

Merchant Banking

# The silver book

June 2007



VM Group

Sponsored by Fortis

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## Introduction

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**Jessica Cross, CEO**

VM Group/MineLife  
London, June 2007

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This is the debut issue of The Silver Book – a record of past activities and a discussion of possible future developments in the international silver market, and sister report to The Yellow and White Books, which cover gold and platinum group metals respectively.

With the compliments of Fortis Bank, The Silver Book will be made available in June and December each year. The VM Group thanks Fortis Bank for recognising the rationale behind this publication.

Like its sister reports, The Silver Book is designed as a quick read but is backed up with data that can be referred to on an on-going basis. Each issue of The Silver Book will contain:

- A feature article specific to the silver industry. This debut publication looks at how VM Group has put together the statistics that appear in this report and comments on the implications these figures have on interpreting the past, current and future silver market. In particular, we question the conventional wisdom that maintains that the silver market has been characterised by years of metal deficits.
- A discussion of the efficiency with which silver is recycled from photographic waste, a sector we believe to have been underestimated over the years. This debut issue looks at how VM Group has modelled this sector.
- Statistical data series considering each sector of the identifiable silver market.

We remind readers that our data is available electronically in Microsoft Excel format – contact us by email with specific data requests at: [info@virtualmetals.co.uk](mailto:info@virtualmetals.co.uk).

### Housekeeping

- All volumes are in metric tonnes or troy ounces unless stated.
- All references to dollars are US dollars unless stated.
- For space saving in the data tables (production, scrap, and jewellery), countries registering small amounts of gold are grouped into “other”. Contact us if you need a detailed breakdown.
- Numbers in the tables have been independently rounded and, accordingly, may not add exactly to indicated totals and subtotals.

Jessica Cross  
CEO  
VM Group  
London, June 2007

## This time 5 years ago

*June 14th 2002*

*Daily fix: \$4.89/oz*

*Dollar to Sterling: 1.47*

*Yen to Dollar: 125.1*

*Euro to Dollar: 1.06*

*1 month lease rate: 0.72%*

**US Mint, June 2<sup>nd</sup> 2002:** According to mint statistics the US Mint's American Eagle silver bullion coinage program passed the 100 Moz sales mark. With an average London price fix of \$4.35/oz (since the programme's inception in 1983) total revenue from sales amounted to approximately \$517 million.

**Innovative Medical Services (IMS), April 1<sup>st</sup> 2002:** IMS has made an announcement regarding its silver based Axenohl product which could become an important non-toxic and non-irritant, over the counter topical remedy to kill off bacteria that can cause acne.

**Silver Institute, 18<sup>th</sup> April 2002:** Kodak are to introduce a camera called the Advantix EasyShare that will combine digital photography with traditional silver backed film. Customers will be able to receive prints from their retailer whilst maintaining a negative and also having the option of e-mailing the images as a digital picture.

**Reuters, May 23<sup>rd</sup> 2002:** According to the Peoples Bank of China, 21 types of silver coins along with a series of 10 commemorative precious metals coins will be issued throughout the year. More than 2 Moz of silver will be used to mint the coins, 474,000 oz more than in 2001.

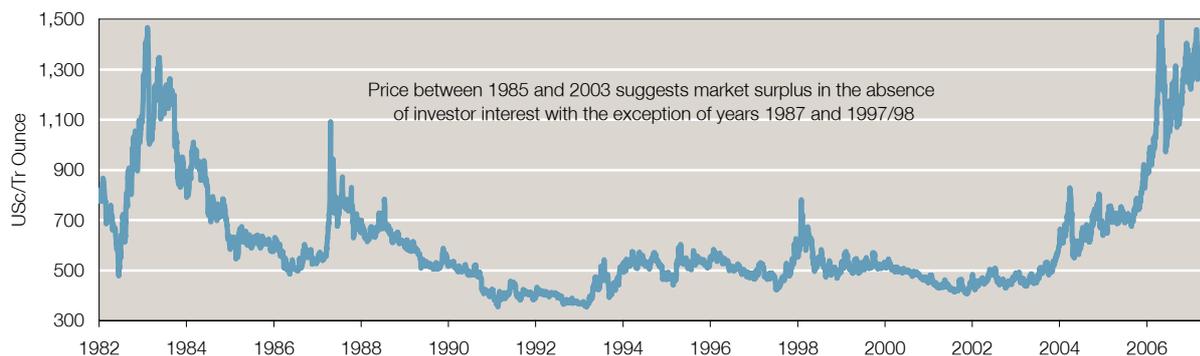
## Feature: Deficit? What deficit?

Jessica Cross and Gary Mead

VM Group  
London, June 2007

In 2000, an American-based precious metals investment website posed a very pertinent question concerning publicly available silver statistics: if the market is in deficit and had apparently been so for many years, why had the price not risen?<sup>1</sup> This is an entirely valid point – the accompanying chart covering the period 1982 to the current year, shows that the silver price from around late 1985 to 2003 languished between \$4 and \$6 per ounce (with the exceptional price rallies of 1987 and 1998). A market in persistent deficit yet prone to a consistently weak price flies in the face of economic theory. What was really going on?

### Silver, LBMA Fixing, USD



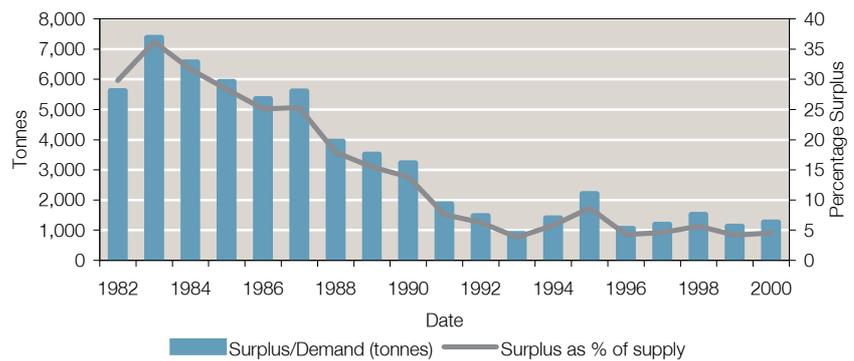
Source: Reuters Ecowin

This question we set out to answer by re-examining the silver industry from scratch, putting together an independent supply/demand imbalance going back to 1980. In line with the statistical methodology we apply to all commodities – metals, energy and agri-business – our supply/demand balances do not balance. Each sub-sector identifies what we **can** measure or proffer model-based estimates, the difference between any annual overall supply and demand being an indication of either a surplus or a deficit. These surpluses or deficits represent what we **cannot** measure (e.g. investment demand) or measure with any degree of certainty (e.g. disharding). Our residual therefore represents – in Donald Rumsfeld’s memorable phrase – the *known unknowns*; the inference being that this is metal either available (surplus) or not available (deficit) for investment. Markets in annual deficit rely on above ground stocks to alleviate the shortage in the underlying commodities. Markets in annual surplus see the levels of above-ground inventories rise.

Thus a supply/demand balance in large deficit, with anecdotal evidence of strong investment interest, could be expected to result in strong upward price pressure. Conversely, the price of a commodity whose market remains in surplus, with scant investment interest, might be expected to show a tendency to price weakness. This we believe is exactly what the status quo happened to be in the silver market for the years 1985-2003.

This next chart shows our calculated annual silver surplus for the period 1982-2000. The left hand axis shows it in tonnes and the right hand axis shows the surplus as a percent of annual supply. Interestingly, it shows a declining surplus over the period.

<sup>1</sup> Ted Butler’s [www.gold-eagle.com](http://www.gold-eagle.com)

**Surplus/deficit of silver supply**

Source: VM Group

What we are saying is that precious metals investors asking the question posed at the start of this argument should turn the question on its head. What they really need to be asking is – given the fact that the silver price has remained so low, how come the data shows this was a market in deficit?

