





# Glitter, Glory and no End in Sight ?

An Outlook for Precious Metals for 2008

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**Heraeus**

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# Summary

## General environment for precious metals today

- **Since 2005 most precious metals have gained massively in value. This process continued through 2007 and no end appears to be sight in the new year either.**
- **Platinum and ruthenium recorded new all-time highs in 2007. Gold missed this by a very thin margin, but broke through the \$850 all-time high of January 1980 within the first few days of 2008.**
- **Iridium and silver both recorded at least fresh multi-year highs in 2007; only palladium seemed to lag behind, not even making it to the high of 2006.**
- **Responsible for the gains were primarily external and more general factors. But, some metal-specific factors also came into play during the year 2007 and were at times instrumental for the price moves; either helping record gains or holding the metal back.**

## General environment for precious metals today

- **As far as general external factors are concerned, the global economic growth we have been seeing for some years has created an increased demand for resources and raw-material, including precious metals. Mine production has often enough not been able to keep up with this increased demand.**
- **The positive global growth simultaneously created larger wealth-reserves, and because of promising fundamentals asset-managers around the world “discovered” commodities as a potentially return-rich alternate asset-class.**
- **Additionally the weakening US-dollar supported the metals, making investments in US-dollar from outside the dollar-area relatively cheaper.**
- **Finally climbing raw-material prices led to increased inflation. This has helped the price of gold to begin with – and as often all precious metals are perceived as a single asset-class – the sentiment has overflowed to some extent into silver, platinum and platinum group metals.**

## General environment for precious metals today

- **In context of political crisis, in the past few months the role of gold as a “crisis-metal” has seldom been noticeable. So far the worsening global situation (Middle East, Pakistan, Kenya) does not seem to have created any remarkable demand on its own.**
- **Things have been different, when it comes to the investor’s worries about the general economic health. In reaction to the US-Subprime crisis investors reshuffled their assets, including buying up physical metal - either in the form of bars, coins or ETF’s – to the extent that the production-capacities of coin and bar manufacturers in the past year were periodically put under severe strain.**

## Platinum

- **In the past year platinum price rose continually – from \$1,100 an ounce on 5th January to over \$1,540 an ounce just after Christmas. Responsible for the gains were on the fundamental side two major factors that were in play simultaneously: production-problems in South Africa and an unrelenting demand.**
- **The industrial demand came primarily from the automobile industry. Despite increasing substitution, the success of the diesel-powered engine in Europe has kept demand for platinum at high levels. Additionally the jewellery industry in China as well as investors have contributed significantly towards the friendly environment.**
- **In 2008 there is no reason to expect a fundamental change in the situation. The price could continue to spiral towards the \$1,750 an ounce mark, more so if the diesel-powered automobile finds greater acceptance in the USA.**



## Palladium

- **Moves in palladium prices in 2007 were definitely less linear than those of platinum. After starting the year at \$330 an ounce it climbed up to \$384 an ounce by spring, only to drop down to the years low of \$312 during the summer-break.**
- **Industrial demand and bargain-hunting investors then again drove the price up to the years high, thereby provoking another wave of selling. At the year end the metal was down trading at \$365 an ounce.**
- **With regard to the actual situation as well as the prognosis, for no other metal are the opinions of the analysts so wide apart as in the case of palladium. Some market-observers point to an alleged high production surplus, which is disputed by others. And the extent of the much discussed metal-stocks in Switzerland is also hotly debated.**



## Rhodium

- **In 2007 rhodium successfully defended its role as the most expensive precious metal. The price fluctuated between \$4,500 an ounce of beginning of last year and \$6,850 an ounce recorded at the year-end.**
- **As in case of iridium and ruthenium, demand is driven primarily by industrial interest and less by speculative buying.**
- **Production shortfalls in South Africa were probably the main cause for the extreme rise in prices, with practically no substantial stocks left that could compensate the supply-shortage.**
- **This is also the reason why lease rates have remained relatively high – most recently between 5 and 15 per cent p.a.**



## Ruthenium und Iridium

- **The strong demand from the electronic-industry, mainly to cater to an increase in production-capacity for computer hard-disc drives, saw ruthenium recording a new historic high of \$885 an ounce in March 2007. As this demand fell away (the actual use in application being only a fraction of what had been bought up), the price slid and even the increased buying from the chemical industry could not contain it.**
- **Early 2007 iridium climbed up to \$450 and ounce and stayed there throughout the year.**
- **In the coming twelve months grave changes in fundamentals leading to much higher prices again are not to be expected initially.**



## Gold

- In the fourth quarter of 2007, gold, reaching \$845 an ounce, recorded its high since January 1980 and thereby narrowly missed – by a mere \$5 – its all-time high.
- This trivial shortfall was corrected in the first few trading days of 2008 and at one stage gold was trading at \$914 an ounce. Medium-term the \$950+ an ounce level is looking like a reality, before we might experience a wave of profit-taking in the second half of the year.
- The price of gold was influenced by a series of factors: strong demand from investors (fuelled by a weak US-dollar and high oil prices), continual “buy-back” of forward hedges by mining companies and a surprisingly strong demand from the jewellery sector – surprising because the high price did not deter this sector. On the supply side new production sank and less “scrap-gold” than one would expect given the high price found its way to the market.



