



Global Mining Trends & Values

November 19, 2018

Market Highlights: Commodities mostly flat, equities edge up

- **Copper fundamentals supportive but still stuck in a range:** Fundamentals remain supportive of the current price range with inventories declining 5% last week and a recent smelter agreement at lower treatment charges for 2019 point to a relatively tight physical market. However, we are likely stuck in a holding pattern until the G20 summit at the end of the month and we continue to get mixed messages over the likelihood of any kind of trade deal between China and the US. Reuters reported last week that Jiangxi Copper and Antofagasta have agreed to 2019 copper TC's of \$80.80/t which is below the 2018 benchmark of \$82.25/t. The copper equities remain at attractive valuations at a 16% discount to NAVPS on the forward curve but unfortunately there is little conviction to step into the sector and we expect the recent sluggish trading flow to get even quieter through the US Thanksgiving holiday this week.
- **Zinc inventory levels suggest a higher price:** Zinc inventories were down another 4% last week and current levels would suggest a higher price based on the historic relationship (see chart of the week). The price has begun to respond and is up to \$1.22/lb this morning but the market remains weary over potential for increased supply into 2019. We remain constructive on the zinc price over the next twelve months as we believe it could take time for the refined market to return to more normal inventory levels. Trevali Mining remains a good option for zinc leverage and following the decline this year is now trading at 2.1x 2019E EBITDA at forward curve pricing, and a 23% discount to NAVPS, which compares to the other base metals stocks trading at 6.3x EBITDA and a 16% discount to NAVPS.
- **Bulks ease along with steel mill profitability:** Bulks prices looked like they were starting to finally pull back alongside declining Chinese steel mill profitability although they have found some stability in the past few days and met coal supply remains tight supporting higher prices. We remain cautious on iron ore in the near term as China decelerates and recent media reports suggest the winter heating cuts may not be as severe this year and may not have the same impact on prices as last year.
- **Mining shares are now trading at an 11.2% discount to NAV at forward curve prices, versus a 12.2% discount one week ago.** At RBC forecast prices, mining shares are now trading at a 4.2% discount to NAV, versus a 5.2% discount one week ago.
- **Mining shares were up on average 1.7% last week.** The best performing group was zinc up 11.5%, followed by coal up 2.9%, copper up 2.6%, the diversified group up 0.3%, uranium down 0.1%, iron ore down 1.6%, and nickel down 1.7%.



Global Mining Research

RBC Mining & Materials Equity Team

[Click here for contributing analysts' contact information.](#)

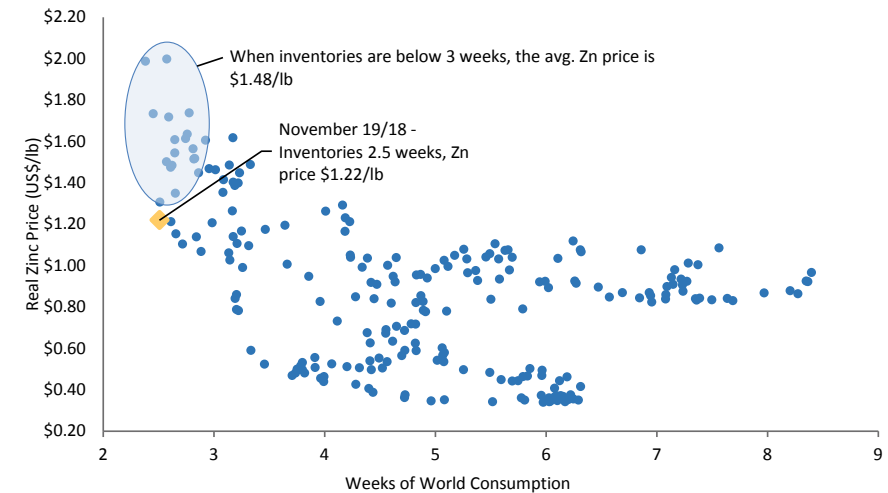
All values in CAD dollars unless otherwise noted.

Priced as of market close ET on November 16, 2018 unless otherwise noted.

For Required Non-U.S. Analyst and Conflicts Disclosures, see page 21.

Chart of the Week: Weeks of consumption vs. Zinc price since 2000

- Zinc inventories are sitting at 2.5 weeks of world consumption. When inventories are at less than 3 weeks of world consumption the zinc price has average \$1.48/lb since 2000.



Source: IZSG, RBC Capital Markets Estimates, Bloomberg



GLOBAL METALS & MINING - SUMMARY VALUATION & RECOMMENDATIONS BASED ON RBCCM FORECASTS (see pages 18-19 for forecasts)

Symbol & Exchange	Analyst	11/16/18 Current Share Price	Current Price % of 52-week Hi/Lo Range	Rating	12-month Target Price	Dividend Yield	Total Implied Return	Performance		Market Cap (US\$MM)	Net Debt/ Total Cap.	Net Debt/ 2018E EBITDA	Net Asset Value	Premium (Discount) to NAV	P/E		P/CFPS		EV/EBITDA		
								QTD	YTD						2018E	2019E	2018E	2019E	2018E	2019E	
COPPER																					
Antofagasta	ANTO L	TB	£8.11	21%	OP	£8.80	4.9%	13%	-5.2%	-19.3%	\$10,252	13.7%	0.8x	£6.56	23.6%	20.9x	15.8x	7.9x	6.1x	6.6x	5.7x
Capstone Mining	CS T	SC	C\$0.64	14%	SP**	C\$1.25	0.0%	97%	-19.6%	-55.9%	\$193	17.0%	1.3x	C\$1.53	-58.5%	5.1x	9.7x	1.8x	2.3x	3.4x	4.4x
First Quantum	FM T	SW/SC	C\$12.52	16%	OP	C\$18.00	0.1%	44%	-14.9%	-28.9%	\$6,562	32.0%	3.4x	C\$26.08	-52.0%	15.9x	10.5x	8.4x	4.2x	8.1x	6.4x
Freeport McMoRan	FCX N	SW/SC	US\$11.96	14%	U	US\$15.00	0.4%	26%	-14.1%	-36.9%	\$17,342	26.7%	1.0x	US\$15.72	-23.9%	8.1x	16.8x	3.7x	5.5x	4.2x	6.5x
HudBay Minerals	HBM T	SW/SC	C\$6.65	26%	OP	C\$8.00	0.2%	21%	1.7%	-40.3%	\$1,321	16.3%	0.9x	C\$11.38	-41.6%	17.1x	21.8x	3.8x	4.2x	3.1x	4.1x
Imperial Metals	III T	SC	C\$1.04	4%	SP**	C\$1.50	0.0%	44%	-47.2%	-69.2%	\$75	65.8%	28.9x	C\$2.80	-62.9%	n/a	3.5x	22.1x	1.0x	32.2x	5.5x
Ivanhoe Mines	IVN T	SC/SW	C\$2.62	22%	OP**	C\$4.00	0.0%	53%	-4.5%	-38.1%	\$1,560	-4.7%	n/a	C\$4.10	-36.1%	n/a	n/a	n/a	n/a	n/a	n/a
Lundin Mining	LUN T	SC/SW	C\$5.57	17%	OP	C\$8.00	2.8%	46%	-18.5%	-33.3%	\$3,078	-22.5%	-1.7x	C\$10.27	-45.7%	19.4x	29.1x	6.4x	6.2x	4.2x	4.0x
Nevada Copper	NCU T	SC	C\$0.39	8%	OP**	C\$1.00	0.0%	156%	-26.4%	-48.0%	\$195	20.6%	-7.8x	C\$1.27	-69.4%	n/a	n/a	n/a	n/a	n/a	n/a
Nevsun Resources	NSU T	SC	C\$5.90	100%	SP**	C\$6.00	0.6%	2%	2.9%	92.6%	\$1,356	-13.4%	-1.9x	C\$6.73	-12.3%	n/a	n/a	24.0x	24.1x	18.3x	19.3x
OZ Minerals	OZL A	PH	A\$9.07	42%	SP	A\$9.50	2.4%	7%	-2.8%	-1.0%	\$2,148	-17.2%	-1.0x	A\$8.85	2.4%	14.2x	18.0x	8.0x	6.1x	5.2x	5.3x
Sandfire Resources NL	SFR A	PH	A\$7.04	26%	SP	A\$8.00	3.8%	17%	-5.2%	1.9%	\$818	-45.2%	-0.9x	A\$7.52	-6.4%	11.3x	6.6x	4.4x	3.2x	3.3x	2.4x
Turquoise Hill	TRQ N	SC/SW	US\$1.94	17%	SP	US\$4.00	0.0%	107%	-8.7%	-43.6%	\$3,894	2.8%	1.1x	US\$4.34	-55.4%	17.1x	29.2x	11.3x	21.9x	10.4x	11.7x
Weighted Average											\$3,753	14.1%			-21.1%	14.2x	17.5x	6.9x	7.3x	6.2x	6.7x
Weighted Average - Large Cap															-17.3%	14.0x	16.7x	6.0x	5.5x	5.5x	5.9x
NICKEL																					
Independence Group	IGO A	PH	A\$4.16	14%	OP	A\$5.25	0.7%	27%	-10.7%	-12.6%	\$1,791	0.1%	0.0x	A\$4.18	-0.5%	29.3x	15.5x	6.5x	5.3x	6.4x	5.0x
Western Areas	WSA A	PH	A\$2.28	5%	SP	A\$3.25	0.9%	43%	-14.3%	-29.6%	\$455	-24.7%	-1.4x	A\$3.42	-33.2%	31.4x	12.2x	6.6x	5.1x	5.3x	3.6x
Weighted Average											\$1,123	-4.9%			-7.2%	29.8x	14.8x	6.5x	5.3x	6.2x	4.7x
ZINC																					
Trevali Mining	TV T	SC	C\$0.48	5%	OP	C\$1.25	0.0%	163%	-34.6%	-68.6%	\$300	2.3%	0.1x	C\$0.92	-48.5%	3.3x	2.8x	1.7x	1.6x	1.5x	1.4x
Weighted Average											\$300	2.3%			-48.5%	3.3x	2.8x	1.7x	1.6x	1.5x	1.4x
DIVERSIFIED																					
Anglo American	AAL L	TB	£17.03	61%	OP	£17.50	4.7%	7%	-1.2%	9.9%	\$28,130	14.0%	0.6x	£19.14	-11.0%	9.0x	8.9x	4.3x	4.6x	4.5x	4.7x
BHP Billiton	BLT L	TB/PH	£16.07	60%	SP	£15.25	4.8%	0%	-3.9%	5.5%	\$109,710	17.1%	0.7x	£14.77	8.8%	10.4x	11.4x	5.7x	6.8x	5.7x	6.4x
Glencore plc	GLEN L	TB	£2.98	11%	OP	£3.50	5.3%	23%	-10.3%	-20.3%	\$54,425	13.4%	0.6x	£3.67	-18.9%	8.6x	9.0x	5.0x	4.4x	3.8x	3.7x
Rio Tinto	RIO L	TB/PH	£39.10	45%	U	£32.00	5.8%	-12%	0.8%	-0.8%	\$87,988	8.2%	0.3x	£36.14	8.2%	11.1x	17.3x	8.0x	9.2x	5.9x	7.9x
South32	S32 A	PH	A\$3.38	27%	SP	A\$3.50	5.4%	9%	-13.8%	-2.0%	\$12,691	-17.5%	n/a	A\$3.34	1.2%	7.9x	10.6x	4.9x	6.1x	3.1x	3.9x
Teck Resources	TECK B.T	SW/SC	C\$28.83	32%	OP	C\$48.00	0.3%	67%	-7.4%	-12.3%	\$12,600	13.5%	0.6x	C\$49.35	-41.6%	6.3x	6.7x	5.0x	3.9x	3.3x	3.6x
Vale	VALE N	TB	US\$14.98	82%	UP	US\$11.00	4.5%	-22%	0.9%	22.4%	\$77,832	27.0%	1.3x	US\$16.34	-8.4%	11.5x	12.0x	7.5x	8.5x	6.7x	6.6x
Weighted Average											\$54,768	15.1%			-2.1%	10.2x	12.2x	6.3x	7.1x	5.4x	6.1x
COAL																					
Warrior Met Coal	HCC N	SC	US\$25.99	69%	SP	US\$31.00	0.8%	20%	-3.9%	31.8%	\$1,395	40.5%	0.6x	US\$34.19	-24.0%	3.6x	6.6x	2.8x	4.4x	3.2x	4.7x
Weighted Average											\$1,395	40.5%			-24.0%	3.6x	6.6x	2.8x	4.4x	3.2x	4.7x
IRON ORE																					
Fortescue Metals	FMG A	PH	A\$4.12	31%	U	A\$3.75	8.2%	-1%	5.1%	-15.6%	\$9,445	23.5%	1.3x	A\$4.01	2.6%	13.4x	11.8x	3.9x	4.0x	5.0x	4.7x
Weighted Average											\$9,445	23.5%			-0.8%	12.1x	11.1x	3.9x	4.0x	5.0x	4.7x
URANIUM																					
Cameco	CCO T	AW	C\$15.68	84%	SP	C\$15.00	2.6%	-2%	6.5%	35.1%	\$4,718	18.9%	2.4x	C\$17.18	-8.7%	86.8x	n/a	10.2x	25.4x	14.6x	18.0x
NexGen	NXE T	AW	C\$2.83	49%	OP**	C\$5.00	0.0%	77%	7.6%	-12.1%	\$737	-6.7%	-1.1x	C\$5.34	-47.0%	n/a	n/a	n/a	n/a	n/a	n/a
Weighted Average											\$2,728	15.4%			-13.9%	86.8x	n/a	10.2x	25.4x	14.6x	18.0x
Total Industry Arithmetic Average															-16.8%	22.8x	10.8x	5.5x	7.9x	6.0x	6.6x