In the first instance our answer is posited on some reconsideration of fundamental supply data. We believe that the recycling of silver from the photographic industry has always been more efficient than claimed. Our development of a detailed recycling model supported this and our methodology is discussed in more detail in the next section. Unlike e-waste, this industrial process tends to be concentrated geographically. Collection of the waste is much simpler and hence more efficient than with e-waste. Contrast the position of a recycler collecting photographic waste from film processors and hospitals with that of one faced with the task of collecting personal computers from millions of individual homes. Second, although there are high collection losses largely associated with low silver prices, there has always been an awareness of the potential value in photographic waste; a phenomenon which shows a high degree of price sensitivity.

Secondly, we also believe that silver jewellery offtake in many parts of the world, especially countries of the Indian subcontinent like Pakistan and throughout much of the Middle East, has been underestimated. Our analysis reveals a relationship between the volumes (as opposed to values) of gold jewellery and the silver jewellery bought in various countries and regions. In many parts of the Indian subcontinent silver is the first point of market entry with households intending to upgrade to gold, when and as soon as they can afford to. This implies that the ratio of silver to gold jewellery purchases in volume terms is high. It also implies that silver jewellery is readily sold back and recycled. Our analysis supports both these implications. These higher jewellery figures go some – but not all – of the way to mop up the higher recycling figures.

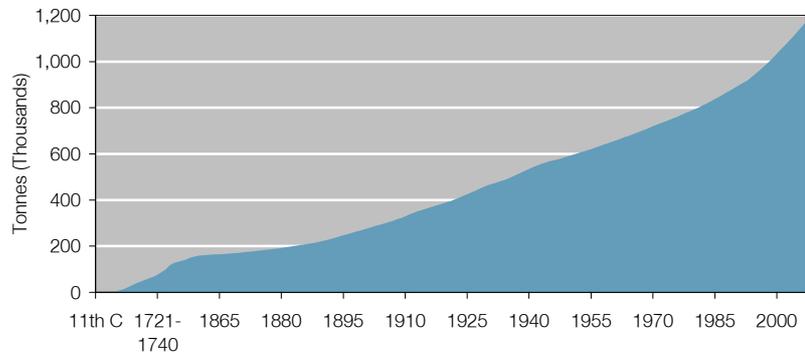
Thirdly, as a direct consequence of higher jewellery offtake in a sector which exhibits a high degree of price sensitivity, our jewellery recycling figures are higher than public domain figures.

Taking all these factors into account we conclude that the silver market during the period 1985-2003 was substantially more liquid than might have been the case. Our analysis suggests an inferred physical surplus which would be available for investment. But of course we know that for long periods the investor was conspicuously absent, and it therefore follows that the silver price showed such sluggish behaviour.

### Should this come as a surprise?

Not at all. With kind assistance from Tim Green, we have computed the total amount of silver we believe has been mined over time. Going back to the eleventh century, we estimate that this figure totals 1.17 million tonnes (Mt) of which the great majority was in the last 100 years.

#### Cumulative tonnes of silver mined



Source: *Virtual Metals extrapolated from various historical sources*

Given the relative value of silver and gold, we assume that losses of silver stocks are far greater than those of gold. If one accepts that at least 40% of the silver mined has over the years been lost, then above-ground stocks today can be estimated to amount to 700,000 tonnes of metal<sup>2</sup>. A good deal of this metal has been recycled many times over.

### But what of the future?

Since 2000, market circumstances have changed. Because of the levels of above-ground stocks, the silver market has and continues to be prone to surplus, in exactly the same way gold is. We must accept this as a chronic feature of the silver market. What has made the difference since 2000 is that the investor, like the Terminator, is back. Thus, in the midst of one of the strongest resource booms on record, investment interest could have easily absorbed surplus silver and asked for more, hence the recovery of the silver price and its upward trajectory.

We believe therefore that while the investment boom in commodities remains intact, the silver price is likely to remain high, in the \$10-15/oz range. This is despite the fact that we believe that the silver market remains in surplus.

In addition to the initial comments we note the following market features:

- Mine supply of silver is very largely dictated by the production of copper, lead and zinc and gold, the silver being recovered as a by-product to the other metals. This has always been the case and it is unlikely to change. The implication then is that silver mine production will remain largely insensitive to movements in the price of the metal.
- Industrial recycling computes at much higher levels than public domain data. Not only do we calculate that silver recovered from photographic waste is more efficient than previously thought, there is also recycling from electronic waste which is likely to become of increasing importance especially in the next three to four years. Our photographic recycling model is considered in more detail later in this report but of importance is the fact that the volumes of recycling from this sector will decline in future years in line with declining usage of traditional photographic film. This is the one supportive side-effect of the move to digital technology.

<sup>2</sup> Compared with our total of 154,000 tonnes of gold. See The Yellow Book, October 2006 edition.

- There are a number of new industrial end uses of silver beginning to emerge as commercially viable. These in general are predicated on silver's place as an effective biocide, and its conductivity. Our supply/demand balance to 2007 computes demand from these sectors at either zero or nominal volumes – essentially just setting the scene as a precursor of things to come. We expect many of them to grow rapidly from this zero base line and therefore any forecasting ought to take them into account. While collectively they are unlikely to take over where photography has left off in volume terms, their potential contribution to supporting the silver supply/demand profile should not be underestimated. Most important is that these end uses are unlikely to become the source of large amounts of future recycling of the metal.
- The VM Group acknowledges that it does not have a complete data series for silver coinage (now a relatively small sector), producer hedge positions (also relatively low figures) and the most recent official disposals of silver. These figures, especially the official sales, are difficult to obtain with any complete reliability; but we will update our data as and when we obtain more accurate information. This lack of data does not materially affect our conclusions, since much of the official disposals of silver (for example from the USA) occurred during the 1960s and 1970s and sales since then have been at much reduced levels. The country of most importance now remains China, which officially came off the silver standard in 1935. Other official holders of silver also appear to be Russia and India. As far as we are aware, there is no public domain data covering the levels of official silver inventories in these countries.

Four people were particularly helpful with this exercise of modelling the silver market. We thank in the first instance Rosemary Van Musschenbroek and Robin Adams formerly associated with MMRS and Martin Fewings of Xstrata. But we also extend very grateful thanks to Tim Green who scoured his attic; a veritable Aladdin's Cave of silver data.

## Silver recycling in photography – waste not, want not

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Students the world over find part time employment to financially tide them over their years of study, and I was no exception.

In the late 1970s I worked for a veterinary practice in the eastern suburbs of Johannesburg. The lead vet, Bill Warnes, was a very kindly man, treating his animal patients with respect and gentleness. He was, however, known for the occasional bout of ill-temper, invariably triggered by some financial misdemeanour – most commonly but not always unpaid bills on the part of pet owners. One incident in particular remains indelibly etched into my memory. One Saturday afternoon Dr Warnes ambled into the X-Ray room to find a newly appointed trainee nurse tidying up and looking rather pleased with herself as she emptied the mucky-looking contents of two large drums down the drain.

Warnes erupted and bellowed: “You silly girl! Don’t you know there is money in those drums?”

The nurse dissolved into tears, not understanding that the murky looking liquid sitting in two 20-gallon drums was the wash water from our X-Ray plates, awaiting collection by the suppliers of the practice’s X-Ray hardware. Every three months a van would appear, the drums would be loaded and taken away, and the practice would be credited for the contained silver.

I did what I normally did in the wake of a grumpy elderly man – I made Bill Warnes a cup of coffee, a remedy that never failed to restore his humour. But that was, essentially, my first experience of the photographic recycling industry. As a student of physical geography, economics and archaeology, this incident had little relevance for me but, with hindsight, it was a precursor of much more to come. It demonstrated that collection networks of photographic scrap have been efficient and well established for decades.

