

Non-Independent Research
A MiFID II compliant note

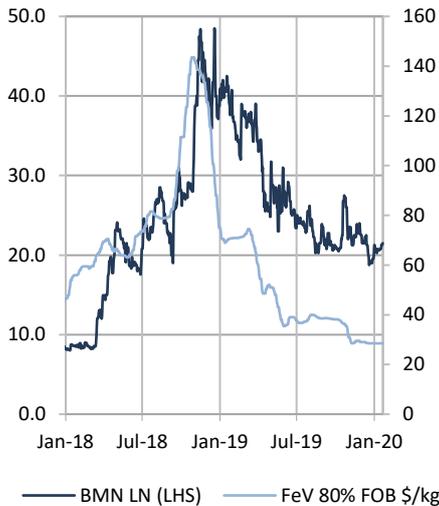
*SP Angel acts as Nomad & Broker to Bushveld Minerals.

30 January 2020

Stock Data

Ticker	BMN LN
Share Price:	20.15
Market Cap:	£232m

Price Chart



Significant Q4 operational improvements help Bushveld to positive year end result

Bushveld Minerals owns 74% of Vametco and 100% of the Vanchem, integrated vanadium mining, processing and technology businesses. 26% of Vametco is held by a BEE group. Bushveld Energy (84%) is developing vanadium redox batteries for grid use in South Africa.

- Bushveld Minerals report a strong, fourth quarter for production and low costs at Vametco in South Africa.
- **Vametco produced** 880mt of ferro-vanadium up 32% yoy in Q4 bringing the year to 2,833mtV vs guidance of 2,800-2900mtV.
- **Vanadium sales** lagged behind Q4 production at 673mt causing sales to fall by 6.7% yoy to 2,392mtV. The difference of 441mtV is worth over \$12m at current price levels.
- **Cash costs** fell 20% qoq for the quarter to an impressive \$15.2/kgV. The sale of this stock should benefit cash flow this year.
- The Q4 fall in cash costs highlights the impact of improvements made to the Vametco plant and the effect of higher production on unit costs.
- Cash costs also fell 5% yoy for the year to \$18.10/kgV (ZAR261/kgV) for the year vs \$19.6/kgV in 2018 and better than guidance of \$18.90-19.50/kgV.
- **Guidance** is for production of 3,000-3,200mtV in 2020 with higher production rate of 3,400mtVpa due to come through in the second half.
- **Cash cost guidance** for the Vametco plant is estimated at between US\$17.20-17.70/kgV (ZAR257-ZAR265/kg representing a 2-5% cost reduction on FY2019).
- **Assumptions:** our key assumptions are in the table below. We expect the price for ferro-vanadium to recover with new buying seen in the market in recent weeks.

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(Dec year end)		2018	2019E	2020E	2021E	2022E	2023E
FeV price	US\$/kg	81	51	45	45	45	45
Vanadium Production	mtV	2,560	2,833	4,114	5,432	6,168	7,645
Vanadium Sales ⁺	mtV	2,573	2,392	4,114 ⁺	5,432 ⁺	6,168 ⁺	7,645 ⁺
Sales ⁺	US\$m	192.1	116.2	176.2	232.6	264.1	327.4
Cash Op costs	US\$m	-65.3	-59.1	-85.2	-109.8	-119.9	-141.4
Unit Cash Op costs ⁺	US\$/kg	25.5	20.8	20.7	20.2	19.4	18.5
Operating profit	US\$m	95.2	38.5	69.3	100.0	119.4	158.1
Pre-tax profit	US\$m	86.6	40.0	66.0	97.2	117.4	156.5
Tax	US\$m	-37.6	-11.4	-18.8	-27.7	-33.5	-44.6
Post-tax profit	US\$m	49.0	28.6	47.2	69.5	83.9	111.9
EPS	US\$/s	2.90	1.67	3.11	4.80	5.94	8.27
PE	x	10.4	17.8	9.5	6.2	5.0	3.6
EV/EBITDA	x	2.7	7.0	3.9	2.7	2.3	1.7
EBITDA	US\$m	101.2	42.4	76.6	110.4	131.4	170.3
Free Cash Flow (100%)	US\$m	32.2	-21.7	0.5	25.7	59.9	107.7

Source: SP Angel, Company. +Vametco & Vanchem figures combined.

SP Angel forecasts: Figures based on 100% of Vametco plant. Bushveld now hold an effective 74% of the Vametco plant. Bushveld hold 100% of Vanchem.

