

## THE WORLD COPPER AND SILVER MARKETS

### The World Copper Market

Copper is an internationally traded commodity, the price of which is effectively established on the main terminal markets where it is traded, including the London Metal Exchange ("LME") and the New York Commodities Exchange ("COMEX"). The two most commercially important properties of copper are:

- it is a ductile metal, which means that it is capable of being drawn into wire or extruded into tubes and
- it is a good conductor of electricity.

The main uses of copper are for electrical wiring and copper piping. The primary users of copper are the building and construction industry, the electrical and electronics industries and the transport industry. Copper exhibits the best combination of physical properties and price for many of these industrial applications. From 1980 to 1995, demand for refined copper worldwide has increased by 23 per cent. to approximately 11.8 million tonnes. The countries producing the largest tonnages of copper in 1995 were Chile, the United States, Canada, Indonesia, Peru, Australia, Russia and Poland.

### Demand for Copper

The consumption of copper is affected by various factors, including trends in the world economy, industrial production and market competition with other metals and materials. Demand patterns have varied considerably across different regions of the world. In Western Europe and North America, the two largest markets for refined copper, demand increased at annual rates of 0.9 per cent. and 1.0 per cent., respectively, between 1980 and 1995. Asia exhibited the highest growth in demand for refined copper, with consumption increasing by 5.8 per cent. annually from approximately 1.5 million tonnes in 1980 to approximately 3.4 million tonnes in 1995. The United States, Japan and Germany, together accounted for 41.8 per cent. of total world demand for refined copper in 1995.

The following table sets forth world consumption of refined copper for the periods indicated.

	Year ended 31st December,				CAGR <sup>(1)</sup> 1980-1995
	1980	1985	1990	1995	
	(thousand tonnes, except percentages)				
Africa . . . . .	116	82	96	117	0.0%
Asia <sup>(2)</sup> . . . . .	1,462	1,801	2,717	3,424	5.8%
Latin America . . . . .	488	418	391	499	0.1%
North America . . . . .	2,282	2,202	2,281	2,639	1.0%
Oceania <sup>(3)</sup> . . . . .	130	128	125	169	1.8%
Western Europe . . . . .	2,937	2,881	3,163	3,381	0.9%
Other countries <sup>(4)</sup> . . . . .	2,151	2,433	1,991	1,545	-2.2%
World total . . . . .	9,566	9,945	10,764	11,774	1.4%

Source: CRU International

(1) Compound annual growth rate

(2) Includes Japan, South Korea, Taiwan, India, Indonesia, Iran, Malaysia, Philippines, Saudi Arabia, Singapore, Thailand, Turkey and others

(3) Includes Australia, New Zealand, Papua New Guinea and Fiji

(4) Includes all Central and Eastern European countries, China, the countries of the former Soviet Union (including Russia), Vietnam, Cambodia, North Korea and others

In the early 1990s refined copper consumption in Central and Eastern Europe declined as a result of the radical restructuring of industry in certain of these countries. In 1993, the rate of decline slowed and since 1994 demand for refined copper in Central and Eastern Europe has strengthened, driven by increased consumption in Poland and the Czech Republic.

The following table sets forth refined copper consumption in Central and Eastern Europe for the periods indicated.

	Year ended 31st December,					
	1990	1991	1992	1993	1994	1995
	(thousand tonnes)					
Albania . . . . .	9	4	2	1	2	2
Bulgaria . . . . .	32	30	31	33	23	21
Czech Republic <sup>(1)</sup> . . . . .	n/a	n/a	n/a	9	7	10
Hungary . . . . .	34	18	15	16	15	14
Poland . . . . .	189	203	165	158	156	201
Romania . . . . .	29	26	27	25	22	22
Slovakia <sup>(2)</sup> . . . . .	76	32	32	15	20	20
Total . . . . .	369	313	272	257	245	290

Source: CRU International

(1) Included with Slovakia for 1990-1992

(2) Includes the Czech Republic for 1990-1992

### Production of Copper

The discovery of sizeable copper deposits outside North America (in particular in Indonesia, Chile and Mexico) coupled with more stringent environmental and mining regulations in North America have led to a shift of mine production of copper towards Latin America and Asia. Mine production of recoverable copper in Latin America has grown by 4.8 per cent. annually since 1980 to approximately 3.3 million tonnes in 1995, primarily due to increased mine production in Chile. During this time, copper mine production has increased by 3.2 per cent. annually in Asia to approximately 0.8 million tonnes in 1995.

