Metals and Mining Note
Vast Resources

13 December 2019

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Front page depicts location major assets held by the Company in Romania and Zimbabwe
(Source: Company)

Mining Note

Vast Resources*

VAST LN

Exposure to copper and rough diamonds in Romania and Zimbabwe

Non-Independent Research
***SP Angel acts as Broker - MiFID II Exempt**

13 December 2019

Stock Data

Ticker (AIM)	VAST LN
Share Price	0.29p
Market Cap	£29m

Price Chart

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Vast Resources is an AIM listed mining company with a portfolio of exploration, development and production multi commodity assets in Romania and Zimbabwe. Flagship development projects include the fully permitted high grade polymetallic brownfield Baita Plai deposit (Romania) with good access to historic infrastructure and first saleable concentrate expected in H1/20 and the alluvial diamonds Chiadzwa Concession in the prolific Marange Diamond Fields to be developed in a JV with a local community and fast tracked to production.

- **Baita Plai (80%)**, a fully permitted, funded and close to production brownfield polymetallic mine, is a low capital intensity and high margin project offering exposure to copper along with a series of precious and base metals' by-products. The mine is expected to launch operations in H1/20 delivering 4ktpa CuEq and yielding $17m in EBITDA (60% margin) and $12m in FCF annually (at $7,500/t Cu price) once ramped up to full 13ktpm capacity.
- **Chiadzwa Community Diamond Concession (TBC%)**, an unmined license area in a prolific Marange Diamond Fields that supplied ~60mcts over the last two decades, is the second major project in the Group. A potential alluvial diamonds operation can be brought quickly into production and at a low capital cost. On preliminary management estimates adjusted for lower than planned plant availability (50% v 85% budgeted by Vast) the project is expected to run at ~1.2mcts in annual production, generating $45m in EBITDA and $33m in FCF per annum (at $58/ct rough diamond price).
- **Carlibaba Extension Project (100%)**, is part of the Manaila Polymetallic Mine (on C&M since Dec/18) and an opportunity to restart operations at reduced unit costs allowing positive FCF potential.
- **Exploration potential** remains in the highly prospective Eastern Carpathians and Apuseni Mountains allowing to further improve on the life of mine of planned operations in Romania, while the scale of the Chiadzwa Community Diamond Concession is yet to be determined at the time when Zimbabwe aims to attract investment in diamond industry and nearly double local output to 6mcts by 2023 (conglomerate source only and not accounting for incremental supply from alluvial operations).
- Vast Resources offers exposure to a diversified portfolio of assets both in terms of commodities and jurisdiction prioritising pre-production projects with a view to deliver early cash flows while also working on a pipeline of early exploration assets.
- **Using our DCF valuation model (10%DR) we arrive at attributed NAVPS of 0.37p adjusted for the development stage of each project. Upside to the valuation lies within further de-risking of the Vast portfolio of assets narrowing down the P/NAV discount that may potentially yield a ~180% increase in attributed project value ($68m v $191m) translating into a 1.22p NAVPS. In particular, Chiadzwa offers the most value upside in terms of gradual de-risking of the project (see valuation section).**

Valuation	Method	Interest	P/NAV adj	Att US$m	GBp/shr
Baita Plai	DCF	80%	0.75	46	0.32
Manaila	DCF	100%	0.25	4	0.03
Chiadzwa	DCF	60%	0.15	17	0.12
Other	Cost-based	Mixed	1.00	1	0.01
Project Value				68	0.47
Adjustments					
Net Debt				-5	-0.03
Corporate overheads				-11	-0.07
Company NAV				53	0.37

GBPUSD exchange rate 1.4

NAV Valuation and investment case

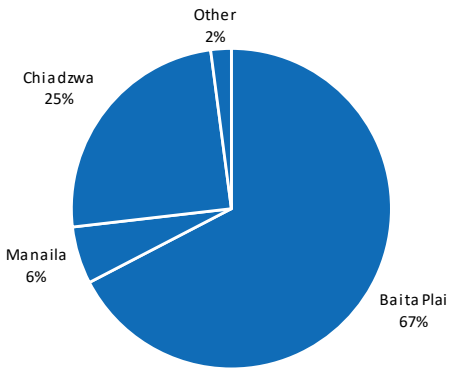
We are using a discounted cash flow-based NAV as our primary valuation tool for the portfolio of Vast assets including two flagship development projects – a polymetallic Baita Plai mine in north-western Romania and an alluvial Chiadzwa Community Diamond Concession project in Zimbabwe, - as well as the Carlibaba extension at the Manaila copper/zinc operation (currently on care and maintenance) in northern Romania.

We arrive at an attributable NAV of $53m or 0.37p per share (10,253m shares in issue) using 10% discount rate, our commodity price forecasts and respective adjustment multiples. We have applied adjustment factors to our NPV estimates to reflect the relative status of each project implying a potential upside as the team gradually de-risks its portfolio of assets. Baita Plai (80% interest) and Chiadzwa Community Diamond Concession (60% interest) account for 67% and 25% of total adjusted NPV.

Valuation	Method	Interest	Att US$m	P/NAV adj	Att US$m	GBp/shr
Baita Plai	DCF	80%	61	0.75	46	0.32
Manaila	DCF	100%	16	0.25	4	0.03
Chiadzwa	DCF	60%	112	0.15	17	0.12
Other	Cost-based	Mixed	1	1.00	1	0.01
Project Value			**191**		**68**	**0.47**
Adjustments						
Net debt					-5	-0.03
Corporate overheads					-11	-0.07
Company NAV					**53**	**0.37**

Long term GBPUSD exchange rate of 1.40 is used
Source: SP Angel

Project NPVs breakdown



Source: SP Angel, Company

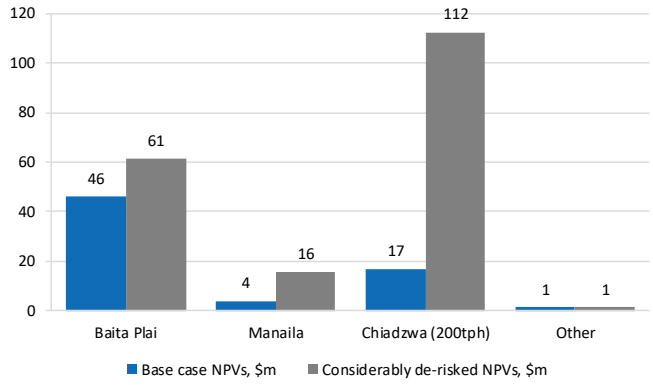
Fast track from development to production

Vast Resources offers an exposure to a pre-production portfolio of assets with the polymetallic Baita Plai project planning to launch operations in H1/20 delivering 4ktpa CuEq and yielding $17m in EBITDA and $12m in FCF annually (at $7,500/t Cu price) once production rises to full 13ktpm capacity. Development diamond licenses in the Chiadzwa Community Concession area may also fast-track once economics of the project are confirmed given the alluvial nature of the deposit allowing for a low in capex and short in construction period delivery of the project. On preliminary management estimates adjusted for lower than planned plant availability (50% v 85% budgeted by Vast) the project is expected to run at ~1.2mcts in annual production, generating $45m in EBITDA and $33m in FCF per annum (at $58/ct rough diamond price). This compares to un-adjusted Vast expectations for 85% plant availability yielding 2.0mcts in production per annum and generating $77m in EBITDA and $57m in FCF per annum (assuming same rough diamond prices).

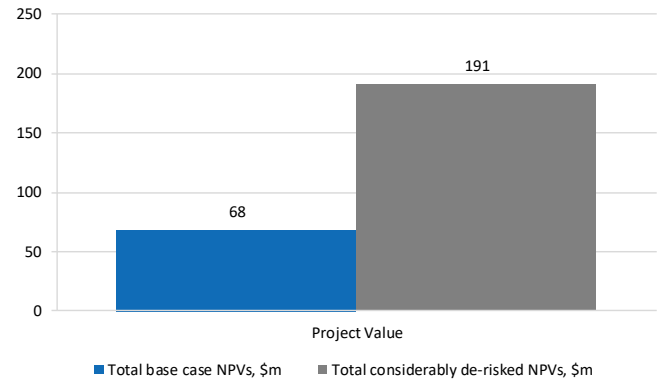
De-risking projects is a way to unlock value in the Vast portfolio of projects

Development stage of Vast portfolio assets varies considerably offering a valuation re-rating opportunity as more work is completed to de-risk respective projects. For instance, we applied 0.75x multiple for the Baita Plai project reflecting its pre-production status, 0.25x multiple for the Carlibaba Extension at Manaila given the pre-reserve and economic study level of the project and 0.15x multiple to Chiadzwa Community Diamond Concession due to its pre-resource stage. In this regard, the Chiadzwa alluvial diamonds project offers the most value upside in terms of gradual de-risking of the project (see chart below). In aggregate, de-risking of the portfolio of assets may potentially see a 181% increase in attributable project NPVs ($68m v $191m) translating into a 1.22p NAVPS.

Attributable NPVs of portfolio assets with/without P/NAV discounts applied to projects based on a respective development stage (see multiples applied in the table above)



De-risking the portfolio of assets may potentially see a 181% increase in attributable project NPVs



Source: Company, SP Angel

Permitted and funded to production

Vast Resources has recently signed an agreement with Atlas Capital Markets for a $15m (gross) convertible bond facility to re-start production at the $3.6m Baita Plai polymetallic brownfield operation in Romania as well as to advance the Chiadzwa Community Diamond Concession project in Zimbabwe.

Exploration potential offers an opportunity to grow the existing mine life

At Baita, the mineralisation remains open at depths while the present in-house mine plan accounts for only two of seven identified mineralised pipes. The future of the Manaila operation lies within the Carlibaba Extension project with the latest mineral resource update referring to an exploration potential to increase the current mineral inventory by ~35kt Cu or 80% in open pit domain (defined as within 125m from surface) and add up to 307kt Cu in the underground domain (assuming top end of the range tonnage and grade). The scale of the Chiadzwa diamond project is yet to be determined with a potential economically viable diamondiferous alluvials as well as conglomerate ore resources given the prospectivity of the region that supplied ~60mcts over the last two decades.

Diversification among commodities and regions

Vast Resources offers exposure to predominantly copper with other base and precious metals by-products across the portfolio of assets in Romania and rough diamonds in Zimbabwe with the spectrum of projects ranging from early exploration to pre-production stages limiting risks typical to a single asset / single jurisdiction mining Company.

The team brings years of regional operation experience with established relationships with local authorities

Andrew Prelea, CEO, has been instrumental in establishing Vast's presence in Romania leveraging off a strong network of contacts in the metals and mining sector. Mark

Mabhudhu, Director of the Zimbabwean Vast subsidiary, has previously acted as CEO of the state controlled ZCDC, a party to the mining agreement at the Chiadzwa Community Diamond Concession, as well as having spent 11 years with Debswana, a JV between the government of Botswana and De Beers.

Delivering production and cash flows to reduce the cost of funding

The team negotiated a non-conversion period with Atlas that may see the Company attracting cheaper sources of funding and avoiding dilution to shareholders once Baita Plai is up and running generating earnings and cash flows.

Future newsflow

1. Progress update at Baita Plai following drilling results and with first production expected in H1/20;

2. JORC-compliant mineral resources/reserves statement at Baita Plai (exp. Q2-Q3/20);

3. Mining license and final ownership structure agreement with regards to the Chiadzwa Community Diamond Concession project;

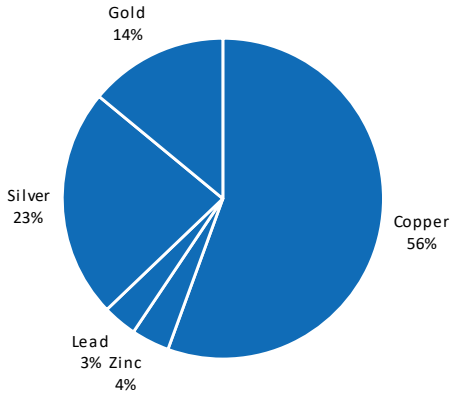
4. Maiden JORC-compliant mineral resource estimate and an economic assessment of the Chiadzwa alluvial diamonds project (exp. 9m after securing the license);

5. Regional exploration and updates on development plans for Carlibaba Extension at Manaila are subject to capital availability with primary focus on Baita and Chiadzwa.

NAVPS sensitivities

Base case price assumptions and discount rates used in the NAV calculation are provided below. We singled out copper as the next most significant commodity exposure after rough diamonds (Chiadzwa Community Diamond Concession) accounting for ~60% of Baita Plai payable metal production (see the pie chart below).

Baita Plai payable metal production breakdown ($m, per annum)



Source: Company

Hence, we have prepared sensitivity tables with Vast Resources' NAV per share at various discount rates as well as copper and rough diamond price assumptions.

SPA NAV assumptions		Mar-20	Mar-21	Mar-22	Mar-23	Mar-24
Copper price	$/t	6,092	6,363	7,125	7,500	7,500
Rough diamond price	$/ct	58	58	58	58	58
Discount rate	10%					

Source: SP Angel

NAV sensitivity to copper price and discount rate

		Discount rate			
		8%	10%	12%	15%
Copper price	-15%	0.32	0.29	0.26	0.23
	-10%	0.35	0.32	0.29	0.25
	0	0.41	0.37	0.33	0.29
	10%	0.46	0.42	0.38	0.33
	15%	0.49	0.44	0.40	0.35

NAV sensitivity to rough diamond price and discount rate

		Discount rate			
		8%	10%	12%	15%
Rough diamond price	-15%	0.38	0.34	0.31	0.27
	-10%	0.39	0.35	0.32	0.27
	0	0.41	0.37	0.33	0.29
	10%	0.42	0.38	0.35	0.30
	15%	0.43	0.39	0.36	0.31

NAV sensitivity to copper and rough diamond price (at 10% discount rate)

		Copper price				
		-15%	-10%	0	10%	15%
Rough diamond price	-15%	0.26	0.29	0.34	0.39	0.42
	-10%	0.27	0.30	0.35	0.40	0.42
	0	0.29	0.32	0.37	0.42	0.44
	10%	0.31	0.33	0.38	0.43	0.46
	15%	0.32	0.34	0.39	0.44	0.47

Source: SP Angel

Risks

We touch on a number of risks below which are by no means exhaustive that typically involve exploration and mining related risks including geological, operational, political, environmental, financial and market issues.

No JORC compliant mineral resources/reserves on development assets

The only JORC-compliant mineral resource statement is currently available is at the Manaila polymetallic mine in Romania that is on care and maintenance. No independently verified mineral inventory or economic studies are available on the other two flagship development projects, namely, Baita Plai and Chiadzwa Community Diamond Concession projects.

Operational risk

Mining dilution, equipment availability and maintenance, underground development, access to skilled labour, metallurgical recoveries at the flotation plant and the quality of produced concentrates at Baita Plai are some of variables central to project economics. To this end, the Company engaged 3rd party consultants to work on economic studies and is planning to prepare JORC-compliant mineral inventory estimates for its assets while SGS is working on metallurgical tests for Baita to identify optimal flowsheet.

Permitting

Securing license for Baita Plai proved to be a lengthy process (~3 years) complicated by the involvement of the State Mining Company Baita SA. Permitting is reported to normally take ~6-9 months.

Regulatory risk

Zimbabwe is facing its worst economic crisis in a decade amid both structural challenges as well as weather related disruptions from Cyclone Idai in March and regional drought. Power shortages, running away inflation, continuous fiscal and current account deficits, corruption and inconsistent policy decisions are among few factors that have constrained business investment, private spending and ultimately economic growth. Amid challenging socio-economic background, risks are for the government to potentially consider increasing fiscal burden on FX earning industries including mining or re-introducing indigenisation policy as well as an outright nationalisation of the project.