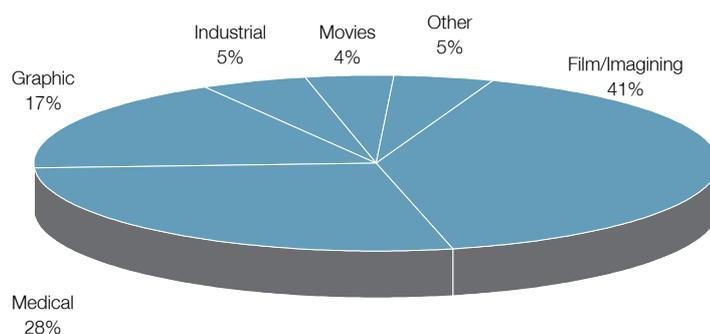
This anecdote has some relevance to this inaugural issue of The Silver Book, where we model the recycling of silver from the photographic industry. In doing this, a number of factors need to be considered.

### More to the photographic sector than meets the eye

First, we are dealing with six discrete end uses: the largest being film and imaging, followed by medical applications, graphic, industrial X-Rays, the movie industry and a catch-all, termed “other”, which includes all those more minor end users who do not fit into any of the previously mentioned categories.

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**Breakdown of photographic recycling by sector**




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Source: VM Group

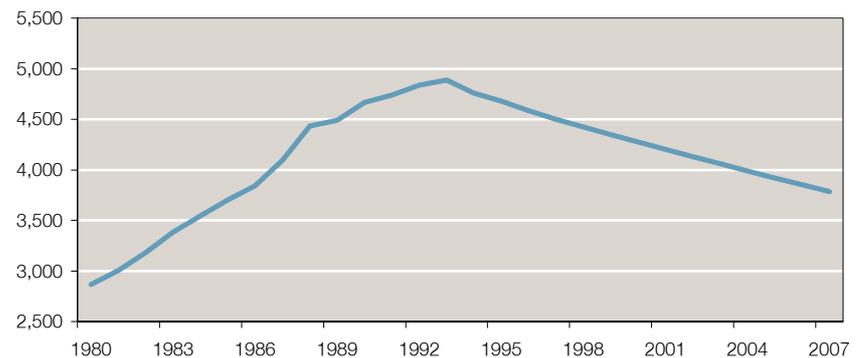
Second, in each of these sectors, we are also dealing with different products, namely, paper and film, both of which can either be black and white or colour, hence a total of four different products.

Third, the end products have different life lengths, some terminating in recycling sooner than others. The silver-rich residue from film and imaging is recycled almost immediately on film processing and therefore enters the secondary chain swiftly. Medical X-Rays tend to be kept on file in patients' records for some years and, therefore, there can be considerable lags before this type of silver scrap is returned.<sup>3</sup> But we also note that the process of film/X-Ray development results in recyclable silver residues – the murky liquid in 20-gallon drums.

And finally, there are recycling losses at every stage of the chain. In photo finishing, we have posited a massive 50%-60% loss of silver. It is historically the case since the low silver prices of the 1980s and 1990s, discouraged colour film processors from installing recovery systems into their processing plants. In other products, we assume that 40% of the contained silver goes down the drain and this again has much to do with the price of the metal. On top of that we make allowances for refining losses of between 5% and 10% which are standard throughout the precious metals secondary supply chain.

The global results of our analysis are shown in the following chart:

**Total photographic tonnes recycled**



Source: VM Group

The volumes of silver returned to the market from the photographic industry have been declining since they peaked in the mid-1990s. Moreover, as the next chart shows, the share of recycled silver from this sector has been declining relative to industrial and jewellery recycling. This trend is likely to remain – an indirect consequence of the growth of digital photography reducing the amount of silver now going into the industry on an annual basis. While off its peaks, however, the recovery of silver from the photographic industry in general will still represent around 10% of total annual supply of the metal.

<sup>3</sup> This is true for human medicine. At the vet, we did not keep X-Rays for long. Once we had established inbred spinal degeneration in a dachshund or hip displacement in a golden retriever, the treatment options were limited.

**Recycling supply by segment**



Source: VM Group

## The data

### The methodology

Some general comments we would like to make are that, in an industry characterised by large and permanent above-ground stocks, a silver supply/demand balance only attempts to record the additions made to those stocks in a calendar year, the destination of that new supply and the mobilisation of the existing stocks largely through recycling.

Furthermore, it has to be recognised that there are large swathes of the silver market which are largely unmeasurable and unverifiable.

These supply/demand balances are designed therefore to give overall general flows of metal between regions and sectors.

### The data sources

Our historical data sources include:

- Simba and Krishnan: The Saga of Silver, The Institute of Financial Management and Research, Madras, 1980.
- Tim Green, The Silver Millennium, electronic copyright, Virtual Metals Research & Consulting.
- The Samuel Montagu & Co Annual Bullion Reviews, 1968-1989 on which Tom Butler, a member of the VM team, worked for many years.
- Bullion imports into India compiled by Janet Long, covering 1925 to 1949.
- Raw Materials Group, Stockholm.
- The MMRS Silver Market Fundamentals Report compiled in August 1994.
- Stephen Fry, The Great Silver Bubble, Hodder and Stoughton, London, 1982.
- Eduard Kann, The Currencies of China, Kelly & Walsh, Shanghai, 1926.
- Benjamin White, Silver its History and Romance, Waterlow & Sons, London, 1920.
- Roy Jastram, Silver the Restless Metal, John Wiley and Sons, 1981.
- US Geological Annual Surveys, various years, archived.
- Silver Trade Data back to the early 1990s.
- Mine supply – data collated from Raw Materials Group, company reports, ABARE, USBM, China Gold Association and newswires.
- Scrap recycling – Data from refineries and industry participants. The VM Group has modelled the recycling of photographic and electronic waste and has made estimates of jewellery recycling based on silver price movements and market information.
- Photographic – Base data from the MMRS Silver Report 1994, with permission and extrapolated using market information and the analysis of annual reports of major manufacturers of film and photographic products.
- Jewellery consumption – Base data from the MMRS Silver Report 1994, with permission. Individual country data series further estimated by the VM Group from our understanding of the individual markets, discussions with the bullion banks active in various physical markets, jewellery wholesalers, hallmarking figures where available, and trade data, which is subject to interpretation but gives direction of physical flows.  
Data further derived from the comparison of gold and silver jewellery data and an analysis of country-by-country and regional gold/silver volumes in this sector.
- Electrical/Electronics – Data series derived by the VM Group, based on work relating to the electronics industry when studying the pgm industry and the recycling of electronic scrap.

- Exchange traded funds – Data series from published data.
- Brazing Alloys and Bearings – Base data from the MMRS Silver Report 1994, with permission and modelled by the VM Group.
- Batteries – VM Group primary research commissioned by The Silver Institute.
- New Industrial End Uses – VM Group primary research commissioned by The Silver Institute.

#### **The residual**

The overall supply/demand balance does not balance. The difference between supply and demand (negative is demand exceeding supply), we term the residual. The residual is an acknowledgement that a) omniscience about this market is impossible, and to pretend otherwise is misleading b) there are silver flows of considerable magnitude associated with the unofficial market, such as smuggled or stolen metal which cannot be verified and c) there are sectors which cannot be measured and therefore we do not pretend otherwise; these include “investment” or “bar hoarding”, which is the purchase of silver in bar form.

The residual also does not reflect the net long or short positions held by the hedge funds or the speculators over year-end. While CFTC data gives an indication of outstanding positions on COMEX, it is not possible to put a number on the net longs or shorts in the OTC market.