## Silver

- **Most of last year silver, by and large, tried to follow gold but lagged in relative gains. It tended to lose ground more often than not and in August recorded a low of \$11.06 an ounce.**
- **Relative to gold, the basic fundamental picture for silver was not as positive and this remained responsible for the losses. Industrial demand in general, electronic demand in specific, was robust, as against reduced quantity being consumed by the photo-industry. Investment demand, spurred in the past year by the introduction of the first ETF in New York, slowed down.**
- **However gold's rally since early August pulled silver up with it and at one stage, on 14 January, with spot silver at \$16.60 an ounce, took it well over its 2006 highs. Silvers dependence on gold is expected to continue in 2008 too.**



2008 in Detail –  
The Global Environment

## The Global Economy – Growth in doldrums I

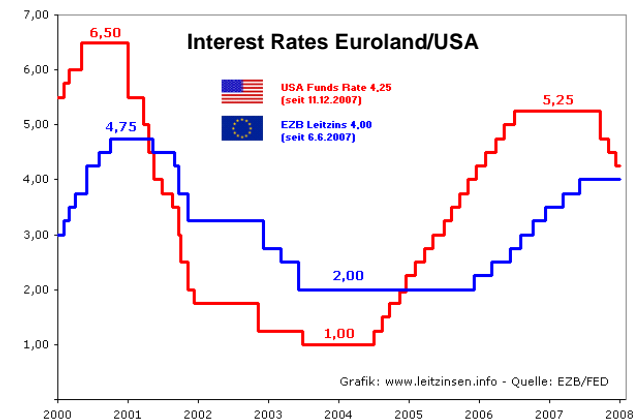
- **After years of strong economic growth in USA, Asia and of late in continental Europe, the 2007 summers US credit-market crisis lead to a cooling down of sentiment which so far is only partly reflected in actual statistics.**
- **Therefore and despite this, world-wide the economic growth figures for 2007 and the prognosis for 2008 have repeatedly been revised downwards by economists. In the USA, where 70 per cent of growth is driven by private consumers, a growth of 2.2 per cent in 2007 is expected – almost 25 per cent lower than 2006. Analysts anticipate 2008 to be even lower, expecting only a 2.1 per cent growth.**

## The Global Economy – Growth in doldrums II

- **In 2007 the European economy is anticipated to have grown by 2.6 per cent. Economists expect this to cool down substantially to 1.9 per cent in 2008. This years Eurozone inflation figure is expected to come in at 2.3 per cent; well above the ECB's maximum mark of just under 2 per cent.**
- **The larger economies of Asia once again showed massive growth in 2007 (China +11.5 per cent; India +9 per cent). For 2008 this region is expected to cool down too; among others, on account of measures that are meant to keep a check on inflation.**
- **Thanks to the positive development in Asia, global economic growth in 2007 should have be in the region of 5.2 per cent; slightly lower than previous years 5.4 per cent. For 2008, economists are awaiting a much lower growth; around only 4.5 per cent.**

## The Global Economy – Interest rates fall again ...

- **The slow growth of the US economy in the second half of 2007 lead to interest rate cuts by the FED. In three steps the FED cut the lending rate (Primary Credit Rate) by a total of 1 per cent to 4.25 per cent. In Europe, on the other hand, the official rates in the first half of the year were twice increased (each time 0.5 per cent) to 4 per cent. In contrast to the USA, later in the year the ECB did not cut rates, rather left them unchanged on inflation fears (with the FED now expressing similar worries).**
- **For 2008 analysts do not rule out further cuts in the USA, but generally the aforementioned inflation-combat measures might prevent any severe actions.**



## The Global Economy – Dollar: the slide continues. For the moment !

- **Expectations of a slowing US economy, lowered US-dollar interest rates and the fear of the consequences the US sub-prime crisis could have on the banking-world, accelerated the devaluing of the US-dollar in 2007.**
- **Against the Euro it lost for example almost 15 per cent since its low of early January; of this 2/3rds was in the period after the US credit-market crisis began in summer 2007.**
- **Analysts have differing opinions as to what the future has in store. With the green-buck having already booked substantial losses in 2007, more and more are tending towards a slow US-dollar recovery in 2008.**
- **But from a (chart)-technical point of view and also fundamentally seen, rates below 1.38 against the Euro are not really to be expected in the near-term.**

## The Global Economy – Oil price almost three digit ...

- **The anticipated weakening of the global economy has so far not had any big negative effect on the price of oil ; oil-price is one of the most important indicators for inflation, and thereby has a strong influence on the gold market. US-light crude at the end of 2007 was trading just under \$100 a barrel and thus very close to its historic high. Since then it has fallen off slightly to \$91 per barrel.**
- **The reason for the high price is much debated: while, for example, OPEC points towards adequately high production, analysts at various investment banks point at the increased consumption caused by exorbitant growth in China and other developing nations and the fact that global stocks of raw oil and products do not support the claim of the producers: at the end of 2007 these were well below their level of a year ago and so far this seems reason enough for justifying the present high prices.**

## The Global Economy – Other commodities mixed ...

- **As the oil and oil product prices have gone up last year, so have the prices of other energy resources. Prices of gas, coal, uranium and electricity climbed up to either fresh multiple year highs or all-times highs.**
- **Base metals came out more mixed in 2007. Demand outside China in 2007 went down and zinc and nickel were at times trading 50 per cent off their 2006 highs. Analysts are expecting a mild change in trend in 2008, at least partially, as depleting stocks will have to be filled-up again. Prognosis for copper and aluminium is stable to slight gains, whereas nickel and zinc are being viewed negatively.**

## EUR/USD



### USD/ZAR



## Oil price (US-Light Crude)



## Dow Jones



Platinum in Detail –  
Repeatedly new records and  
(so far) no end in sight

## New Records: a look back in 2007

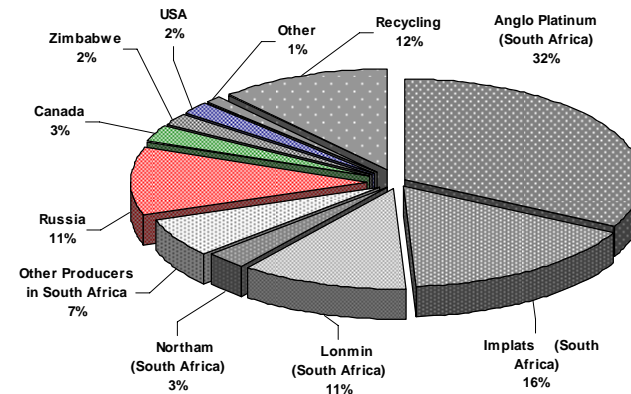
- **After the platinum market demonstrated unprecedented fluctuations in 2006, it began last year with a very calm but clearly strong upward trend. Starting the year at \$1,100 an ounce it un-relentlessly climbed up to \$1,300 an ounce by summer. Early summer it moved side-ways in a \$100 band before it took off afresh in August. The breather came early January after the metal marked a new all-time high of \$1,590 an ounce. Together with gold, platinum recorded in the last 12 months the largest percentage gain amongst all precious metals.**
- **Even though demand was said to be robust, the gains were probably more on account of problems on the production side. Throughout last year South African producers were periodically confronted with labour-strikes and temporary closures due to accidents.**