Zimbabwe geopolitical risk

Zimbabwe has been subject to the US and EU sanctions for a number of years on accusation of human rights' violations with the latest development involving the US issuing a ban on trading in rough diamonds from Zimbabwe arguing the nation uses forced labour at its diamond fields in Marange. Sanctions undermines the competitiveness of diamond production from Zimbabwe in international markets potentially adversely affecting realised prices for stones. The Company is planning to market rough diamonds directly avoiding sanctioned Minerals Marketing Corporation of Zimbabwe (MMCZ) while the ZCDC is planned to be moved in the ownership of the Ministry of Mines from sanctioned Zimbabwe Mining Development Corporation.

Dilution risk

The Company currently has no FCF generating assets and relies on equity and debt funding to develop the Baita Plai brownfield polymetallic mine and greenfield Chiadzwa concession alluvial diamond project. Budget projections guide for low capital investment requirements for restarting the brownfield Baita Plai polymetallic mine as well as commissioning of the greenfield Carlibaba Extension project highlighting low cost operations' jurisdiction. Capital/operating cost overruns and project delivery delays will put pressure on the

Company to source additional equity/debt funding leading to a weakening in the financial position or potential dilution.

Commodity price risk

The Baita Plai polymetallic mine is expected to be producing copper, zinc and lead flotation concentrates with gold and silver by-products, while the Chiadzwa Community Diamond Concession is forecast to produce industrial and gem quality diamonds which in turn exposes Vast Resources to fluctuations in prices for base and precious metals as well as rough diamonds.

Corporate governance risk

Mr Prelea and Mr Tucker, two acting Executive Directors on the Board of Directors at Vast Resources, are shareholders in the AP Group that own a 20% interest in the Baita Plai project representing a potential conflict of interest. Negotiations are ongoing regarding a conversion of the interest in the project into Vast shares and alignment of interests.

Credit risk

The Company is planning to direct $2m of the latest $15m (gross) convertible bond proceeds to close the $1m SSGI loan and repay $1m of the outstanding $4m Mercuria loan. While Atlas loan facility is convertible into Vast shares at an adjustable conversion price, we see credit risk limited to the remaining $3m owed under the Mercuria debt (plus accrued interest).

Market data		
Ticker		VAST LN
Last price	GBp	0.29
GBPUSD		1.30
Mkt cap	GBPm	29.7
	USDm	38.7
EV	GBPm	33.5
	USDm	43.6
Av # of sh in issue	mln	10,253
Av # traded, 100d	mln	369

Prices as of 12/12/19

Vast Resources Financials

(YE Mar)

Commodity prices		Mar-15	Mar-16	Mar-17	Mar-18	Mar-19
Copper price	US$/t	6,531	5,217	5,168	6,482	6,356
Zinc price	US$/r	2,182	1,840	2,376	3,038	2,721
Rough diamond index	x	239	198	200	197	204
Income Statement ($m)		**Mar-15**	**Mar-16**	**Mar-17**	**Mar-18**	**Apr-19**
Revenues	$m	-	7.2	23.8	3.1	3.4
EBITDA	**$m**	**-6.0**	**-5.9**	**0.9**	**-3.1**	**-7.9**
margin	**%**	**-**	**-**	**4%**	**-**	**-**
EBIT	$m	-6.0	-8.0	-1.7	-4.5	-9.1
Net Interest	$m	0.0	-0.5	-0.7	-0.7	-0.8
PBT	**$m**	**-6.0**	**-8.5**	**-2.4**	**-17.8**	**-10.0**
Tax	$m	-	1.7	-1.2	-	-
PAT (ex disc.op)	**$m**	**na**	**na**	**na**	**-17.8**	**-10.0**
PAT		**-6.9**	**-15.6**	**-3.6**	**-15.5**	**7.1**
EPS basic	**$c**	**-0.75**	**-1.02**	**-0.13**	**-0.36**	**-**
EPS diluted	**$c**	**-0.75**	**-1.02**	**-0.13**	**-0.36**	**-**
Cash flow ($m)		**Mar-15**	**Mar-16**	**Mar-17**	**Mar-18**	**Apr-19**
CFO	**$m**	**-4.5**	**-1.2**	**4.1**	**0.1**	**6.2**
Interest paid	$m	0.0	-0.5	-0.7	-0.7	-0.8
Tax paid	$m	-	-	-	-	-
Net CFO	**$m**	**-4.5**	**-1.7**	**3.4**	**-0.6**	**5.4**
Capex (incl Exploration)	$m	-0.5	-8.7	-8.8	-9.2	-11.4
CFI	**$m**	**-0.1**	**-8.1**	**-9.0**	**-7.5**	**-13.3**
Issue of shares	$m	3.8	5.2	4.2	3.1	8.1
Dividends paid	$m	-	-	-	-	-
Proceeds from borrowings	$m	1.6	2.4	5.3	9.2	6.2
Repayment of borrowings	$m	-	-	-3.4	-4.1	-7.0
CFF	**$m**	**7.1**	**7.6**	**6.1**	**8.1**	**7.2**
Net cash flow	$m	2.5	-2.3	0.5	-0.0	-0.7
Cash cf	**$m**	**3.1**	**0.8**	**1.3**	**1.3**	**0.6**
Balance Sheet ($m)		**Mar-15**	**Mar-16**	**Mar-17**	**Mar-18**	**Apr-19**
Cash	$m	3.7	0.8	1.3	1.3	0.6
Receivables/prepayments	$m	4.1	3.9	5.5	5.4	2.5
Inventories	$m	0.1	1.9	2.8	4.1	0.4
Current assets	**$m**	**8.0**	**6.6**	**9.7**	**10.8**	**3.5**
Exploration & PPE	$m	31.4	32.5	38.6	45.5	11.3
Non-current assets	**$m**	**31.4**	**34.2**	**39.5**	**46.1**	**11.3**
Total assets	**$m**	**39.3**	**40.8**	**49.1**	**56.9**	**14.8**
Payables, provisions	$m	2.8	6.7	7.4	7.6	3.5
Borrowings ST	$m	1.2	4.3	3.9	4.3	1.5
Current liabilities	**$m**	**4.1**	**11.0**	**11.4**	**11.9**	**4.9**
Borrowings LT	$m	1.6	0.9	3.2	22.6	4.0
Other	$m	-	1.0	1.1	4.7	0.5
Non-current liabilities	**$m**	**1.6**	**1.9**	**4.3**	**27.4**	**4.5**
Total liabilities	**$m**	**5.6**	**12.9**	**15.6**	**39.3**	**9.5**
Net assets	**$m**	**33.7**	**28.0**	**33.5**	**17.6**	**5.3**
Key financial metrics		**Mar-15**	**Mar-16**	**Mar-17**	**Mar-18**	**Apr-19**
Net debt/(cash)	$m	-0.9	4.4	5.8	25.7	5.0
Av # of sh (diluted)	mln	885	1,580	3,458	4,822	5,887
EV/EBITDA	x	-	-	21.2	-	-
PER	x	-	-	-	-	-
FCF (NCFO-Capex)	$m	-4.9	-10.5	-5.4	-9.8	-6.0
FCF yield	x	-	-	-	-	-
DY	x	-	-	-	-	-
ROA	x	-	-	-	-	19.8%
P/BV	x	0.41	0.90	0.42	1.73	6.41
Interest coverage	x	-	-	-	-	-
Net Debt/EBITDA	x	-	-	6.2	-	-

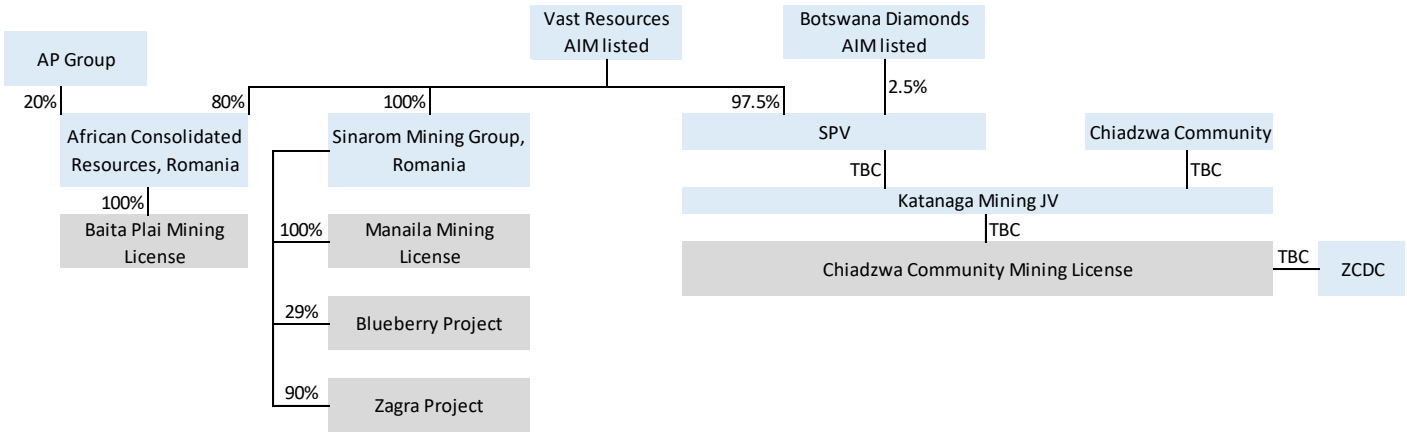
Source: SP Angel, Company

The Company divested its 50.1% interest in Ronquil Enterprises through which it held 25.01% interest in Pickstone Peerless Gold Mine leading to a deconsolidation of the latter that has been previously accounted for 100% in accounts. FY19 Income Statement and Balance Sheet are reported net of Zimbabwean gold assets.

Company overview and ownership structure

Vast Resources listed on AIM in 2006 under the previously held name of African Consolidated Resources Plc[1] focused on precious and base metals projects in Zimbabwe. The Company acquired stakes in Baita Plai and Manaila polymetallic assets in Romania in 2015 expanding the geographical reach and commissioned the 1.0moz in reserves Pickstone-Peerless gold operation in Zimbabwe same year. The team divested the 25% effective interest in Pickstone-Peerless in 2019 narrowing down the focus to projects in Romania and alluvial diamond concessions in Zimbabwe and aiming to fast track the existing portfolio of assets into production.

Vast Resources main assets ownership structure



The remaining 20% is owned by AP Group owned by Mr Prelea (50%), Mr Kellow, a former Director of the Company (30%), Mr Tucker, Business Director (10%)
Source: Company

[1] Name changed in Mar/15.

Romania

Baita Plai (80%)

Baita Plai (formerly Baita Bihor) is a brownfield polymetallic deposit with a historic flotation processing plant located in the Apuseni Mountains, north-western Romania. The area is known to host large precious, base metals and uranium deposits. The operation has been on care and maintenance since mid-2013 and was acquired by the Group in H1/15. After securing the mining permit in Oct/18, the polymetallic operation is in the development stage with first concentrate expected in H1/20 following successful completion of the development capital funding. The deposit is estimated to host 1.8mt at 2.2% Cu, 3.5% Zn, 3.1% Pb, 1.4g/t AU and 128g/t Ag[2] (12y LoM assuming budgeted 13ktpm production levels and 100% conversion) and with a small scale flotation plant planned to be ramped up to production of 4kt CuEq per annum (including 2kt Cu with zinc, lead and precious metals by-products).

Location of Vast portfolio assets in Romania

Source: Company

Baita Plai production profile		Mar-20	Sep-20	Mar-21	Sep-21	Mar-22	Sep-22	Mar-23	Sep-23
Cu price	$/t	6,200	6,150	6,575	7,000	7,250	7,500	7,500	7,500
Zn price	$/t	2,478	2,450	2,500	2,550	2,550	2,550	2,550	2,550
Pb price	$/t	1,993	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Au price	$/oz	1,493	1,545	1,523	1,500	1,500	1,500	1,500	1,500
Ag price	$/oz	16	17	17	17	17	17	17	17
Throughput	kt	-	45.0	78.0	78.0	78.0	78.0	78.0	78.0
CuEq	%	-	4.28	4.12	3.95	3.88	3.81	3.81	3.81
Cu grade	%	-	1.90	1.90	1.90	1.90	1.90	1.90	1.90
Zn grade	%	-	.50	.50	.50	.50	.50	.50	.50
Pb grade	%	-	.60	.60	.60	.60	.60	.60	.60
Au grade	g/t	-	1.58	1.58	1.58	1.58	1.58	1.58	1.58
Ag grade	g/t	-	79.28	79.28	79.28	79.28	79.28	79.28	79.28
Gross CuEq production	kt	-	1.42	2.37	2.28	2.24	2.20	2.20	2.20
Payable CuEq production	kt	-	1.29	2.15	2.08	2.04	2.01	2.01	2.01
Net revenue (post royalty)	$m	-	7.1	12.7	13.1	13.4	13.6	13.6	13.6
	$/t milled	-	158	163	168	171	175	175	175
Operating costs	$m	-	2.9	5.1	5.1	5.1	5.1	5.1	5.1
	$/t milled	-	65	65	65	65	65	65	65
EBITDA	$m	-	4.2	7.6	8.0	8.3	8.5	8.5	8.5
Capex	$m	3.6	1.2	1.2	1.2	1.2	1.2	1.2	1.2
FCF	$m	-3.6	2.4	5.3	5.6	5.9	6.1	6.1	6.1
NPV10%	$m	77							

[2] Non-JORC local NAEN Code.

Source: Company, SP Angel

Production facilities

Underground operation is set to benefit from some 400kt of ore in already developed mine workings located between levels 16 to 18 (260-350m from surface) as well as refurbished underground and surface infrastructure including two operating shafts (one running from surface to level 13 and another one from level 13 to level 18). Shaft capacity is for 16ktpm accommodating planned 13ktpm plant throughput rates. After securing the asset, the Company has invested in pumping capacities to keep mine workings dry while also looking after mine shafts having replaced cages and installed new ropes. Mining equipment will need complete replacement with existing stopes to be developed using overhead shrinkage stoping with the blasted ore to be collected by mechanical front loaders, transported to the ore pass, collected at lower levels and loaded onto rail hoppers.

Two ball mills along classifiers owned by the Group

1km tramway receiving end with the blasted ore to be fed into silos feeding the crushing circuit

Source: Company, SP Angel

Existing processing complex features standard crushing, milling, flotation and filtration circuit for production of base and precious metals rich concentrate. The site includes 3 ball mills (7.5ktpm capacity each), although, only two of those are owned by the Company offering a potential 15ktpm run rate, fully accommodating budgeted 13ktpm production rate. Two lines of flotation cells, thickener tanks and filter presses are in place.

Management suggests the amount of refurbishment works required to reach first production is minimal focused on the pre-milling part of the circuit including installation of new crusher and conveyor belts among other things. $3.6m budgeted development capex amounts to a low $23/t of milling rate reflecting brownfield nature of the deposit with most of capital-intensive underground infrastructure as well as ball mills in the processing plant being in place.

The plan is to launch production at a reduced 6ktpm rate (H1/20) ramping it up to 13ktpm over the course of six months (H2/20 in our model).

Geology and mineralisation

Baita Plai is characterised as a skarn deposit with faults controlled high grade copper-silver-zinc-lead-gold-tungsten-molybdenum mineralization. Faults are reported to be dipping at 55-70 degrees with encountered average mineralised widths of 6-8m.

