Metals: The zinc story is not over yet

- In our 2018 zinc outlook published last December, we expected zinc prices to remain high and reach $3300/3500/t on a 3/6-month horizon, respectively. Zinc reached $3500/t in February, sooner than we initially anticipated. Most recently, however, a host of macro headwinds - including trade tensions, a stronger dollar, and EM growth concerns - sent zinc prices c.20% lower in a month.
- With zinc mine supply set to rise on new projects (e.g., Gamsberg and Dugald River) and restarts (e.g., Mt Isa and Century), is the zinc story over? We think not. In our view, zinc market fundamentals are still solid and we expect prices to rise in 2018H2. On demand, Chinese galvanized production is likely to pick up given the multi-year low levels of inventory. Ex-China demand should also stay robust given the still healthy pace of global growth.
- On supply, even though zinc mine supply is poised to grow, increases in refined zinc production are likely to come more slowly than the market expects. During the decade from 2005 to 2015, all of the global smelting capacity came from China. With ongoing environmental checks and supply discipline, we do not expect China smelting capacity to increase much in the near term. For ex-China, the smelting capacity utilization rate is already above 90%, leaving little room to absorb the upcoming wave of concentrates.
- As a result, we expect treatment charges (TCs) to inflect to incentivize new smelting capacity. Barring further escalations in trade tensions and/or a significant slowdown in global growth, we see zinc prices rising in the second half of this year as demand strengthens and investors come to the realization of smelter capacity bottlenecks. Currently, the market appears to be overly focusing on the pipeline of mine supply increases without realizing the looming smelting constraints.
- Our new 3/6/9-month forecasts are $2800/3000/3300/t, notably above the forward curve. Over a longer time horizon, we continue to expect the market to move into surplus. In our base case, global zinc mine supply increases 2.5mt from 2017 to 2022. The concentrate market moves into surplus in 2019 and the refined market follows suit in 2020. As such, we still expect zinc prices to decline to $2500/t by 2022.

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The zinc story is not over yet

After outperforming other industrial metals during 2016-2017 and peaking in February 2018, zinc prices have lost momentum. While concerns over China credit tightening and trade tensions escalating have been strong headwinds to the base metals complex more broadly, sentiment in the zinc market appears to be particularly weak on supply increases. Given the ongoing ramping up of new projects such as Gamsberg and Dugald River as well as announced restarts such as Mt Isa and Century, many investors think the zinc story is over: rising mine supply will move the market into surplus and prices will decline going forward.

We disagree with this narrative. Our equity colleagues have taken a close look at Zinc Top Projects and we incorporate their detailed work on ex-China zinc mine supply into our model. Our revised supply and demand balance shows that the refined zinc market is still in deficit in 2018 and 2019. Therefore, we see zinc prices remaining high for longer than we previously thought based on our views related to demand outlook, global mine supply, and constraints on smelting capacities.

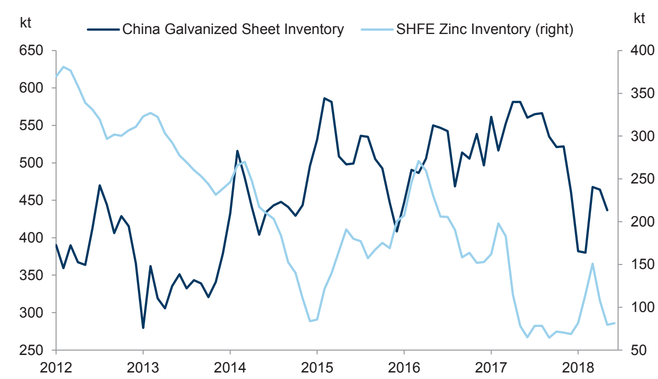
Solid demand in 2018H2

Given that galvanizing accounts for 55% of Chinese zinc consumption, the reduction in Chinese galvanized sheet production over the past few months has massively reduced Chinese zinc demand and led to domestic stocks build of refined zinc (Exhibits 1, 2). Production cuts of galvanized sheets in China were largely the result of environmental restrictions in North China. While we expect the supply impact from environmental checks to be sustained for longer, Chinese galvanized production needs to pick up to replenish the supply chain as the current level of galvanized sheet inventory is at a multi-year low. As such, restocking from downstream is likely to create strong demand for refined zinc over the next few months.