### Platinum - The charts



## Promises broken: new production down, instead of up

- **South Africa remained the unchallenged largest platinum producer in the world, followed by Russia, Canada, Zimbabwe and the USA. Total production in 2007 is estimated at 205 tonnes.**
- **The market is dominated by four large producers; three large South African platinum mining companies and the worlds largest nickel and palladium producer, Norilsk Nickel from Russia.**
- **Strikes and accident-related closures in South Africa lead to a production reduction of almost 5 per cent in 2007.**



## Promises broken: new production down, instead of up

- **Meanwhile the signs for a production expansion of up to 50 per cent over the next five years by numerous junior miners in South Africa that were still discussed last summer, are fading. At least 20 of these miners are said to be either planning a listing on the Johannesburg Exchange or increasing their capital base in different ways in the coming years. Some of them will probably succumb to the enormous technological and organisational challenge before production-begins.**
- **But those junior-companies who make it to the production-stage might only be replacing lost production of established producers, who might find it increasingly difficult to keep production at current levels due to a possible depletion of their existing mines.**
- **Therefore global production in the coming years, even under optimal political conditions, is hardly likely to add more than 5 per cent to the (more problem-free) 2006 level.**

## Platinum: 90% of new-production carries a political risk!

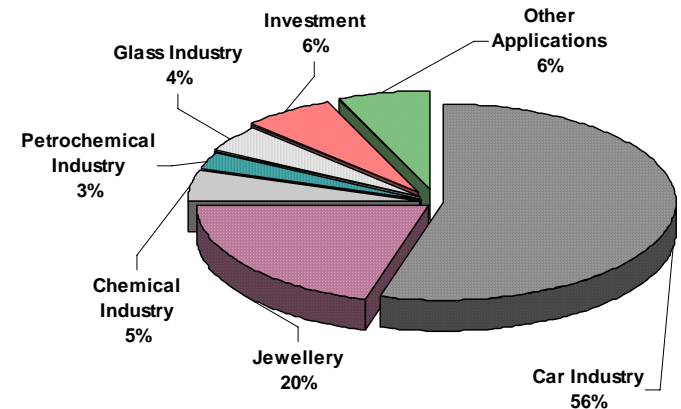
- **Jacob Zuma's election as new head of South Africa's ruling party ANC has led to some uncertainties on the platinum markets and a number of political observers have expressed worries about his potential political agenda. Therefore, when he foreseeable takes over as the new President of South Africa in 2009, the much needed push towards new production-capacity and fresh investments in mines may suffer.**
- **An extreme case in that respect is Zimbabwe where president Mugabe's government has repeatedly threatened to nationalise (parts of) the mining industry, leading to a standstill in foreign investments in that platinum metal-rich country.**
- **There were also fears about possible delays in Russian metal deliveries as export-licenses were not granted in time and the flow of metals was thus disrupted.**

## Supply from recycling growing, albeit slowly

- **Supply from secondary material, mainly used-up auto-catalysts, grew to record levels in 2007 and is expected to continue to grow at 5 – 8 per cent p.a. in the coming years. However, at around 28 tonnes (900,000 troy ounces), this made up for just over 10 per cent the total 2007 supply.**
- **Other industrial users of platinum like the oil or chemical industry play a more distant and secondary role as the metal here is usually not “consumed”, merely tied down to a particular production-process. The replenishment of the metal normally happens without putting any strain on the overall demand/supply situation. The temporary high metal requirement during the recycling period is covered by leasing the metal (and not through buying).**

## Diesel, the saviour: automobile industry demand grows further

- **The most important platinum consumer was and remains the automobile industry. Around 56 per cent (131 tonnes) of the total available metal in the market gets “consumed” by auto-catalysts and filters. Demand in this segment has grown significantly; alone in the past ten years it has more than doubled, despite all efforts to thrift.**
- **The largest single platinum market, thanks to the boom in diesel-driven automobiles, is Europe. Their market-share here is over 50 per cent and so far only 25 per cent of the platinum needed for their catalyst could be substituted by palladium. A partial substitution with gold, as has been discussed in the past few weeks, does not seem to be in sight for an extended period of time.**



## Diesel, the saviour: automobile-industry demand grows further

- **Also the greater part of the platinum-use in Japan and some of it in the USA should end up in diesel-cars which are eventually sold in Europe.**
- **In view of the high oil prices, market experts are assuming that diesel-automobiles will in future also become popular in the USA and their market share could increase from the present 4 per cent to up to 15 per cent. This should lead to more platinum going into auto-catalysts in the USA.**
- **In future, despite all substitution efforts, demand from the automobile industry will therefore continue to grow. And stringent emission regulations in many countries require even higher platinum loadings. Latest 2010 onwards, on account of aforementioned regulations, trucks and larger heavy vehicles would also need platinum-loaded catalysts (containing up to 100 gram = 3 troy ounces per automobile); something the manufacturers have been able to avoid so far.**

## “Expensive” allures: jewellery-buyers still in love with platinum

- **At almost 50 tonnes world-wide consumption in 2006, platinum as a jewellery-metal maintained a surprisingly stable demand in 2007, despite a much higher average price of \$1,304 an ounce (basis London Fixing) last year; on the average it cost \$160 an ounce more than the previous year.**
- **Compared to the record years 1999 – 2003, when demand regularly exceeded 80 tonnes p.a., the metal however has lost some fans, and Japan and China are mainly responsible for that drop in demand.**
- **In the last years China has become by a long way the single largest jewellery market for platinum. It accounts now for 50 per cent of world-wide demand.**
- **Keeping in view the present prices, demand in 2008 should fall more than it did in the previous year. We do not rule out a drop in off-take to the extent of 10 – 15 per cent, even if Chinese economic growth continues to remain robust, thus decoupling itself from the global development.**