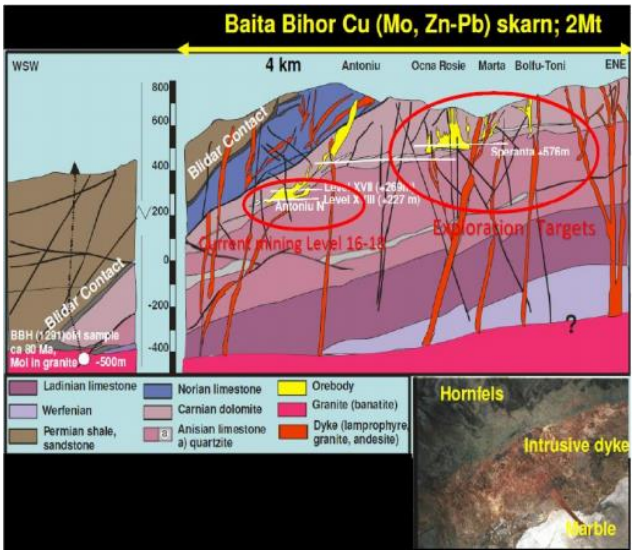
Exposed oxidised material in stopes at Level 16

Sulphide mineralisation in developed stopes level 16

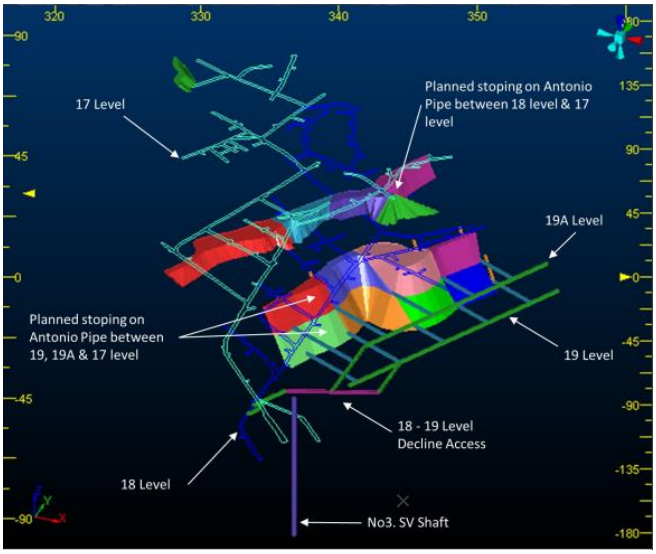
Source: Company, SP Angel

Exploration works have been constrained as the Group awaited the resolution of the mining permit application. The team is planning a drilling programme in December 2019 to convert the available resource into JORC compliant Code. The mineralisation remains open at depth with historic drilling returning mineralised intersections 90m below the deepest level 18 (see graph) which are believed to reflect a merger of two orebodies and result in higher grade but narrower mineralisation. Additionally, there are seven skarn pipes identified at Baita with the in-house mine plan currently including only two of those. Some 400kt of polymetallic ore having been identified within the developed mine workings which is enough to feed the plant for nearly three years. The team is in no rush to expand the resource but is in a good position to do so once funding is made available.

Baita Plai cross section



Baita Plai planned underground stopes



Source: Company

Metallurgy

The Company commissioned SGS to prepare metallurgical testwork on the Baita Plai polymetallic ore looking at recoveries, potential to separate out zinc and lead as well as any deleterious elements in the final product. Results will help to determine optimal flotation plant parameters, target yields, recoveries, concentrate grades driving product marketability and smelter payabilities.

Metallurgical samples will be collected as part of the confirmation drilling programme that commenced in December 19.

Vast internal production model assumed low 78%, 69% and 56% copper, zinc and lead recoveries in final concentrate for production of 28% Cu copper concentrate, 56% Zn zinc concentrate and 50% Pb lead concentrate.

Baita Plai concentrate production assumptions	Processed grades	Flotation recoveries	Con grade	Payable metal in con
Cu	1.90	78%	28%	96%
Zn	0.50	69%	56%	85%
Pb	0.60	56%	50%	94%

Source: Company (for grades, recoveries, con grades), SP Angel (payabilities)

Resources and reserves

Baita plai	Ore mt	Cu pp	Zn pp	Pb pp	Au g/t	Ag g/t	CuEq	CuEq, kt
C1+C2	1.8	2.19	3.46	3.07	1.41	128.2	6.04	108.7

Prices used for conversion to CuEq are SP Angel long term forecasts
Non JORC NAEN Code
C1 and C2 is equivalent to Measured and Indicated categories under JORC depending on the complexity of the orebody
Source: Company

JORC compliant resource/reserve statement is to be prepared following the drilling programme initiated in Q4/19 and released in H2/20.

Infrastructure

The Baita Plai mining and processing complex has good road access allowing the delivery of mining equipment, spare parts and consumables as well as transportation of produced concentrates (the photo below features access to the site with the complex sharing space with an operating limestone facility).

Limestone operation (run by Baita SA) next to the Baita Plai processing plant

Source: Company, SP Angel

The Company has installed an independent power line with all trenching works and cabling completed with a view to source electricity from the national power grid in December 2019.

Regularly inspected tailings dam facility has got capacity to accommodate future production while the team is currently in the process of replacing the seven kilometre pipeline. The Company invested $6.5m to date accounting for acquisition and legal fees as well as spending nearly half of that on keeping pumps running and keeping some staff since acquiring the asset in anticipation of development works. In the underground, historic mine

adits, drives and cross-cuts are in place along with three access shafts and underground and surface rail tracks connecting the mine with the processing plant.

Dual purpose shaft at level 13

Winders at level 13 for the second shaft to levels 16 and 18

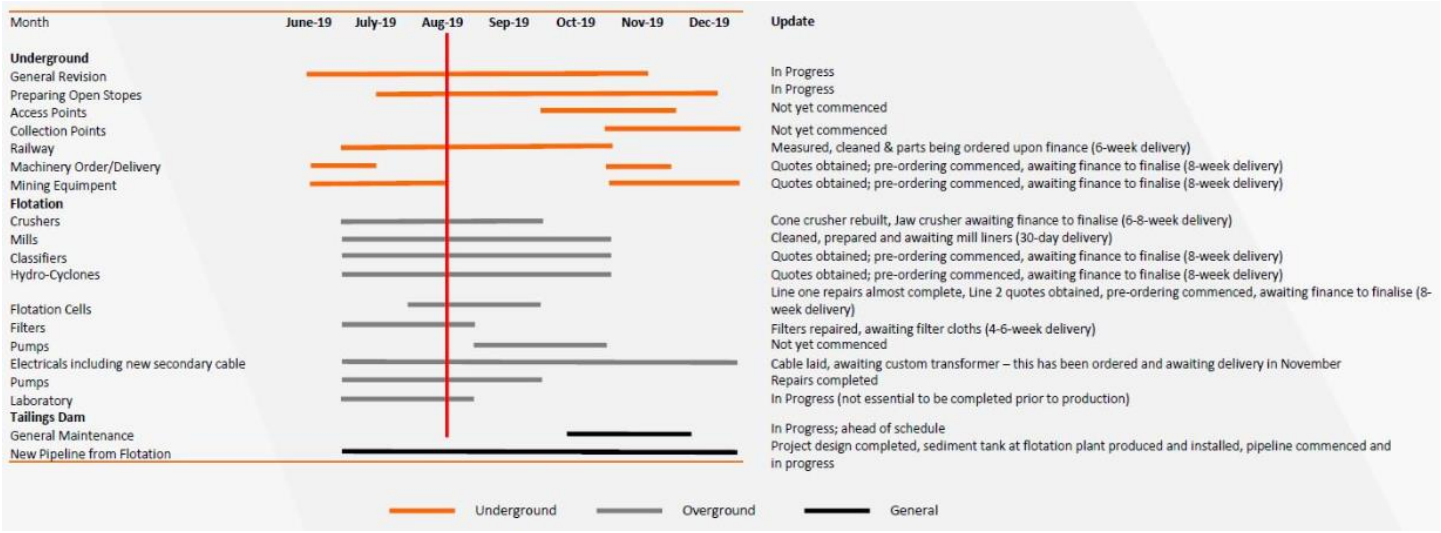
Source: Company, SP Angel

Development schedule

The Company secured the mining permit in Oct/18 allowing African Consolidated Resources SRL, a 80% subsidiary of the Company, to commence development works.

Development works include a replacement of the existing pipeline to the tailings dam storage facility, underground infrastructure (ventilation fans and a shaft incline to new mining levels), replacement of flotation cells, new crusher, mining equipment and refurbishment works on the remaining parts of the processing plant.

Progress report as of Aug/19



Source: Company

Project economics

In arriving at project economics estimates we used Vast's in-house indicative production profile involving gradual ramp up profile[3], guided development capital expenditures and adjusted operating costs. The Company has identified a number of cost optimisation options that is estimated to yield a 40% saving on the initial $81/t milled estimate. We used a mid-range between two estimates and applied $65/t unit operating cost. We applied our

[3] Source: http://www.vastplc.com/wp-content/uploads/2019/03/2019-production-portfolio-29.01.19.pdf

own commodity price assumptions highlighted in the production profile in the table above to arrive at NPV estimates.

Based on guided production rates, operating and capital costs as well as commodity price forecasts, the Project NPV10% is estimated at $77m (post tax) or $61m for 80% Vast share, equivalent to 0.32p in NAV per share contribution after adjusting for a 0.75 P/NAV factor reflecting the status of the project.

Baita Plai underground operation (100%)		
Throughput	ktpa	156
LoM	years	12
Cu grade	%	1.90
CuEq	%	3.85
Cu production	ktpa	2.3
CuEq production	ktpa	4.3
Cu TC 5y average	$/t	50
Zn TC 5y average	$/t	115
Royalty	%	5%
C1 cost	$/t milled	65
Development capex	$m	3.6
Cu price	$/t	7500
Zn price	$/t	2550
Total FCF (post tax)	$m	133
NPV10% (post tax)	$m	76.6
IRR (post tax)*	%	246%

*Subject to amendment if capital costs change
Source: Company, SP Angel

Manaila (100%)

The Manaila Polymetallic Mine (MPM) is an open pit copper/zinc operation located in the Suceava County, northern Romania, approximately 340km away from the capital city of Bucharest. The Company acquired the asset in H2/15 taking over mining operations and the metallurgical complex producing copper and zinc concentrates. The mining license is for 0.3km^2 secured in the present expanded form in Feb/18 with the expiry date of 2021 (the license can then be extended by five years every five years). Additionally, the Company holds a 1.4km^2 license covering the adjacent to the pit area as well as the Carlibaba extension. Manaila run at 3ktpa in 18% Cu concentrate and 0.5ktpa in 35% Zn concentrate with the flotation plant treating c.10ktpm of ore, 50% below the installed capacity reflecting a bottleneck in mining operations. In terms of metal output volumes, Manaila produced 0.5kt and 0.2kt in copper and zinc, respectively, generating c.$3m in annual revenues. The mine is currently remaining temporarily suspended after having been placed on care and maintenance in mid-Dec/18 on the back of high operating costs and continuously running at negative FCF. The team is considering to potentially develop an adjacent Carlibaba deposit and build a new processing plant ($4m, 2x15ktpm) in the vicinity of the mining operations. Both the Manaila open pit as well as Carlibaba extension are estimated to host 4.6mt at 0.97% Cu, 0.68% Zn and 0.32% Pb in the open cut resource domain with another 1.1mt at 1.58% Cu, 0.88% Zn and 0.82% Pb in the underground mineral resource (JORC-compliant).

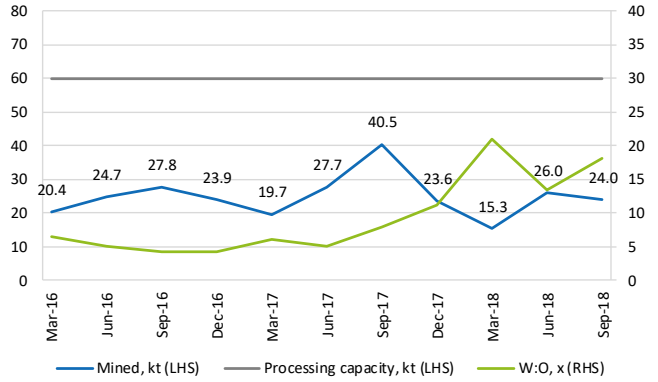
Manaila open pit, processing plant and tailings facility layout

Source: Company

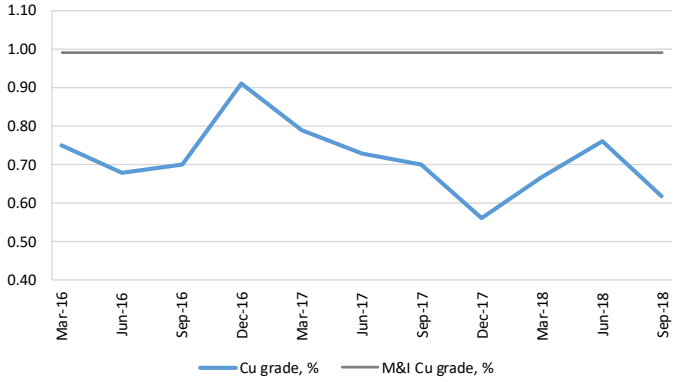
Production facilities

The open pit polymetallic mine involves standard drilling, blasting, loading, hauling and dumping operation with a capacity of c.100ktpm of material (ore with waste) using contractor mining. Ore mining rates have been running low at <10ktpm due to weak equipment availability and limited working week. An increase in waste stripping at deeper horizons has further highlighted the mining side bottleneck at Manaila. Operations have also been showing higher than planned mining dilution with lack of grade control drilling carried at the site (30-35%, around 2x planned levels).

Tonnages mined, increasing waste stripping and target processing rates at Manaila highlight mining operations' bottleneck (quarterly data)



Mined grades v latest resource grades (M&I category) highlight dilution issues



Source: Company, SP Angel

The processing plant represents a retrofitted former manganese treatment facility and includes a standard crushing, milling, flotation and filtration circuit for production of copper/zinc concentrates. From 2016 to 2018, the Company has been producing separate zinc concentrate establishing a second revenue stream. This, importantly, minimised zinc content in copper concentrate that previously attracted penalties from smelters. The site features two ball mills (14ktpm installed in 2013 and 8ktpm installed in 1970s) with a combined capacity of 18-22ktpm. With mining operations running at <10ktpm, the plant operated one ball mill at a time. The plant is located 32km away from the pit with transportation between mining and processing operations accounting for c.25-30% of mining expenses. Tailings are filter pressed and trucked to a former manganese open pit that was re-permitted as a tailings storage facility, TSF (14km away from the site). Remaining TSF capacity is around 0.5mt equivalent to more than a couple of years at full plant capacity (240ktpa).

Manaila plant ball mills

Flotation cells

Source: Company, SP Angel

Geology and mineralisation

Manaila is a volcanogenic massive sulphide (VMS) type deposit with mineralisation comprised of higher grade, darker coloured massive sulphides running at 0.5-5.0% Cu and Zn and lower grade, lighter coloured disseminated sulphides formed on the flanks of the massive sulphide and containing 0.2-0.6% Cu and Zn. The orebody thickness ranges from <1m to 30m with 5m on average and dips moderately at 20-30', although the orebody

steepens around faults to 70-80'. The mineralisation remains open along strike and dip. In fact, Carlibaba deposit which is set to become the source for the new 30ktpm processing plant appears to be an extension of the Manaila deposit separated by a fault.

Manaila sulphide ore – disseminated (left) and massive (right) sulphides

Manaila open pit with operations running mid-2018

Source: Company, SP Angel

Infrastructure

The operation benefits from power grid connection and good road access being located 26km from the local city of Iacobeni. The Company operates an on-site laboratory significantly accelerating assays of the collected drilling samples as well as verifying grades and impurities of the produced concentrate. Availability of skilled labour and the location of the dry stacked tailings waste dump found 14km away from the processing facility is a limitation.