## Physical supply and demand, world total and by region, 2001-2007f

## World total supply/demand imbalances (tonnes, 2001-2007f)

	2001	2002	2003	2004	2005	2006	2007f
<b>Supply</b>							
Mine supply	18,950	18,833	18,874	19,342	19,910	20,911	20,896
Recycling - Jewellery	2,659	3,302	3,285	3,800	2,961	4,164	3,348
Recycling - Photographic	4,204	4,132	4,060	3,990	3,921	3,852	3,785
Recycling - Coin Melt	137	135	134	133	131	130	129
Recycling - Other Industrial	2,336	2,920	3,650	4,563	5,124	5,722	6,360
Government disposals	500	500	500	500	500	500	500
<b>Total supply</b>	<b>28,785</b>	<b>29,823</b>	<b>30,504</b>	<b>32,327</b>	<b>32,548</b>	<b>35,280</b>	<b>35,017</b>
<b>Demand</b>							
Jewellery and Silverware	11,458	10,666	10,265	10,491	11,142	8,659	8,801
Photographic	5,832	5,747	5,664	5,582	5,501	5,421	5,343
Electrical/Electronics	4,258	4,479	4,711	4,956	5,640	5,901	6,207
Brazing Alloys	1,122	1,143	1,164	1,187	1,209	1,232	1,255
Catalysts	1,414	1,428	1,442	1,457	1,471	1,486	1,501
Others:	1,964	2,183	2,429	2,721	2,878	3,031	4,019
- Solar Panels	478	562	661	778	840	907	980
- Water Purification	382	449	529	622	672	726	784
- Wood Preservatives	0	0	0	0	0	0	778
- Batteries	439	448	457	467	476	485	495
- Mirrors/Reflective Glass	439	448	457	467	476	485	495
- Plasma Screens	191	225	264	311	317	324	330
- Food Hygiene	5	10	10	16	23	35	52
- Medical Applications	15	15	20	25	31	39	49
- Radio Frequency Tags	0	10	15	21	27	14	25
- Bearings	16	16	16	16	16	16	16
- Detox, chemical	0	0	0	0	0	0	16
- Fibre/Textiles	0	0	0	0	0	0	0
ETF	0	0	0	0	0	3,768	2,000
Coins	275	326	285	299	261	310	255
<b>Total demand</b>	<b>26,323</b>	<b>25,971</b>	<b>25,961</b>	<b>26,692</b>	<b>28,103</b>	<b>29,809</b>	<b>29,381</b>
<b>Residual (supply less demand)</b>	<b>2,463</b>	<b>3,851</b>	<b>4,543</b>	<b>5,635</b>	<b>4,445</b>	<b>5,471</b>	<b>5,636</b>

Source: VM Group

Note: Because of rounding of individual items the total might not equal the sum of the subtotals

## Mine production (tonnes, 2001 – 2007f)

	2001	2002	2003	2004	2005	2006	2007f
Morocco	279.3	276.8	200.5	210.0	230.0	230.0	230.0
South Africa	109.4	113.1	80.0	73.0	75.0	75.0	75.0
Congo (Dem Rep)	35.7	69.7	69.7	69.7	45.6	45.6	45.0
Zambia	6.0	6.0	7.0	10.0	10.0	10.0	10.0
Ghana	3.4	1.6	1.8	3.0	3.0	3.0	3.0
Tunisia	3.5	3.0	3.0	3.0	3.0	3.0	3.0
Algeria	1.5	1.5	1.5	1.0	1.0	1.0	1.0
Zimbabwe	1.8	2.6	0.8	0.5	0.5	0.5	0.5
<b>Total Africa</b>	<b>440.6</b>	<b>474.3</b>	<b>364.3</b>	<b>370.2</b>	<b>368.1</b>	<b>368.1</b>	<b>367.5</b>
China	1,450.0	1,400.0	2,000.0	2,450.0	2,500.0	2,540.0	2,600.0
Indonesia	348.0	220.0	260.0	262.0	270.0	270.0	270.0
Japan	80.5	100.0	100.0	86.0	70.0	70.0	70.0
North Korea	50.0	40.0	40.0	40.0	40.0	40.0	40.0
Mongolia	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Thailand	1.2	18.1	15.0	10.9	14.3	15.0	15.0
Philippines	33.6	8.8	9.3	10.0	10.0	10.0	10.0
Myanmar	6.0	6.0	6.0	6.0	6.0	6.0	6.0
<b>Total Asia</b>	<b>1,989.3</b>	<b>1,812.9</b>	<b>2,450.3</b>	<b>2,884.9</b>	<b>2,930.3</b>	<b>2,971.0</b>	<b>3,031.0</b>
Australia	1,970.0	2,120.0	1,870.0	1,373.0	1,300.0	2,407.0	2,500.0
Papua New Guinea	69.6	64.0	62.0	53.8	51.3	51.3	50.0
New Zealand	27.1	29.0	25.0	30.0	40.0	40.0	40.0
Fiji	2.1	2.0	2.0	2.0	2.0	2.0	2.0
<b>Total Australasia</b>	<b>2,068.8</b>	<b>2,215.0</b>	<b>1,959.0</b>	<b>1,458.8</b>	<b>1,393.3</b>	<b>2,500.3</b>	<b>2,592.0</b>
Russia	650.0	770.0	850.0	1,000.0	1,200.0	1,200.0	1,200.0
Kazakhstan	900.0	900.0	700.0	708.0	800.0	800.0	800.0
Bulgaria	25.0	25.0	25.0	70.0	70.0	70.0	70.0
Uzbekistan	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Romania	35.0	35.0	30.0	30.0	30.0	30.0	30.0
Macedonia	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Serbia	6.0	5.0	5.0	5.0	5.0	5.0	5.0
<b>Total Eastern Europe</b>	<b>1,686.0</b>	<b>1,805.0</b>	<b>1,680.0</b>	<b>1,883.0</b>	<b>2,175.0</b>	<b>2,175.0</b>	<b>2,175.0</b>
Poland	1,231.0	1,230.0	1,250.0	1,300.0	1,373.0	1,300.0	1,300.0
Sweden	306.0	320.8	330.0	319.6	310.0	310.0	300.0
Turkey	188.0	124.0	120.0	150.0	150.0	150.0	150.0
Yugoslavia	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Portugal	23.1	24.0	24.0	24.0	25.0	25.0	25.0
Finland	10.0	15.0	15.0	20.0	20.0	20.0	20.0
Greece	62.4	74.8	70.0	50.0	40.0	20.0	20.0
Ireland	8.7	15.0	15.0	20.0	20.0	20.0	20.0
Spain	52.1	10.0	5.0	3.6	3.5	3.5	3.5
France	0.9	0.7	0.7	0.7	0.7	0.7	0.7
<b>Total Western Europe</b>	<b>1,942.2</b>	<b>1,874.3</b>	<b>1,889.7</b>	<b>1,947.8</b>	<b>2,002.2</b>	<b>1,909.2</b>	<b>1,899.2</b>
India	57.7	59.5	60.0	60.0	60.0	60.0	60.0
<b>Total Indian sub-continent</b>	<b>57.7</b>	<b>59.5</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>	<b>60.0</b>
Mexico	3,030.0	3,146.0	2,946.0	3,093.0	3,213.0	3,212.0	3,200.0
Peru	2,673.0	2,686.6	2,921.0	3,060.0	3,060.0	3,193.0	3,000.0
Chile	1,349.0	1,210.0	1,313.0	1,275.0	1,360.0	1,380.0	1,375.0
Bolivia	408.0	450.0	450.0	425.0	411.3	420.0	400.0
Argentina	152.8	135.0	150.0	155.0	160.0	160.0	160.0
Honduras	46.8	52.9	51.0	48.2	53.6	53.6	50.0
Colombia	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Brazil	10.0	10.0	10.0	6.2	5.0	5.0	5.0
Nicaragua	2.5	3.0	3.0	3.0	3.0	3.0	3.0
<b>Total Latin America</b>	<b>7,680.1</b>	<b>7,701.5</b>	<b>7,852.0</b>	<b>8,073.4</b>	<b>8,273.9</b>	<b>8,434.6</b>	<b>8,201.0</b>
Iran	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Saudi Arabia	10.0	10.0	10.0	10.0	10.0	10.0	10.0
<b>Total Middle East</b>	<b>70.0</b>						
USA	1,740.0	1,420.0	1,240.0	1,250.0	1,300.0	1,300.0	1,300.0
Canada	1,275.6	1,401.0	1,309.0	1,344.0	1,337.5	1,123.0	1,200.0
<b>Total North America</b>	<b>3,015.6</b>	<b>2,821.0</b>	<b>2,549.0</b>	<b>2,594.0</b>	<b>2,637.5</b>	<b>2,423.0</b>	<b>2,500.0</b>
<b>World total</b>	<b>18,950.3</b>	<b>18,833.5</b>	<b>18,874.3</b>	<b>19,342.1</b>	<b>19,910.3</b>	<b>20,911.2</b>	<b>20,895.7</b>

