Investing in Copper and Alloy Fabrication Plants: Global Overcapacity versus a New Role for Asia.

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Summary. There are many analysis of the evolution of copper demand, but not enough information about the fundamental data for investment and utilization of copper, the most important non ferrous metal industry driving Asian output. This paper looks to fill this gap. Industrial copper use capacity, copper and copper alloy semi-fabrication output and utilization trends for copper and alloys fabrication in different regions of the world are presented in this paper. Global trends are presented in the first place, followed by regional evolution for different copper intensive industrial products. Trends for 2010-2012 are discussed in the last section.

1. Global Copper First Use Capacity Directory 2012 and Semis Production Trends

Recent Trends in Copper Fabrication Capacity, Output and Utilization by Region

World copper and copper alloys fabrication capacity reported in 2012 was well over 42 million tonnes (Mt) in gross weight, including all plants in operation, construction and projects in early stages. Total wire capacity, with 23.3 Mt of wire rod and 1.8 Mt of alloy wire, represents 54% of the world capacity in 2012. Flat products, including plates, sheets and strips (PSS) is 13% of the total with 6 Mt. Rods, bars and sections (RBS) capacity is 11 % of the global capacity. Tube capacity reported is 10.3% of the world capacity with 4.8 Mt in 2012. Copper foil capacity is 1% of the world semis capacity with 499 Kt. Copper powder capacity remains small and under reported. Copper alloy ingot capacity is reported to be below 1.17 Mt. Over 3.5 Mt of identified semis capacity is unclassified by product, significantly in Japan, the United States, Germany and India.

China

Total copper and brass industrial capacity expansion in China, including wire rod and brass mill plants, is close to 745 Kt just for 2012. Nevertheless, we observe slower capacity addition in 2012 and the delay of some projects for 2013 and beyond. Less new brass mill capacity additions are expected beyond 2012. As the dominance of new wire rod project capacity with technology using refined copper as an input is clear, more refined copper is expected to be used in the country if there is demand for all the wire rod that China is capable of producing now.

More than 3 Mt of new wire rod capacity was planned in China but no more than 1.05 Kt of wire rod capacity has started operating. Wire rod capacity in operation is expected to be 8.3 Mt in late 2012 and may expand to 10.2 Mt in 2015 if all plants under construction and expansion projects are delivered. Around 567 Kt of new brass mill capacity is identified in China. Most of this capacity started operation in 2011 and 2012, with 440 Kt in brass mill plants recently in operation and plants expected to be operational in

2012. Operational capacity in PSS was 1.96 tonnes at the end of 2010 and is expected to grow to 2.1 Mt in 2015. Copper and copper alloy tube capacity operational was 1.9 Mt at the end of 2010 and is expected to grow to 2.2 Mt in 2015. RBS was at 929 Kt in 2010 and is expected to expand to around 1 Mt in 2015. Alloy wire plants may grow modestly to 250 Kt in 2015, while copper foil capacity will reach around 180 Kt. In 2015, if all plants that are currently under construction and early stages are operational, Chinese copper and copper alloy industrial capacity may achieve more than 16 Mt.

Chinese official copper and copper alloy semis output increased from 10.1 Mt gross weight in 2010 to 10.3 Mt in 2011. In the first half of 2012, China reported over 5.4 Mt of semis output, that represents a 10.1% year-on-year. It is estimated that the capacity utilization in 2011 was close to 81%.

Europe

European installed capacity in reality is significantly higher than that reported in the 2012 Directory. Many plants have been identified but are not reporting capacity. Total capacity reported in the European Union increased from 8.38 Mt in 2010 to 9.34 Mt reported in 2011 due to better data coverage, and in 2012 operational capacity fell to 8.38 Mt. The most significant event in Europe was the closure of the 300 Kt wire rod plant located in Chauny, France. According to ICSG statistics, the closure of this plant caused a significant reduction in French copper usage in 2011. As the plant has not been dismantled, we are keeping it in the capacity database. In addition, a company is reallocating operations from a plant in Switzerland to Belgium and from a plant in Sweden to the Netherlands. There are also expansion plans for wire rod capacity in Croatia and in Italy. It is also noted that as a consequence of a change in refined export tax, more Russian wire rod has been going into Europe.

European brass mills are showing a weak performance as there is limited confidence in the European market for brass mill products in recent years. According to some fabricators interviewed, there is a downturn in order books in 2012, and fabricators are targeting overseas markets, with some plants in Italy and Spain running only 50% of its capacity. Some signals of downstream slowdown are observed as the Derby cable plant closed in the United Kingdom in early 2012.

