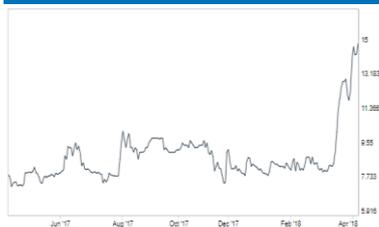


10 April 2018

**BMN LN Mining & Metals**


Source: LSE

**Market data**

Price (p)	15.00
12m High (p)	15.00
12m Low (p)	7.12
Shares (m)	1,067.8
Mkt Cap (£m)	160.2

**Company summary**

Bushveld Minerals is an AIM-quoted mineral resource development and production company. The group's key asset is a majority controlling interest in the Vametco vanadium operation in South Africa. Bushveld also has thermal coal interests via its wholly-owned Lemur Resources subsidiary and tin exposure via a 17.5% stake in AfriTin Mining Ltd.

**Key forecasts**

	2016	2017e	2018e
Sales (£m)	0.0	0.0	127.5
EBITDA (£m)	(1.5)	(3.0)	64.7
EPS (GBp)	(0.28)	(0.97)	2.57
EV/EBITDA (x)	na	na	2.3
EV/EBITDA* (x)	na	na	3.9
P/E (x)	na	na	5.8
Net cash (£m)	0.1	(8.9)	35.0

\*Equity-attributable adjusted EBITDA

**Analyst contact**

Nick Chalmers  
 Email: nchalmers@altrescap.com  
 Tel: +44 (0)20 7186 9003

**Broking contact**

Alex Wood  
 Email: awood@altrescap.com  
 Tel: +44 (0) 20 7186 9004

## Bushveld Minerals\*

### Balance sheet strengthened, vanadium marches on

Bushveld's recent US\$22m equity placing strengthens the group's balance sheet as it looks to simplify its organisational structure to improve exposure to the underlying cash flow of its majority-owned Vametco vanadium operation in South Africa. Moreover, it has added institutional and mining-specialist investors to a previously retail-investor dominated shareholder register. We believe the strong appetite for the placing amongst such institutions (the issue was oversubscribed) is testament to management's transformation of Bushveld over the past 18 months from a multiple-commodity explorer/developer to a focused producer of vanadium, one of the strongest performing commodities over recent times. Indeed, vanadium has moved higher still since our initiation note earlier this year, reflecting structural market tightness that shows little sign of abating. We have accordingly revised upwards both our near-term and longer-term pricing assumptions. However, at US\$35/t V (up 17% on our previous assumption) our long-term (from 2020) price deck is still a conservative 50% below current market pricing levels. Our resultant 20p sum-of-parts valuation represents >30% upside to Bushveld's share price, a valuation gap we think should narrow as Bushveld further executes its expansion plans for Vametco and begins drawing up surplus cash flow.

- ▶ **Enhanced financial firepower:** Bushveld has raised US\$22m (£15.7m) through an oversubscribed placing of 153m new shares (14% of the group's enlarged share capital) at a price of 10.3p/share (equal to Bushveld's five-day volume-weighted average share price one-week prior to the issue date). The proceeds are to be used to: redeem the £4.5m (US\$6.3m) outstanding convertible bonds held by Atlas Capital; simplify Bushveld's organisational and corporate structure to enhance its exposure to the underlying cash flow of Vametco (US\$9.0m); and increase resources and reserves at both the Vametco mine and adjacent Brits project to support future expanded production rates (US\$5.6m).
- ▶ **Share register evolves:** The placing gained strong support from institutional and resource-specialist investors, including participation from a consortium with a strong track record in the mining sector (including the founders of Mimosa Platinum, LionOre Mining International and Mantra Resources).
- ▶ **Vanadium continues upwards march:** Vanadium has maintained its strong start to the year, with media reports indicating that European ferrovanadium (FeV) is currently changing hands at around US\$70/kg V. We estimate it averaged cUS\$60/kg in Q1 2018, versus cUS\$33/kg across CY2017. Recognising the continued fundamental market tightness, we have increased our 2018 price assumption by 25% to US\$50/kg (still a conservative c30% below current pricing levels), and our long-term (from 2020) price deck by 17%, to US\$35/kg.
- ▶ **Undemanding valuation metrics:** Our revised sum-of-parts valuation of 20p equates to over 30% upside to Bushveld's current share price, while our updated 2018 EBITDA estimate of £65m (fully consolidated) would put the group on an undemanding EV/EBITDA multiple of just 3.9x (after adjusting for its 59% current ownership of Vametco). We see potential for further upwards re-rating as the Vametco expansion progresses over the next 12 months and, in time, as Bushveld begins drawing up surplus cash generated. Moreover, we see substantial valuation upside on vanadium price (FeV is currently trading at around 2x our revised US\$35/kg long-term (from 2020) assumption, and at a 40% premium to our 2018 price forecast of US\$50/kg).