Source: VM Group

**Photographic recycling (tonnes, 2001 – 2007f)**

	2001	2002	2003	2004	2005	2006	2007f
Imaging	1,919.8	1,844.9	1,772.9	1,703.8	1,637.5	1,573.7	1,512.5
Medical	993.4	1,008.4	1,023.5	1,038.9	1,054.5	1,070.4	1,086.6
Graphic	729.0	718.4	708.0	697.7	687.6	677.6	667.8
Industrial	196.8	193.9	191.1	188.3	185.6	182.9	180.2
Other	195.4	192.5	189.7	187.0	184.3	181.6	179.0
Movies	169.2	173.4	175.2	174.5	171.4	166.2	158.7
<b>Total</b>	<b>4,203.6</b>	<b>4,131.6</b>	<b>4,060.4</b>	<b>3,990.2</b>	<b>3,920.9</b>	<b>3,852.4</b>	<b>3,784.9</b>

Source: VM Group

## Jewellery recycling (tonnes, 2001 – 2007f)

	2001	2002	2003	2004	2005	2006	2007f
Algeria	10.0	13.0	13.0	13.5	10.0	20.4	11.2
Tunisia	6.5	7.3	6.9	7.1	7.6	8.2	5.0
Total Africa	16.5	20.3	19.9	20.6	17.6	28.6	16.2
Thailand	500.0	539.1	538.2	537.3	508.5	521.5	406.8
Indonesia	44.6	73.7	73.1	79.7	97.9	173.8	141.4
Japan	140.0	135.0	132.1	128.7	129.5	155.7	109.8
China	60.9	82.9	79.4	81.2	57.0	70.6	77.9
South Korea	50.0	60.0	60.0	66.7	50.0	101.7	59.0
Malaysia	31.3	45.0	45.0	45.0	54.6	54.9	34.9
Singapore	18.8	30.0	30.0	37.5	25.0	46.0	29.5
Philippines	18.8	30.0	26.3	26.3	26.5	26.8	17.1
Hong Kong	0.4	0.6	0.4	0.5	0.3	0.5	0.3
<b>Total Asia</b>	<b>864.6</b>	<b>996.4</b>	<b>984.4</b>	<b>1,002.8</b>	<b>949.2</b>	<b>1,151.5</b>	<b>876.6</b>
Australia	7.5	7.5	7.5	10.0	7.5	9.4	8.8
<b>Total Australasia</b>	<b>7.5</b>	<b>7.5</b>	<b>7.5</b>	<b>10.0</b>	<b>7.5</b>	<b>9.4</b>	<b>8.8</b>
Russia	50.0	56.3	56.3	56.3	65.6	66.3	56.3
<b>Total Eastern Europe</b>	<b>50.0</b>	<b>56.3</b>	<b>56.3</b>	<b>56.3</b>	<b>65.6</b>	<b>66.3</b>	<b>56.3</b>
Italy	219.8	299.4	299.0	328.2	244.0	296.5	276.7
Turkey	293.7	327.6	287.1	335.6	186.7	519.0	256.0
Germany	44.2	53.8	43.4	50.8	37.2	50.5	53.2
Spain	34.9	34.2	35.4	50.7	41.0	50.2	40.2
France	8.7	10.5	10.6	11.6	9.0	11.0	9.6
Sweden	3.3	4.7	4.7	9.5	6.7	8.1	7.3
Switzerland	5.0	6.0	5.0	5.7	4.3	5.7	5.3
UK & Ireland	3.2	5.1	4.7	4.8	3.7	4.4	4.2
Austria	3.0	3.9	3.9	4.2	2.9	3.5	3.6
Belgium	2.0	2.9	2.9	3.3	2.9	3.5	3.4
Greece	3.3	3.9	3.9	4.8	3.2	0.0	3.0
Denmark	1.4	4.5	4.4	4.4	2.7	3.2	2.7
Portugal	2.0	2.4	2.4	3.9	2.0	2.4	2.1
Cyprus	1.7	2.0	2.0	3.3	1.7	2.1	1.5
Norway	1.4	1.4	1.4	2.6	1.3	1.6	1.3
Yugoslavia	0.5	0.6	0.6	1.2	1.0	1.2	1.2
Netherlands	0.5	0.6	0.6	1.0	0.5	0.6	0.5
<b>Total Western Europe</b>	<b>628.8</b>	<b>763.5</b>	<b>712.0</b>	<b>825.7</b>	<b>550.6</b>	<b>963.5</b>	<b>672.1</b>
India	399.0	546.6	594.3	738.0	510.4	722.7	723.5
Pakistan	66.0	111.0	109.7	151.9	93.4	109.3	120.2
Bangladesh	7.5	20.0	20.0	35.5	18.8	35.8	20.3
Sri Lanka	2.5	7.5	7.5	10.0	7.5	7.5	4.5
<b>Total Indian sub-continent</b>	<b>475.0</b>	<b>685.1</b>	<b>731.5</b>	<b>935.4</b>	<b>630.1</b>	<b>875.3</b>	<b>868.5</b>
Brazil	33.3	46.7	46.7	66.7	40.0	52.8	49.0
Mexico	33.3	53.3	53.3	53.3	33.3	49.0	36.9
Chile	25.1	28.1	30.8	31.1	31.1	31.5	27.0
Peru	28.2	28.2	28.2	28.2	29.2	29.6	25.2
Colombia	14.4	14.9	15.4	15.9	15.9	16.1	13.5
Argentina	22.7	22.7	22.7	22.7	22.7	22.7	8.5
Venezuela	10.7	10.7	8.7	8.7	8.7	8.8	7.6
<b>Total Latin America</b>	<b>167.8</b>	<b>204.6</b>	<b>205.9</b>	<b>226.6</b>	<b>180.9</b>	<b>210.6</b>	<b>167.6</b>
Saudi Arabia	146.7	172.4	145.3	177.8	156.9	278.3	222.5
Iraq	33.7	51.2	94.0	148.3	97.6	121.8	107.4
Egypt	52.7	77.3	74.8	81.3	50.6	101.2	65.0
Iran	18.2	26.8	26.7	49.3	36.0	54.3	49.0
Kuwait	37.5	54.3	49.9	61.0	51.3	65.6	47.3
Arab Emirates	15.6	27.8	24.2	34.9	25.3	47.4	30.2
Lebanon	13.1	15.1	13.4	19.6	11.9	23.9	15.6
Israel	3.6	3.4	3.3	3.7	3.7	2.8	3.2
<b>Total Middle East</b>	<b>321.2</b>	<b>428.1</b>	<b>431.7</b>	<b>575.9</b>	<b>433.2</b>	<b>695.4</b>	<b>540.1</b>
USA	102.7	115.6	111.5	117.4	102.2	133.0	115.2
Canada	24.9	24.7	24.6	29.2	24.4	30.4	26.6
<b>Total North America</b>	<b>127.6</b>	<b>140.3</b>	<b>136.0</b>	<b>146.5</b>	<b>126.6</b>	<b>163.4</b>	<b>141.8</b>
<b>World Total</b>	<b>2,658.9</b>	<b>3,302.1</b>	<b>3,285.2</b>	<b>3,799.8</b>	<b>2,961.3</b>	<b>4,164.0</b>	<b>3,348.0</b>