Resources and reserves

Manaila	Interest	Ore mt	Cu pp	Zn pp	Cu, kt	Zn, kt
OP domain						
Measured&Indicated		3.6	0.93	0.63	33.3	22.6
Inferred		1.0	1.10	0.84	11.5	8.8
MII		4.6	0.97	0.68	44.8	31.4
UG domain						
Measured&Indicated		0.4	1.58	0.83	6.3	3.3
Inferred		0.7	1.57	0.89	10.7	6.1
MII		1.1	1.57	0.87	17.0	9.4
Total						
Proven&Probable	**100%**	-	-	-	-	-
Measured&Indicated		4.0	0.99	0.65	39.6	25.9
Inferred		1.7	1.28	0.86	22.2	14.9
MII		**5.7**	1.08	0.71	**61.8**	**40.8**

Resource also includes 0.41% Pb, 0.21g/t Au and 24g/t Ag; OP COG 0.25% Cu, UG COG 1.0%; Effective as of Feb/18; Source: Company

The Feb/18 updated mineral resource announcement highlighted above also included estimated 'Exploration Target' over the remainder of the exploration license based on existing surface drilling and historical records. Vast estimates there is an exploration potential to increase current mineral resource by ~35kt Cu or 80% in open pit domain (defined as within 125m from surface) and add up to 307kt Cu in the underground domain (assuming top end of the range tonnage and grade).

Manaila	mt	Cu pp	Zn pp	Cu, kt	Zn, kt
OP Exploration Target min	1.1	0.4	0.2	4	2
OP Exploration Target max	3.2	1.1	0.6	35	19
UG Exploration Target min	7.9	0.4	0.3	31	24
UG Exploration Target max	23.6	1.3	1.1	307	259

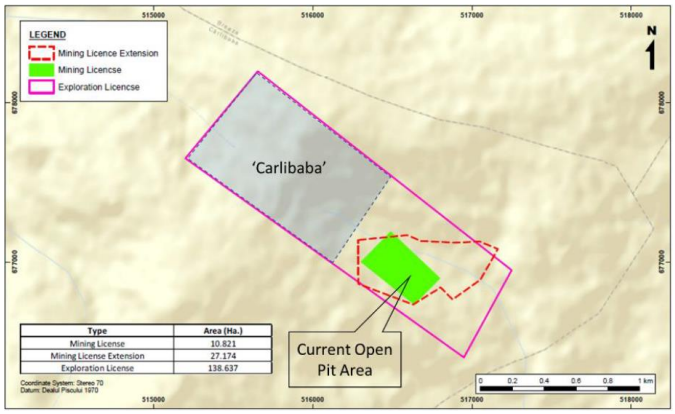
Source: Company

Carlibaba Extension project

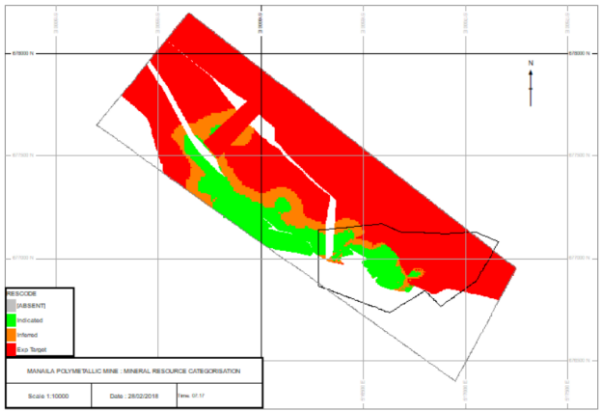
The Company is planning to launch development of the new processing plant with a 30ktpm processing capacity (two 15ktpm mills) next to the future Carlibaba open pit operation. The $4m project is planned to replace the existing operation allowing operating costs to be cut significantly by locating the plant next to the open pit.

The Company does not breakout the Carlibaba resource from the total of 5.7mt and does not run mineral reserves on the asset. Although, looking at the outline of Indicated/Inferred mineral resources (see below), Carlibaba accounts for major share of that with management draft estimates pointing to a 14-year mine life supplying 0.80% Cu material to the new 360ktpa plant. The Company does not expect significant amounts of pre-stripping required (15m overburden); however, the LoM waste stripping ratio is expected to average relatively high 8.5x, which is still less than 16x times recorded over the last 12 months at the Manaila deposit (in fairness, we highlight the elevated waste stripping ratio was also a function of limited mining equipment availability). The Company is considering expanding the mining equipment to match expanded processing capacity that would help improve the availability of the machinery, flexibility of operations as well as allow to minimise initial capital outlay if leased from equipment providers.

Carlibaba extension location relative to the Manaila open pit



The outline of Indicated and Inferred mineral resource categories over the exploration permit



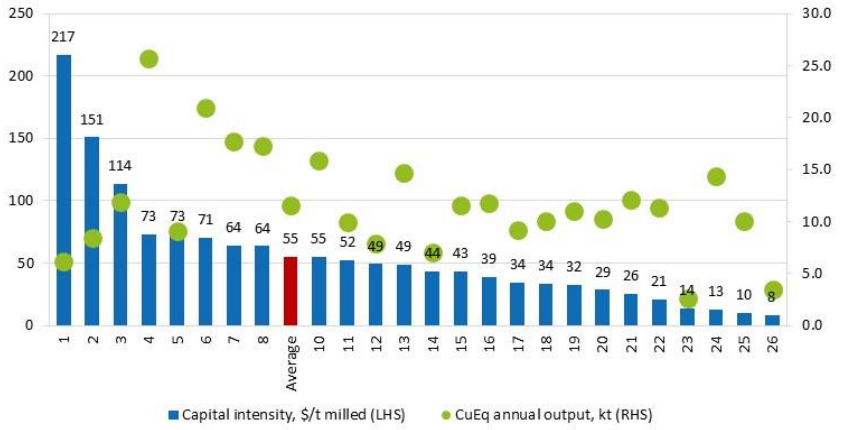
Source: Company

We expect the Company to resume project design work, land acquisition and concession agreement discussions once the two priority projects, namely Baita Plai and Chiadzwa Community Diamond Concession projects, start generating FCF that may potentially be leveraged off with bank funding for development capital.

We have put together a provisional in nature and very preliminary DCF model using assumed throughput rates, grades, recoveries and operating costs with adjustments to guided capex and life of mine estimates.

We have adjusted development capex up to US$8.5m applying a low $23/t mill size capital intensity estimate to 360ktpa projected mill throughput rate versus c.$11/t guided by the Company. This also amounts to half of the average $55/t capital intensities reported by other open pit copper development projects (see below).

Capital intensities for open pit development stage copper projects ($/t milling rate pa) with respective CuEq annual production rates



Source: Company

Furthermore, we feel project economics would benefit from a shorter mine life that would, in turn, potentially reduce the average waste stripping ratio which is currently assumed at high 8x for 1.0% CuEq ROM (0.8% Cu and 0.6% Zn). Post tax FCF drops to ~$1m pa at 11x waste to ore (W:O) ratio. We summarise our main assumptions and respective DCF model results below.

Carlibaba open pit operation (100%)

Ore (over LoM)	mt	3.2
Throughput	ktpa	360
W:O	x	6.5
LoM	years	9
Cu grade	%	0.80
Zn grade	%	0.60
Cu production	ktpa	2.3
Zn production	ktpa	1.4
Cu TC 5y average	$/t	50
Zn TC 5y average	$/t	115
Royalty	%	5%
C1 cost	$/t milled	30
Development capex	$m	8.5
Cu price	$/t	7000
Zn price	$/t	2550
Total FCF (post tax)	$m	24.6
NPV10% (post tax)	$m	15.8
IRR (post tax)	%	62%

Source: Company, SP Angel

Carlibaba NAV is estimated at $16m, equivalent to 0.03p per share contribution after adjusting for a 0.25x P/NAV multiple reflecting the status of the project.

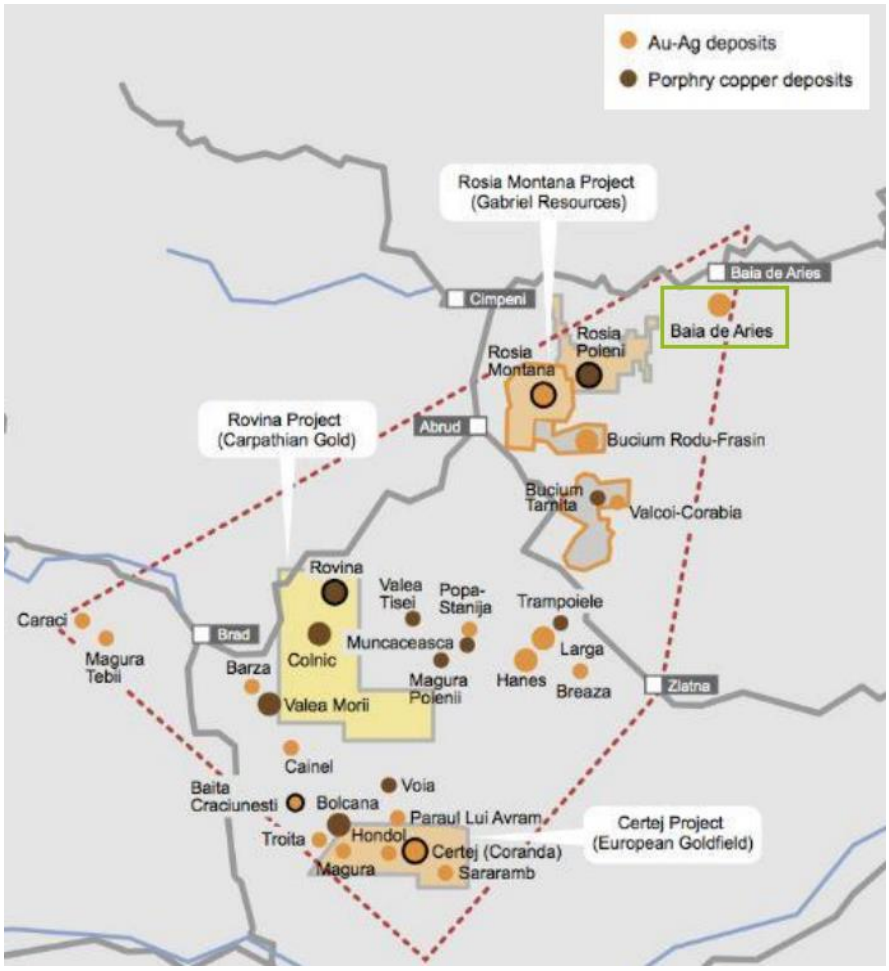
The project would benefit from a detailed engineering study, metallurgical work and a mineral reserve estimate allowing to narrow down project economics and funding options which in turn would help to fine tune potential NAV contribution of the Carlibaba Extension project to the Group. Additionally, more drilling across the "Exploration Target" area may help expand the existing JORC mineral resource and convert additional tonnages into the mine plan.

Exploration assets in Romania – Expanding the regional presence and building the pipeline of polymetallic development projects

Blueberry Project (29.4%)

Vast secured an indirect 29.41% interest in the Blueberry Project in Aug/18 gaining exposure to a 7.3km^2 brownfield area in the highly prospective for polymetallic mineralisation 'Golden Quadrilateral' region in the north western Romania. The region hosts such projects as Rosia Montana (10moz gold and 48moz silver in reserves), Rovina Valley (10moz GEO in Measured and Indicated resources), Certej (2.5moz gold and 16moz silver in refractory mineralisation reserves) as well as Rosia Poieni (nearly a billion tonnes of copper porphyry accounting for 60% of the nation's copper reserves and running at c.5ktpa in copper production per annum). Historic work completed on the project and more recent drilling returned encouraging results pointing to a potential to prove up a precious and base metals bearing mineral deposit.

The area of the Blueberry Project license (highlighted in green)



Source: Company

The license surrounds the old Baia de Aries Mine that has historically produced gold from six breccia pipes accounting for 20% of total 55moz of gold production in the Golden Quadrilateral region. Blueberry in turn is hosting a number of such breccia pipes that have been the subject to exploration works in the past including soil sampling (159 assays), rock sampling (98 assays) and surface drilling (25 holes). Polymetallic mineralisation occurs in sulphide bearing veins developed adjacent to the breccia pipes in the areas of intense fracturing with veins dimensions of around 100-400m along strike, 50-150m in depth and 1m in width. The mineralisation is dominated by zinc and lead with copper being subordinate. Gold mineralisation appears more prevalent in the breccia and occurs as free gold or inclusions within sulphides.

Recently, Vast completed a soil sampling programme identifying eight target areas for further surface drilling programme. In particular, a new previously unknown anomaly has been identified that strikes 1,700m east-west and returned an average value of 4.6g/t Au in samples. Of eight, four areas have been drill tested with two showing elevated gold and silver values over >10.0m intersections. Mineralisation has been intersected at or near surface within targeted breccia zones with high grade mineralised zones intersected at depth within zones of veining and faulting. Selected assay results from the ~6,800 core drilling programme received over the 2018-19 period include:

- 21.7m at 3.14g/t Au from 25m (AVBB009A)
- 6.2m at 1.99g/t Au from 48m (AVBB010)
- 16.0m at 2.95g/t Au from 190m (AVBB011)
- 39.0m at 2.42g/t Au from 108m, including 13.7m at 4.10g/t Au (AVBB013)
- 24.0m at 2.64g/t from 19m (AVBB021)
- 0.5m at 9.83g/t Au, 147.0g/t Ag, 18.90% Pb and 32.50% Pb from 41m (AVBB024)

The team is planning to use the data to complete a maiden JORC-compliant Mineral Resource Estimate as well as a feasibility study, development plan, environmental and social impact assessment and rehabilitation study to apply for an exploitation license.

So far, Blueberry has been funded on a project level with institutional and private investors putting $1m into EMA Resources, a subsidiary of Vast and a holder of the license, minimising dilution for the Vast shareholders. The plan is to de-risk the project sufficiently to list the EMA Resources as a separate entity with Vast remaining as one of shareholders. Third party investors have invested ~$1.0m in the project.

Zagra Project – Piciorul Zimbrului and Magura Neagra licenses (90%)

The Zagra project is located in the Zagra-Telciu area in Bistria-Nassaud County in northern Romania. The project comprises two adjacent areas including the 10km^2 Piciorul Zimbrului and the 21km^2 Magura Neagra with the Company having completed a 4,000m drilling programme in 2018. The plan is to identify further targets and prepare a drilling programme as part of the exploration license application. Historic exploration points to a copper-gold porphyry mineralisation at Magura Neagra and vein hosted copper-gold mineralisation at Piciorul Zimbrului.

At Magura Neagra, state owned exploration firm, IPEG Cluj, carried a prospecting programme in the 1986-93 period identifying five polymetallic veins ranging from 0.3-5.0m as well as an 800m long zone of disseminated sulphide mineralisation intersected in an underground adit. The prospect benefits from underground access to mineralised zones with drives developed between 972m and 1,340m amsl. Preliminary estimates (non-JORC) suggest an exploration target of up to 3.0bn tonnes of up to 0.8% Cu and 0.5g/t Au. 2,000m of drilling was completed at the site in 2018.

At Piciorul Zimbrului, previous exploration work conducted by IPEG Cluj included geological mapping of the 4.0km2 area, 1,200m of underground development and diamond drilling, 862m of surface drilling, 238m of pitting and 3,483m3 of pitting. The work identified six veins with associated copper and gold mineralisation along a 820m long drive at the 835m amsl level and two gold/silver/antimony bearing veins at the 950 amsl level. 2,000m of drilling was completed at the site in 2018.