## Balance sheet strengthened, shareholder register evolves

Bushveld has raised US\$22m (£15.7m) gross through an oversubscribed placing of 152.7m new shares at 10.3p per share, the issue price equating to Bushveld’s five-day volume-weighted average share price at close on 19 March 2018 (one-week prior to the issue). The new shares represent approximately 14% of Bushveld’s enlarged issued share capital.

Bushveld’s planned use of the net proceeds include: redeeming entirely the £4.5m (US\$6.3m) outstanding convertible bonds held by Atlas Capital; simplifying Bushveld’s organisational and corporate structure to enhance the group’s exposure to the underlying cash flow of Vametco (US\$9.0m); and expanding its resource and reserve base at both the Vametco mine and the adjacent Brits project to support future and expansion at Vametco (US\$5.6m).

In addition to bolstering Bushveld’s cash resources for the above-stated purposes, the placing introduced several institutional and mining-specialist investors, transforming what had previously been a retail-investor dominated shareholder register. Most notably, the placing was corner-stoned by a consortium of investors with a strong track record in the mining sector, including the founders of Mimosa Platinum, LionOre Mining International (sold to Norilsk Nickel for US\$6.3 billion in 2007) and Mantra Resources (sold to Rosatom for US\$1.6 billion in 2010).

## Vanadium market continues to tighten

Vanadium has maintained its upwards price trajectory through the first quarter of 2018, buoyed by still constrained supply of co-product sourced vanadium on depressed iron-ore pricing and Chinese environmental-related closures, and rising demand from the steel-rebar sector in China as new product standards take effect. These tightening market fundamentals saw ferrovanadium (FeV) – a close proxy for the vanadium product supplied by Vametco – rise by over 50% across the quarter, and it is currently trading at around US\$70/kg V (Figure 1).

Figure 1: Vanadium ten-year price history (FeV basis)



Source: Bloomberg (Metal Bulletin data)

Looking at the supply-side drivers, vanadium co-produced from slag generated through the processing of magnetite iron ores in steelmaking (which has historically accounted for over two-thirds of global supply of vanadium) has become significantly constrained over recent times owing to the following factors:

- ▶ The high cost of mining and processing low-grade magnetite ores relative to the cost of importing higher-quality (and, in recent times, increasingly low-cost) seaborne-traded haematite ore;
- ▶ The high running costs of the complex steel plants that are necessary to extract titanium and vanadium from magnetite ores, which struggle to compete with the simpler blast furnace operations that process haematite iron ores;
- ▶ No leverage on steel prices owing to the small share of global production that the vanadium and titanium-bearing magnetite ore-processing steel plants have.

Integrated magnetite iron-ore mining and steel manufacturing operations have thus come under severe economic pressure, and in China this issue has been compounded by increased environmental scrutiny on domestic industrial operations. The result has been significant production curtailments and/or increased blending of higher-quality (but vanadium free) ore in the feed mix. This has led to a marked tightening in global supply of co-product sourced vanadium, with inventories being drawn down and market prices spiking upwards accordingly (Figure 2).

The phenomenon has placed even greater importance on primary vanadium production, which has historically accounted for a much smaller share of total global supply at just 15-20%. We believe the development of any new potential primary production of scale would likely require elevated vanadium prices to be sustained over the longer term – we see few projects globally that have sufficiently high grades to maintain economic viability across a cycle.