* Currently Restricted, ** Speculative Risk
 Large Cap - ANTO, FM, FCX, HBM, LUN, OZL
 Source: Bloomberg, RBC Capital Markets estimates

GLOBAL METALS & MINING - ESTIMATES & VALUATION BASED ON FORWARD CURVE PRICES

Symbol & Exchange	11/16/18 Current Share Price	Rating	12-month Target Price*	Dividend Yield	Total Implied Return*	Performance		Net Asset Value	Premium (Discount) to NAV	P/E		P/CFPS		EV/EBITDA		
						QTD	YTD			2018E	2019E	2018E	2019E	2018E	2019E	
COPPER																
Antofagasta	ANTO L	£8.11	OP	£8.80	4.9%	13%	-5.2%	-19.3%	£7.04	15%	17.3x	14.9x	7.1x	5.9x	6.0x	5.5x
Capstone Mining	CS T	C\$0.64	SP**	C\$1.25	0.0%	97%	-19.6%	-55.9%	C\$1.17	-46%	4.0x	8.3x	1.6x	2.2x	3.1x	4.2x
First Quantum	FM T	C\$12.52	OP	C\$18.00	0.1%	44%	-14.9%	-28.9%	C\$22.69	-45%	13.8x	10.2x	7.5x	4.2x	7.6x	6.3x
Freeport McMoRan	FCX N	US\$11.96	U	US\$15.00	0.4%	26%	-14.1%	-36.9%	US\$13.60	-12%	6.8x	15.7x	3.3x	5.3x	3.8x	6.3x
HudBay Minerals	HBM T	C\$6.65	OP	C\$8.00	0.2%	21%	1.7%	-40.3%	C\$10.46	-36%	12.3x	38.2x	3.4x	4.6x	2.9x	4.4x
Imperial Metals	III T	C\$1.04	SP**	C\$1.50	0.0%	44%	-47.2%	-69.2%	C\$1.51	-31%	n/a	3.4x	n/a	0.9x	n/a	5.4x
Ivanhoe Mines	IVN T	C\$2.62	OP**	C\$4.00	0.0%	53%	-4.5%	-38.1%	C\$3.96	-34%	n/a	n/a	n/a	n/a	n/a	n/a
Lundin Mining	LUN T	C\$5.57	OP	C\$8.00	2.8%	46%	-18.5%	-33.3%	C\$8.98	-38%	15.2x	55.5x	5.9x	6.9x	3.8x	4.6x
Nevada Copper	NCU T	C\$0.39	OP**	C\$1.00	0.0%	156%	-26.4%	-48.0%	C\$1.13	-65%	n/a	n/a	n/a	n/a	n/a	n/a
Newsun Resources	NSU T	C\$5.90	SP**	C\$6.00	0.6%	2%	2.9%	92.6%	C\$6.23	-5%	n/a	n/a	18.6x	n/a	13.7x	n/a
Sandfire Resources NL	SFR A	A\$7.04	SP	A\$8.00	3.8%	17%	-5.2%	1.9%	A\$6.80	4%	8.2x	7.2x	3.6x	3.5x	2.8x	2.6x
Turquoise Hill	TRQ N	US\$1.94	SP	US\$4.00	0.0%	107%	-8.7%	-43.6%	US\$4.17	-54%	15.6x	28.7x	10.4x	21.3x	9.4x	11.5x
Weighted Average										-16%	11.9x	19.1x	6.1x	6.7x	5.6x	6.3x
Weighted Average - Large Cap										-12%	11.7x	18.5x	5.4x	5.4x	5.0x	5.8x
NICKEL																
Independence Group	IGO A	A\$4.16	OP	A\$5.25	0.7%	27%	-10.7%	-12.6%	A\$3.77	10%	30.8x	23.9x	6.6x	6.5x	6.5x	6.0x
Western Areas	WSA A	A\$2.28	SP	A\$3.25	0.9%	43%	-14.3%	-29.6%	A\$2.90	-21%	41.8x	66.6x	7.1x	8.1x	5.7x	6.4x
Weighted Average										4%	33.0x	32.6x	6.7x	6.8x	6.4x	6.1x
ZINC																
Trevali Mining	TV T	C\$0.48	OP	C\$1.25	0.0%	163%	-34.6%	-68.6%	C\$0.62	-23%	2.6x	4.9x	1.5x	2.2x	1.3x	2.1x
Weighted Average										-23%	2.6x	4.9x	1.5x	2.2x	1.3x	2.1x
DIVERSIFIED																
Anglo American	AAL L	£17.03	OP	£17.50	4.7%	7%	-1.2%	9.9%	£23.72	-28%	8.3x	6.5x	4.1x	3.8x	4.2x	3.8x
BHP Billiton	BLT L	£16.07	SP	£15.25	4.8%	0%	-3.9%	5.5%	£16.67	-4%	9.5x	9.6x	5.4x	6.1x	5.4x	5.6x
Glencore plc	GLEN L	£2.98	OP	£3.50	5.3%	23%	-10.3%	-20.3%	£4.11	-28%	8.0x	9.1x	4.8x	4.4x	3.6x	3.7x
Rio Tinto	RIO L	£39.10	U	£32.00	5.8%	-12%	0.8%	-0.8%	£41.41	-6%	10.3x	12.1x	7.5x	7.5x	5.6x	6.4x
South32	S32 A	A\$3.38	SP	A\$3.50	5.4%	9%	-13.8%	-2.0%	A\$3.36	1%	8.8x	13.0x	5.5x	6.9x	3.5x	4.5x
Teck Resources	TECK.B T	C\$28.83	OP	C\$48.00	0.3%	67%	-7.4%	-12.3%	C\$49.28	-41%	6.3x	12.5x	5.0x	5.5x	3.3x	5.3x
Vale	VALE N	US\$14.98	UP	US\$11.00	4.5%	-22%	0.9%	22.4%	US\$15.88	-6%	9.7x	9.1x	6.7x	6.9x	5.9x	5.4x
Weighted Average										-11%	9.3x	10.0x	6.0x	6.2x	5.1x	5.3x
COAL																
Warrior Met Coal	HCC N	US\$25.99	SP	US\$31.00	0.8%	20%	-3.9%	31.8%	US\$57.79	-55%	3.1x	2.7x	2.5x	2.2x	2.9x	2.6x
Weighted Average										-55%	3.1x	2.7x	2.5x	2.2x	2.9x	2.6x
IRON ORE																
Fortescue Metals	FMG A	A\$4.12	U	A\$3.75	8.2%	-1%	5.1%	-15.6%	A\$4.06	2%	7.9x	6.3x	3.3x	3.1x	3.9x	3.5x
Weighted Average										2%	7.2x	5.8x	3.2x	3.0x	3.9x	3.5x

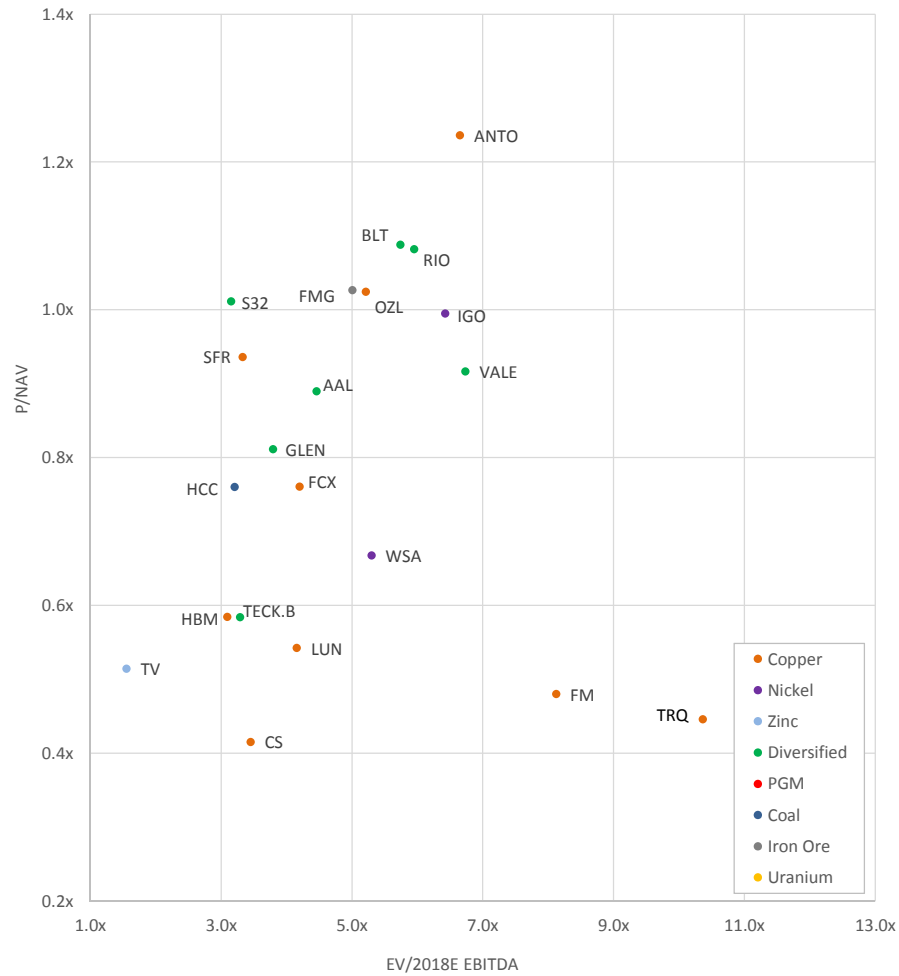
*Price Target and implied return at RBCCM Commodity Price Forecasts, **Speculative Risk

[^]Moly prices are RBCCM forecasts as there is no forward curve, Large Cap - ANTO, FM, FCX, HBM, LUN, OZL

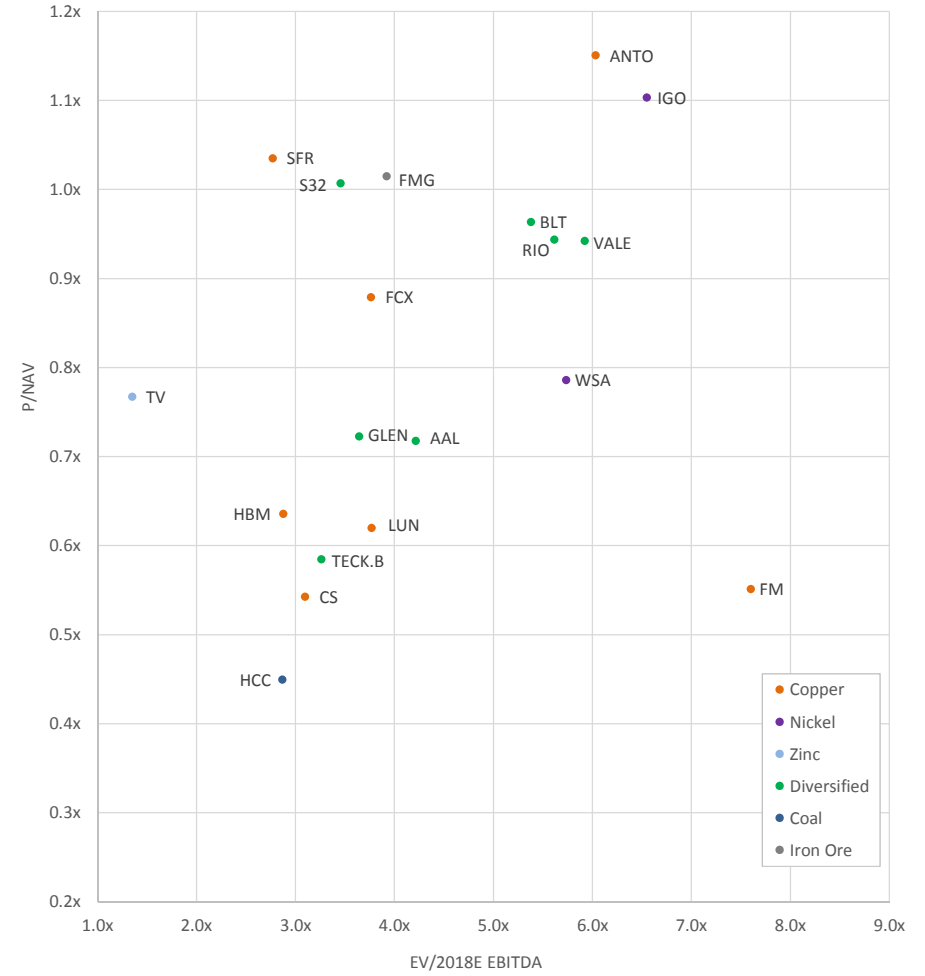
Source: Bloomberg, RBC Capital Markets estimates

GLOBAL METALS & MINING - VALUATION AT RBC FORECAST AND FORWARD CURVE PRICES

Industrial metal valuations at RBC forecast prices



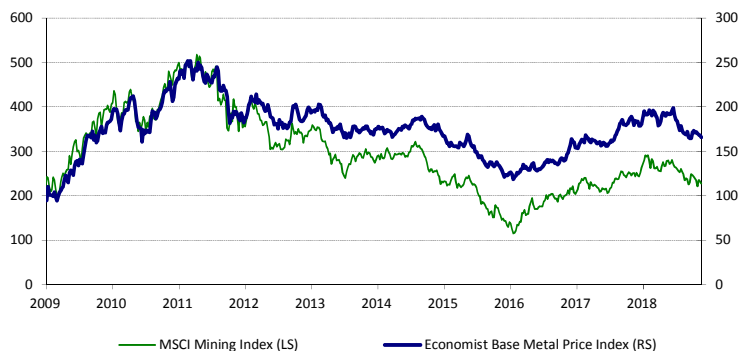
Industrial metal valuations at forward curve prices



Source: Bloomberg, RBC Capital Markets estimates

GLOBAL METALS & MINING - COMMODITY & SHARE PRICE PERFORMANCE

Metal prices were down on average 0.5% last week. Zinc was the best performer up 3.3%, followed by copper up 1.5%, gold up 0.9%, lead up 0.2%, uranium flat 0.0%, coking coal flat 0.0%, and cobalt flat 0.0%. Thermal Coal was the worst performer down 4.6%, followed by iron ore down 2.8%, aluminium down 2.6%, nickel down 1.7%, and moly down 0.4%.


