



Copper Mining and Processing Sector Chile

July 2015

Produced by:



Table of Contents

I. Copper Mining and Processing Sector Overview

1. [Copper Mining and Processing Sector Highlights](#)
2. [Economic Importance](#)
3. [Economic Importance \(cont'd\)](#)
4. [Sector Forecast](#)
5. [Sector Competitiveness](#)
6. [Drivers of Sector Growth](#)
7. [Production](#)
8. [External Trade](#)
9. [Main Trading Partners](#)
10. [Foreign Direct Investment](#)
11. [Employment and Wages](#)
12. [Number of Enterprises](#)
13. [Taxes and Contributions](#)
14. [Government Policy](#)

II. Copper Mining Sector Overview

1. [Copper Mining Sector Highlights](#)
2. [Chile in Global Copper Mining Market](#)
3. [Copper Mine Production](#)
4. [Copper Mine External Trade](#)

5. [Copper Mine Resources](#)

6. [Copper Mine Reserves](#)

7. [Copper Mine Fuel and Electricity Consumption](#)

III. Copper Smelting Sector Overview

1. [Copper Smelting Sector Highlights](#)
2. [Chile in Global Copper Smelting Market](#)
3. [Smelted Copper Production](#)
4. [Smelted Copper External Trade](#)
5. [Smelted Copper Emissions](#)
6. [Smelted Copper Fuel and Electricity Consumption](#)

IV. Copper Refining Sector Overview

1. [Copper Refining Sector Highlights](#)
2. [Chile in Global Copper Refining Market](#)
3. [Refined Copper Production](#)
4. [Refined Copper External Trade](#)
5. [Refined Copper Sales](#)
6. [Refined Copper Fuel and Electricity Consumption](#)

Table of Contents

V. Main Players

1. Top M&A Deals
2. M&A Activity, 2013-2014
3. Corporación Nacional del Cobre de Chile (Codelco)
4. Corporación Nacional del Cobre de Chile (Codelco) (cont'd)
5. Minera Escondida Ltda.
6. Minera Escondida Ltda. (cont'd)
7. Compañía Minera Doña Inés de Collahuasi SCM
8. Compañía Minera Doña Inés de Collahuasi SCM (cont'd)
9. Anglo American Sur S.A.
10. Anglo American Sur S.A. (cont'd)
11. Minera Los Pelambres S.A.
12. Minera Los Pelambres S.A. (cont'd)

I. Copper Mining and Processing Sector Overview

Copper Mining and Processing Sector Highlights

Sector Overview

Copper mining and processing is one of the traditional economic sectors of the Chilean economy. Despite the favourable international copper prices and the increase in domestic production over 2009-2014, negative factors such as high costs and reduced productivity limited the real CAGR of the sector to only 0.94%, well below the real CAGR of 4.6% for the overall economy. Nonetheless, as of 2014, the sector still accounts for 10% of the country's GDP and for over 50% of total export, and its output is expected to continue growing in the near term. Moreover, its huge weight on Chile's trade balance allows a partial reduction of international price shocks, as the exchange rate of the country is directly tied to news in the copper industry. Similarly, as the country is the largest copper producer in the world, potential reductions in output will be partially offset by increases in global prices.

Recent Developments

The decline in the international copper prices since 2014 has further impaired the growth of the domestic sector. This phenomenon is associated with the slowdown of the Chinese economy, the recent reforms in the financial sector of the Asian country and the appreciation of the U.S. dollar. In recent past, the direct costs of domestic producers have risen rapidly, but this was offset by the high-copper-price environment over 2010-2013. Under current conditions, the profitability of the sector has dwindled and Chilean copper mining companies are thereby preparing contingency measures. These include rationalisation of investment plans, reduction of consultancy and workers' transportation expenses, contract renegotiation with service providers and optimisation of equipment utilisation.

Forecast

According to the most recent estimates by the Chilean Copper Commission (COCHILCO) from July 2015, despite the recent fall in copper prices, copper mine production is expected to reach 5.9mn tonnes in 2015, 2.3 up y/y. Moreover, the new mines entering into operation (i.e. the Ministro Hales field operated by Chilean miner Codelco) are more than compensating the lower production from older deposits deriving from decrease of ore grades. Although current prices are low, they do not threaten the closure of active or about-to-open operations, which translates into expected increase in copper mine production in the forthcoming years. However, long-term projections are more uncertain. In order to increase or even sustain the current levels of production, large investments are needed, which will only materialise in the appropriate scale if copper prices rebound.

Challenges

Chilean copper industry faces many structural challenges. The main handicap for the sector are the high energy costs, with electricity and diesel accounting for about 14% and 6% of total operating costs of the industry in 2013, according to COCHILCO. Chile currently relies on expensive oil import to cover its energy deficit, while the development of additional electricity generation capacity, even for high development potential sources like hydropower, faces some difficulties as a result of growing opposition by environmentalists. In addition, water supply is expensive and chronically insufficient, as most of the water is brought from the sea and has to be desalinated. Finally, due to some deficiencies in the Chilean educational system, there is a shortage of skilled labour, mostly engineers, but also IT professionals and mobile equipment operators.

Economic Importance

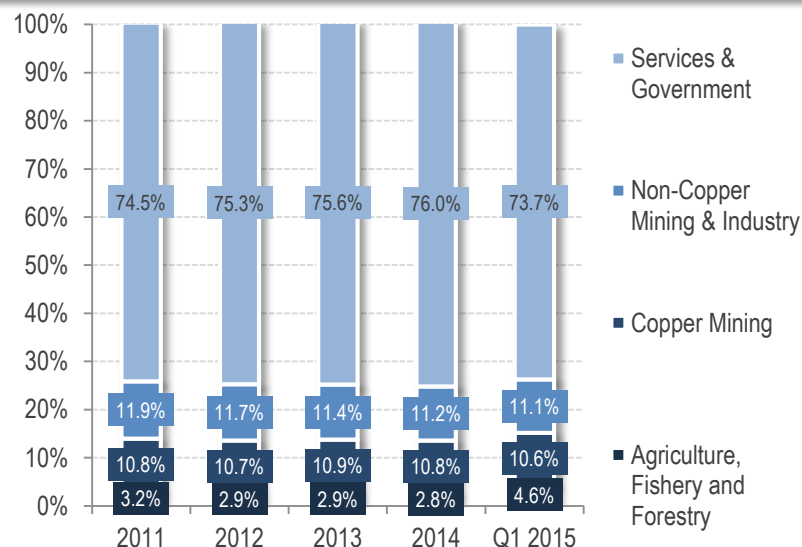
Main Economic Indicators						
	2009	2010	2011	2012	2013	2014
Total Population (mn)	16.8	17.1	17.3	17.4	17.6	17.8
GDP, current prices (CLP trn)	96.4	111.0	121.3	129.0	137.0	147.2
GDP, constant prices (yoy change, %)	-1.0	5.8	5.8	5.4	4.2	1.9
GDP per capita, current prices (USD)	10,142	12,682	14,511	15,245	15,732	13,649
Consumer Price Index (yoy change, %)	-1.4	3.0	4.4	1.5	3.0	4.6
Copper Mining Gross Value Added, current prices (CLP trn)	11.6	16.4	16.1	14.6	13.6	14.7
Copper Mining Gross Value Added, constant prices (% change)	-0.4	0.4	-6.2	3.9	6.5	0.6
Copper Mining Gross Value Added, current prices (% of total)	12.1	14.7	13.3	11.3	9.9	10.0
Total Actual FDI Inflow Under Decree Law 600 (USD mn)	5,363.3	2,988.9	4,278.9	9,897.3	7,406.0	11,910.3
Actual FDI Inflow in Mining Sector Under Decree Law 600 (USD mn)	1,014.5	1,190.8	2,616.3	3,083.2	3,936.5	1,823.0
Actual FDI Inflow in Mining Sector Under Decree Law 600 (% of total)	18.9	39.8	61.1	31.2	53.2	15.3
Monetary policy rate (year-end, %)	0.50	3.25	5.25	5.00	4.50	3.00
Exchange rate USD/CLP (year-end)	499.8	462.0	519.2	478.3	525.1	605.8

Source: National Statistics Institute (INE), Central Bank of Chile, World Bank, OANDA, CEIC

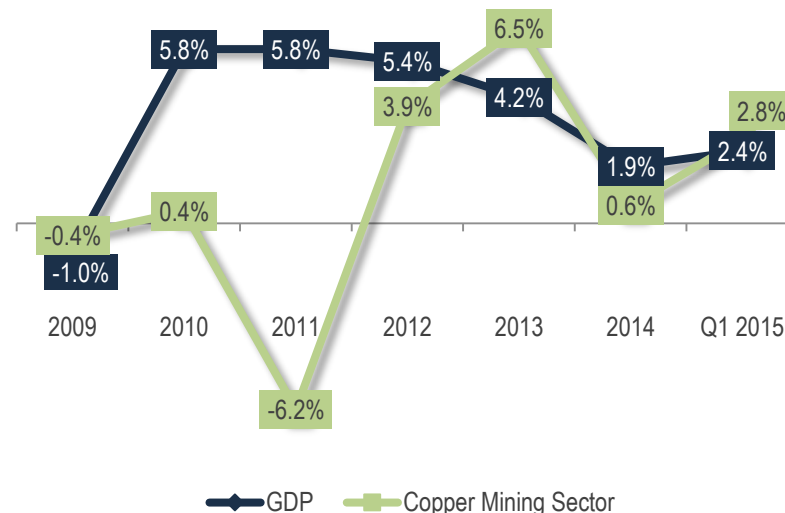
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

Economic Importance (cont'd)

GDP Composition by Industry (%)



GDP and Copper Mining Value Added Real Growth Rate (%)

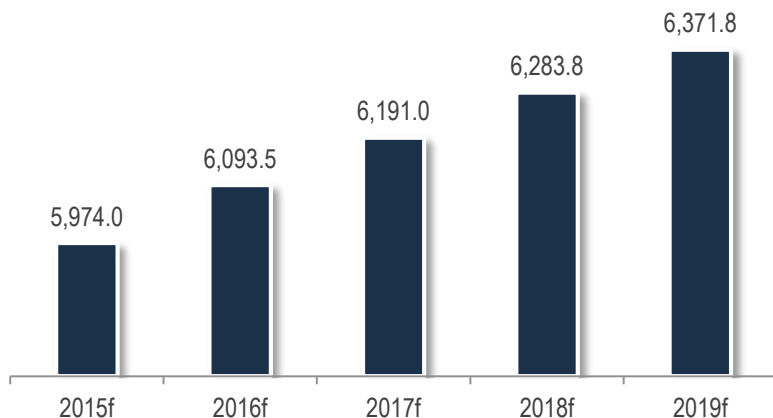


Comments

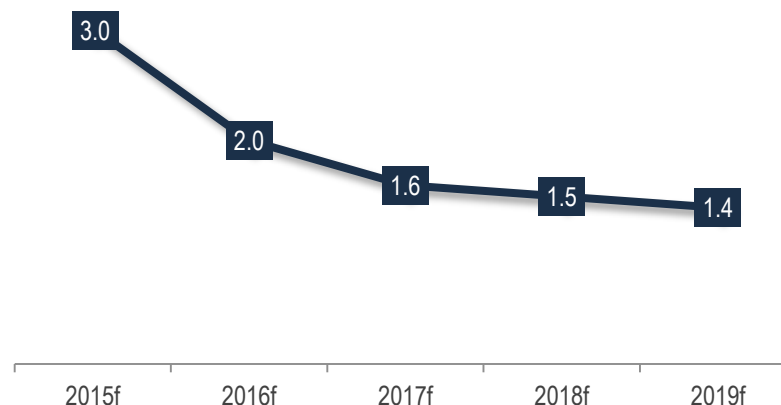
Despite being one of the most relevant sectors in Chile, copper mining has been steadily losing pace in the past few years when compared to the rest of the economy. The gross value added of the sector expanded at a real CAGR of only 0.94% between 2009 and 2014, compared with a much stronger figure of 4.6% for the overall economy. There are many reasons that explain this sub-par performance. Besides 2011, which was a particularly bad year due to unusually poor weather and a high number of labour strikes, medium and long-term factors like the gradual fall in copper grades and rising costs of strategic supplies (i.e. energy and sulphuric acid) have been constraining the development of the sector. On the other hand, GDP growth lately was led by the robust performance of the telecommunications and financial services sector.

Sector Forecast

Copper Mine Production Evolution (thou tonnes)



Copper Mine Production Growth Rate (%)

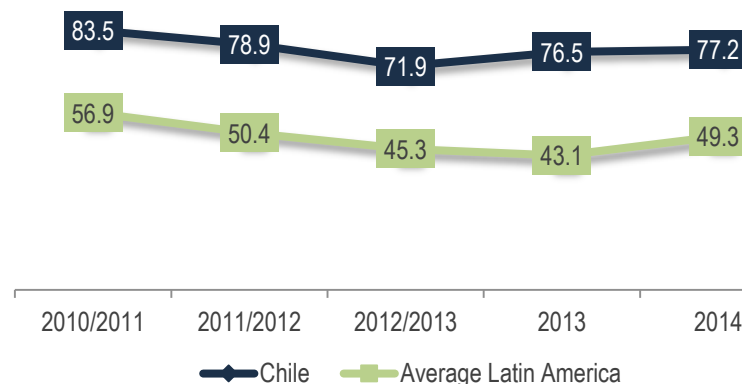


Comments

Copper mine production is forecast to continue rising, with a CAGR of 1.62% over 2015-2019, according to BMI Research. Most of this growth will be a result of past investments starting to bear fruit, i.e. projects in the Escondida Mine by Anglo-Australian miner BHP Billiton. However, there will be a gradual slowdown in output over the next five years, given the fact that the current conditions in the copper industry are detrimental to investment: copper prices are getting lower; electricity generation capacity is inadequate and is pushing up energy costs, while the use of desalinated water as water supply, which is costly and energy consuming, will continue to be the norm due to environmental reasons. Although labour costs are high compared to competing countries like Peru, the elevated unemployment rate (6.8% in Q1 2015) and the expected depreciation of the Chilean peso vis-à-vis the U.S. dollar will ensure a somewhat slower growth of real wages.

Sector Competitiveness

Investment Attractiveness Index*



Best Practices Mineral Potential Index (BPMPi)*



Policy Perception Index (PPI)*



Comments

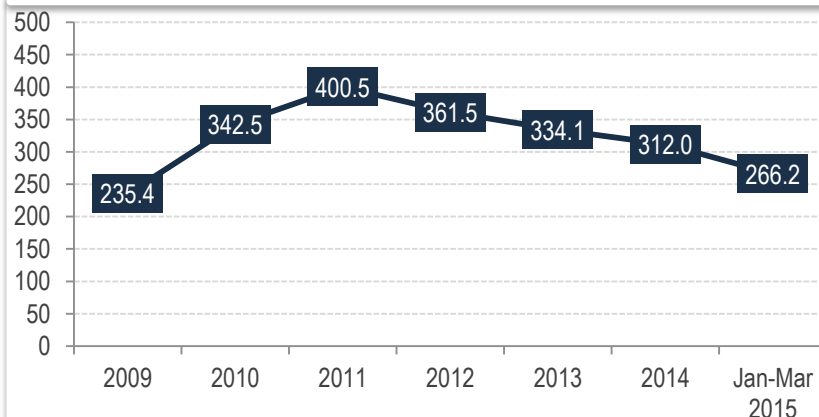
The Fraser Institute's Survey of Mining Companies is an annual publication on the investment attractiveness of the mining sector in different countries. It evaluates 122 jurisdictions. The Policy Perception Index (PPI), is a composite index that measures factors such as current regulations, legal system, taxation regime, infrastructure, community development, trade barriers, political stability, security, and labour and skills availability. It is normalized to a maximum score of 100. The Best Practices Mineral Potential Index (BPMPi) rates a region's attractiveness based on the perceptions of mining company executives of a jurisdiction's geology, independent of policy restrictions, and its maximum possible score is 1. In 2014, Chile was the most attractive country for mining investment in Latin America, ranking 22th in the PPI index and 6th in the BPMPi index.

Source: Fraser Institute, - * Higher index corresponds to improved competitiveness

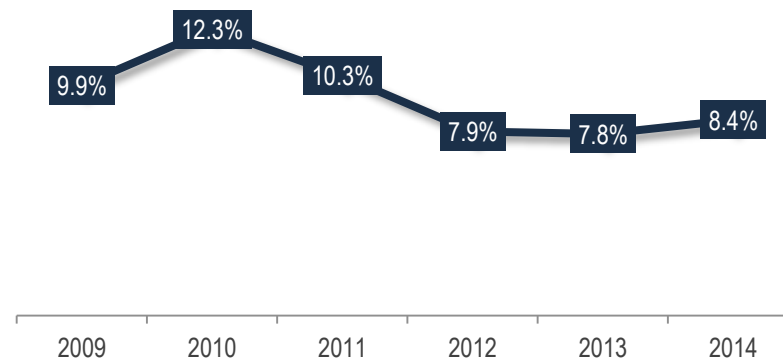
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

Drivers of Sector Growth

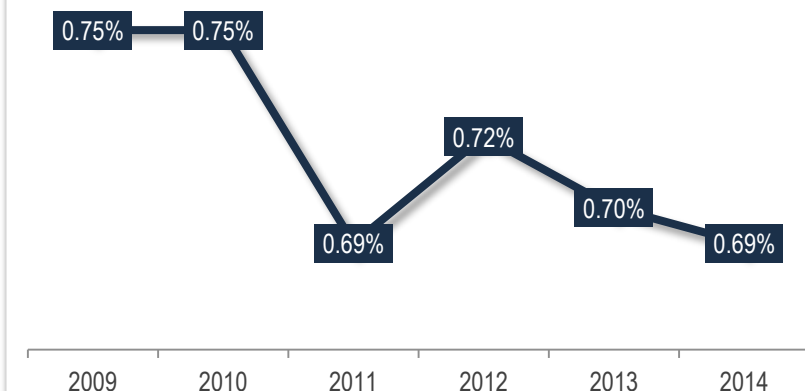
COMEX* Refined Copper Prices (USD cents/lb.)



