways before pursuing smaller enterprise roles in 2002. He joined CAML in 2007 and became CFO in 2009. He is also a director of Copper Bay Ltd.

Gavin Ferrar is an executive director responsible for business development. He holds post-graduate degrees in geology and finance and has been involved in the mining sector for 21 years. His career in industry began at Anglo American in the New Mining Business Division. He spent 10 years in the investment-banking sector focusing on equity and debt financing for junior and major mining clients of Barclays Capital and Investec. Since 2011, he has worked with junior mining companies arranging finance and providing corporate advisory services before joining CAML in June 2014.

Non-executive directors are former managing director and head of oil and gas at Canaccord Europe, **Robert Cathery** (chairman of the remuneration committee); Kazakh national and executive director of Investment Banking at UBS (Kazakhstan), **Nurlan Zhakupov**; chartered accountant and experienced resources executive, **David Swan** (chairman of the audit committee); **Roger Davey**, a mining engineer and company director; and **Kenges Rakishev**, who was until the recent equity raising the company's largest shareholder (he now holds a 6.6% interest).

Howard Nicholson is technical director of CAML, although he does not sit on the board. He is a metallurgist with 33 years of experience in project development and mine operations management.

Of specific relevance is his role as European Minerals Corporation chief operating officer during the development of the Varvarinskoye copper-gold mine, in Kazakhstan. Howard has held senior management positions with Ashanti Goldfields, Lonrho, and Anglo American. He is a director of Copper Bay Ltd, CAML's partner at the Chañaral Bay project.

The Kazakhstan management team is led by **Pavel Semenchenko** who is general director for Sary Kazna, one of CAML's two Kazakh subsidiaries. He has more than 15 years of experience in managing businesses in Kazakhstan and a proven record in the resources industry.

Oleg Telnoi is general director for KCC. Oleg joined CAML in 2007 with over 10 years of experience in finance management within the mining industry in Central Asia. He is a qualified engineer and received an MBA in 1997.

Nick Shirley is the CSR Director and the only ex-pat in Kazakhstan. Nick has over 20 years of experience in the fields of environmental sciences, social responsibility and hydrogeology gained predominantly in the international overseas mining industry in Central Asia, the former Soviet Union and West Africa. He has previously worked for the Environment Agency in the United Kingdom, Avocet Mining, Newmont-BHP's joint venture in Guinea and Orsu Metals as well as running his own consultancy practice.

Neil Stevenson is general director of the Sasa mine. He is a Bachelor of Engineering and has 30 years' experience in both underground and open pit mining operations, of which 12 years have been spent in Eastern Europe and Kazakhstan.

Previous research publications

Readers interested in further information about CAML may wish to read our previous research notes as detailed in Figure 38. You can read the notes by clicking on them in Figure 38 or by visiting QuotedData's website.

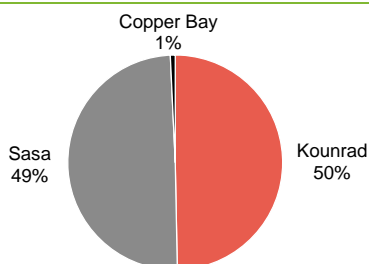
Figure 38: Marten & Co. previously published research on CAML

Title	Note type	Date
Dividend-paying, low cost copper producer	Initiation	24 February 2016
Defending the dividend	Update	21 April 2016
Profits soar as costs slashed	Update	13 September 2016
A consistent dividend payer with a high yield	Annual overview	25 April 2017
Site visit: bright future for 'dividend factory'	Update	23 May 2017

Source: Marten & Co.

Figure 39: Central Asia Metals summary

Sum of the parts valuation	US\$M	Pence per share
November 2017		
Kounrad NPV ^{8%}	420.7	182.5
Sasa NPV ^{10%}	419.5	182.0
Investments - Shuak	0.0	0.0
Investments – Copper Bay	6.2	2.7
Net cash/(debt)	(153.7)	(66.7)
NAV	692.7	300.5



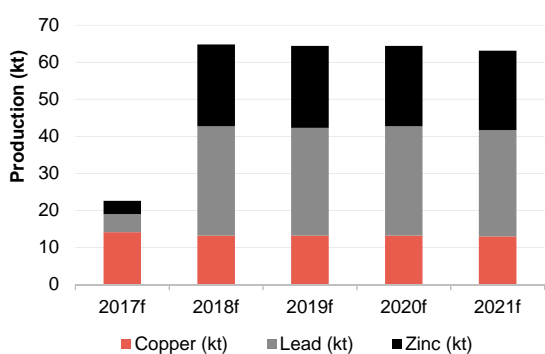
CAML share price



NAV sensitivity analysis (pence per share)

Metal prices	-30%	-20%	-10%	Base	10%	20%	30%
5%	128	203	278	396	428	504	579
8%	99	161	223	321	348	411	473
10%	83	139	195	283	306	362	418
12%	70	121	171	250	271	322	372