Figure 2: Vanadium price (V<sub>2</sub>O<sub>5</sub> basis) versus inventories

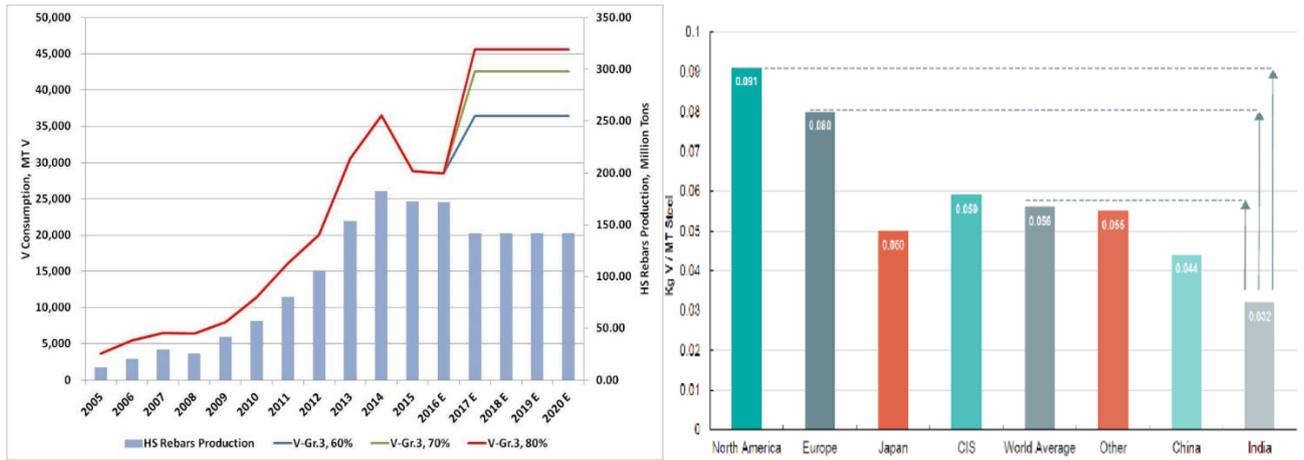


Source: Technology Metals (based on TTP Squared and Metal Bulletin data)

On the demand side, while global steel production growth rates remain well below the levels witnessed during the last commodities super cycle, the intensity of vanadium utilisation in high-strength steel manufacturing is expected to increase in the key Chinese market following the introduction of new domestic safety standards. The latter include moves to eliminate 335MPa tensile strength steel rebar and replace it with 600MPa strength material in an effort to enhance the earthquake resistance of civil constructions.

Assuming the new regulations are enforced strictly, Chinese steel rebar producers will need to add significantly more vanadium to their production mix. This could trigger a material increase in global vanadium demand given China’s historic under-utilisation of vanadium in steel making compared with its Western counterparts (according to Metal Bulletin, vanadium consumption in crude steel over recent years has averaged 37g/kt in China, versus 73g/kt in Europe and 93g/kt in North America).

Figure 3: The intensity of vanadium use in Chinese steelmaking is rising from a low base

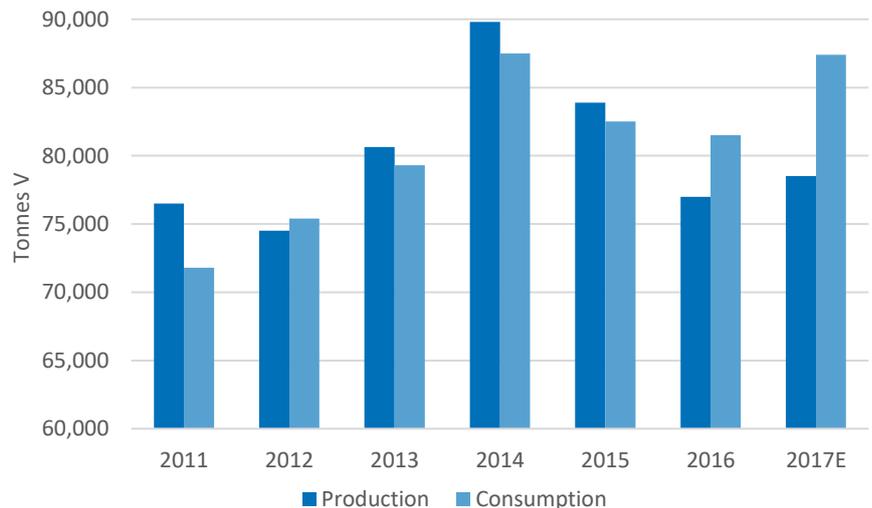


Source: Vanitec (LHS) and Australian Vanadium (RHS)

Recognising the sustained strength of market pricing throughout Q1 2018 owing to the above-discussed factors, we have upwardly revised our near-term vanadium price assumptions. We now assume an average price of US\$50/kg for 2018, up 25% compared with our previous assumption of US\$40/kg, but still a conservative c30% below current levels.