China Industry Value Added Real Growth Rate (%)



Average Copper Mining Grades in Chile (%)



Comments

On the supply side, the copper mining sector in Chile has been gradually losing competitiveness due to declining copper grades over the last ten years. Copper grade is the percentage of actual copper metal in a regular copper ore. Although the decline is a global phenomenon, the fall has been considerable steeper in Chile compared to the world's average, according to COCHILCO. On the demand side, copper prices have been falling since 2012, as a consequence of the slowdown in the growth rate of Chinese industry, the largest consumer of copper worldwide. Moreover, after the fraud investigation in China's Qingdao port in June 2014, banks restrained from operating with commodity financial deals, a financial instrument used by metal importers to get access to cheap USD loans, which are re-lend to the Chinese real estate sector. This process was artificially inflating copper demand.

Production

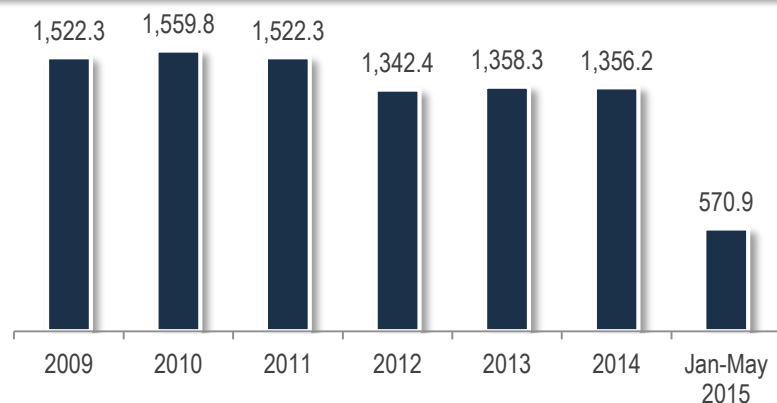
Comments

In recent years, smelted copper production has followed a downward trend due to increased competition from Chinese and Indian companies. Furthermore, costs for smelters have soared as a result of expensive investments made to appease environmentalists, who pressure the companies to curtail arsenic and sulphur dioxide emissions. Moreover, refined copper production in Chile has shrunk in the past few years in spite of strong international demand, pressured by output decline from existing projects and lack of new investment to offset it. On the other hand, copper mine production has been quite robust due to recent increments in production capacity of major fields like Escondida and Collahuasi.

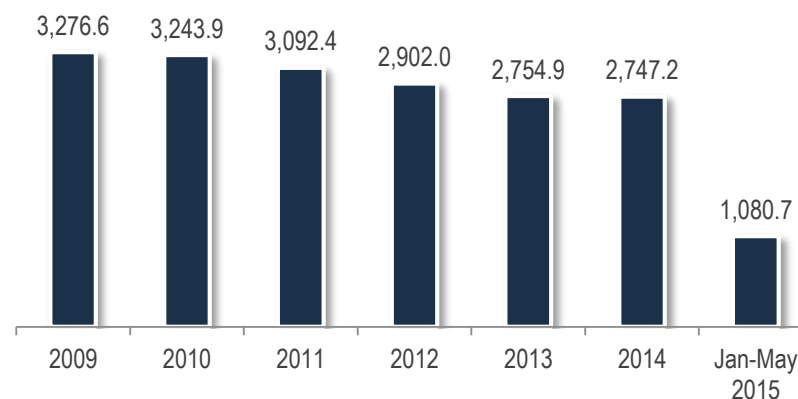
Copper Mine Production Evolution (thou tonnes)



Smelted Copper Production Evolution (thou tonnes)



Refined Copper Production Evolution (thou tonnes)

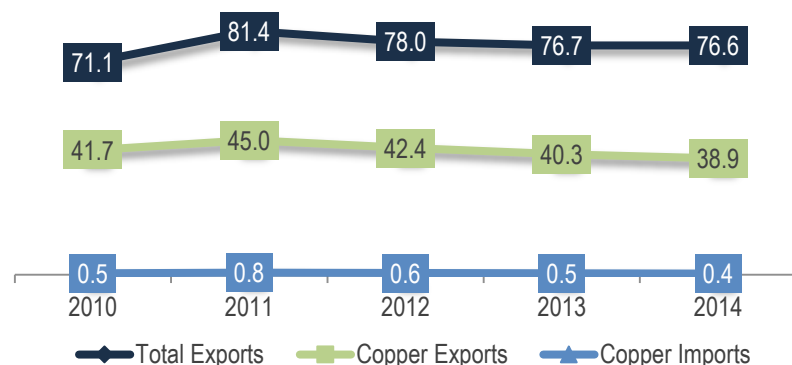


Source: COCHILCO, Que Pasa Minería, CSIRO, Market Realist, CODELCO

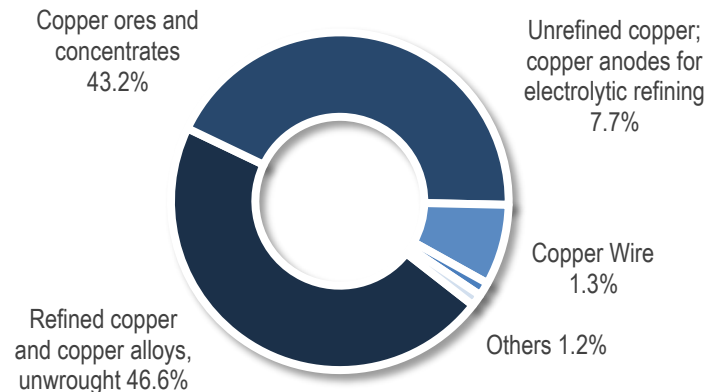
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

External Trade

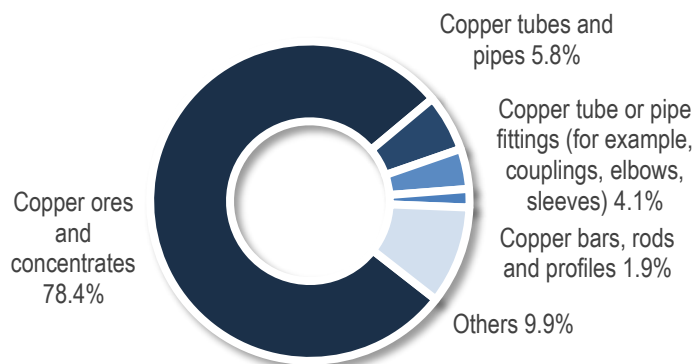
Chile External Trade in Copper Products* (USD bn)



Export Segmentation By Product, 2014 (%)



Import Segmentation By Product, 2014 (%)

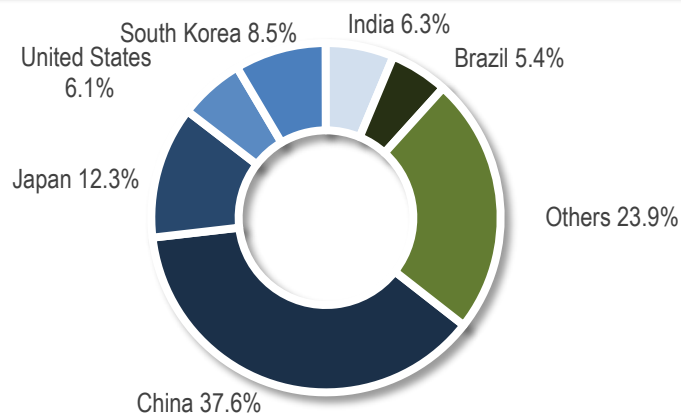


Comments

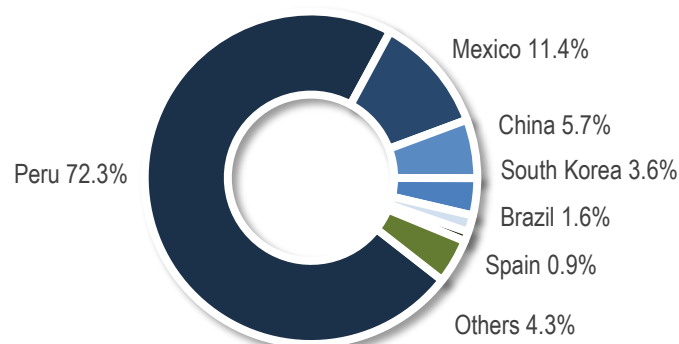
Although copper mining accounted for only 10% of the country's GDP in 2014, the sector was responsible for 50.7% of total exports in current USD terms. This implies that the trade balance of the country is highly sensitive to fluctuations in global copper price and domestic output. However, this dependence has been gradually diminishing in recent years (the share of copper in total export was 58.1% in 2010). This development is explained by faster-growing export sectors like fruit and vegetables, which experienced the highest nominal CAGR (10.3%) in export among the other economic sectors for 2010-2014.

Main Trading Partners

Copper Exports* by Destination in Value Terms, 2014 (%)



Copper Imports* by Source Country in Value Terms, 2014 (%)

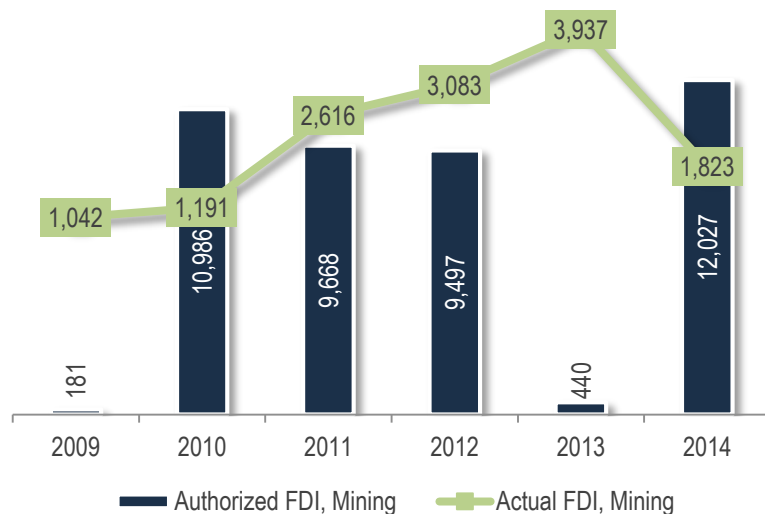


Comments

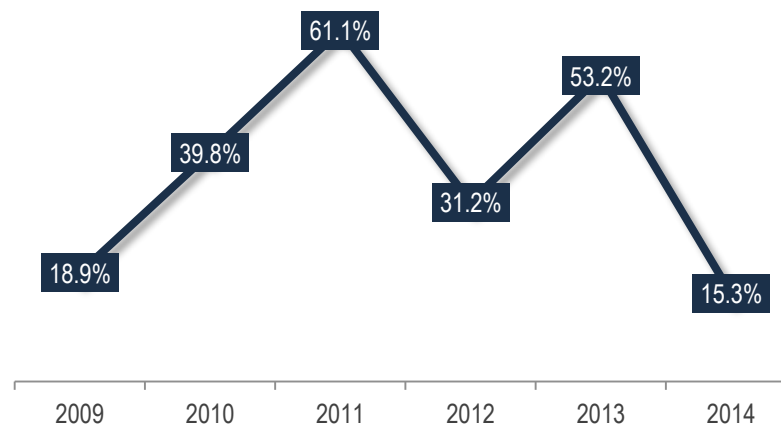
- In 2014, China was the world's largest consumer of copper and the second biggest copper producer. However, the output of the Asian country falls very short of domestic demand. Chile, being the largest mine copper supplier globally, partially fills this structural gap. According to estimates of COCHILCO, the share of China in the global copper consumption will rise above 50% by 2025, which in turn will increase the dependence of the Chilean copper export on the economic performance of the Asian country.
- The fact that Peru is the world's third largest copper producer creates opportunities for a sizable intra-sectorial trade between the two neighbouring countries, valued at USD 398.7mn in 2014. On the one hand, Chile imports from Peru mainly copper ores and concentrates and tiny amounts of copper bars, rods, profiles and wire. On the other hand, Chile exports to Peru copper ores and concentrates, copper wires and refined copper.

Foreign Direct Investment

FDI in Mining Sector Under Decree Law 600 (USD mn)



FDI in Mining Sector Under Decree Law 600 (% of total)



Comments

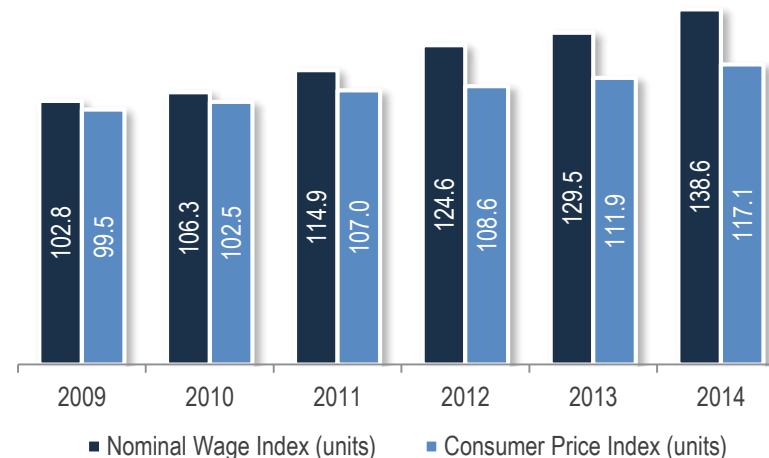
Over the period 2009-2014, the mining sector was the largest recipient of FDI in Chile, under the Decree Law 600, except for 2009, when it ranked second after trade, and 2014, when it ranked fourth, behind industry, electricity, water & gas and trade. According to COCHILCO, the copper mining sector will receive total investments of USD 80.4bn over the period 2012-2020, with 46.2% of these being of foreign origin. Marcela Blazquez, spokesman of the Corporation of Technological Development on Capital Goods (CBC), attributes the recent fall in mining investment to the paralysation and postponement of several megaprojects due to energy, environmental and legal issues, besides the drop in copper prices over the last two years. In that regard, in a special report in July 2014, CBC estimated a total mining investment (both foreign and domestic) of USD 33.5bn for the 2015-2018 period, for projects only with a defined timetable, less than Peru's investment portfolio for the same timeframe of USD 59.5bn.

Employment and Wages

Number of Employees in Copper Mining Sector



Nominal Wage Index of Mining Sector and CPI* (year-end)

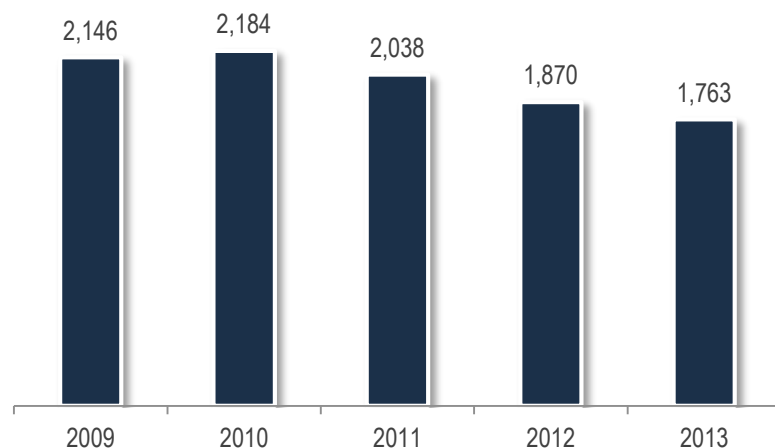


Comments

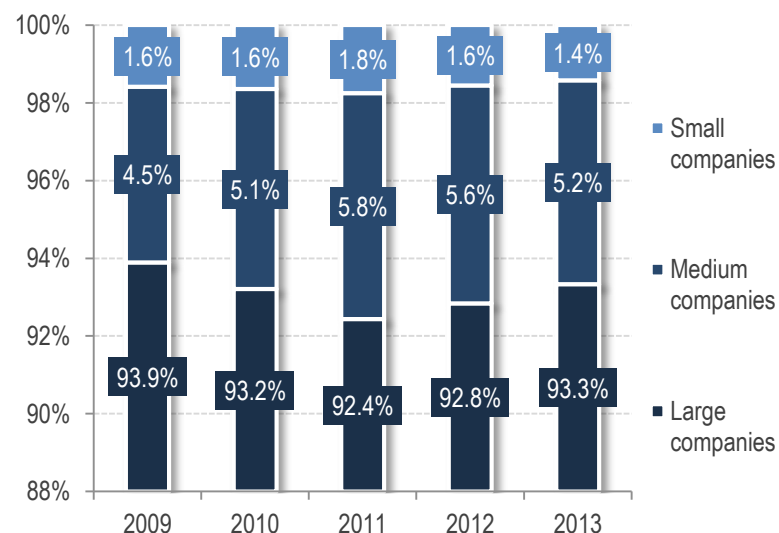
Despite its significant share in the country's GDP, copper mining, being a capital-intensive industry, employs directly just 0.7% of the total workforce in the country. Nevertheless, the number of jobs expanded at a CAGR of 3.9% between 2009 and 2013, at a similar pace to the rest of the economy, thus keeping a constant share of total workforce. In turn, nominal wages in the entire mining sector expanded at a CAGR of 6.1% over the 2009-2014 period, with an average inflation of just 3.3% in the same timeframe. As a result, in 2014, real wages were up 14.5% compared to 2009. Most of this gain was derived from a series of labour strikes in 2011 and 2012, when copper prices were relatively high. Although this increase is significant, a more appropriate measure for the mining sector, who sells export products, are the nominal wages in U.S. dollar terms. These are only 11.1% up since 2009, mainly due to the depreciation of the Chilean peso.