Implied commodity prices:
Implied copper prices (US\$/lb)*

FCX	\$2.71
HBM	\$2.57
FM	\$2.60
LUN	\$1.98
TRQ	\$2.05
CS	\$2.72
III	\$2.81
IVN	\$2.49
Average	\$2.49

Implied coking coal prices (US\$/tonne)*

TECK	\$99.60
------	---------

Implied zinc price (US\$/lb)*

TV	\$1.01
----	--------

*All other commodities and currencies at spot

Source: Bloomberg, RBC Capital Markets estimates

Mining shares were up on average 1.7% last week. The best performing group was zinc up 11.5%, followed by coal up 2.9%, copper up 2.6%, the diversified group up 0.3%, uranium down 0.1%, iron ore down 1.6%, and nickel down 1.7%.

Weekly Performance (US\$ basis)

Commodities	% Chg
Zinc	3.3%
Copper	1.5%
Gold	0.9%
Lead	0.2%
Uranium	0.0%
Coking Coal	0.0%
Cobalt	0.0%
Silver	-0.4%
Moly	-0.4%
Nickel	-1.7%
Aluminium	-2.6%
Iron Ore	-2.8%
Thermal Coal	-4.6%
Average	-0.5%

Top Equity Performers

Company	% Chg
1. Capstone Mining	18.1%
2. Trevali Mining	11.5%
3. Turquoise Hill	7.5%
4. Freeport McMoRan	5.4%
5. Teck Resources	5.2%

Bottom Equity Performers

Company	% Chg
1. Imperial Metals	-15.1%
2. NexGen	-5.0%
3. Sandfire Resources NL	-3.4%
4. Glencore plc	-3.2%
5. South32	-3.1%

Year-to-Date Performance (US\$ basis)

Commodities	% Chg
Moly	19.0%
Uranium	17.5%
Iron Ore	1.0%
Cobalt	0.0%
Thermal Coal	-2.9%
Gold	-5.3%
Nickel	-8.0%
Copper	-13.6%
Aluminium	-14.6%
Coking Coal	-14.9%
Silver	-15.3%
Zinc	-20.2%
Lead	-21.4%
Average	-6.1%

Top Equity Performers

Company	% Chg
1. Nevsun Resources	84.1%
2. Warrior Met Coal	31.8%
3. Cameco	29.2%
4. Vale	22.4%
5. Anglo American	4.3%

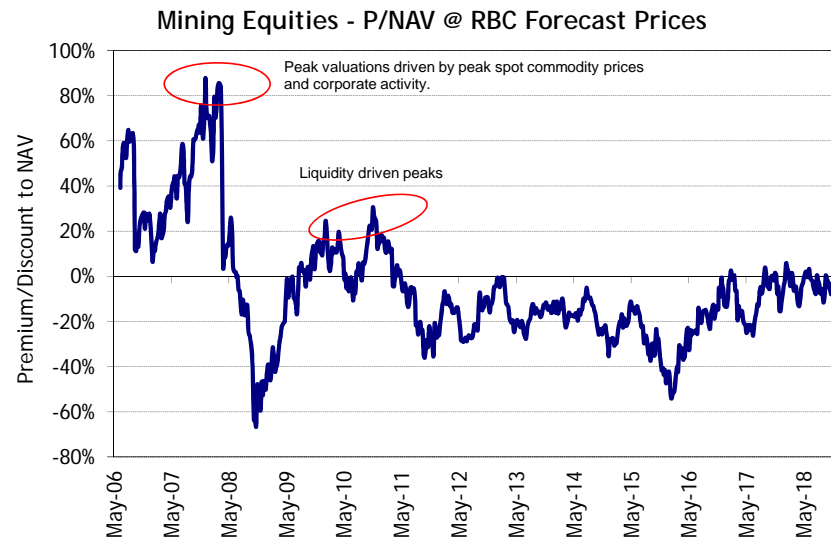
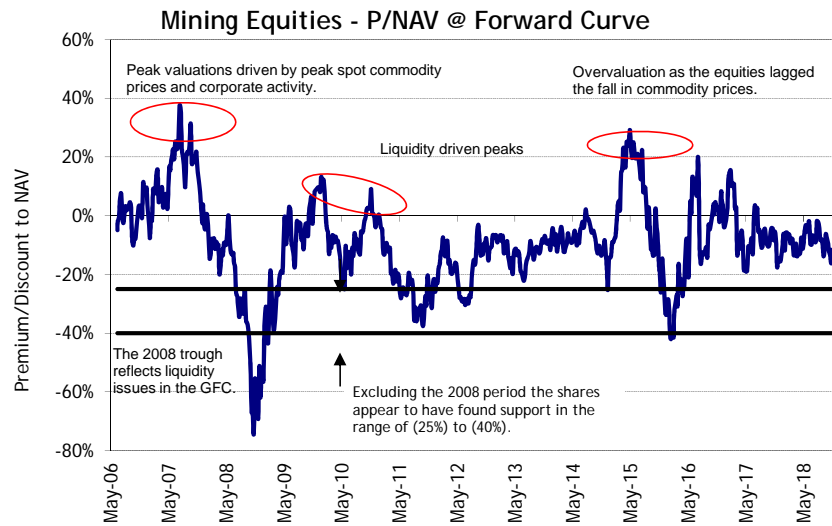
Bottom Equity Performers

Company	% Chg
1. Imperial Metals	-70.6%
2. Trevali Mining	-70.0%
3. Capstone Mining	-57.9%
4. Nevada Copper	-50.3%
5. Turquoise Hill	-43.6%

GLOBAL METALS & MINING - HISTORICAL PRICE / NAV VALUATIONS

Mining shares are now trading at a 11.2% discount to NAV at forward curve prices, versus a 12.2% discount one week ago.

At RBC forecast prices, mining shares are now trading at a 4.2% discount to NAV, versus a 5.2% discount one week ago.



On average mining shares often attract entry points for investors near or below a 20% discount to our NAV at the forward curve.

Outliers trading above the average P/NAV at forward curve prices include ANTO, IGO and SFR, and at a discount include OZL, HCC, TRQ and CS.

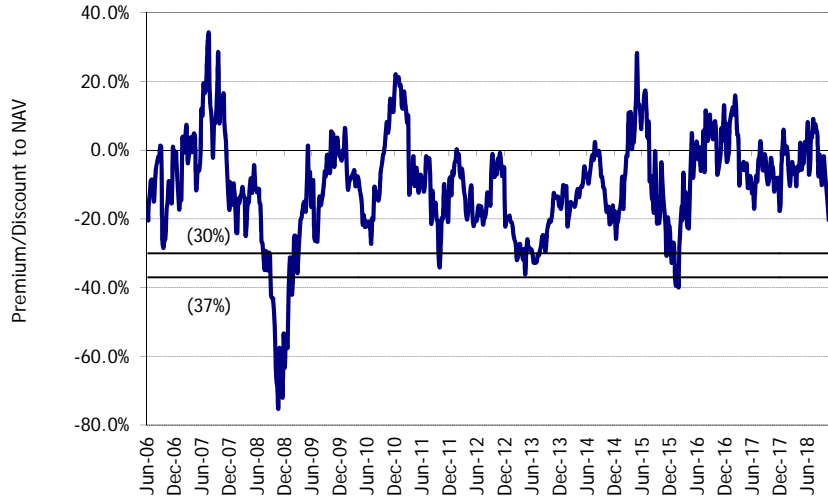
Forward curve valuations are shown on page 3.

Source: Bloomberg, RBC Capital Markets estimates

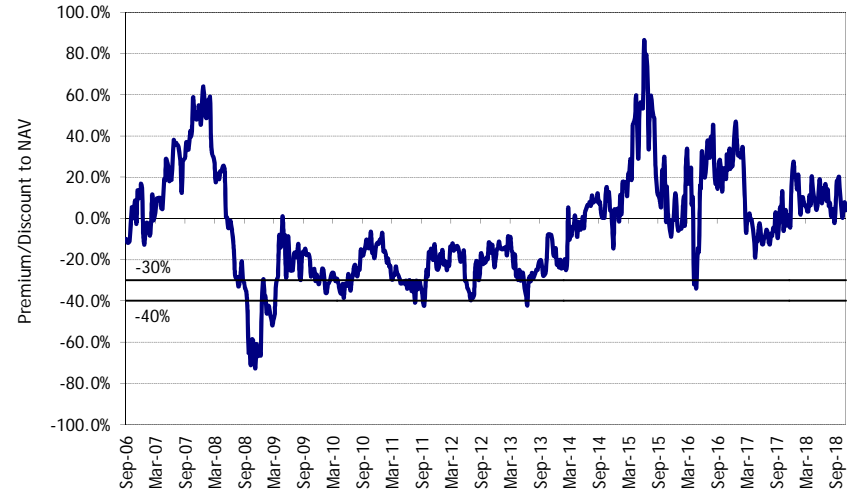
CHARTS FOR INDIVIDUAL BASE METALS ON NEXT PAGE

