



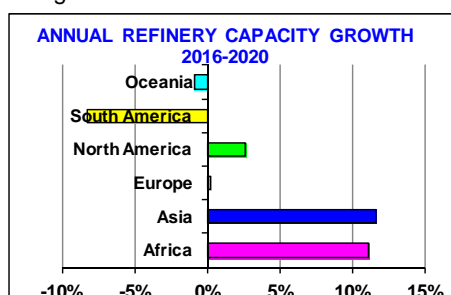
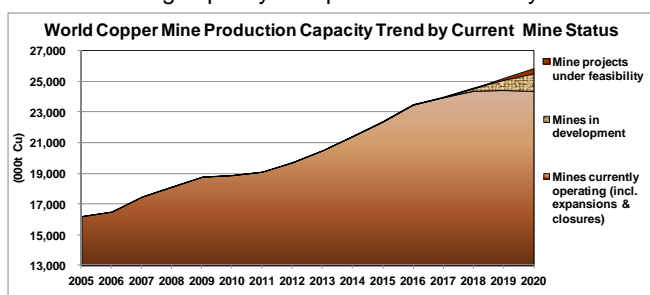
New Edition of 'Directory of Copper Mines and Plants'

The International Copper Study Group (ICSG) released a new Edition of its biannual Directory of Copper Mines and Plants that **provides global facility-by-facility production capacity and summary country capacity through 2020, and also presents the main projects expected to be developed in the next decade.** The Directory, which incorporates the latest updates to capacity and ownership for about 1,200 individual facilities, also includes charts/tables on the current and long-term global distribution of capacity by country, size, operational/development status and process type.

The biannual Directory is available for sale to ICSG member country/non-member country clients at the single issue rate of €400/€600 and annual subscription rate of €500/€750. At an additional cost of €200/€250 capacity data for copper mines, smelters and refineries may be accessed through the ICSG interactive online statistical database allowing users to easily extract data suited to their analysis requirements. Please see the attached Directory table of contents or contact ICSG for additional information or purchasing details (mail@icsg.org).

Trends in copper mine, smelter and refinery development can be found in ICSG Directory of Copper Mines and Plants. Based on existing facilities and announced project developments, and including revisions to data presented in the previous edition, this Directory highlights:

- **Production capacity data reflects production capability and not necessarily production forecasts.** In the last 5 years, global mines and refineries have operated at an average of 85% of the capacity reported in ICSG Directory.
- **Through 2020 annual copper mine production capacity might grow at an average rate of around 2.5% per year (%/yr) compared to an average capacity growth rate of almost 4%/yr in the last 5 years**
 - Concentrates will represent around 90% of the total growth in world mine production capacity until 2020.
 - Global capacity from current operating mines is expected to remain essentially unchanged in the period 2018-2020 as growth originating through expansions will be offset by planned closures and lower ore grades.
 - Continued delays in project development are shifting new capacity forward owing mainly to length of project permitting, opposition from local communities and budget/finance constraints.
 - China, the Democratic Republic of the Congo (DRC), Panama, Peru and Zambia are expected to be the biggest contributors to the growth in world mine capacity.
 - Production capacity from countries that started mining copper in the last decade increased from zero in 2000 to around 400,000 t/yr this year.
 - Projects are also being planned in countries that currently do not mine copper, including Afghanistan, Ecuador, Ethiopia, Fiji, Greece, Israel, Panama, Sudan and Thailand. By 2020, total expected copper production capacity from projects starting in these countries could reach 400,000 t/yr, and capacity could continue to increase well above 1 Mt/yr if projects under evaluation in these countries are developed.
 - There is increased interest in seabed copper exploration with several projects being evaluated, the first of which is expected to start in 2019 in the Bismarck Sea, off Papua New Guinea.
- **Through 2020 annual copper smelter production capacity might grow at an average rate of around 1.8% per year (%/yr) compared to an average capacity growth rate of 3%/yr in the last 5 years**
 - China is continuing to expand its smelting capacity but at a slower pace than before. China's copper smelting capacity more than quintupled in the period 2000-2016 and is expected to increase by a further 20% until 2020, accounting for 80% of the expected world growth in smelting capacity by then.
 - Outside of China, new copper smelters are planned to be built in the DRC, India, Indonesia, Kazakhstan, Mexico and Mongolia but, if approved, are only expected to start beyond 2020.
 - In Chile, it is expected that some smelters will undergo modernisation processes to comply with the new emissions standards that becomes effective by end 2018.
- **Through 2020 annual copper refinery production capacity might grow at an average rate of around 1.4% per year (%/yr) compared to an average capacity growth rate of 3%/yr in the last 5 years**
 - About 85% of the growth in global refined capacity through 2020 is expected to come from electrolytic refineries.
 - Electrolytic refinery capacity growth is projected to average 1.5%/yr and is generally tied to the growth of smelter capacity.
 - China (in the form of electrolytic capacity) will be by far the biggest contributor to world growth in refined capacity followed by the DRC (in the form of electrowinning capacity).
 - Electrowinning capacity is expected to decline by 18% in Chile through 2020.