Number of Enterprises

Number of Enterprises in the Copper Mining Sector



Copper Mine Production Segmentation by Company Size (%)

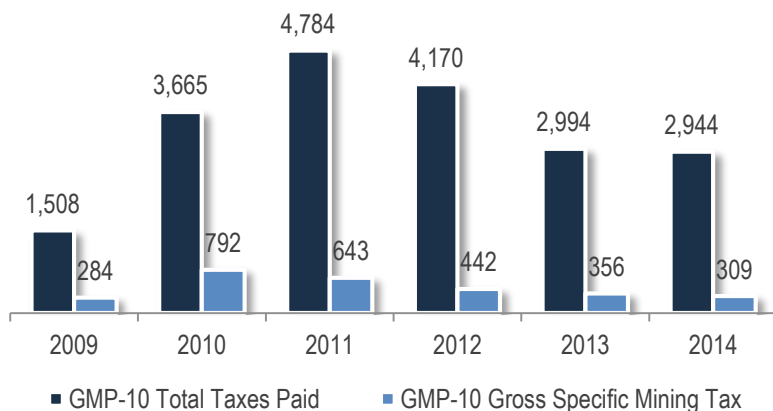


Comments

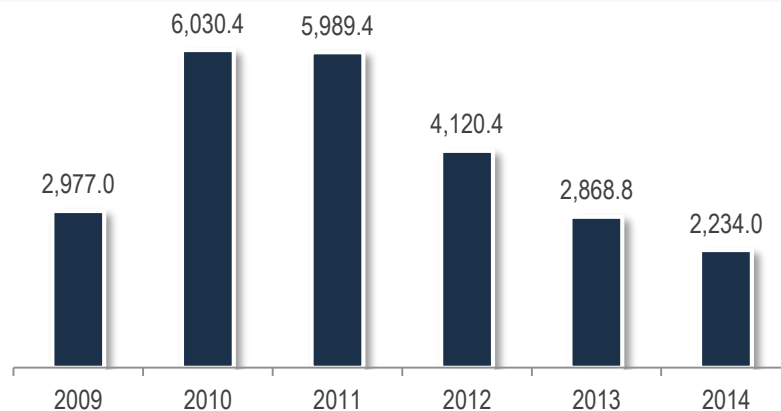
According to the classification system of the National Geology and Mining Service (SERNAGEOMIN), small mining companies are those with less than 80 employees and less than 200,000 worked hours per year, medium mining enterprises employ 80-400 people and have 200,000-1mn worked hours per year, and large mining companies employ over 400 people and have more than 1mn worked hours per year. As of 2014, the number of large and medium-sized companies is 18 and 22 respectively, invariant since 2011. In the case of large copper mining companies, two are owned by 100% Chilean capitals, ten by 100% foreign capital and six by mixed capital. Most of the medium-sized companies are 100% Chilean. Foreign capital in both cases is of Peruvian, U.S., British, Australian, Canadian, Swiss and Japanese origin. As of May 2015, Chinese investment in Latin American copper mines has been focused mainly in Peru (Las Bambas, Toromocho, El Galeno and Rio Blanco mines) and Ecuador (Mirador deposit).

Taxes and Contributions

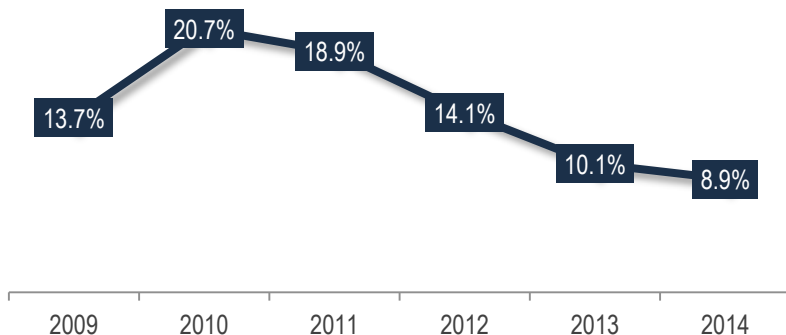
Taxes Paid by GMP-10* Private Companies (USD mn)



Contributions of State-Owned Mining Companies (USD mn)



Share of Mining Companies in Fiscal Revenues (%)



Comments

- Every company that operates in Chile is due to pay an income tax of 22.5% as of 2015. Foreign companies also have to pay an annual tax rate on profit remittance, currently at 35%, or can choose to pay a guaranteed fixed rate of 42% for a period of ten years.
- Additionally, mining companies are obliged to pay a specific mining tax (royalty), which has a progressive variable rate between 0.5% and 14%. For copper mining companies with total annual sales of less than 50,000 tonnes, the rate is calculated based on the revenues. Otherwise, it is calculated over the operating income. Companies with exclusive dedication to exploration are exempt from the royalty, and if they choose the fixed profit remittance tax, they have tax certainty over a long timespan.

Source: COCHILCO, CIECHILE, - * GMP 10: ten largest private copper mining companies operating in Chile as of 2001

Government Policy

Mining Concession Policy

According to the Chilean Copper Commission (COCHILCO), the current mining concession system guarantees strong protection of property rights, but could potentially hinder exploration activities that are key for the sustainable development of the industry. The problem arises because exploration concessions, which are of limited duration (two years), can be easily converted to production concessions, which once obtained are of indefinite time duration. The latter cannot be terminated even if the beneficiary does not invest or execute mining activities. Statistics by COCHILCO show that areas with production concessions occupy more than 40% of the territory in the Northern regions (part of it not being operated), with property increasingly being concentrated in few agents. Therefore, the share of small companies in the Chilean mining sector is relatively low, with the five largest players accounting for more than 50% of total exploration expenditure in 2013. Large miners tend to favour brownfield exploration (i.e. exploration of zones adjacent to operational mines), whereas companies focused exclusively on exploration devote more resources to grassroots exploration (i.e. exploration of completely new areas). This reflects in a gradual reduction of the share of grassroots exploration from more than 50% of total exploration expenditure in 2005 to just about 35% in 2013.

Environmental Regulation

Since 2010, the government has introduced a series of profound reforms in the environmental policy in order to comply with both domestic and international demands for reduction of the impact of mining operations on the environment and population's health. The government created a whole new ministry, the Ministry of Environment (MMA) and two associated agencies, the Environmental Evaluation Service (SEA) and the Superintendence for the Environment (SMA). The former is in charge of evaluating and approving business projects that pose environmental risks (i.e. copper mining operations), while the latter is tasked to enforce the compliance with environmental policies by public and private agents. Since 2011, SMA has raised charges against 13 mining companies, founding six of them guilty of severe environmental damage, and imposing fines for a total amount of CLP 24.5bn. In June 2015, Chilean miner Minera Esparta Limitada received by SMA the hardest possible sanction under the environmental regulation and was forced to discontinue its operations.

Energy Policy

Chile has a high dependence on imported fossil fuels for its energy generation, with around 87% of total energy consumption being supplied by foreign energy sources. Thus, the price and supply of energy are very volatile, which has a considerable impact on energy-intensive industries, including copper mining. Although the country has unexploited conventional hydroelectric potential, several obstacles remain in place, i.e. lack of dams nearby mining zones and resistance from local communities. Instead, the government has developed an ambitious plan to promote the development of the non-conventional renewable energy sources (NCRE). The main objective of the plan, approved by the Parliament in 2010, is to reach a 20% share of total energy production from NCRE sources by 2025. The government also introduced a series of measures, including tax exemptions for the transport of energy from NCRE origin and a quota system that obliges electricity companies with more than 200MW of installed capacity to sell a minimum amount of energy originated from such sources. Moreover, the state-owned company Production Promotion Corporation (CORFO) created a special credit facility, CORFO NCRE Credit, to promote access to long-term financing for companies that generate or distribute this type of energy. So far, the development of NCRE seems on track with the plan, as the share of those energy sources in total energy production reached 10.9% in 2014, up from 7.3% in 2013.

II. Copper Mining Sector Overview

Copper Mining Sector Highlights

Sector Development

Over the period 2009-2014, the combined production of copper concentrates and SX-EW cathodes expanded by a modest real CAGR of 1.3%. However, this figure can be misleading, because SX-EW cathodes are both a mine copper product and a refined copper product in the Chilean classification system. Therefore, the production of copper concentrates is a more preferable indicator for the performance of the sub-sector. The latter expanded by a stronger real CAGR of 3.5% over 2009-2014, increasing its share in total mine copper output from 60.7% to 67.6%. This better relative performance of the copper concentrates segment is explained not only by market factors, but also by technical factors. For example, the Ministro Hales integrated copper complex of Codelco, which became operational in 2013, still had start-up difficulties with its roaster as of March 2015 (used to treat copper concentrates in order to make them ready for traditional smelters), which may have pushed the company to export part of its concentrates.

Growth Drivers and Constraints

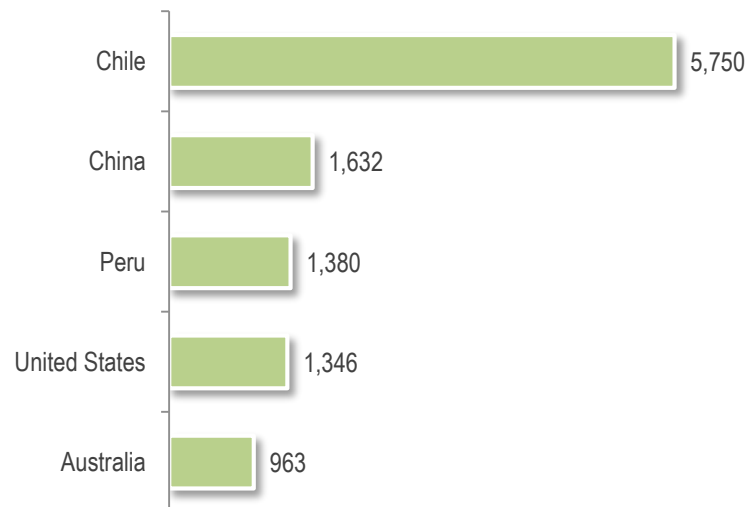
The main challenge for the copper mining sub-sector is the maturing of deposits, which impacts the cost structure of the companies in several ways: reduction in copper ore grades, hardening of the mineral and longer transportation distances. All these factors have increased the energy usage per unit of copper content by 14.7% for ore extraction and by 18.6% for the concentration process over the period 2009-2014. Low copper prices, concerns about energy supply and environmentalists' litigation of mining projects like El Morro are also a handicap. However, Chile still holds the largest reserves in the world as of 2014, and remains competitive in copper concentrates production. According to Mark Burton, Metal Bulletin's copper editor, the Ministro Hales mine's export of high arsenic copper concentrates to the Nchanga smelter in Zambia, showed that production and export of such concentrates from Chilean mines remained profitable as of June 2015. The transaction was made despite elevated treatment and refining charges (TC/RC), estimated at USD 200/20 per metric tonne, arsenic penalties of around USD 100 per metric tonne, the shipment from Chile to the Durban port and the 2,500km road distance from Durban to the plant.

Forecast

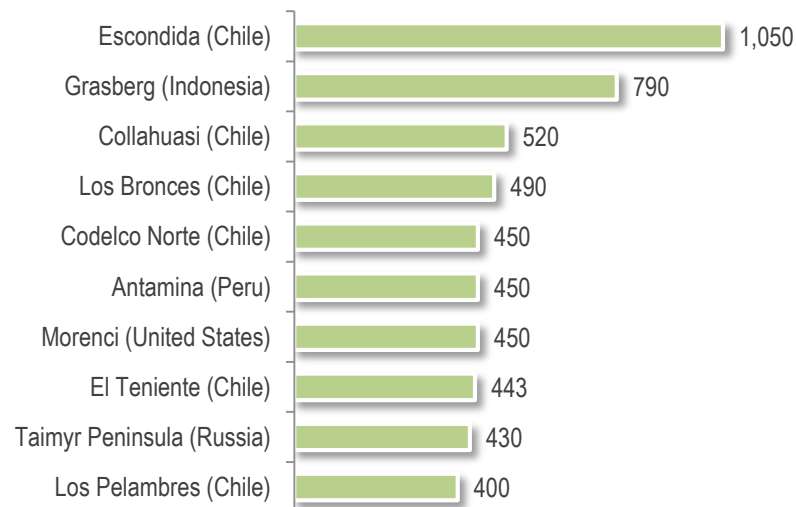
According to the latest copper market report by COCHILCO from July 2015, mine copper production is expected to reach 5.9mn tonnes in 2015, 2.3% up, and 6.1mn tonnes in 2016. These figures have been revised downwards from the previous estimates as a result of severe rainfalls in the North region of the country at the end of March 2015, when at least 13 large mines had to stop operations, due to interruptions in electricity supply, and around 90% of small mining companies in the region were affected. As a response to this situation, the Chilean government delivered emergency loans for USD 4.5mn to the small miners from the region, and as of July 2015, 92% of these companies were operational again. Regarding long term projections, an academic study conducted by the Mining Strategic Research Centre from July 2015, outlined that Chile has the potential to reach 9.5mn tonnes of mine copper production by 2025, which implies a CAGR of 4.7% for the 2014-2025 period. However, Aurora Williams, the Minister of Mining, is less optimistic and expects a figure below 8mn tonnes for the same year, a vision shared by Alvaro Merino from the Chilean Mining Association SONAMI. The official forecast of COCHILCO, as of April 2015, stands at 7.5mn tonnes in 2024.

Chile in Global Copper Mining Market

Top 5 Copper Mine Producers, 2014 (thou tonnes)



Top 10 Copper Mines by Capacity, 2014 (thou tonnes)

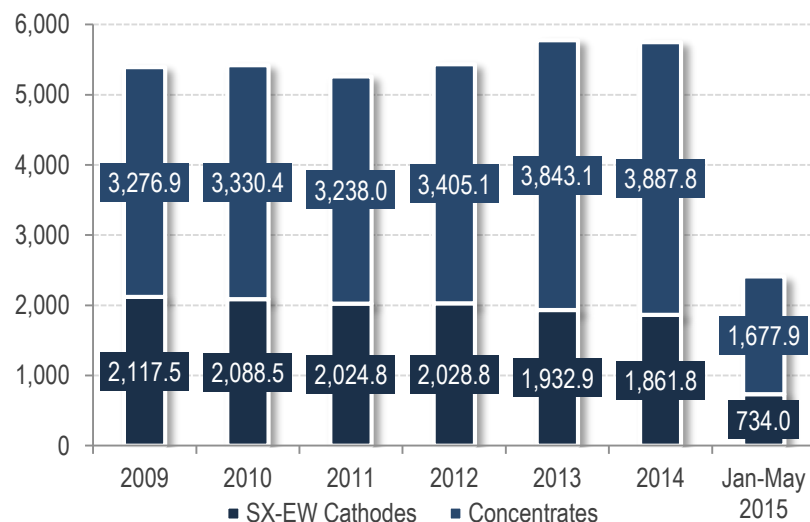


Comments

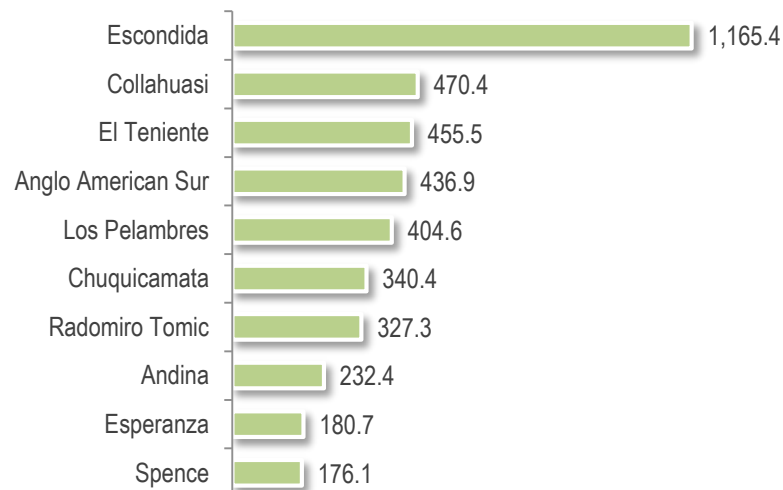
In 2014, Chile was the largest copper mine producer in the world by a wide margin, with a 31.1% share of global output. Furthermore, the country had six of the ten largest individual copper mines in the globe. Notwithstanding this dominant position in the present, the future of copper mining in Chile is at a crossroad. Freeport-McMoRan, a competitor from the United States, has announced that by 2016 it would take over the place of Chilean state-owned Codelco as the world's largest copper producer. The mines of the latter are among the oldest in production and ores are falling rapidly, a situation that will also be faced by the large private miners in Chile in the near future. However, the scarcity of copper deposits creates good opportunities for consolidation, especially for Chilean companies, as a way to overcome the current problems and improve their financial strength in order to sustain production. According to Bloomberg, in March 2015, there were talks between Chilean miner Antofagasta Plc and Canadian peer Teck Resources Ltd for a potential merger.

