

10 February 2021

**BMN LN Mining & Metals**


Source: LSE

**Market data**

Price (p)	18.5
Valuation (p)	29.0
12m High (p)	23.9
12m Low (p)	8.7
Shares (m)	1,192
Mkt Cap (£m)	220.6

**Company summary**

Bushveld Minerals is an AIM-quoted vanadium development and production company. The group's key assets are the Vametco and Vanchem primary vanadium producing operations in South Africa. Bushveld also participates in the development of the downstream, and fast-growing, vanadium-redox flow battery market through its majority-owned Bushveld Energy subsidiary.

**Key forecasts\***

	2019	2020e	2021e
Sales (\$m)	116.5	87.9	142.6
EBITDA (\$m)	32.6	(12.3)	19.5
EPS (\$/sh)	0.05	(0.03)	(0.01)
FCF (\$m)	(21.3)	(26.4)	6.7
EV/EBITDA (x)	9.2	na	15.4
EV/EBITDA adj* (x)	14.0	na	21.0
P/E (x)	4.7	na	na
FCF yield (%)	na	na	2.2
Net debt (\$m)	7.7	33.5	30.8

\*Equity-attributable adjusted EBITDA

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# Bushveld Minerals\*

## Solid platform for growth after challenging 2020

Overcoming coronavirus-related operational interruptions in H1 and unplanned maintenance stoppages in H2, Bushveld just about reached the lower end of its production guidance range for 2020. It is now targeting a 13-20% increase this year, albeit weighted towards the second half. Encouragingly, the group saw a recovery in demand and sales in late 2020, a trend that has continued into the new year. We are cautiously optimistic vanadium prices could strengthen further through 2021, which, together with the forecast higher production rates, should see improved profitability despite an anticipated temporary increase in production costs. Looking beyond this year, we see much greater earnings upside as Bushveld rolls out long-planned production growth initiatives at both Vametco and Vanchem, which could see group vanadium output more than double over the next few years. Schedules and capital budgets will be firmed up by ongoing studies, but last year's US\$65m financing with Orion Mine Finance significantly de-risks these expansion ambitions. As operational performance stabilises and production expands, we see scope for further upwards re-rating of Bushveld's shares, which, despite rallying late last year, remain at a significant discount to our risk-adjusted valuation of 29p.

- ▶ **Targeting up to 20% production growth in 2021:** A full year of contribution from Vanchem offset the negative impact of the nationwide lockdown in South Africa during H1 2020 and maintenance-related interruptions in H2 as Bushveld recorded a 24% y-on-y increase in group vanadium production in 2020, to 3,631t. The total was broadly in-line with the lower end of the annual guidance range of 3,660-3,940t. Guidance for this year has been set at 4,100-4,350t, with a targeted 2-7% increase in production rates at Vametco (slightly lower than we had been expecting, owing to a now-planned 35-day maintenance shutdown during Q1) and a 41-52% increase at Vanchem as the latter's refurbishment continues with the recommissioning of a second mothballed kiln.
- ▶ **Costs edge up:** 2020 cash production costs were a little above guidance, reflecting the unplanned maintenance stoppages in Q4 and a strengthening Rand, but also higher raw-material costs at Vanchem as the group tested alternative feedstock concentrates. 2021 cost guidance is set at \$20.00-21.30/kg V for Vametco (up 9-16% y-on-y) and \$26.20-26.70/kg for Vanchem (up 17-19%), the increases reflecting Bushveld's expectation of higher raw-material and labour costs, but also hopefully one-off costs associated with the additional maintenance at Vametco and commissioning of the next kiln at Vanchem.
- ▶ **2021 should see return to profitability:** Given higher-than-anticipated costs in Q4, we now expect a slightly larger earnings loss for 2020 compared with our last estimates. However, notwithstanding forecast further cost inflation in 2021, we expect a return to cash profitability this year as production grows and vanadium price recovery (up c10% year-to-date) continues. Assuming an average FeV price of US\$32/kg (not much above current pricing of US\$28-30/kg), we think consolidated EBITDA of c\$20m could be achievable in 2021.
- ▶ **Expansion key to further margin growth:** Given the significant fixed component of costs at both Vametco and Vanchem, key to driving further margin growth is pushing up production rates. Bushveld has long pointed to the potential for each operation to operate at over 4,200t pa rates through further de-bottlenecking/expansion at Vametco and refurbishment of dormant capacity at Vanchem. Detailed studies on both are ongoing, and the recent \$65m financing greatly de-risks Bushveld plans, in our view. We believe roll-out of this expansion could see EBITDA grow to over US\$150m pa within the next five years (assuming a long-term FeV price of US\$40/kg), with margins widening to over 45%.