GLOBAL METALS & MINING - HISTORICAL PRICE / NAV VALUATIONS

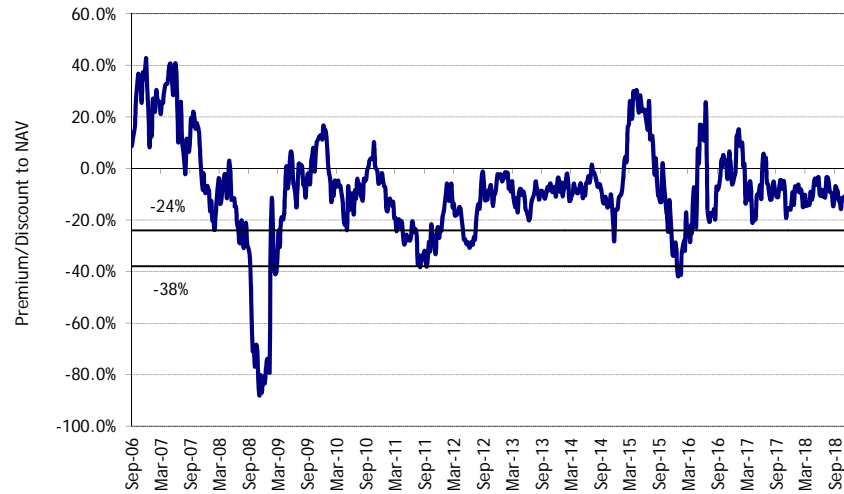
Copper Equities - P/NAV @ Forward Curve



Nickel Equities - P/NAV @ Forward Curve



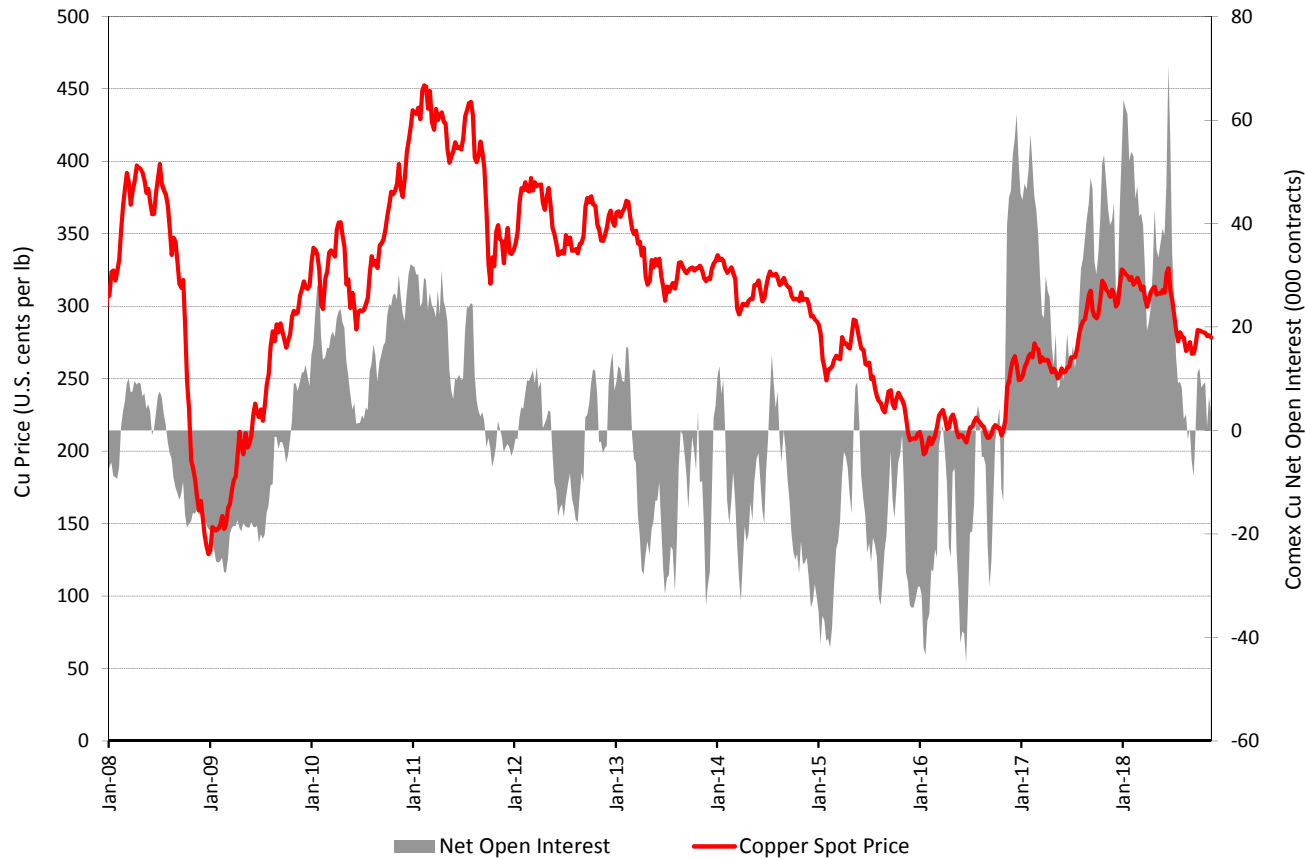
Diversified Equities - P/NAV @ Forward Curve



Source: Bloomberg, RBC Capital Markets estimates

GLOBAL METALS & MINING - SPECULATIVE NET LONG/SHORT POSITIONS

Comex Copper Price vs. Comex Net Position of Large Speculators

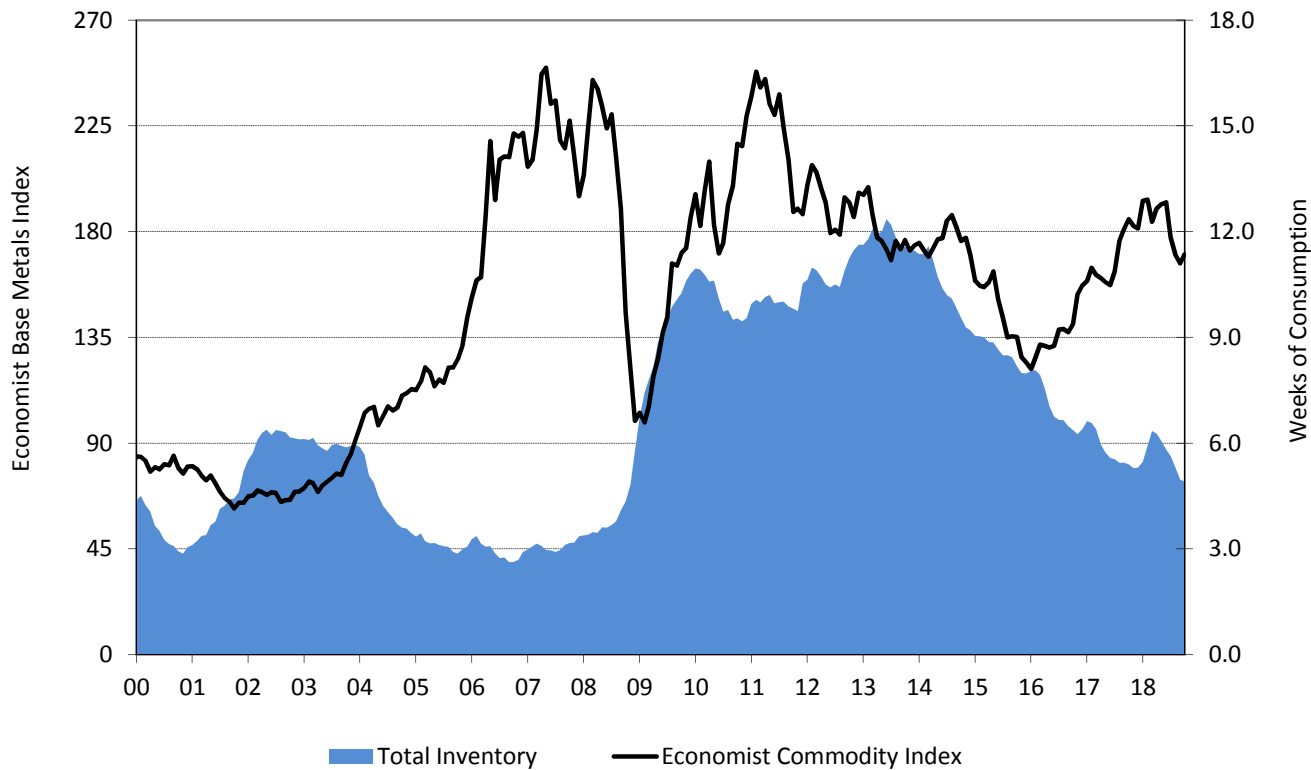


The Comex commitments of traders data for copper shows that the net long position decreased from its position last week.

Source: Bloomberg, RBC Capital Markets

GLOBAL METALS & MINING - INVENTORY & PRICE

Total Al, Cu, Ni & Zn Inventories in Weeks of Consumption versus The Economist Base Metal Price Index



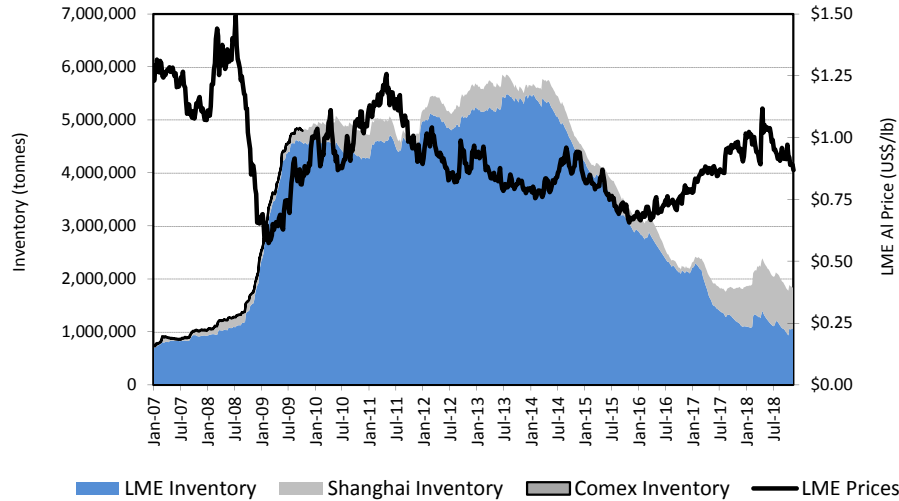
Total inventories in October 2018 decreased month-over-month and decreased year-over-year.

Total exchange inventories of aluminium, copper, and zinc decreased last week, while total inventories of nickel increased last week.

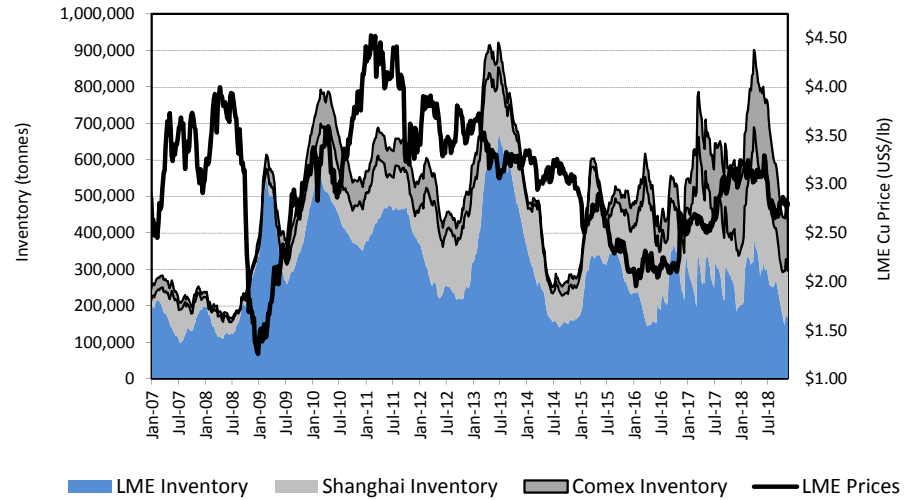
Source: ICSG, INSG, IZSG, WBMS, Bloomberg, RBC Capital Markets, Economist

GLOBAL METALS & MINING - INVENTORY & PRICE - Al & Zn continue to decline and Cu and Ni stable