Copper Mine Production

Copper Mine Production Evolution by Product (thou tonnes)



Top 10 Copper Mines by Production, 2014 (thou tonnes)

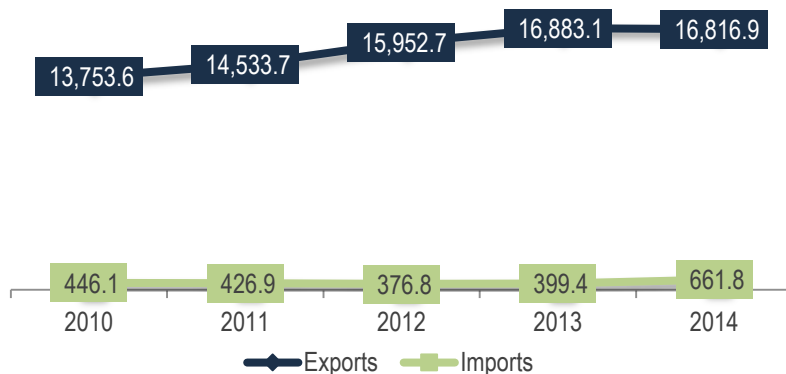


Comments

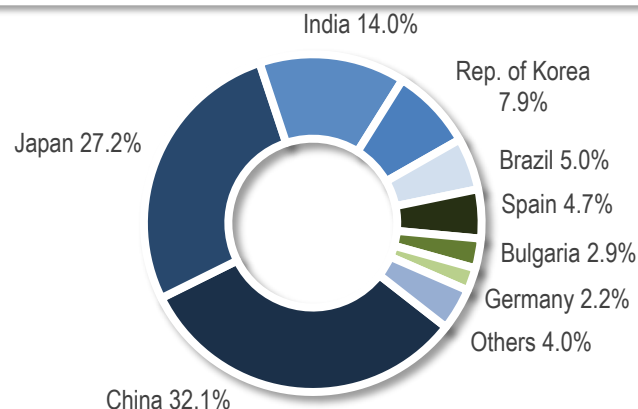
Copper mine production has two main sub-products. On the one hand, there are the copper concentrates, an intermediate product in the pyro metallurgical route, obtained by flotation and usually containing around 20-40% copper. On the other hand, there are the SX-EW cathodes, the final product of the hydrometallurgical route, with a 99.9% concentration of copper. The latter process involves extracting copper from low grade oxide and sulphide ores through leaching and electrowinning. In the period 2009-2014, the share of SX-EW cathodes in total output has decreased from 39.3% to 32.4%. According to Sergio Hernandez, vice-president of COCHILCO, this trend will continue in the future due to the fact that Chile is competitive in concentrate production, but not in smelting or hydrometallurgy, where China holds the advantage. Moreover, most of the mineral that is being extracted lately is not suitable for the SX-EW process. Despite this, Chile copper mine production is expected to reach 7.5mn tonnes by 2024, according to COCHILCO.

Copper Mine External Trade

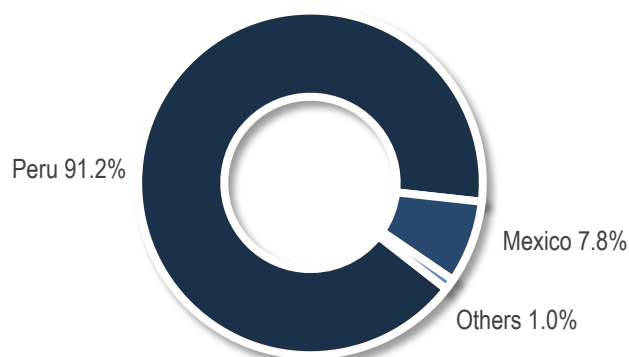
External Trade in Copper Ores and Concentrates* (USD mn)



Export Segmentation by Destination, 2014 (%)



Import Segmentation by Origin, 2014 (%)

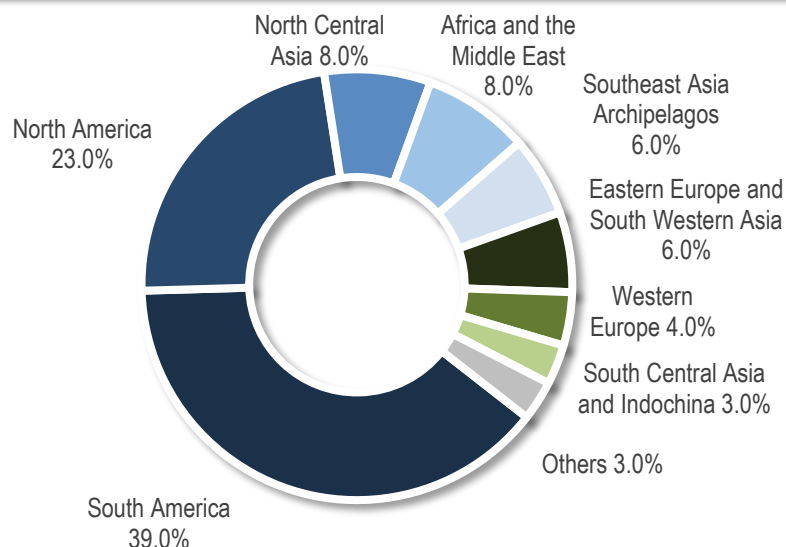


Comments

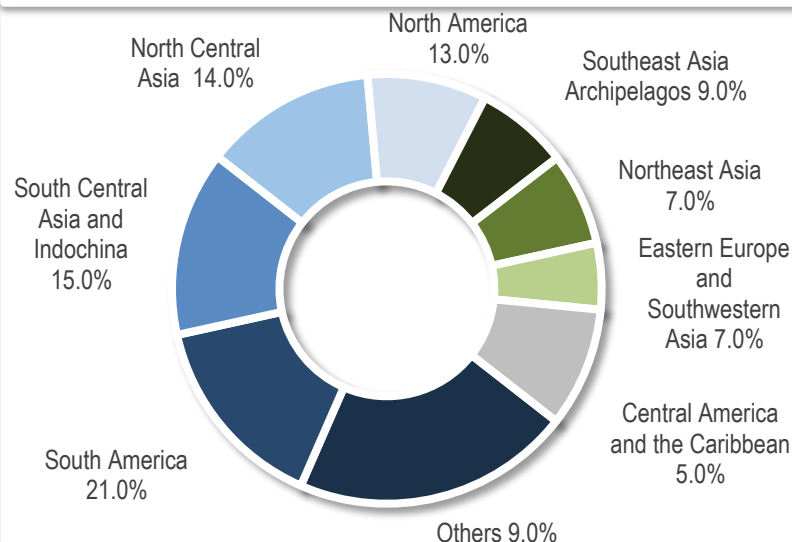
Chilean export of copper ores and concentrates has expanded at a CAGR of 5.2% in value terms over the 2010-2014 period, due to the recent trend for export specialisation in low value-added copper products. However, 2015 data from COCHILCO shows that bulk copper exports (a classification that includes copper ores and concentrates plus copper cements) are 23% down y/y in value terms and 5.3% down y/y in volume for the period Jan-May 2015, with most of the decline being attributable to the fall in copper prices. Regarding imports, there is a steady growth in the last few years (CAGR of 10.4% over 2010-2014). According to Peruvian newspaper Gestion, this boom in copper imports from Peru is largely explained by the free trade agreement signed between the two countries back in 2009.

Copper Mine Resources

Identified Copper Resources by Region, 2014 (%)



Undiscovered Copper Resources by Region, 2014 (%)

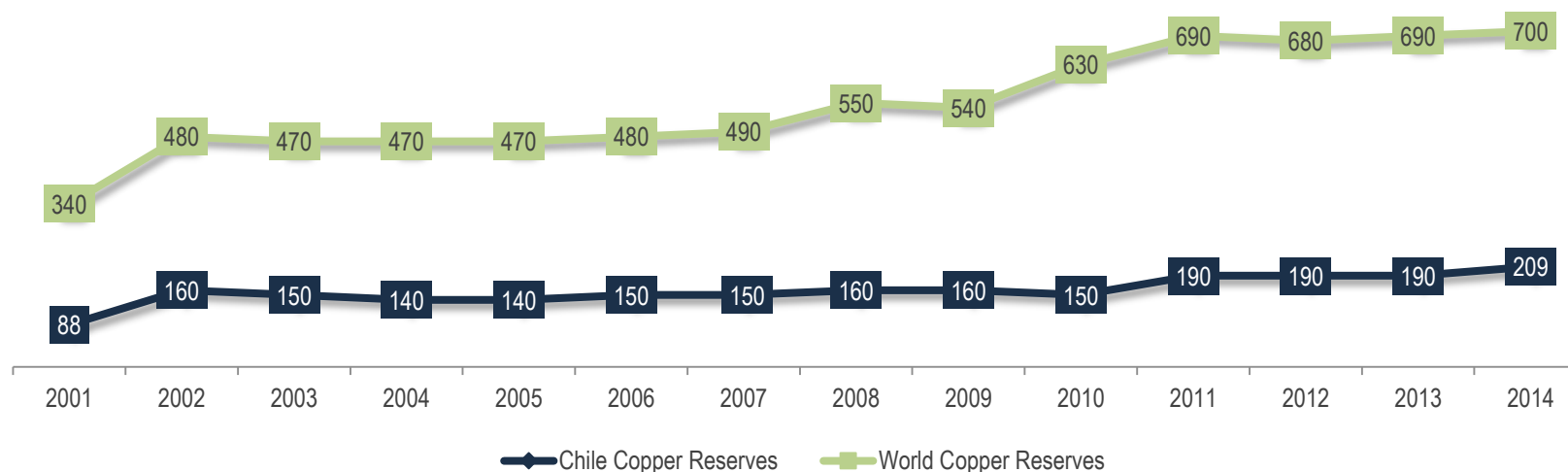


Comments

Copper reserves are deposits that have been discovered and whose profitability has been assessed. Resources include reserves, discovered deposits that are potentially profitable and undiscovered deposits that are estimated by preliminary geological surveys. In 2013, the United States Geological Survey (USGS) completed an assessment of the world's copper resources located in two different kind of deposits (porphyry and sediment-hosted stratabound) that together account for 80% of global supply. Identified copper resources were estimated at 2.1bn tonnes, while undiscovered deposits amounted to 3.5bn tonnes. According to a study by the International Copper Study Group (ICSG), 160mn tonnes of copper have been mined over the 2004-2013 period, whereas reserves have grown by 220mn tonnes.

Copper Mine Reserves

Copper Mine Reserves Evolution (mn tonnes)

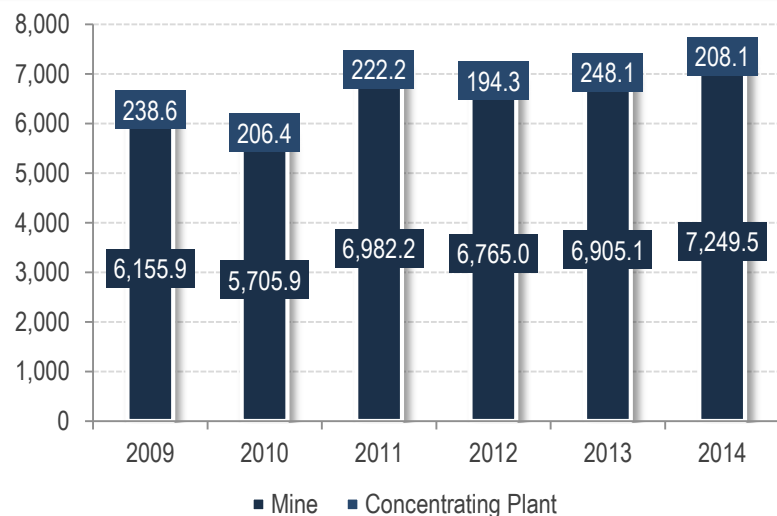


Comments

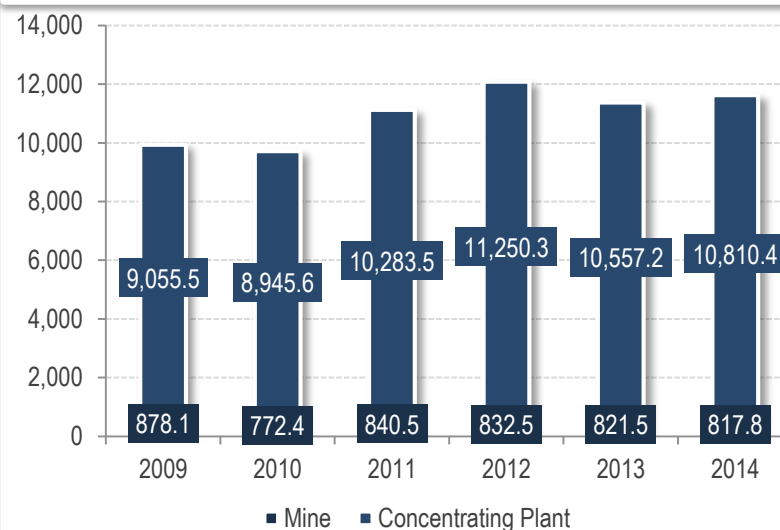
As of 2014, Chile had the largest copper reserves in the world, with a 29.9% global share, followed by Australia, Peru, Mexico and the United States. According to the 2014 annual report of Codelco, the company alone had 125mn tonnes of mineral resources, a hybrid definition that includes proven and probable reserves plus geological resources with economic attractiveness and reasonable extraction feasibility. In the period 2010-2013, exploration efforts made by Codelco allowed the discovery of new deposits. The most relevant is La Huifa Zone in the El Teniente division, with an estimated 200mn tonnes of mineral and an average copper grade of 1%. Other recent discoveries include Los Sulfatos and San Enrique Monolito, both made by Anglo American Sur. The former is a very good prospect, with an estimated 1.2bn tonnes of inferred resources and an average copper grade of 1.46%.

Copper Mine Fuel and Electricity Consumption

Fuel Use per Tonne of Copper (MJ/tonne)



Electricity Use per Tonne of Copper (MJ/Tonne)



Comments

Both fuel and electricity are essential inputs in the copper mining process. Mineral extraction and transportation are very intensive in the use of diesel, fuel oil, natural gas and also use small quantities of coal, kerosene, liquefied gas, gasoline and lumber. Electricity is used mainly in concentrating plants. COCHILCO elaborates measures of fuel and electricity consumption (in mega joules) per unit of fine copper content in the product of each sub-sector, called "intensity indicators". Fuel consumption intensity rose by 90.8% between 2005 and 2014, whereas electricity consumption intensity in concentrating plants grew by 49.3% for the same period. According to the organisation, this is not due to poor efficiency in terms of use of energy. Instead, structural factors closely related to deposit maturing, such as reduction in copper ore grades, hardening of the mineral and longer transportation distances, are to blame for the rise in the fuel and electricity consumption intensity.

III. Copper Smelting Sector Overview

Copper Smelting Sector Highlights

Sector Development

After reaching a peak of 1.6mn tonnes in 2010, the production of smelted copper followed a downward trend through 2014. On the other hand, smelted copper export performed better, expanding by a CAGR of 2.6% over 2009-2014, but remained still below the historical record of 0.5mn tonnes in 2007. These figures suggest a stagnation in real terms, as a result of few additions of smelting capacity. In 2010, the Environmental Policy and Regulation Division (DPRA) of the Ministry of Environment determined that the seven copper smelters in Chile had a combined nominal smelting capacity of 6.3mn tonnes of copper concentrates. Thus, the DPRA proposed an environmental adequacy plan for the smelters, which in 2013 became law. The plan required that no additional capacity should be added until the new requirements are met in 2018. Thus, as of 2014, the actual smelting capacity for copper concentrates stood at 1.7mn tonnes of fine copper (the difference between nominal and actual capacity derives from the fact that copper concentrates have between 20% and 40% of true copper content), which combined with a production of 1.35mn tonnes of smelted copper implied a capacity utilisation rate of 79%. SONAMI estimates that Chilean copper smelters are on the third quartile in terms of costs. As a result, only 36% of Chilean production of copper concentrates was made in domestic smelters in 2014.

Growth Drivers and Constraints

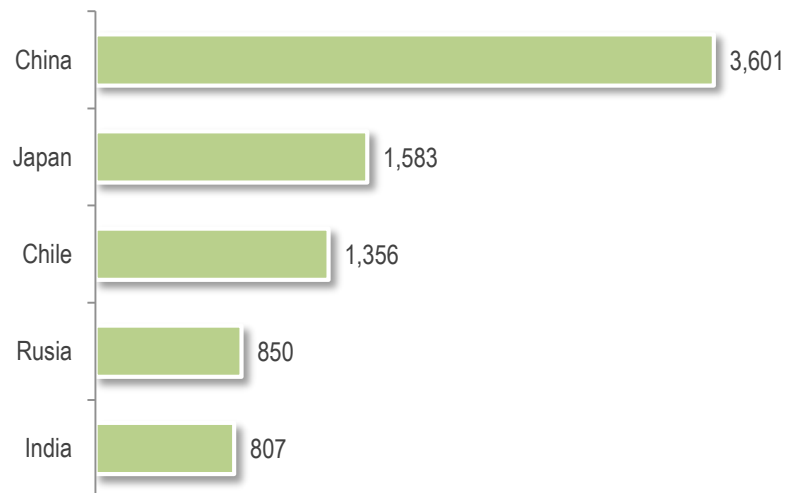
The closure seminar of the mining expo Expomin, held in May 2014, was devoted to the copper smelting and refining industries in Chile. Pedro Reyes, general manager of the Chagres smelter, remarked that factors impairing the growth of the sector are high levels of required capital and elevated labour and energy costs. Adolfo Lopez from COCHILCO, focused on energy costs as the main disadvantage. Instead, Gustavo Lagos, an academic researcher, pointed that the main issue was the fusion technology: five smelters used the Noranda/Teniente system, one used the Flash Outokumpu system (Chagres), and one smelter had the two of them (Chuquicamata). The Noranda/Teniente technology, of limited use outside Chile, is both more energy consuming and more contaminating. As a result, some smelters like Ventanas will inevitably become unprofitable once they comply with the new environmental regulation. Others like German Ritcher, general manager of Caletones Foundation, still believed in the potential of the technology, quoting trial tests where a 97% capture rate for sulphur dioxide (SO₂) and arsenic (As) was achieved. In case further development of Teniente converters becomes infeasible, the plan B for the industry is to use the Chinese "Bottom Blown Reactor" system, which Codelco plans to try in Ventanas in the near future.