Exhibit 1: Chinese galvanized sheet production declined on environmental restrictions

Source: Wind, Goldman Sachs Global Investment Research

Exhibit 2: Decline in galvanized sheet production led to falling galvanized sheet inventory and rising zinc inventory



Source: SHFE, Wind, Goldman Sachs Global Investment Research

Outside of China, despite the recent pullback, global growth remains at high levels, pointing to solid ex-China demand. If we use ex-China crude steel production as a proxy for ex-China zinc demand, it shows the strong recovery since early 2016 and continued strength this year (Exhibit 3). Given our view that the soft patch in global growth in 2018Q1 is likely temporary and as our constructive view on global growth remains intact, we expect ex-China zinc demand to stay healthy for the rest of 2018. At the same time, zinc inventories remain at historically low levels (Exhibit 4), putting pressure on production increases to meet the rising demand.

Exhibit 3: Strong ex-China recovery in steel production since early 2016

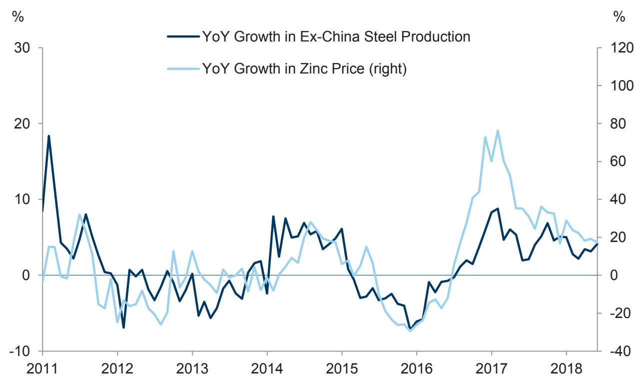
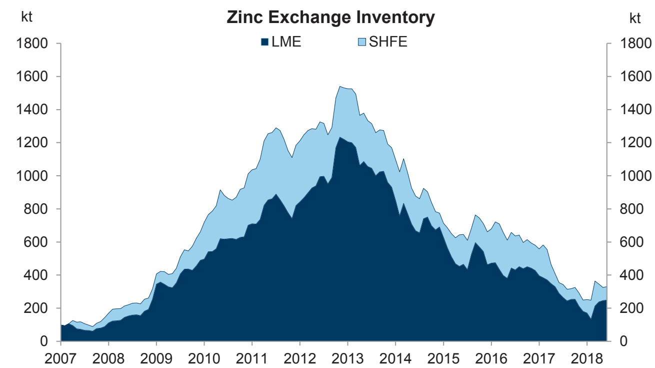


Exhibit 4: Zinc market remains tight with inventories around historical lows



Source: WSA, Goldman Sachs Global Investment Research

China mine supply constrained by environmental restrictions

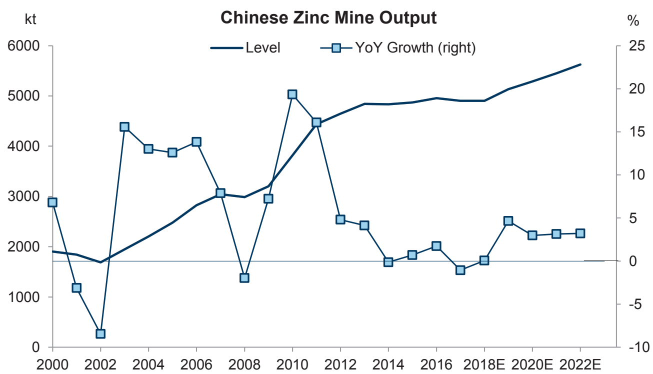
Historically, Chinese mine supply responds quickly and strongly to zinc prices. Over the past two years, however, Chinese zinc mine production did not increase much, even when domestic concentrate prices hit record highs. This suggests that the supply risk remains on the policy side as environmental restrictions prevent mine production from responding to economic incentives. Incorporating recent announcements from the Inner Mongolia government on the restricting of a list of industries, including zinc mining, we have reduced our zinc mine supply forecast for Inner Mongolia in 2018 and expect no growth from this province going forward. For total Chinese zinc mine production, we have flat growth (allowing for 3% disruption) in 2018.