The partner earned 10% into the project by spending $0.7m.

Zimbabwe

Chiadzwa Community Diamond Concession (ownership TBC)

The Company secured exclusive access to the Chiadzwa Community Diamond Concession in the Marange Diamond Fields in Aug/18 to carry the necessary due diligence assessing the exploration potential of the area with a view to establishing a JV with a local partner for development of commercial alluvial diamond operation and marketing of Marange rough diamonds. The team is in final talks with authorities regarding the ownership structure and exploitation license regarding the project.

The Chiadzwa Community Diamond Concession covers 73km^2 area in the Chiadzwa region of the eastern Zimbabwe. The project is next to Vast legacy Marange Diamond Fields claims and is believed to be an extension of the same geological system hosting potentially economically viable diamondiferous alluvials as well as conglomerate ore resources given the prospectivity of the region that supplied ~60mcts over the last two decades.

Marange Diamond Fields in the eastern Zimbabwe

Source: Kitco

As part of the due diligence, the Company engaged an independent Competent Person's preliminary geological assessment of the property that, in turn, highlighted a number of targets for placer diamond mineralisation. Contiguous licenses recorded grades in the range of 50-500cpht and typically 100-200cpht and average prices of $80/ct.

Company projections suggest the operation may potentially run at 2.0mcts per annum (90/10 spit between industrial and gem quality stones) generating ~$120m in turnover using $58/ct average value with 10% of production and 95% of sales proceeds coming from gem quality rough diamonds. At guided $20/ct or $10/t cash costs (incl royalty), the operation is forecast to generate $77m in EBITDA, equivalent to 65% margin, once fully ramped up to 110tph XRT feed (assuming 4.1mtpa in mining rates at 5.0x XRT yields and 85% plant availability). Assuming 10-year mine life that amounts to 39mt of mined mineral material and production of ~20mcts generating $329m in NPV10% and 473% IRR.

We have adjusted management numbers down given the early stage of the project and preliminary nature of Company projections leaving a potential for upside revisions once the project is further de-risked.

We assumed 50% availability on the 110tph XRT plant, reducing annual production post full ramp up to 1.2mcts per annum while keeping same split between industrial and gem quality stones, that in turn generates ~$70m pa in turnover translating into $45m pa in EBITDA at $20/ct cash costs. This brings down estimated NPV10% to $187m and IRR to 286%.

The plan is to finalise terms with the government and launch drilling, pitting, bulk sampling and trial mining as part of the mineral resource/reserve preparation process along with environmental and economic studies paving the way for a fast-paced development of the mining operation.

Additionally, the Company is referring to targets with potential remnants of the basal Umkondo unit in the area which runs at estimated grades of 100-3,000cpht elsewhere in the Marange Diamond Fields but involves more expensive mining (drilling and blasting) and processing (crushing) methods as compared to free digging and screening/sorting used for gravel hosted diamonds. Further exploration and economic studies should evaluate the economic potential of conglomerate diamonds.

Development plans

According to the Company's indicative development schedule for Chiadzwa Community Diamond Concession, the team is planning a geological evaluation, mineral resource preparation, engineering and environmental assessment work (Phase I – six months), followed by a launch of production and gradual ramp up to 110tph XRT plant (Phase II – six months) with a potential to further expand production rates should the scale of Chiadzwa proves to be larger than anticipated.

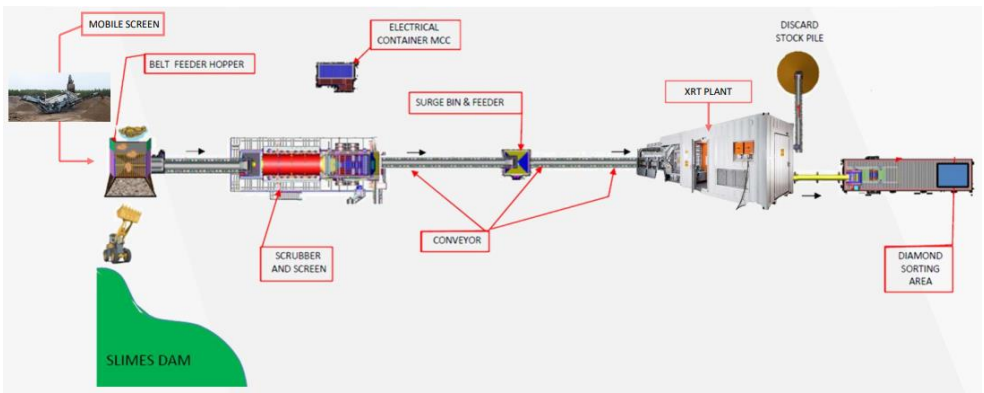
The staged development schedule allows for a gradual de-risking of the project helping the team to fine-tune the production process, potentially generate cash for expansion and further exploration as well as optimise development funding structure.

Proposed production facilities

Commercial production is likely to involve open cast mining involving excavating of diamondiferous gravels, loading onto ADTs and transportation to the beneficiation circuit.

The processing flowsheet is to involve mobile screens, scrubber and wash plant to beneficiate the feed to remove fines and oversize before directing the material to the X-RAY Transmission (XRT) plant that detects diamonds based on the properties of treated material to absorb X-ray radiation (diamonds absorb less X-rays compared to gangue material). The final stage in the recovery process involves sorthouse and the use of glove-boxes where hand sorting takes place under secure and controlled conditions (e.g. camera surveillance).

Provisional Chiadzwa Community Diamond Concession processing flowsheet



Source: Company

We assumed Phase II production plan as our base case scenario with in-situ grades of 50cpht upgraded to 250cpht to be fed into the XRT unit that running at 110tph at 85% (Company guidance) and 50% (SPA assumption) to generate ~2mcts and ~1.2mcts per annum, respectively. This compares to ~5-12mcts per annum produced by the country in total with more recent production mostly derived from conglomerate sources that are lower in volume but higher in value per carat terms and run at 2-3mcts per annum during the 2016-18 period.

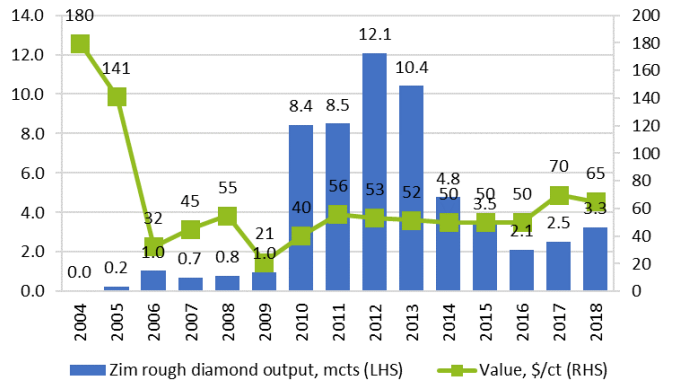
Chiadzwa economics comparison		Vast	SPA adj
XRT plant	tph	110	110
Plant utilisation	x	85%	50%
Grade in-situ	cpht	50	50
XRT feed	cpht	250	250
Value	$/ct	58	58
Production	mcts pa	2.0	1.2
EBITDA	$m pa	77	45
FCF	$m pa	57	33
NPV10%	$m pa	329	187
IRR	x	473%	286%

Source: Company, SPA

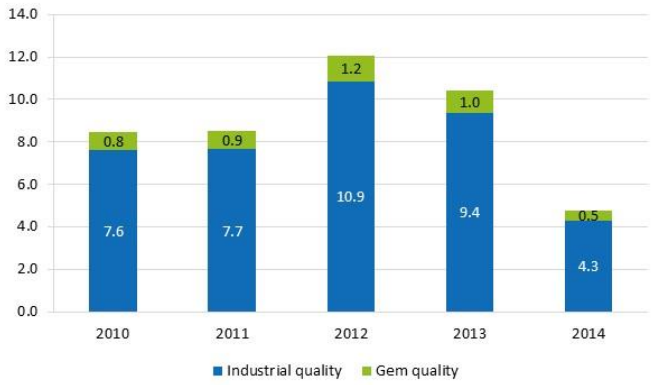
Grades and values

As previously highlighted, the management indicative production plan is for mining rate of ~4.1mt (gravel) per annum at a grade of 50cpht (assuming 5.0:1 beneficiation through the circuit to the XRT) with an average assumed value of $58/ct which is in turn broadly in line with average values reported for Marange diamonds that ranged between $50/ct and $70/ct over the last few years. Low values for mined rough stones reflect high share of industrial quality stones which again reflects the quality of regional diamond production as ~84% of Marange diamonds are reported to be of industrial quality stones that are predominantly used as abrasives with around ~8% of the production being of gem quality and the balance of 8% referred to as near-gem of "lower rejections" with only a small part of the rough diamond to be polished and used in jewellery (Kimberley Process Certification Scheme, KPCS, data). Although, it may be argued that high value stones have not been included in official statistics previously, thus, which in turn biased average numbers downwards.

Zimbabwe annual rough diamonds output v value per carat ($/ct)



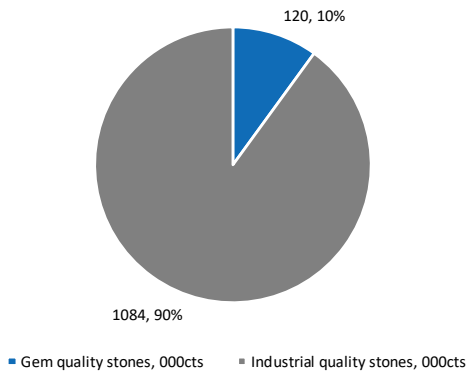
Zimbabwe rough diamonds production breakdown, mcts (2010-14)



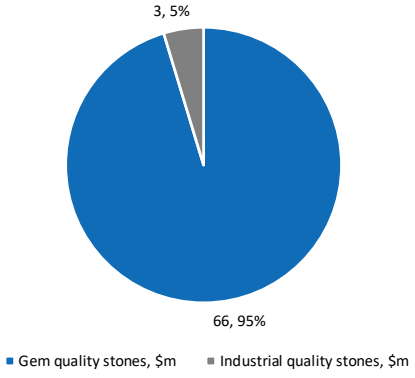
Source: Kimberley Process, USGS, SP Angel

The 2.0mcts per annum production rate is assumed to be comprised of 90% of industrial quality low value stones and 10% of gem quality rough diamonds with the latter accounting for 95% of total sales. While non gem quality stones are expected to provide a by-product value, it is production rates and values for gem quality diamonds that would define economics of the project.

Breakdown in production b/n gem and industrial quality stones, cts



Breakdown in sales revenues b/n gem and industrial quality stones, $m



Source: Company, Kimberley Process, SP Angel

Below we compare assumed parameters of the gem quality stones at Chiadzwa versus other selected (past/present) alluvial operations. While $/ct values come in below levels recorded by other operations (Lulo diamonds are currently ranked as the 2nd highest in $/ct terms after the hard rock operations at Letseng that report ~$2,100/ct), assumed grades at Chiadzwa compare favourably to other projects.

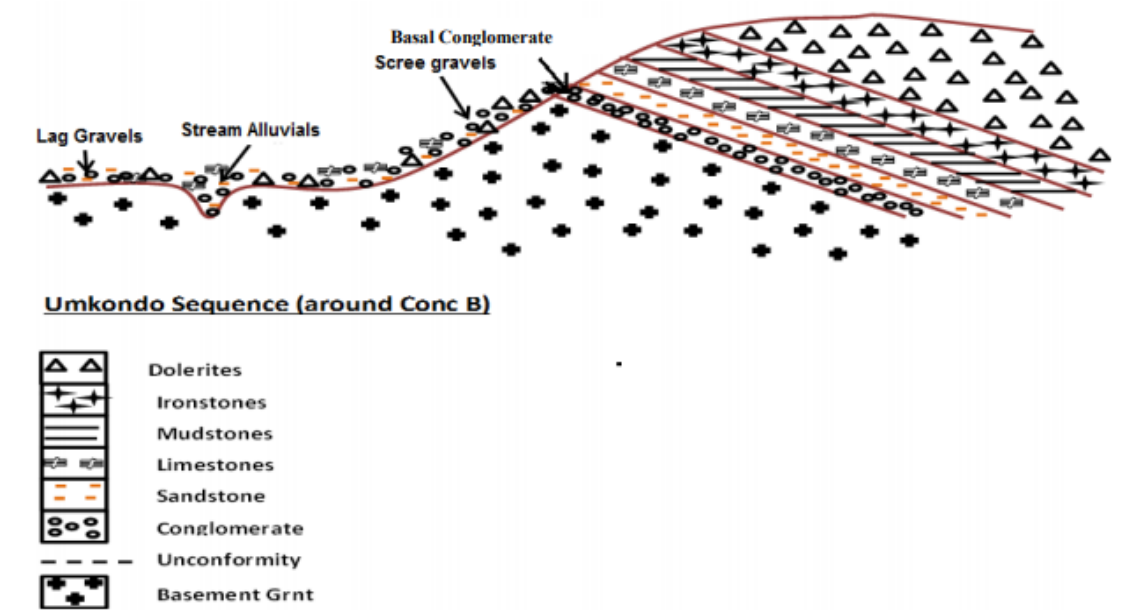
Vast grades and values v selected alluvial diamonds mines (present/historic)

Category	Units	Vast (conservative case)	Vast (gem only; conservative case)	Lulo**	Wouterspan	RHC	Saxendrift	NJK
Grade	cpht	50*	5*	3.6	0.3	0.5	0.2	0.2
Value	$/ct	58*	550*	1420	2400	1500	2378	1850
Value	$pht	2900	2750	5041	768	675	538	370

*Vast preliminary illustrative projections (non-JORC)
**Diluted grades used v 8.9cpht in-situ undiluted
Used 2t/m3 density assumption to convert cphm3 to cpht
Lucapa operates Lulo mine in Angola; Wouterspan, Remhoogte/Holsloot Complex (RHC), Saxendrift and Niewejaarskraal (NJK) are historic assets of Rockwell Diamonds in South Africa
Source: Company data, SP Angel

Geology

Stylised depiction of different hosts in which diamonds occur within the Chiadzwa concessions



Source: ZCDC

The geology of the Chiadzwa Diamond Fields area is comprised of the basement granites overlain by the younger Umkondo Formation sediments, that have undergone various degrees of deformation and metamorphism, according to the ZCDC. Regarding the diamond

deposition, there must have been a period of erosion of the kimberlites/lamproites after they were emplaced and before the formation of the Umkondo sediments with diamonds from the primary source eroded and deposited into the basal conglomerate of the Umkondo formation. As a result of weathering and erosion, some of the diamonds within the conglomerate are believed to have been released into the surrounding environments and now found in scree, rubble, lag material just above the basement granite and alluvial sediments confined to stream channels[4].

Botswana Diamonds JV

In Oct/18, Vast signed an MOU agreement with Botswana Diamonds, an AIM listed Company led by an experienced team of explorers, developers and operators of diamond placer deposits headed by James Campbell (ex De Beers), to develop diamond resources within the Marange Diamond Fields through an SPV (revised to 2.5%/97.5% BOD/VAST in Nov/19). Botswana Diamonds agreed to provide consultancy services over a five year period (a minimum of 40 hours per month) in relation to exploration, mining, processing and marketing at Chiadzwa Community Diamond Concession.