Production summary



Reserves & resources	Mt	Metal grade	Metal (kt)
Kounrad			
Indicated	389.0	0.10% Cu	372.5
Inferred	264.0	0.09% Cu	237.2
Sasa			
Reserves	10.9	3.85% Pb 3.08% Zn	421 Pb 337 Zn
Indicated resources	13.3	4.59% Pb 3.68% Zn	611 Pb 490 Zn
Inferred resources	10.1	3.55% Pb 1.67% Zn	357 Pb 168 Zn

Y/E 31 Dec, all figures in 2017 US\$M unless otherwise stated

Forecast assumptions	2016a	2017f	2018f	2019f	2020f
Copper price (US\$/t)	4,994	5,900	6,200	6,600	6,600
Copper price (US\$/lb)	2.27	2.68	2.81	3.00	3.00
Lead price (US\$/t)	na	2,450	2,300	2,300	2,300
Zinc price (US\$/t)	na	3,300	3,300	3,000	2,700

Production summary

	2016a	2017f	2018f	2019f	2020f
Kounrad – Eastern dumps					
Copper production (kt)	14,020	8,311	4,993	3,075	493
Kounrad – Western dumps					
Copper production (kt)	-	5,186	8,168	10,113	12,706
Total copper production (kt)	14,020	14,145	13,161	13,187	13,198
C1 cash costs (US\$/lb)	0.43	0.50	0.52	0.53	0.55
Sasa					
Lead in concentrate (kt)	-	4,925	29,548	29,108	29,548
Zinc in concentrate (kt)	-	3,579	22,113	22,113	21,704
C1 cash costs (US\$/lb)	-	0.37	0.38	0.37	0.35
Gross copper revenue (US\$m)	69.3	83.4	81.6	87.0	87.1
Gross lead revenue (US\$m)	-	11.5	64.6	63.6	64.6
Gross zinc revenue (US\$m)	-	10.0	62.0	56.4	49.8

Profit & loss summary (US\$m)

	2016a	2017f	2018f	2019f	2020f
Gross revenue	69.3	105.3	210.0	208.8	203.3
Net revenue	66.7	100.8	195.9	194.8	189.3
Cost of sales	(18.4)	(27.2)	(62.6)	(63.5)	(64.5)
Gross profit	48.3	73.5	133.3	131.3	124.8
G&A and other	(15.3)	(14.0)	(13.0)	(13.0)	(13.0)
Operating profit	33.0	59.3	120.0	118.0	111.6
Net interest	(0.2)	(4.5)	(11.8)	(9.4)	(7.0)
Profit before tax	32.9	59.4	108.2	108.6	104.6
Taxation	(6.7)	(9.4)	(17.0)	(17.3)	(16.6)
Net income	26.1	50.0	91.2	91.3	88.0
Average shares outstanding (m)	112.1	176.0	176.0	176.0	176.0

EPS (USc)

	2016a	2017f	2018f	2019f	2020f
EPS (USc)	23.7	28.4	51.8	51.9	50.0
Dividend (pence per share)	15.5	12.9	17.9	23.2	22.3
EBITDA (US\$m)	39.1	71.0	138.5	136.8	131.0
EV/EBITDA	7.0	10.3	4.6	4.5	4.3

Abridged balance sheet Y/E

	2016a	2017f	2018f	2019f	2020f
Cash & equivalents	40.4	64.5	86.5	96.2	111.9
Other current assets	4.3	29.6	29.6	29.6	29.6
PPE & intangible assets	91.1	443.3	410.1	389.7	368.3
Other non-current assets	2.7	2.7	2.7	2.7	2.7
Total assets	138.5	540.0	528.9	518.2	512.5
Short-term debt	0.0	36.2	36.2	36.2	36.2
Long-term debt	0.0	144.8	108.6	72.4	36.2
Other liabilities	17.0	55.5	49.7	39.9	38.1
Total liabilities	17.0	236.5	177.8	133.6	97.4
Total equity	121.5	303.5	351.1	384.6	415.1

Cash flow summary

	2016a	2017f	2018f	2019f	2020f
Cash from operations	35.5	62.8	115.4	115.9	113.2
Capital expenditure & investments	(13.9)	(344.0)	(12.5)	(9.1)	(10.5)
Cash used in investing activities	(13.3)	(343.9)	(12.4)	(9.0)	(10.4)
Net debt raised	0.0	181.0	(36.2)	(36.2)	(36.2)
Equity issued	0.0	153.5	0.0	0.0	0.0
Dividends	(20.4)	(29.6)	(41.2)	(53.4)	(51.3)
Cash from financing activities	(22.8)	304.9	(81.4)	(97.6)	(87.5)
Cash at end	40.3	64.5	86.5	96.2	111.9

Profitability

	2016a	2017f	2018f	2019f	2020f
EBITDA margin (%)	56%	67%	66%	66%	64%

Note that financial tables above are summaries and totals may not always agree

Source: CAML, Marten & Co

QuotedData

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123a Kings Road, London SW3 4PL
0203 691 9430

www.quoteddata.com

Registered in England & Wales number 07981621,
2nd Floor Heathmans House
19 Heathmans Road, London SW6 4TJ

Edward Marten
(em@martenandco.com)

Research contacts:

Resources analyst - Paul Burton
(pb@martenandco.com)

James Carthew
(jc@martenandco.com)

Matthew Read
(mr@martenandco.com)

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