The following table sets forth world mine production of recoverable copper for the periods indicated.

	Year ended 31st December,				CAGR <sup>(1)</sup> 1980-1995
	1980	1985	1990	1995	
	(thousand tonnes, except percentages)				
Africa . . . . .	1,358	1,340	1,131	636	-4.9%
Asia . . . . .	495	537	565	789	3.2%
Latin America . . . . .	1,628	1,957	2,234	3,285	4.8%
North America . . . . .	1,898	1,844	2,381	2,589	2.1%
Oceania . . . . .	390	435	497	592	2.8%
Western Europe . . . . .	296	331	401	346	1.0%
Other countries . . . . .	1,660	1,932	1,748	1,802	0.5%
World total . . . . .	7,725	8,376	8,957	10,039	1.8%

Source: CRU International

(1) Compound annual growth rate

A significant proportion of copper ore is smelted and refined outside the country in which it is mined. Refined copper production in Latin America has grown 4.1 per cent. annually since 1980 to approximately 2.2 million tonnes in 1995 with Asia registering an increase in production of 3.2 per cent. annually over the same time period to approximately 1.9 million tonnes. As a result of political instability in many copper producing countries in Africa, refined copper production in that region declined significantly over the same period.

The following table sets forth refined copper production for the periods indicated.

	Year ended 31st December,				CAGR <sup>(1)</sup> 1980-1995
	1980	1985	1990	1995	
	(thousand tonnes, except percentages)				
Africa . . . . .	908	907	813	538	-3.4%
Asia . . . . .	1,156	1,379	1,520	1,866	3.2%
Latin America . . . . .	1,175	1,341	1,695	2,155	4.1%
North America . . . . .	2,191	1,929	2,533	2,810	1.7%
Oceania . . . . .	182	194	274	260	2.4%
Western Europe . . . . .	1,474	1,615	1,635	1,717	1.0%
Other countries . . . . .	2,181	2,324	2,284	2,259	0.2%
World total . . . . .	9,267	9,689	10,754	11,605	1.5%

Source: CRU International, WBMS

(1) Compound annual growth rate

From 1980 to 1995, refined copper production in Central and Eastern Europe showed only limited growth, with most of the increase attributable to a rise in copper output in Poland.

### Regional Imbalances

Significant disparities exist between the locations where copper is extracted, where it is refined and where it is ultimately consumed. For example, in 1995 only 10 per cent. of Western Europe's copper requirement was satisfied from the region's own mines and only 51 per cent. from the region's own refineries. Consequently, Western Europe is a major importer of refined copper.

The following table sets forth copper mine production, refined copper production and refined copper consumption for 1995.

	Copper mine Production	Refined Copper Production	Refined Copper Consumption
	(thousand tonnes)		
Africa . . . . .	636	538	117
Asia . . . . .	789	1,866	3,424
Latin America . . . . .	3,285	2,155	499
North America . . . . .	2,589	2,810	2,639
Oceania . . . . .	592	260	169
Western Europe . . . . .	346	1,717	3,381
Other countries . . . . .	1,802	2,259	1,545
World total . . . . .	10,039	11,605	11,774

Source: CRU International

## Prices

Copper is an internationally traded commodity the price of which is effectively established on the main terminal markets where it is traded including the LME and COMEX. The following table sets forth the average, high and low cash price per tonne for Grade A copper on the LME for the periods indicated. The currency of price quotation on the LME changed in 1993 from pounds sterling to U.S. dollars. Accordingly copper prices set forth below for the years up to and including 1992 are denominated in pounds sterling, while copper prices for subsequent periods are denominated in dollars.

