

THIS COMMENTARY IS PUBLISHED BY FITCH SOLUTIONS MACRO RESEARCH and is NOT a comment on Fitch Ratings' Credit Rating. Any comments or data included in the report are solely derived from Fitch Solutions Macro Research and independent sources. Fitch Ratings' analysts do not share data or information with Fitch Solutions Macro Research.

Industry Trend Analysis - Global Zinc Mining Outlook

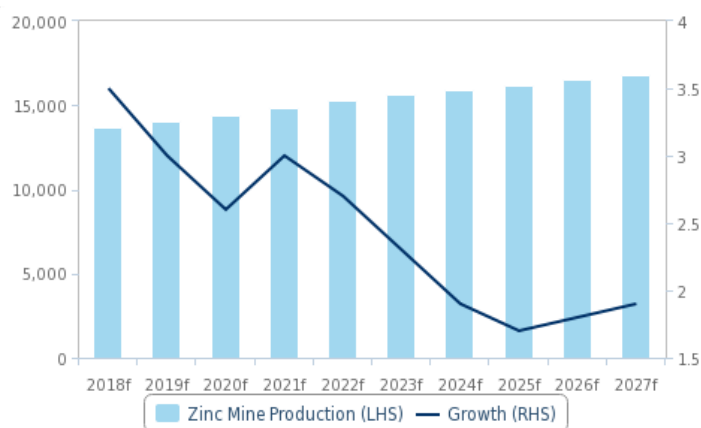
04 Oct 2018 | Global | Zinc - Mining | Zijin Mining Group Co

Key View: Globally, mined zinc production continues to ramp up over the coming years as elevated prices encourage miners to restart idled capacity and key new mines come online.

Global mined zinc production will continue to ramp up in 2018, as strong zinc prices prompt miners to bring idled capacity back online. While some capacity taken offline over 2015-2016 was due to permanent mine closures, the return of some stalled capacity and new projects in key countries will drive growth over the coming quarters. We forecast global mined zinc production to increase by 3.5% y-o-y in 2018, to 13.7mnt, and rise to 16.8mnt by 2027.

Modest Rebound Ahead

Global Zinc Mine Production ('000 tonnes) & Growth (% y-o-y)



f = Fitch Solutions forecast. Source: USGS, Fitch Solutions

[Click here to explore data](#)

China

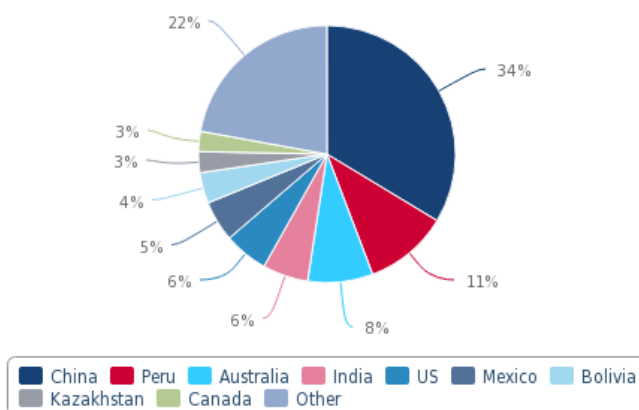
China's zinc production will stagnate due to declining ore grades and increasingly stringent environmental regulations. The conservation of minerals and increasing consolidation of mining industries outlined in China's 13th Five-Year Plan will weigh on zinc output in China. Additionally, the strong support for state-owned enterprises (SOEs) in the plan will ensure that China's zinc industry remains dominated by SOEs, with increasing consolidation of smaller miners. Since August 2017, operations at about 60% of zinc and lead mines in Sichuan province have been suspended due to ongoing environmental inspections. In H117, **China Polymetallic Mining** recorded a slight decline in zinc feed grades to 3.1%, and subsequently saw zinc output contract by 10.6% y-o-y at the Dakuangshan mine.

We forecast the country's zinc production to edge higher, from 4.6mnt in 2018 to 4.7mnt by 2027, averaging 0.3% annual growth. Despite this muted growth rate, China will remain the largest global producer of zinc by a wide margin, accounting for approximately 34% of total output in 2018. Dominant producers will include domestic miners such as **Zijin Mining**, which plans to produce 270kt of mined zinc.

THIS COMMENTARY IS PUBLISHED BY FITCH SOLUTIONS MACRO RESEARCH and is NOT a comment on Fitch Ratings' Credit Rating. Any comments or data included in the report are solely derived from Fitch Solutions Macro Research and independent sources. Fitch Ratings' analysts do not share data or information with Fitch Solutions Macro Research.