⁺Vanadium sales see a 8 -12 week lag when product is delivered to final customer. This applies for all the sales

*An SP Angel mining analyst and nomad have visited the Vametco in South Africa.

*SP Angel act as Nomad and broker to Bushveld Minerals

Bushveld Cont...

- **Maintenance:** a 10-day planned maintenance programme is scheduled in Q2 2020 which is much reduced from the 22 day- maintenance seen in in Q3 last year.
- **Vanchem** which was acquired in November produced 98mtV in the form of ferrovandium and vanadium chemicals under Bushveld ownership.
- Bushveld will diversify its vanadium chemical and product range with Vanchem.
- Vanchem guidance is for 960-1,100mtV of Vanadium from stockpiles.
- Vanchem cash cost guidance will be given in the Q1 operational update.
- While there is sufficient feedstock at Vanchem to meet 2020 guidance feedstock may also be trucked to Vanchem from Vametco while the Mokopane mine is being planned and built.

Vanchem plant

- **Synergies:** are expected from the Vanchem acquisition through improved focus on safety, volumes and costs with Vametco to start producing ferrovandium through the Vanchem processing facility.
- Bushveld now has a much more scalable, low cost production base offering the potential to develop further value.
- **EBITDA:** Vametco generated an Underlying EBITDA of \$42m for the year vs our estimate of \$39.7m lifted by strong performance in the fourth quarter. We are impressed by the EBITDA performance despite a 35% decline in ferro-vandium prices year on year.
- Management improved productivity sufficiently at Vametco to cut costs offsetting much of the impact of the price fall and ensuring ongoing profitability of the plant while the market worked through some surplus stocks.

Higher productions and process control initiatives lowered unit costs. A weaker South African rand also helped but was offset by higher inflation.

- **Mokopane:** Bushveld received a 30-year mining right from the Department of Mineral Resources and Energy in South Africa. Bushveld plans to develop the Mokopane project to raise vanadium production at Vanchem.
- Development of production from Mokopane will serve to restart idled production at Vanchem while cutting costs. The Vametco team should also be able to apply recent improvements at Vametco to Vanchem realising further new value.

Vanchem plant



- Management are focussed on maintenance of their low-cost base and on the creation of new low-cost growth at Vanchem which may serve to temper the restart of some furnaces while vanadium prices remain at current levels.
- A DFS 'definitive feasibility study' to mine the Main Magnetite Layer is underway for Vanchem primary feedstock. The DFS is expected to be completed during H2 2020.
- **ESKOM:** management managed Vametco on reduced power consumption of 10MW between the hours of 8am and 6pm each day in place of the normal 12MW consumption.
- **Vametco based Solar/VRFB Mini-Grid:** A new self-generating mini grid is being planned to help support Vametco and to better demonstrate the performance of VRFB batteries with Solar power generation. The project has a grid connection with geotechnical studies also done and procurement started.

An Avalon Solar battery instillation at Huanghe Hydro



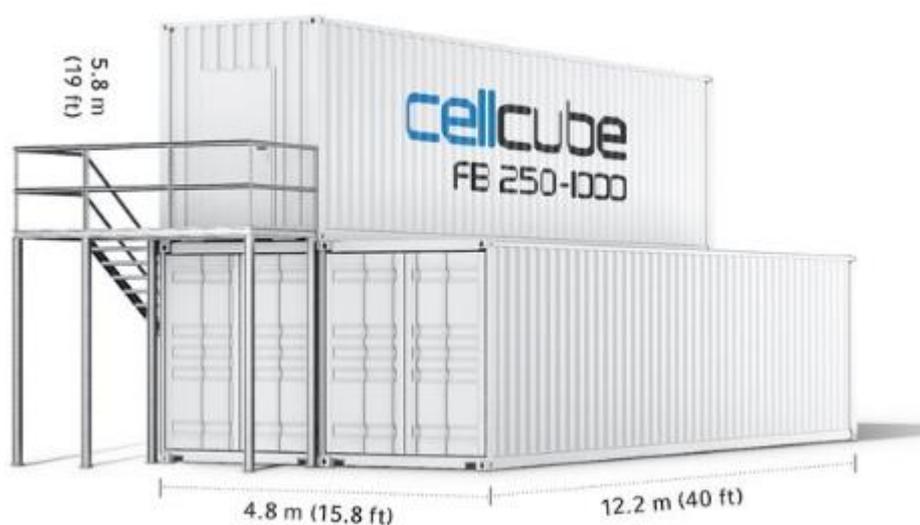
- **Environmental:** A kiln off-gas project has been initiated to comply with environmental regulatory requirements and further increase kiln feed throughput. Commissioning is planned to be completed during H1 2020.
- **Bushveld Energy** offers a value-added vertically integrated business model.
- Investments into the new ‘VIP’ Vanadium Investment Platform should act as a natural hedge for Bushveld in future years as the company ramps up electrolyte production for sale into their new leasing model
- **Avalon/redT:** Investment into the Avalon’s takeover of redT should enable the rollout of existing VRFB contracts. There should be considerable synergies in Bushveld’s involvement in this business.