## 2020 operational results: challenging year negotiated

Consolidated vanadium production for the year to 31 December 2020 totalled 3,631t, within 1% of full-year guidance and some 24% higher than 2019 output owing to the inclusion of a full 12 months' from Vanchem for the first time (Vanchem's acquisition was completed in late 2019). The latter more than offset the negative impact of the nationwide lockdown in South Africa during the first half of 2020 and unplanned maintenance stoppages at both operations towards the end of the year.

At 4,264t, annual sales volumes exceeded production and were 78% higher year-on-year, aided by a marked increase in demand over the final quarter of the year as industrial output in developed economies began recovering from earlier coronavirus-triggered recession. Sales to China (a higher-priced market over recent times) accounted for 21% of total volumes, up from just 10% in 2019.

## Q4 interruptions see guidance narrowly missed at Vametco

At 2,654t, vanadium production (in the form of Nitrovan and ferrovandium) at Vametco narrowly missed revised (post-coronavirus outbreak) 2020 guidance of 2,700-2,850t, owing to lower-than-expected volumes in Q4. The latter was due to a combination of adverse weather conditions which negatively impacted overall plant throughput, power-supply failures which negatively affected shaft furnaces, and commissioning issues with the new kiln off-gas system (since resolved). Despite the Q4 interruptions, and approximately five weeks of shuttered operations in H1 amid South Africa's nationwide coronavirus lockdown, Vametco's annual production total was just 6% lower than that achieved in 2019.

Sales volumes totalled 3,333t for the year, of which 2,911t were final sales to customers and 422t were inter-company sales (and thus not yet income realised).

Cash production costs (which exclude depreciation, royalties, selling and G&A expenses) averaged \$18.30/kg V (R302/kg) for the year, very marginally above guidance of \$17.50-17.90/kg (R295-300/kg), owing mainly to the lower-than-expected production volumes in the final quarter of the year and a strengthening Rand-US Dollar exchange rate.

Figure 1: Vametco 2020 operational highlights

	Unit	Q4 2020	Q4 v Q3	FY 2020	FY20 v 19
Production	t	703	(3%)	2,654	(6%)
Sales volumes*	t	907	42%	3,333	39%
Average sales price	\$/kg V	22.2	-	23.4	(52%)
USD/ZAR rate	\$/R	15.6	(8%)	16.5	14%
Production cash cost	R/kg	328	7%	302	16%
Production cash cost	\$/kg	21.0	16%	18.3	2%

\*Includes inter-company sales of 15t for Q4 and 422t for the full year

Source: Bushveld Minerals

## Vametco 2021 production and capex guidance

Management has set 2021 production guidance for Vametco at 2,700-2,850t, the upper end of which would represent a 7% increase relative to 2020 output. Production volumes are expected to be weighted towards H2 2021, with a 35-day maintenance shutdown factored in during Q1 2021 as well as planned further de-bottlenecking work on the downstream end of the process circuit (to complement work that has already been completed on the upper end of the plant).

The group is targeting cash production costs at Vametco of \$20.00-21.30/kg (R320-340/kg), a 9-16% increase relative to 2020 owing to the anticipated higher

maintenance costs to improve operational stability, but also to higher raw-materials and power costs.