Background notes:

The biannual ICSG Directory of Mines and Plants provides basic data for all copper mining, smelting and refining operations on a world-wide basis and projects the development of future capacities for these operations. These projections can serve as a basis for forecasts of the supply side development for copper. Each edition is complemented by a list of web addresses of companies, enabling quick and easy access to more company details. The ICSG database is continually updated to reflect recent announcements and operational changes. Salient details for each operation are included and the Directory separates operations between 'Operating', 'Developing' and 'Planned (Exploration and Feasibility)' stages.

CONTENTS

	PAGE
Notes and Definitions	4
Company Homepages links on Internet	6
Summary tables:	
Figure 1, Trends in Mine Capacities 2002 to 2020	15
Figure 2, Trends in Smelter Capacities 2002 to 2020	16
Figure 3, Trends in Refinery Capacities 2002 to 2020	17
Figure 4, Trends in Mine and Refinery Capacities by Product 2002 to 2020	18
Figure 5, Trends in Mine, Smelter and Refinery Capacities by Mine/Plant Status 2002 to 2020	19
Table A, Mine Capacities: Country Totals 2006 to 2020	20
Table B, Smelter Capacities: Country Totals 2006 to 2020	21
Table C, Refinery Capacities: Country Totals 2006 to 2020	22
Table D, Electrowinning Capacities: Country Totals 2006 to 2020	23
Figure 6, Projected Cu Mine Production Capacity in New Producing Countries (countries currently not yet producing copper)	24
Figure 7, Projected Cu Mine Production Capacity at Countries that Started Copper Mining in the Last Decade	24
Figure 8, Projected Cu Mine Production Capacity at Countries that were Producing at Low/medium Levels in the Las Decade	24
Figure 9, Projected Copper Smelter Production Capacity Increase by Country – until 2020	25
Figure 10, Projected World Copper Refined Capacity Increase by Country – until 2020	25
Figure 11, Country Concentrate Balance by 2020 (Concentrate vs Electrolytic Refinery Capacity)	25
Table E, Mine Closures 2006-2016	26
Table F, Mines Currently in Development 2017-2020	27
Table G, Planned Mines (currently under feasibility or exploration status)	29
Figure 12, Major Copper Mines Projects (cap \geq 110ktpy Cu)	33
Table H, Ranking of the 20 Biggest World Copper Mines Currently in Operation	34
Table I, World Copper Production Capacity Currently Available by Mine Size/Type	35
Table J, Refinery Closures 2006-2016	36
Table K, Developing and Planned Refinery Projects 2017-2020	37
Table L, Ranking of the 20 Biggest World Copper Refineries Currently in Operation	38
Table M, World Copper Production Capacity Currently Available by Refinery Size	39
Table N, World Copper Mine, Smelter and Refinery Production Capacity Summary and Growth	40
Table O, Comparison between current and previous Directory data (tons change)	40
Mines and Plants Data Tables: (detailed information/capacity data by mines and plants)	
Table 1, World Copper Mines Capacities 2015 to 2020 (by country/by mine)	41
Table 2, World Copper Smelters Capacities 2015 to 2020 (by country/by smelter)	133
Table 3, World Copper Refineries Capacities 2015 to 2020 (by country/by refinery)	152
Table 4, World Copper Electrowinning Capacities 2015 to 2020 (by country/by SX-EW plant)	189
Table 5, Seafloor Exploration - Update on off-shore copper exploration projects	214
ICSG Publications List and Order Form	215