Forecast

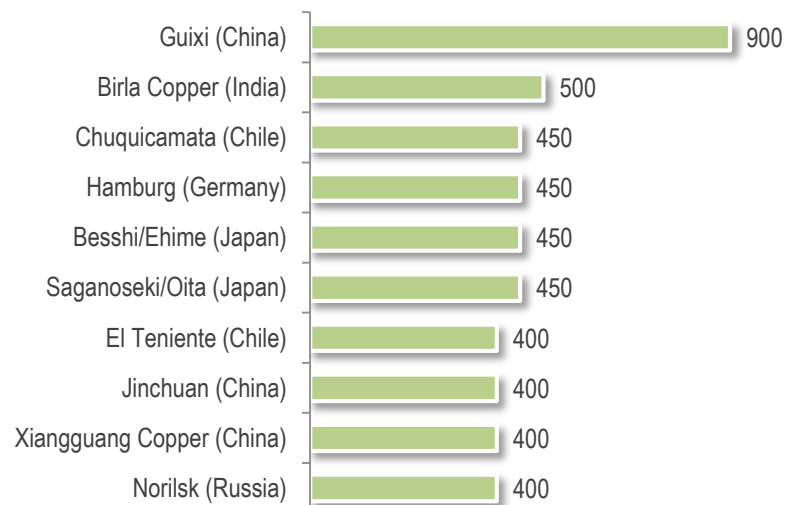
According to German Ritcher, general manager of Caletones Foundation, the future of Chilean smelters hinges on their ability to process copper concentrates with high level of impurities. Most smelters around the world are demanding increasing quantities of clean concentrates (with an arsenic limit of 0.3-0.5%), as arsenic penalties are becoming very expensive. Furthermore, Chilean copper deposits are getting older and the level of arsenic in the concentrates is rising, and even new mines like Ministro Hales are producing concentrates with arsenic level well above 5%. Hence, a natural opportunity arises for Chilean smelters to specialise in the processing of such kind of minerals. However, Gustavo Lagos points that even if all smelters comply with the current environmental regulation by 2018, it is likely that a tougher normative requiring As and SO₂ capture rate above 98% to be introduced afterwards, which will hinder the development of new smelting capacity.

Chile in Global Copper Smelting Market

Top 5 Smelted Copper Producers, 2014 (thou tonnes)



Top 10 Copper Smelters by Capacity, 2014 (thou tonnes)

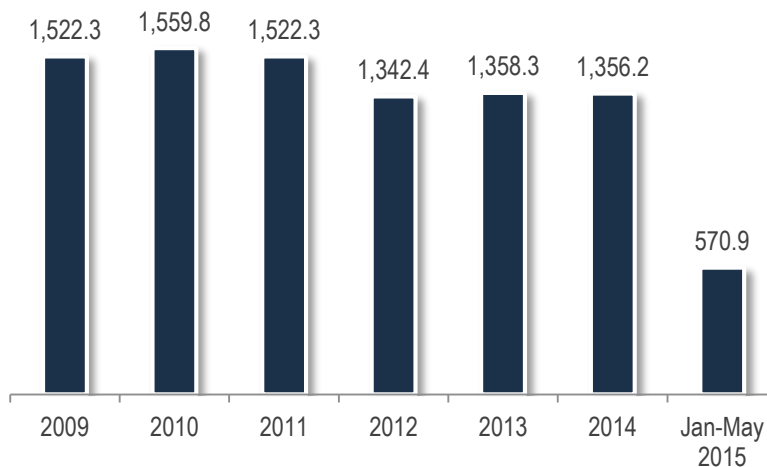


Comments

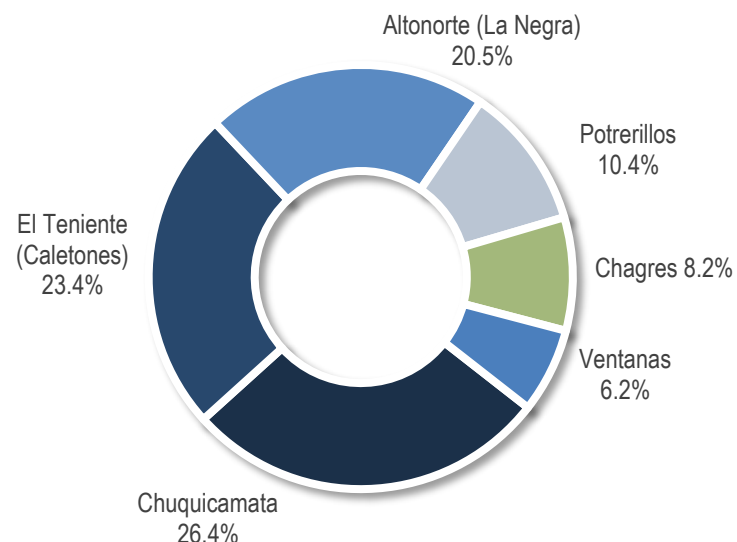
Copper smelting is an intermediate step necessary to obtain fine copper through pyrometallurgical route. The process uses as inputs copper concentrates, one of the main end products of copper mines. China is the global leader in the sector, due to capital cost and operating cost advantages. However, Harry Liu, vice president of Chinese company Yanggu Xiangguang Copper, says that, as of April 2015, these advantages are dwindling due to environmental regulations aimed to put Chinese smelting industry on par with their western competitors in terms of pollution control. In 2014, Chile accounted for 9% of global smelted copper production, the lowest share since 1973. A June 2015 report of Chilean consulting company JRI Ingenieria, warned that Chilean smelting facilities were technologically obsolete, had poor economies of scale and like Chinese smelters, did not comply with modern environmental regulation. SONAMI estimates that a minimum investment of USD 2.5bn is required so that the current operating smelters in Chile comply with the new environmental normative that is expected to enter into force in 2018.

Smelted Copper Production

Smelted Copper Production Evolution (thou tonnes)



Smelted Copper Production Capacity by Smelter, 2014 (%)

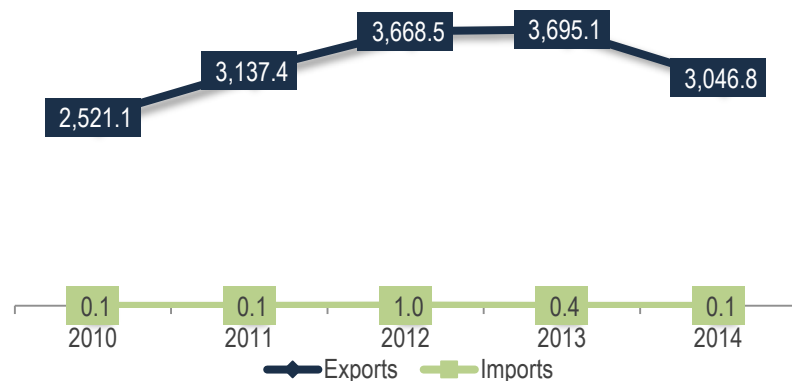


Comments

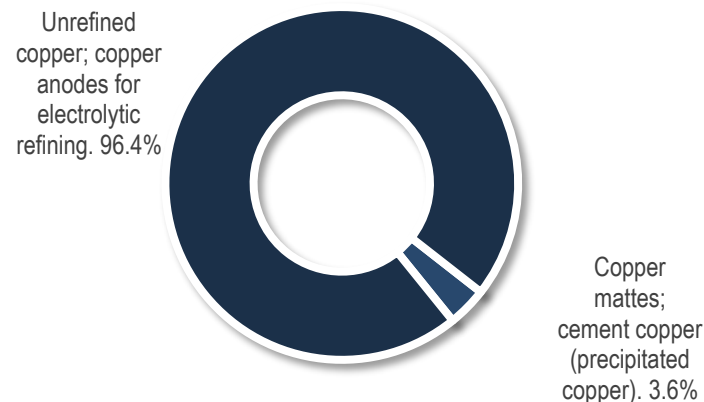
The Chilean government through the Ministry of Mining has recently entered into the debate on how to promote the development of copper smelters, given the many challenges the industry faces, especially the environmental ones. According to estimates by Ignacio Moreno, Undersecretary of Mining, from March 2015, the copper smelters were not competitive and did not provide sufficient incentives for new investment to their owners. This is a consequence of large required investments in order to comply with OECD regulations regarding pollution, high direct costs (35-40 cents per pound in Chile against under 20 cents per pound in the most efficient countries) and lower metal recovery rate compared with Japanese and Chinese competitors. In that regard, Baldo Prokurica, a member of the Energy and Mining Commission in the Chilean Senate, noted in June 2015 that Chilean copper smelters recovered only gold, copper and silver, whereas their Asiatic counterparts recovered up to 14 different metals.

Smelted Copper External Trade

External Trade in Smelted Copper Products* (USD mn)



Export Segmentation By Sub-Product, 2010-2014 avg. (%)



Import Segmentation By Sub-Product, 2010-2014 avg. (%)

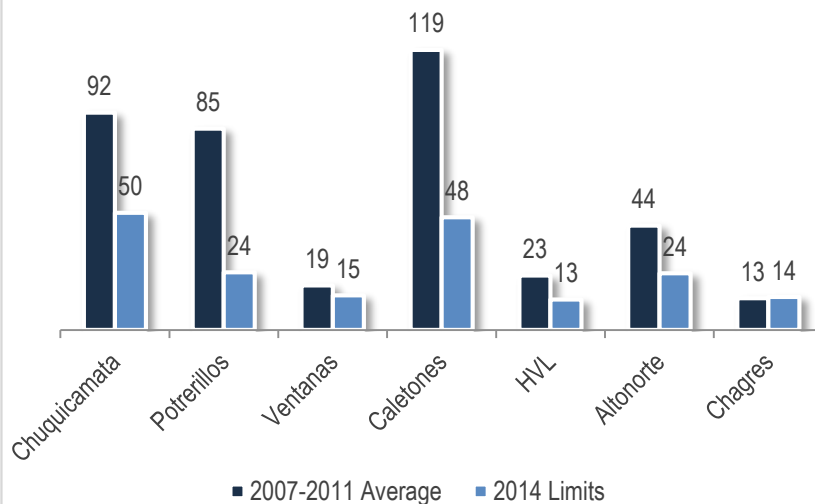


Comments

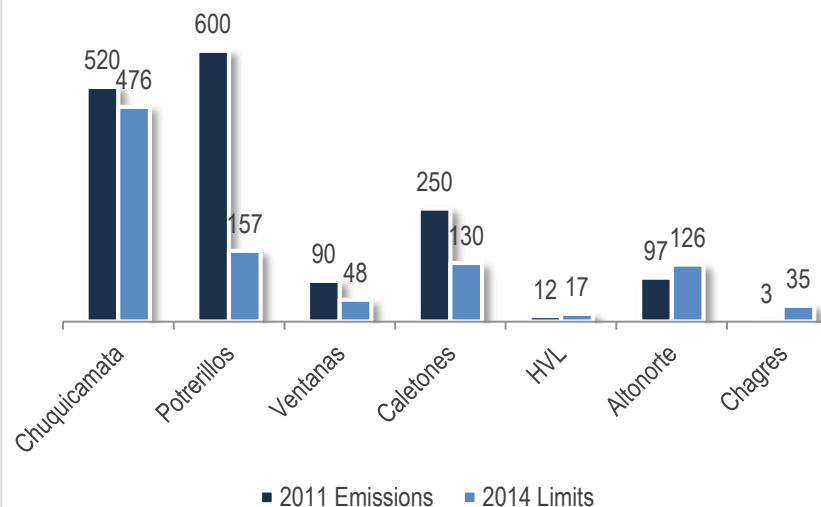
Chilean smelted copper exports consist mostly of blister copper and copper anodes ready for electrolytic refining. Copper matte, the result of fusion of copper sulphide concentrates, usually is transferred in liquid state to a converting furnace, in order to obtain copper blisters. However, a small percentage of the copper matte is solidified and enters the market as an intermediate product to be sold/exported. In 2014, Chile exported 450,000 tonnes of smelted copper products, equivalent to 33.2% of the domestic production for the same year. For the period Jan-May 2015, exports were 0.6% down y/y in volume, but 11.6% down y/y in value, due to the lower copper prices.

Smelted Copper Emissions

SO2 Emissions in Chilean Copper Smelters (thou tonnes)



Arsenic Emissions in Chilean Copper Smelters (tonnes)

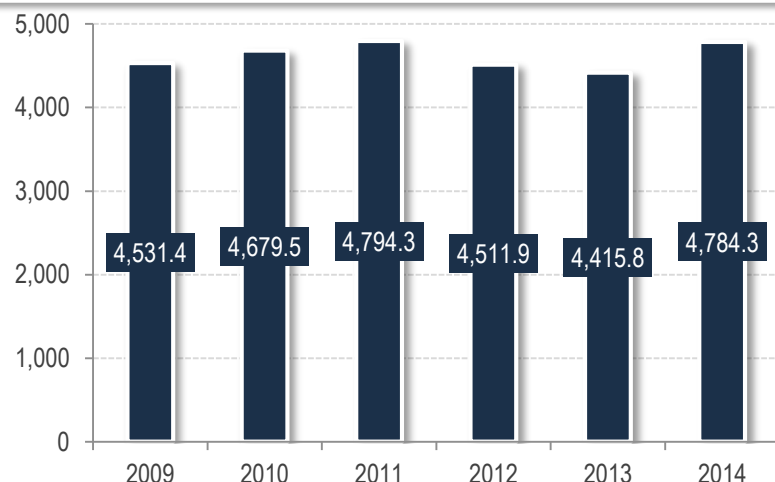


Comments

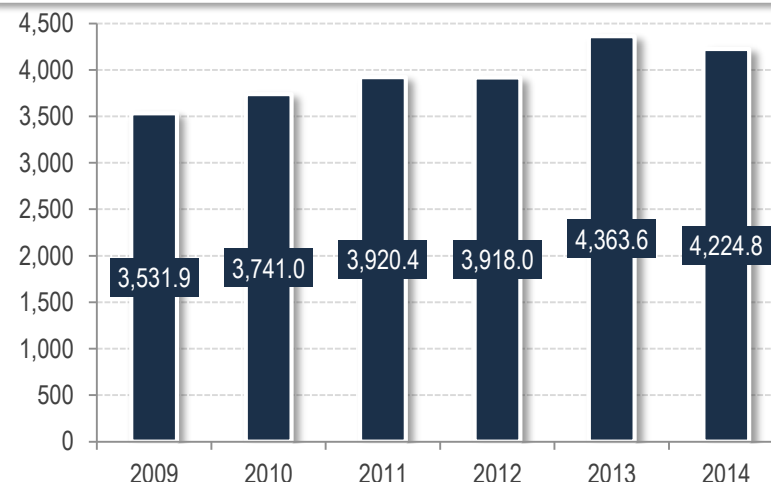
The copper smelters emissions are a key concern for the Chilean government. The fusion and conversion stages generate large quantities of sulphur dioxide (SO₂) and arsenic (As), among other elements. The former is related to respiratory and cardiovascular problems, while the latter is related to several types of cancer. In 2014, the government introduced a new regulation imposing limits on the emissions of both SO₂ and As for each Chilean smelter. In addition, smelters were required to capture at least 95% of the annual emissions of the two elements, while suggesting and even harder rule of 98% recovery for future revisions of the norm. Smelters were granted a grace period of between two and a half and five years to comply with the legislation, depending on the technology used. The goal is to achieve a 53% reduction in SO₂ emissions and a 37% reduction in As, compared to the average emissions over the period 2007-2011.

Smelted Copper Fuel and Electricity Consumption

Fuel Use per Tonne of Copper (MJ/tonne)



Electricity Use per Tonne of Copper (MJ/tonne)



Comments

The copper smelting process is based on separating the sulphur (S) and iron (Fe) from the copper concentrate (which has around 35% of copper) in order to obtain what is called “white metal”, with a 70-75% copper concentrate. This is done with an oven, which heats the copper concentrate to temperatures high enough to liquefy it, thus expelling sulphur dioxide gas and iron in the process. In the case of the Teniente (Caletones) oven, the heating is done with electricity at 1,200 Celsius degrees. In the next step, the white metal is converted to copper blister in a Pierce-Smith smelter. A joint study conducted by Xstrata and the University of Toronto in 2010, compared the energy consumption and the proportion of fuel and electricity used in four different copper smelting technologies. The Noranda/Teniente technology, used in all Chilean smelters except Chagres, relies heavily on electricity (a 80% share in total energy usage) and has the highest total energy consumption among the processes studied.

IV. Copper Refining Sector Overview

Copper Refining Sector Highlights

Sector Development

After reaching a peak of 3.3mn tonnes in 2009, the production of refined copper in Chile followed a downward trend. The export of refined copper had a similar behaviour, decreasing by on average 4.8% over 2009-2014 after a record-high export of 3.2mn tonnes in 2009. Regarding sub-products, the situation mirrored total production, with the output of SX-EW cathodes and electro-refined cathodes falling by on average 2.5% and 3.7%, respectively. Given that domestic demand for refined copper, which stood at 94,800 tonnes in 2014, is a mere 3.5% of the 2.7mn tonnes produced for the same year, the performance of the sub-sector is extremely reliant on the external demand, which has been relatively weak as a result of the boom in the Chinese copper smelting and refining industry.

Growth Drivers and Constraints

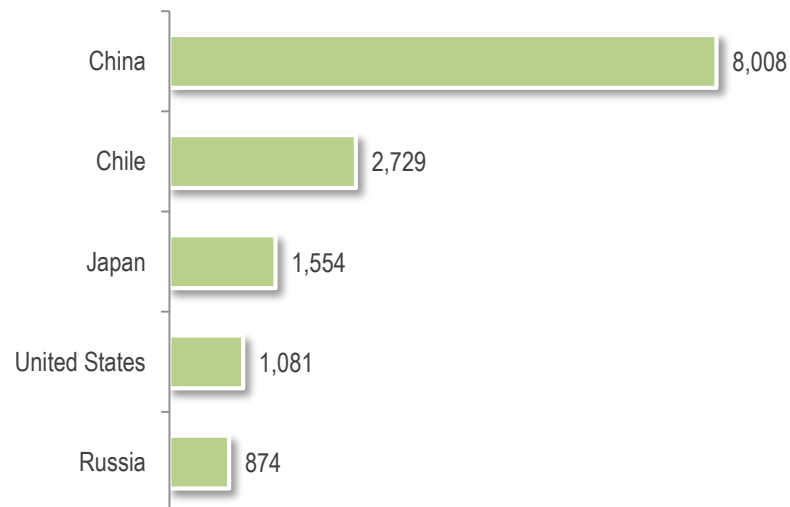
One of the major factors behind the steady decline in copper refining in Chile is the swift transformation of the Chinese copper industry. Although the refined copper imports of the Asian country grew by 12.7% in volume for the period 2009-2014 (from 3.2mn to 3.6mn tonnes), copper concentrates imports expanded by 93.1% (from 6.1mn to 11.9mn tonnes). Thus, the ratio between the import of refined copper and copper concentrates shrunk from 51.8% to only 30.2% for the period. Nonetheless, Chile's share of Chinese refined copper imports declined from 44.8% in 2009 to 34.9% in 2014. Therefore, not only China became more self-sufficient in terms of refined copper production, it also diversified its import source country (i.e. Indian refined copper exports to China increased fivefold between 2009 and 2014, due to the growing availability of copper concentrates for Indian smelters and refineries).