Status

The Chiadzwa Community Diamond Concession is an early stage greenfield pre-resource project. The team is currently in discussion with the state-owned Zimbabwe Consolidated Diamond Company Ltd (ZCDC) regarding an ownership structure of the concession area involving Katanaga Mining, a JV between Vast and The Chiadzwa Community representing Chiadzwa-Marange local community, and the ZCDC. Given the abolishment of the indigenisation act for diamond producers, the structure that would have previously involved Vast holding a maximum interest of 49% in the project is now subject to negotiations and is likely to change. We assumed 60% interest in the project held by Vast. The mining permit is expected to be secured in due course.

As previously discussed, NPV10% estimate based on guided production rates adjusted for the plant utilisation rate (50% v planned 85%), operating and capital costs as well as commodity price forecasts, comes at $187m (post tax) for 100% interest in the asset or $112m for 60% assumed interest to be held by Vast. This is equivalent to 0.12p per share NAV contribution after adjusting for the assumed 60% interest and a 0.15x status of the project adjustment.

Chiadzwa Concession alluvial diamonds (100%)		
Throughput - XRT	ktpa	482
Utilisation of the reported 110tph capacity		50%
LoM	years	10
Front end feed grade	cpht	50
XRT feed grade	cpht	250
Share of gem quality stones	%	10%
Share of industrial quality stones	%	90%
Gem quality rough diamond value	$/ct	550
Industrial quality stones value	$/ct	3
Royalty	%	10%
Operating cost (incl royalty)	$/ct	20
Development capex	$m	10.0
Total FCF (post tax)	$m	302
NPV10% (post tax)*	$m	187
IRR (post tax)*	%	286%

Alluvial diamonds mines are notoriously variable in their production of diamonds
Source: Company, SP Angel

[4] https://www.zcdco.com/wp-content/uploads/2017/09/Geology-of-the-Chiadzwa-Diamond-Fields.pdf

Board and senior management

Board of Directors and Senior Management

Brian Moritz	Non-Executive Chairman (BoD member)	Brian Moritz is a Chartered Accountant and former Senior Partner of Grant Thornton UK LLP, London; he formed Grant Thornton's Capital Markets Team which floated over 100 companies on AIM under his chairmanship. In December 2004, he retired from Grant Thornton UK LLP to concentrate on bringing new companies to the market. He specialises in natural resources companies, primarily in Africa, and was formerly chairman of Metal Bulletin plc, African Platinum plc and Chromex Mining plc as well as currently being chairman of several junior mining companies.
Andrew Prelea	CEO (BoD member)	Andrew Prelea joined Vast in 2013 leading the development of the Company's Romanian portfolio. Andrew was involved in bulk iron ore and steel trading in Romania in the early 1990s before working in the property and earthmoving sector in Australia. After returning to Romania in 2003 he focused on the development of properties for the Romanian Ministry of Defence and latterly, private sector developments, gaining extensive investor and public relations experience as well as advising the Romanian government on wide ranging high-level topics including social housing and economic policy. He has built a strong network of contacts across the mining and metals industries in Europe and southern Africa, in addition to policy makers and governmental authorities.
Craig Harvey	COO (BoD member)	Craig Harvey joined Vast as a consultant in 2013 and moved into the COO role in Mar/17 overseeing projects in both Zimbabwe and Romania. Craig began his career with Gold Fields of SA in 1988 as a bursary student in Economic Geology where he worked on various gold, platinum, coal and exploration projects. At Harmony Gold he managed the mineral resources on various operations and was involved in due diligence on acquisitions. He worked for Simmer and Jack managing and auditing the mineral resource process across all gold and uranium operations while also spent three years in a Principal Consultant role for Ravensgate based in Perth, Australia, conducting numerous resource estimations, valuations and technical reports mainly in gold, uranium, copper and iron ore.
Roy Tucker	Business Director (BoD member)	Roy Tucker is a Chartered Accountant with 43 years of high level and broad spectrum professional and business experience. He has been the founder of a London banking group, served on bank boards and had a position as a major shareholder of a substantial London commodity house. He is also the founder of Legend Golf and Safari Resort in South Africa as well as holds a portfolio of real estate investments in Romania.
Erick Diack	Non-Executive Director (BoD member)	Eric Diack is a Chartered Accountant with years of experience in the mining and industrial sector having previously served as CEO of Anglo American Ferrous Metals Divisions, as well as holding different positions in a number of major listed and unlisted company boards, mainly associated with Anglo American. He currently acts as a member on the Bidvest Group and Aveng boards.
Nick Hatch	Non-Executive Director (BoD member)	Nick Hatch has 35 years of experience in mining investment banking, primarily as a mining analyst in the equity research He was most recently Director of Mining Equity Research at Canaccord Genuity in London. After leaving investment banking in 2017, Nick has recently set up his own company, Nick Hatch Mining Advisory Ltd, to provide mining research, business development and financing advice. He holds a degree in Mining Geology and is a Chartered Engineer.
Paul Fletcher	CFO (BoD member)	Paul Fletcher has 25 years of experience working in the commodity and financial services industries. Previously, Paul worked for Bunge, the US agribusiness and food company, as Global CFO & Controller of Bunge Financial Services, a Bunge group business unit providing financing and risk management solutions, and as Treasury and Trading Product Line Controller. Before Bunge, he was involved in various senior roles within Cargill's energy business and internal audit, PepsiCo Snacks and KPMG.
Mark Mabhudhu	Executive Director, Diamond Division	Mark Mabhudhu is a Zimbabwean national and has over 25 years of experience in the mining industry. Mark spent more than 22 years in the diamond mining sector both in Zimbabwe and internationally, including 11 years with Debswana, the joint venture company between De Beers and the Government of Botswana. Recently, Mark worked as CEO of Government owned Zimbabwe Consolidated Diamond Company (Pvt) Ltd and, prior to that, COO and CEO of Marange Resources (Pvt) Ltd. Mark has a BSc (Hons) degree in

		metallurgical engineering, an MBA, an MPhil in Information & Knowledge Management, and is currently working on his Doctoral studies.
Andrew Hall	CCO	Andrew works closely with the board of directors and is responsible for Vast's strategic business initiatives, capital raising, joint venture opportunities and investor relations. He has a background in natural resources and finance linked businesses. Before joining Vast, Andrew worked at a natural resources focused merchant bank where he established and managed the alternative finance distribution business covering asset managers, private equity, investment banks, family offices and trading houses.

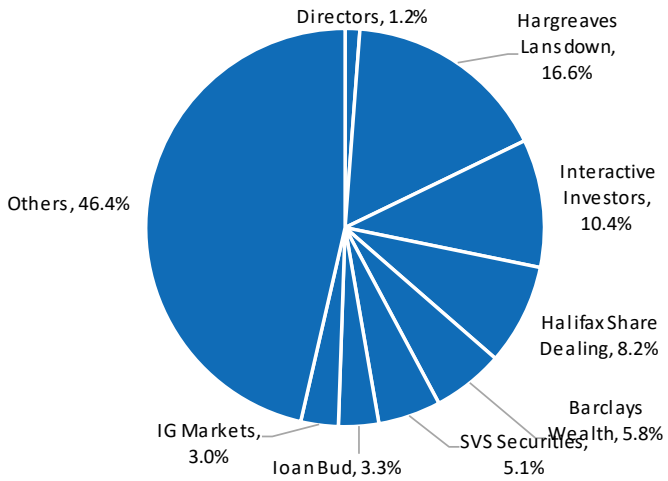
Source: Company

Shareholders

The Company had 10,253m shares in issue as at end of November 2019.

Management and Board of Directors own just over 1%. The remaining shareholder base is largely comprised of retail investors.

Major shareholders (Oct/19)



Source: Company

The number of warrants and options currently outstanding is 529m (warrants) exercisable at 0.5p and maturing in Dec/19. This does not account for the potential dilution from Atlas conversion rights (discussed below) as well as Atlas and Mercuria warrants. The Company secured authority from shareholders for the issuance of 2,315m warrants to Mercuria as part of the $4m funding secured in Mar/18 exercisable only to the extent necessary to repay the loan. Additionally, Vast will issue warrants for $3.75m worth of shares at fixed price of 0.26p on each Atlas facility drawdown that expire on the third anniversary of each relevant issuance date, equivalent to ~1,109m new shares at 0.26p price per share and 1.3 exchange rate.

Balance sheet

The Company had $0.6m in cash as of reporting Apr/19 date and raised £3.4m (gross, ~$4.4m) in equity to advance the flagship Baita Plai and Chiadzwa projects since then.

The Company had $5.5m in debt as of Apr/19 with $4m owed to Mercuria under the Tranche A drawn in 2018 and $1m outstanding to Sub-Sahara Gold Investments (SSGI) who between two of them share a roughly 50/50 security over Manaila Polymetallic Mine (MPM). Post the drawdown on the $15m facility and repayment of SSGI loan, Mercuria will hold a security over 100% in MPM through a 24-month standstill agreement.

The team is currently finalizing the $15m (gross) secured convertible bond with Atlas Capital Markets, a UK based fund, offering development funding for Baita Plai and Chiadzwa as well as refinancing $1m of Mercuria and $1m of SSGI debt. The Company secured non-conversion rights for the facility allowing to potentially replace Atlas notes with a cheaper source of funding (see loan facility details below).

Atlas secured convertible note	
Amount	$15m (gross and $13.5m, net) in four tranches: $7.1m, $4.5m, $2.1m and $1.4m.
Drawdown	Tranches to be drawn according to cashflow needs and specific conditions.
Term	Two years from the date of each issuance.
Conversions rights	Tranche 1 is subject to a six month non-conversion period; the tranche (+ interest) together with a premium if the share price is in excess of 0.24p at the time of repayment may be closed in cash. Traches 2, 3 and 4 (Zimbabwe Bonds) may be subject to a 12-month non-conversion period from the second issuance date (at the election of Atlas) but the par amount would double and to be repaid at the end of the 12m period. The Company can elect to cash settle the conversion notice. Conversion price is the lower of 0.24p or 90% 20d VWAP.
Interest Rate	5% pa
Warrants	Right to acquire $3.75m worth of shares at an exercise price of 0.26p Issued pro rata to each drawdown Expire in three years of each respective issue date
Security	Security over Baita Plai and shares in the Company's subsidiary holding the Diamond Concession
Use of Funds	Development funding for Baita Plai and Chiadzwa Diamond Concession

Appendix I – Country profiles

Romania

Capital	Bucharest (1.9m population)
Population	19.4m
Official language	Romanian
Political system	The system is a bicameral parliamentary republic involving the Chamber of Deputies (the lower house with 329 members) and the Senate (the upper house with 136 members) with both chambers directly elected for four year terms. Next parliamentary elections are scheduled for late 2020 or early 2021 with the National Liberty Party (PNL) currently leading polls coming ahead of the Social Democratic Party (PSD) that secured most of votes in 2016 elections and formed a coalition government with Alliance of Liberals and Democrats (ALDE). The parliament approves the Prime Minister candidacy designated by the President. Viorica Dancila, a leader of the PSD, acts as PM since Jan/18. Next presidential elections are scheduled for 10 Nov/19 (first round) and 24 Nov/19 (second round) with the President eligible to serve up to two five year terms. Klaus Iohannis, a former leader of the PNL and current president, announced his candidacy for coming elections aiming for a second term.
Economy	A former part of the Eastern Bloc of the Warsaw Pact, Romania came out of the communist regime more than 29 years ago and joined the EU in 2007. The nation is ranked #5 among other seven former USSR satellite states[5] on GDP per capita basis with c.$24k coming in below the EU's $38k but above $19k for the CIS region. Among other EU28 countries, Romania remains relatively poor ranking #26 with only Croatia and Bulgaria placed below. In absolute terms, the economy is the 3rd largest ($240bn v $586bn for Poland, the largest, and $15bn for Albania, the smallest) among the selected group of seven countries. On growth, Romania was the fastest growing economy since the turn of the century averaging 4.9%pa (on GDP per capita basis among seven countries) with the pace of growth normalising from 5.3% in the 2000-10 period to 4.3% in 2010s. GDP growth hit a nearly decade high 7% in 2017 led by private consumption on the back of indirect tax cuts and wage hikes both in the public and the private sectors. Growth came down in 2018 (4.1%) as the central bank hiked rates by 75bp to 2.5% through the year to bring down the inflation that averaged 4.6%, 110bp above the upper limit of the target 1.5-3.5% target range, with the IMF forecasting the economy to expand at around 3% from 2019 onwards. Government debt wise, Romania has relatively low leverage ranking in the middle of the pack with 28% in Net Debt to GDP compared to Hungary with 66% and Poland 45% (2018). Although, the debt has been creeping up on the back of continuously running budget deficits with the latest reading coming in very close to the EU 3% limit in 2018 (-2.9%). In fact, the IMF forecasts the budget deficit to run at around 4% from 2019 onwards highlighting the need for fiscal consolidation amid slowing growth. Trade wise, the nation runs a high current account deficit (-4.6% in 2018) predominantly trading with EU members. Major exports include electrical machinery and equipment (18%), vehicles (17%), machinery including computers (11%). Metals and mining sector is small with iron and steel imports accounting for 2.9%. The S&P confirmed the BBB- credit rating in Mar/19.
Currency regime	Romanian Leu (RON) is the national currency that follows the managed free floating exchange rate regime to reduce FX volatility. No capital controls are in place. The RON has been oscillating in the 3.8-4.3 range against the US$ over the last 4 years and depreciated 11% since the start of 2018 (from 3.75 to 4.21) reflecting a general strength in the US currency as well as higher current account and budget deficits.
Corruption	Romania is ranked #61 of 180 countries according to the Transparency International Corruption Perception Index next to Malaysia and Cuba. Among Western Europe subgroup Romania ranks #28 of 31 countries (2018).
Investment attractiveness	The Fraser Institute does not break out Romania in the Investment Attractiveness Index, with aggregate European region coming in #3, behind the US (#1) and Canada (#2) while ahead of Australia (#4) and Africa (#6). Rankings within the subgroup vary significantly with 5 countries (of 11 included in the regional index) coming in the upper 1/3 of all 83 countries, another 4 in the middle 1/3 and two countries in the lower third (i.e. weaker rating – Turkey and Greenland).

[5] Countries included in the sample (from richest to poorest): Czech Republic, Slovakia, Poland, Hungary, Romania, Bulgaria and Albania (IMF).

Infrastructure	Infrastructure-wise, the country scores 55/140 based on the 2018 World Economic Forum Global Competitiveness Index with only Bulgaria (58/140) and Albania (100/140) of seven former Eastern Bloc countries ranking lower. Density of road network ranks 66/140 while the quality of roads scores 113/140 reflecting poor maintenance and underinvestment. Rail density is quite good at 18/140, although the quality of the rail network is somewhat below average 75/140. The nation's power generation mix is one of the most balanced in the EU with coal, hydropower, natural gas, nuclear energy and wind power capacities installed and electrification runs high; however, with the exception of wind and solar, almost all units are fairly old and most generation units outside renewables are government owned that have not been spending on maintenance enough. Official installed capacity is around 22GW while utilization is low with 7GW used in 2017 (44% thermal, 23% hydro, 18% nuclear, 15% renewables).
Mining industry	Latest data from the USGS (2014) showed the mining sector represented an insignificant share of the economy with only 60k people employed in the sector of which a third was involved in the extraction of crude oil and natural gas, another c.30% in mining coal and lignite supplying coal to thermal power plants, 3k involved in mining metal ores and 9k in other mining and quarrying. The Metaliferi Mountains in the Carpathian Range of northwestern Romania hosts a number of mineral deposits rich in precious and base metals. The nation's largest copper mine Rosia Poieni in Alba County, hosting nearly a billion tonnes of ore and accounting for 60% of copper reserves in Romania is state owned and operates at c.5ktpa in copper production. Tailings management is an issue with historic settling pond located in the place of former Geamana village valley. Most well known gold project in the country, Rosia Montana, located in the Alba County and hosting 10moz gold and 48moz silver in reserves has been stalled over continued opposition from environmental and community groups over concerns regarding the preservation of historical sites and potential environmental damage. TSX listed Euro Sun is working on a BFS for the Rovina Valley gold-copper project located in the Hunedoara County (together with Alba Country part of the Golden Quadrilateral) hosting 10moz GEO in Measured & Indicated resources. Eldorado Gold owns 80% in the Certej refractory gold/silver project located in the Hunedoara County and hosting 2.5moz gold and 16moz silver in mineral reserves.
Tax and royalties	16% corporate tax. 5% royalties are charged on base metals and gold concentrates. Mineral rights are acquired through prospecting, exploration, and exploitation permits or concessions granted by the National Agency for Mineral Resources (NAMR). Exploration license is valid for up 5 years and is renewable for a maximum of 3 years. Mining license is granted for initial term of 20 years and is renewable for successive 5-year periods.

