UOBKayHian

China

Thursday, 25 January 2018

INITIATE COVERAGE

China Molybdenum Co (3993 HK)

An Emerging Global Mining Giant; Riding On Cobalt And Copper Momentum

China Molybdenum Co has evolved into one of the world's leading mining companies with diversified resources exposure. We forecast 40%+ EPS CAGR in 2017-20, given: a) our positive view on copper and cobalt in the medium to long term, b) the likelihood of tungsten and molybdenum's high-margin advantage persisting, and c) the niobium and phosphate segments providing stable cash flows. Initiate coverage with BUY and target price of HK$6.78 on DCF life-of-mine valuation.

- **Copper: Positive outlook in the medium term on solid fundamentals.** From a global perspective, we favour copper among base metals for the next 2-3 years given: a) supply constraint due to under-investment, mines' grade declines and elevated mine strike risks; and b) demand supported by traditional consumption and rising adoption of electric vehicles (EV). We expect LME copper prices to stay high at US$7,000-7,200/tonne in 2018-20. China Molybdenum Co (CMOC) owns two world-class copper mines – Tenke Fungurume Mining S.A (Tenke) and Northparkes Mine (Northparkes) – with a combined mined copper production of 240k-260k tpa.
- **Cobalt: Riding on EV momentum.** We expect the cobalt market to remain tight in the foreseeable future, due to the rising demand from EV batteries which is expected to outpace the potential supply increase. We think ternary is the main trend among cathode materials for EV batteries, while cobalt is a core material in ternary batteries. As early as in 2020, we think the forecast demand for EV-related metal will be significant, requiring an extra 390kt of copper and 24kt of cobalt (c.50% of 2017 demand from EV batteries). CMOC is now the second-largest cobalt producer globally, with an annual production of 16-18kt from the Tenke copper and cobalt mine in the Democratic Republic of the Congo.
- **Tungsten and molybdenum: Low-cost advantage amid market recovery.** CMOC started as a leading molybdenum producer in China, with an annual output of 17-20kt of molybdenum and 11k-13k tpa of tungsten.The current mine in operation is San Dao Zhuang Mo&W mine, which enjoys a high gross margin of 40%+ vs domestic peers' 20%. We believe supply and demand dynamics would support the relatively stable tungsten and molybdenum markets in the next few years.
- **Niobium and phosphate: Stable cash flow.** CMOC entered this business through an acquisition in Brazil in 2016. This segment is expected to have contributed 19% of total revenue in 2017; we think it will continue to provide stable positive cash flows and enhance the company's anti-cyclical nature.
- **Initiate coverage with BUY and target price of HK$6.78.** We use DCF life-of-mine to derive our target price of HK$6.78 (WACC: 8.0%), or an implied 13% upside. For 2018-19, the stock trades at 22x and 20x PE, and 2.5x and 2.4x P/B respectively.

KEY FINANCIALS

Year to 31 Dec (Rmbm)	2015	2016	2017F	2018F	2019F
Net turnover	4,197	6,950	23,584	28,924	30,742
EBITDA	1,635	2,450	10,576	14,497	15,960
Operating profit	890	1,290	7,506	11,295	12,624
Net profit (rep./act.)	761	998	2,858	4,735	5,358
Net profit (adj.)	761	998	2,858	4,735	5,358
EPS (Fen)	5.0	5.9	14.9	21.9	24.8
PE (x)	97.5	82.4	32.8	22.2	19.6
P/B (x)	4.7	4.4	2.7	2.5	2.4
EV/EBITDA (x)	114.9	76.6	17.8	13.0	11.8
Dividend yield (%)	0.5	0.7	1.6	2.6	3.0
Net margin (%)	18.1	14.4	12.1	16.4	17.4
Net debt/(cash) to equity (%)	2.1	127.6	33.3	29.2	23.6
Interest cover (x)	35.4	6.0	6.6	10.4	11.4
ROE (%)	4.8	5.5	10.0	11.8	12.5
Consensus net profit	-	-	2,598	3,896	4,337
UOBKH/Consensus (x)	-	-	1.10	1.22	1.24

Source: CMOC, Bloomberg, UOB Kay Hian

BUY

Share Price	HK$5.97
Target Price	HK$6.78
Upside	+13.0%

COMPANY DESCRIPTION

China Molybdenum Co is a mineral mining and exploration company engaged in the mining and processing of molybdenum, tungsten, copper, cobalt, niobium and phosphate minerals.

STOCK DATA

GICS sector	Materials
Bloomberg ticker:	3993 HK
Shares issued (m):	3,933.5
Market cap (HK$m):	200,112.6
Market cap (US$m):	25,595.4
3-mth avg daily t'over (US$m):	48.0

Price Performance (%)

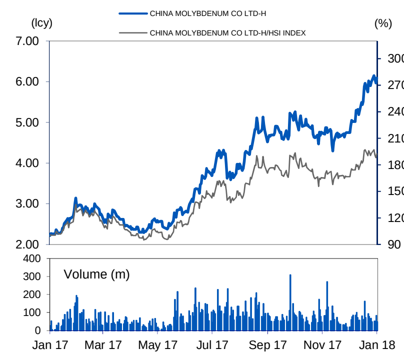
52-week high/low HK$6.02/HK$2.06

1mth	3mth	6mth	1yr	YTD
25.7	18.2	60.1	168.9	18.9

Major Shareholders	%
Cathay Fortune Corporation	24.69
Luoyang Mining Group	24.68

FY18 NAV/Share (Rmb)	1.93
FY18 Net Debt/Share (Rmb)	0.56

PRICE CHART



Source: Bloomberg

ANALYST(S)

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This report uses the closing prices of 24 January 2018

Investment Highlights

The leading mining company has diversified exposures to copper, cobalt, molybdenum, tungsten, niobium and phosphate.

A truly diversified international miner. Headquartered in Luoyang City, Henan Province, CMOC started as a molybdenum miner in China, and has since evolved into one of the world's leading mining companies with a diversified resources portfolio. Following the acquisition of Tenke Fungurume (Tenke) in the Democratic Republic of the Congo (DRC) in 2016, CMOC is now the second-largest cobalt producer and a leading copper miner in the world. Also, CMOC's other acquisition in 2016 helped it become a key niobium producer globally and a phosphate player in Brazil. As of 2017, the copper and cobalt segments are its two largest revenue contributors as well as key earning drivers, accounting for 44% and 21% of total revenue respectively. Meanwhile, 89% of its revenue was generated overseas vs 11% from the domestic market in 2017.

Well-positioned in copper and cobalt mining at the trough of a cycle; expected to be the direct beneficiary of EV momentum.

Copper: Positive outlook in the medium term on solid fundamentals. From a global perspective, we are bullish on copper over the next 2-3 years due to: a) supply constraint resulting from under-investment, mines' grade declines and elevated strike risks; and b) demand supported by traditional consumption and rising adoption of EVs. We estimate LME copper prices to stay high at US$7,000-7,200/tonne in 2018-20. CMOC owns two world-class copper mines – Tenke and Northparkes – with a combined mined copper output of 240k-260k tpa. Particularly, the acquisition of the Tenke mine from Freeport-McMoRan was completed at the trough of the cycle in 2016 when copper price was at US$4,861/tonne. Thus, CMOC is likely to ride on the upcycle of the global copper and cobalt markets, and be a direct beneficiary of EV momentum going forward.

Tight market to continue into 2017-20; rising demand from EV batteries to outpace potential supply increase.

Cobalt: Riding on EV momentum. We think the cobalt market will remain tight in the foreseeable future, due to the rising demand from EV batteries which is expected to outpace the potential supply increase. We think ternary is the trend among cathode materials for EV batteries, while cobalt is inevitably a core material for ternary batteries. As early as in 2020, the forecast demand for EV-related metal will be significant, requiring an additional 390kt of copper and 24kt of cobalt (c.50% of 2017 consumption from EV batteries). We expect an 11% CAGR in cobalt demand for 2017-20 (vs 10% CAGR in supply). In terms of demand, EV batteries' cobalt consumption is expected to rise 32-54% yoy in 2017-20. CMOC is now the second-largest cobalt producer globally, with an output of 16-18k tpa from Tenke.

Enjoys high margins in the China market as tungsten is produced as a by-product.

Tungsten and molybdenum: High margins to persist. We believe the overall supply and demand for tungsten and molybdenum will be relatively stable in the next few years, supporting prices at current levels. Potential upside will come from stricter environment policies and supply-side reform in China as well as the global economic recovery. We see the potential steel production decline to be the headwind for molybdenum prices. CMOC enjoys a relatively high margin (40%+ vs 20% for peers) as tungsten is produced as a by-product.

Continues to provide stable positive cash flows, and enhances anti-cyclical nature.

Niobium and phosphate: Consistent and stable cash flow. CMOC entered the niobium and phosphate business through an acquisition in Brazil in 2016. The global niobium market is a highly concentrated market. CMOC is ranked after CBMM (巴西矿业公司) as the world's second-largest producer. Brazil's fertiliser demand is high, with more than half of its fertiliser demand relying on imports. The niobium and phosphate segment is expected to have contributed 19% of CMOC's revenue in 2017; we think it will continue to provide stable positive cash flows and also enhance CMOC's anti-cyclical nature.

Estimate a 42% EPS CAGR in 2017-20, with a healthy financial position.

Promising earnings outlook. With our constructive views on the copper and cobalt markets in the medium to long term, and relatively stable outlook for the tungsten and molybdenum markets in China as well as for its niobium and phosphate business in Brazil, we expect CMOC to report a 42% EPS CAGR in 2017-20. Currently, we see a healthy financial position with a comfortable net gearing level of 30% and interest coverage ratio at above 6x.

Initiate coverage with BUY and target price of HK$6.78. We use DCF life-of-mine to derive our target price of HK$6.78 (WACC: 8.0%), or an implied 13% upside. For 2018-19, the stock trades at 22x and 20x PE, and 2.5x and 2.4x P/B respectively. Copper and cobalt prices are key risks. The sensitivity analysis shows every 5%/2% change in copper/ cobalt ASP moving net profit by 7%/1.6% respectively.

Valuation And Risk Factors

We set our target price based on the life-of-mine DCF method, assuming WACC of 8.0%, risk-free rate of 3.96%, market premium of 9.9% and beta of 0.85.

For 2018-19, the stock trades at 22x and 20x PE, and 2.5x and 2.4x P/B respectively, above global peers' average of 14x. In our view, its valuation is not demanding, considering its EPS CAGR of 42% in 2017-20 (vs global peers Glencore at 27% and Vale at 8%).

Initiate coverage with a BUY. Our target price is HK$6.78, implying 13% upside towards the current price level. We believe CMOC will continue to benefit from its strong product mix and above-peers margins.

FIGURE 1: WACC ASSUMPTIONS

Risk-free rate	3.96%
Beta	0.85
Cost of Equity	8.98%
Cost of Debt	3.40%
% of capital in equity	82.4%
% of capital in debt	17.6%
WACC	8.0%

Source: UOB Kay Hian

KEY RISK FACTORS

a) Lower-than-expected ASPs for its products.

b) Lower output from major mines due to weather or other disruptions; higher unit production costs.

c) Lower grid spending and thus weaker copper demand in China.

d) Worse-than-expected steel market leading to lower-than-expected demand for molybdenum and niobium.

e) Foreign exchange risks.

KEY RISKS TO OUR GLOBAL COBALT SUPPLY & DEMAND PROJECTIONS

a) Risks arising in DRC, such as policy risk, transportation disruption and bad weather, leading to supply disruption.

b) Slower-than-expected development of EVs; missing EV sales targets.

c) Demand to moderate if EV batteries' switch to high-nickel ternary is faster than expected, eg NMC chemistry moves from 1-1-1 to 8-1-1 earlier than expected.

SENSITIVITY ANALYSIS

Movements in copper and cobalt prices are the key risks to CMOC's earnings. Thus, we conducted a sensitivity analysis against copper and cobalt ASP and CMOC's profitability.

We estimate that for every 5% increase in copper ASP, our 2018 revenue, gross profit and net profit forecasts would increase 2%, 5% and 7% respectively.

And for every 2% increase in cobalt ASP, our 2018 revenue, gross profit and net profit forecasts would increase 0.5%, 1.2% and 1.6% respectively.

FIGURE 2: SENSITIVITY ANALYSIS (2018)

COPPER	ASP change								
	-15%	-10%	-5%	-2%	0%	2%	5%	10%	15%
Revenue	-7%	-4%	-2%	-1%	0%	1%	2%	4%	7%
Gross Profit	-16%	-10%	-5%	-2%	0%	2%	5%	10%	16%
Net Profit	-22%	-14%	-7%	-3%	0%	3%	7%	14%	22%

COBALT	ASP change								
	-6%	-4%	-2%	-1%	0%	1%	2%	4%	6%
Revenue	-1.5%	-1.0%	-0.5%	0%	0%	0%	1%	1%	2%
Gross Profit	-3.6%	-2.4%	-1.2%	-1%	0%	1%	1%	2%	4%
Net Profit	-4.9%	-3.3%	-1.6%	-1%	0%	1%	2%	3%	5%

Note: Base forecasted price for copper ASP: US$7,200/tonne; base forecasted price for cobalt ASP: US$60,000/tonne