There is still some room left: demand grows in other sectors

- **Significant quantities of platinum are also sought by other industries and both the electronic industry and the chemicals sector demand grew last year. However with the possible cooling-down of the global economy this year at best a repeat of 2007's demand of 25 tonnes is to be expected. The petrochemicals industry should consume more platinum in the current year; demand in 2007 was ca. 7 tonnes. Construction of new refineries, especially in Asia, could however completely offset demand shortfalls in other industrial sectors.**
- **Fuel cells on the other hand have no serious role to play at the moment; a broad-based application in automobiles is at least 5 to 10 years away.**
- **Demand by the glass industry fell last year by 15 per cent to around 20 tonnes; a consequence primarily of dwindling investments in the Asian glass industry. It is unlikely that this trend reverses in 2008.**

## ETFs: investors and not just “speculators” get involved

- **Through the introduction of a series of platinum-ETFs in the past 18 months demand for the metal from long-term oriented investors has significantly increased. For the first time those investors, many of them with rather conservative investment rules, now have direct access to the platinum market.**
- **In 2007 a total of six tonnes of platinum were sold in the form of ETFs. Simultaneously (the more speculative) long positions on the New York and Tokyo Futures exchanges have added about seven tonnes and additionally about two tonnes of physical metal (e.g. bars) have been sold to investors.**
- **Presently all open exchange positions are at 34 tonnes; 1/6th of global annual production. This figure does not appear to be extraordinarily high and as such the potential downward pressure it can apply on the price seems limited.**

### Forecast for 2008 and thereafter

- **Continuous problems on the production-side in South Africa and expectations of growing demand from the automobile industry allow for a prognosis of higher prices in the coming months. In this environment, the 1st half of this year could see the metal climbing to the \$1,750 an ounce mark, while profit-taking could possibly drive the metal temporarily as low as \$1,475.**
- **In case the global economy cools down significantly in the latter part of 2008, then a larger downward price correction is becoming more probable, which could then well continue into 2009.**

<b>Platinum</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>Q1 2008</b>	<b>2008</b>	<b>2009</b>
<b>High</b>	\$858.00	\$942.50	\$1,015.00	\$1,400.00	\$1,534.00	\$1,620.00	\$1,750.00	\$1,500.00
<b>Low</b>	\$597.25	\$764.25	\$836.75	\$987.10	\$1,112.00	\$1,520.00	\$1,400.00	\$1,225.00
<b>Average</b>	\$692.51	\$845.99	\$897.46	\$1,142.75	\$1,304.57	\$1,585.00	\$1,510.00	\$1,375.00

## A strategy for the future for industrial end-user

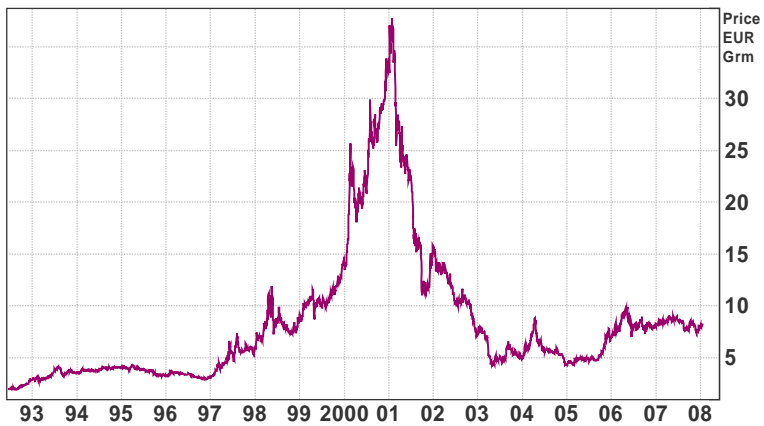
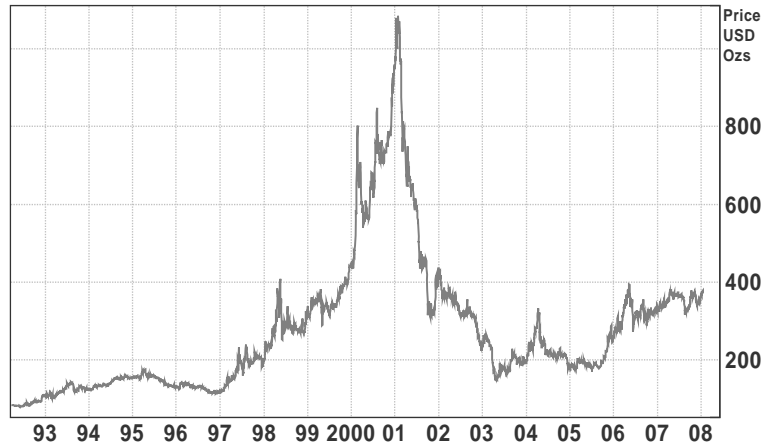
- **Though the effects of the platinum price-surge in the past year on the European industrial end-users are partly offset by the strengthening Euro (against the US-dollar), they are not suffering any less than their dollar-based colleagues.**
- **We would recommend that any dips in platinum price are used to buy future metal requirements using the forward market. An end-user could for example place staggered purchase orders, e.g. 25 to 50 dollars apart, starting just under the \$1,525 an ounce level.**
- **At the currently high spot price buying call-options does not appear to be feasible. However a combination of selling a put-option and buying a call-option, either at zero-cost or at a very small net premium could be worth some consideration. The presently high platinum interest rate works in favour of such a strategy.**

Palladium in Detail –  
Still playing “catch-up”; but  
then it has been doing so  
since 2002.