Official semi-fabrication output reported for Europe is limited to a few countries. To overcome the limitations we used our observed semis output data for the European Union and we note that semis output was around 4.54 Mt in gross weight in 2010 and 4.24 Mt in 2011. Considering the high levels of capacity reported in 2010 and 2011 in Europe and discounting some capacity not operational, it is estimated that capacity utilization in the European Union has been around 52% in recent years.

Americas

Taking into account of all projects delivered, under construction and feasibility for 2011-2015, semis capacity in the Americas is reported to be 6.3 Mt this year. In 2012, we have identified 346 plants and added 460 Kt in new capacity projects: 415 Kt are wire rod and 45 Kt are copper tube. This is contributed by 10 plants located in Chile, Brazil and the United States. One of the most interesting developments is the new Spanish-American plant with 90 Kt of new wire rod capacity and using scrap as input. Moreover, a new

furnace and caster was announced to start operations in 2012 and we added the plant in the group of unallocated capacity.

Regional wire rod production capacity grows to almost 3.1 Mt, of which 57% of the wire rod capacity is allocated in the United States. It is important to note that 159 plants identified with no reported capacity in the region, mainly in the United States, so the capacity should be higher than the reported level in reality. Brazil is the second largest with wire rod capacity of 623 Kt. Canada remains the third with wire rod capacity of 272 Kt. Copper and alloy tube capacity in the Americas is 848 Kt in 2012, meanwhile rods and bars capacity is 824 Kt, and flat products (PSS) is 831 Kt. The share of the United States in the regional tube capacity is achieving 69%, in rods and bars capacity the weight of the United States is 74% of the regional capacity and 83% in the case of flat copper and copper alloy products.

The regional output of copper and alloy semi-fabricated products has been in a downtrend since its peak at around 5 Mt in 2004. Volumes recovered to over 3.3 Mt of output in 2011. Regional capacity utilization of 53% is estimated for copper fabrication in the Americas in 2011. Utilization estimates ranges between 42%-52% in different countries of the region in 2011. The estimate is upside biased in the USA given the limited reported capacity available, so is no surprise that the United States reported the highest capacity utilization in 2011. Mexican capacity is under estimated: observed output is higher than reported capacity as there is not information on Mexico brass mill sector.

North East Asia (excluding China)

The North East Asia ex-China group is including Japan, the Korean Republic and Taiwan (China). Copper first use capacity reported in 2012 was slightly above 6.7 Mt, compared to 6.6 Mt in 2011. Most of capacity reported is in Japan (51%) and Korea (30%). The remaining 19% is in Taiwan (China) with 1.26 Mt in 2012 while this is an under reported figure. In Korea, a 120 Kt wire rod plant announced the replacement of outdated facilities and with a modern plant to be operational in 2014. In Taiwan, a new wire rod plant started operations in 2012, and a new copper foil plant fully operational in June 2012, but no capacity has been reported. In Japan, a 60 Kt copper tube plant was closed in 2012 and a potential sale is being discussed. A regional capacity utilization of 50.3% is observed in recent years, but observed utilization is lower in Japan, with just 43% against the Korean republic (65%) and Taiwan (68%). This is partly explained by the under reported capacity in Japan, but also by output slowdown in 2009-2011.

South East Asia and Oceania

The South East Asian and Oceania region covers the following 13 economies, ranked according reported copper first use capacity and regional shares in 2012. India (44%), Thailand (13%), Indonesia (12%), Malaysia (11%), Australia (8%). Vietnam, Pakistan and Philippines ranges from 2% to 4% of regional capacity. In Singapore, Bangladesh, New Zealand, Nepal and Myanmar shares are 1% or lower. Reported capacity is expected to reach 3.23 Mt in 2012. A Japanese corporation started a wire rod project in Thailand, adding 17 Kt of capacity. In the Philippines a foil mill plant capacity has been added by a Japanese owned plant and another new foil mill capacity plan in Malaysia is announced. Observed capacity utilization in 2011 was very high in Thailand (79%),

Malaysia (69%) and Vietnam (65%), and lower utilization rates observed in the Philippines (56%), Australia (56%) and Indonesia (49%). India (45%) in the rest of the countries of the region with observed output.

Eastern Europe and Central Asia

This group includes Armenia, Georgia, Kazakhstan, Mongolia, Uzbekistan, the Russian Federation, Albania, Macedonia, Serbia and Ukraine. In 2012, over 2 Mt of copper first use capacity reported in this region, with 73 plants identified and only 23 plants not reporting capacity. A new project under feasibility studies in Mongolia is added this year: investment in a wire rod plant expecting to start in 2012.