China To Remain Key Player

Global Zinc Mine Production By Country (%), 2018f



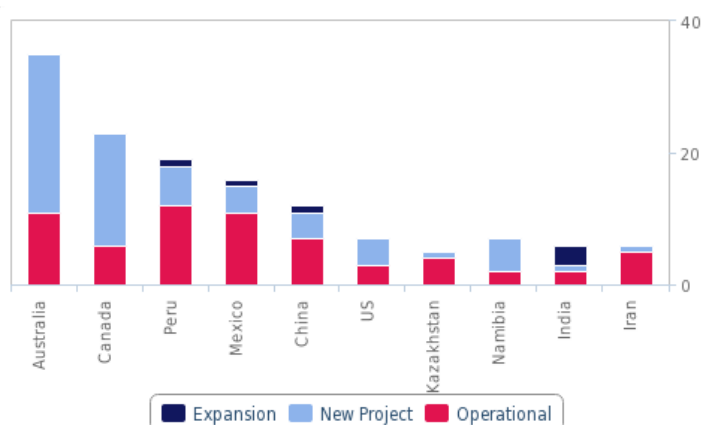
f = Fitch Solutions forecast. Source: USGS, Fitch Solutions

Australia

Australia's zinc sector will gradually recover from the H215 closure of **Minerals and Metals Group's** (MMG) Century zinc mine over the coming decade, as rising prices prompt miners to restart major operations. We have revised up our zinc production growth forecast for 2018 and 2019, to 12% and 8% respectively, based on plans for **New Century Resources** to restart production at the Century mine in Q318. Additionally, **Glencore** announced plans to restart the idled Lady Loretta zinc mine in H118, with 2018 output expected to total 100kt and MMG's USD1.bn Dugald River, began production in November 2017 and will add an estimated 170kt of zinc annually at full capacity. Junior miners will continue to advance zinc projects in Australia, given the positive outlook for zinc prices over the coming years. For instance, in February, **Heron Resources** awarded the contract for underground mining at the Woodlawn copper-zinc project to **Pybar Mining Services** and expects annual production of 40kt zinc between late-2018 to early-2019.

Project Pipeline To Support Long-Term Growth

Select Countries - Zinc Mines By Phase



Source: Fitch Solutions Mines Database

India

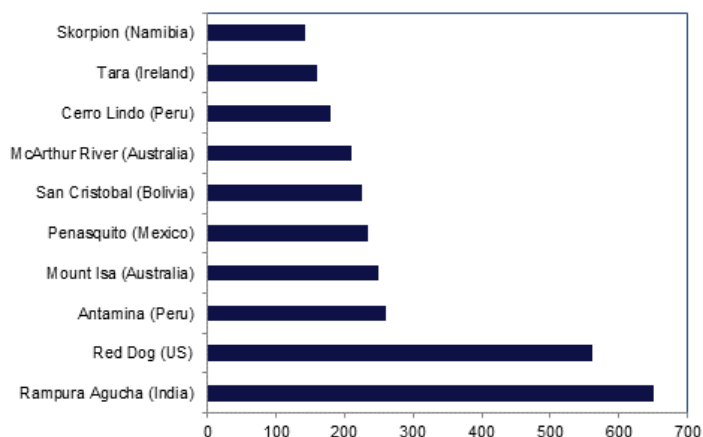
India will increasingly drive global zinc production growth, as the country's key miner **Hindustan Zinc Limited** (HZL) implements a large-scale expansion plan. In the fiscal year ended March 2018, HZL recorded an 18% y-o-y increase in refined zinc production to 791kt as the Rampura Agucha mine transitions

THIS COMMENTARY IS PUBLISHED BY FITCH SOLUTIONS MACRO RESEARCH and is NOT a comment on Fitch Ratings' Credit Rating. Any comments or data included in the report are solely derived from Fitch Solutions Macro Research and independent sources. Fitch Ratings' analysts do not share data or information with Fitch Solutions Macro Research.

from an open-cast mine to underground operations. We maintain a solid production growth outlook for the country, forecasting zinc output to increase from 783kt in 2018 to 1.7mnt by 2027. The company's Rampura-Agucha zinc-lead mine in Rajasthan is the world's largest zinc mine, with reserves of more than 110mnt and a mine life of more than 25 years. HZL, 64.9% owned by **Vedanta Resources**, accounts for approximately 90% of India's zinc output.