## Cinderella (before the ball ?): a look back in 2007

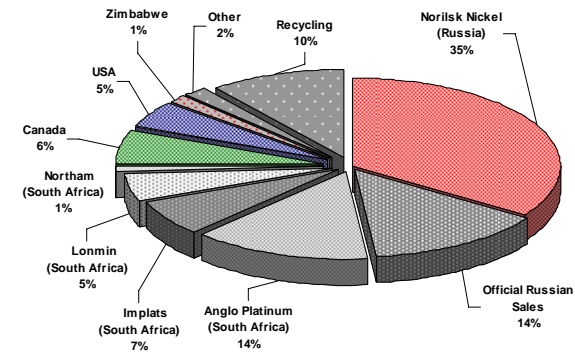
- **Palladium started the year at \$330 an ounce and closed the year at \$365 an ounce. From the investors point of view, that was the worst p.a. yield of the four major precious metals. What was disheartening for the investors, was good-news for industrial end-users, more so for those calculating in Euros. In Euro-terms the price actually even fell slightly in 2007.**
- **This lead to palladium finding greater use in the industry. Demand from the automobile and electronic industry grew significantly last year.**
- **Investors, using the futures exchanges and ETFs, stocked up on their long position in 2007 by almost 30 tonnes. Thereby they decisively supported the price and at least to some extent counterbalanced - what would have been otherwise- a much oversupplied market.**

### Palladium - The charts



## It is enough: supply stable at high level

- Palladium supply in the last few years has been at a high level of around 280 tonnes p.a. The absolute maximum (so far) was reached in 2004; since then it has fallen mildly.
- The largest supplier of the white metal, with a share of 49 per cent, remains Russia. However new-production accounted for only 2/3rds of its supply, the difference coming from de-stocking of metal accumulated since the beginning of this decade. South Africa contributes 30 per cent on the supply side, with about 10 per cent each coming from the USA and from recycling.
- In the future significant supply-side growth is not to be expected. New production should, if at all, then increase only slightly. Existing Russian stocks will at some stage get depleted, even though some analysts estimate these stocks to be still as large as one years global production.



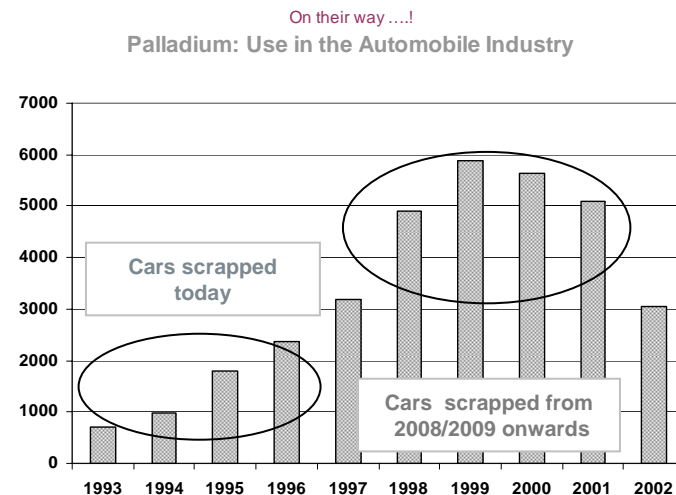
No car runs for ever: “old-metal” supply going up and up ...

- **Supply of secondary metal coming from used catalysts has gone up significantly in the last five years to almost 30 tonnes p.a.**

- **To begin with, this is an effect of the meanwhile very efficient collection-system of used catalysts.**

- **In North America and Europe, mathematically one-third of the automobile industry’s demand is met from recycled metal.**

- **This share could go up significantly in the coming years; use of palladium by the automobile industry had grown ten times in the period 1993 – 1999 and these cars are coming quickly towards the end of their life-time now.**



## Despite and thanks to diesel: auto industry demand going up

- **The higher recycled quantities in the two aforementioned, established automobile-markets is however well met by rising global automobile sales. The largest sales jump in this sector comes from Asia, a market that traditionally does not use diesel-engines in cars and as such palladium remains the preferred catalyst metal.**
- **Among others, this development has seen automobile industry's use of palladium growing to 136 tonnes in 2007; with almost 57 per cent of demand share, by far the largest sector.**
- **The quantity has grown by 50 per cent since the (price driven) collapse in 2002; partly due to the above mentioned reason, but also because since early 2007 palladium is being used in diesel auto-catalysts as well where it is substituting up to 25 per cent of the platinum loadings used.**

## Palladium so far as jewellery only second choice

- **After its initial success as a jewellery metal in 2004 – 2006, palladium's appeal to this sector has cooled down.**
- **Cause for this is most likely that the metal has not been able to position itself with a clear identity in one of the most important markets, namely China (which accounts for a market-share of ca. 2/3rds).**
- **This was reason enough for global demand from this sector to drop down to only 25 tonnes in 2007; almost 50 per cent less than the top year 2005.**
- **We would not rule out a revival of palladium as jewellery metal and, as a result, sales could climb back well over 30 tonnes p.a. again.**

## Each his mobile and iPod: electronic demand booming

- **The second largest industrial demand for palladium comes from the electronic sector. After the collapse of 2002, sales to this sector have since doubled again to almost 35 tonnes. Still, this is quite a way off from the years 1999 – 2001. Then the quantity sought was twice as much before the customers were driven out of the market by Russia’s temporary export-stop which pushed the price to a record \$1,100 an ounce.**
- **While the more important markets for palladium recorded growth, sales to the chemical and dental sectors – at around 10 and 15 tonnes respectively – were relatively stable compared to 2006. In 2008 no great changes to this is to be expected.**

### Forecast for 2008 and thereafter

- **With increasing recycling supply matched by higher demand from the automobile industry, a rediscovery of palladium by the electronic industry and hope of increasing jewellery demand lead us to believe that stocks will further deplete. Also investors might stay faithful to the metal, adding more of the still relatively cheap metal to their portfolios.**
- **Based on this we do not rule out that the metal in 2008 may, relatively seen, give the best yield amongst the major precious metals and the price could, at least intermittently, go well above the \$ 400 an ounce mark.**