Source: LME, UOB Kay Hian

FIGURE 3: GLOBAL PEER COMPARISON

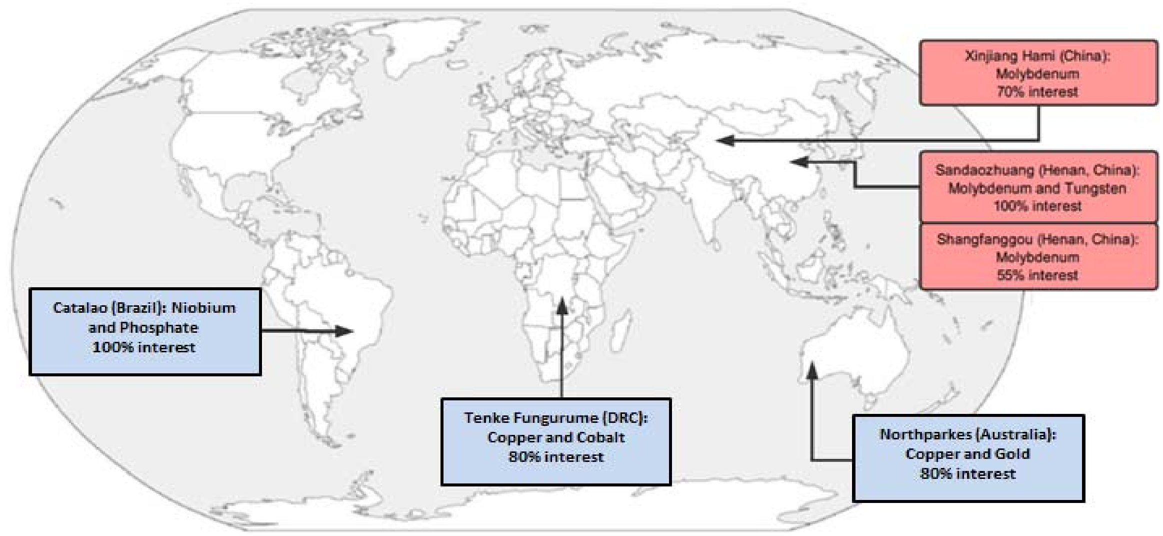
Company	Ticker	Price @ 24 Jan 18 (Rmb)	Target Price (Rmb)	Rec	Market Cap (Rmbm)	Market Cap (US$m)	------ PE ------ 2018F (x)	2019F (x)	------ PB ------- 2018F (x)	2019F (x)	---- ROE---- 2018F (%)	2019F (%)	--EV/EBITDA-- 2018F (x)	2019F (x)	Net gearing 2016 (%)
A-share															
Zhejiang Huayou Cobalt	603799 CH	93.47	n.a	NR	49,631	7,734	27.1	20.0	7.1	5.4	27.6	27.1	19.0	15.3	59.1
Nanjin Hanrui Cobalt	300618 CH	318.58	n.a	NR	33,115	5,160	49.1	38.3	20.9	14.0	42.4	36.3	29.1	20.2	52.7
GEM	002340 CH	6.90	n.a	NR	25,910	4,037	28.0	21.4	2.9	2.5	10.8	13.0	17.8	-	111.0
Xiamen Tungsten	600549 CH	25.76	n.a	NR	26,592	4,144	27.8	20.1	2.9	2.3	13.6	15.9	13.7	12.6	41.7
Jinduicheng Molybdenum	601958 CH	7.87	n.a	NR	24,619	3,836	75.0	31.5	1.9	1.8	2.5	5.6	18.3	14.4	net cash
Jinzhou New China Dragon	603399 CH	14.42	n.a	NR	8,105	1,263	-	-	-	-	-	-	-	-	28.0
Chongyi Zhangyuan Tungsten	002378 CH	9.67	n.a	NR	8,817	1,374	138.1	64.5	4.4	4.0	1.8	2.2	-	-	39.3
Average							57.5	32.6	6.7	5.0	16.4	16.7	19.6	15.6	53.5
H-share		(HK$)	(HK$)		(HK$m)	(US$m)									
China Molybdenum	3993 HK	5.97	6.78	BUY	197,092	25,210	22.2	19.6	2.5	2.4	11.8	12.5	13.0	11.8	127.6
Zijin Mining	2899 HK	3.48	3.86	BUY	113,373	14,502	13.6	13.6	1.8	1.8	14.2	14.7	7.5	6.5	48.3
Jiangxi Copper	358 HK	12.90	14.00	HOLD	66,170	8,464	24.9	24.9	0.8	0.8	5.9	6.6	9.1	8.3	6.5
MMG	1208 HK	4.66	n.a	NR	36,471	4,665	10.0	8.1	2.2	1.6	19.4	64.4	6.8	6.0	374.6
Average							17.8	16.7	1.8	1.6	12.8	24.6	9.0	7.9	139.2
Global Copper Producers		(Lcl)	(Lcl)		(Lclm)	(US$m)									
BHP Billiton	BHP AU	30.68	n.a	NR	157,350	125,817	14.7	17.8	2.1	2.1	14.7	12.3	6.2	6.9	43.5
Rio Tinto	RIO AU	78.20	n.a	NR	125,777	100,572	13.9	15.1	2.4	2.3	18.1	16.0	6.5	6.8	19.9
Glencore	GLEN LN	394.10	n.a	NR	58,623	81,351	13.1	13.5	1.5	1.5	12.2	11.7	6.4	6.5	70.1
Vale SA-SP	VALE US	12.70	n.a	NR	70,548	70,548	9.9	10.4	1.3	1.2	12.6	12.7	6.2	6.3	61.1
Southern Copper	SCCO US	49.16	n.a	NR	38,280	38,280	19.3	19.1	4.6	4.0	25.9	26.5	10.6	10.2	91.2
Norilsk Nickel	GMKN RX	11,008.00	n.a	NR	1,829,318	32,372	10.1	9.8	6.2	6.1	68.6	69.2	7.0	6.7	116.5
Anglo American	AAL LN	1,749.80	n.a	NR	22,755	31,577	10.4	12.4	1.3	1.3	12.7	10.9	5.2	5.9	29.3
Freeport-McMoRan	FCX US	19.55	n.a	NR	28,083	28,083	10.4	15.2	2.6	2.2	27.4	13.9	5.4	7.0	127.3
Antofa	ANTO LN	951.20	n.a	NR	9,843	13,659	17.5	15.6	1.7	1.6	8.9	9.6	6.4	5.7	12.5
First Quantum	FQVLF US	14.93	n.a	NR	10,720	10,720	16.0	9.6	1.0	0.9	7.2	11.7	8.7	5.8	42.6
OZ Minerals	OZL AU	9.11	n.a	NR	2,730	2,183	15.0	18.5	1.0	1.0	5.4	4.6	4.6	5.0	net cash
Average							13.7	14.3	2.4	2.2	19.4	18.1	6.6	6.6	61.4
Cobalt Producers															
Glencore	GLEN LN	394.10	n.a	NR	58,623	81,351	13.1	13.5	1.5	1.5	12.2	11.7	6.4	6.5	70.1
Vale SA-SP	VALE US	12.70	n.a	NR	70,548	70,548	9.9	10.4	1.3	1.2	12.6	12.7	6.2	6.3	61.1
Sherritt Intl'	S CN	1.26	n.a	NR	393	316	-	-	-	-	-2.9	-5.1	15.9	11.3	net cash
Average							11.5	11.9	1.4	1.4	7.3	6.5	9.5	8.0	65.6

Source: Bloomberg, UOB Kay Hian

Business Outlook

We have bullish view on the copper and cobalt markets in the medium to long term *(see "copper and cobalt section")*, and the fact that CMOC entered the business at the trough of a cycle, we think it is riding on the upcycle of the global copper and cobalt markets, and is expected to be a direct beneficiary of EV momentum going forward. In addition, the tungsten and molybdenum segments are expected to continue to improve, given our relatively optimistic outlook on downstream demand *(see "molybdenum and tungsten" section)*. CMOC should continue to enjoy the highest margins (above 40% for 2017-20) among domestic peers. Furthermore, we think the acquired niobium and phosphate assets in Brazil would be able to provide CMOC with consistent and positive cash flows, and enhance its anti-cyclical nature *(see details in "niobium and phosphate" section).*

FIGURE 4: BUSINESS ALLOCATION



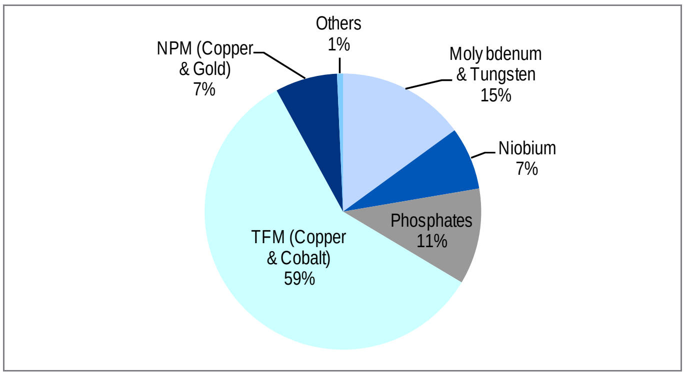
Source: CMOC, UOB Kay Hian

FIGURE 5: BUSINESS ALLOCATION

Mine	Location	Product	Interest	Production (kt, expect for gold: oz) 2016	9M17	2017F Guidance	Resources (m tonnes)	Grade (%, except for gold: g/t)	Ranking
Molybdenum and Tungsten	China								
Sandaozhuang	Luoyang, Henan	Moly concentrate	100%	16.3	12.2	n.a.	522	0.10	Moly: 4th globally Tungsten: 1st globally
		Tungsten concentrate		10.1	8.5	n.a.		0.09	
Shangfanggou	Luoyang, Henan	Moly concentrate	55%	-	-	Not in operation			
Donggebi	Xinjiang	Moly concentrate	70%	-	-	Not in operation			
Copper and Cobalt									
Tenke Fungurume (Acquired 56% in 2016 and 24% in 2017)	DR Congo	Copper	56%+24%	216.0	159.6	219	836	2.89	Top Copper miner; Cobalt: 2nd globally
		Cobalt		16.1	11.6	16.0-18.0		0.27	
Northparkes (Acquired in 2013)	Australia	Copper	80%	36.7	27.5	34	482	0.56	
		Gold		29.1	23.3	25		0.18	
Niobium and Phosphate									
Catalao (Acquired in 2016)	Brazil	Ferroniobium	100%	7.4	6.3		Area I: 107.6	Area I: 1.07	Niobium: 2nd globally Phosphate: 2nd in Brazil
Catalao and Cubatao (Acquired in 2016)	Brazil	Phosphate fertilizer	100%	1,215.2	854.0		Area II: 457.5	Area II: 0.26	

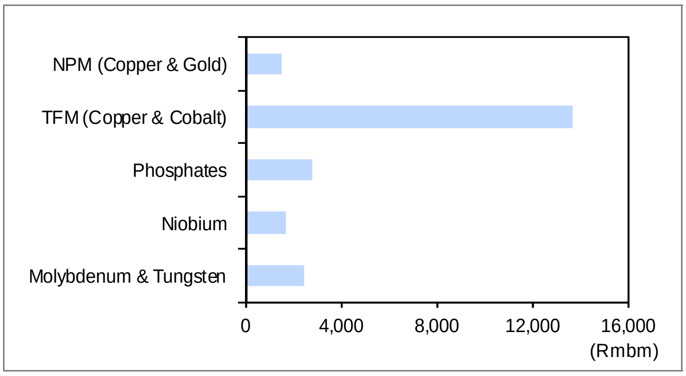
Source: CMOC, UOB Kay Hian

FIGURE 6: REVENUE MIX (1H17)



Source: CMOC, UOB Kay Hian

FIGURE 7: REVENUE MIX (2017F)

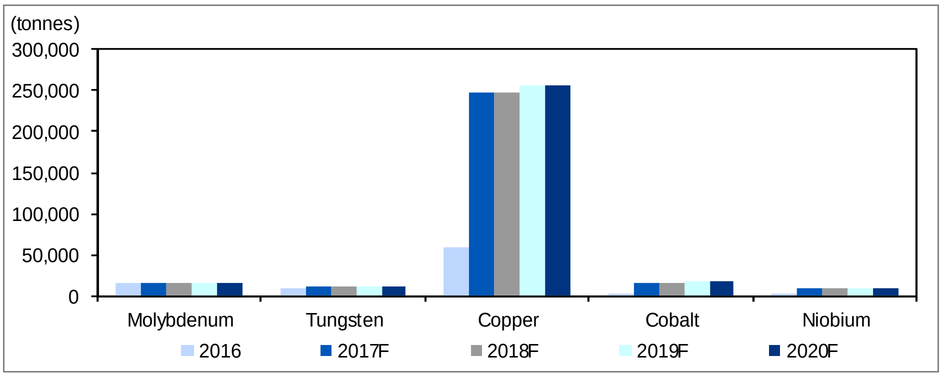


Source: UOB Kay Hian

Copper and cobalt to be key drivers. As the major revenue contributors, copper, cobalt and gold related products accounted for 66% of CMOC's total revenue in 1H17, of which Tenke (copper & cobalt) contributed 59% and Northparkes (copper & gold) contributed 7%. We expect total copper production from Tenke to have reached 212kt in 2017 and maintain flat going forward, and that from Northparkes to stay at 37kt in the next few years. We also expect total cobalt production to have reached 16kt in 2017 (2H17: 7.4kt) and gradually increase to 18kt in 2020. Based on our analysis of the global copper and cobalt markets, we expect Tenke to be one of the most profitable mines with a ~50% gross margin, and Northparkes to maintain gross margin at 30-40% throughout 2017-20.

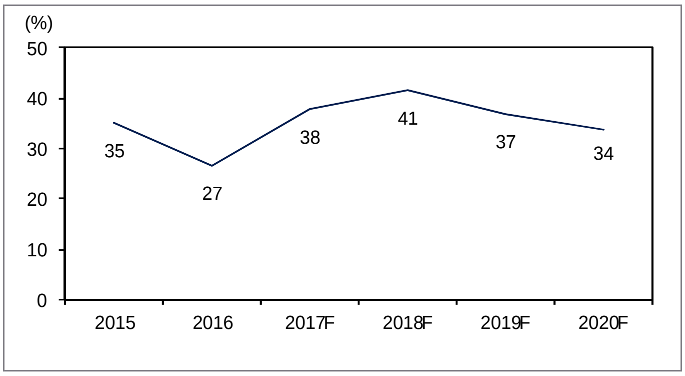
Molybdenum and tungsten were CMOC's major revenue contributors before its global expansion, but the segment accounted for only 15% of total revenue in 1H17. We expect production of molybdenum/tungsten to reach 16.2kt/11.4kt in 2017 and remain flat at current levels during 2018-20. We estimate niobium production at 8.4kt in 2017 and 9.0kt in 2018-20, and that of phosphate to reach 1.1m tonnes during the same period.

FIGURE 8: PRODUCTION BY COMMODITY



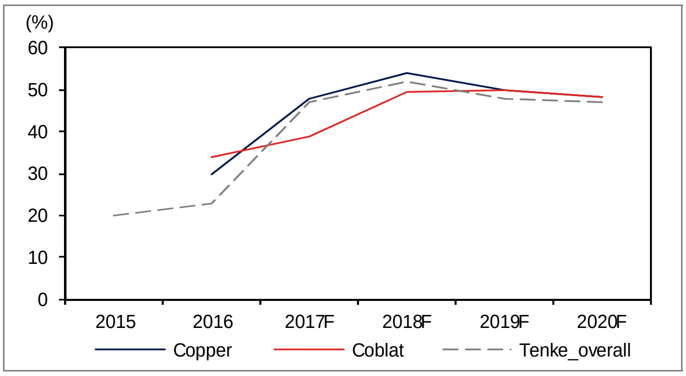
Source: CMOC, UOB Kay Hian

FIGURE 9: NORTHPARKES - GROSS MARGIN



Source: CMOC, UOB Kay Hian

FIGURE 10: TENKE - GROSS MARGIN



Source: CMOC, UOB Kay Hian

Earnings Outlook

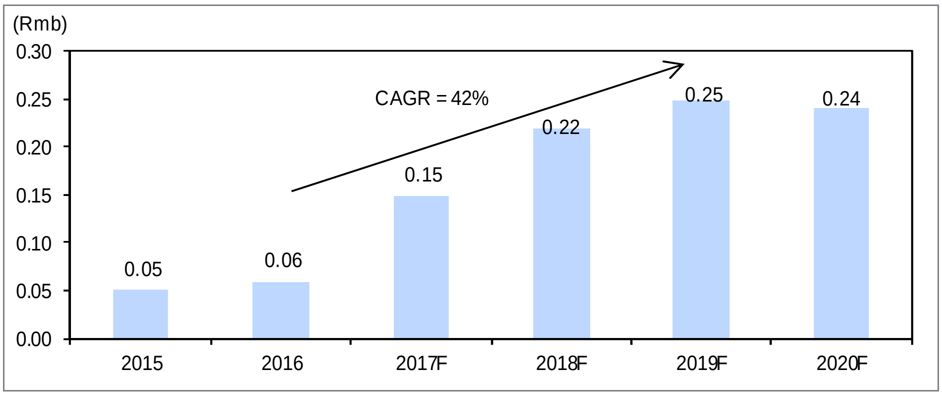
Earnings outlook looks promising. We are positive on the copper and cobalt markets in the medium to long term. This, coupled with the relatively stable outlook for the tungsten and molybdenum markets in China as well as for its Brazilian niobium and phosphate business, leads us to forecast a 42% EPS CAGR in 2017-20. We see healthy financials with a comfortable net gearing level of 30% and interest coverage ratio at above 6x in 2017.