The largely Rand-denominated capex budget for 2021 has been set at just over \$5m (R85m), the majority of which is sustaining capital. The budget includes US\$0.2m to complete a prefeasibility study (PFS) of the planned Phase 3 expansion of Vametco. This long-flagged project has the potential to increase steady-state production rates to at least 4,200t pa through a series of further de-bottlenecking and upgrading initiatives. Guidance on the ramp-up and capex profile of the project will be provided following completion of the PFS later this year – Bushveld has previously referred to an estimated total capital cost for Phase 3 of R430m (\$27m).

### Step-change in output expected at Vanchem this year

Vanchem achieved annual production of 990t (in the form of ferrovandium, vanadium chemicals and flake) in its first full year under Bushveld ownership. This was comfortably within the 2020 guidance range of 960-1,100t, despite coronavirus lockdown-related disruption in H1 and an unplanned maintenance stoppage during the final quarter of the year. Sales volumes were broadly in line with production.

Cash production costs averaged \$22.40/kg (RR369/kg), some 18% above guidance of \$18.40-19.00/kg (R310-320/kg). The miss reflected the unplanned maintenance stoppage in Q4 (which both lowered production volumes quarter-on-quarter and increased direct maintenance costs), but also higher raw-materials costs in Q4 as the group took the opportunity to test different concentrate feedstock through the Vanchem kiln to optimise process parameters for future use of such concentrate.

Figure 2: Vametco 2020 operational highlights

	Unit	Q4 2020	Q4 v Q3	FY 2020
Production	t	261	(11%)	990
Sales volumes*	t	361	20%	931
Average sales price	\$/kg V	21.1	(4%)	21.3
USD/ZAR rate	\$/R	15.6	(8%)	16.5
Production cash cost	R/kg	402	16%	369
Production cash cost	\$/kg	25.7	11%	22.4

\*Includes inter-company sales of 15t for Q4 and 422t for the full year Source: Bushveld Minerals

### Vanchem 2021 production and capex guidance

Bushveld is targeting 1,400-1,500t of production in 2021 at Vanchem. This would represent an increase of 41-52% over 2020, reflecting the planned commissioning of one of the two remaining mothballed kilns in H2 post its refurbishment in H1. The full production benefit of the additional kiln will be realised in 2022.

Some additional maintenance on the sole currently operating kiln also needs to be undertaken during the year, but this is not expected to result in production downtime as it will only be conducted after the additional kiln has been brought online in H2 (illustrating one of the operational flexibility benefits of running a multi-kiln configuration).

Cash production cost guidance for Vanchem has been set at \$26.20-26.70/kg (R419-427/kg), a 17-19% increase on 2020 costs reflecting anticipated higher maintenance, labour and raw-material costs associated with the refurbishment and commissioning of the additional kiln.

Evaluation of what other areas of the Vanchem plant may need to be refurbished to cater for the second kiln re-commissioning is ongoing. Bushveld's current capex

budget for 2021 is \$16m (R251m), most of which is Rand-denominated. In addition to refurbishment of the second kiln, the budget includes work already underway (and scheduled for completion in H1) on extending Vanchem's waste disposal facility.

Vanchem has sufficient ore stockpiles from the nearby Mapochs mine to support its current levels of production through H1 2021. Bushveld has the option of supplying Vanchem with magnetite concentrates from Vametco thereafter, or it could seek to procure more third-party feedstock. However, the group continues to evaluate the potential of developing its greenfield Mokopane project to the north as a long-term source of feed for Vanchem. Mokopane is amongst the world's largest resources of high-grade primary vanadium, and a feasibility study of the potential to construct an open-pit mine and basic ore concentrating operation at the site will commence this year. Bushveld estimates the cost of the feasibility study at c\$2.5m (R40m).

### **Bushveld Energy gathers momentum**

By the end of 2020 the group's Bushveld Energy subsidiary had completed the engineering phase of the Engineering Procurement Construction (EPC) process for its planned vanadium electrolyte production facility in East London. The procurement process will commence in Q1 2021, followed by construction.