<b>Palladium</b>	2003	2004	2005	2006	2007	<i>Q1 2008</i>	<i>2008</i>	<i>2009</i>
High	\$266.50	\$335.25	\$298.25	\$407.00	\$381.00	<i>\$420.00</i>	<i>\$465.00</i>	<i>\$400.00</i>
Low	\$140.00	\$173.80	\$162.60	\$253.25	\$320.00	<i>\$365.00</i>	<i>\$335.00</i>	<i>\$280.00</i>
Average	\$200.82	\$229.84	\$201.52	\$319.31	\$354.95	<i>\$395.00</i>	<i>\$415.00</i>	<i>\$365.00</i>

## A strategy for the future for industrial end-user

- **Even though the industrial end-user in Europe seems to have got away relatively lightly in 2007, they should not bet on the average price remaining as low in 2008.**
- **We would recommend staggered purchases of future requirements by buying on the forward market. In view of the currently relatively low prices, price-hedging could start already at present levels itself.**
- **Palladiums high volatility makes buying call-options not feasible. Either they would be too expensive or be too far from the market to provide a realistic price protection. Conceivable would be, as in the case of platinum, a combination of selling a put-option and buying a call-option at a small net premium.**

Rhodium in Detail –  
150 Euro for a gram of gray dust

## Not far to all-time highs: a look back in 2007

- **After the extreme jump in 2006 – at times the price had doubled – rhodium added a further \$ 1,400 in 2007 to end the year at \$ 6,875 an ounce.**
- **With the years high achieved at the year-end, the by far most expensive precious metal took only a short break. In the new year it started right away with further gains and it finally matched the 1991 all-time high of \$7,050.**
- **Behind its initial ascent, that was equally spread between two periods – in the first quarter and then again in October – was a continually increasing demand from the automobile industry. This alone would not have managed to push the metal up to these levels; South Africa's production problems provided the necessary impetus for the upward surge. For every 100,000 (3 tonnes) of platinum not produced – due to strikes or accidents – ca. 13,000 ounces of fresh rhodium supply is lost.**

### Rhodium - The charts



## Supply: When South Africa sneezes, the price gets a fever

- **South Africa is by a long margin the most important rhodium producer. Of the ca. 31 tonnes of new production and from recycling that come to the market each year, South Africa accounts for about 70 per cent.**
- **In South Africa the metal is a secondary product of platinum mining. Generally in S-Africa the ore has a platinum:rhodium content ratio of around 7:1. Rhodium for South Africa has become almost as important as gold: the value of annual rhodium mined in the Cape is currently 2/3rd the value of gold produced p.a.**
- **Of the rest, 18 per cent of the supply comes from recycling or as a by-product at the nickel mines in Russia (7 per cent) and Canada.**

Demand: the industry has hardly any substitution options

- **As in case of the other two important platinum-metals, the automobile industry is the main buyer of rhodium.**
- **Alone in this sector the demand has overshoot the new-production by a good margin, the difference being made up by recycled metal.**
- **Chemical and glass industries each make up for only 5 per cent of demand. Given the low stocks in the metal, any new large industrial investment in these sectors could however influence the price positively. This is partly due to the fact that only a small quantity of rhodium is available to the market for finding a price level; the larger part of new production is already committed to direct delivery contracts between producers and industrial end-users.**

## Forecast for 2008 and thereafter

- **Fast relief for the industrial consumers due to higher supplies in 2008 and 2009 is not to be expected.**
- **However the automobile industry is desperately working on how best to reduce the loadings and this should reduce some demand in the coming two years, leaving room for the slightly increasing demand expected in other applications.**
- **We anticipate that with rising platinum prices, rhodium could also record gains and even reach a new all-time high, but after that the air gets thin. 2009 could then bring notable losses.**

<b>Rhodium</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>Q1 2008</b>	<b>2008</b>	<b>2009</b>
<b>High</b>	\$440,00	\$1.350,00	\$3.100,00	\$5.775,00	\$ 6.875,00	\$7.250	\$7.250	\$6.500
<b>Low</b>	\$650,00	\$500,00	\$1.325,00	\$3.000,00	\$5.550,00	\$6.750	\$6.200	\$4.800
<b>Average</b>	\$525,00	\$985,00	\$2.055,00	\$4.550,00	\$6.190,00	\$6.875	\$6.700	\$5.600

## A strategy for the future for industrial end-user

- **When it comes to securing a rhodium price, industrial consumers should keep a keen eye mainly on the first three quarters of 2008.**
- **During this period it could be worthwhile to consider hedging the price in the forward market as high (in US-dollar quoted) lease-rates for rhodium (which also give an indication of the tight metal liquidity) might at times provide a discount (backwardation) vis-a-vis the spot price. The strong Euro (against the US-dollar) is further favouring the Euro-zone industrial user.**
- **The rhodium market does not offer any derivative products such as options.**

Ruthenium, Iridium in Detail –  
Calm at higher levels, but  
also for perpetuity?

## Ruthenium at times the third most expensive metal: a look back in 2007

- **Ruthenium recorded extraordinary gains in the first quarter of 2007, adding to the trend that began in the middle of 2006. The metal finally reached an all-time high of \$ 885 an ounce in early 2007.**
- **Greater demand from some manufactures of hard-disc drives, who introduced a technology that is using ruthenium to enhance the memory capacity of those devices significantly, was primarily responsible for the price surge.**
- **In practise however only a small fraction of the metal eventually got used in this process and subsequently, after the successful increase in production capacity was achieved, the price fell again, at times to under \$ 400 an ounce.**

## Ruthenium at times the third most expensive metal: a look back in 2007

- **More hard-disc drive manufactures, changing over to the new technology, came into the market in the second half of 2007 with fresh demand and gave the price a new upward push. The rally this time went up to just under the \$ 500 an ounce mark and then lost momentum. By the year-end ruthenium was down again and traded almost 25 per cent lower again.**
- **Last year, in addition to the electronic industry, good demand for ruthenium came from the chemical sector. However the quantities were not large enough to have any significant effect on the price.**
- **Iridium on the other hand had a relatively calm 2007. It started the year by climbing up from \$ 400 to \$ 450 an ounce and obstinately stayed at this level through to the year-end.**