Environmental considerations aside, we see a few new projects in the pipeline over the next couple of year in China. Some of them are not producing yet as they are either experiencing technical difficulties or facing issues with permits. For example, the HuoShaoYun mine - located in Xinjiang - is a world-class asset and the biggest zinc mine discovered so far in China. Its annual production is expected to reach at least 200kt (potential production could be as much as c.400kt). However, mining activity has been on hold due to legal issues. There is another large, new mine in China - Guojiagou. It failed to be commissioned last year due to environmental issues. We expect it to start contributing 50-80kt per year starting from 2018. These big projects are likely to offset losses from some smaller mines closed during the environmental crackdown.

Overall, we maintain the view that environmental restrictions in China will continue over the next couple of years. While a few old mine deposits are facing grade depletion, new projects and expansions of existing mines can fill the gap. On net, we expect Chinese zinc mine supply to grow at single low digits during 2019-2022 (Exhibit 5). In addition, supply growth is mainly coming from Xinjiang, Hunan, and Gansu (Exhibit 6). While

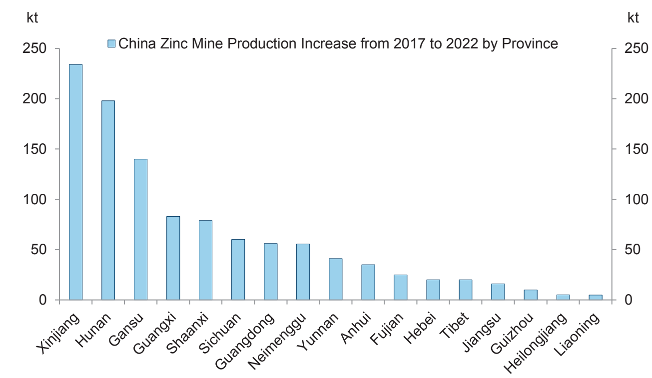
Hunan and Gansu provinces are traditionally rich in zinc reserves and having undergone years of consolidation and restructuring, Xinjiang is a new zinc producing region with the discovery of HuoShaoYun deposits more recently.

Exhibit 5: Chinese zinc mine supply will grow at a slow pace in 2018-2022



Source: Wood Mackenzie, Company data, Goldman Sachs Global Investment Research

Exhibit 6: We expect Xinjiang to contribute the most to China zinc mine supply growth over the next few years