Bushveld Energy also progressed its vanadium redox flow battery (VRFB) deployment initiatives during 2020, receiving environmental authorisation to construct a hybrid mini-grid at Vametco. Enerox GmbH will supply the 1MW/4MWh battery for the project, and Abengoa will manage the project EPC.

In line with its VRFB market development strategy, Bushveld also completed investments in VRFB equipment manufacturers Invinity Energy Systems and Enerox in 2020. Late in the year and post period end, it sold a portion of its shareholding in Invinity, realising cash proceeds of \$4m. This recoups most of Bushveld's original \$5m investment, and will be used to fund some of Bushveld Energy's 2021 capex budget. The latter has been set at c\$9.5m (R152m), and includes Bushveld's share of the vanadium electrolyte plant EPC costs and scaling-up its electrolyte rental model, financing the equity portion of the Vametco mini-grid, and supporting the further growth of Enerox.

### **Vanadium market: recovery now firmly underway**

Bushveld saw a recovery in vanadium demand and pricing in the latter part of 2020, market prices having earlier dipped to a nadir of close to \$20/kg in early April as the coronavirus pandemic swept the globe. This recovery, driven by higher steel mill capacity utilisation rates and low warehouse stocks, has carried through into 2021 across all key markets, with prices currently trading around \$28-30/kg.

As outlined in detail in our note of 1 December 2020, we believe the longer-term fundamentals of the vanadium market look strong, with China driving demand growth as its construction steels become more aligned with the vanadium intensity of those in the West, and long-term supply growth is constrained by the limitations of co-product supply (which we believe is at or close to capacity, and may well fall as sea-borne iron-ore prices retreat from current highs). Further development of the emerging VRFB could add further demand upside.

We therefore expect vanadium pricing to remain robust in the near-term, with potentially substantial upside longer term. We still consider our long-term price assumption of \$40/kg to be reasonable, and perhaps even conservative.

## Valuation

We have updated our risked sum-of-the-parts calculation to incorporate Bushveld's 2020 operational results and its 2021 production, operating-cost and capex guidance. Our per-share valuation rises very slightly (+1p), to 29p, a function of rolling forward our cash-flow model by one year (offset partially by a stronger GBP/USD rate when converting to pence per-share values).

Figure 3: Base-case sum-of-the-parts valuation\*

		Unrisked		Risk	Risked
		US\$m	GBP/sh	multiple	GBP/sh
Vametco (incl PFA)	NPV <sub>10%</sub>	347	21.1	0.75x	15.8
Vanchem	NPV <sub>10%</sub>	453	27.5	0.50x	13.8
Brits property	nominal	10	0.6		0.6
Bushveld Energy	nominal	25	1.5		1.5
Investments	market	17	1.0		1.0
Corporate-level costs	NPV <sub>10%</sub>	(58)	(3.5)		(3.5)
<b>EV</b>		<b>794</b>	<b>48.3</b>		<b>29.2</b>
Cash	end-2020	50	3.1		3.1
Bank debt	end-2020 est	(8)	(0.5)		(0.5)
Convertible debt	end-2020 est	(47)	(2.8)		(2.8)
<b>NAV</b>		<b>791</b>	<b>48.0</b>		<b>29.0</b>

\*Assumes long-term (from 2022) US\$40/kg V price and R16.00:US\$1 FX rate Source: ARC estimates

Figure 4: Unrisked NAV<sub>10%</sub> (GBP) sensitivity to vanadium price and FX rate

		Ferrovanadium price (US\$/kg V)						
		25	30	35	40*	45	50	55
USD/ZAR rate	14.00	2	15	28	40	53	66	79
	15.00	6	19	32	45	57	70	83
	16.00*	10	23	35	48	61	74	86
	17.00	13	26	39	51	64	77	90
	18.00	16	29	41	54	67	80	93

\*Valuation base-case assumptions

Source: ARC estimates

## Forecasts

Our updated financial forecasts are summarised in Figures 5-9 overleaf. Our forecast net loss for 2020 has widened a little with incorporation of the operational results, which revealed a slightly lower realised vanadium price and slightly higher production costs than we had estimated previously. We forecast a return to profitability at the EBITDA level this year, albeit at a lower margin than we had estimated previously owing to the group's guidance of temporarily rising costs this year for the reasons outlined above, and slightly lower production guidance for Vametco than we had been expecting.