## Supply: mines disclose new-production figures for the first time

- **More than with all other metals, South Africa plays a prominent role as far as the new-production of ruthenium and iridium is concerned. The rainbow nation accounts for over 90 per cent of global fresh supply of both metals.**
- **Till now these metals were as best mentioned as footnotes in the annual reports of the South African producers; this changed in 2007. The mines disclosed, at least for ruthenium, detailed production figures which added up to a total of ca. 30 tonnes. Anglo Platinum accounted for 50 per cent of this, Impala 25 per cent, Lonmin 20 per cent; the balance being spread amongst smaller South African producers and Russia.**
- **Iridium is the rarest of the precious metals (if one ignores osmium) with only four tonnes being produced p.a.**

## Demand: the hard-disc boom is not yet over

- **Even though numerous hard-disc manufacturers have switched to the new technology in the last 18 months, the process does not appear to be completely over. However the potential demand for ruthenium from this will be much lower than that of 2006/2007 and accordingly have a milder effect on the price.**
- **Demand for ruthenium in the chemical industry as well as iridium's demand from the chemical and electronic sectors is expected to grow, however extreme demand-surges are not foreseen.**
- **Fresh deliberations on the use of iridium in auto-catalysts appear from experience – as that of Mitsubishi in the nineties – to be more of an academic nature. Then the price of the tightly-supplied metal exploded ten times in value when the automaker loaded their petrol-driven, direct-injection car's catalyst with rare metal.**

## Forecast for 2008 and thereafter

- It cannot be ruled out that in line with the overall precious metals scenario, both the PGM's add between 15 (iridium) and 25 (ruthenium) per cent in value in the first half of 2008.
- Longer-term it would be difficult for them to hold on to these high levels and in 2009 we expect them to book considerably lower prices.

<b>Ru / Ir</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>Q1 2008</b>	<b>2008</b>	<b>2009</b>
<b>High</b>	\$32/\$125	\$85/\$85	\$85/\$145	\$85/\$400	\$885/\$465	\$450/\$475	\$500/\$535	\$480/\$480
<b>Low</b>	\$41/\$85	\$40/\$230	\$55/\$195	\$620/\$195	\$350/\$400	\$380/\$440	\$340/\$425	\$300/\$350
<b>Average</b>	\$35/\$93	\$65/\$185	\$75/\$170	\$193/\$350	\$580/\$445	\$407/\$465	\$420/\$460	\$390/\$430

Gold in Detail –  
Are four-digit prices still an  
utopia ?

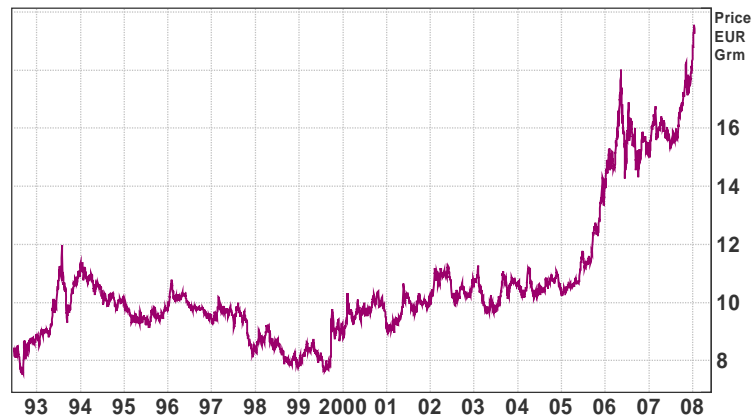
## New records: a look back in 2007

- **The gold boom that began in 2005 continued relentlessly in 2007 and at the turn of the year 2007/2008 recorded a new all-time high of \$860 an ounce. In the third week of January the metal even reached a peak of \$914 an ounce.**
- **Compared to the recent volatility of the gold price, last year started rather calm: from its early-year level of \$ 640 an ounce the price climbed up relatively quickly to \$ 690 an ounce. Until the middle of the year the gold traded in a tight range between this and the years beginning level.**
- **Then, starting in August, the oil prices rally which started in August and the simultaneous collapse of the US-dollar gave gold a new drive and moved it continuously upwards to the aforementioned high.**
- **On the buyers side both private and institutional investors were active in the market, using gold to diversify their portfolios.**

## New records: a look back in 2007

- **The buyers were not just influenced by external factors like oil and US-dollar rates, but also from the fundamental environment:**
- **The jewellery demand, at least in the first nine months and despite the then already relatively high prices remained very robust (see page 69).**
- **New production fell again in 2007 and at the same time mining companies bought back their hedges to the extent of some 350 – 450 tonnes; both thereby supporting the gold price (page 65).**
- **European central bank sales in 2007 were just below their self-determined maximum sales quantity of 500 tonnes. Other central banks such as the Russian Central Bank added to their holdings (page 66).**

### Gold - The charts



## It is time for a new gold-rush: new production falls again

- **Though not yet confirmed officially, 2007 could be the first time since 1905 that South Africa loses its position as the largest gold producers – to China. Both countries have produced ca. 265 tonnes of gold last year. Global production in 2007 is estimated at slightly below the 2006 level of 2,471 tonnes.**
- **Production in the coming years is not expected to go up either, though more new projects will be going into production and more gold as a by-product to base metal mining should reach the market as well. The reason for the net supply reduction is the falling production at the primary mines of the classical gold-producing countries. Here the mines are running into difficult technical challenges and additionally some countries like Peru, Indonesia and Zimbabwe bring with them a potentially higher political instability.**