Forecast

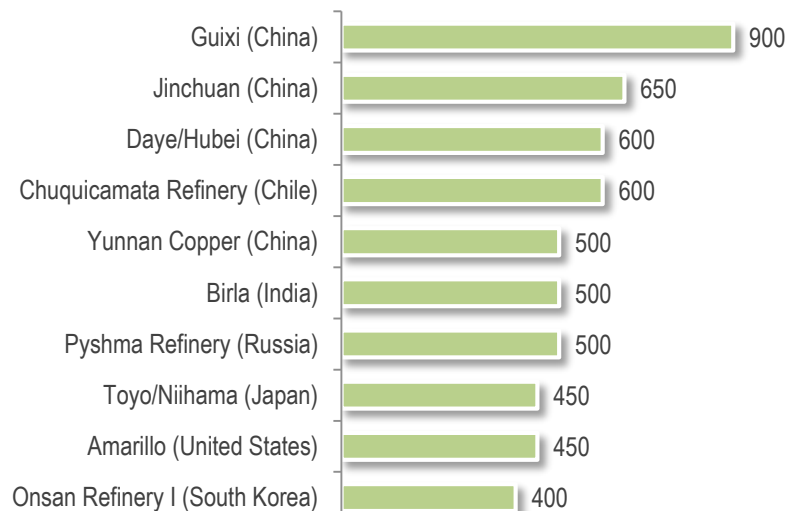
In the period Jan-May 2015, the refined copper production decreased by 3% y/y. Regarding sub-products, SX-EW output dropped by 2.8%, whereas the production of electro-refined cathodes was 3.5% down y/y. According to Sergio Hernandez, vice president of COCHILCO, the share of copper cathodes (the bulk of refined copper production) in total copper exports will fall from 33% in 2014 to just 18% in 2023. In absolute terms, the reduction will be from 2.1mn tonnes in 2014 to 1.8mn tonnes in 2023. Hernandez remarked that this trend will continue in the future, given the fact that Chile is competitive in the production of concentrates, but neither in smelting and electro-refining, nor in the SX-EW process, where China holds the advantage. Moreover, most of the mineral that is being lately extracted in Chile is not suitable for the SX-EW process, and production for this type of cathodes is expected to fall just for this reason alone.

Chile in Global Copper Refining Market

Top 5 Refined Copper Producers, 2014 (thou tonnes)



Top 10 Copper Refineries by Capacity, 2014 (thou tonnes)

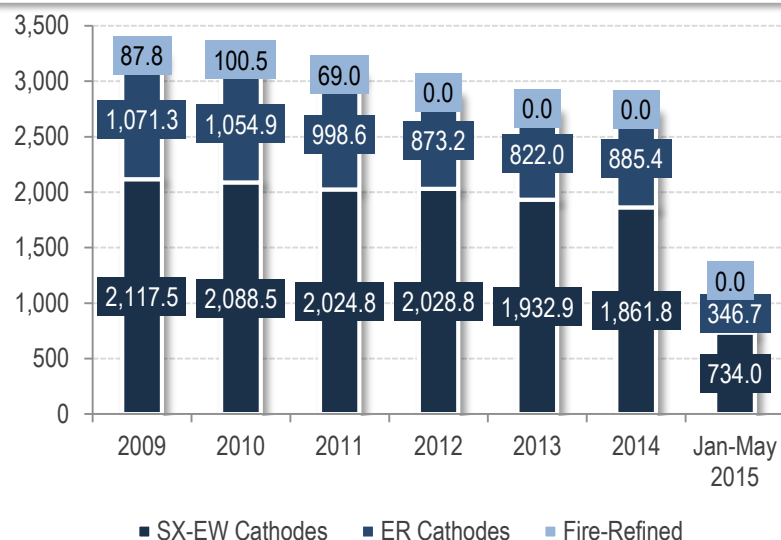


Comments

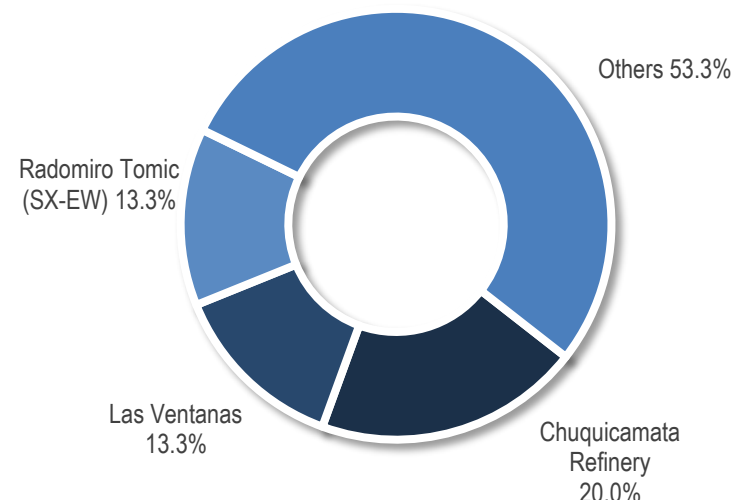
Copper refining is the last stage of copper production. It involves treating the two sub-products of copper smelting: blisters are put to the process of fire-refinement and copper anodes are put through electro-refining, obtaining fire-refined copper and electro-refined cathodes, respectively. Alternatively, refined copper can also be obtained through solvent extraction and electrowinning (SX/EW), a hydrometallurgical process. In 2014, Chile accounted for 11.9% of global refined copper output, the lowest share since 1994, ranking second behind China. In the same year, the Asian country had a 14% increase in refined copper output, as a consequence of new smelting (13% up y/y) and refining capacity (10% up y/y) being added. According to Bloomberg, China is expected to add further smelting and refining capacity in 2015, while Chilean refining capacity is projected to remain stagnant.

Refined Copper Production

Product-wise Refined Copper Production (thou tonnes)



Refined Copper Production Capacity by Refinery, 2014 (%)

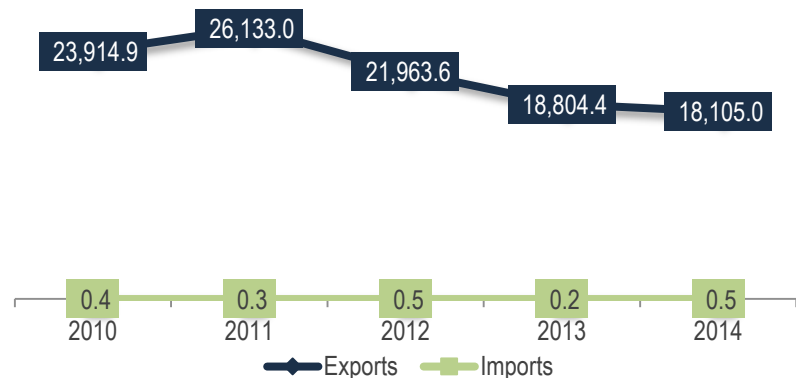


Comments

Data of the International Copper Study Group (ICSG) for 2013 showed that SX-EW cathodes accounted for 18% of total refined cathodes output worldwide. However, in Chile they prevail, with a 67.8% share in 2014. In the period 2009-2014, the output of SX-EW cathodes and electro-refined cathodes declined on average by 2.5% and 3.7% per year, due to increased competition from Chinese refineries. Meanwhile, fire-refined cathodes, elaborated with an obsolete technology, have been completely phased out since 2012. Chilean state-controlled Codelco is the company with the largest copper refining capacity in the world, considering the Chuquicamata and Las Ventanas electro-refineries and the Radomiro Tomic electrowinning plant, with a combined capacity of 1.4mn tonnes. In November 2014, Bloomberg reported that the company has an ambitious strategy to stem this decline in cathodes by investing USD 24bn over the next five years with the goal to reach a refined copper production of 2.5mn tonnes by 2025. Nelson Pizzaro, CEO of the company, warned that without investment, production will be below 1mn tonnes by 2020, due to deposit maturing.

Refined Copper External Trade

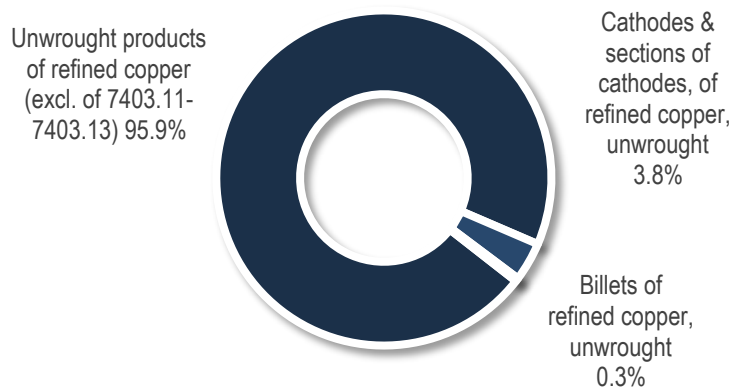
External Trade in Refined Copper Products* (USD mn)



Export Segmentation By Sub-Product, 2010-2014 avg. (%)



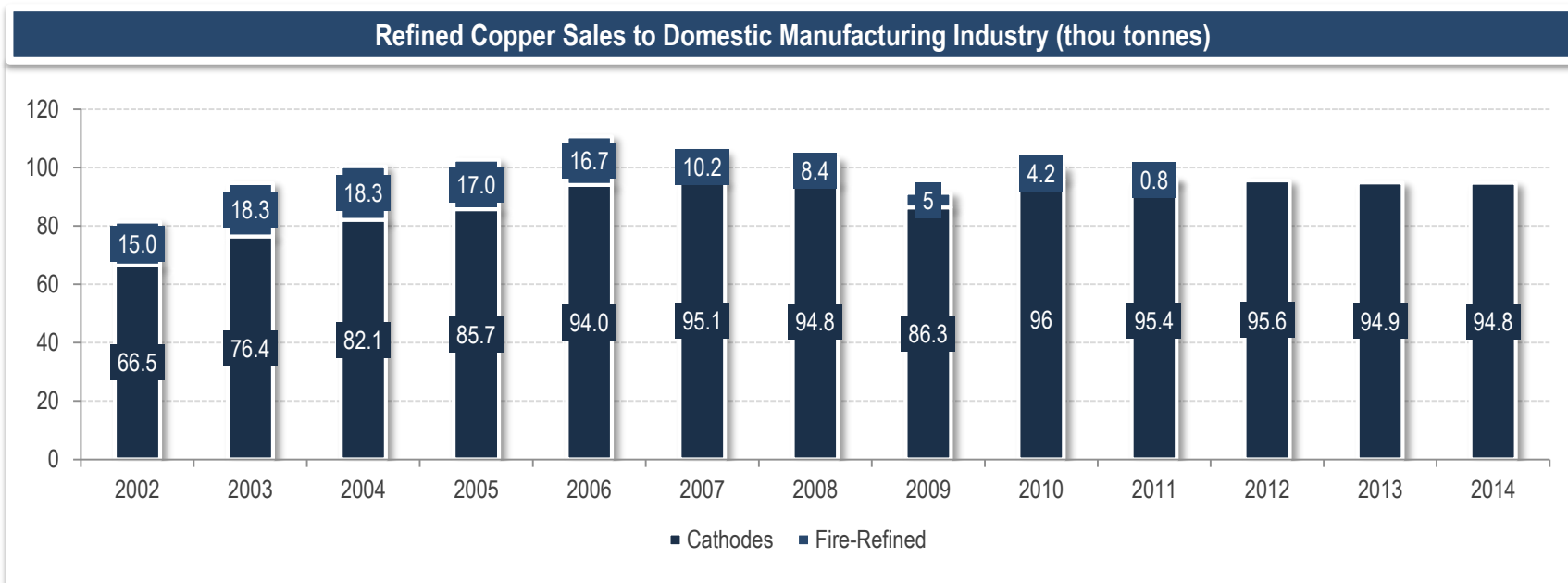
Import Segmentation By Sub-Product, 2010-2014 avg. (%)



Comments

Chilean refined copper exports followed a downward trend in the last few years, decreasing by a cumulative 24.3% over 2009-2014. This phenomenon is closely related to the rise in the export of copper concentrate during the same timeframe, since both are motivated by the lack of competitiveness of Chilean copper refining industry compared with its Chinese counterparts. As electro-refined copper cathodes production in Chile dwindles due to lack of external demand, less copper anodes and blisters are required, so domestic copper concentrates demand also falls. Therefore larger quantities of the latter are available for export. For the period Jan-May 2015, exports are 1.8% up y/y in volume, but 11.7% down y/y in value, due to the low-copper-price global environment.

Refined Copper Sales

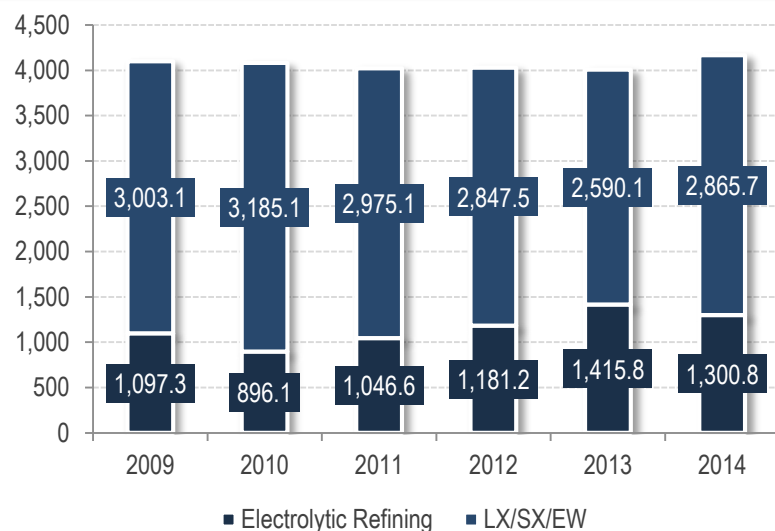


Comments

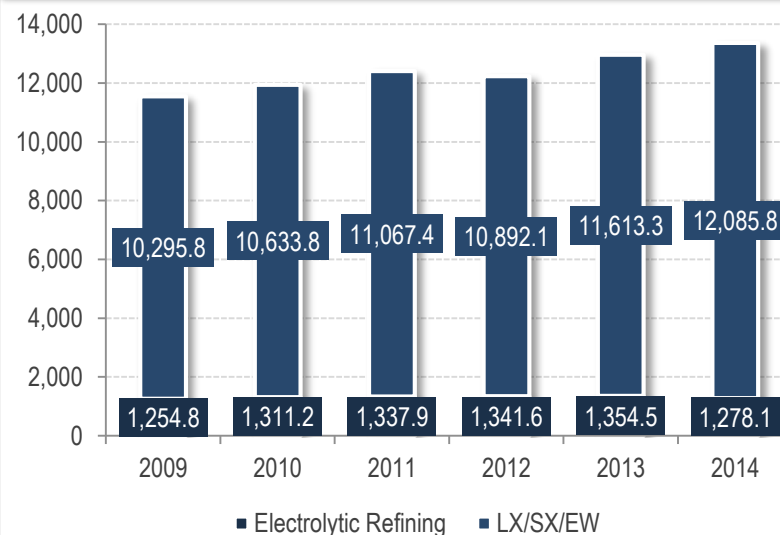
In Chile, companies from the domestic manufacturing industry that are members of COCHILCO have the right to reserve each year a certain amount of refined copper that must be provided by Chilean copper refineries. This amount is called “global copper reserve”, and is determined the year before. In October 2014, 11 Chilean manufacturing companies asked for a guaranteed reserve supply of 122,243 tonnes of copper cathodes in 2015, which was granted. Two companies alone, Cobre Cerillos S.A. and Nexans Chile S.A., demanded a total of 100,000 tonnes. The former is a copper wire manufacturer, specialised in bare overhead wire for electrical power distribution for street light. The latter is also a cable provider both to the domestic economy (including mining, energy and industry sectors) and to other countries in Latin America. These firms are part of the “Semis” segment, the first users of refined copper, a sector which is very small in Chile.

Refined Copper Fuel and Electricity Consumption

Fuel Use per Tonne of Copper (MJ/tonne)



Electricity Use per Tonne of Copper (MJ/tonne)



Comments

The copper refining process consumes a lot of electricity, regardless the route utilised to obtain copper cathodes (electrolytic refining or electrowinning – EW process). COCHILCO measures the total energy consumption of the latter, which includes not only electrowinning, but also the preliminary steps of leaching (LX) and solvent extraction (SX). According to a survey by the organisation, in 2014 the consolidated LX-SX-EW process had a 24% share of total energy consumption in mining, while electrolytic refining had a much modest 2% share. Nevertheless, COCHILCO estimates that the entire LX-SX-EW process would have its share reduced to only 7% by 2025, due to the progressive abandonment of this technology in Chile. Even so, total electricity consumption will grow as a result of increased production of copper concentrates, which has similar levels of intensity of electricity usage.