Zimbabwe

Capital	Harare (1.5m population)
Population	16.9m
Official language	16 official languages with three main languages – English, Shona and Ndebele.
Political system	The legislative branch is represented by a bicameral Parliament including the House of Assembly (270 seats) and the Senate (80 seats) with members of both chambers serving five year terms. Next elections for the Senate and the National Assembly are in 2023. Zanu-PF is a leading political party in Zimbabwe that has been the ruling force since independence in 1980 long led by ousted Robert Mugabe with Emmerson Mnangagwa currently acting as the party's first secretary. Zanu-PF has absolute majority in the House (179/270) and is the largest party in the Senate (34/80) with the main opposition party being centre-left Movement for Democratic Change led by Nelson Chamisa. Following a military coup in Nov/17, Emmerson Mnangagwa replaced Robert Mugabe ending his 30 year long rule. Mnanagagwa won 2018 presidential elections in a close contest with Movement for Democratic Change Alliance candidate Nelson Chamisa having secured 50.8% v 44.3% for contender in the first round. President is elected for a five year term (next elections scheduled for 2023) with no limit on number of terms allowed.
Economy	Zimbabwe is one of the few countries in the Sub Saharan Region (SSA) that is on track to be poorer by 2020 when compared to the start of the century with GDP per capita down 21% over the 2000-2018 period with other countries in the same underperforming group being Central African Republic (-32%), Gabon (-9%) and Liberia (5%). Of 45 SSA countries (as per IMF), Zimbabwe GDP per capita amounted to around $2.5k or #23 in the sample. GDP per capita growth averaged -1.8%pa in the 2000-2018 period which heavily weighed down by weak performance in 2000s as the government enacted a land reform at the turn of the century that confiscated farmland from white minority in favour of black Zimbabweans leading to a drop in agricultural output, reduced exports, lack of tax revenues, food shortages as well as resulting in a backlash from Western nations that cut off financial aid and investment. Farm production collapsed and by 2008 output was 2/3s below its peak levels in 2000. In light of continuous budget deficits the government resorted to increasing money supply that in turn culminated in the 2005/09 hyperinflation. Inflation rates reached 79.6bn percent (%mom) and 89.7 sextillion (10^{21}) percent (%yoy) in mid-2008 at which point authorities eventually suspended official reporting of inflation rates and in early 2009 replaced the Zimbabwean dollar with a basket of currencies dominated by the US$. That helped to bring inflation back down (<2% average over the 2009-2016 period) with the government now looking to introduce its own currency back. Authorities introduced bond notes, a quasi Zimbabwean currency, in Nov/16 followed by the RTGS in Feb/19 and eventually suspending all foreign currencies in Jun/19. T Growth averaged 2.8% this decade (v 1.1% for the SSA region) bouncing off a low base on the back of stronger agriculture and mining production. In five years to 2015, gold production climbed +120% to 20t, nickel +160% to 16kt (Ni in con), platinum +43% to 13t, palladium +44% to 10t and bituminous coal +81% to 4.3mt. On the other hand, diamonds (-59%), chromite ores (-59%) and ferrochrome (-21%) posted declines. Tobacco production has also favoured better as output climbed from c.110kt in 2010 to c.250kt in 2018. The economy is expected to dip 5.2% this year reflecting cyclone Idai related disruptions in H1/19 and budget consolidation plans in a bid to earn a track record of fiscal discipline seeking future funding from international donors. Zimbabwe is continuously running a capital account deficit (-4.0% in 2018) that in turn adds to the shortage of foreign currency in the country, puts further pressure on local currency and complicates repayment of $8.8bn in foreign loans (v c.$20bn GDP). Export revenues are dominated by gold (28% in 2018), tobacco (21%), nickel ore, concentrates and other products (22%) as well as iron ferroalloys (6%) and chromium ores and concentrates (2%). Heavy reliance on hard and soft commodities leaves the economy exposed to metal prices moves and weather.
Currency regime	The Real Time Gross Settlement (RTGS) is currently the sole national currency introduced in Feb/19 designed to gradually move back to the Zimbabwean dollar and replace other currencies in circulation. Upon introduction, the value was set at 2.5:1 to the US$, however, the RTGS market rate has been falling fast amid deficit of foreign currency and rapid inflation rates and reached 8.9 (as of end July) based on the official interbank rate published by the Reserve Bank of Zimbabwe implying more than 70% of value erosion in just half a year.

	In June/19 the government suspended other currencies including the US$ and South African Rand from circulation leaving the RTGS dollar as the sole legal tender in Zimbabwe. The decision has been criticised by the population with unions threatening strikes if the government does not overturn the policy. Meanwhile, the nation is rapidly approaching towards hyperinflation, defined as +50%mom growth in CPI, with inflation hitting 98%yoy and 176%yoy in May and June this year that may in turn see the government opting to resume the usage of foreign currencies in the country. Zimbabwe that is desperate for foreign currency has imposed limits on retention of US$ sales proceeds for gold and platinum producers to 55% with the remainder to be converted into local RTGS. RTGS balances may be converted to US$ for overseas payments, however, miners remain exposed to the volatility in the exchange rate as well as delays in execution. The diamond regime is reported to favour better with most sales made overseas and is believed to be possible to remit or retain profit overseas, according to Vast Resources.
Corruption	Zimbabwe is ranked #160 of 180 countries according to the Transparency International Corruption Perception Index, worse than 157 scored in 2017 and next to Mozambique and the DRC. Among Sub Saharan nations, Zimbabwe ranked 39/49.
Investment attractiveness	Zimbabwe is ranked #62 of 83 countries in the 2018 Investment Attractiveness survey of The Fraser Institute, ie in the bottom third of all jurisdictions and roughly in the middle for the African subgroup, ahead of Ethiopia, Ghana, the DRC and Tanzania while losing to Botswana, South Africa, Zambia, Mali and Namibia. Although it should be noted that the ranking is on an improving trend when compared to 112/122 in 2014 and 98/109 in 2015.
Infrastructure	Infrastructure-wise, Zimbabwe ranks below the median for the Sub Saharan region (43 score v 48 for SSA on the 2018 Global Competitiveness Index subcategory) coming in #122 among 140 countries in the World Economic Forum survey. Although, the road network is ranked at high 31/140 the quality is close to the bottom of the sample 122/140 highlighting strong investment needs to upgrade the existing infrastructure. Electrification is ranked at 124/140 and the quality of transmission and distribution systems is at 106/140 reflecting another infrastructure bottleneck. Investment constrained nation currently experiencing severe power shortages with rolling blackouts forced to close the production/consumption gap with imports from Mozambique and South Africa. Zimbabwe has one hydro power plant accounting for more than half of the generated electricity and four coal-fired plants that together produce c.1,100MW of power v national demand of 1,500MW. The Kariba dam is currently operating at nearly a 1/3 of its 1,050MW capacity due poor rains last year and receding water levels in the Zambezi river. Authorities are trying to minimise disruptions to the mining sector (although, platinum producers are reported to import their own power) given its major FX earner status. Reliability of water supply is at 129/140.
Mining industry	Zimbabwe is a mineral rich country hosting large resources of gold, PGMs (3rd world's largest reserves; 3rd largest platinum producer; 5th largest palladium producer), diamonds (3.2m carats produced in 2018 making #8 largest producer, but output reached 12.1m carats in 2012), nickel, chrome (ample high grade chromium ore resources along the great Dyke found in seam/stratiform deposits) and coal among other commodities. The sector accounts for c.15% of GDP and around 60% of export value, but the industry has been hindered from operating at full potential due to lack of development capital, inconsistent government policies, corruption and infrastructure limitations.
Tax and royalties	25% corporate tax. Royalties are charged at 10% on diamonds (from 2020, 15% previously), 10% on platinum, 5% on gold and 2% on base metals. The government takes no free carried interest in the mining project. Withholding tax is charged at a rate of between 10-15% depending on whether the Company paying out the dividend is listed on the Zimbabwe Stock Exchange or not.
Indigenisation terms	Zimbabwe amended its controversial Indigenisation and Economic Empowerment Act in 2018. Aiming to attract foreign capital, the government dropped terms of the Act (2007) requiring Indigenous Zimbabweans to own 51% interest in local mining projects.

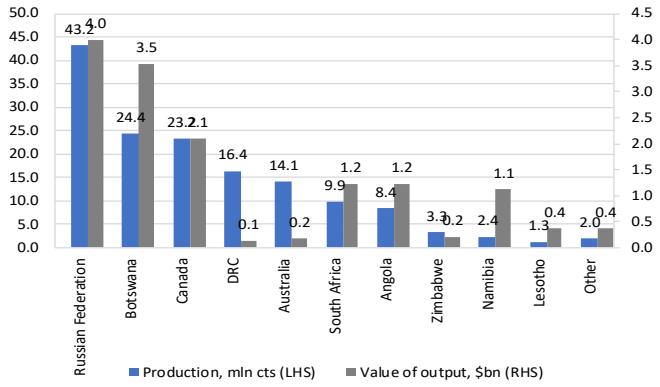
Appendix II – Rough diamond market review

Supply

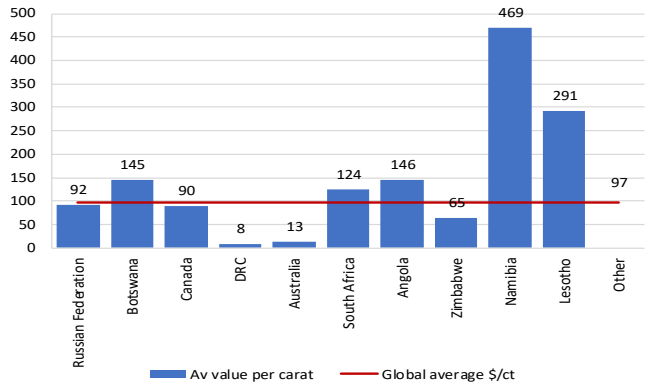
Annual supply of rough diamonds is estimated at c.150m carats valued at around $14.5bn using an average value per carat of $97/ct on the 2018 Kimberley Process data. To put it into perspective, that is ~10% of the annual gold mine supply, ~14% of seaborne iron ore market, c.2x of the palladium market and nearly 3x of the platinum market.

The market is highly concentrated with top five producer accounting for 82% of annual supply including Russia (29%), Botswana (16%), Canada (16%), DRC (11%) and Australia (9%), in volume terms. In value terms, same five producers account for 69% reflecting higher per carat value of stones mined outside those countries including South Africa ($124/ct v $97/ct global average), Angola ($146/ct), Namibia ($469/ct) and Lesotho ($291/ct).

Rough diamonds production (mcts) v value of production ($bn), 2018



Average value per carat per country v global average, $/ct, 2018

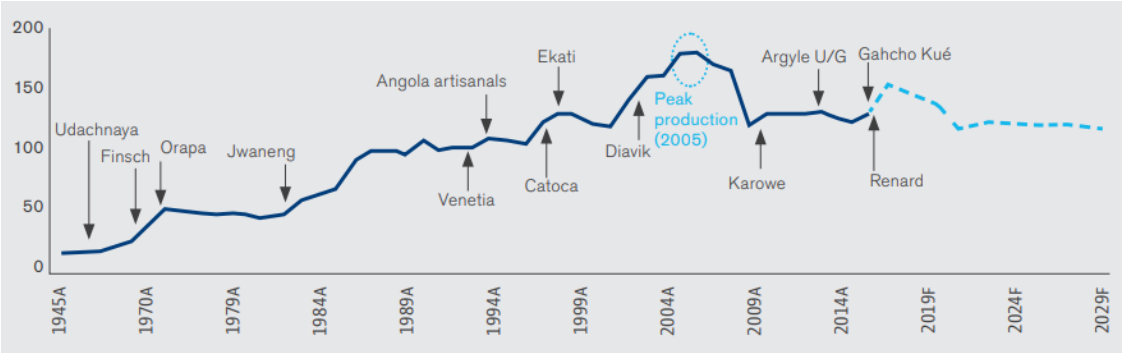


Source: Kimberley Process (2018)

Mine production peaked in 2005 at 177mcts as new mines coming online failed to keep up with declining profile of existing operations. Supply somewhat oscillated in the 125-130m range since the start of the decade before jumping ~20% to 151m in 2017 on commissioning of Ganhcho Kue and Renard in Canada and Liqhobong in Lesotho as well as stronger output at existing operations attributed to processing of lower-quality ores and tailings.

2017 is forecast to be another "pinnacle production level for the natural diamond supply… from here on, output is expected to remain stable at least", according to the 2018 Bain & Co report.

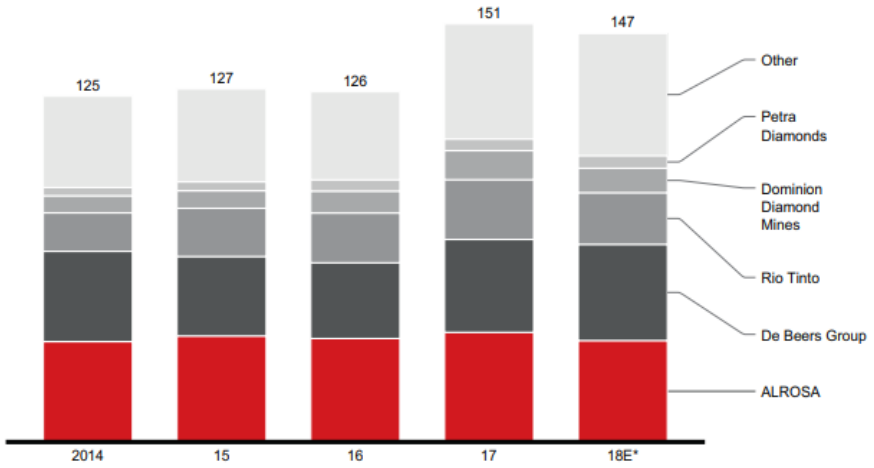
Rough diamond mine supply including market forecasts, mcts



Source: Petra Diamonds (2018)

Company level production profile is also highly concentrated with top three producers ALROSA (Russia, Angola, exploration in Botswana and Zimbabwe), De Beers (Botswana, South Africa, Namibia and Canada) and Rio Tinto (Australia and Canada) accounting for 2/3s of mine supply.