Source: VM Group

**Jewellery consumption (tonnes, 2001 – 2007f)**

	2001	2002	2003	2004	2005	2006	2007f
Morocco	22.6	22.6	22.0	22.0	22.3	20.5	20.5
South Africa	11.7	12.4	13.1	14.7	14.5	22.6	13.0
Libya	12.6	13.1	13.3	13.0	13.3	13.4	8.0
Algeria	13.9	13.9	13.3	13.3	13.5	13.7	8.0
Tunisia	8.1	8.6	8.2	7.9	8.4	8.6	5.3
<b>Total Africa</b>	<b>68.9</b>	<b>70.5</b>	<b>69.8</b>	<b>70.9</b>	<b>71.9</b>	<b>78.8</b>	<b>54.8</b>
China	635.7	609.7	585.9	582.0	680.5	633.5	648.8
Thailand	600.0	599.0	598.0	597.0	565.0	440.0	452.0
Indonesia	202.8	204.6	203.2	205.0	207.1	144.3	146.8
Japan	153.3	150.0	146.8	143.0	143.9	121.5	122.0
South Korea	175.0	125.0	125.0	125.0	130.0	78.0	78.7
Afghanistan	78.5	75.3	68.8	70.0	77.3	79.9	63.6
Vietnam	50.0	62.5	62.5	62.5	62.5	51.8	62.5
Afghanistan	65.4	62.7	57.3	58.3	64.4	51.3	53.0
Malaysia	92.2	92.0	69.2	69.0	72.8	46.3	46.5
Singapore	60.1	60.0	47.3	47.2	48.6	32.5	32.8
Taiwan	32.9	31.1	29.3	27.5	27.3	22.4	22.4
Myanmar	30.3	31.3	29.1	31.6	31.6	20.0	20.5
Philippines	32.3	203.0	29.2	29.2	29.5	18.8	19.0
Cambodia	25.0	25.0	25.0	25.0	25.0	15.3	15.3
Hong Kong	11.3	7.5	7.5	7.5	7.5	6.5	6.5
Nepal	8.8	8.8	8.8	8.8	8.8	5.3	5.5
<b>Total Asia</b>	<b>2,253.3</b>	<b>2,347.3</b>	<b>2,092.7</b>	<b>2,088.3</b>	<b>2,181.7</b>	<b>1,767.1</b>	<b>1,795.7</b>
Australia	15.0	12.5	12.5	12.5	13.8	11.8	11.8
<b>Total Australasia</b>	<b>15.0</b>	<b>12.5</b>	<b>12.5</b>	<b>12.5</b>	<b>13.8</b>	<b>11.8</b>	<b>11.8</b>
Russia	75.0	75.0	75.0	75.0	87.5	74.5	75.0
Uzbekistan	3.1	2.8	2.5	2.3	2.4	1.5	1.3
Croatia	3.1	2.8	2.5	2.3	2.4	1.5	1.3
Bulgaria	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Estonia	3.1	2.8	2.5	2.3	2.4	0.5	0.5
<b>Total Eastern Europe</b>	<b>85.1</b>	<b>84.2</b>	<b>83.3</b>	<b>82.5</b>	<b>95.5</b>	<b>78.8</b>	<b>78.8</b>
Italy	1,178.5	1,050.1	922.3	847.0	851.0	811.0	804.0
Germany	552.8	541.8	589.8	584.5	574.0	501.2	507.0
Turkey	407.0	403.5	560.5	642.5	688.0	445.5	465.5
Spain	172.6	151.0	149.6	148.6	136.9	130.0	130.3
France	98.4	91.2	86.7	79.8	87.2	83.2	82.8
Switzerland	64.7	65.9	72.9	72.7	71.7	63.7	64.4
Portugal	58.1	57.8	57.5	57.4	57.2	57.2	57.6
UK & Ireland	69.9	64.4	59.5	59.9	56.9	56.9	57.0
Greece	34.8	32.3	33.3	34.3	36.0	29.4	29.7
Sweden	22.0	20.0	18.1	15.7	16.7	16.7	16.0
Austria	10.9	10.1	9.4	8.5	9.3	9.0	9.0
Belgium	9.1	8.7	8.2	8.0	8.7	8.5	8.6
Finland	8.3	8.3	8.3	8.3	8.3	8.0	8.0
Netherlands	9.6	9.0	8.4	7.8	7.7	7.4	7.4
Poland	6.3	6.5	7.0	7.0	7.0	6.7	6.8
Denmark	8.4	7.7	7.0	6.4	6.3	6.0	6.0
Norway	8.4	7.7	7.0	6.4	6.7	6.7	6.0
Cyprus	6.7	6.7	6.7	6.7	6.7	5.0	5.0
Yugoslavia	3.4	3.4	3.2	3.0	2.9	2.9	2.9
Hungary	3.3	3.0	2.8	2.5	2.6	2.6	2.5
Malta	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Czechoslovakia	2.0	2.0	2.0	2.0	2.2	2.1	2.1
Romania	0.9	1.0	1.0	1.0	1.0	1.0	1.0
<b>Total Western Europe</b>	<b>2,738.6</b>	<b>2,554.7</b>	<b>2,623.6</b>	<b>2,612.4</b>	<b>2,647.5</b>	<b>2,263.2</b>	<b>2,282.1</b>
India	3,065.5	2,524.5	2,413.5	2,628.5	2,857.5	2,009.0	2,067.0
Pakistan	510.3	450.1	444.9	471.9	501.0	333.5	343.5
Bangladesh	245.0	203.8	177.5	185.0	164.5	107.5	110.0
Others	17.5	17.5	17.5	17.5	17.5	17.9	18.0
Sri Lanka	25.0	25.0	12.5	12.5	12.5	7.5	7.5
<b>Total Indian sub-continent</b>	<b>3,863.3</b>	<b>3,220.9</b>	<b>3,065.9</b>	<b>3,315.4</b>	<b>3,553.0</b>	<b>2,475.4</b>	<b>2,546.0</b>

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**Jewellery consumption (tonnes, 2001 – 2007f)**

	2001	2002	2003	2004	2005	2006	2007f
Mexico	182.4	182.4	182.4	182.4	182.7	155.3	158.7
Brazil	73.1	73.1	73.1	73.3	80.0	68.0	70.0
Chile	27.9	31.2	34.3	34.5	34.7	29.3	30.0
Peru	31.3	31.3	31.3	31.3	32.7	28.0	28.0
Dominican Republic	28.4	28.4	28.4	28.4	28.4	24.0	24.0
Bolivia	21.2	21.2	21.2	21.2	21.3	18.0	18.0
Colombia	19.2	19.9	20.5	21.2	21.3	18.0	18.0
Venezuela	17.9	17.9	14.5	14.5	14.7	12.7	12.7
Ecuador	14.5	14.5	14.5	14.5	13.3	11.3	11.3
Argentina	10.7	10.7	10.7	10.7	10.7	10.7	10.7
<b>Total Latin America</b>	<b>426.5</b>	<b>430.5</b>	<b>430.9</b>	<b>432.1</b>	<b>439.7</b>	<b>375.3</b>	<b>381.3</b>
Saudi Arabia	335.4	327.9	298.6	300.7	400.0	286.0	296.8
Egypt	222.5	222.6	184.5	188.9	214.5	137.0	144.5
Iraq	100.0	120.3	130.4	123.5	139.0	110.0	113.0
Iran	117.5	117.5	138.8	128.5	150.8	94.8	98.0
Arab Emirates	79.2	79.1	87.8	94.0	107.8	72.8	75.5
Lebanon	66.3	71.8	71.4	74.8	95.3	60.0	62.3
Syria	67.5	63.8	74.0	80.5	86.0	55.8	58.3
Yemen	67.2	67.7	65.1	67.2	83.3	55.5	58.0
Kuwait	61.2	61.3	64.4	67.6	77.0	48.0	49.8
Jordan	59.7	59.3	64.0	68.3	72.5	45.5	47.5
Israel	4.5	4.2	4.2	4.6	4.5	3.8	4.0
<b>Total Middle East</b>	<b>1,181.1</b>	<b>1,195.5</b>	<b>1,183.2</b>	<b>1,198.5</b>	<b>1,430.5</b>	<b>969.0</b>	<b>1,007.5</b>
USA	732.0	658.3	615.7	592.3	620.3	556.2	558.0
Canada	94.0	91.2	88.0	86.0	88.5	84.0	85.0
<b>Total North America</b>	<b>826.0</b>	<b>749.5</b>	<b>703.7</b>	<b>678.3</b>	<b>708.8</b>	<b>640.2</b>	<b>643.0</b>
<b>World Total</b>	<b>11,457.7</b>	<b>10,665.5</b>	<b>10,265.4</b>	<b>10,491.0</b>	<b>11,142.5</b>	<b>8,659.5</b>	<b>8,800.9</b>