We consider our longer-term forecasts beyond 2021 to be more speculative, as they incorporate our own assumptions on the production growth profile (and corresponding capex schedule) of expansion initiatives that remain subject to ongoing technical and economic evaluation by Bushveld. However, as discussed previously, we believe these growth plans have been significantly de-risked with completion of the \$65m financing with Orion Mine Finance in late 2020.

Figure 5: Summary operational forecasts and macro assumptions

		2019	2020E	2021E	2022E	2023E	2024E	2025E
Vanadium production	t V	2,931	3,631	4,250	5,200	6,850	7,650	8,400
Sales volumes	t V	2,490	3,842	4,421	5,293	6,920	7,702	8,440
Vanadium price (FeV basis)	US\$/kg V	47.77	22.89	32.25	40.00	40.00	40.00	40.00
C1 cash production costs	US\$/kg V	18.11	19.41	22.52	19.75	17.22	16.05	15.66
Total cash costs (incl royalties & G&A*)	US\$/kg V	26.84	24.34	27.59	24.10	21.45	20.48	20.07
South African Rand	ZAR:USD	14.40	16.50	16.00	16.00	16.00	16.00	16.00

\*Operating-level G&A (estimate) only, does not include corporate-level overheads

Source: ARC estimates

Figure 6: Summary Bushveld Minerals consolidated income statement

Year-end 31 Dec		2019	2020E	2021E	2022E	2023E	2024E	2025E
Revenue	US\$m	116.5	87.9	142.6	211.7	276.8	308.1	337.6
Cost of sales	US\$m	(56.2)	(88.8)	(116.2)	(129.8)	(150.0)	(156.0)	(164.1)
Selling and distribution costs	US\$m	(7.6)	(5.2)	(6.4)	(8.2)	(10.6)	(11.7)	(12.8)
Administrative and other costs	US\$m	(31.4)	(24.2)	(19.5)	(17.0)	(16.0)	(15.0)	(15.0)
<b>Operating profit/(loss)</b>	<b>US\$m</b>	<b>22.3</b>	<b>(29.4)</b>	<b>1.5</b>	<b>57.6</b>	<b>101.2</b>	<b>126.3</b>	<b>146.6</b>
Net finance costs	US\$m	1.9	(1.8)	(5.5)	(6.1)	(5.7)	(2.7)	(2.1)
Exceptional non-cash items	US\$m	59.1	0.0	0.0	0.0	0.0	0.0	0.0
<b>Profit/(loss) before tax</b>	<b>US\$m</b>	<b>83.3</b>	<b>(31.2)</b>	<b>(4.0)</b>	<b>51.5</b>	<b>95.5</b>	<b>123.6</b>	<b>144.6</b>
Tax	US\$m	(14.0)	(0.0)	0.0	(14.7)	(32.9)	(46.3)	(68.4)
<b>Net profit/(loss)</b>	<b>US\$m</b>	<b>69.2</b>	<b>(31.2)</b>	<b>(4.0)</b>	<b>36.8</b>	<b>62.6</b>	<b>77.3</b>	<b>76.2</b>