Cognizant of the highly volatile nature of vanadium markets through recent history, we prudently adopt a significantly lower long-term (from 2020) price assumption, though this too has been upwardly revised, by 17% to US\$35/kg. The latter is above the ten-year average price of just under US\$30/kg, reflecting our view that there has been a structural shift in the vanadium market (Figure 4).

Figure 4: The vanadium market has moved in to a structural deficit



Source: Australian Vanadium, USGS, Vanitec

We believe that our long-term price assumption is of a level that would support the widespread commercialization of vanadium redox-flow batteries, an emerging end-use market of potentially significant scale in the future (prolonged elevated vanadium prices could constrain growth in VRFB use, as, unlike lithium in the context of lithium-ion batteries, vanadium electrolyte feedstock is the major component in the overall cost of producing a VRFB unit).

## Updated valuation

We have updated our sum-of-the-parts valuation to incorporate both the recent equity issue but also our revised vanadium price assumptions and currency rates. The positive impact of our higher vanadium price assumptions more than offsets the slightly dilutive effect of the equity placing (which at 10.3p was undertaken at a discount to our previous risked NAV of 14p) and the negative impact of our stronger Rand assumptions (R12.00 to US\$1, vs R12.50 previously). The net result is a 39% increase to our risked NAV estimate, to 19.8p per share. This represents 32% upside to Bushveld’s share price, a market discount we believe should narrow as the group further progresses its expansion of Vametco and, crucially, simplifies the ownership structure to enhance its access to cash generated by the operation.

Figure 5: Sum-of-the-parts valuation\*

		Unrisked US\$m	Risk multiple	Riskd US\$m	Riskd GBP/s
Vametco (BMN share)	NPV <sub>10%</sub>	209	1.0x	209	14.0
Mokopane	NPV <sub>10%</sub>	285	0.2x	57	3.8
Brits	nominal	20		20	1.3
AfriTin Mining (17.5%)	market	2		2	0.1
Lemur Resources	nominal	10		10	0.7
Corporate G&A	NPV <sub>10%</sub>	-19		-19	-1.3
<b>EV</b>		<b>507</b>		<b>279</b>	<b>18.6</b>
BMN-level cash	estimate	17		17	1.2
<b>NAV</b>		<b>524</b>		<b>296</b>	<b>19.8</b>

\*Assumes long-term FX rate assumptions of R12.00:US\$1 and US\$1.40:£1 Source: ARC estimates

Notwithstanding our upwardly revised vanadium price assumptions, we continue to see significant upside potential to our sum-of-parts valuation should recent gains in market vanadium pricing hold – our conservative long-term FeV price assumption (from 2020) is around 50% below recently reported market trading levels.

Figure 6: Risked NAV (GBP) sensitivity to V price (flat from 2018\*) and FX rate

		Vanadium price (US\$/kg V)						
		20.00	30.00	40.00	50.00	60.00	70.00	80.00
USD/ZAR rate	10.00	-10.4	8.3	20.5	32.9	45.5	58.2	71.0
	11.00	-4.9	10.3	22.5	35.0	47.7	60.4	73.2
	12.00	-0.4	11.9	24.2	36.8	49.5	62.3	75.0
	13.00	1.5	13.3	25.7	38.3	51.1	63.8	76.5
	14.00	2.7	14.6	26.9	39.7	52.4	65.1	77.9

\*Our base-case NAV assumes V drops to a long-term US\$35/kg from 2020 Source: ARC estimates

Figure 7: Risked NAV (GBP) sensitivity to V (flat from 2018\*) and discount rate

		Vanadium price (US\$/kg V)						
		20.00	30.00	40.00	50.00	60.00	70.00	80.00
Discount rate	15%	-0.5	8.1	16.7	25.5	34.4	43.4	52.3
	12%	-0.5	10.0	20.6	31.3	42.3	53.2	64.1
	10%	-0.4	11.9	24.2	36.8	49.5	62.3	75.0
	8%	-0.3	14.4	29.1	44.1	59.2	74.4	89.6
	5%	0.0	20.3	40.2	60.5	81.0	101.5	122.1

\*Our base-case NAV assumes V drops to a long-term US\$35/kg from 2020 Source: ARC estimates

## Updated forecasts

Figures 8-12 below summarise our updated operating and financial forecasts, incorporating our revised vanadium pricing assumptions and the recently completed US\$22m equity placing. We assume some of the net proceeds from the fundraise are deployed immediately to redeem in full the £4.5m (US\$6.3m) outstanding convertible bonds held by Atlas Capital.