V. Main Players

Top M&A Deals

Top 10 M&A Deals in the Mining Sector* in Chile (2014)

Date	Target Company	Deal Type	Buyer	Country of Buyer	Deal Value USD (mn)	Stake (%)
6-Oct	Candelaria/Ojos del Salado copper mining operations in Chile	Acquisition	Lundin Mining Corp	Canada	1,852.0 (Official data)	80.0
17-Jun	Amancaya project in Chile	Acquisition	Eduardo Elsztain - private investor	Argentina	12.0 (Official data)	100.0
29-Oct	Polar Star Mining Corp	Acquisition	Iron Creek Capital Corp	Canada	7.1 (Official data)	100.0
23-Oct	Filo del Sol copper-gold-silver project	Minority stake purchase	NGEx Resources Inc	Canada	7.0 (Official data)	40.0
20-May	Southern Legacy Minerals Inc	Acquisition	Regulus Resources Inc	Canada	3.9 (Market estimate)	100.0
3-Jun	Humberto Reyes Arriendo de Maquinarias SpA	Acquisition	Eduardo Elsztain - private investor	Argentina	2.7 (Official data)	51.0
28-Oct	Tuina copper project located in Chile	Minority stake purchase	RMG Ltd	Australia	2.3 (DW estimate)	25.0
18-Sep	Aegean Metals Group Inc	Acquisition	Mariana Resources Ltd	Australia	2.2 (Official data)	100.0
30-Jan	Minera Li Energy SpA	Acquisition	BBL SpA	Chile	1.5 (Official data)	51.0
16-Jul	AQM Copper Inc	Minority stake purchase	Teck Resources Ltd	Canada	1.4 (Official data)	10.5

Source: EMIS DealWatch, - * NAICS code 212

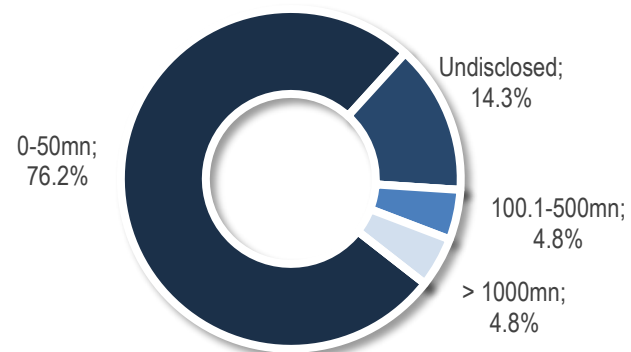
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

M&A Activity, 2013-2014

Number and Value of Deals in Chile's Mining Sector*



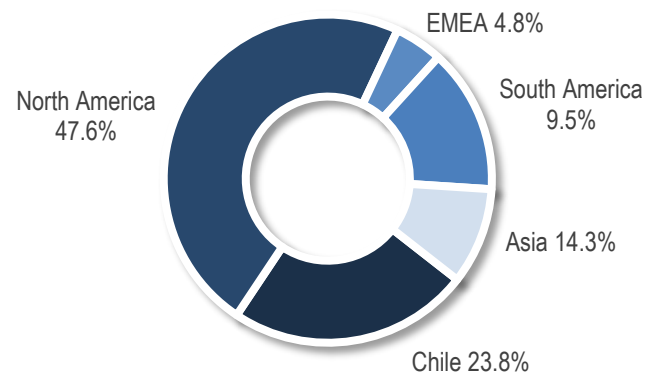
Number of Deals by Deal Value, USD (%)



Number of Deals by Deal Type (%)



Number of Deals by Region of Investors (%)

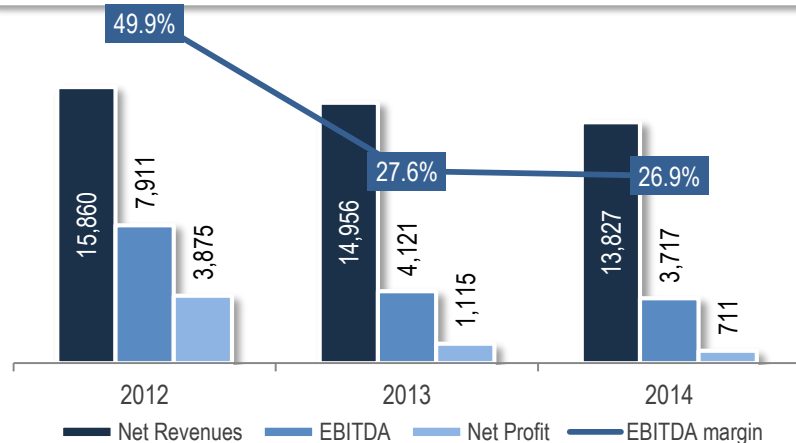


Source: EMIS DealWatch, - * NAICS code 212

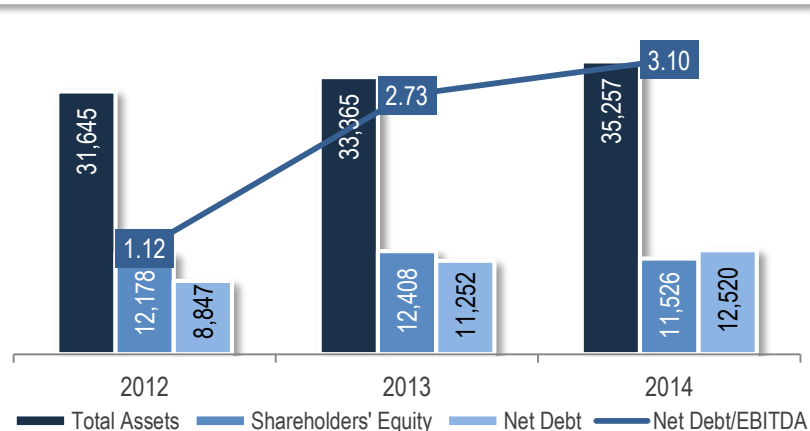
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

Corporación Nacional del Cobre de Chile (Codelco)

Income Statement (Consolidated, USD mn)



Balance Sheet (Consolidated, USD mn)



Highlights

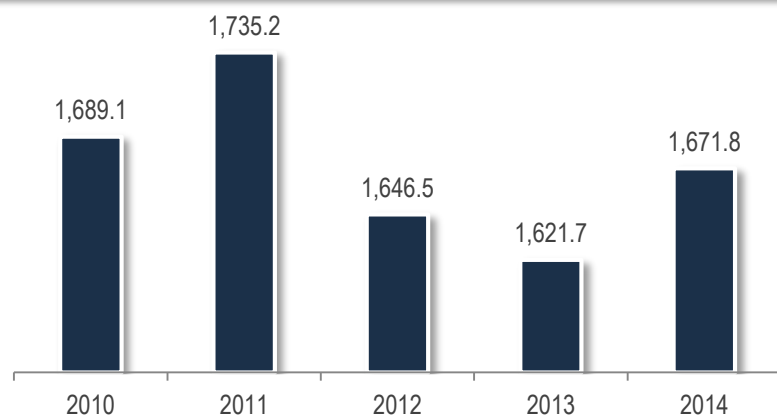
- Corporación Nacional del Cobre de Chile (Codelco) is a state-owned company, created in 1976, as a result of the nationalisation process of all private mining companies initiated in 1971 during Salvador Allende's government. In 2014, the company was the world's largest mine copper producer, accounting for 9.1% of global output and for 29.1% of Chilean output, according to the World Bureau of Metal Statistics. It was also the world's second largest molybdenum producer, with 30,600 tonnes.
- The main business operations of Codelco are the manufacture and sale of copper cathodes and molybdenum. The company is vertically-integrated and self-sufficient in terms of raw materials, operating seven mining fields in Chile, a copper smelter operation and a refinery in the Ventanas industrial complex. As of 2014, it had mineral resources for 125mn tonnes of fine copper, enough for sustaining operations for the next 70 years. However, proved and probable reserves amounted to 53.2mn tonnes of fine copper.
- The largest division of the company is Codelco Norte, which encompasses the Chuquicamata, Ministro Hales and Radomiro Tomic fields, located near Calama in the Antofagasta region. As of December 2014, the division employed 8,241 people.

Source: Company data, World Bureau of Metal Statistics, own calculations

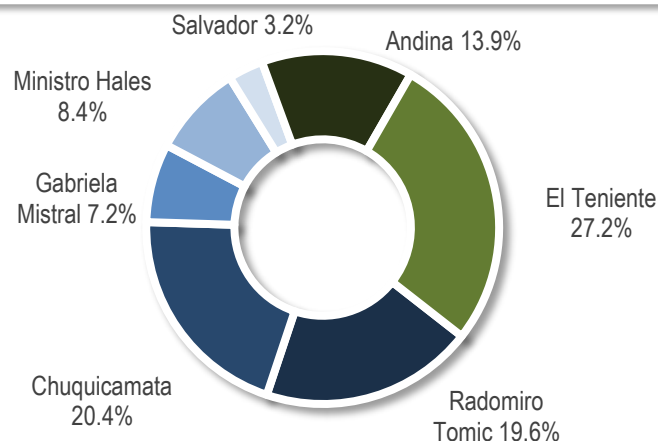
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

Corporación Nacional del Cobre de Chile (Codelco)

Total Copper Mine Production Evolution (thou tonnes)



Copper Mine Production by Division, 2014 (%)

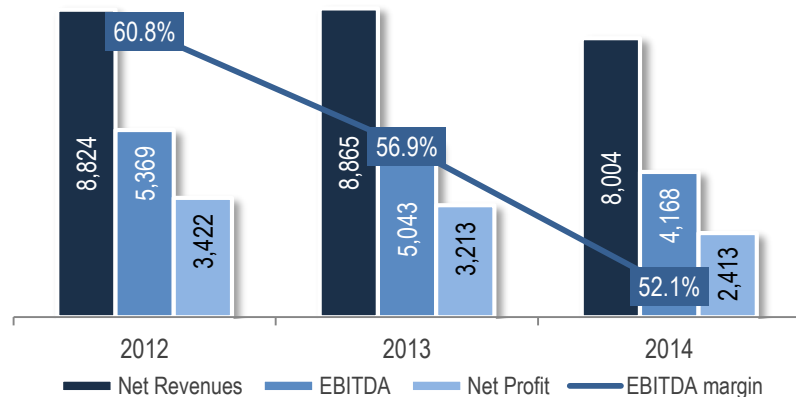


Highlights

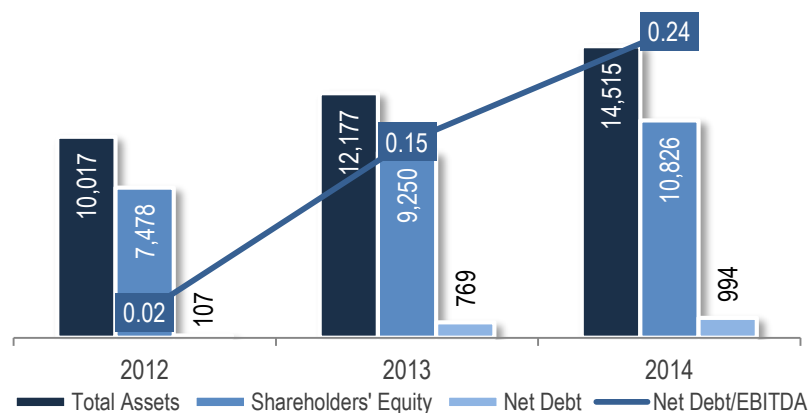
- The other divisions of Codelco are: Andina, located 3,700m above sea level, 80km far from Santiago de Chile and employing 1,617 people as of December 2014; Gabriela Mistral, located in Sierra Gorda, Antofagasta region, and employing 565 people; Salvador, located in the Atacama region and employing 1,528 people; and El Teniente, located in the Rancagua region, 80km south of Santiago, and employing 5,064 people.
- In 2014, the management of the company approved a USD 3.3bn expenditure for the construction of the Chuquicamata Subterranea copper mine project, one of the seven ongoing projects for the 2015-2020 period, which will require a total investment of USD 23bn. Chuquicamata Subterranea will reach operational status in 2019, and will expand the production capacity of the company by 320,000 tonnes of fine copper and 15,000 tonnes of fine molybdenum.
- In August 2012, Codelco purchased a 29.5% stake in Anglo American Sur, one of its main competitors, for USD 2.9bn. Later in the same year, it sold back 4.5% of these shares to Japan's industrial conglomerates Mitsui & Co Ltd for USD 998mn. As of June 2015, Anglo American is in a process of selling non-strategic assets, and there are rumours that Codelco is interested in some of them, i.e. Los Bronces (in which it has a 50.1% stake), Mantos Verdes and Mantos Blancos copper mines.

Minera Escondida Ltda.

Income Statement (Consolidated, USD mn)



Balance Sheet (Consolidated, USD mn)



Highlights

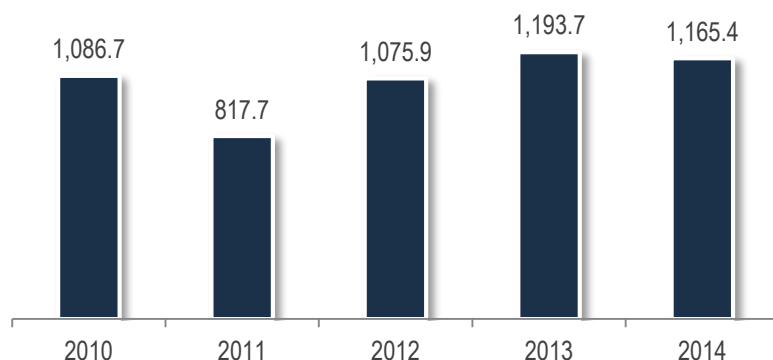
- Minera Escondida is the largest individual mining operation in the world, ranking second in terms of copper production in Chile, with a 20.3% share in national output in 2014, according to the World Bureau of Metal Statistics. It was founded in 1985, as a result of a joint venture between Anglo-Australian miner BHP (57.5% stake), British-Australian peer Rio Tinto (30% stake), Japanese peer Jeco Corp (10% stake) and the International Finance Corporation (2.5% stake). In 2010, IFC sold its minority stake to Mitsubishi Corporation in a deal estimated at more than USD 537mn.
- Minera Escondida engages in the production of copper concentrates by flotation of sulphide ore and copper cathodes by the processes of oxide ore leaching and bioleaching of low-grade sulphide. In 2014, it had proved and probable reserves of 33.3mn tonnes of fine copper and a production capacity of 1.1mn tonnes of mine copper.
- The mining operation is located in the Antofagasta region in Chile, 170km south of Antofagasta city and 3,100m above sea level. The infrastructure comprises two open pits (Escondida and Escondida Norte), mineral transport systems, two concentration plants (Laguna Seca and Los Colorados), two leaching piles, two plants for solvent extraction, two ducts, one electrowinning plant and one filtering plant. The company has own port installations (Puerto Coloso) and a sea water desalination plant.

Source: Company data, World Bureau of Metal Statistics, own calculations

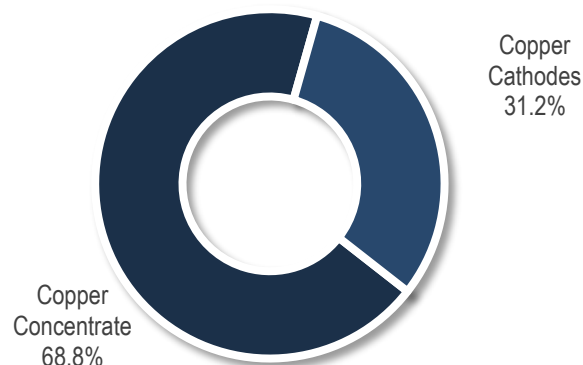
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

Minera Escondida Ltda. (cont'd)

Total Copper Mine Production Evolution (thou tonnes)



Revenue Segmentation by Product, 2014 (%)



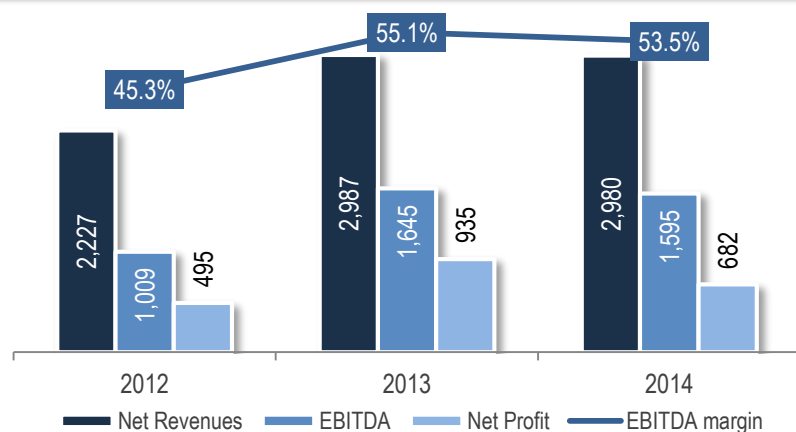
Highlights

- As of December 2014, the company directly employed 4,608 people and subcontracted 8,707 additional workers. The company has an investment plan of more than USD 8bn for the 2011-2017 period, which will be allocated in development of new projects. For 2015, the objective is to reach a copper production of 1.3mn tonnes, 11.5% up y/y.
- One of the new investment projects is called Organic Growth Project (OGP1), which aims to replace Los Colorados concentration plant with a new treatment plant and will allow the access to higher grade minerals. The project is valued at USD 3.8bn and is expected to become operational in the first half of 2015.
- Among the other investment projects are the Escondida Oxide Leach Area, which consists of a new dynamic leaching pile and a belt mineral transport system. The latter became operational in 2014, following an investment of USD 721mn.
- In 2013, the company announced the construction of a second desalination plant by 2017. The purpose of this plant is to sustain Escondida operations once OGP1 is finished. The planned investment is USD 3.4bn.