	Average Cash Price	Low	High
	(in £ per tonne)		
1980 . . . . .	£ 942	£ 756	£ 1,375
1981 . . . . .	866	754	1,036
1982 . . . . .	846	685	934
1983 . . . . .	1,049	905	1,153
1984 . . . . .	1,031	942	1,141
1985 . . . . .	1,103	915	1,303
1986 . . . . .	965	865	1,028
1987 . . . . .	1,080	869	1,720
1988 . . . . .	1,460	1,120	2,006
1989 . . . . .	1,735	1,471	2,008
1990 . . . . .	1,497	1,256	1,815
1991 . . . . .	1,325	1,146	1,500
1992 . . . . .	1,297	1,111	1,506
	Average Cash Price	Low	High
	(in U.S.\$ per tonne)		
1993 . . . . .	\$ 1,790	\$ 1,596	\$ 2,009
1994 . . . . .	2,313	1,720	3,088
1995 . . . . .	2,937	2,716	3,235
1996 . . . . .	2,290	1,830	2,841
1997			
January . . . . .	2,435	2,255	2,574
February . . . . .	2,406	2,312	2,500
March . . . . .	2,421	2,364	2,487
April . . . . .	2,391	2,292	2,590
May . . . . .	2,517	2,374	2,616

Source: World Bureau of Metal Statistics

Historically, the price of copper has been affected primarily by levels of production and consumption, copper production costs, prevailing trends of inventory levels, and, to a lesser degree, inventory carrying costs (primarily costs of financing), international exchange rates and the actions of participants in the commodities markets. These factors have been of varying importance in influencing the prevailing price of copper and often have had divergent impacts on the price.

Production capacity increases in the early 1990s had an adverse impact on prices, particularly in 1993, when supply exceeded demand. A general recovery in the world economy in 1994 led to an increase in demand for copper which resulted in strong appreciation of copper prices in 1995 and the first half of 1996. As a result of market activity by a market participant who was suspended in mid 1996, copper prices prior to such suspension may have been artificially high. Following the publicity regarding this market activity, copper prices declined from approximately \$2,800 per tonne to approximately \$1,840 per tonne. Since the third quarter of 1996, copper prices have increased and on 2nd July, 1997 the cash price of copper per tonne quoted on the LME was \$2,509.

## The World Silver Market

Silver is an actively traded commodity in several markets throughout the world. The primary uses of silver are for jewellery and silverware, photography and industrial applications. Demand for such uses is referred to as "fabrication demand". Silver's main industrial applications include electronics, batteries and catalysts.

Since 1980, fabrication demand for silver worldwide has grown at 4.3 per cent. per annum to approximately 715 million troy ounces in 1995. The largest silver producing countries in 1995 were Mexico, Peru and the United States.

### ***Fabrication Demand for Silver***

Europe is the most significant market for silver accounting for approximately 220 million troy ounces of fabrication demand in 1995. North America and Asia are also important markets with fabrication demand exceeding 161 and 173 million troy ounces respectively, in 1995. In 1995, the United States, Japan and India together accounted for more than 45 per cent. of total world fabrication demand. Between 1980 and 1995, fabrication demand for industrial and decorative uses grew at a compound annual rate of 3.3 per cent. driven primarily by increased demand for silver in electrical and electronics applications. Silver consumption for photographic uses grew at 3.9 per cent. during this period. Between 1980 and 1995, silver consumption in jewellery and silverware increased at a compound annual growth rate of 11.4 per cent. as a result of strong demand for these products in North America, the Middle East and Asia.

The following table sets forth the silver fabrication demand for the periods indicated.

	Year ended 31st December,				CAGR <sup>(1)</sup> 1980-1995
	1980	1985	1990	1995	
	(million troy ounces, except percentages)				
Industrial and decorative. . . . .	137.8	135.8	186.9	222.8	3.3%
Photography . . . . .	123.8	152.7	196.5	221.2	3.9%
Jewellery/silverware . . . . .	47.9	55.5	124.9	241.2	11.4%
Coins . . . . .	15.0	13.4	29.8	22.0	2.6%
Other <sup>(2)</sup> . . . . .	54.8	37.2	6.3	7.9	-12.1%
<b>Total . . . . .</b>	<b>379.3</b>	<b>394.6</b>	<b>544.4</b>	<b>701.0</b>	<b>4.2%</b>

Source: CPM Group

(1) Compound annual growth rate

(2) Includes total demand for countries for which a breakdown by use is not available. The decline may thus be attributable to a change in the basis of collection of data rather than a decline in demand.

### ***Production of Silver***

In 1995, the top ten silver producing countries were Mexico, Peru, the United States, the countries of the former Soviet Union (including Russia), Canada, Chile, Poland, Australia, China and Bolivia. Together these countries accounted for approximately 86 per cent. of total world silver mine production.