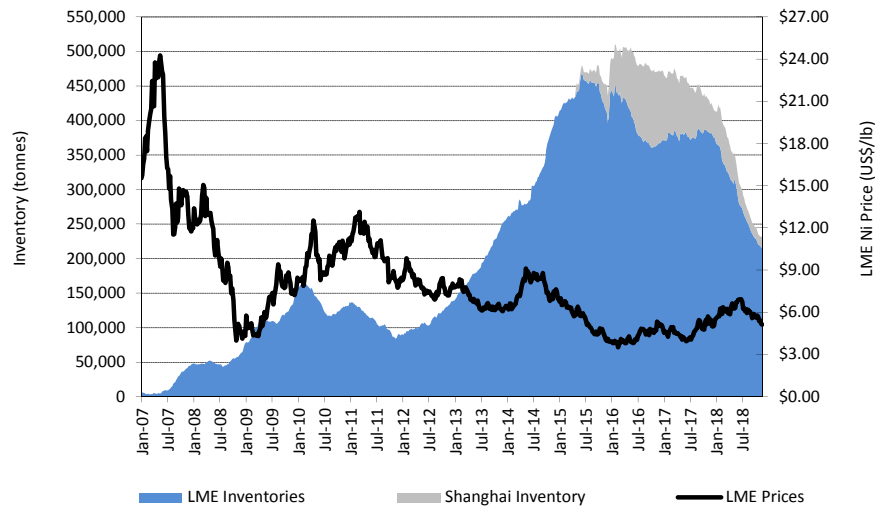
Aluminium Weekly Inventory & LME Prices



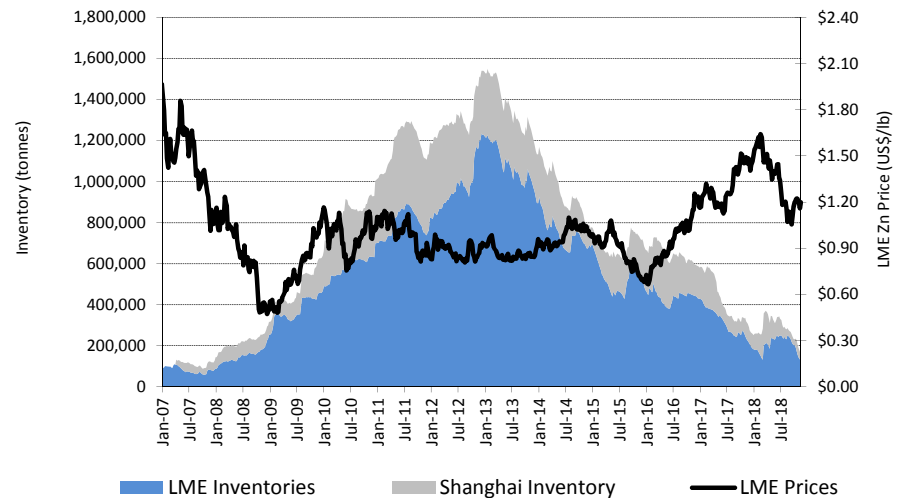
Copper Weekly Inventory & LME Prices



Nickel Weekly Inventory & LME Prices

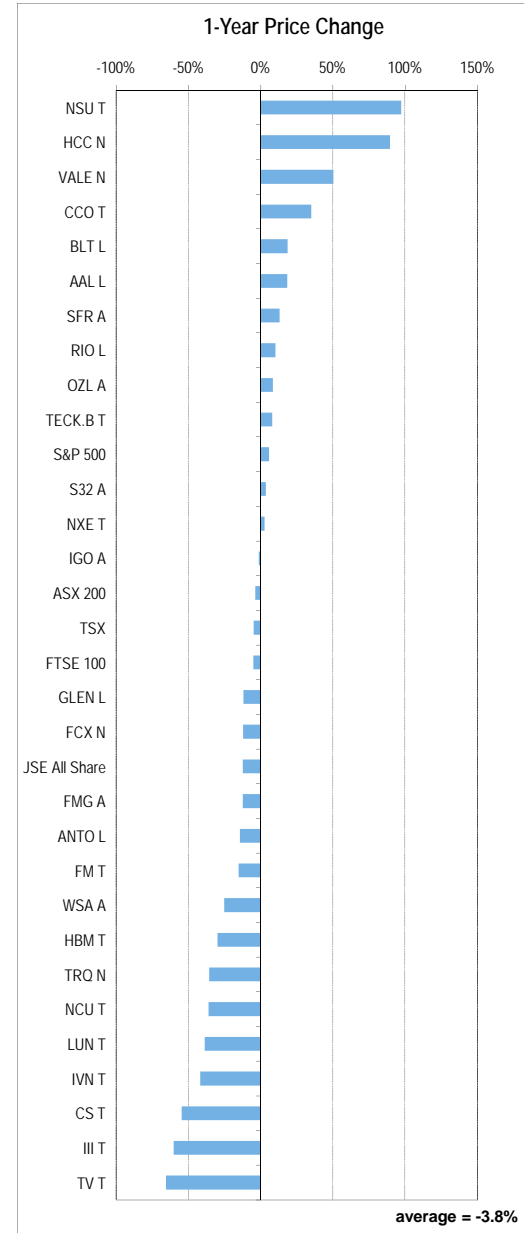
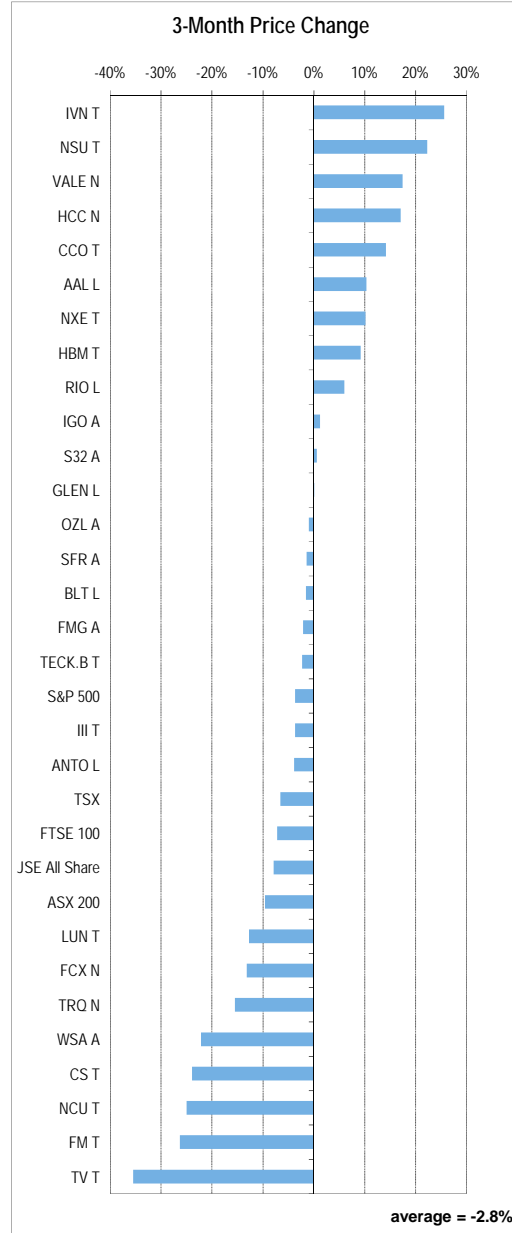
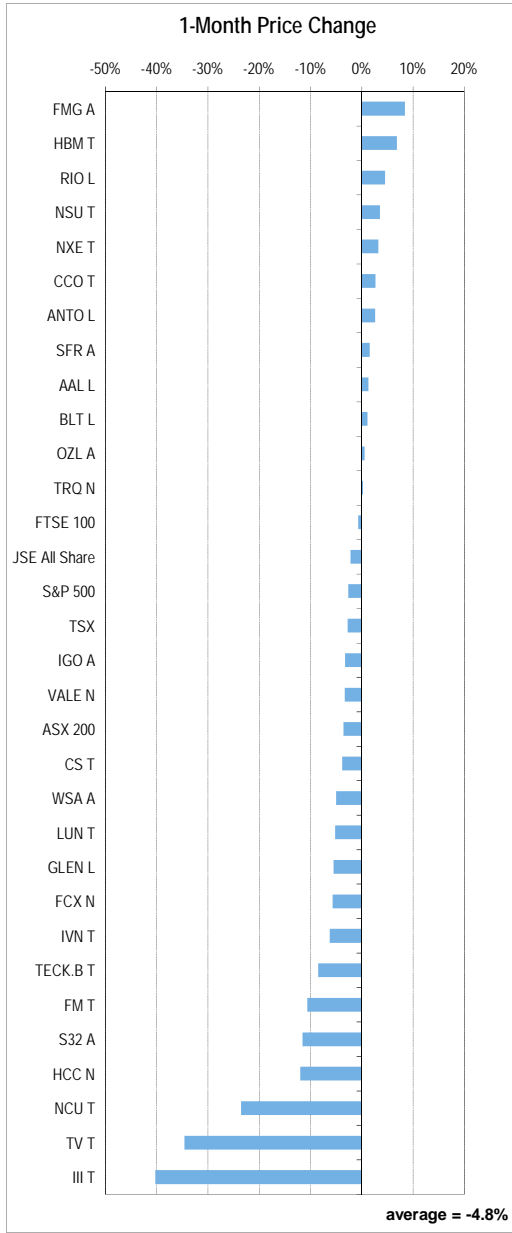


Zinc Weekly Inventory & LME Prices



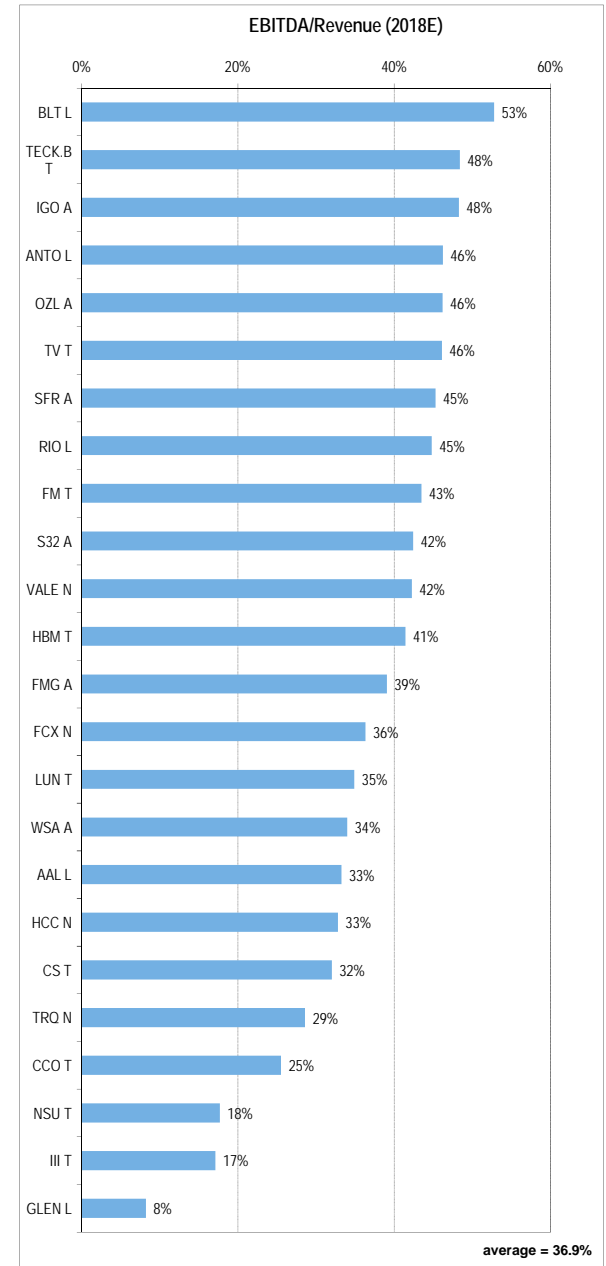
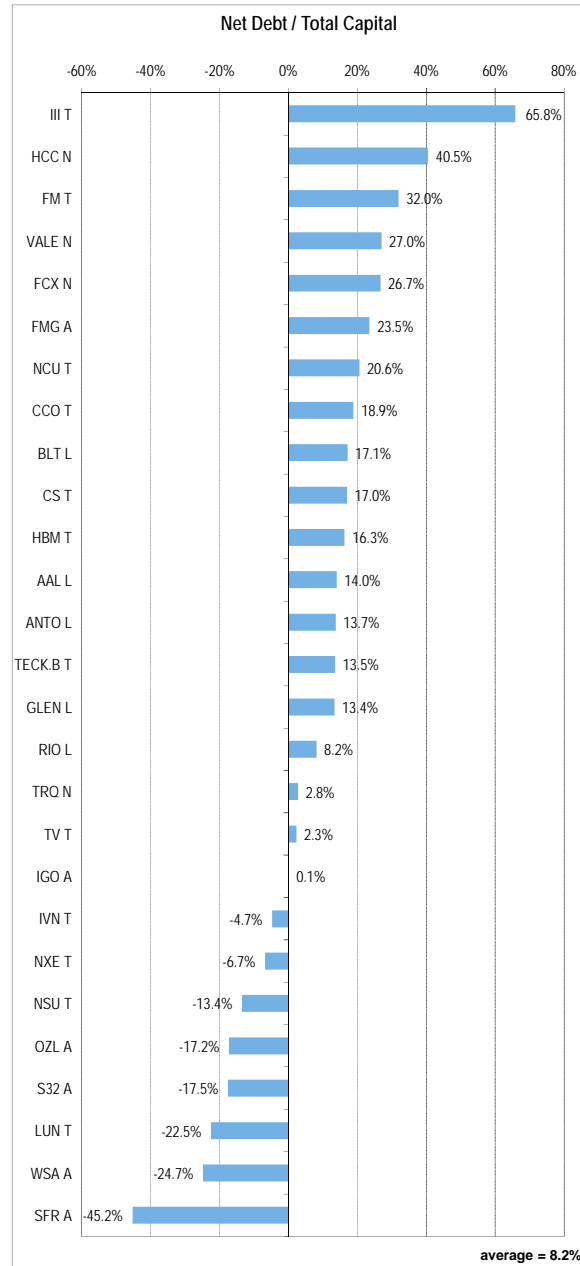
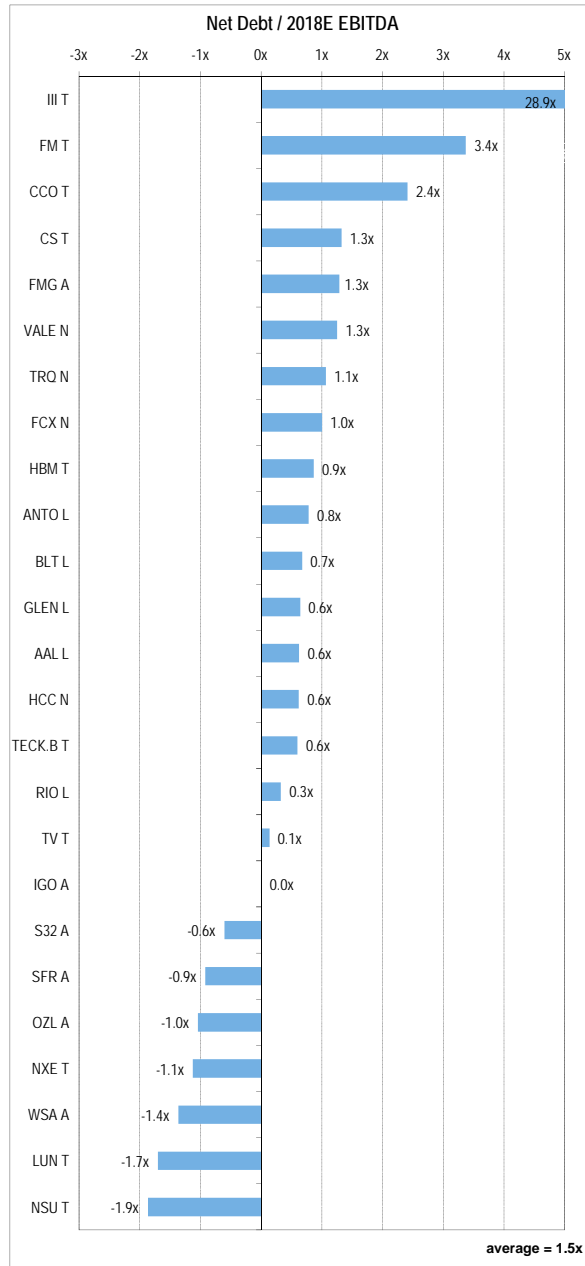
Source: Bloomberg, RBC Capital Markets

