



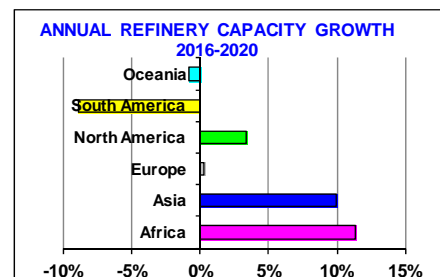
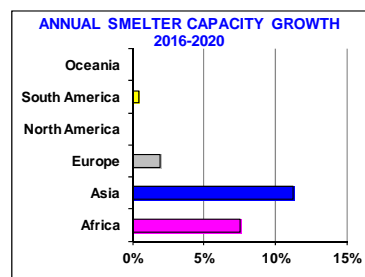
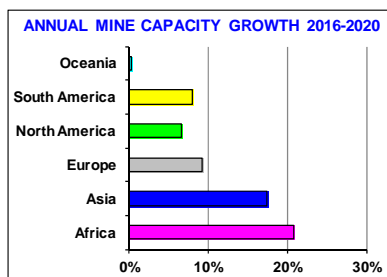
New Edition of 'Directory of Copper Mines and Plants'

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**
 - 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.
 - Concentrates will represent around 90% of the total growth in world mine production capacity until 2020.
 - Chile, China, the Democratic Republic of the Congo (DRC), Peru and Zambia together are expected to represent 55% of the additional copper mine capacity brought on stream.
 - Production capacity from countries that started mining copper in the last decade is seen as increasing from zero in 2000 to around 420,000 t/yr by 2020.
 - 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 330,000 t/yr, and capacity could continue to increase well above 1 Mt/yr if projects under evaluation in these countries are developed.
 - 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 1.7% per year (%/yr) compared to an average capacity growth rate of almost 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 beyond 2020.
 - Annual copper smelter capacity growth is projected to lag behind the growth in concentrate capacity. The balance between concentrate production and available smelting capacity will depend on capacity utilization rates.
- **Through 2020 annual copper refinery production capacity might grow at an average rate of around 1.2% per year (%/yr) compared to an average capacity growth rate of 3%/yr in the last 5 years**
 - About 80% of the growth 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.
 - About 65% of the world refinery capacity increase during this period is expected to come from electrolytic refineries in China and about 18% from electrowinning capacity increases in the DRC.
 - Electrowinning capacity is expected to decline by 15% 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.

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