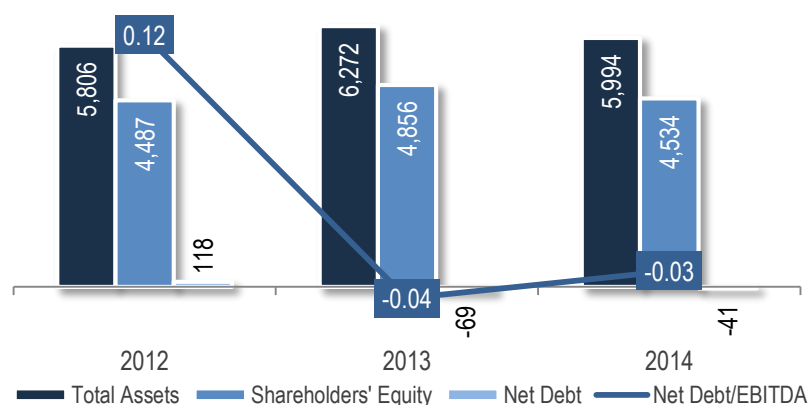
Compañía Minera Doña Inés de Collahuasi SCM



Income Statement (Consolidated, USD mn)



Balance Sheet (Consolidated, USD mn)



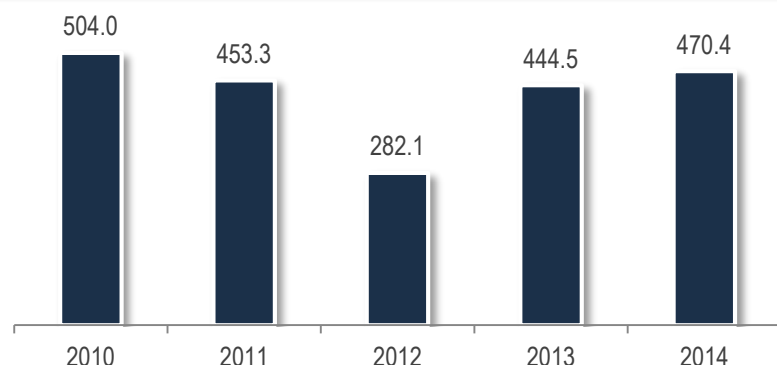
Highlights

- Collahuasi was founded in April 1983 as a limited liability company. In August 1996, it was transformed in a contractual mining society (SCM), a legal entity under the Chilean law with tax benefits specifically aimed at the mining sector. Commercial operations started in 1999.
- In 2014, the company was the third largest copper miner in Chile, with a 8.2% share of national copper output, according to the World Bureau of Metal Statistics. Besides, it holds the sixth largest copper reserves in the world, estimated at 25.9mn tonnes of fine copper as of 2012.
- Collahuasi is focused on the production and sale of copper concentrate, although it also produces copper cathodes and molybdenum concentrates.
- The ownership structure of the company as of December 2014 is as follows: 44% for U.K.-based miner Anglo American Plc., 44% for Anglo-Swiss multinational commodity trading and mining company Glencore and 12% for a Japanese consortium led by Mitsui & Co Ltd.

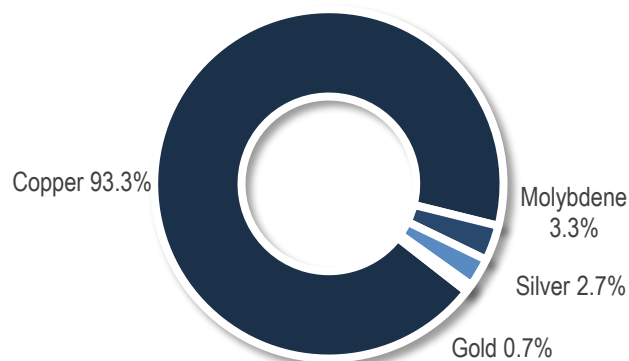
Source: Company data, World Bureau of Metal Statistics, own calculations

Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

Total Copper Mine Production Evolution (thou tonnes)



Revenue Segmentation by Product, 2014 (%)

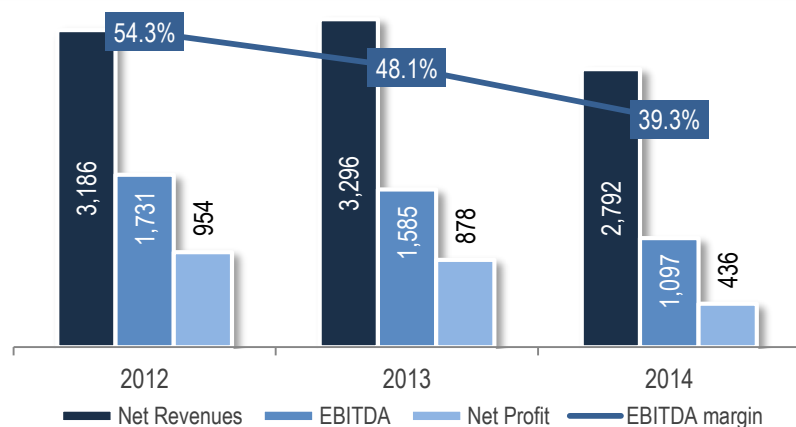


Highlights

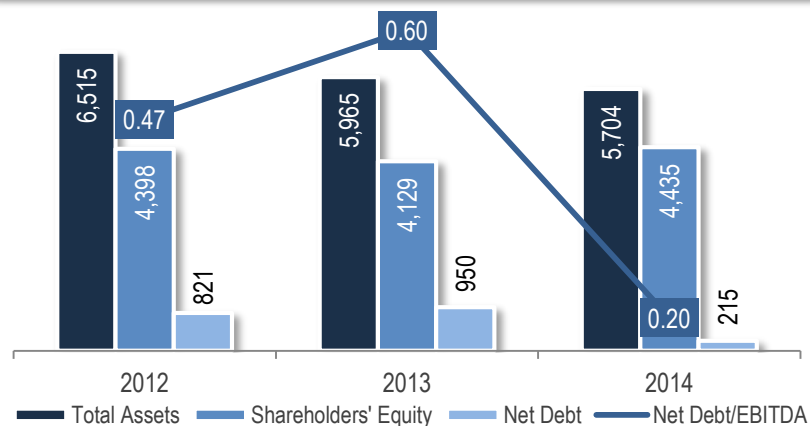
- The Collahuasi mine is located in the first region of Tarapaca, Pica commune, in the northern extreme of Chile, above 4,400m over sea level. It operates three open pit fields, Rosario, Ujina and Huinquentipa.
- Sulphide minerals from Ujina and Rosario mines, are processed in a primary crusher. Rosario's crusher has a capacity of 150,000 tonnes per day, while Ujina's crusher capacity is 100,000 tonnes per day.
- The concentration plant, located in the Ujina sector, has a stock pile with a capacity of 220,000 tonnes. A 203km-long duct connects the plant with the shipping facilities of the company, located in Punta Patache, 65km south of Iquique.
- Also in Ujina, the company operates a molybdenum plant and copper concentrate filtering plant. Collahuasi ended 2014 with a total of 2,575 employees.
- In 2014, the company allocated USD 240mn in several construction projects for optimisation of the production capacity, replacement of mining equipment and optimisation of water consumption. This is a considerable reduction from the USD 536mn invested in 2013.

Anglo American Sur S.A.

Income Statement (Consolidated, USD mn)



Balance Sheet (Consolidated, USD mn)



Highlights

- Anglo American was the fourth largest mining company in terms of output in 2014, with a 7.6% share of Chilean copper production, according to the World Bureau of Metal Statistics. It is controlled by U.K.-based mining group Anglo American Plc, which also has operations for molybdenum and silver production in Chile.
- As of December 2014, the ownership structure of the company is as follows: 50.1% for Inversiones Anglo American Sur SA, 29.5% for Inversiones Mineras Becrux SpA (a joint venture between Codelco and Mitsui & Co) and 20.4% for Mitsubishi Corporation.
- The company controls three different operations: Los Bronces and El Soldado mines, and Chagres smelter. It has fine copper reserves of 11.2mn tonnes. As of 2014, the company employed 2,691 people.
- El Soldado is located in the fifth region, Nogales commune, 132km from Santiago, and above 600m over sea level. It has an open pit mine and a underground mine. Besides, the complex has mineral oxides and sulphides treatment plants.

Source: Company data, World Bureau of Metal Statistics, own calculations

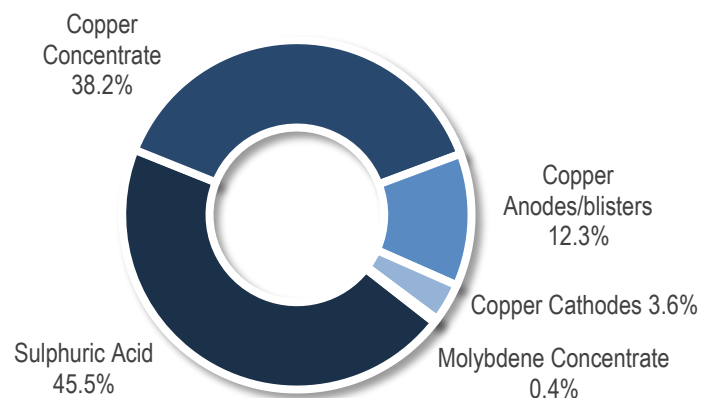
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

Anglo American Sur S.A. (cont'd)

Total Mine Copper Production Evolution (thou tonnes)



Production Segmentation By Product, 2014 (%)

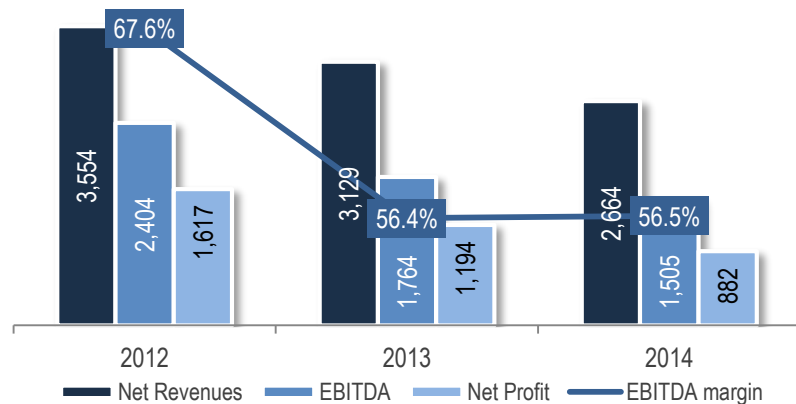


Highlights

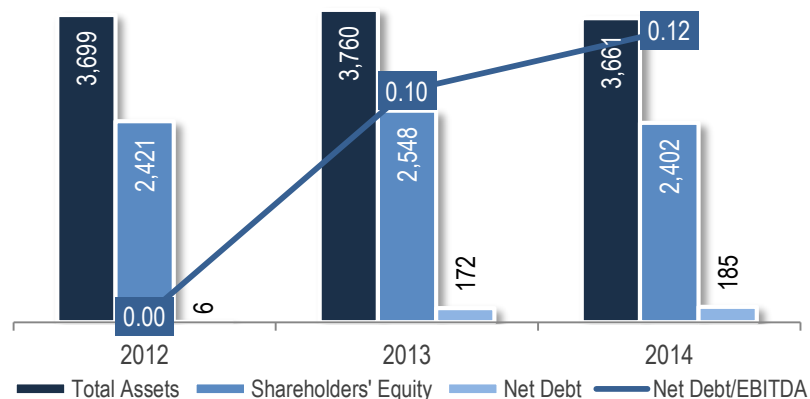
- Los Bronces is a copper and molybdenum mine located 65km away of Santiago de Chile, 3,500m above sea level. It has two plants for treatment of sulphur minerals, and two plants for processing solutions obtained from leaching of low grade minerals in waste zones. The mineral is transported by duct from the mines to Las Tortolas, where the company has a concentration plant.
- Chagres is one of the most modern copper smelters in Chile, located in the Catemu municipality, 100km away from Santiago. The smelting process is done with a flash oven, which has a design capacity of 184,000 tonnes of fine copper per year.
- In 2014, to maintain current operations the company invested USD 199.2mn in Los Bronces, USD 21.6mn in El Soldado and USD 23.6mn in Chagres.
- As of June 2015, Anglo American Plc. was in a process of selling non-essential assets around the world, as part of a new strategy focused on improving profitability and optimising operations. According to a Deutsche Bank report, regarding its Chilean assets, the company has already decided to sell the Mantos Blancos and Mantoverde mines, and is also considering the sale of El Soldado mine and the Chagres smelter. According to Reuters, as of June 2015, British investment firm Audley Capital, Anglo-Swiss mining company Glencore and British private mining venture X2 have bid for Mantos Blancos and Mantoverde, which are valued at some USD 480mn.

Minera Los Pelambres S.A.

Income Statement (Consolidated, USD mn)



Balance Sheet (Consolidated, USD mn)



Highlights

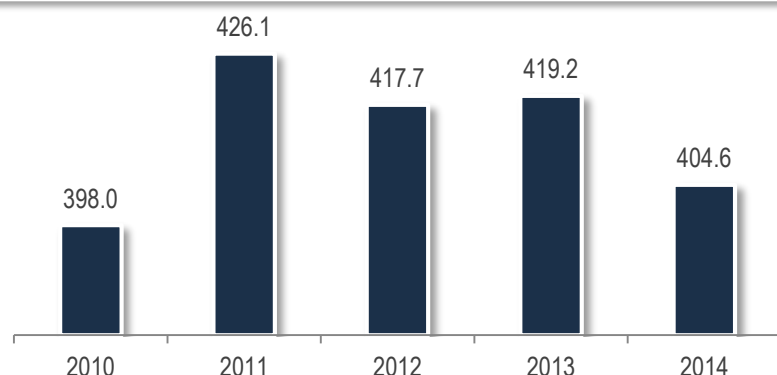
- In 2014, Minera los Pelambres was the fifth largest copper producer in Chile, with a 7.0% of national copper output, and the second largest molybdenum producer behind Codelco, according to COCHILCO. The company was born in 1996, as a result of the spin-off of the old Compania Contractual Minera Los Pelambres Ltda.
- As of December 2014, the ownership structure of the company is as follows: 60% for Chilean copper miner Antofagasta Minerals Plc., and 40% for a Japanese consortium of the industrial conglomerates Nippon, Marubeni and Mitsubishi.
- The core business of Minera Los Pelambres is the production and sale of copper concentrate, and as a sub-product molybdenum concentrate. Also, the company produces foldable concentrates of copper, silver and gold.
- The company owns a mining field in the province of Choapa, region of Coquimbo, 3,600m above sea level and next to the border with Argentina. As of 2012, it had reserves of 6mn tonnes of fine copper. The concentration plant is located 1,600m above sea level and processes 210mn tonnes per day. The concentrated copper is transported through a 120km-long duct to Los Vilos city, and then is shipped through the Punta Chung port.

Source: Company data, COCHILCO, own calculations

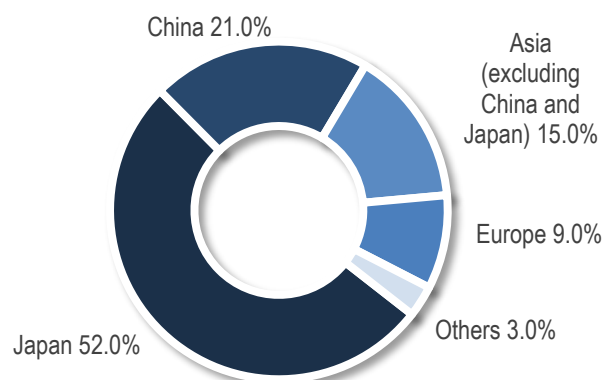
Any redistribution of this information is strictly prohibited.
Copyright © 2015 EMIS, all rights reserved.

Minera Los Pelambres S.A. (cont'd)

Total Copper Mine Production Evolution (thou tonnes)



Revenue Segmentation by Export Destination, 2014 (%)



Highlights

- In 2014, raw material extraction amounted to 129.5mn tonnes, with a mineral sterile ratio of 1.3. The plant processed 64.3mn tonnes of mineral, with an average copper grade of 0.7%, reaching 1.1mn tonnes of copper concentrate. The company ended 2014 with a total of 924 direct employees.
- In 2014, fine molybdenum production stood at 7,943 tonnes, 11% down y/y, due to a small downgrade in the average law of the material, from 154ppm to 149ppm. This was partially compensated with a slight improvement of 0.9pp in the molybdenum recovery rate.
- In 2014, Antofagasta Minerals announced a revised expansion plan for Minera Los Pelambres, worth USD 1.2bn, with the goal of adding 95,000 tonnes of production capacity by 2018. The original plan amounted to USD 10bn, and had the more ambitious goal of duplicating production capacity in the same timespan. According to the CEO of the company, the plan was revised as a result of ongoing difficulties in signing a long-term contract with an energy provider with reasonable costs, which is a prerequisite for a larger expansion plan.

Contact:**Corporate Headquarters**

6-8 Bouverie Street
London EC4Y 8DD
UK
Voice: +44 20 7779 8100
Fax: +44 20 7779 8224

Americas Headquarters

225 Park Avenue South
New York, New York 10003
US
Voice: +1 212 610 2900
Fax: +1 212 610 2950

Asia Headquarters

Eucharistic Congress Bldg. No.
III
4th Floor, 5 Convent Street
Mumbai 400 001
India
Voice: +91 22 22881123
Fax: +91 22 22881137

**Disclaimer:**

The material is based on sources which we believe are reliable, but no warranty, either expressed or implied, is provided in relation to the accuracy or completeness of the information. The views expressed are our best judgment as of the date of issue and are subject to change without notice. EMIS and Euromoney Institutional Investor PLC take no responsibility for decisions made on the basis of these opinions.

Any redistribution of this information is strictly prohibited. Copyright © 2015 EMIS, all rights reserved. A Euromoney Institutional Investor company.

About EMIS Insight

EMIS Insight is a unit of EMIS that produces proprietary strategic research and analysis. The service features market overviews, industry trend analysis, legislation and profiles of the leading sector companies provided by locally-based analysts.

About EMIS

Founded in 1994, EMIS (formerly known as ISI Emerging Markets) was acquired by Euromoney Institutional Investor PLC in 1999. EMIS works from over 15 offices around the world to deliver electronic information products, by subscription, to institutional customers globally. EMIS provides hard-to-get information covering more than 100 emerging markets. Its flagship products are EMIS Intelligence and EMIS Professional.

EMIS clients include top investment banks, corporations, law firms, consultants, investment and insurance companies, universities and libraries, multilateral organisations, and others.