GLOBAL METALS & MINING - SHARE PRICE PERFORMANCE IN LOCAL CURRENCY



Source: Bloomberg, RBC Capital Markets

GLOBAL METALS & MINING - BALANCE SHEET & MARGIN ANALYSIS



Source: Bloomberg, RBC Capital Markets

GLOBAL METALS & MINING - METAL PRODUCTION

	Symbol & Exchange	Reporting Currency	11/16/18 Current Share Price	Payable Production (000 tonnes)			% of Revenue		
				2017A	2018E	2019E	2017A	2018E	2019E
Aluminium (Ingots)									
BHP Billiton	BLT L	US\$	£16.07	-	-	-	-	-	-
Rio Tinto	RIO L	US\$	£39.10	3,554	3,348	3,050	26%	29%	26%
South32	S32 A	US\$	A\$3.38	988	982	985	29%	28%	28%
Copper									
Antofagasta	ANTO L	US\$	£8.11	704	693	754	90%	87%	87%
Anglo American	AAL L	US\$	£17.03	596	630	597	15%	17%	16%
BHP Billiton	BLT L	US\$	£16.07	1,447	1,813	1,693	28%	30%	29%
Capstone Mining	CS T	US\$	C\$0.64	90	72	71	93%	89%	90%
First Quantum	FM T	US\$	C\$12.52	574	596	728	85%	92%	92%
Freeport McMoRan	FCX N	US\$	US\$11.96	1,695	1,735	1,524	77%	72%	81%
Glencore plc	GLEN L	US\$	£2.98	1,297	1,434	1,585	44%	39%	37%
HudBay Minerals	HBM T	US\$	C\$6.65	159	149	124	57%	54%	51%
Imperial Metals	III T	C\$	C\$1.04	43	34	54	69%	76%	73%
Independence Group	IGO A	A\$	A\$4.16	8	11	11	10%	11%	11%
Ivanhoe Mines	IVN T	US\$	C\$2.62	-	-	-	-	-	-
Lundin Mining	LUN T	US\$	C\$5.57	231	193	195	63%	63%	59%
Nevada Copper	NCU T	C\$	C\$0.39	-	-	1	-	-	98%
Nevsun Resources	NSU T	US\$	C\$5.90	7	13	14	12%	21%	18%
OZ Minerals	OZL A	A\$	A\$9.07	112	109	98	77%	74%	68%
Rio Tinto	RIO L	US\$	£39.10	478	596	576	10%	13%	15%
Sandfire Resources NL	SFR A	A\$	A\$7.04	65	67	75	89%	87%	90%
Teck Resources	TECK.B T	C\$	C\$28.83	262	266	289	19%	21%	20%
Turquoise Hill	TRQ N	US\$	US\$1.94	95	95	101	86%	73%	73%
Vale	VALE N	US\$	US\$14.98	439	388	411	8%	6%	6%

TABLE CONTINUED ON NEXT PAGE

GLOBAL METALS & MINING - METAL PRODUCTION

	Symbol & Exchange	Reporting Currency	11/16/18 Current Share Price	Payable Production (000 tonnes)			% of Revenue		
				2017A	2018E	2019E	2017A	2018E	2019E
Nickel									
Anglo American	AAL L	US\$	£17.03	44	41	43	2%	2%	2%
First Quantum	FM T	US\$	C\$12.52	18	-	-	4%	-	-
Glencore plc	GLEN L	US\$	£2.98	109	133	153	5%	6%	7%
Independence Group	IGO A	A\$	A\$4.16	14	21	22	11%	47%	51%
Lundin Mining	LUN T	US\$	C\$5.57	19	15	11	9%	11%	8%
South32	S32 A	US\$	A\$3.38	41	43	39	6%	7%	8%
Vale	VALE N	US\$	US\$14.98	288	244	254	9%	10%	10%
Western Areas	WSA A	A\$	A\$2.28	16	15	16	100%	100%	100%
Zinc									
BHP Billiton	BLT L	US\$	£16.07	108	124	120	-	-	-
Capstone Mining	CS T	US\$	C\$0.64	4	7	4	2%	3%	2%
First Quantum	FM T	US\$	C\$12.52	21	25	16	1%	2%	1%
Glencore plc	GLEN L	US\$	£2.98	1,090	1,062	1,108	21%	20%	20%
HudBay Minerals	HBM T	US\$	C\$6.65	135	130	123	22%	24%	26%
Ivanhoe Mines	IVN T	US\$	C\$2.62	-	-	-	-	-	-
Lundin Mining	LUN T	US\$	C\$5.57	125	128	142	16%	19%	20%
Nevsun Resources	NSU T	US\$	C\$5.90	79	97	101	77%	78%	71%
Trevali Mining	TV T	US\$	C\$0.48	102	182	176	72%	94%	86%
South32	S32 A	US\$	A\$3.38	49	47	53	2%	1%	2%
Teck Resources	TECK.B T	C\$	C\$28.83	554	549	532	33%	29%	32%
Coking Coal									
Anglo American	AAL L	US\$	£17.03	16,981	19,288	21,800	11%	13%	13%
BHP Billiton	BLT L	US\$	£16.07	38,880	43,388	46,100	12%	14%	13%
Glencore plc	GLEN L	US\$	£2.98	6	8	13	3%	3%	4%
Rio Tinto	RIO L	US\$	£39.10	7,703	3,988	-	4%	2%	-
South32	S32 A	US\$	A\$3.38	4,077	4,517	5,113	11%	11%	11%
Teck Resources	TECK.B T	C\$	C\$28.83	26,800	26,100	27,950	49%	47%	41%
Vale	VALE N	US\$	US\$14.98	6,953	6,520	9,400	4%	3%	4%
Warrior Met Coal	HCC N	US\$	US\$25.99	6,716	7,500	7,550	96%	97%	97%

TABLE CONTINUED ON NEXT PAGE

GLOBAL METALS & MINING - METAL PRODUCTION

	Symbol & Exchange	Reporting Currency	11/16/18 Current Share Price	Payable Production (000 tonnes)			% of Revenue		
				2017A	2018E	2019E	2017A	2018E	2019E
Thermal Coal									
Anglo American	AAL L	US\$	£17.03	60,892	50,934	54,600	14%	16%	15%
BHP Billiton	BLT L	US\$	£16.07	29,633	31,229	31,950	8%	10%	10%
Glencore plc	GLEN L	US\$	£2.98	115	122	138	22%	26%	26%
Rio Tinto	RIO L	US\$	£39.10	13,939	2,526	-	3%	1%	-
South32	S32 A	US\$	A\$3.38	25,903	25,817	28,239	18%	19%	21%
Vale	VALE N	US\$	US\$14.98	4,307	5,578	6,400	1%	1%	1%
Iron Ore									
Anglo American	AAL L	US\$	£17.03	62	47	63	20%	14%	17%
BHP Billiton	BLT L	US\$	£16.07	230,860	244,834	243,317	35%	31%	31%
Fortescue Metals	FMG A	US\$	A\$4.12	168,800	170,050	170,345	100%	100%	100%
Rio Tinto	RIO L	US\$	£39.10	290,316	298,674	309,037	48%	46%	49%
Vale	VALE N	US\$	US\$14.98	361,494	382,250	402,020	73%	74%	73%
Uranium									
NexGen	NXE T	C\$	US\$2.83	-	-	-	-	-	-
Cameco	CCO T	C\$	C\$15.68	15.2	15.6	11.8	100%	100%	100%
Rio Tinto	RIO L	US\$	£39.10	2.1	2.3	1.8	1%	1%	0%

* Currently Restricted

Source: Bloomberg, RBC Capital Markets estimates

GLOBAL METALS & MINING - FREE CASH FLOW ANALYSIS

	Symbol & Exchange	Reporting Currency	11/16/18 Current Share Price	EBITDA			EV / EBITDA			FREE CFPS (FCFPS)			PRICE / FCFPS			Free Cash Flow Yield		
				2017A	2018E	2019E	2017A	2018E	2019E	2017A	2018E	2019E	2017A	2018E	2019E	2017A	2018E	2019E
COPPER																		
Antofagasta	ANTO L	US\$	£8.11	\$2,587	\$2,061	\$2,403	5.3x	6.6x	5.7x	\$1.22	\$0.60	\$0.43	8.6x	17.3x	24.0x	11.7%	5.8%	4.2%
Capstone Mining	CS T	US\$	C\$0.64	\$194	\$143	\$111	2.5x	3.4x	4.4x	\$0.09	\$0.06	\$0.09	5.1x	8.7x	5.5x	19.4%	11.5%	18.3%
First Quantum	FM T	US\$	C\$12.52	\$1,137	\$1,636	\$2,077	11.7x	8.1x	6.4x	(\$1.60)	(\$1.22)	\$1.17	n/a	n/a	8.1x	n/a	n/a	12.3%
Freeport McMoRan	FCX N	US\$	US\$11.96	\$5,965	\$6,532	\$4,235	4.6x	4.2x	6.5x	\$2.25	\$1.65	\$0.59	5.3x	7.2x	20.4x	18.8%	13.8%	4.9%
HudBay Minerals	HBM T	US\$	C\$6.65	\$622	\$594	\$452	3.0x	3.1x	4.1x	\$1.11	\$0.83	\$0.22	4.6x	6.1x	22.6x	21.94%	16.48%	4.43%
Imperial Metals	III T	C\$	C\$1.04	\$94	\$30	\$176	10.3x	32.2x	5.5x	(\$0.53)	(\$0.60)	\$0.52	n/a	n/a	2.0x	n/a	n/a	49.9%
Ivanhoe Mines	IVN T	US\$	C\$2.62	(\$60)	(\$61)	(\$61)	n/a	n/a	n/a	(\$0.04)	(\$0.03)	(\$0.08)	n/a	n/a	n/a	n/a	n/a	n/a
Lundin Mining	LUN T	US\$	C\$5.57	\$1,082	\$612	\$629	2.3x	4.2x	4.0x	\$0.57	(\$0.49)	(\$0.21)	7.5x	n/a	n/a	13.4%	n/a	n/a
Nevada Copper	NCU T	C\$	C\$0.39	(\$4)	(\$8)	(\$7)	n/a	n/a	n/a	(\$0.11)	(\$0.28)	(\$0.22)	n/a	n/a	n/a	n/a	n/a	n/a
Nevsun Resources	NSU T	US\$	C\$5.90	\$13	\$67	\$64	98.5x	18.3x	19.3x	(\$0.05)	(\$0.16)	(\$0.05)	n/a	n/a	n/a	n/a	n/a	n/a
OZ Minerals	OZL A	A\$	A\$9.07	\$546	\$475	\$466	4.5x	5.2x	5.3x	\$0.49	(\$0.32)	(\$0.44)	18.6x	n/a	n/a	5.4%	n/a	n/a
Sandfire Resources NL	SFR A	A\$	A\$7.04	\$274	\$264	\$358	3.2x	3.3x	2.4x	\$0.89	\$0.78	\$1.63	7.9x	9.0x	4.3x	12.7%	11.1%	23.2%
Turquoise Hill	TRO N	US\$	US\$1.94	\$245	\$322	\$286	13.6x	10.4x	11.7x	(\$0.40)	(\$0.47)	(\$0.59)	n/a	n/a	n/a	n/a	n/a	n/a
Weighted Average													7.3x	10.7x	18.8x	15.4%	11.1%	6.6%
NICKEL																		
Independence Group	IGO A	A\$	A\$4.16	\$173	\$381	\$486	14.1x	6.4x	5.0x	(\$0.03)	\$0.40	\$0.59	n/a	10.4x	7.1x	n/a	9.58%	14.18%
Western Areas	WSA A	A\$	A\$2.28	\$51	\$93	\$137	9.8x	5.3x	3.6x	\$0.03	\$0.09	\$0.11	80.6x	26.7x	20.2x	1.24%	3.74%	4.94%
Weighted Average													80.6x	13.7x	9.7x	1.2%	8.4%	12.3%
ZINC																		
Trevali Mining	TV T	US\$	C\$0.48	\$119	\$213	\$231	2.8x	1.5x	1.4x	\$0.09	\$0.10	\$0.13	4.2x	3.8x	2.8x	23.8%	26.5%	35.1%
Weighted Average													4.2x	3.8x	2.8x	23.8%	26.5%	35.1%
DIVERSIFIED																		
Anglo American	AAL L	US\$	£17.03	\$8,823	\$8,792	\$8,395	4.4x	4.5x	4.7x	\$4.23	\$2.37	\$0.76	5.2x	9.2x	28.8x	19.4%	10.9%	3.5%
BHP Billiton	BLT L	US\$	£16.07	\$21,171	\$22,708	\$20,465	6.2x	5.7x	6.4x	\$2.12	\$2.58	\$1.75	9.7x	8.0x	11.8x	10.3%	12.5%	8.5%
Glencore plc	GLEN L	US\$	£2.98	\$14,762	\$17,231	\$17,803	4.4x	3.8x	3.7x	\$0.09	\$0.29	\$0.60	44.2x	13.2x	6.4x	2.3%	7.6%	15.7%
Rio Tinto	RIO L	US\$	£39.10	\$18,580	\$16,796	\$12,591	5.4x	5.9x	7.9x	\$5.36	\$2.77	\$1.76	9.4x	18.1x	28.5x	10.7%	5.5%	3.5%
South32	S32 A	US\$	A\$3.38	\$2,839	\$3,385	\$2,699	3.8x	3.1x	3.9x	\$0.27	\$0.38	\$0.26	9.2x	6.6x	9.4x	10.9%	15.2%	10.6%
Teck Resources	TECK.B T	C\$	C\$28.83	\$5,867	\$6,230	\$5,754	3.5x	3.3x	3.6x	\$3.88	\$1.35	\$1.57	7.4x	21.4x	18.4x	13.4%	4.7%	5.4%
Vale	VALE N	US\$	US\$14.98	\$15,345	\$14,462	\$14,663	6.3x	6.7x	6.6x	\$1.66	\$1.28	\$1.06	9.0x	11.7x	14.2x	11.1%	8.5%	7.1%
Weighted Average													14.0x	12.3x	16.7x	10.2%	9.1%	7.7%