Source: ARC estimates

Figure 7: Summary Bushveld Minerals consolidated cash flow statement

		2019	2020E	2021E	2022E	2023E	2024E	2025E
Operational CF before WC changes	US\$m	23.9	(12.3)	19.5	64.6	90.9	101.7	97.4
Working capital changes	US\$m	4.6	(9.1)	13.0	(5.6)	3.8	(5.6)	3.4
<b>Cash flow from operations</b>	<b>US\$m</b>	<b>28.5</b>	<b>(21.4)</b>	<b>32.5</b>	<b>59.0</b>	<b>94.7</b>	<b>96.1</b>	<b>100.8</b>
Capex	US\$m	(13.3)	(5.8)	(20.8)	(45.1)	(24.7)	(14.5)	(3.2)
Other	US\$m	(36.4)	0.8	(5.0)	(0.0)	0.5	0.6	1.4
<b>Cash flow from investing activities</b>	<b>US\$m</b>	<b>(49.7)</b>	<b>(5.0)</b>	<b>(25.8)</b>	<b>(45.1)</b>	<b>(24.2)</b>	<b>(13.9)</b>	<b>(1.8)</b>
Net borrowings	US\$m	18.6	44.2	(12.5)	(1.0)	(43.8)	(1.0)	(1.0)
Dividends to minorities	US\$m	(4.5)	0.0	0.0	0.0	0.0	(0.6)	(32.0)
Other	US\$m	(0.8)	(1.3)	(3.8)	(3.0)	(13.5)	(3.3)	(3.5)
<b>Cash flow from financing activities</b>	<b>US\$m</b>	<b>13.3</b>	<b>42.9</b>	<b>(16.3)</b>	<b>(4.0)</b>	<b>(57.3)</b>	<b>(4.9)</b>	<b>(36.5)</b>
Increase/(decrease) in cash	US\$m	(8.0)	16.5	(9.6)	9.8	13.2	77.2	62.5

Source: ARC estimates

Figure 8: Summary Bushveld Minerals consolidated balance sheet

		2019	2020E	2021E	2022E	2023E	2024E	2025E
Cash	US\$m	34.0	50.5	40.9	50.7	63.9	141.1	203.7
P,P&E	US\$m	185.3	174.0	176.8	200.2	202.3	195.2	179.2
Intangible assets	US\$m	59.4	59.4	61.9	61.9	61.9	61.9	61.9
Other assets	US\$m	56.1	59.8	55.4	63.8	60.1	65.5	62.1
<b>Total assets</b>	<b>US\$m</b>	<b>334.8</b>	<b>343.7</b>	<b>335.1</b>	<b>376.6</b>	<b>388.2</b>	<b>463.7</b>	<b>506.9</b>
Payables	US\$m	15.7	10.4	14.2	17.0	17.7	48.9	56.6
Debt	US\$m	41.8	84.0	71.7	70.7	26.9	25.9	24.9
Other liabilities	US\$m	36.2	28.3	28.3	28.3	28.3	28.3	28.3
<b>Total liabilities</b>	<b>US\$m</b>	<b>93.7</b>	<b>122.6</b>	<b>114.2</b>	<b>116.0</b>	<b>72.9</b>	<b>103.1</b>	<b>109.8</b>
Total equity	US\$m	241.1	221.1	220.8	260.6	315.3	360.6	397.1
<b>Total liabilities &amp; equity</b>	<b>US\$m</b>	<b>334.8</b>	<b>343.7</b>	<b>335.1</b>	<b>376.6</b>	<b>388.2</b>	<b>463.7</b>	<b>506.9</b>

Source: ARC estimates

Figure 9: Key financial measurements and ratios

		2019	2020E	2021E	2022E	2023E	2024E	2025E
EBITDA	US\$m	32.6	(12.3)	19.5	79.3	123.8	148.0	165.8
EBITDA margin	%	28%	na	14%	37%	45%	48%	49%
EPS	US\$/sh	0.05	(0.03)	(0.01)	0.02	0.04	0.05	0.05
Net profit margin	%	53%	na	na	13%	18%	21%	19%
Free cash flow	US\$m	(21.3)	(26.4)	6.7	13.9	70.5	82.1	99.0
Net debt/(cash)	US\$m	7.7	33.5	30.8	20.0	(37.0)	(115.2)	(178.8)
EV/EBITDA (fully consolidated)	x	9.2	na	15.4	3.8	2.4	2.0	1.8
EV/EBITDA (equity attributable)	x	14.0	na	21.0	4.6	2.8	2.3	2.1
P/E	x	4.7	na	na	10.8	5.9	4.8	4.7
FCF yield	%	na	na	2.2%	4.6%	23.2%	27.0%	32.5%

Source: ARC estimates

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