Rough diamonds production by Company



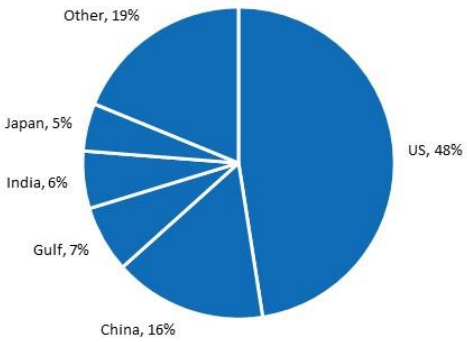
Source: Bain & Co (2018)

~21mcts in annual production is expected to exit the market by 2023, according to ALROSA, with most of that accounted for by the depletion of the Rio's Argyle (14mcts pa and c.2/3s of Rio diamond production) mine in Western Australia, the source of nearly 90% of high value pink diamonds, although, 3/4s of output is composed of lower-value brown diamonds weighing on the total average value per carat for the mine. Argyle is set to cease production in 2020.

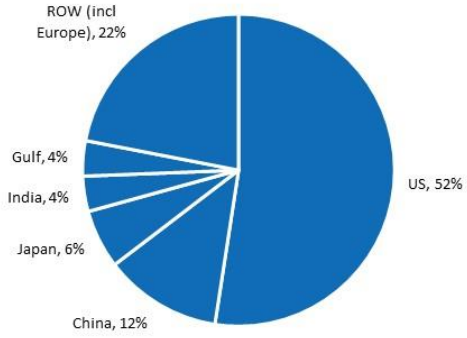
Demand

Polished diamond and diamond jewellery demand are driven by levels in the disposable income, consumer confidence, FX rate volatility and general economic growth. On regional level, diamond jewellery demand is split between the US (46%), China (16%), Gulf countries (7%), India (6%), Japan (5%) and RoW (19% including Europe (~6%) that is ranking #3 after China).

Global polished diamond demand b/n, $25bn 2017



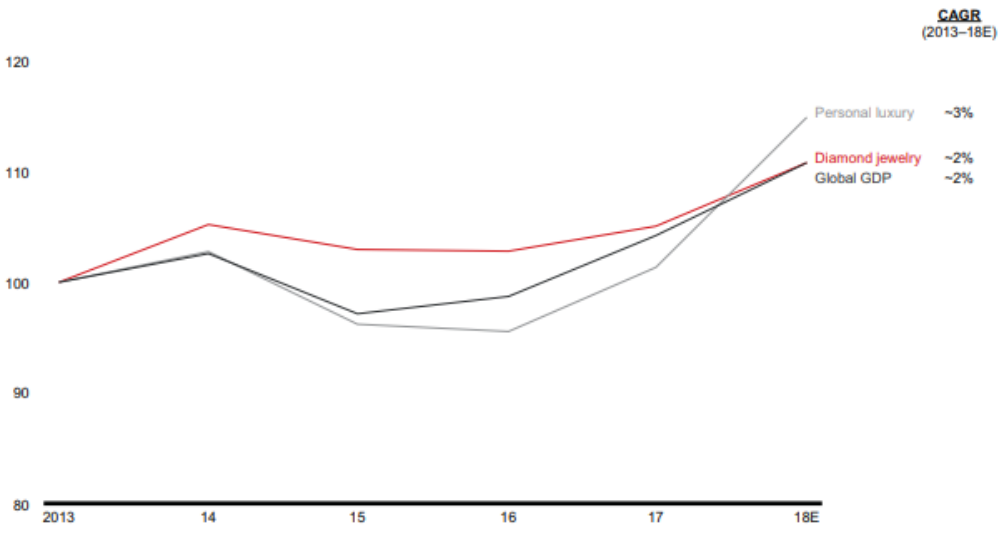
Global diamond jewellery demand, $82bn 2017



Gulf countries include Saudi Arabia, UAE, Oman, Bahrain and Qatar
Source: De Beers Diamond Insight Report 2018

Demand has gone through a soft patch in 2015-16 amid slowing economic growth rates in China, constrained consumer credit in India as well as appreciation in the US$ against other major markets' currencies during the period. After picking up in 2017, demand for polished stones and diamond jewellery climbed back to around 2014 levels, with CAGR over the 2015-17 period averaging 0.3%pa and -0.3%pa, respectively. This marks a significant slowdown from 3.4%pa and 4.8%pa recorded in the 2011-2014 period.

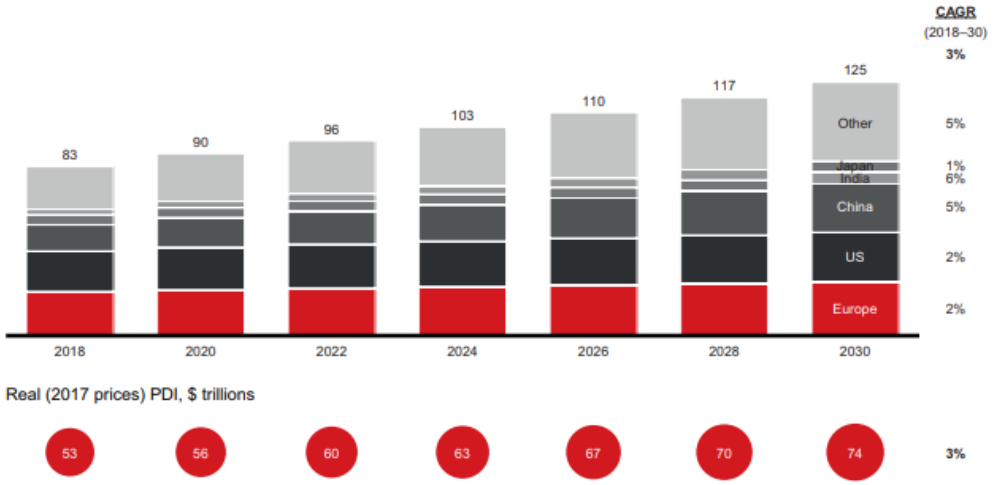
Fluctuations in luxury goods and diamond jewellery demand with nominal GDP growth rates (normalised to 2013=100)



Luxury goods include luxury jewellery, watches, beauty goods, apparel and accessories
Source: Bain & Co (2018)

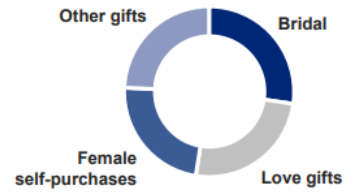
Longer term, diamond jewellery demand is expected to be driven by increasing income levels in rapidly developing economies of China and India, while low unemployment and robust economic growth in the US should support consumption the world's largest market for polished diamond.

Stronger personal disposable income growth in China is forecast to gradually narrow the gap with the US market share, while demand in Europe and Japan is expected to remain relatively stable



Source: Bain & Co (2018)

Diamond jewellery b/d, 2016



Source: De Beers

Demand for rough diamonds, while ultimately driven by downstream demand for polished stones and diamond jewellery, is also led by the midstream part of the value chain (see the table below), a highly competitive sector characterised by high level of players and thin margins heavily exposed to both rough and polished stones prices, FX volatility and cost of funding.

India dominates the mid-stream diamond cutting and polishing scene accounting for ~90% of global rough diamonds net imports reflecting low labour costs, favourable regulatory environment and relatively easier access to funding, although, the latter has weakened recently on the back of several defaults leading to banks tightening credit requirements.

Producers have recently been referring to higher than anticipated stock levels of both rough and polished inventories at polishers/cutters and retailers at the start of 2019 weighing on demand for rough stones' sales. US retail sales were affected by stock market volatility and US/China trade tensions while stronger US$ affected demand for polished stones in China and the Gulf.

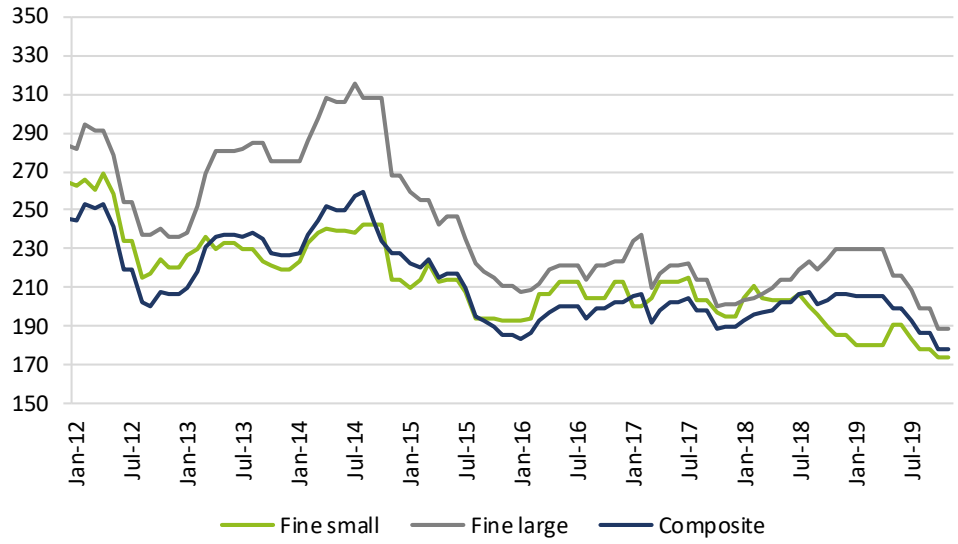
Diamond industry value chain

	Rough diamonds		Polished diamonds		Diamond jewellery	
	Production	Sales	Cutting and polishing	Sales	Jewellery manufacturing	Retail sales
	- exploration, production, sorting	- sale of rough diamonds from producers - rough diamond trading	- cutting and polishing rough diamond for production of polished diamonds	- polished diamond wholesale - polished diamond trading	- Jewellery design and manufacturing	- Jewellery and watches
No of players	Top 5 players (~70% control)	~100 players	~5,000 players		>10,000 players	Large retailers control ~35% of the market
Entry barriers	High	High	Low	Low	Medium	Medium
Bargaining power	High	medium	Low	Low	Low	Medium
Operating margin, 2017	22-24%		1-3%		2-4%	3-5% for small retailers (~65% of the market) 9-11% for large retailers (~35% of the market)

Source: Bain & Co (2018)

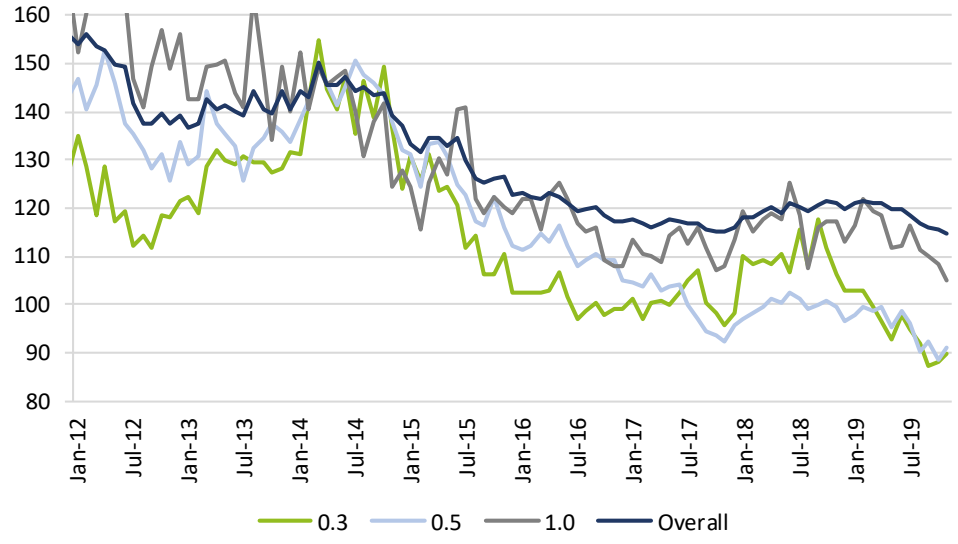
Prices

Rough diamond price indices for small/large stones along with composite index for both categories



Source: Bloomberg

Polished diamond price indices for 0.3ct/0.5ct/1.0ct stones along with composite price index



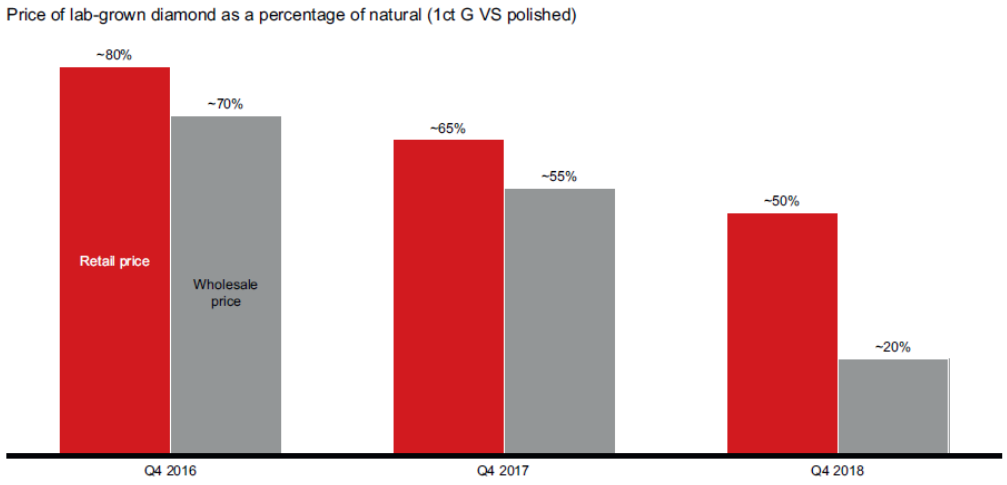
Source: Bloomberg

Industry challenges

US/China trade war challenges global trade, economic growth and income levels outlook. The conflict between two largest markets for polished diamonds and diamond jewellery weigh on the consumer confidence and demand outlook in the short to medium term.

Competition from lab-grown/synthetic gem quality diamonds is on the rise. While lab-grown diamonds are being used extensively in the industrial use segment accounting for nearly 99%, gem quality synthetic stones presence is beginning to be felt by traditional players. Gem quality lab-grown diamonds capacity is currently estimated at 2mcts most of which is of size less than 0.18cts ('melee') with forecasts for the market to grow to 10-17mln cts by 2030 (Bain & Co, 2018). Falling production costs, better technologies and expanding range of stones in terms of size/quality improves the commercial case of synthetic versus natural gem diamonds. 2018 Bain & Co report suggests the substitution may be limited to 5-10% in value terms through 2030 should natural diamond industry succeed in differentiating natural stones from lab-grown analogue with Bain suggesting that producers may position synthetic stones as fashion jewellery rather than luxury items. As a recognition of changing industry dynamics, De Beers launched Lightbox Jewellery, a lab-grown gem diamonds brand, in 2018, although, the Company is not offering grading reports on its products arguing that reporting is a feature for natural stones reflecting their rarity and value. Careful not to cannibalise natural diamond sales, Lightbox offers a flat rate of $800/ct price, regardless of the size (i.e 75% discount to other synthetic diamond producers and c.80% discount to the natural diamond price (for 1ct stone)), does not involve engagement ring pieces and follows the marketing strategy of "affordable fashion jewellery that may not be forever, but is perfect for right now".

Efficiencies in the production process drive costs and price for gem quality lab-grown diamonds lower with retail price almost halving and wholesale prices dropping 3x over the last two eyars



Source: Bain & Co (2018)

Changing preferences of younger generations demand changes in marketing and sales strategies from the industry with Millennials (DOB 1981-2000) and Generation Z (DOB post 1998) accounting for 2/3s of the global population is becoming the major spending force in decades to come and to drive demand for polished stones and diamond jewellery moving forwards. Millennials are estimated to account for nearly 60% of diamond jewellery purchases (in value terms) in the US and nearly 80% in China versus 36% and 21% for older generations, respectively, according to De Beers 2018 Insight report. Gen Z is the next big wave of new consumers that are coming of age at the moment accounting for the largest share of current population 36% (Millennials are 29%) with their share of purchases (4% in the US and 1% in China) is set to expand significantly in the future.

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