India To Clinch Title For Largest Zinc Mine

Global - 10 Largest Zinc Mines By Volume ('000 tonnes)



Source: Hindustan Zinc Company Report

Peru

We forecast Peru's zinc output to total 1.4mnt in 2018 and increase to 1.9mnt by 2027, averaging 2.9% annual growth. In Q118, Glencore reported a significant increase in zinc production at the Antamina mine, totaling 30.3kt compared to 24.5kt in Q117 (reflecting Glencore's stake), citing a higher proportion of copper/zinc ores being mined. Glencore holds a 33.8% stake in Antamina along with **BHP Billiton**, **Teck Resources** and **Mitsubishi Corp.** In Q118, domestic miner **Compania de Minas Buenaventura** reported a 15% y-o-y increase in zinc production, to 16.6kt, due to increased production at Uchucchacua and new production from Tambomayo. In Q118, Canada-based **Trevali Mining** reported a slight y-o-y decline in payable zinc production at the Santander mine, to 5.0kt, however continues to advance the Magistral North ramp development to access higher-grade zinc-lead mineralization. The firm expects 2018 payable zinc production at the Santander mine to be slightly higher, between 24.5-25.9kt.

GLOBAL ZINC MINE PRODUCTION FORECASTS (2018-2027)

Geography	Indicator	2018f	2019f	2020f	2021f	2022f	2023f	2024f	2025f	2026f	2027f
Global	Global Zinc Mine Production, '000 tonnes	13,663.0	14,077.6	14,443.0	14,871.5	15,280.1	15,634.9	15,927.6	16,198.0	16,493.6	16,813.5
Global	Global Zinc Mine Production Volumes, % y-o-y	3.5	3.0	2.6	3.0	2.7	2.3	1.9	1.7	1.8	1.9
Australia	Zinc Mine Production, '000 tonnes	1,120.00	1,209.60	1,282.18	1,333.46	1,373.47	1,414.67	1,442.96	1,471.82	1,501.26	1,531.29
Australia	Zinc Mine Production Volumes, % y-o-y	12.00	8.00	6.00	4.00	3.00	3.00	2.00	2.00	2.00	2.00
China	Zinc Mine Production, '000 tonnes	4,599.54	4,636.34	4,659.52	4,668.84	4,678.17	4,682.85	4,687.54	4,687.54	4,687.54	4,687.54
China	Zinc Mine Production Volumes, % y-o-y	1.20	0.80	0.50	0.20	0.20	0.10	0.10	0.00	0.00	0.00
India	Zinc Mine Production, '000 tonnes	782.93	857.30	938.75	1,027.93	1,120.44	1,221.28	1,318.98	1,424.50	1,538.46	1,661.54
India	Zinc Mine Production Volumes, % y-o-y	9.50	9.50	9.50	9.50	9.00	9.00	8.00	8.00	8.00	8.00
Mexico	Zinc Mine Production, '000 tonnes	698.36	717.91	738.73	760.90	787.53	803.28	815.33	823.48	827.60	827.60
Mexico	Zinc Mine Production Volumes, % y-o-y	2.70	2.80	2.90	3.00	3.50	2.00	1.50	1.00	0.50	0.00
Peru	Zinc Mine Production, '000 tonnes	1,442.00	1,485.26	1,514.97	1,560.41	1,622.83	1,679.63	1,730.02	1,764.62	1,808.73	1,863.00
Peru	Zinc Mine Production Volumes, % y-o-y	3.00	3.00	2.00	3.00	4.00	3.50	3.00	2.00	2.50	3.00
United States	Zinc Mine Production, '000 tonnes	759.20	781.98	797.62	877.38	921.25	935.06	944.42	953.86	972.94	997.26
United States	Zinc Mine Production Volumes, % y-o-y	4.00	3.00	2.00	10.00	5.00	1.50	1.00	1.00	2.00	2.50

f = Fitch Solutions forecast. Source: USGS, national sources, Fitch Solutions

THIS COMMENTARY IS PUBLISHED BY FITCH SOLUTIONS MACRO RESEARCH and is NOT a comment on Fitch Ratings' Credit Rating. Any comments or data included in the report are solely derived from Fitch Solutions Macro Research and independent sources. Fitch Ratings' analysts do not share data or information with Fitch Solutions Macro Research.