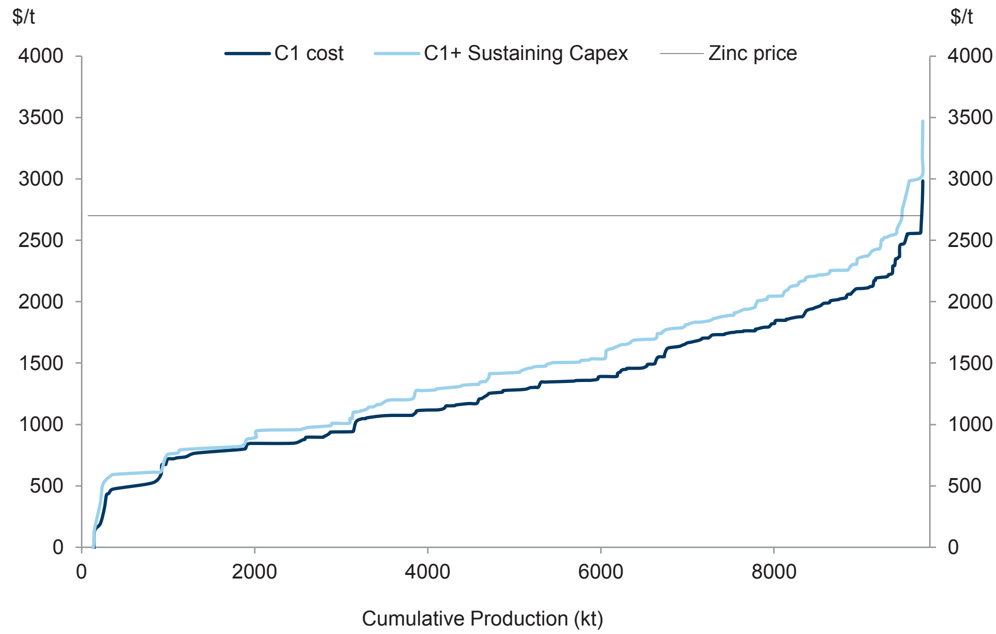


Source: Wood Mackenzie, Company data, Goldman Sachs Global Investment Research

Ex-China mine supply to accelerate, but with a caveat

While Chinese mine supply growth is likely muted, we expect ex-China supply to rise strongly on economic incentives and to drive global zinc supply growth in the coming years. Given that zinc prices remain significantly higher than cash costs (Exhibit 7), and that we expect prices to stay above the upper end of the range reached over the past decade, we see few reasons why "probable" ex-China zinc mines should not be commissioned. For 2018 alone, we estimate ex-China incremental supply is 740kt (before disruption). Over the 2018-2022 forecast period, we expect ex-China mine production to growth at an average annual rate of c.4%. Exhibit 8 lists the ex-China mines with the most increases in zinc production over the next few years in our model.

Exhibit 7: Zinc price remains notably above cash costs of zinc producers



Source: Wood Mackenzie, Goldman Sachs Global Investment Research

Exhibit 8: Major ex-China new projects and expansions

Major New Projects and Expansions			Annual Production / Forecast ('000t)						Cum Chg
	Mine	Country	2017	2018	2019	2020	2021	2022	2017-2022
1	Mt Isa	Australia	226	320	430	470	470	470	244
2	Century	Australia	0	30	151	238	238	238	238
3	Gamsberg	South Africa	0	116	178	178	178	178	178
4	Dugald River	Australia	11	81	153	153	153	153	141
5	Zhairem	Kazakhstan	0	0	0	43	86	138	138
6	Citronen	Greenland	0	0	0	0	2	130	130
7	Kipushi	DRC	0	0	0	12	82	112	112
8	Mehdiabad	Iran	0	0	0	0	0	107	107
9	Asmara	Eritrea	0	0	0	51	18	97	97
10	Khnaiguiyah	Saudi Arabia	0	0	0	0	50	93	93
11	Shalkiya	Kazakhstan	0	0	23	58	92	92	92
12	Antamina	Peru	372	390	300	460	460	460	88
13	Neves Corvo	Portugal	71	70	90	157	186	153	82
14	Zawar Mines	India	15	55	65	85	95	95	80
15	Tala Hamza	Algeria	0	0	0	41	91	67	67

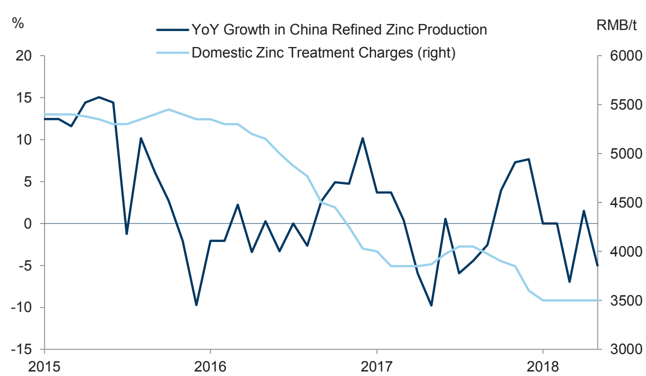
Source: Wood Mackenzie, Company data, Goldman Sachs Global Investment Research