TABLE CONTINUED ON NEXT PAGE



GLOBAL METALS & MINING - FREE CASH FLOW ANALYSIS

	Symbol & Exchange	Reporting Currency	11/16/18 Current Share Price	EBITDA			EV / EBITDA			FREE CFPS (FCFPS)			PRICE / FCFPS			Free Cash Flow Yield		
				2017A	2018E	2019E	2017A	2018E	2019E	2017A	2018E	2019E	2017A	2018E	2019E	2017A	2018E	2019E
COAL																		
Warrior Met Coal	HCC N	US\$	US\$25.99	\$540	\$541	\$367	3.2x	3.2x	4.7x	\$8.41	\$7.03	\$3.54	3.1x	3.7x	7.3x	32.4%	27.0%	13.6%
Weighted Average													3.1x	3.7x	7.3x	32.4%	27.0%	13.6%
IRON ORE																		
Fortescue Metals	FMG A	US\$	A\$4.12	\$3,900	\$2,545	\$2,708	3.3x	5.0x	4.7x	\$0.75	\$0.42	\$0.32	4.0x	7.3x	9.3x	24.8%	13.7%	10.7%
Weighted Average													4.0x	7.3x	9.3x	24.8%	13.7%	10.7%
URANIUM																		
Cameco	CCO T	C\$	C\$15.68	\$561	\$510	\$414	13.3x	14.6x	18.0x	\$1.04	\$1.26	\$0.28	15.0x	12.5x	55.2x	6.6%	8.0%	1.8%
NexGen	NXE T	C\$	C\$2.83	(\$47)	\$19	(\$18)	n/a	50.1x	n/a	(\$0.15)	(\$0.13)	(\$0.14)	n/a	n/a	n/a	n/a	n/a	n/a
Weighted Average													15.0x	12.5x	55.2x	6.6%	8.0%	1.8%
Total Industry Arithmetic Average													18.3x	9.1x	17.1x	16.4%	14.8%	12.6%

* Currently Restricted

Source: Bloomberg, RBC Capital Markets estimates

GLOBAL METALS & MINING - INPUT ASSUMPTIONS & FORECAST PRICES

Economic Assumptions	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Long-term*
Australian Prime	6.4%	6.7%	3.3%	4.4%	4.7%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
Canadian Prime	6.3%	4.7%	2.4%	2.6%	3.0%	3.0%	3.0%	3.0%	2.8%	2.7%	2.9%	3.5%	4.5%	5.5%	6.0%	6.0%	6.0%
U.S. Prime	8.0%	4.9%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.5%	4.1%	5.2%	7.5%	7.5%	7.0%	7.0%	7.0%
US\$ per A\$	0.8389	0.8520	0.7923	0.9205	1.0328	1.0358	0.9686	0.9024	0.7526	0.7441	0.7668	0.7435	0.7225	0.7350	0.7400	0.7450	0.7500
US\$ per C\$	0.9351	0.9400	0.8763	0.9707	1.0110	1.0004	0.9710	0.9054	0.7822	0.7548	0.7710	0.7701	0.7717	0.8027	0.8280	0.8280	0.8000
S.A. Rand per US\$	7.0542	8.2727	8.4187	7.3181	7.2637	8.2079	9.6445	10.8489	12.7694	14.6964	13.3085	13.4802	14.2500	13.5000	13.5000	13.5000	13.5000
US\$ per British Pound	2.0023	1.8526	1.5661	1.5457	1.6041	1.5851	1.5647	1.6478	1.5284	1.3555	1.2889	1.3392	1.3023	1.3023	1.3023	1.3023	1.3700
US\$ per Euro	1.3702	1.4710	1.3941	1.3269	1.3924	1.2860	1.3283	1.3290	1.1103	1.1069	1.1300	1.1809	1.1727	1.2190	1.2568	1.2568	1.1500
BRL per US\$	1.9475	1.8360	1.9994	1.7599	1.6751	1.9553	2.1573	2.3537	3.3310	3.4850	3.1935	3.7186	3.7838	3.4350	3.1950	3.1950	3.6000

Base Metal Prices	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Long-term*
Aluminium (US\$/lb)	1.20	1.17	0.75	0.99	1.09	0.92	0.84	0.85	0.75	0.73	0.89	0.97	0.85	0.90	0.95	0.95	0.90
Copper (US\$/lb)	3.23	3.15	2.34	3.42	4.00	3.61	3.32	3.11	2.50	2.21	2.80	2.89	2.75	3.25	3.50	3.50	3.00
Lead (US\$/lb)	1.17	0.95	0.78	0.97	1.09	0.94	0.97	0.95	0.81	0.85	1.05	1.03	1.10	1.10	1.10	1.10	0.85
Nickel (US\$/lb)	16.91	9.57	6.64	9.89	10.38	7.95	6.81	7.65	5.37	4.35	4.72	6.15	6.50	7.00	7.00	8.00	8.00
Uranium - Spot (US\$/lb)	98.68	63.02	46.66	46.46	57.01	48.83	38.44	33.44	36.83	26.37	22.06	23.69	27.50	35.00	40.00	40.00	65.00
Zinc (US\$/lb)	1.47	0.85	0.75	0.98	0.99	0.88	0.87	0.98	0.88	0.95	1.31	1.33	1.30	1.30	1.25	1.25	1.00
Alumina (Contract) (US\$/t)	279.50	341.00	250.00	348.00	383.00	327.00	305.00	336.00	308.00	265.00	353.01	364.08	318.57	337.31	356.05	356.05	340.00
Molybdenum (US\$/lb)	29.91	28.42	10.91	15.60	15.33	12.62	10.26	11.30	6.90	6.43	8.13	11.03	9.50	9.50	9.50	9.50	8.50
Cobalt (US\$/lb)	30.55	39.01	17.86	20.85	17.99	14.07	12.89	14.48	13.44	12.01	26.96	36.26	27.50	27.50	27.50	27.50	27.50

Precious Metal	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Long-term*
Gold (US\$/oz)	696	872	972	1225	1571	1668	1412	1266	1160	1250	1257	1275	1300	1300	1300	1300	1300
Silver (US\$/oz)	13.38	14.99	14.67	20.16	35.12	31.12	23.85	19.09	15.70	17.11	17.05	16.02	16.50	16.50	16.50	16.50	16.50
Platinum (US\$/oz)	1332	1581	1204	1610	1721	1551	1487	1385	1053	987	948	879	875	950	1050	1050	1050
Palladium (US\$/oz)	354.00	351.75	263.42	525.97	733.09	643.01	725.09	802.78	692.42	613.43	869.82	979.18	1000.00	975.00	950.00	950.00	950.00

Bulk Commodities	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Long-term*
Coal (Coking) (US\$/t)	102.25	249.50	171.75	190.75	288.75	210.00	158.50	125.50	102.13	114.38	208.15	196.71	160.00	140.00	140.00	140.00	140.00
Coal (Semi Soft Coking) (US\$/t)	62.50	196.00	118.50	140.00	207.75	147.50	112.25	92.38	78.00	85.00	139.75	124.46	117.50	90.00	90.00	90.00	90.00
Coal (PCI) (US\$/t)	67.13	200.63	128.75	147.25	223.25	152.75	125.38	103.75	88.75	87.50	148.75	137.97	127.50	100.00	100.00	100.00	100.00
Coal (Steaming) (US\$/t)	55.38	107.88	84.13	91.25	121.89	118.71	100.00	85.10	71.30	66.64	88.27	108.09	95.00	90.00	85.00	80.00	75.00
Iron Ore (Fines CV - 62.0% Fe CFR China) (US\$/dmt)				141.00	168.75	128.75	135.50	96.90	55.56	58.40	71.31	64.03	58.13	70.00	70.00	70.00	65.00

TABLE CONTINUED ON NEXT PAGE

GLOBAL METALS & MINING - INPUT ASSUMPTIONS & FORECAST PRICES

Other Prices		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Long-term*	
Ferrochrome	(US\$/lb)			0.82	1.27	1.23	1.11	1.01	1.13	1.07	1.03	1.05	1.10	1.00	1.00	1.00	1.00	1.10	
MAGNESIUM	(US\$/lb)			2.68	2.57	2.40	2.20	1.08	1.08	2.15	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	
Oil WTI	(US\$/bbl)	72.35	101.44	61.70	79.49	95.07	94.16	97.95	93.13	48.71	43.27	50.92	67.87	75.91	83.00	77.00	77.00	70.00	
Nymex	(US\$/MMbtu)	6.96	8.87	3.94	4.38	4.00	2.75	3.73	4.33	2.60	2.49	2.96	2.95	2.85	2.75	2.75	2.75	2.75	
TC/RCS		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E	Long-term*	
Copper																			
Actual Contract TCs	US\$/t conc	53.50	43.50	62.50	42.75	73.00	63.50	71.50	91.50	107.00	97.35	92.50	90.00	70.00	70.00	70.00	70.00	76.43	
Actual Contract RCS	US\$/lb Cu	0.05	0.04	0.06	0.04	0.07	0.06	0.07	0.09	0.11	0.10	0.09	0.09	0.07	0.07	0.07	0.07	0.08	
Combined TC / RCS/Plus PP		0.14	0.11	0.16	0.11	0.19	0.16	0.18	0.23	0.27	0.25	0.24	0.23	0.18	0.18	0.18	0.18	0.20	
Zinc																			
Actual Contract TCs (exc PP)	US\$/t conc	300.00	300.00	195.00	275.00	229.00	191.00	210.50	224.00	245.00	188.00	172.00	165.00	165.00	180.00	180.00	180.00	201.74	
Base Price	US\$/tonne	3500	2000	1250	2500	2500	2000	2000	2000	2100	1500	2500	2500	2500	2500	2500	2500	2000	
Escalator	US\$/t per US\$/t Chg In Price	0.10	0.14	0.14	0.08	0.08	0.08	0.08	0.08	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.08	
De-escalator	US\$/t per US\$/t Chg In Price	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.06	
Lead	T.C. US\$/tonne Concentrate	144.00	350.00	210.00	220.00	240.00	215.00	192.00	191.00	190.00	179.00	233.00	132.00	144.00	189.44	235.65	261.00	261.00	
Gold	R.C. US\$/oz	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
Silver	R.C. US\$/oz	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
Forward Curves																			
Aluminium	(US\$/lb)									0.75	0.73	0.89	0.96	0.91	0.94	0.96	0.99	0.90	
Copper	(US\$/lb)									2.50	2.21	2.80	2.99	2.81	2.81	2.81	2.81	3.00	
Lead	(US\$/lb)									0.81	0.85	1.05	1.02	0.88	0.89	0.89	0.89	0.85	
Nickel	(US\$/lb)									5.37	4.35	4.72	6.04	5.38	5.49	5.57	5.65	8.00	
Zinc	(US\$/lb)									0.88	0.95	1.31	1.33	1.13	1.10	1.06	1.02	1.00	
Alumina (Contract)	(US\$/t)									308.00	265.00	353.01	340.33	320.63	330.32	339.26	373.74	340.00	
Gold	(US\$/oz)									1160.39	1249.63	1257.35	1267.96	1251.24	1288.78	1335.45	1373.85	1300.00	
Silver	(US\$/oz)									15.70	17.11	17.05	15.66	14.91	15.42	16.09	16.60	16.50	
Oil WTI	(US\$/bbl)									48.71	43.27	50.92	66.74	63.69	62.52	60.28	58.20	70.00	
Coal (Coking)	(US\$/t)									102.13	114.38	208.15	229.46	214.88	205.36	198.46	198.46	140.00	
Coal (Semi Soft Coking)	(US\$/t)									78.00	85.00	139.75	130.97	122.65	117.21	113.28	113.28	90.00	
Coal (PCI)	(US\$/t)									88.75	87.50	148.75	139.35	130.50	124.72	120.53	120.53	100.00	
Coal (Steaming)	(US\$/t)									71.30	66.64	88.27	106.14	99.40	94.99	91.80	91.80	75.00	
Iron Ore (Fines CY - 62.0% Fe CFR China)	(US\$/dmt)									55.56	55.56	71.62	70.13	67.97	65.26	64.00	61.86	65.00	

*Long-term values are real (not nominal) in 2018\$
Source: RBC Capital Markets estimates, Platt's Metal



Contributing Authors

RBC Dominion Securities Inc.