LARGEST ZINC PROJECTS BY CAPEX

Country	Mine	Company	Capex (USDmn)	Notes
Greenland	Kvanefjeld	Greenland Minerals & Energy Ltd	1,316	Measured Resources: 143mnt; Mine Life: 37 years
United States	Hermosa	Arizona Mining	1,244	January 2018 - Arizona Mining has announced the results for four drill holes from a drilling programme at the project; Mine Life: 29years; Estimated Production: 95.7kt/yr; Estimated start year: 2020
Mexico	Pitarrilla	SSR Mining	1,145	Mine Life: 32 years; Estimated Production: 46kt/yr; Measured Resources: 10.1mnt
Australia	Dugald River	Minerals and Metals Group	1,031	November 2017 - Minerals and Metals Group has produced first concentrate at the mine, with commercial production achieved late 2017; Estimated Production: 170kt/yr; Reserves: 22.5mnt; Mine Life: 28years
Saudi Arabia	Khnaiguiyah	United Arabian Mining Company (50%)	890	Proved Reserves: 17.7mnt; Expected Production: 80kt/yr
Canada	Macmillan Pass	Fireweed Zinc	824	May 2018 - A preliminary economic assessment has reported that the mine will produce 85kt/yr of zinc over the mine life of 18years; Indicated Resources: 11.2mnt
United States	Arctic	Trilogy Metals	718	Estimated Production: 68.9kt/yr; Indicated Resources: 1.1mnt
Eritrea	Asmara	Sichuan Road & Bridge Mining Investment Development Corp (60%) Eritrean National Mining Corporation (ENAMCO) (40%)	666	Reserves: 56.6mnt; SRBM is a subsidiary of Sichuan Road & Bridge Corporation and one of the core subsidiary companies of Sichuan Railway Investment Group
Algeria	Oued Amizour	Western Mediterranean Zinc Spa - WMZ	579	The project includes the Tala Hamza zinc deposit; Terramin has a 65% shareholding in WMZ, the remaining 35% is held by two Algerian government-owned companies, Entreprise Nationale des Produits Miniers Non-Ferreux et des Substances Utiles Spa (ENOF) (32.5%) and Office National de Recherche Geologique et Miniere (ORGM) (2.5%); Measured Resources: 30.6mnt
Greenland	Citronen	Ironbark Zinc	514	September 2017 - An updated feasibility study into the project has estimated a production rate of up to 200kt/yr of zinc and a mine life of 14 years; Measured Resources: 25mnt
Brazil	Aripuana	Nexa Resources (70%) Karmin Exploration (30%)	354	April 2018 - Karmin Exploration has received the preliminary licence to develop the project; Measured Resources: 10.9mnt; Estimated Production: 51kt/yr; Mine Life: 24years; Expected start year: 2020
Peru	Accha	Zincore Metals	346	The complex comprises Accha and Yanque deposits; Production start year: 2017; Estimated Production: 60kt/yr; Reserves: 10.6mnt; Mine Life: 11 years
Canada	Halfmile-Stratmat	Trevali Mining	327	Mine Life: 13years; Estimated Production: 53.1kt/yr; The complex includes Halfmile and Stratmat deposits; Indicated Resources: Halfmile (5.6mnt) and Stratmat (3mnt)
Canada	Prairie Creek	Canadian Zinc Resources	319	Reserves: 8.1mnt; Mine Life: 15years
Peru	Florida Canyon (formerly Bongara)	Nexa Resources (61%) Solitario (39%)	297	February 2018 - The planned 2018 work programme on the project includes completion of the access road into the mineralised portion of the project area and permitting that will allow new underground tunnelling, surface drilling and other activities associated with the future development of the project; Measured Resources: 1.3mnt; Mine Life: 12.5years; Expected Production: 50.7kt/yr
Mexico	Rey de Plata (Guerrero)	Industrias Penoles	296	Expected start year: 2018; Expected Production: 40kt/yr; Reserves: 22.8mnt
Cuba	Castellanos	Geominera (51%) Trafigura Group (49%)	278	2017 - Trafigura Group has completed construction at the project; Mine Life: 22years; Estimated Production: 100kt/yr; Estimated start year: 2017
Turkey	Gediktepe	Alacer Gold (50%) Lidya Madencilik (50%)	267	2017 - DFS study has been commenced on the project; Proved Reserves: 11.9mnt; Mine Life: 12years
United States	Back Forty	Aquila Resources	261	February 2018 - Aquila Resources has announced an updated mineral resource estimate of 16.6mnt in the measured and indicated category for the project; Mine Life: 16years
Australia	Sulphur Springs	Venturex Resources	221	December 2017 - Venturex Resources has reported that the three latest diamond holes have all returned strong zinc and copper

THIS COMMENTARY IS PUBLISHED BY FITCH SOLUTIONS MACRO RESEARCH and is NOT a comment on Fitch Ratings' Credit Rating. Any comments or data included in the report are solely derived from Fitch Solutions Macro Research and independent sources. Fitch Ratings' analysts do not share data or information with Fitch Solutions Macro Research.

intercepts at the project; Reserves: 7.3mnt; The project consists of Sulphur Springs and Kangaroo Caves deposits; Estimated Production: 32kt/yr; Mine Life: 12years

Source: Fitch Solutions Mines Database