Our forecasts assume Vametco is fully consolidated in Bushveld's P&L from 2018 (we equity account Vametco for 2017). Note that our 2016 numbers reflect Bushveld's reported financial statements for the 12 months to 28 February 2017, its previous fiscal year – the company has since moved to a calendar year end.

Bushveld has not yet reported financial results since taking majority control of Vametco, so our forecasts are presented on a 'best estimates' basis. The accounting treatment may differ materially (specifically in relation to minorities and dividends).

We conservatively assume Vametco only commences cash dividends in 2020 (with dividend withholding tax applied at 20%) following completion of the capacity expansion programme.

Figure 8: Summary Vametco operational forecasts and macro assumptions

		2017E*	2018E	2019E	2020E
Vanadium production	t	2,649	3,680	4,280	5,000
V <sub>2</sub> O <sub>5</sub> equivalent	t	4,729	6,569	7,641	8,926
Vanadium sales	t	2,721	3,680	4,280	5,000
Ferrovandium market price	US\$/kg V	32.60	50.00	42.50	35.00
Received basket price (Nitrovan and FeV)	US\$/kg V	30.13	48.50	41.23	33.95
Total cash costs (including royalties)	US\$/kg V	20.91	23.61	22.37	21.06
Operating cash margin	%	31%	51%	46%	38%
All-in costs (including depreciation)	US\$/kg V	21.47	24.69	23.90	22.25
All-in margin	%	29%	49%	42%	34%
South African Rand	ZAR:USD	13.30	12.00	12.00	12.00
GB Sterling	USD:GBP	1.29	1.40	1.40	1.40

\*Bushveld did not assume majority control of Vametco until end 2017

Source: ARC estimates

Figure 9: Summary Bushveld Minerals consolidated income statement

		2016*	2017E**	2018E	2019E	2020E
Revenue	£m	0.0	0.0	127.5	126.0	121.3
Cost of sales	£m	0.0	0.0	(54.4)	(62.3)	(68.5)
Other income	£m	0.0	0.0	0.8	0.8	0.7
Selling & distribution costs	£m	0.0	0.0	(6.7)	(6.9)	(7.1)
G&A costs	£m	(1.6)	(1.5)	(5.4)	(5.4)	(5.4)
Other expenses	£m	0.0	(1.5)	0.0	0.0	0.0
<b>Operating profit</b>	<b>£m</b>	<b>(1.5)</b>	<b>(3.0)</b>	<b>61.9</b>	<b>52.2</b>	<b>41.0</b>
Net finance costs	£m	(0.2)	(0.5)	(0.9)	(0.7)	(0.4)
Impairments	£m	0.0	(7.7)	0.0	0.0	0.0
Share of profit/(loss) from associates**	£m	0.0	3.5	0.0	0.0	0.0
Tax	£m	0.0	0.0	(17.5)	(14.8)	(19.5)
<b>Net profit/(loss)</b>	<b>£m</b>	<b>(1.7)</b>	<b>(7.6)</b>	<b>43.4</b>	<b>36.7</b>	<b>21.1</b>
Minority interests	£m	0.0	0.0	(18.4)	(15.6)	(9.1)
<b>Attributable net profit/(loss)</b>	<b>£m</b>	<b>(1.7)</b>	<b>(7.6)</b>	<b>25.0</b>	<b>21.1</b>	<b>12.0</b>

\*Reflects Bushveld's reported accounts to the 28 February 2016 \*\*Vametco equity accounted in 2017