Top-line boosted by cobalt and copper businesses. We expect CMOC's revenue to be boosted over the next few years by the copper and cobalt segments. Thanks to the ramp-up of the Tenke mine and positive ASP outlook, revenue from copper production is expected to have grown 404% yoy in 2017 with a CAGR of 56% over 2017-20, and cobalt revenue to have grown 15x in 2017 with a CAGR of 118% over the same period.

We expect the company's gross margin to see a steady improvement from 30% in 2016 to 47% in 2020, thanks to higher margins from the Tenke mine and the San Dao Zhuang Mo&W mine.

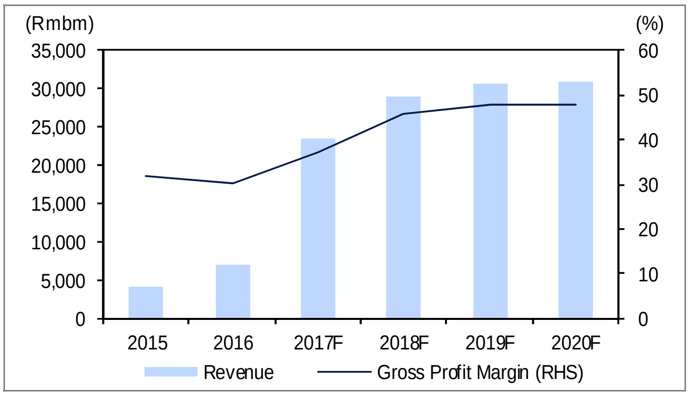
We expect EPS CAGR of 42% in 2017-20, driven by the major M&As (copper and cobalt) in late-16. EPS will likely to increase from Rmb0.06 in 2016 to Rmb0.15 in 2017 (+151% yoy), Rmb0.22 in 2018 (+48% yoy) and Rmb0.25 in 2019 (+13% yoy).

FIGURE 11: EPS CAGR TREND



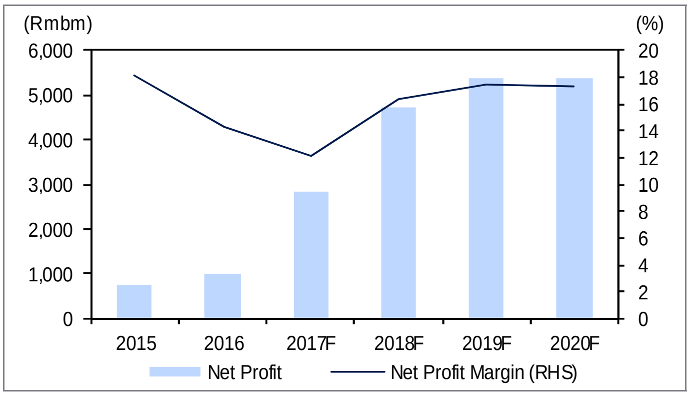
Source: CMOC, UOB Kay Hian

FIGURE 12: REVENUE AND GROSS MARGIN



Source: CMOC, UOB Kay Hian

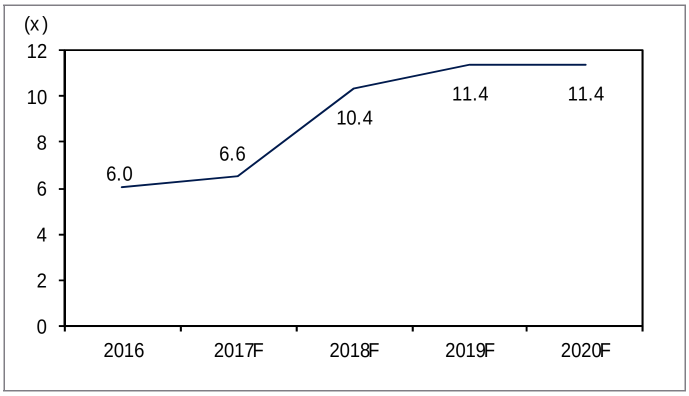
FIGURE 13: NET PROFIT AND NET MARGIN



Source: CMOC, UOB Kay Hian

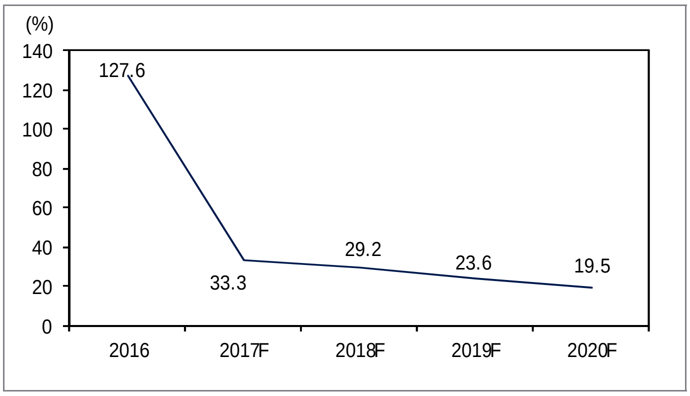
Comfortable interest coverage ratio and healthy cash flow. We expect interest expense to increase from 2017 as CMOC had obtained US$900m and US$1,590m syndicated loans in Sep 16 and Nov 16 respectively to fund its M&A projects. However, the company's debt structure should remain healthy as net gearing would have dropped to 33% in 2017 from 173% in 2016 after the completion of an Rmb18b non-public share placement in Jul 17, while interest coverage ratio would stay above 6x in the next few years. We expect free cash flow to firm (FCFF) to remain stable at Rmb10b from 2018.

FIGURE 14: INTEREST COVERAGE RATIO



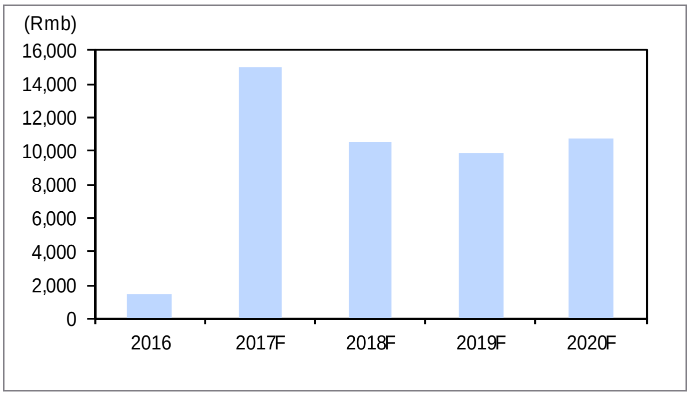
Source: CMOC, UOB Kay Hian

FIGURE 15: NET GEARING RATIO



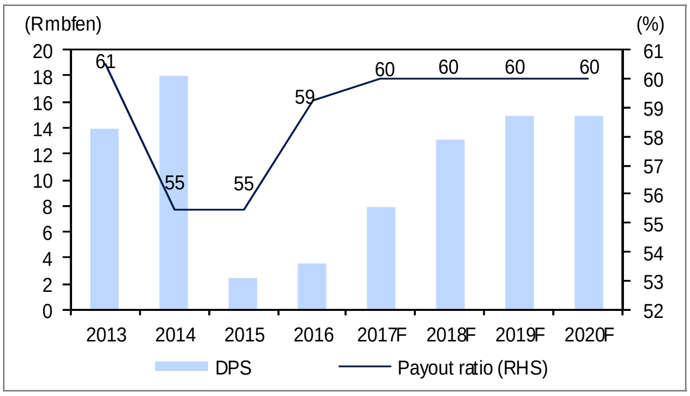
Source: CMOC, UOB Kay Hian

FIGURE 16: FCFF ESTIMATES



Source: CMOC, UOB Kay Hian

FIGURE 17: DIVIDEND ESTIMATES



Source: CMOC, UOB Kay Hian

FIGURE 18: KEY ASSUMPTIONS

		2016	2017F	2018F	2019F	2020F
Molybdenum & Tungsten						
Molybdenum concentrate production	tonne	16,302	16,222	16,500	16,500	16,500
yoy % chg		*-4%*	*0%*	*2%*	*0%*	*0%*
Ferro-moly ASP	Rmb/tonne	67,412	86,476	95,123	99,879	99,879
yoy % chg		*-1%*	*28%*	*10%*	*5%*	*0%*
Molybdenum cash cost	Rmb/tonne	55,279	57,071	59,924	61,123	62,345
yoy % chg		*3%*	*3%*	*5%*	*2%*	*2%*
Tungsten production	tonne	10,118	11,393	11,400	11,500	12,000
yoy % chg		*3%*	*13%*	*0%*	*1%*	*4%*
Tungsten concentrate ASP	Rmb/tonne	69,269	90,316	112,286	115,654	119,124
yoy % chg		*9%*	*30%*	*24%*	*3%*	*3%*
Tungsten cash cost	Rmb/tonne	12,593	17,171	18,888	19,455	20,039
yoy % chg		*-16%*	*36%*	*10%*	*3%*	*3%*
Copper						
Copper price_LME, spot	US$/tonne	4,861	6,145	7,200	7,000	7,000
yoy % chg		*-12%*	*26%*	*17%*	*-3%*	*0%*
Northparkes - sales volume	tonne	35,962	36,044	37,000	37,000	37,000
yoy % chg			*0%*	*3%*	*0%*	*0%*
Northparkes - unit cash cost	Rmb	1,786	1,976	2,173	2,282	2,396
yoy % chg		*27%*	*11%*	*10%*	*5%*	*5%*
Tenke - sales volume	tonne	27,356	211,615	210,000	220,000	220,000
yoy % chg			*674%*	*-1%*	*5%*	*5%*
Tenke_unit cash cost	US$/tonne	2,557	648	681	715	750
yoy % chg			*-75%*	*5%*	*5%*	*5%*
Cobalt						
Cobalt - ASP	US$/tonne	25,548	44,912	60,000	59,200	57,600
yoy % chg		*12%*	*76%*	*34%*	*-1%*	*-3%*
Tenke - sales volume	tonne	1,825	16,075	17,000	17,500	18,000
yoy % chg			*781%*	*6%*	*3%*	*3%*
Tenke _ by-product unit cost	US$/tonne	*12,676*	*20,679*	*22,747*	*22,292*	*22,292*
yoy % chg		*474%*	*63%*	*10%*	*-2%*	*0%*
Niobium						
ASP	Rmb/tonne	209,245	204,707	210,000	210,000	210,000
yoy % chg		*5%*	*-2%*	*3%*	*0%*	*0%*
Sales volume	tonne	1,998	8,386	9,000	9,000	9,000
yoy % chg			*320%*	*7%*	*0%*	*0%*
unit cost	Rmb/tonne	153,440	161,120	165,900	170,900	170,900
yoy % chg			*5%*	*3%*	*3%*	*0%*
Phosphate						
ASP	Rmb/tonne	2,400	2,400	2,478	2,428	2,428
yoy % chg		*20%*	*0%*	*3%*	*-2%*	*0%*
Sales volume	kt	303.812	1154.114	1100	1100	1100
yoy % chg			*280%*	*-5%*	*-2%*	*-1%*
Unit cost	Rmb/tonne	1,927	2,035	2,137	2,201	2,267
yoy % chg			6%	5%	3%	3%
US$/Rmb		6.64	6.77	6.65	6.80	6.80

Source: UOB Kay Hian

FIGURE 19: PROFIT & LOSS

Year to 31 Dec (Rmbm)	2015	2016	2017F	2018F	2019F
Revenue, net	4,197	6,950	23,584	28,924	30,742
Operating expenses	(3,307)	(5,659)	(16,079)	(17,630)	(18,119)
EBIT	890	1,290	7,506	11,295	12,624
Other non-operating income	(278)	134	26	26	26
Associate contributions	117	174	174	174	174
Net interest income/(expense)	(46)	(408)	(1,612)	(1,400)	(1,400)
Pre-tax profit	683	1,190	6,094	10,095	11,424
Tax	20	(171)	(2,011)	(3,331)	(3,770)
Minorities	58	(21)	(1,225)	(2,029)	(2,296)
Net profit (rep./act.)	761	998	2,858	4,735	5,358
Net profit(adj.)	761	998	2,858	4,735	5,358
Deprec. & amort.	745	1,160	3,070	3,202	3,336
EBITDA	1,635	2,450	10,576	14,497	15,960
Per share data (Fen)					
EPS - diluted	5.0	5.9	14.9	21.9	24.8
Reported EPS - diluted	5.0	5.9	14.9	21.9	24.8
Book value per shares (BVPS)	102.8	111.0	178.6	192.6	204.3
Dividend per share (DPS)	2.5	3.5	7.9	13.2	14.9

Source: CMOC, UOB Kay Hian

FIGURE 20: BALANCE SHEET

Year to 31 Dec (Rmbm)	2015	2016	2017F	2018F	2019F
Cash/Near cash equiv.	8,982	8,420	22,277	26,033	31,114
Accounts receivable/debtors	1,694	3,855	11,255	14,896	15,832
Stocks	593	5,083	6,169	4,343	3,555
Other current assets	4,464	2,445	5,526	6,298	6,803
Current assets	15,732	19,803	45,227	51,570	57,304
Fixed assets	4,974	27,968	27,448	26,816	26,069
Investments	1,261	1,192	1,311	1,442	1,586
Other financial assets	2,373	3,001	3,301	3,631	3,994
Intangible assets	3,836	25,616	25,218	24,830	24,455
Other non-current tangible assets	2,705	10,567	9,899	9,509	9,356
Total non-current assets	15,149	68,344	67,176	66,227	65,459
Total assets	30,881	88,147	112,403	117,797	122,763
Accounts payable/creditors	1,058	1,453	2,415	2,157	1,774
Short-term debt/borrowings	5,401	6,957	7,394	7,875	8,404
Other current liabilities	2,310	7,571	7,229	7,539	7,881
Current liabilities	8,769	15,982	17,039	17,571	18,059
Long-term debt	3,942	25,377	27,715	30,286	33,115
Deferred tax liability	0	10,055	11,061	12,167	13,383
Other non-current liabilities	353	2,396	3,634	3,827	4,040
Total non-current liabilities	4,295	37,828	42,409	46,280	50,538
Total liabilities	13,064	53,810	59,447	63,851	68,596
Minority interest - accumulated	463	15,599	14,374	12,345	10,049
Shareholders' equity	17,353	18,738	38,581	41,601	44,118
Liabilities and shareholders' funds	30,881	88,147	112,403	117,797	122,763