Stephen D. Walker (Head of Global Mining Research)

(416) 842-4120

stephen.walker@rbccm.com

Sam Crittenden (Analyst)

(416) 842-7886

sam.crittenden@rbccm.com

Andrew D. Wong (Analyst)

(416) 842-7830

andrew.d.wong@rbccm.com

Alexander Jackson (Senior Associate)

(416) 842-6140

alexander.jackson@rbccm.com

Melissa Oliphant (Senior Associate)

(416) 842-8934

melissa.oliphant@rbccm.com

Royal Bank of Canada - Sydney Branch

Paul Hissey (Analyst)

+61 3 8688 6512

paul.hissey@rbccm.com

Alexander Hislop (Associate)

+61 3 8688 6551

alexander.hislop@rbccm.com

RBC Europe Limited

Tyler Broda (Analyst)

+44 20 7653 4866

tyler.broda@rbccm.com

Barbora Baluskova (Senior Associate)

+44 20 7029 0875

barbora.baluskova@rbccm.com

Definitions:

Analysts: Paul Hissey (PH), Sam Crittenden (SC), Tyler Broda (TB), Stephen Walker (SW), Andrew D. Wong (AW)

Ratings: Top Pick (TP), Outperform (OP), Sector Perform (SP), Underperform (U), Restricted (R), Not Rated (NR)

Risk Qualifier: Speculative (SPEC)

Note: All of our NAVs are calculated using a real after-tax discount rate of 8% based on our metal price forecasts and the existing and/or forecast production and reserve bases of the individual companies.



Required disclosures

Non-U.S. analyst disclosure

Stephen D. Walker, Sam Crittenden, Andrew D. Wong, Alexander Jackson, Melissa Oliphant, Paul Hissey, Alexander Hislop, Tyler Broda, and Barbora Baluskova (i) are not registered/qualified as research analysts with the NYSE and/or FINRA and (ii) may not be associated persons of the RBC Capital Markets, LLC and therefore may not be subject to FINRA Rule 2241 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

Conflicts disclosures

This product constitutes a compendium report (covers six or more subject companies). As such, RBC Capital Markets chooses to provide specific disclosures for the subject companies by reference. To access conflict of interest and other disclosures for the subject companies, clients should refer to <https://www.rbccm.com/GLDisclosure/PublicWeb/DisclosureLookup.aspx?entityId=1>. These disclosures are also available by sending a written request to RBC Capital Markets Research Publishing, P.O. Box 50, 200 Bay Street, Royal Bank Plaza, 29th Floor, South Tower, Toronto, Ontario M5J 2W7 or an email to rbcinsight@rbccm.com.

The analyst(s) responsible for preparing this research report received compensation that is based upon various factors, including total revenues of the member companies of RBC Capital Markets and its affiliates, a portion of which are or have been generated by investment banking activities of the member companies of RBC Capital Markets and its affiliates.

Distribution of ratings

For the purpose of ratings distributions, regulatory rules require member firms to assign ratings to one of three rating categories - Buy, Hold/Neutral, or Sell - regardless of a firm's own rating categories. Although RBC Capital Markets' ratings of Top Pick/Outperform, Sector Perform and Underperform most closely correspond to Buy, Hold/Neutral and Sell, respectively, the meanings are not the same because our ratings are determined on a relative basis.

Distribution of ratings RBC Capital Markets, Equity Research As of 30-Sep-2018				
Rating	Count	Percent	Investment Banking Serv./Past 12 Mos.	
			Count	Percent
BUY [Top Pick & Outperform]	859	54.33	251	29.22
HOLD [Sector Perform]	646	40.86	125	19.35
SELL [Underperform]	76	4.81	5	6.58

Conflicts policy

RBC Capital Markets Policy for Managing Conflicts of Interest in Relation to Investment Research is available from us on request. To access our current policy, clients should refer to <https://www.rbccm.com/global/file-414164.pdf> or send a request to RBC Capital Markets Research Publishing, P.O. Box 50, 200 Bay Street, Royal Bank Plaza, 29th Floor, South Tower, Toronto, Ontario M5J 2W7. We reserve the right to amend or supplement this policy at any time.



Dissemination of research and short-term trade ideas

RBC Capital Markets endeavors to make all reasonable efforts to provide research simultaneously to all eligible clients, having regard to local time zones in overseas jurisdictions. RBC Capital Markets' equity research is posted to our proprietary website to ensure eligible clients receive coverage initiations and changes in ratings, targets and opinions in a timely manner. Additional distribution may be done by the sales personnel via email, fax, or other electronic means, or regular mail. Clients may also receive our research via third party vendors. RBC Capital Markets also provides eligible clients with access to SPARC on the Firm's proprietary INSIGHT website, via email and via third-party vendors. SPARC contains market color and commentary regarding subject companies on which the Firm currently provides equity research coverage. Research Analysts may, from time to time, include short-term trade ideas in research reports and / or in SPARC. A short-term trade idea offers a short-term view on how a security may trade, based on market and trading events, and the resulting trading opportunity that may be available. A short-term trade idea may differ from the price targets and recommendations in our published research reports reflecting the research analyst's views of the longer-term (one year) prospects of the subject company, as a result of the differing time horizons, methodologies and/or other factors. Thus, it is possible that a subject company's common equity that is considered a long-term 'Sector Perform' or even an 'Underperform' might present a short-term buying opportunity as a result of temporary selling pressure in the market; conversely, a subject company's common equity rated a long-term 'Outperform' could be considered susceptible to a short-term downward price correction. Short-term trade ideas are not ratings, nor are they part of any ratings system, and the firm generally does not intend, nor undertakes any obligation, to maintain or update short-term trade ideas. Short-term trade ideas may not be suitable for all investors and have not been tailored to individual investor circumstances and objectives, and investors should make their own independent decisions regarding any securities or strategies discussed herein. Please contact your investment advisor or institutional salesperson for more information regarding RBC Capital Markets' research.

For a list of all recommendations on the company that were disseminated during the prior 12-month period, please click on the following link: <https://rbcnew.bluematrix.com/sellside/MAR.action>

The 12 month history of SPARCs can be viewed at <https://www.rbcinsightresearch.com/>.

Analyst certification

All of the views expressed in this report accurately reflect the personal views of the responsible analyst(s) about any and all of the subject securities or issuers. No part of the compensation of the responsible analyst(s) named herein is, or will be, directly or indirectly, related to the specific recommendations or views expressed by the responsible analyst(s) in this report.

Third-party-disclaimers

The Global Industry Classification Standard ("GICS") was developed by and is the exclusive property and a service mark of MSCI Inc. ("MSCI") and Standard & Poor's Financial Services LLC ("S&P") and is licensed for use by RBC. Neither MSCI, S&P, nor any other party involved in making or compiling the GICS or any GICS classifications makes any express or implied warranties or representations with respect to such standard or classification (or the results to be obtained by the use thereof), and all such parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability and fitness for a particular purpose with respect to any of such standard or classification. Without limiting any of the foregoing, in no event shall MSCI, S&P, any of their affiliates or any third party involved in making or compiling the GICS or any GICS classifications have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

References herein to "LIBOR", "LIBO Rate", "L" or other LIBOR abbreviations means the London interbank offered rate as administered by ICE Benchmark Administration (or any other person that takes over the administration of such rate).



Disclaimer

RBC Capital Markets is the business name used by certain branches and subsidiaries of the Royal Bank of Canada, including RBC Dominion Securities Inc., RBC Capital Markets, LLC, RBC Europe Limited, Royal Bank of Canada, Hong Kong Branch and Royal Bank of Canada, Sydney Branch. The information contained in this report has been compiled by RBC Capital Markets from sources believed to be reliable, but no representation or warranty, express or implied, is made by Royal Bank of Canada, RBC Capital Markets, its affiliates or any other person as to its accuracy, completeness or correctness. All opinions and estimates contained in this report constitute RBC Capital Markets' judgement as of the date of this report, are subject to change without notice and are provided in good faith but without legal responsibility. Nothing in this report constitutes legal, accounting or tax advice or individually tailored investment advice. This material is prepared for general circulation to clients and has been prepared without regard to the individual financial circumstances and objectives of persons who receive it. The investments or services contained in this report may not be suitable for you and it is recommended that you consult an independent investment advisor if you are in doubt about the suitability of such investments or services. This report is not an offer to sell or a solicitation of an offer to buy any securities. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. RBC Capital Markets research analyst compensation is based in part on the overall profitability of RBC Capital Markets, which includes profits attributable to investment banking revenues. Every province in Canada, state in the U.S., and most countries throughout the world have their own laws regulating the types of securities and other investment products which may be offered to their residents, as well as the process for doing so. As a result, the securities discussed in this report may not be eligible for sale in some jurisdictions. RBC Capital Markets may be restricted from publishing research reports, from time to time, due to regulatory restrictions and/or internal compliance policies. If this is the case, the latest published research reports available to clients may not reflect recent material changes in the applicable industry and/or applicable subject companies. RBC Capital Markets research reports are current only as of the date set forth on the research reports. This report is not, and under no circumstances should be construed as, a solicitation to act as securities broker or dealer in any jurisdiction by any person or company that is not legally permitted to carry on the business of a securities broker or dealer in that jurisdiction. To the full extent permitted by law neither RBC Capital Markets nor any of its affiliates, nor any other person, accepts any liability whatsoever for any direct or consequential loss arising from any use of this report or the information contained herein. No matter contained in this document may be reproduced or copied by any means without the prior consent of RBC Capital Markets.

Additional information is available on request.

To U.S. Residents: This publication has been approved by RBC Capital Markets, LLC (member FINRA, NYSE, SIPC), which is a U.S. registered broker-dealer and which accepts responsibility for this report and its dissemination in the United States. Any U.S. recipient of this report that is not a registered broker-dealer or a bank acting in a broker or dealer capacity and that wishes further information regarding, or to effect any transaction in, any of the securities discussed in this report, should contact and place orders with RBC Capital Markets, LLC.

To Canadian Residents: This publication has been approved by RBC Dominion Securities Inc. (member IIROC). Any Canadian recipient of this report that is not a Designated Institution in Ontario, an Accredited Investor in British Columbia or Alberta or a Sophisticated Purchaser in Quebec (or similar permitted purchaser in any other province) and that wishes further information regarding, or to effect any transaction in, any of the securities discussed in this report should contact and place orders with RBC Dominion Securities Inc., which, without in any way limiting the foregoing, accepts responsibility for this report and its dissemination in Canada.

To U.K. Residents: This publication has been approved by RBC Europe Limited ('RBCEL') which is authorized by the Prudential Regulation Authority and regulated by the Financial Conduct Authority ('FCA') and the Prudential Regulation Authority, in connection with its distribution in the United Kingdom. This material is not for general distribution in the United Kingdom to retail clients, as defined under the rules of the FCA. RBCEL accepts responsibility for this report and its dissemination in the United Kingdom.

To German Residents: This material is distributed in Germany by RBC Europe Limited, Frankfurt Branch which is regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin).

To Persons Receiving This Advice in Australia: This material has been distributed in Australia by Royal Bank of Canada - Sydney Branch (ABN 86 076 940 880, AFSL No. 246521). This material has been prepared for general circulation and does not take into account the objectives, financial situation or needs of any recipient. Accordingly, any recipient should, before acting on this material, consider the appropriateness of this material having regard to their objectives, financial situation and needs. If this material relates to the acquisition or possible acquisition of a particular financial product, a recipient in Australia should obtain any relevant disclosure document prepared in respect of that product and consider that document before making any decision about whether to acquire the product. This research report is not for retail investors as defined in section 761G of the Corporations Act.

To Hong Kong Residents: This publication is distributed in Hong Kong by Royal Bank of Canada, Hong Kong Branch, which is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission ('SFC'), RBC Investment Services (Asia) Limited and RBC Investment Management (Asia) Limited, both entities are regulated by the SFC. Financial services provided to Australia: Financial services may be provided in Australia in accordance with applicable law. Financial services provided by the Royal Bank of Canada, Hong Kong Branch are provided pursuant to the Royal Bank of Canada's Australian Financial Services Licence ('AFSL') (No. 246521).

To Singapore Residents: This publication is distributed in Singapore by the Royal Bank of Canada, Singapore Branch, a registered entity licensed by the Monetary Authority of Singapore. This material has been prepared for general circulation and does not take into account the objectives, financial situation, or needs of any recipient. You are advised to seek independent advice from a financial adviser before purchasing any product. If you do not obtain independent advice, you should consider whether the product is suitable for you. Past performance is not indicative of future performance. If you have any questions related to this publication, please contact the Royal Bank of Canada, Singapore Branch. Royal Bank of Canada, Singapore Branch accepts responsibility for this report and its dissemination in Singapore.

To Japanese Residents: Unless otherwise exempted by Japanese law, this publication is distributed in Japan by or through RBC Capital Markets (Japan) Ltd. which is a Financial Instruments Firm registered with the Kanto Local Financial Bureau (Registered number 203) and a member of the Japan Securities Dealers Association ("JSDA").

® Registered trademark of Royal Bank of Canada. RBC Capital Markets is a trademark of Royal Bank of Canada. Used under license.

Copyright © RBC Capital Markets, LLC 2018 - Member SIPC

Copyright © RBC Dominion Securities Inc. 2018 - Member Canadian Investor Protection Fund

Copyright © RBC Europe Limited 2018

Copyright © Royal Bank of Canada 2018

All rights reserved