Source: ARC estimates

Figure 10: Summary Bushveld Minerals consolidated cash flow statement

		2016*	2017E**	2018E	2019E	2020E
Operational CF before WC changes	£m	(1.4)	(3.0)	47.2	42.1	25.8
Working capital changes	£m	1.4	(1.9)	(9.4)	1.9	(1.7)
<b>Cash flow from operations</b>	<b>£m</b>	<b>0.0</b>	<b>(4.9)</b>	<b>37.8</b>	<b>44.0</b>	<b>24.0</b>
Capex	£m	(0.0)	(0.5)	(9.5)	(12.0)	(2.5)
Other	£m	(0.8)	(4.9)	(1.8)	(1.9)	(1.5)
<b>Cash flow from investing activities</b>	<b>£m</b>	<b>(0.8)</b>	<b>(5.4)</b>	<b>(11.3)</b>	<b>(13.9)</b>	<b>(4.0)</b>
Equity issue and warrant exercises	£m	3.2	1.7	15.6	0.0	0.0
Net borrowings	£m	(2.5)	16.3	(4.5)	0.0	0.0
Dividends to minorities	£m	0.0	0.0	0.0	0.0	(19.7)
Other	£m	(0.5)	(1.3)	(0.7)	(0.4)	(0.4)
<b>Cash flow from financing activities</b>	<b>£m</b>	<b>0.1</b>	<b>16.7</b>	<b>10.4</b>	<b>(0.4)</b>	<b>(20.1)</b>
Increase/(decrease) in cash	£m	(0.7)	6.4	36.9	29.7	0.0

\*Reflects Bushveld's reported accounts to the 28 February 2016 \*\*Vametco equity accounted in 2017

Source: ARC estimates

Figure 11: Summary Bushveld Minerals consolidated balance sheet

		2016*	2017E**	2018E	2019E	2020E
Cash	£m	0.1	6.6	43.5	73.2	73.2
P,P&E	£m	0.3	14.1	20.8	28.1	26.4
Intangible assets	£m	60.2	53.6	54.3	54.7	54.7
Other assets	£m	2.5	30.8	37.0	32.4	33.8
<b>Total assets</b>	<b>£m</b>	<b>63.1</b>	<b>105.1</b>	<b>155.6</b>	<b>188.4</b>	<b>188.1</b>
Payables	£m	1.4	17.4	15.2	13.6	22.9
Debt	£m	0.0	15.5	8.5	8.5	8.5
Other liabilities	£m	0.0	0.0	0.0	0.0	0.0
<b>Total liabilities</b>	<b>£m</b>	<b>1.4</b>	<b>32.9</b>	<b>23.7</b>	<b>22.1</b>	<b>31.5</b>
Shareholders' equity	£m	59.7	60.5	101.8	120.6	121.4
Non-controlling interests	£m	2.0	11.7	30.1	45.8	35.2
Total equity	£m	61.7	72.2	131.9	166.4	156.6
<b>Total liabilities &amp; equity</b>	<b>£m</b>	<b>63.1</b>	<b>105.1</b>	<b>155.6</b>	<b>188.4</b>	<b>188.1</b>

\*Reflects Bushveld's reported accounts to the 28 February 2016 \*\*Vametco equity accounted in 2017

Source: ARC estimates

Figure 12: Key financial measurements and ratios

		2016*	2017E**	2018E	2019E	2020E
EBITDA	£m	(1.5)	(3.0)	64.7	56.9	45.3
EBITDA margin	%	na	na	51%	45%	37%
EBIT	£m	(1.5)	(7.1)	61.9	52.2	41.0
EBIT margin	%	na	na	49%	41%	34%
EPS	GBP	(0.3)	(1.0)	2.6	2.0	1.1
Net profit margin	%	na	na	20%	17%	10%
Free cash flow	£m	(0.8)	(10.3)	26.5	30.1	20.0
Net cash/(debt)	£m	0.1	(8.9)	35.0	64.7	64.6
EV/EBITDA (consolidated)	x	na	na	2.3	2.6	3.3
EV/EBITDA (equity attributable)	x	na	na	3.9	4.4	5.5
P/E	x	na	na	5.8	7.6	13.4
FCF yield	%	na	na	0.2%	0.2%	0.1%

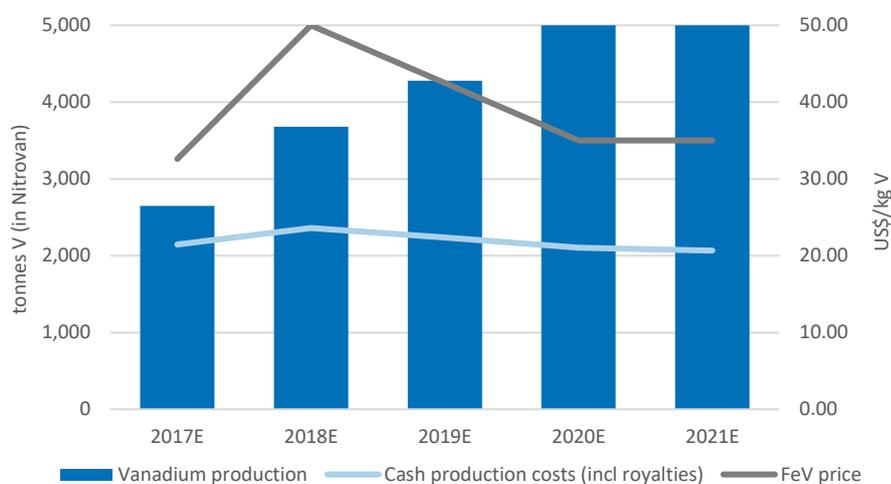
\*Reflects Bushveld's reported accounts to the 28 February 2016 \*\*Vametco equity accounted in 2017