Source: CMOC, UOB Kay Hian

FIGURE 21: CASH FLOW

Year to 31 Dec (Rmbm)	2015	2016	2017F	2018F	2019F
Operating cashflows	1,359	2,915	(4,462)	5,670	8,018
Pre-tax profit	683	1,190	6,094	10,095	11,424
Tax	20	(171)	(2,011)	(3,331)	(3,770)
Deprec. & amort.	745	1,160	3,070	3,202	3,336
Working capital changes	241	(51)	(8,946)	(1,763)	(190)
Others	(330)	787	(2,668)	(2,532)	(2,782)
Cash from investing activities	(166)	(27,648)	(217)	(1,222)	(1,158)
Capex (growth)	(434)	(23,325)	(1,647)	(1,662)	(1,678)
Capex (maintenance)	(159)	22,470	(394)	(398)	(402)
Investments	(11,872)	(29,250)	(119)	(131)	(144)
Proceeds from sale of assets	12,236	3,365	0	0	0
Others	64	(909)	1,943	969	1,066
Cash from financing activities	2,074	23,991	18,535	(692)	(1,779)
Dividend payments	(1,333)	(1,108)	(591)	(1,715)	(2,841)
Issue of shares	0	0	17,859	0	0
Proceeds from borrowings	3,004	24,243	2,775	3,052	3,358
Others/interest paid	403	856	(1,508)	(2,029)	(2,296)
Net increase/(decrease) in cash	3,267	(742)	13,857	3,757	5,081
Beginning cash	5,626	8,982	8,420	22,277	26,033
Changes due to forex impact	89	181	0	0	0
End cash	8,982	8,420	22,277	26,033	31,114

Source: CMOC, UOB Kay Hian

FIGURE 22: KEY METRICS

Year to 31 Dec (%)	2015	2016	2017F	2018F	2019F
Growth					
Turnover	(37.0)	65.6	239.4	22.6	6.3
EBITDA	(39.5)	49.9	331.6	37.1	10.1
Pre-tax profit	(68.2)	74.3	412.0	65.7	13.2
Net profit	(58.3)	31.1	186.4	65.7	13.2
Net profit (adj.)	n.a.	31.1	186.4	65.7	13.2
EPS	(58.3)	18.2	151.3	47.6	13.2
Profitability					
EBITDA margin	39.0	35.3	44.8	50.1	51.9
EBIT margin	21.2	18.6	31.8	39.0	41.1
Gross margin	31.7	30.2	37.2	45.9	48.0
Pre-tax margin	16.3	17.1	25.8	34.9	37.2
Net margin	18.1	14.4	12.1	16.4	17.4
ROE	4.8	5.5	10.0	11.8	12.5
ROA	2.6	1.7	2.9	4.1	4.5
ROIC	4.2	2.8	6.8	9.1	7.9
RONTA	7.7	5.0	9.8	11.8	10.3
Leverage					
Interest cover (x)	35.4	6.0	6.6	10.4	11.4
Debt to total capital	34.4	48.5	39.9	41.4	43.4
Debt to equity	53.8	172.6	91.0	91.7	94.1
Net debt/(cash) to equity	2.1	127.6	33.3	29.2	23.6
Current ratio (x)	1.8	1.2	2.7	2.9	3.2

Source: CMOC, UOB Kay Hian

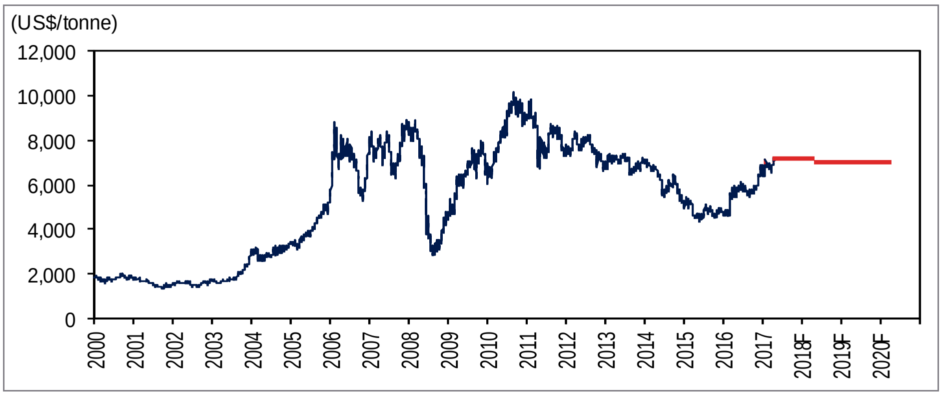
Appendix I: Copper And Cobalt

COPPER

Positive outlook in medium term. We reiterate our bullish view on the global copper market in the next 2-3 years, taking into account: a) supply constraint due to under-investment, mines' grade declines and elevated strike risks; and b) demand supported by traditional consumption and rising adoption of EVs. From the China market's perspective, we expect policy changes, including tightened environmental regulations and the ban on scrap copper imports from end-18, to pose upside risk to copper prices in 2018.

Copper prices to remain strong. Copper prices rallied by 30% in 2017 and hit a four-year high of US$7,254/tonne on 28 Dec 17. Most base metal prices have recovered since 2016 on the back of a global economic recovery, particularly in Europe and the US. Copper has not been the best performer so far but we believe copper prices will remain strong based on the solid fundamentals of the global market. **We estimate LME copper prices to rise 16% yoy to US$7,200 per tonne in 2018, US$7,000 in 2019 and US$7,000 in the long term.**

LME COPPER PRICES

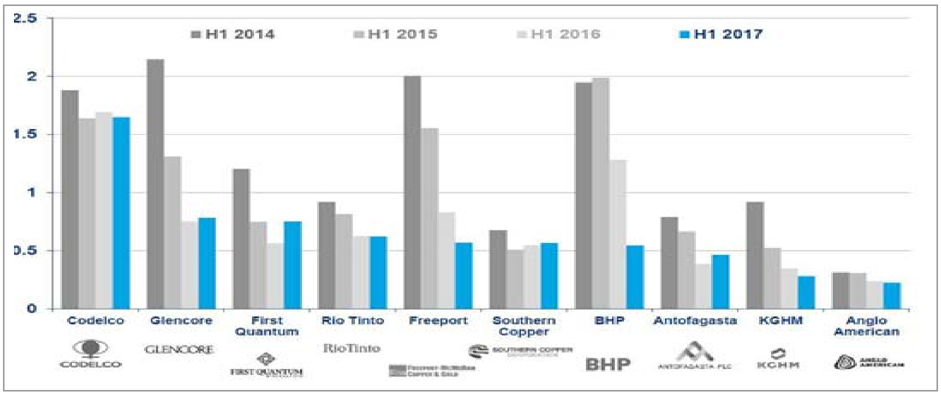


Source: LME, UOB Kay Hian

Under-investment in copper mining for years. Copper mining has a typically long investment cycle. It normally takes one decade from initiating studies, securing permits, carrying out engineering and construction works, to commissioning of production. Major global copper miners' investments have declined since 2011, given the downcycle of the global metals market. Although investments have started to pick up with the recovery of the commodities market in 2016, the long investment cycle means a ramp-up in new copper capacity will take time.

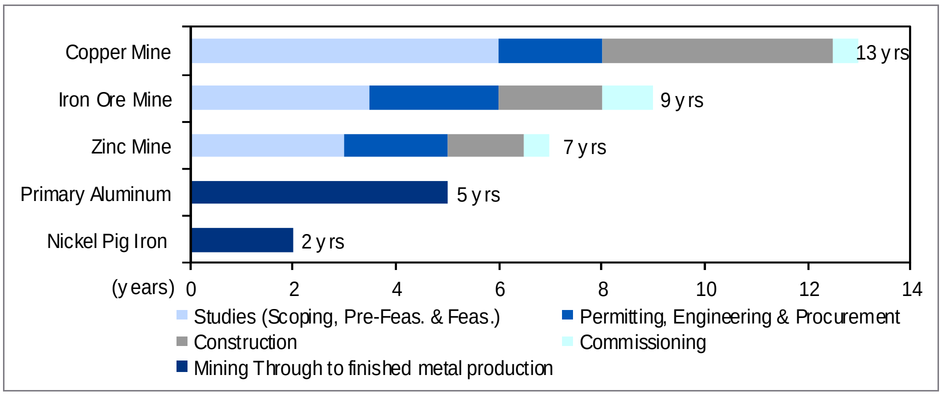
Therefore, we expect the lack of early-stage investments and long lead time between project approvals and production to result in limited supply growth in the global copper market towards the end of this decade.

MAJOR COPPER MINING COMPANIES' CAPEX (US$B)



Source: CRU, respective companies

METAL MINES INVESTMENT CYCLE



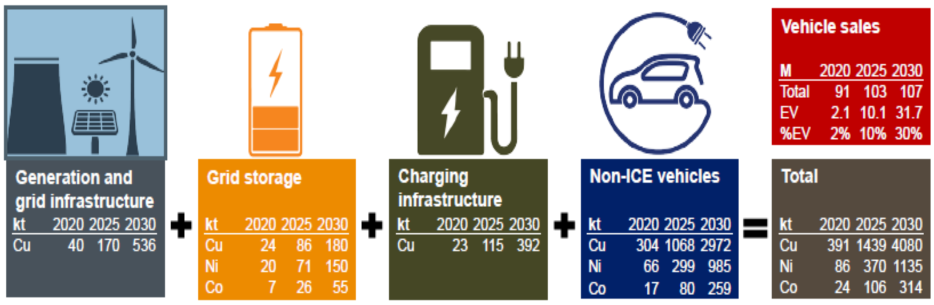
Note: Based on a sample of projects for each metal, under favourable market conditions

Source: CRU

Decline in mines' grades. After mining for more than half a century, most key global copper mines' grades have declined significantly. According to Woodmac, copper mines' grades have declined from average of 1.6% in 1990 to less than 1% currently. In China, copper mines' average grade was only 0.6%.

Growing new demand from rising EV adoption. Copper is one of the direct beneficiaries of the rising adoption of EVs. Assuming EV sales of 2.1m units by 2020 and 30m units by 2030, Glencore estimates that as early as 2020, forecast EV-related metal demand would be significant, requiring an additional 390kt of copper, 85kt of nickel and 24kt of cobalt. By 2030, forecast copper requirement is expected to reach 4.1m tonnes (or 18% of total copper supply in 2016).

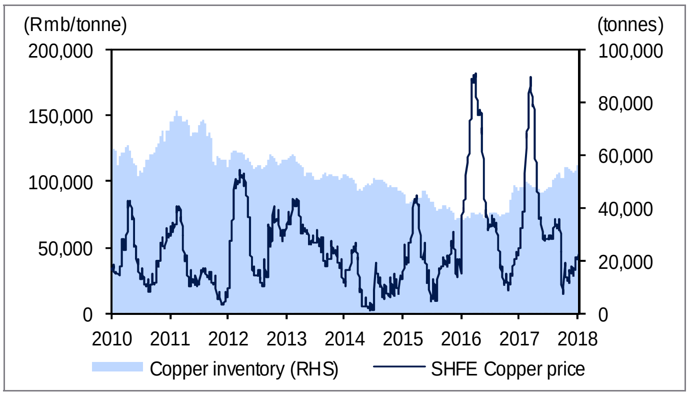
ADDITIONAL METALS REQUIREMENTS UNDER EV SALES TARGET



Source: CRU, Glencore investor update Dec 17

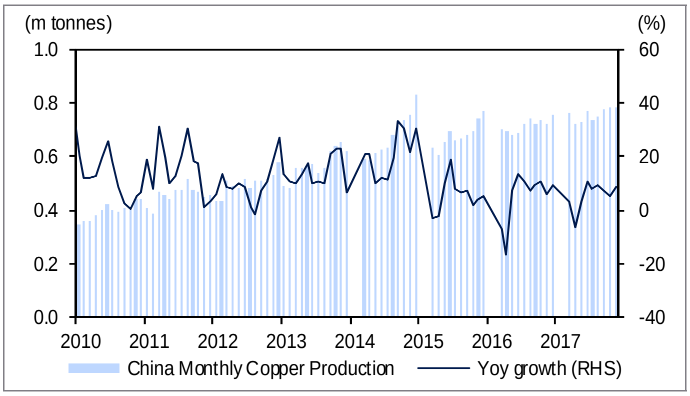
China's copper market: Tight balancing. In China, we think policy changes will pose upside risk to copper prices in 2018. Although the copper industry was not the focus of China's supply-side reforms in 2016-17, two environment-related policies would impact domestic copper supply from 2018. The first is China's tightening regulations on small copper mines and curbing of smelter production, which we believe would impact the mining industry in the long run. The other policy is the ban on scrap copper imports, which is expected to start from end-18.

SHFE COPPER PRICES VS INVENTORY



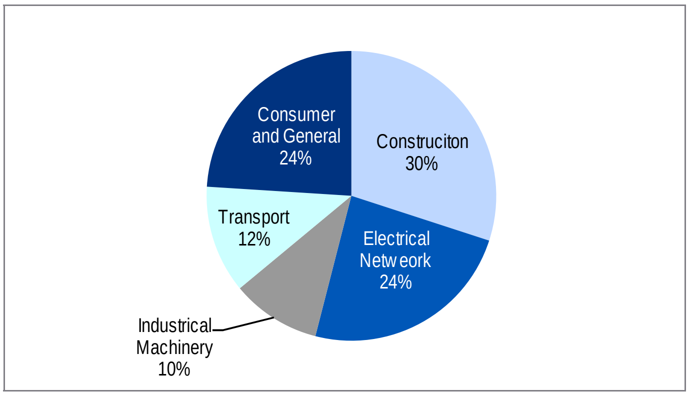
Source: SHFE, UOB Kay Hian

CHINA MONTHLY COPPER PRODUCTION AND YOY GROWTH



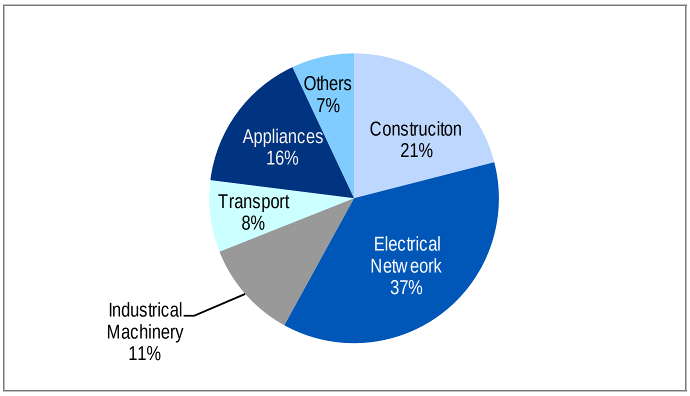
Source: WIND, UOB Kay Hian

GLOBAL COPPER CONSUMPTION BY END USER (2017)



Source: CRU, UOB Kay Hian

CHINA'S COPPER CONSUMPTION BY END USER (2017)



Source: CRU, UOB Kay Hian

COBALT

Riding on EV momentum. The global cobalt market had an exceptional year in 2017, thanks to buoyant demand from EV batteries. Cobalt prices (LME spot) surged to US$75,205/tonne in 2017, up 194% yoy (2016: US$25,500/tonne), hitting a new high since the financial crisis in 2008. Based on our analysis, we think the cobalt market will remain tight in the foreseeable future, as rising demand from EV batteries is expected to outpace the potential supply increase. We think ternary is the trend among cathode materials for EV batteries, while cobalt is inevitably the core material in ternary batteries. As discussed previously, assuming EV sales of 2.1m units by 2020 and 30m units by 2030, Glencore estimates that as early as 2020, the forecast demand for EV-related metals will be significant, requiring an additional 390kt of copper and 24kt of cobalt (c.50% of 2017 consumption from EV batteries).