While the market has priced in the upcoming mine supply increases, it may not have priced in the fact that a significant share of the added supply will have high levels of impurities - silica in the case of Century and manganese in the case of Gamsberg and Dugald River - as our equity colleagues highlight. Because concentrates with high impurities need to be blended with other concentrates first before feeding into smelting facilities, this essentially implies that the lag between mine supply increases and refined production increases will be longer than usual, prolonging the deficit in the refined market and imposing near-term upside to zinc prices.

Smelter capacity likely the new bottleneck

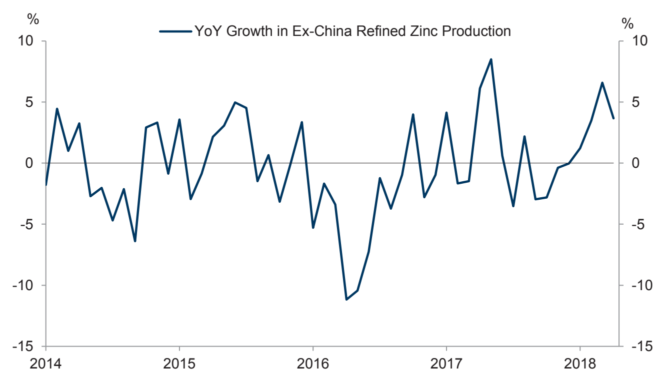
So far this year, Chinese refined zinc production has been weak due to smelter maintenance and low levels of concentrate feed stock (Exhibit 9). As a result, Chinese domestic treatment charges have stayed within a historically low range of RMB 3400-3500/t. Imported treatment charges have edged up in recent months, but remain round record-low levels. Low smelter profitability has led to stagnating smelter capacity growth over the past year and talks about cutting refined production (see Reuters). Meanwhile, ex-China refined production picked up in 2018Q1, consistent with rising ex-China mine supply (Exhibit 10). However, capacity utilization rate has already increased to above 90%, leaving limited room for ex-China smelters to absorb the mine supply increases over the next few years.

Exhibit 9: Chinese zinc output remains soft due to maintenance schedule and feeds shortages



Source: SMM, NBS, Goldman Sachs Global Investment Research

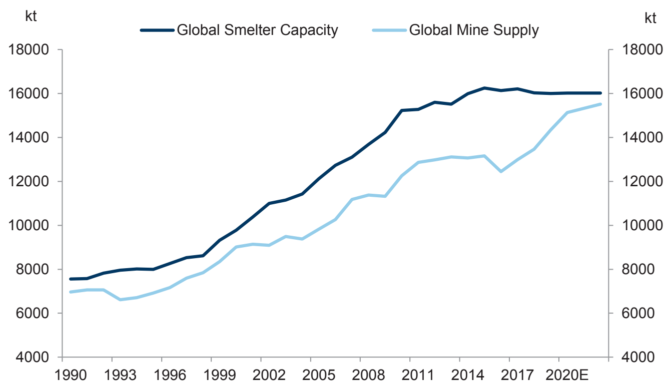
Exhibit 10: Ex-China zinc production rises on higher mine supply



Source: Bloomberg, Goldman Sachs Global Investment Research

Therefore, while higher concentrate supply would eventually lead to an inflection in metal inventories, we think that smelting capacity is likely to become the next bottleneck slowing down the rebalancing of the refined market (Exhibit 11). For example, mine supply is expected to increase 2.5mt over the next five years but existing smelter capacity can only take in half of it. One way or another, we need new smelters built to absorb the additional concentrates. Given today's low TCs and limited price participation, smelters both inside and outside of China have no incentives to expand. This is the key reason why we think TCs and zinc prices will need to go higher to incentivize new smelter capacities.