Avalon Batteries



- **Enerox: acquisition** of minority stake in Enerox through a consortium puts the company in a key position for the construction and roll-out of Vanadium Redox flow Batteries. Again, there should be synergies for Bushveld in their involvement with Enerox.

Enerox Cellcube



2020 priorities:

- Advance construction of the vanadium electrolyte plant.
 - Implement additional, larger electrolyte rental contracts.
 - Vametco mini-grid: Bushveld plans to develop mini-grid to supply and store power at Vametco, this project should advance through 2020.
 - Submit bids for Battery Energy Storage Systems opportunities as part of South Africa's Integrated Resource Plan.
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- **Electrolyte plant:** basic design completed, and tenders issued for the EPC 'Engineering, Procurement and Construction' contract.
 - The plant should produce electrolyte for VRFB storage at Vametco and support the vanadium electrolyte rental product.
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- **Sales:** Vametco sales pulled back to US\$111.1m for the year. Our forecasts include around \$5m of additional sales from other parts of the group.
 - Vametco sell the majority of their ferro-vanadium into the US.
 - The 2019 sale split was US (50%), Europe (20%), China (10%) and elsewhere (20%) with an average delivery period of 8 to 12 weeks to the final customer. Sales into the US recorded better averages last year than other regions supporting Vanchem's focus of sales into this region. Sales could currently realise better prices in China and Europe, and this may see the proportion of sales change over the year into these regions.
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- **Ferro-vanadium prices** rose 7.2% to \$27.5-29.5/kgV this week in Western Europe (Fastmarkets MB).
 - Prices rose on increasing ferro-vanadium imports into China in recent months as China better enforces the rebar standards introduced in November 2018
 - Production of vanadium from other non-primary sources such as stone coal should continue to fall.
 - Substitution with niobium should also substantially reduce due to higher relative niobium prices driven by niobium demand for alloying for magnet and battery metals.
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- **Supply/demand:** Bushveld see positive 'supply and demand dynamics supported by reduced supply and increased intensity of use of vanadium in steel from emerging markets'.
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- **VRFB market growth:** management also see 'growing demand for VRFB contributing to increased demand' and are encouraged by the recovery of ferro-vanadium prices in Europe.
 - **Debt:** Bushveld secured ~US\$25m in facilities through Vametco with Nedbank last year in the form of a R250m loan and a R125m revolving credit facility. This is carved out from the obligation to repay 50% of any debt raised over US\$15m, provided no more than 50 per cent of the Vanchem loan notes have been repaid.

Valuation:

While the EBITDA figure is better than expected and ferro-vanadium prices have risen in recent weeks we are conscious of potential impact from an extended seasonal shutdown in China due to the Coronavirus.

The Coronavirus is now declared as a global health emergency according to the World Health Organisation and the extended shutdown of industry in China may disrupt steel production, consumer confidence and construction demand.

China is likely to move to restore economic growth and confidence in the ruling Communist Party through greater than planned expenditure on infrastructure and other construction.

This is likely to stimulate further demand for steel and ferro-alloys and serves to support our view that ferro-vanadium prices are likely to rise further this year.

We do not include any additional value for Bushveld's involvement in Enerox and Avalon/redT though we can see the 'VIP' VRFB Investment Platform adding to our valuation of the group in future years.

We maintain our valuation of 82p for Bushveld. We see Vanchem as offering good flexibility in terms of production and product diversification. We have adjusted our assumed rand/USD exchange rate to reflect some further slippage to SAR18/USD from 2022.

We maintain our valuation on Bushveld Energy at 8.4p/s.

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Recommendations are based on a 12-month time horizon as follows:

Buy - Expected return >15%

Hold - Expected return range -15% to +15%

Sell - Expected return < 15%