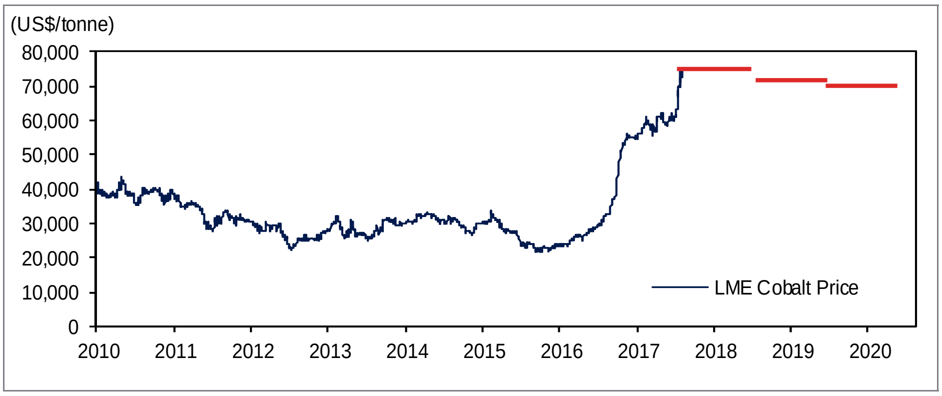
TESLA MODEL BATTERY

Source: Tesla

TESLA MODEL S

Source: Tesla

COBALT PRICES



Source: Bloomberg; UOB Kay Hian

Global cobalt supply and demand model. We expect an 11% CAGR in cobalt demand for 2017-20, mainly resulting from the surge in EV batteries' cobalt consumption, which we expect to rise 32-54% yoy over the same period. Cobalt supply is expected to rise at 10% CAGR in 2016-20. The tight market will persist over 2017-20. As such, we forecast cobalt prices at US$34.50, US$33.50 and US$32.50 per pound in 2018-20 respectively.

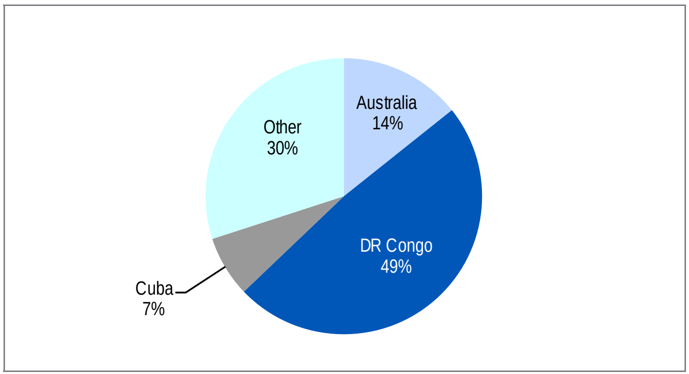
GLOBAL COBALT SUPPLY AND DEMAND

	2014	2015	2016	2017	2018F	2019F	2020F
Supply (kt)	92	98	106	116	128	141	156
yoy % chg		*7%*	*8%*	*9%*	*10%*	*10%*	*11%*
Demand (kt)	88	93	102	115	128	139	153
yoy % chg		*6%*	*10%*	*11%*	*11%*	*9%*	*9%*
Batteries	52	55	60	68	78	89	100
yoy % chg		*6%*	*10%*	*11%*	*12%*	*13%*	*15%*
EV batteries (XEV)	2	5	8.5	13	20	28	37
yoy % chg		*150%*	*70%*	*53%*	*54%*	*40%*	*32%*
Portable devices (IT)	37	39	41	46	48	51	53
yoy % chg		*5%*	*5%*	*12%*	*5%*	*5%*	*5%*
Others (ESS)	13	11	11	9	10	10	10
Super-alloy	13.2	14.0	15.4	17.0	18.0	20.0	21.0
yoy % chg		*6%*	*10%*	*11%*	*8%*	*8%*	*8%*
Carbide alloy	6.2	6.5	7.2	8.1	8.2	8.2	8.2
Ceramics	3.5	3.7	4.1	4.6	5.0	5.0	5.0
Catalyst	3.5	3.7	4.1	4.6	5.0	5.0	5.0
Other material	9.7	10.2	11.3	12.7	12.7	12.7	12.7
S-D	4.0	5.0	3.2	1.0	0.5	1.6	3.5
Cobalt prices (US$/lb)	14.2	13.2	11.8	26.0	34.5	33.5	32.5

Source: Antaike, respective companies, Bloomberg, UOB Kay Hian

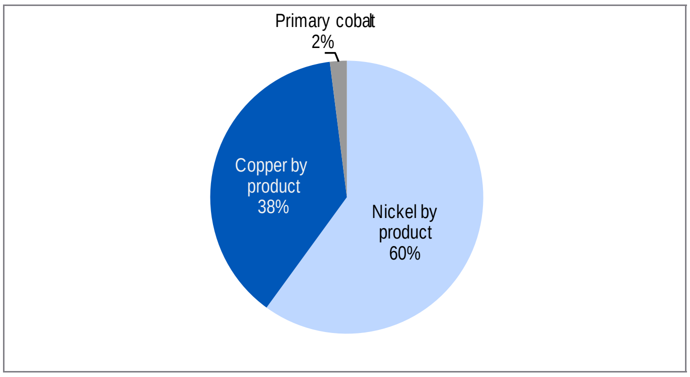
Supply: Concentrated market; price hike triggers ramp-up in supply. Cobalt resources normally come from copper mines, nickel mines and by-products. DR Congo's cobalt reserves make up about 50% of global cobalt reserves. A few global mining giants dominate the cobalt supply market, such as Glencore, CMOC, Jinchuan, Vale and Sherrit. The top five producers accounted for 53% of the market in 2017. CMOC is the second-largest cobalt supplier in the world following its acquisition of the Tenke mine. The company guided cobalt production of 16k-18k tpa. Due to the secular increase in cobalt prices and optimistic demand outlook, the cobalt market is attracting more miners' attention. Based on the available mines' schedules, we estimate a 10% yoy growth p.a. for the next 2-3 years, with the major additional supply expected to come from Glencore, which announced aggressive cobalt production targets of 36k-42kt, 62-68kt and 60-66kt for 2018-20 respectively.

COBALT RESERVES DISTRIBUTION BY COUNTRY



Source: USGS, UOB Kay Hian

BREAKDOWN OF MINED COBALT SOURCES



Source: Antaike

TOP COBALT MINERS AND PRODUCTION

(Tonne)	2012	2013	2014	2015	2016	2017F
Glencore	14,000	19,400	20,700	23,000	28,300	26,500
CMOC	-	-	-	-	14,515	16,000
Sherritt	4,285	5,402	6,125	7,198	6,967	6,900
Vale	2,291	3,518	3,658	4,356	5,657	5,480
Jinchuan	4,535	4,645	5,185	5,944	5,091	6,500
Freeport	11,794	12,701	13,154	15,876	Sold to CMOC	-
Top 5_ Total	25,111	32,965	35,668	40,498	60,530	61,380
Global Total			92,000	98,000	105,560	116,000
Top 5 proportion			38.8%	41.3%	57.3%	52.9%

Source: Respective companies, Antaike

Glencore. As the largest global cobalt producer, Glencore's cobalt production in 2017 could have declined 6% yoy due to the power shortage at its major mine (Mutanda), according to Antaike, a Chinese provider of metals information. Glencore also announced aggressive cobalt production targets of 36k-42kt, 62-68kt and 60-66kt for 2018-20 respectively.

Sherritt International. Affected by Hurricane Irma, Sherritt's 2017 production could have remained flat at 6.9kt, in line with its target.

Vale SA. Cobalt production in 2017 could be flat at 5.5kt as a result of a production decline in its Vale New Caledonia project, partially offset by an increase in production from the Subdury and Voisey's Bay projects.

Jinchuan Group International Resources Co (金川). Cobalt production in 2017 could have increased 28% yoy to 6.5kt, thanks to the production recovery at Ruashi Mining and growth from its domestic mines.

Metallurgical Corporation of China (中冶). Cobalt production reached 1.6kt in 1H17 and is expected to have hit 3.3kt in 2017, up 51% yoy.

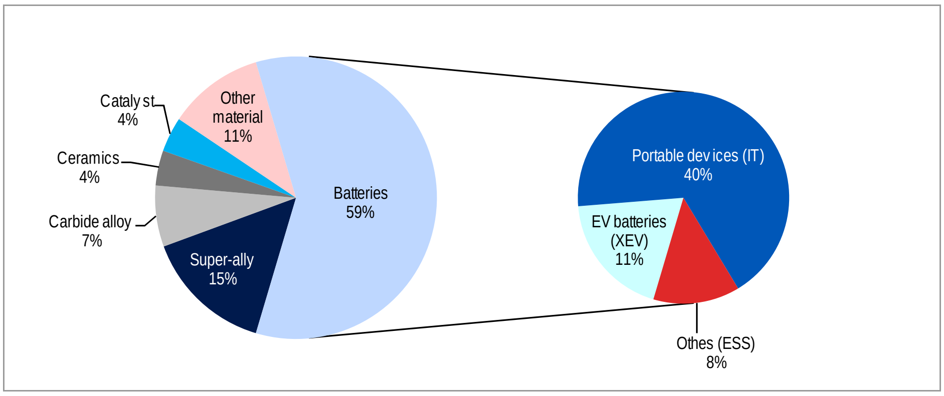
Shalina Resources. According to Antaike, Shalina's 2017 cobalt production is estimated at a historical high of 4kt (2016: 2kt).

Wanbao Mining (万宝). Cobalt production in 2017 could have reached 3.5kt after the completion of the first stage of its Kamoya project in late-16.

Demand boost from EV ternary batteries. Cobalt demand from EV batteries have surged by over 50% yoy in 2017 to 12-13kt, and accounted for 11-12% of global cobalt consumption. Going forward, EV batteries would be the key driver of cobalt demand. Cobalt is used as a cathode material for EV ternary batteries. We see ternary battery as the main trend in the foreseeable future based on the current technology in the EV industry. The EV30@30 Campaign (an international EV initiative started in Jun 17 and endorsed by 10 countries, including China, Canada, France and Japan) has set a collective goal for EV sales to reach 30% of total vehicle sales by 2030 (estimated at 30m units), meaning global EV sales are expected to rise at a 26% CAGR in 2016-30.

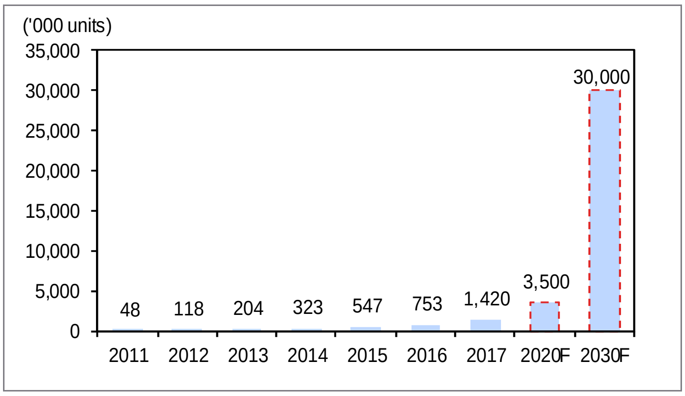
According to the Technology Roadmap of Key Technologies in the Made in China 2025 initiative, annual sales of new energy vehicles (NEV) – including EV and plug-in hybrid electric vehicle (PHEV) – in China are expected to account for 5% of total automobile demand by 2020 and 20% by 2025. This trend will continue into 2030, with annual sales predicted to exceed 10m units, considering China's target for carbon emissions and the need for primary energy alternatives.

COBALT DOWNSTREAM CONSUMPTION BREAKDOWN (2017)



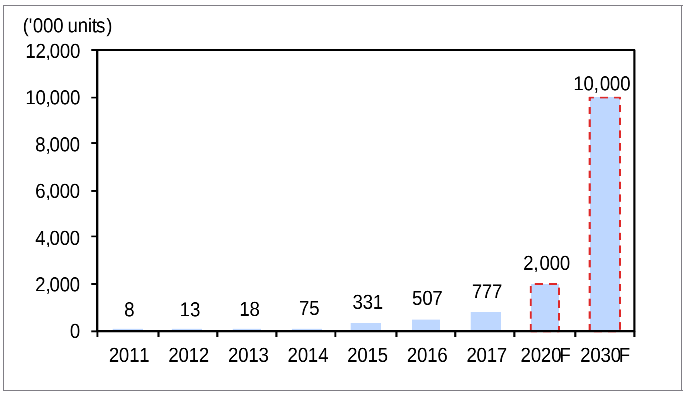
Source: Antaike, UOB Kay Hian

GLOBAL NEW-ENERGY VEHICLES SALES



Source: EV30@30 Campaign, UOB Kay Hian

CHINA NEW-ENERGY VEHICLES SALES



Source: WIND; UOB Kay Hian

Appendix II: Tungsten And Molybdenum

TUNGSTEN

China dominates the market; global players exit. According to the 2017 edition of the US Geological Survey (USGS), China dominates the global tungsten market with 60% of global reserves and over 80% of global production. Jiangxi, Hunan and Henan are the top three provinces accounting for 75% of the official quota and over 90% of total production. Global players have been exiting the market with major tungsten mines shutting down in recent years, eg two major tungsten mines in Canada were shut down in 2016 (Cantung and Mactung Mine) due to rising labour and transportation costs.