Source: VM Group

**Photographic demand (tonnes, 2001 – 2007f)**

	2001	2002	2003	2004	2005	2006	2007f
Japan	1,594.1	1,570.2	1,546.7	1,523.5	1,500.6	1,478.1	1,455.9
China	90.1	91.5	92.8	94.2	95.6	97.1	98.5
<b>Total Asia</b>	<b>1,684.2</b>	<b>1,661.7</b>	<b>1,639.5</b>	<b>1,617.7</b>	<b>1,596.3</b>	<b>1,575.2</b>	<b>1,554.5</b>
Belgium	592.8	583.9	575.2	566.5	558.0	549.7	541.4
Germany	416.5	410.2	404.1	398.0	392.0	386.2	380.4
UK & Ireland	363.3	357.9	352.5	347.2	342.0	336.9	331.8
France	319.9	315.1	310.4	305.7	301.1	296.6	292.2
Italy	69.1	68.1	67.1	66.1	65.1	64.1	63.1
Spain	68.2	67.2	66.2	65.2	64.2	63.3	62.3
<b>Total Western Europe</b>	<b>1,829.8</b>	<b>1,802.4</b>	<b>1,775.3</b>	<b>1,748.7</b>	<b>1,722.5</b>	<b>1,696.6</b>	<b>1,671.2</b>
<b>Total Latin America</b>	<b>280.9</b>	<b>276.7</b>	<b>272.5</b>	<b>268.4</b>	<b>264.4</b>	<b>260.5</b>	<b>256.5</b>
USA	1,774.0	1,747.4	1,721.2	1,695.4	1,669.9	1,644.9	1,620.2
Canada	263.2	259.2	255.3	251.5	247.7	244.0	240.4
<b>Total North America</b>	<b>2,037.2</b>	<b>2,006.6</b>	<b>1,976.5</b>	<b>1,946.9</b>	<b>1,917.7</b>	<b>1,888.9</b>	<b>1,860.6</b>
<b>World Total</b>	<b>5,832.1</b>	<b>5,747.4</b>	<b>5,663.9</b>	<b>5,581.7</b>	<b>5,500.8</b>	<b>5,421.2</b>	<b>5,342.8</b>

Source: VM Group

**Electrical/Electronic demand (tonnes, 2001 – 2007)**

	2001	2002	2003	2004	2005	2006	2007f
Japan	1,018.6	1,069.5	1,123.0	1,179.2	1,341.9	1,409.0	1,479.4
Taiwan	295.7	310.5	326.0	342.3	389.5	409.0	429.5
China	237.0	255.9	276.4	298.5	339.7	366.9	396.3
South Korea	147.8	155.2	163.0	171.1	194.8	204.5	214.7
Others	73.9	77.6	81.5	85.6	97.4	102.3	107.4
<b>Total Asia</b>	<b>1,773.0</b>	<b>1,868.8</b>	<b>1,969.9</b>	<b>2,076.7</b>	<b>2,363.3</b>	<b>2,491.6</b>	<b>2,627.2</b>
Germany	470.5	494.1	518.8	544.7	619.9	650.9	683.4
France	250.0	262.5	275.6	289.4	329.3	345.8	363.1
Others	167.1	175.4	184.2	193.4	220.1	231.1	242.7
Italy	165.8	174.0	182.7	191.9	218.4	229.3	240.7
UK & Ireland	165.8	174.0	182.7	191.9	218.4	229.3	240.7
<b>Total Western Europe</b>	<b>1,219.1</b>	<b>1,280.1</b>	<b>1,344.1</b>	<b>1,411.3</b>	<b>1,606.0</b>	<b>1,686.3</b>	<b>1,770.6</b>
India	307.5	323.7	340.8	358.7	408.2	397.5	417.4
<b>Total Indian sub-continent</b>	<b>307.5</b>	<b>323.7</b>	<b>340.8</b>	<b>358.7</b>	<b>408.2</b>	<b>397.5</b>	<b>417.4</b>
USA	919.7	965.7	1,013.9	1,064.6	1,211.6	1,272.1	1,335.8
Canada	38.8	40.7	42.7	44.9	51.1	53.6	56.3
<b>Total North America</b>	<b>958.4</b>	<b>1,006.4</b>	<b>1,056.7</b>	<b>1,109.5</b>	<b>1,262.6</b>	<b>1,325.8</b>	<b>1,392.1</b>
<b>World Total</b>	<b>4,258.1</b>	<b>4,479.0</b>	<b>4,711.4</b>	<b>4,956.2</b>	<b>5,640.2</b>	<b>5,901.2</b>	<b>6,207.3</b>

Source: VM Group

**Brazing Alloys demand (tonnes, 2001 – 2007f)**

	2001	2002	2003	2004	2005	2006	2007f
China	172.2	176.5	180.9	185.4	190.0	194.8	199.6
Japan	139.4	142.2	145.1	148.0	150.9	153.9	157.0
South Korea	46.9	47.8	48.8	49.7	50.7	51.7	52.8
Taiwan	30.3	30.9	31.5	32.2	32.8	33.5	34.1
Others	12.2	12.5	12.8	13.1	13.4	13.8	14.1
<b>Total Asia</b>	<b>400.9</b>	<b>409.9</b>	<b>419.0</b>	<b>428.4</b>	<b>437.9</b>	<b>447.7</b>	<b>457.7</b>
Germany	164.0	167.3	170.7	174.1	177.6	181.1	184.7
UK & Ireland	76.2	77.7	79.2	80.8	82.4	84.1	85.8
Switzerland	73.8	75.3	76.8	78.3	79.9	81.5	83.1
Italy	69.1	70.5	71.9	73.4	74.8	76.3	77.8
<b>Total Western Europe</b>	<b>383.1</b>	<b>390.8</b>	<b>398.6</b>	<b>406.6</b>	<b>414.7</b>	<b>423.0</b>	<b>431.5</b>
India	87.9	89.6	91.4	93.3	95.1	97.0	99.0
Others	36.3	37.0	37.8	38.5	39.3	40.1	40.9
<b>Total Indian sub-continent</b>	<b>124.2</b>	<b>126.7</b>	<b>129.2</b>	<b>131.8</b>	<b>134.4</b>	<b>137.1</b>	<b>139.9</b>
USA	191.7	193.6	195.5	197.5	199.4	201.4	203.5
Canada	21.7	21.9	22.1	22.3	22.5	22.8	23.0
<b>Total North America</b>	<b>213.3</b>	<b>215.5</b>	<b>217.6</b>	<b>219.8</b>	<b>222.0</b>	<b>224.2</b>	<b>226.4</b>
<b>World Total</b>	<b>1,121.6</b>	<b>1,142.8</b>	<b>1,164.5</b>	<b>1,186.5</b>	<b>1,209.1</b>	<b>1,232.1</b>	<b>1,255.5</b>

Source: VM Group

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**Inflation-adjusted silver price (in 2006 dollars)**


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	Nominal silver price (\$/oz)	US CPI (2006=100)	Real silver price (2006 dollars)
1980	15.2	42.77	35.54
1981	8.125	46.58	17.44
1982	10.93	48.36	22.60
1983	8.91	50.20	17.75
1984	6.385	52.18	12.24
1985	5.8	54.16	10.71
1986	5.2815	54.76	9.65
1987	6.7015	57.19	11.72
1988	6.05	59.71	10.13
1989	5.2165	62.49	8.35
1990	4.1925	66.30	6.32
1991	3.86	68.33	5.65
1992	3.6695	70.32	5.22
1993	5.115	72.25	7.08
1994	4.85	74.18	6.54
1995	5.142	76.07	6.76
1996	4.7975	78.59	6.10
1997	5.995	79.93	7.50
1998	5.005	81.22	6.16
1999	5.33	83.40	6.39
2000	4.575	86.22	5.31
2001	4.52	87.56	5.16
2002	4.665	89.64	5.20
2003	5.965	91.33	6.53
2004	6.815	94.30	7.23
2005	8.83	97.52	9.05
2006	12.9	100.00	12.90