Between 1980 and 1995, silver mine production in Europe declined slightly. The 2 per cent. average annual increase in silver production in North America during this period was primarily attributable to strong silver mine production growth in the United States and limited increases in production in Canada and Mexico. During this period, Latin America exhibited the highest rate of increase in silver mine production, primarily driven by the increase in mining activity in Chile, Peru and Bolivia.

The following table sets forth the production of refined silver for the periods indicated.

	Year ended 31st December,				CAGR <sup>(1)</sup> 1980-1995
	1980	1985	1990	1995	
	(thousand troy ounces, except percentages)				
Africa . . . . .	18,575	15,938	24,404	16,304	-0.9%
Asia . . . . .	14,668	20,325	12,105	17,222	1.1%
Latin America. . . . .	114,848	153,386	159,117	169,574	2.6%
North America . . . . .	66,719	77,842	110,862	89,550	2.0%
Oceania. . . . .	26,178	36,459	40,700	36,170	2.2%
Western Europe . . . . .	25,463	25,947	22,940	19,124	-1.9%
Other countries . . . . .	82,182	98,132	102,476	106,036	1.7%
<b>World total . . . . .</b>	<b>348,633</b>	<b>428,029</b>	<b>472,604</b>	<b>453,980</b>	<b>1.8%</b>

Source: CPM Group

(1) Compound annual growth rate



## Prices

Silver is an actively traded commodity in several markets throughout the world. Silver prices are quoted on the principal markets such as the LBM, COMEX, the Tokyo Commodities Exchange, the Chicago Board of Trade, the Mid America Commodity Exchange and the Winnipeg Commodity Exchange. Silver concentrate is also traded internationally and sold in third party transactions or produced for dedicated refineries.

The three primary price references are the LBM price, the COMEX price and the Handy & Harman price. The following table sets forth the yearly average, high and low spot prices for silver per troy ounce on the LBM for the periods indicated. The currency of price quotation on the LBM changed in 1993 from pounds sterling to U.S. dollars. Accordingly, silver prices set forth below for the years up to and including 1992 are denominated in pounds sterling while silver prices for subsequent periods are denominated in U.S. dollars.

	<i>Average Spot Price</i>	<i>Low</i>	<i>High</i>
	<i>(in £ per troy ounce)</i>		
1980 . . . . .	£ 9.01	£ 4.68	£ 21.65
1981 . . . . .	5.15	4.13	6.71
1982 . . . . .	4.23	2.85	6.85
1983 . . . . .	7.53	5.60	9.49
1984 . . . . .	6.08	5.29	6.89
1985 . . . . .	4.77	4.01	5.77
1986 . . . . .	3.72	3.18	4.52
1987 . . . . .	4.28	3.44	6.54
1988 . . . . .	3.68	3.28	4.58
1989 . . . . .	3.36	3.09	3.76
1990 . . . . .	2.73	2.04	3.24
1991 . . . . .	2.30	1.83	2.82
1992 . . . . .	2.25	1.83	2.54
	<i>Average Spot Price</i>	<i>Low</i>	<i>High</i>
	<i>(in U.S.\$ per troy ounce)</i>		
1993 . . . . .	\$ 4.31	\$ 3.92	\$ 5.42
1994 . . . . .	5.28	4.64	5.75
1995 . . . . .	5.20	4.42	6.04
1996 . . . . .	5.20	4.71	5.83
1997			
January . . . . .	4.77	4.65	5.03
February . . . . .	5.07	4.80	5.25
March . . . . .	5.20	5.09	5.31
April . . . . .	4.77	4.64	5.04
May . . . . .	4.75	4.66	4.87

Source: World Bureau of Metal Statistics

Historically, the price of silver has been affected primarily by the actions of bullion holders in the commodity markets, the levels of production and consumption, and, to a lesser extent, inventory carrying costs (primarily interest rates) and international exchange rates. These factors have been of varying importance in influencing the prevailing price of silver and often have had divergent impacts on the price.

Between 1980 and 1988, the yearly average spot prices for silver on the LBM declined from a high of approximately £9.01 per troy ounce to approximately £3.68 per troy ounce due to a significant release of silver stock onto the market. The pattern of trading since then has been one in which there is recurrent volatility within a price band ranging between \$4.30 and \$5.30 per troy ounce. There have been occasional rallies which have taken the price out of this range, but these have not been sustained. On 2nd July, 1997 the price of silver per troy ounce quoted on the LBM was \$4.65.