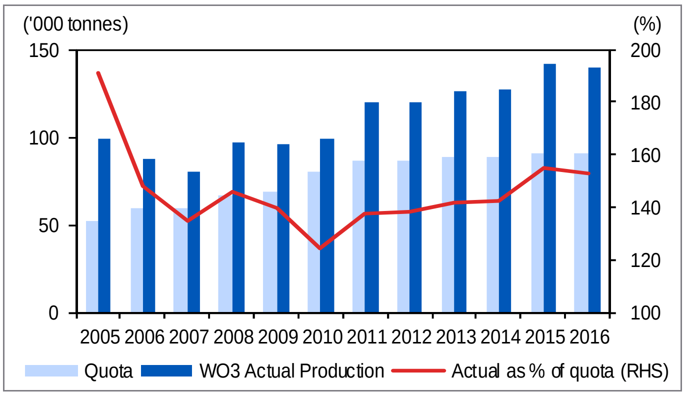
GLOBAL TUNGSTEN RESERVE AND PRODUCTION BY COUNTRY

	--------Mine Production------		Reserves	As % of total --------Mine Production------		Reserves
(tonne)	2015	2016		2015	2016	
United States	n.a.	n.a.	n.a.	n.a	n.a	n.a
Austria	861	860	10,000	1.0%	1.0%	0.3%
Bolivia	1,460	1,400	n.a.	1.6%	1.6%	n.a
Canada	1,680	-	290,000	1.9%	0.0%	9.2%
China	73,000	71,000	1,900,000	81.6%	82.2%	60.4%
Portugal	474	570	2,700	0.5%	0.7%	0.1%
Russia	2,600	2,600	83,000	2.9%	3.0%	2.6%
Rwanda	850	770	n.a.	1.0%	0.9%	n.a
Spain	835	800	32,000	0.9%	0.9%	1.0%
United Kingdom	150	700	51,000	0.2%	0.8%	1.6%
Vietnam	5,600	6,000	95,000	6.3%	6.9%	3.0%
Other countries	1,910	1,700	680,000	2.1%	2.0%	21.6%
World total (rounded)	89,400	86,400	3,100,000	100%	100%	99%

Source: USGS, UOB Kayhian

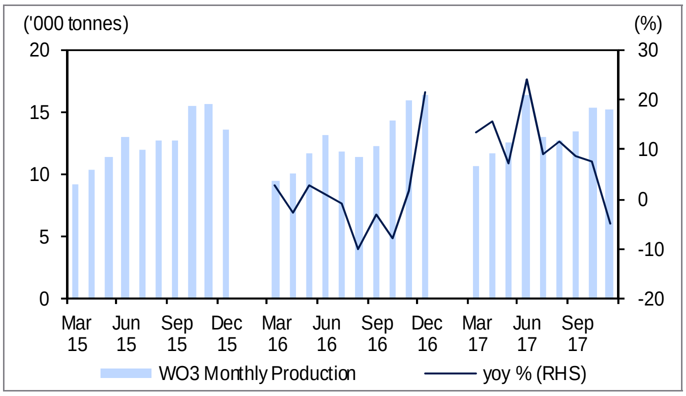
Supply to be constrained by supply-side reform and tightening of environmental policies. The Chinese government has been trying to restrict tungsten production by suspending the issuance of mining rights and setting annual tungsten production quotas. Despite these restrictions, actual output continues to exceed the government's official quota by 24-55% in the past decade. We believe the tightening environmental restrictions and ongoing supply-side reform would help to further contain production by removing illegal and small mines and reducing capacity.

WO3 PRODUCTION AND CHINA QUOTAS



Source: Wind, UOB Kay Hian

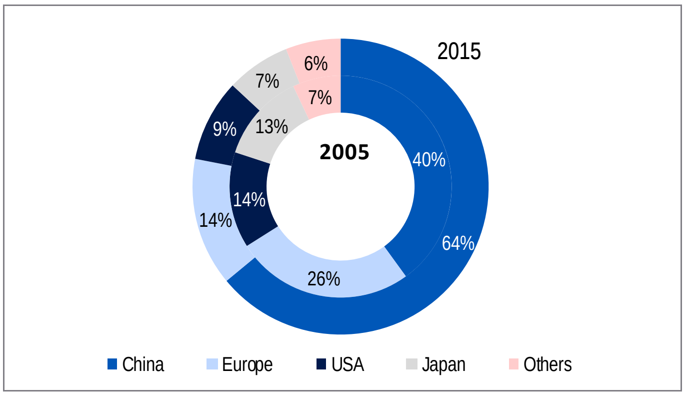
CHINA WO3 PRODUCTION



Source: Wind, UOB Kay Hian

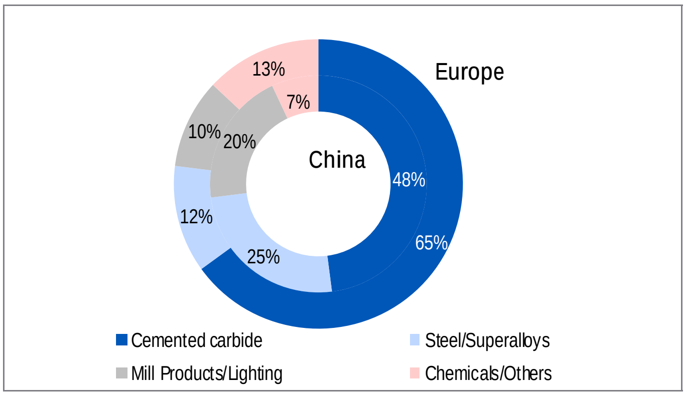
Demand: Stable demand from China and global economic recovery. China accounted for 64% of global tungsten consumption in 2015 (2005: 40%). We see stable demand for tungsten in China, thanks to China's resilient economic growth and ongoing manufacturing industry upgrading. For example, as the largest end-application of tungsten, cemented carbide (硬质合金) accounted for only 48% of total use in China in 2015 vs 65% in Europe. We believe this gap will narrow in the future. China's exports of tungsten products in 11M17 grew 34.6% yoy, supported by increasing global demand. We expect this trend to continue in 2018 with the gradual recovery in the global economy.

DEMAND FOR TUNGSTEN BY COUNTRY



Source: Wind, *UOB Kay Hian*

TUNGSTEN CONSUMPTION BY APPLICATION (2015)



Source: Wind, *UOB Kay Hian*

MOLYBDENUM

Molybdenum prices declined from 2011 to 2015 with supply surplus peaking in between. Prices have been supported and trending upwards since 2016 on smaller output as a result of large mines' closures in the US. We believe prices have bottomed out in 2015 and should be well supported at the current levels.

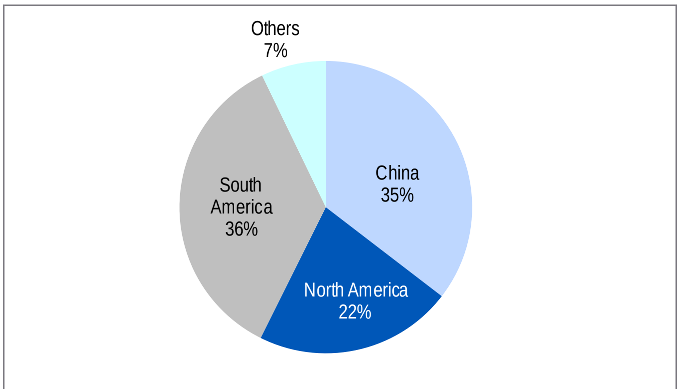
GLOBAL MOLYBDENUM RESERVES AND PRODUCTION BY COUNTRY

	--------Mine Production------		Reserves	As % of total --------Mine Production------		Reserves
(tonne)	2015	2016		2015	2016	
United States	47,400	31,600	2,700,000	20.1%	13.9%	18.1%
Armenia	7,200	7,000	150,000	3.1%	3.1%	1.0%
Australia	—	—	190,000	n.a	n.a	1.3%
Canada	2,300	1,700	260,000	1.0%	0.8%	1.7%
Chile	52,600	52,000	1,800,000	22.3%	23.0%	12.1%
China	83,000	90,000	8,400,000	35.3%	39.7%	56.3%
Iran	3,500	3,500	43,000	1.5%	1.5%	0.3%
Kazakhstan	—	—	130,000	n.a	n.a	0.9%
Kyrgyzstan	n.a.	n.a.	100,000	n.a	n.a	0.7%
Mexico	11,300	12,300	130,000	4.8%	5.4%	0.9%
Mongolia	2,000	2,500	160,000	0.8%	1.1%	1.1%
Peru	20,200	20,000	450,000	8.6%	8.8%	3.0%
Russia	4,500	4,500	250,000	1.9%	2.0%	1.7%
Turkey	900	1,000	100,000	0.4%	0.4%	0.7%
Uzbekistan	450	450	60,000	0.2%	0.2%	0.4%
World total (rounded)	235,000	227,000	15,000,000	100%	100%	101%

Source: Wind, Bloomberg, media, UOB Kay Hian

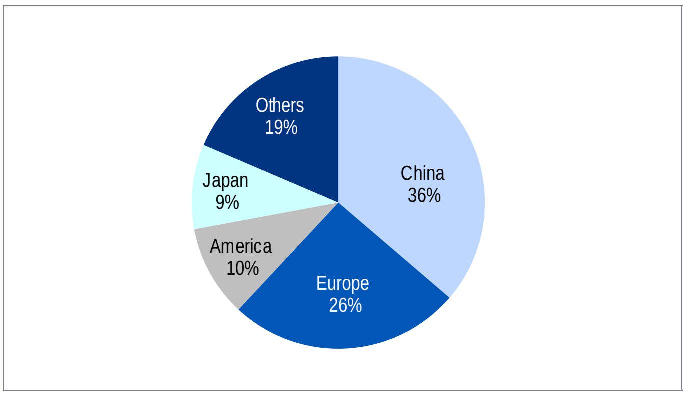
Supply: Relatively stable. According to USGS, global molybdenum reserves stand at 15mt, with China, the US and Chile accounting for 86% of total reserves and 77% of total production. South America, China and North America are major producers, accounting for over 93% of total production volume in 2016. Overall supply has been declining gradually in the past few years with shrinking production in the US partially offset by an increase from South America.

GLOBAL MOLYBDENUM PRODUCTION BY COUNTRY (2016)



Source: USGS, UOB Kay Hian

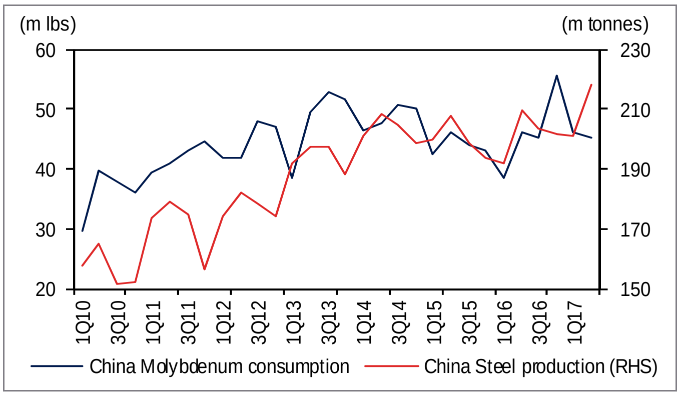
GLOBAL MOLYBDENUM CONSUMPTION BY COUNTRY (2016)



Source: USGS, UOB Kay Hian

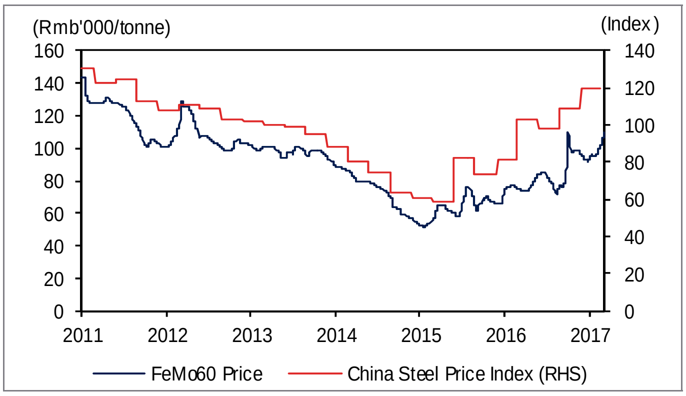
Demand: Limited upside as we expect steel production to decline in the next few years. Molybdenum is primarily used as an additive in steel production, thus it is highly correlated with steel production and prices. According to International Molybdenum Association (IMOA), 22% of molybdenum is used to produce molybdenum grade stainless steel and 57% is used in constructional steel, tools and high-speed steel and cast iron.We expect crude steel production in China to decline gradually in the next few years, thus causing demand for molybdenum to slide as well *(see report China Steel Sector: Structural supply-side reform leads to sustainable structural changes published on 13 Nov 17)*.

CHINA MOLYBDENUM CONSUMPTION VS. STEEL PRODUCTION



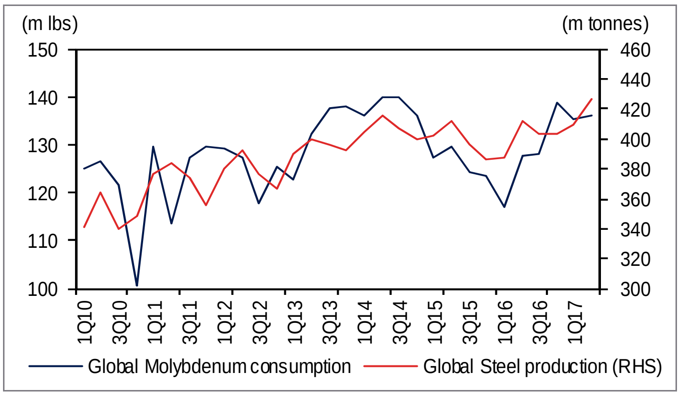
Source: CEIC, UOB Kay Hian

FEMO60 PRICE VS. CHINA STEEL PRICE INDEX



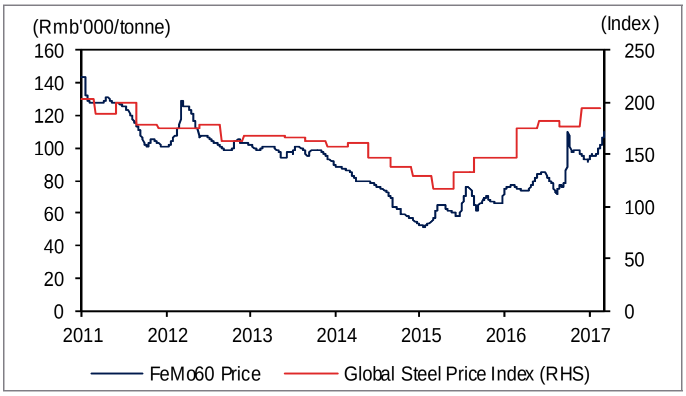
Source: WIND, UOB Kay Hian

GLOBAL MOLYBDENUM CONSUMPTION VS STEEL PRODUCTION



Source: CEIC, UOB Kay Hian

FEMO60 PRICE VS GLOBAL STEEL PRICE INDEX

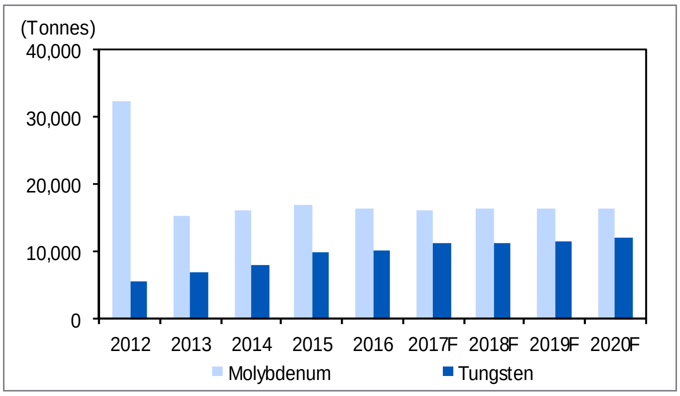


Source: WIND, UOB Kay Hian

CMOC'S MOLYBDENUM AND TUNGSTEN ASSETS

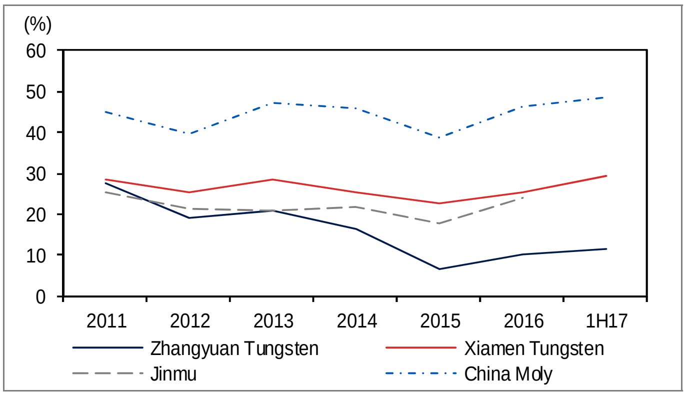
CMOC owns three molybdenum mines – San Dao Zhuang, Shang Fang Gou and Xinjiang Hami. San Dao Zhuang has one of the largest molybdenum reserves and the second-largest tungsten reserves in the world. Currently, the mine, located in Luoyang, Henan, is CMOC's sole producer of molybdenum and tungsten, while the other two mines have not yet been developed. CMOC enjoys an absolute cost advantage with its significantly lower-than-peers cash cost, thanks to its resource structure, delivering 45% gross margin in the past few years. We expect the high margin to continue in the foreseeable future as tungsten is produced as a by-product (mine life c.20 years). The mine produced 8.1kt of molybdenum concentrates and 5.6kt of tungsten in 1H17, up 2% yoy and 14% yoy respectively.