Source: Reuters Ecowin

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**Silver prices in various currencies (average, 1994-2006)**


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	\$/oz	Euro/oz	Yen/gr
1997	4.90	4.34	19.07
1998	5.54	4.95	23.30
1999	5.22	4.90	19.08
2000	4.95	5.37	17.15
2001	4.37	4.88	17.05
2002	4.60	4.87	18.49
2003	4.88	4.31	18.14
2004	6.66	5.35	23.11
2005	7.31	5.90	25.97
2006	11.55	9.17	43.16
Jan-06	9.15	7.55	33.96
Feb-06	9.53	7.99	36.14
Mar-06	10.38	8.63	39.16
Apr-06	12.61	10.26	47.37
May-06	13.45	10.52	48.29
Jun-06	10.80	8.52	39.77
Jul-06	11.23	8.85	41.77
Aug-06	12.18	9.51	45.37
Sep-06	11.68	9.17	43.97
Oct-06	11.56	9.16	44.06
Nov-06	12.93	10.03	48.74
Dec-06	13.36	10.11	50.35
Jan-07	12.84	9.89	49.71
Feb-07	13.91	10.63	53.83
Mar-07	13.18	9.95	49.71
Apr-07	13.74	10.16	52.53
May-07	13.15	9.73	51.05

Source: Reuters Ecowin

**Lease Rates (%)**

	1-month	3-month	6-month	12-months
<b>1999</b>	3.1	4.0	4.9	5.7
<b>2000</b>	1.0	1.6	2.4	3.6
<b>2001</b>	0.6	1.2	1.3	1.5
<b>2002</b>	(0.2)	0.9	1.3	1.6
<b>2003</b>	0.3	0.4	0.6	0.9
<b>2004</b>	0.2	0.4	0.6	1.1
<b>2005</b>	0.5	0.7	1.2	2.1
<b>2006</b>	1.1	1.8	2.5	3.4
<b>Jan-06</b>	1.9	2.5	3.0	3.7
<b>Feb-06</b>	2.2	2.9	3.5	4.4
<b>Mar-06</b>	2.4	3.8	4.9	5.8
<b>Apr-06</b>	1.2	2.3	3.5	5.2
<b>May-06</b>	1.4	3.8	4.9	6.2
<b>Jun-06</b>	2.4	3.4	4.0	5.0
<b>Jul-06</b>	0.4	0.9	1.6	2.7
<b>Aug-06</b>	0.3	0.6	1.2	2.4
<b>Sep-06</b>	0.3	0.5	1.2	2.2
<b>Oct-06</b>	0.3	0.5	1.0	1.8
<b>Nov-06</b>	0.3	0.5	0.9	1.7
<b>Dec-06</b>	0.1	0.5	0.7	1.4
<b>Jan-07</b>	0.1	0.4	0.7	1.5
<b>Feb-07</b>	0.0	0.2	0.7	1.3
<b>Mar-07</b>	(0.0)	0.1	0.5	1.1
<b>Apr-07</b>	0.0	0.1	0.6	1.0
<b>May-07</b>	(0.0)	0.1	0.5	0.9

Source: Reuters Ecowin

**Silver ETFs offtake, tonnes**

	US ETF		UK & Swiss ETFs	
	ETF offtake	Change	ETF offtake	Change
<b>2006</b>	3,768	n/a		
<b>Apr-06</b>	653	653		
<b>May-06</b>	2,146	1,493		
<b>Jun-06</b>	2,580	434		
<b>Jul-06</b>	2,874	294		
<b>Aug-06</b>	3,122	247		
<b>Sep-06</b>	3,245	123		
<b>Oct-06</b>	3,259	14		
<b>Nov-06</b>	3,413	154		
<b>Dec-06</b>	3,768	355		
<b>Jan-07</b>	3,642	(126)		
<b>Feb-07</b>	3,920	277		
<b>Mar-07</b>	4,104	184		
<b>Apr-07</b>	4,195	91	14	
<b>May-07</b>	4,225	29	106	91

Source: Company websites and data requests

## COMEX silver (tonnes)

	Open interest	Futures net long		Options net long		Total	Change
		Large	Small	Large	Small		
		speculators	speculators	speculators	speculators		
<b>2001</b>	9,838	3,587	1,620	(58)	387	5,536	
<b>2002</b>	12,584	4,958	3,580	66	706	9,309	3,773
<b>2003</b>	15,985	8,013	3,900	760	373	13,046	3,737
<b>2004</b>	15,438	5,864	3,661	231	325	10,081	(2,965)
<b>2005</b>	20,999	9,517	3,482	(580)	202	12,620	2,539
<b>2006</b>	15,729	5,366	2,601	(607)	326	7,686	(4,934)
<b>Jan-06</b>	20,724	8,749	3,490	(428)	(27)	11,784	
<b>Feb-06</b>	19,881	6,940	3,202	(172)	151	10,120	(1,664)
<b>Mar-06</b>	20,929	8,143	3,389	(274)	25	11,282	1,163
<b>Apr-06</b>	19,790	5,607	3,739	(125)	269	9,490	(1,792)
<b>May-06</b>	17,012	4,101	3,507	(226)	312	7,694	(1,796)
<b>Jun-06</b>	16,955	3,085	2,820	(581)	258	5,582	(2,112)
<b>Jul-06</b>	15,347	3,785	3,111	(635)	265	6,525	943
<b>Aug-06</b>	17,472	4,582	3,001	(719)	346	7,210	685
<b>Sep-06</b>	15,594	2,872	2,704	(478)	294	5,392	(1,818)
<b>Oct-06</b>	17,144	4,370	2,890	(554)	292	6,998	1,606
<b>Nov-06</b>	17,086	6,072	3,010	(307)	238	9,013	2,015
<b>Dec-06</b>	15,729	5,366	2,601	(607)	326	7,686	(1,326)
<b>Jan-07</b>	17,468	6,065	3,026	(587)	326	8,830	1,144
<b>Feb-07</b>	19,478	8,458	2,903	(422)	241	11,180	2,350
<b>Mar-07</b>	17,317	4,989	3,091	(494)	359	7,946	(3,234)
<b>Apr-07</b>	16,968	4,934	3,392	(266)	373	8,433	488
<b>May-07</b>	17,378	4,307	2,992	(96)	379	7,581	(852)

Source: CFTC

## Weights and measures

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### Chemical properties

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Atomic weight	107.87
Atomic number	47
Chemical symbol	Ag
Melting point deg C	961.78
Hardness (mohs)	2.5
Boiling point deg C	2,162
Specific gravity gr/cubic cm	10.49
Hardness	24.5
Tensile strength psi	21,000

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Source: VM Group

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### Measures

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1 troy ounce	= 31.103 grammes = 408.6 grains = 1.097 oz avoirdupois = 20 pennyweights
1 metric tonne	= 32.151 troy ounces = 1.102 short tons
1 short ton	= 0.893 long tonnes = 2,000 Pounds
1 pound	= 14.58 troy ounces
1 grain	= 0.0648 grammes = 0.002083 troy ounces
1 gramme	= 14.43 grains
1 pennyweight	= 24 grains
1 kilogramme	= 32.1507 troy ounces
1 oz avoirdupois	= 0.9115 troy ounces

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Source: VM Group

## Notes

## Notes

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VM Group comprises a team of dynamic, highly experienced analysts dedicated to understanding and explaining the current and future state of commodity markets – focusing on the precious and base metals markets but also covering energy, plastics and agribusiness. The VM Group team combines a range of skills with a collective 70 years' experience in the precious metals markets and all that this implies – a plethora of market contacts and personal networks of long-standing trust and wisdom.

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In July 2005, VM Group launched MineLife a non-profit alliance of mining members committed to heightened social responsibility among host communities throughout Africa.

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