Source: ARC estimates

### Upcoming catalysts

- ▶ Completion of second phase of Vametco expansion (mid 2018)
- ▶ Commissioning of pilot VRFB unit at Eskom (H1 2018)
- ▶ Continued development of the Bushveld Energy business (2018 and beyond)
- ▶ Completion of final phase of Vametco expansion (by end 2019)

Figure 13: Production and cost profile (next four years forecast)



Source: ARC estimates

## Disclaimer

*This document has been prepared and issued by Alternative Resource Capital, a trading name of Shard Capital Partners LLP ("Alternative Resource Capital"), which is authorised and regulated by the Financial Conduct Authority.*

*Bushveld Minerals is a corporate client of Alternative Resource Capital, and Alternative Resource Capital is contractually engaged and paid by Bushveld Minerals to produce marketing communications on an ongoing basis. In addition, Alternative Resource Capital may from time to time receive additional compensation from Bushveld Minerals for provision of other advisory services, including fundraising services. This document constitutes a minor non-monetary benefit.*

*This document is a marketing communication and not independent research. As such, it has not been prepared in accordance with legal requirements designed to promote the independence of investment research.*

*This document is published solely for information purposes and is not to be construed as a solicitation or an offer to buy or sell any securities, or related financial instruments. It does not constitute a personal recommendation as defined by the Financial Conduct Authority, nor does it take account of the particular investment objectives, financial situations or needs of individual investors. The information contained herein is obtained from public information and sources considered reliable. However, the accuracy thereof cannot be guaranteed.*

*The information contained in this document is solely for use by those persons to whom it is addressed and may not be reproduced, further distributed to any other person or published, in whole or in part, for any purpose, at any time, without the prior written consent of Alternative Resource Capital. This document is not intended for retail customers and may not be distributed to any persons (or groups of persons) to whom such distribution would contravene the UK Financial Services and Markets Act 2000. Moreover, this document is not directed at persons in any jurisdictions in which Alternative Resource Capital is prohibited or restricted by any legislation or regulation in those jurisdictions from making it available. Persons into whose possession this document comes should inform themselves about, and observe, any such restrictions.*

*Alternative Resource Capital or its employees may have a position in the securities and derivatives of the companies researched and this may impair the objectivity of this report. Alternative Resource Capital may act as principal in transactions in any relevant securities, or provide advisory or other service to any issuer of relevant securities or any company connected therewith.*

*Neither Alternative Resource Capital nor any of its directors, officers, employees or agents accept any responsibility or liability whatsoever for any loss however arising from any use of this document or its contents or otherwise arising in connection therewith. The value of the securities and the income from them may fluctuate. It should be remembered that past performance is not a guarantee of future performance. Investments may go down in value as well as up and you may not get back the full amount invested. The listing requirements for securities listed on AIM or ISDX are less demanding and trading in them may be less liquid than main markets. If you are unsure of the suitability of share dealing specifically for you then you should contact an Independent Financial Adviser, authorised by the Financial Conduct Authority.*

*By accepting this document, the recipient agrees to the foregoing disclaimer and to be bound by its limitations and restrictions.*

*Further information on Alternative Resource Capital's policy regarding potential conflicts of interest in the context of investment research and its policy on disclosure and conflicts in general are available on request.*

**Alternative Resource Capital is a trading name of Shard Capital Partners LLP, which is authorised and regulated by the Financial Conduct Authority. Shard Capital Partners LLP's registered partnership number is OC360394.**



Shard Capital Partners LLP  
23rd Floor,  
20 Fenchurch St,  
London, EC3M 3BY

T +44 (0)207 186 9900  
F +44 (0)207 186 9979  
E [info@shardcapital.com](mailto:info@shardcapital.com)  
W [shardcapital.com](http://shardcapital.com)