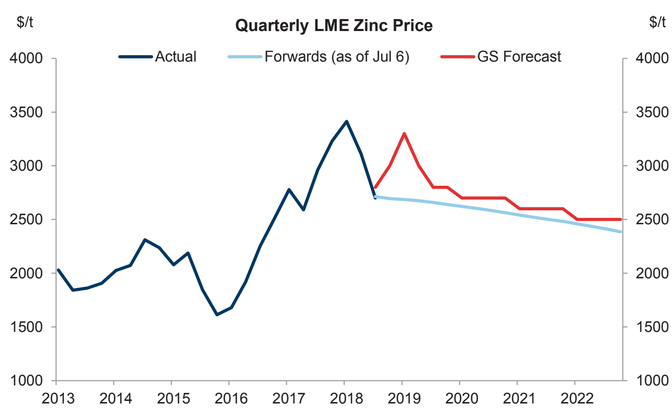
Exhibit 11: Zinc mine supply growth outpacing smelter capacity growth



Source: Wood Mackenzie, Goldman Sachs Global Investment Research

Overall, the market has been over-emphasizing the upcoming zinc mine supply increases without paying sufficient attention to the potential smelter capacity constraints. In addition, solid demand growth in 2018H2 combined with delays in converting high-impurity zinc ore into refined metal implies persisting market deficits over the next 12 months. Given these considerations, we revise our zinc price forecast and our new 3/6/9-month targets are $2800/3000/3300/t (Exhibit 12). Over the longer horizon, we continue to expect the market to return to surplus after smelter capacity bottleneck problems are resolved, driving zinc prices down to $2500/t by 2022 (Exhibit 13).

Exhibit 12: We expect higher zinc prices in 2018H2



Source: Bloomberg, Goldman Sachs Global Investment Research

Exhibit 13: Global zinc supply and demand balance

000' tonnes	2013	2014	2015	2016	2017	2018E	2019E	2020E	2021E	2022E
Global mine supply	**13114**	**13068**	**13159**	**12445**	**12991**	**13467**	**14341**	**15131**	**15323**	**15514**
% change y/y	*1.1*	*-0.4*	*0.7*	*-5.4*	*4.4*	*3.7*	*6.5*	*5.5*	*1.3*	*1.2*
Global refined supply	**13250**	**13700**	**13820**	**13900**	**13700**	**14100**	**14750**	**15300**	**15700**	**15900**
% change y/y	*1.8*	*3.4*	*0.9*	*0.6*	*-1.4*	*2.9*	*4.6*	*3.7*	*2.6*	*1.3*
Global refined consumption	**13248**	**13751**	**13780**	**14038**	**14344**	**14622**	**14870**	**15114**	**15370**	**15636**
% change y/y	*4.5*	*3.8*	*0.2*	*1.9*	*2.2*	*1.9*	*1.7*	*1.6*	*1.7*	*1.7*
Of which China	5948	6305	6431	6624	6823	6959	7064	7170	7277	7386
% change y/y	*9.0*	*6.0*	*2.0*	*3.0*	*3.0*	*2.0*	*1.5*	*1.5*	*1.5*	*1.5*
Of which World ex-China	7300	7446	7349	7414	7521	7662	7807	7944	8093	8250
% change y/y	*1.1*	*2.0*	*-1.3*	*0.9*	*1.4*	*1.9*	*1.9*	*1.8*	*1.9*	*1.9*
Balance	**2**	**-51**	**40**	**-138**	**-644**	**-522**	**-120**	**186**	**330**	**264**
LME Price ($/t)	**1909**	**2163**	**1928**	**2094**	**2893**	**3081**	**2975**	**2700**	**2600**	**2500**

Source: Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

We, Yubin Fu, Mikhail Sprogis, Hui Shan, Anna Zandi and Jeffrey Currie, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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