The regional leader in capacity in 2012 is again the Russian Federation with a reported capacity for this country close to 1,218 Kt in 2012, followed by Ukraine with 326 Kt. Kazakhstan is approaching almost 200 Kt of capacity in 2012 and Serbia (193.5 Kt) remains in the fourth regional position. Uzbekistan continues to be the only other country of the region with a significant capacity of 99 Kt in 2012. Semis output data is collected from the Russian Federation, Ukraine, Uzbekistan and Kazakhstan, but not yet for Serbia and the rest of the countries of the region. The region covered was not far from achieving 1 Mt of output before 2009 but contracted to less than 600 Kt a year in the 2009 credit crisis. With a recovery in 2010 and 2011, volumes are over 800 Kt, well below historic peaks. The Russian Federation was the country with highest semis capacity utilization in 2011, with output achieving close to 60% of the reported capacity. Uzbekistan capacity utilization rate was close to 47% last year, meanwhile Ukraine and Kazakhstan reports significantly lower utilization. Additional efforts to improve future capacity and output reporting are needed in this region.

The Middle East and Africa

Total capacity in the Middle East reported in 2012 is around 2.28 Mt, but 28 plants identified are not reporting capacity. Capacity in the Middle East is mainly wire rod with 1.6 Mt reported in 2012. RBS is around 312 Kt, and PSS capacity is 141 Kt. Reported capacity of ingot for casting foundries was 88 Kt. New wire rod plant capacity completed in 2009- 2010 in the United Arab Emirates and recently in Saudi Arabia reveals a combined capacity of 710 Kt from their (mainly) new wire rod plants operational in 2012. Turkish copper first use has been flat around 400 Kt per year in 2006-2011. In Saudi Arabia, much more copper use in its new plants is expected in coming years. In Iran, a slow but continuous expansion in copper use is observed, same as in Oman where capacity and output remains small.

Capacity reported in 2012 was 606.8 Kt in Africa, with over 62% concentrated in two large and one medium-sized wire rod plants in Egypt. South Africa has the second largest capacity in the region: 150 Kt, mainly brass mill capacity and 6 Kt of wire rod capacity reported. Zambia reported 40.5 kt and less than 20 Kt in Zimbabwe (3.2% of Africa reported) and 12 Kt in Sudan (2 %), with marginal capacity in Tunisia and Morocco. We do not have capacity information for Algeria, Angola, Kenya and Mozambique. Some wire rod project proposals have been under debate in Botswana, Namibia and Zambia. Updated information for 53 plants and capacity information for 43 plants was reported in Africa, with 10 plants not reporting capacity. A recent World Bank pre-feasibility study in Zambia concluded that the lack of a local downstream

market is a restriction to capacity expansion. Observed statistics for semi-fabricated output in Egypt, South Africa, Zambia and Zimbabwe, a group that represents 97.3% of the reported capacity, revealed a reducing output close to 260 Kt in 2011. Low capacity utilization observed in Egypt (around 40%) is related limited statistics on brass mill output and to political instability observed in Egypt in 2011. South Africa capacity utilization was close to 50% in 2011, 60 % in Zimbabwe, but much higher in Zambia with 78% in 2011.

Copper and Copper Alloys Semifabrication: Recent Trends

Historically, copper only semi-fabricated products reported worldwide in ICSG official statistics have been over 70% copper and the remaining 30% has been copper alloy products. Between January 2010 and April 2012, world copper and alloy semifabricated output reported by ICSG statistics remained at an average of 1.58 Kt per month, but with a high volatility: average standard deviation was 337 Kt per month.

In China, reported monthly semis output has been very stable: a monthly average of 863 Kt per month between November 2010 and March 2012, with 127 Kt/month of standard deviation. Semis output reported word wide ex-China remained over 800 Kt per month until June 2011, and then it fell below 800 Kt every month until December 2011. Semis output reported for a group of countries including the United States, Germany, Japan, Italy, the Korean Republic, Taiwan (China), Poland and Spain is available by product type until December 2011. After falling to 7.8 Mt in 2009, semis output reported by this group recovered to 8.6 Mt in 2010 and remained at the same level in 2011. The group reported close to 6 Mt of copper only semis and close to 2 Mt in copper alloy products both in 2010 and 2011.

Monthly semis output of the top five producers ex-China (USA, Germany, the Korean Republic and Italy) fell in 2011 from almost 700 Kt per month in March 2011 to 600 kt per month between July and November 2011. A joint group of middle scale semis producers including Spain, France, Benelux, Poland, Egypt, Kazakhstan and Slovakia reported a slow monthly output downtrend in 2011. Between January and April 2012, the United States semis output has been stable below 200 Kt per month, same as in Japan, where monthly semis output has been flat over 100 Kt per month.