CMOC'S MOLYBDENUM & TUNGSTEN PRODUCTION



Source: CMOC, UOB Kay Hian

GROSS MARGIN COMPARISON



Source: Respective companies, UOB Kay Hian

Appendix III: Niobium And Phosphate

NIOBIUM

A highly-concentrated market. According to the USGS, global niobium reserves exceed 4.3m tons, and distribution of niobium reserves is concentrated with Brazil accounting for 95% of global niobium reserves. The iron and steel industry is the largest consumer of niobium, and ferronibium accounted for 90% of total niobium consumption. Niobium is used in the steel industry for the production of a variety of steel alloys that contain small amounts of other metals (microalloy and low-alloy steels) to improve corrosion resistance, strength, toughness and other properties. Given the global niobium market is highly concentrated, niobium producers naturally enjoy high pricing power.

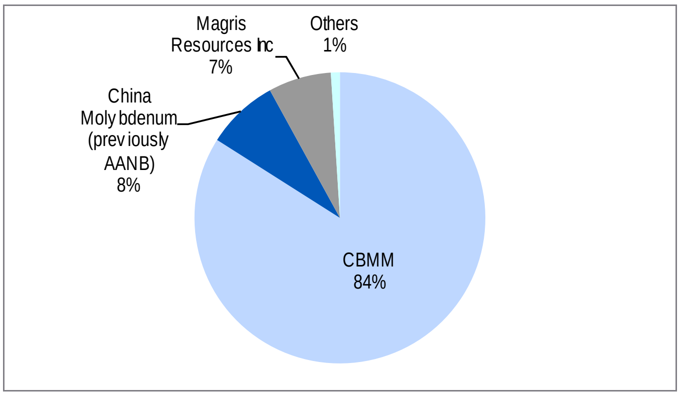
CBMM dominates global niobium market. Companhia Brasileira de Metalurgia e Mineração (CBMM), the world's leading niobium supplier, has an annual production of over 40kt, or more than 80% of the world's niobium production volume. CMOC is the world's second-largest niobium producer with a market share of 8% (capacity: 9,000tpa), following its acquisition of Anglo American Nióbio Brasil Limitada (AANB) in 2016.

Stable prices and less cyclical. Ferroniobium prices have been rather stable over the past 8-10 years because: a) CBMM dominates the supply market, b) there are few substitutes for the metal, and c) ferroniobium's small contribution to the cost of iron and steel production. Besides, compared with any new prospective capacities, the current players are more competitive in terms of size, grade and cost. We expect the global niobium market to remain relatively stable going forward, suggesting a stable price outlook as well.

CMOC BRAZIL NIOBIUM OPERATION

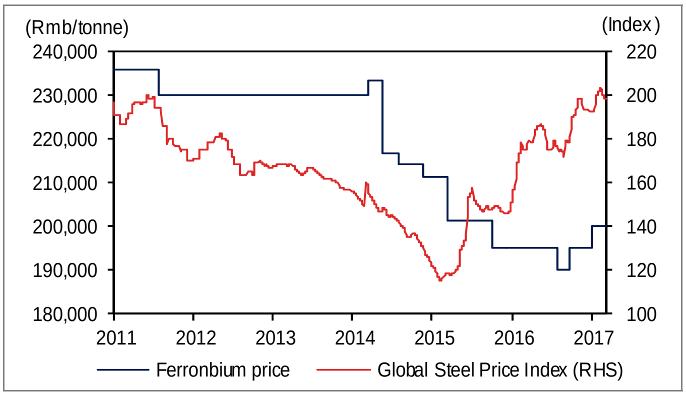
Source: CMOC

NIOBIUM PRODUCTION BY PRODUCER



Source: USGS, UOB Kay Hian

FERRONIOBIUM 66% PRICES VS STEEL PRICES



Source: Bloomberg, UOB Kay Hian

To provide stable cash flow for CMOC. CMOC's niobium segment produces a single product – ferroniobium at 65%Nb concentration, with annual capacity of 9,000k tpa. In 9M17, the company produced 6,318 tonnes of niobium. Given the nature of the global niobium market, we expect the niobium segment to provide CMOC with a stable cash flow in the foreseeable future, and to enhance its anti-cyclical nature.

PHOSPHATE MARKET IN BRAZIL

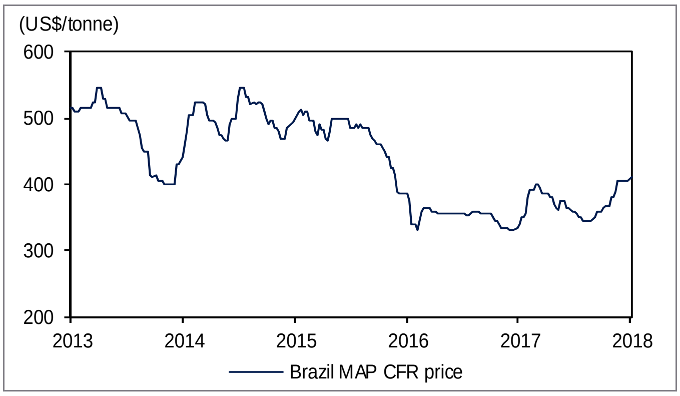
Brazil is the world's third-largest phosphate consumer; supply shortage in domestic market. Brazil is one of the world's main producers and exporters of agricultural products. It is the third-largest phosphate consumer (12% of global consumption) for the production of agricultural products, including soybeans, coffee and sugarcane. Besides, Brazil is believed to have the largest potential arable land in the world. Given the high demand for fertilisers, demand significantly exceeds domestic production. Currently, more than half of Brazil's annual fertiliser demand is met via imports, eg from China.

Prices rebounded on robust demand in 2017. Brazil's demand for fertilisers was robust last year, mainly due to a favourable barter ratio (fertiliser costs relative to crop commodity prices), driven by a shortage of corn in the market which allowed Brazilian farmers to charge a price premium and fostering fertiliser pre-purchases (mostly in 1Q17). Phosphate price (MAP CFR Brazil) averaged US$370/tonne in 2017, up 4.7% yoy (2016: US$354/tonne).

CMOC BRAZIL PHOSPHATES OPERATION

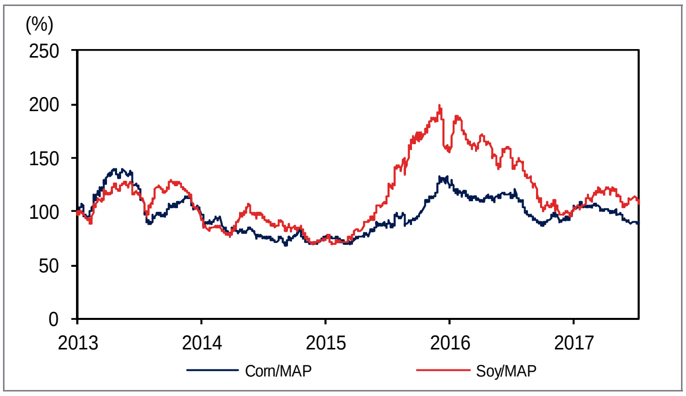
Source: CMOC

MAP CFR BRAZIL PRICES



Source: Wind, UOB Kay Hian

BRAZIL - BARTER RATIO



Source: Wind, UOB Kay Hian

CMOC is second-largest producer in Brazil. In 2016, CMOC acquired a 100% interest in Anglo American Fosfatos Brasil (AAFB), the subsidiary of multinational mining company Anglo American in charge of phosphate operation. The deal was completed at the same time as the acquisition of AANB, for an aggregate consideration of US$1.5b.

CMOC'S NIOBIUM AND PHOSPHATE ASSETS

	Interest (%)	Reserves (%)	Expected mine-life (year)	Grade (%)	2016 (H1/H2) (Output, kt)	1H17 (Output, kt)	2017 Guidance (Output, kt)
Niobium	100	371	40	0.93	2.6/4.0	4.3	8.5 ~ 9.0
Phosphate fertiliser	100	36020	30	12.10	561/607	547	1,170 ~ 1,180

Source: CMOC, UOB Kay Hian

We expect Brazil's phosphate price recovery to continue into 2018. Although we do not expect a significant growth in phosphate prices in the near term, this segment should be able to provide CMOC with consistent and positive cash flow due to its direct sales in Brazil which gives it a cost advantage vs importers.

Appendix IV: Company Background

PRINCIPAL BUSINESSES

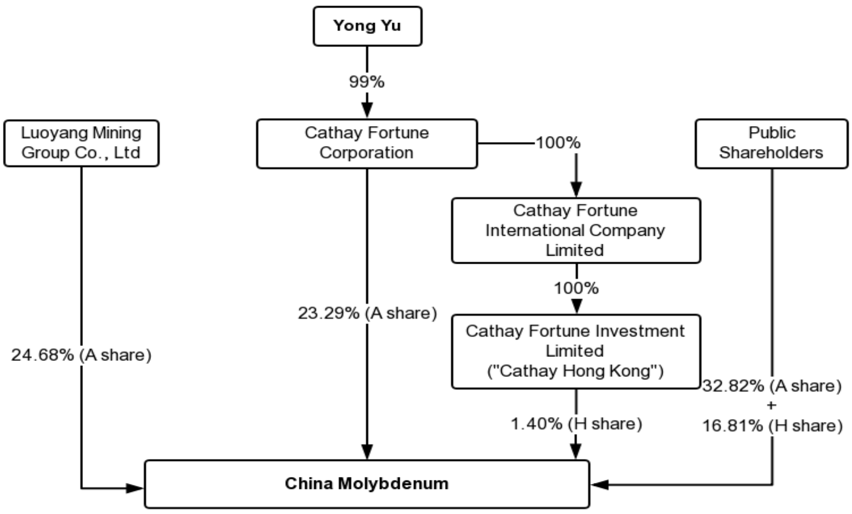
CMOC is a leading company for mining, selecting, smelting and deep processing of molybdenum and other complex resources. The company was listed on the Hong Kong Stock Exchange in 2007 and the Shanghai Stock Exchange in 2012 as a joint-stock limited company by Luoyang Mining Group (LMG) and Cathay Fortune Corporation (CFC). After acquiring Northparkes, Tenke and Brazil assets, CMOC is now one of the top five molybdenum producers, one of the largest tungsten producers and the second-largest cobalt and niobium producer in the world, as well the one of top copper miners globally. CMOC has a market capitalisation of more than Rmb160b with net profit of Rmb1.02b in 2016.

HISTORY AND DEVELOPMENT

1999	• Luoyang Luanchuan Molybdenum Group (LLMG)was established .
2004	• Cathay Fortune Corporation (CFC) subscribed shares in LLMG, increased registered capital by RMB1.8bn while reduced state-owned interest.
2006	• LLMG re-organized and converted into a joint stock company with limited liability, with Luoyang Mining Group (LMG) and CFC holding 51% and 49% of its share capital, respectively.
2007	• Listed in HKEx in April as China Molybdenum Co. Ltd (CMOC).
2012	• Listed in Shanghai Stock Exchange in October.
2013	• CMOC acquired 80% equity of Northparkes Joint Venture.
2014	• The biggest shareholder of the company changed from LMG to CFC.
2016	• The company acquired 56% equity of Tenke Fungurume Mining and 100% interest Anglo American's niobium and phosphate business.
2017	• The company increased registered capital by RMB180bn through directional issuance to eight institutions including China Structural Reform fund Co. ltd which is state fund.

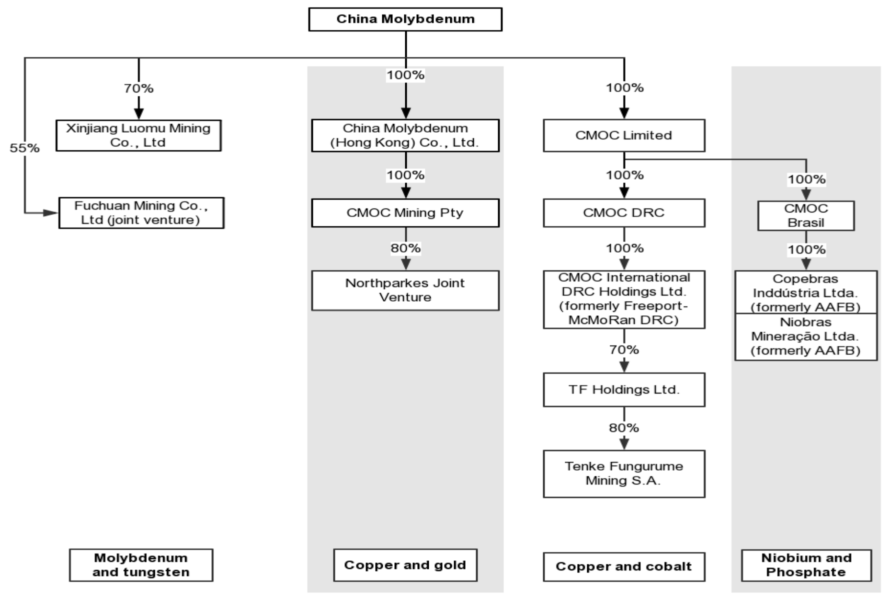
Source: CMOC, UOB Kay Hian

SHAREHOLDING STRUCTURE



Source: CMOC, Bloomberg, UOB Kay Hian

BUSINESS SECTOR AND MAJOR SUBSIDIARIES



Source: CMOC

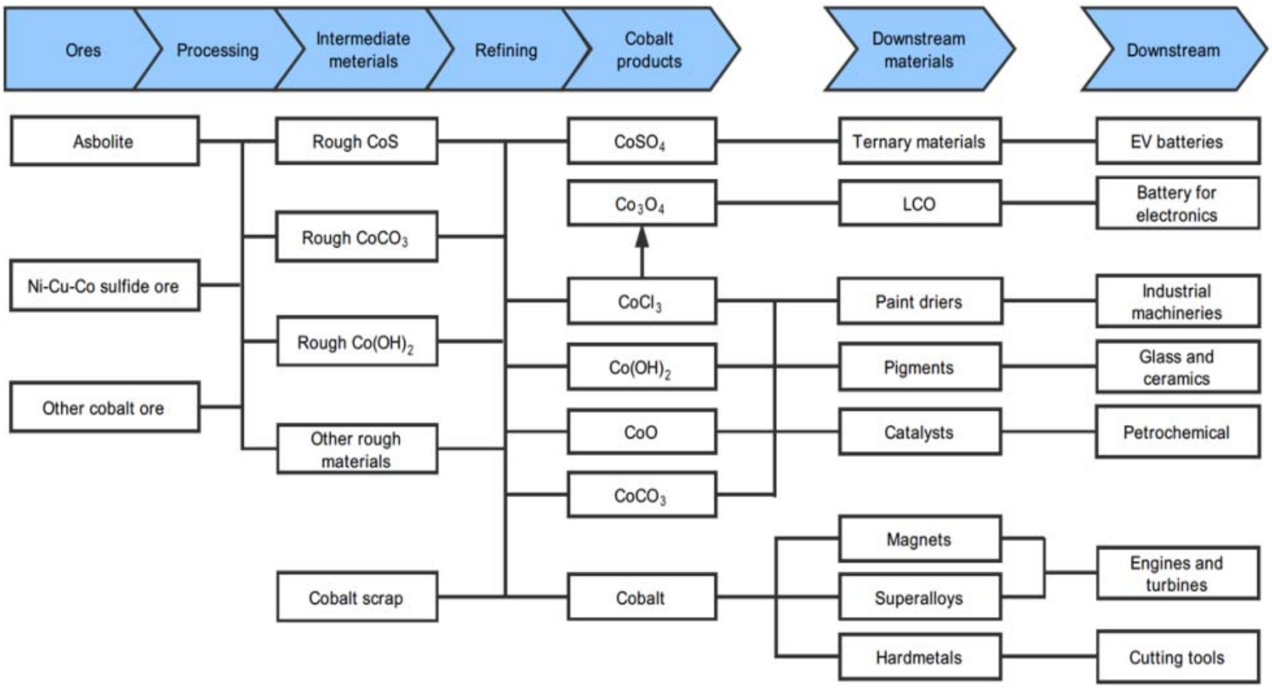
MANAGEMENT TEAM

Name	Age	Position	Experience
Chaochun Li	40	Chairman, Executive Director	Mr Li held positions as senior consultant for the tax division in Huaqiang Andersen accounting firm, executive vice president of planning and strategy in Hong Kong Shanghai HSBC Ltd, executive director in the Investment Department of Hong Shang Industry Holding Group Co Ltd, and vice chairman of the nomination committee and chairman of the strategic committee of CMOC. He has been an executive director since Jan 07 and Chairman of the board since Jan 14. Mr Li has a bachelor's degree in law from Shanghai Jiaotong University.
Faben Li	53	Executive Director, General Manager, Senior Engineer	Since he joined the company in 1988, Mr Li has been an executive director since Aug 06 and general manager and a member of the strategic committee since Oct 12. He has a bachelor's degree in mining engineering from Central South University and a master's degree in management science and engineering from Xian University of Architecture and Technology.
Meifeng Gu	52	Chief Financial Officer, Senior Accountant	Ms Gu has been the chief financial officer of the company since Aug 06. She was an executive director of the company from Jun 13 to Jun 15. Ms Gu has a bachelor's degree from Henan University and master's degree in accounting from Chinese University of Hong Kong.
Zhongqiang Jiang	50	Deputy General Manager	Mr Jiang has been deputy general manager since Jan 14. After joining the company in Dec 12, he has held positions as assistant general manager, manager of sales and head of the marketing administration department. Mr Jiang has a bachelor's degree in engineering from Harbin University of Science and Technology.
Shigun Jing	50	Deputy General Manager, Senior Engineer	Mr Jing has been a deputy general manager since Jan 16. He has more than 20 years of experience in the mining industry. Mr Jing has a bachelor's degree in engineering from North West Institute of Light Industry and a doctorate degree in management science and engineering from Xian University of Architecture and Technology.
Yonghong Wang	49	Deputy General Manager, Senior Engineer	Mr Wang has been deputy general manager since Jan 16. He has over 20 years of experience in the mining industry.
Yuanbin Yue	43	Secretary of the Board	Mr Yue served as managing director of Guotai Junan Securities and vice president of Shanghai Huaxin Securities prior to joining CMOC. He became secretary of the board in Mar 17. Mr Yue has a master's degree in economics from Tongji University.

Source: CMOC

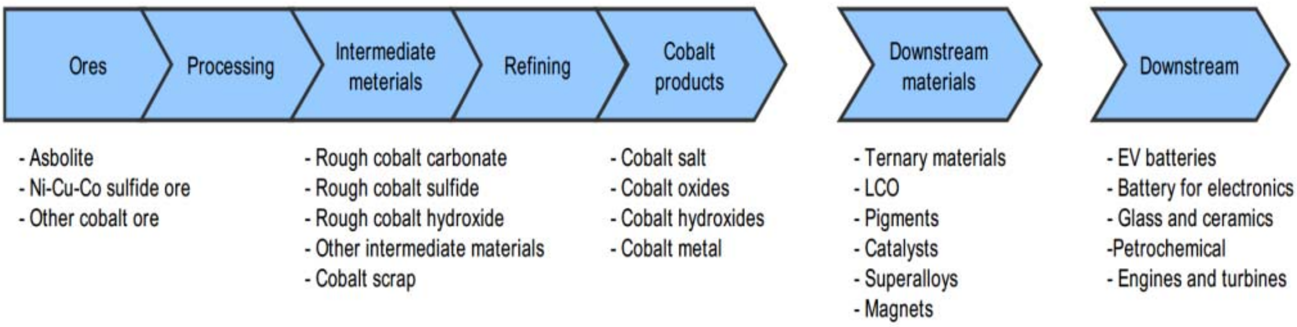
Appendix V: Cobalt Industry Analysis

COBALT SUPPLY CHAIN OVERVIEW



Source: CMOC

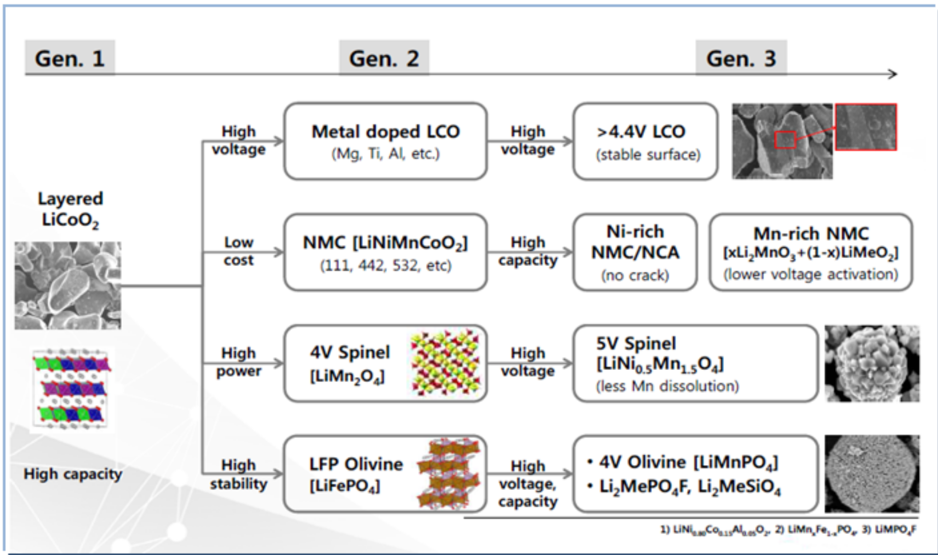
COBALT SUPPLY CHAIN AND MAJOR PLAYERS



Major miners	Major refiners	Major ternary producers	Major EV battery makers
- Glencore - China Molybdenum - Eurasian Resources	- Huayou Cobalt - Jinchuan Group - Freeport Cobalt - Glencore **Major recyclers** - Umicore - GEM	- Umicore - L&F - Hunan Shanshan - Hunan Reshine - GEM	- Guoxuan High-tech - Panasonic - LG Chem - Samsung SDI

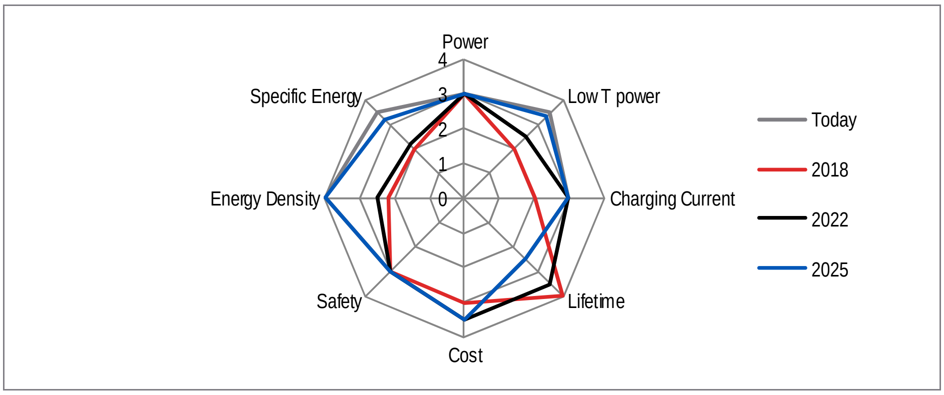
Source: CMOC

CATHODE DEVELOPMENT PROGRESS



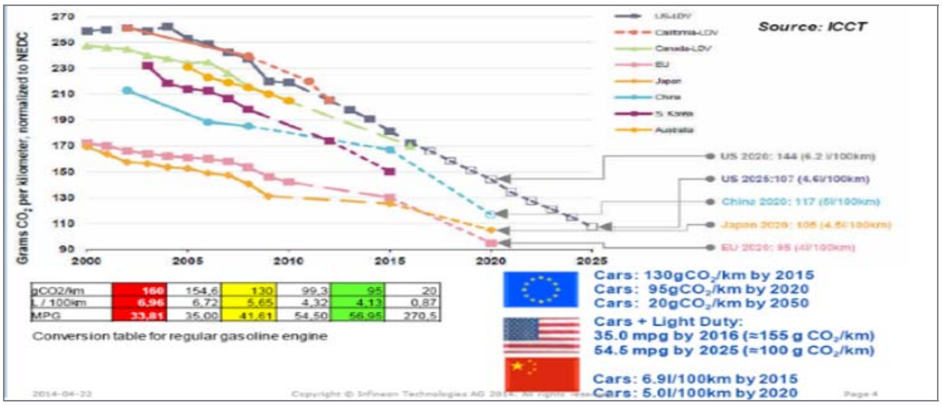
Source: Antaike, Eastspring

BATTERY DEVELOPMENT: TECHNOLY DEVELOPMENT TREND



Source: Antaike, Eastspring

GLOBAL TREND TO REDUCE CO2 POLLUTION



Source: Antaike, Eastspring

BAN ON PETROL-POWERED VEHICLES BY COUNTRY

	Year	Target
Norway	2025	Ban on petrol powered vehicles
Netherlands	2025	Ban on petrol powered vehicles
Germany	2030	Ban on petrol powered vehicles
India	2030	Ban on petrol powered vehicles
France	2040	Ban on petrol powered vehicles
England	2040	Ban on petrol powered vehicles

Source: Respective country policy guidance on EV sector

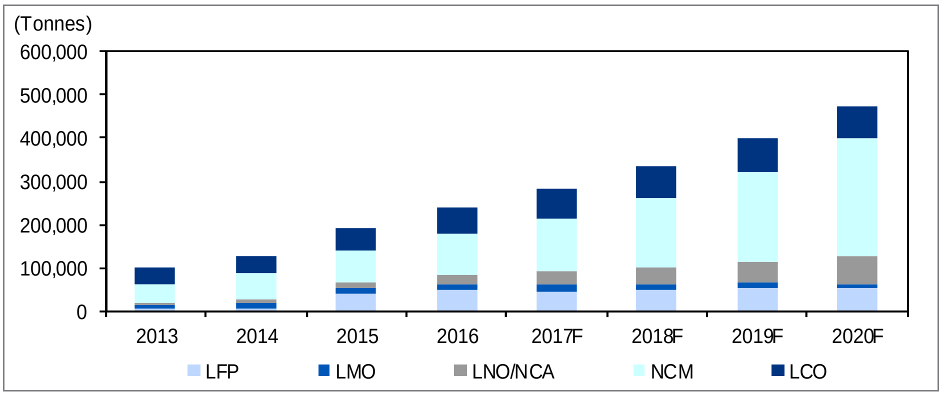
BAN ON PETROL-POWERED VEHICLES BY BRAND

	Year	Target
Volvo	2019	Stop producing petrol-powered vehicles
Ford	2020	10~25% of total
Mercedes Benz	2025	10~25% of total
BMW	2025	10~25% of total
Volkswagen	2020	10~25% of total
Toyota	2025	Stop producing petrol-powered vehicles

Source: Respective companies

For 2017, global demand for lithium battery cathode material is estimated at 284kt, including 69kt of LCO (24%), 154kt of NCM+NCA (54%), 14kt of LMO (5%) and 47kt of LFP(16%). For 2020, global demand for lithium battery cathode material is estimated at 479kt, including 76kt of LCO (16%), 340kt of NCM+NCA (71%), 11kt of LMO (2%) and 52kt of LFP (11%).

GLOBAL DEMAND FOR LITHIUM BATTERY CATHODES



Source: IEK

TERNARY BATTERIES METALS COMPOSITION BREAKDOWN

Cathode material	Nickel (%)	Cobalt (%)	Li_2CO_3 unit consumption	$LiOH.H_2O$ unit consumption
LCO (钴酸锂)	-	60.21%	0.40	-
NCM333	21.28%	20.36%	0.40	-
NCM523	30.39%	12.21%	0.40	-
NCM622	36.33%	12.16%	0.40	-
NCM811	48.27%	6.06%	-	0.46
NCA	48.87%	9.20%	-	0.46
LMO	-	-	0.21	-
LFP	-	-	0.24	-

Source: OFweek Lithium industry research

COBALT NEW SUPPLY – PROJECT LIST

Mine	Country	Owner	Product	2016	2017F	2018F	2019F	2020F
Etoile mine	DRC	Shalina Resources	Hydroxide	2.0	5.0	5.0	5.0	5.0
Kamoya	DRC	Wanbao Mining	Concentrate	1.8	4.0	4.0	4.0	4.0
Kamoto	DRC	Glencore	Hydroxide	-	-	5.0	14.0	20.0
PE527	DRC	Huayou	Concentrate	-	-	1.5	3.5	3.5
Kambove tailing	DRC	Huayou	Concentrate	-	-	0.5	1.0	1.0
Idaho project	US	eCobalt	Sulphate	-	-	-	0.4	1.5
Metalkol RTR	DRC	Eurasian Resources	Hydroxide	-	-	-	-	5.6
Syerston project	Australia	Clean TeQ	Sulphate	-	-	-	-	1.9
Total				3.8	9.0	16.0	27.9	42.5

Source: Respective companies, Antaike, UOB Kay Hian

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