## Old-gold supply grows slowly, central bank sales rise

- **The flow-back of secondary metal has since 2006 increased and in 2007 could have surpassed the previous years tonnage of 1,108. This would then be the highest tonnage in the last ten years, nonetheless the number is smaller than one would expect given the high price of the metal.**
- **Central banks sales almost reached their self-imposed upper limit of 500 tonnes in 2007, among others because the Swiss National Bank announced planned sales of another 250 tonnes. As against this the Bundesbank and the Italian central bank are holding back on sales till further notice. Should no new sale-plans be announced in Europe, the 2008 and 2009 known quota of the 2004 Central Bank Gold Agreement will surely not be all sold. What could prevent a drop in central bank sales is that the probability of sales emanating from the IMF has gone up recently. The IMF might actually take up some of the otherwise unsold quota of the CGBA.**

## Investors look for and find that extra kick

- **Gold appears to have forfeited at least to some extent its historic roll as a crisis metal in the face of political turmoil. This became visible for example last month after news such as the assassination of the Pakistani politician Bhutto or when the Turkish army crossed the border into Iraq. If at all the yellow metal reacted to such news it was only for a brief period of time before being caught again in the day-to-day business.**
- **Things appear to look different though when it came to economic crisis in the last 12 months. A correlation between increased demand for gold and the sub-prime driven financial-crisis in the USA with its difficult to analyse effect on the global banking sector was clearly evident. As a repercussion, investor interest in physical forms of gold – bars, coins and ETFs – went up significantly.**
- **Gold continues to still be seen as a hedge against inflation, as is evident from the very similar moves in the price of oil and gold.**

And so far investors are not yet over-invested

- **Last year investors added significantly to their long gold positions, however they are still far off from being over-invested in the metal.**
- **Investors bought 260 tonnes of gold in the form of the increasingly popular ETFs in 2007 and the more speculative positions on the futures exchanges added a further 325 tonnes. On top of this come physical gold bars and coins that could have accounted for up to 500 tonnes of demand. What at first sight seems like a large quantity, is about half the net-worth of Bill Gates; admittedly a rich, but after all one single, person.**

The future of the gold price still depends on the jewellery market

- **With all the eyes on the investors and their new tailor-made products, the activities of the speculators, the central banks and the behaviour of the mines, one should not forget that the health and woes of the gold market are still very much in the hands of the jewellery market.**
- **Even in the past year (a year marked with high and climbing prices), 50 per cent (around 2,100 tonnes) of the demand found its way becoming jewellery.**
- **Even though the importance of the jewellery market is now reduced (in 1997 its share in total demand was still around 78 per cent); any losses in jewellery demand in China and especially in India will most likely see the yellow metals' prices correcting downwards.**

It would be nice ... but industrial demand does not play a role

- **The industrial demand for gold limited itself mainly to applications in the electronic and dental sectors. Together these industries consumed around 400 tonnes of metal in 2007, making up just 10 per cent of total demand. Consumption in these segments is expected to grow by 5 to 10 per cent p.a. in the future, though a global recession could temporarily hamper this growth.**
- **Latest reports about the use of gold in auto-catalysts should not be (mis-) interpreted as positive for the gold market. Even if (after a long test and implementation phase) and when a small amount of platinum that is used for cleaning emissions can be substituted by gold, the relative-to-platinum 20 times larger gold market will hardly feel the impact.**

## Forecast for 2008 and thereafter

- **In the general, positive fundamentals not much should change in the coming months, whereby periodic profit-taking could lead nonetheless to price-dips. These then provide the best buy-opportunities for the time being.**
- **Also bullish are the indications that central banks are expected to sell less in 2008, production is stagnating and the mining companies will resume their buy-backs.**
- **Investors will most likely continue to diversify their portfolios and gold will clearly play a role here as an alternate asset-class. And there is clearly room for improvement left: if only the Germans were to allocate 5 per cent of their 4.7 trillion Euro near-cash assets to gold, they would be buying up an equivalent of six years annual production.**

## Forecast for 2008 and thereafter

- **Based on reasons mentioned earlier we do not rule out that the present rally will continue. At the peak the gold price could well hit the \$975 an ounce mark.**
- **But no party goes on forever and already the second half of 2008 could see things calming down on gold's front should a recession in the USA firmly set in and as a result the price of oil comes off substantially. Also one cannot rule out that mining companies at some stage might decide on fresh hedging. All this could have the gold price dropping down to under \$700 an ounce by 2009.**

<b>Gold</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>Q1 2008</b>	<b>2008</b>	<b>2009</b>
High	\$418.75	\$457.00	\$541.00	\$729.25	\$848.00	\$935.00	\$975.00	\$815.00
Low	\$318.85	\$371.75	\$410.25	\$520.00	\$601.00	\$840.00	\$740.00	\$650.00
Average	\$363.83	\$409.53	\$444.99	\$604.33	\$696.43	\$885.00	\$825.00	\$735.00

## A strategy for the future for industrial end-user

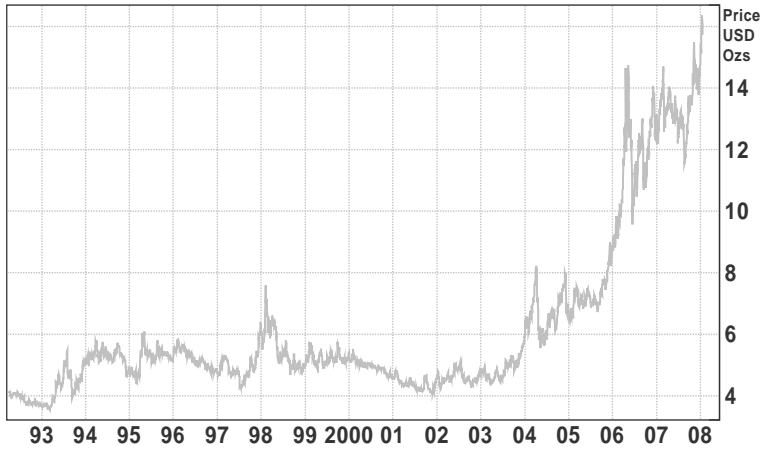
- **At the present levels forward contracts as a hedge-strategy for industrial end-users cannot be really recommended. Also options to not actually provide a good alternative.**
- **Instead one should – even in this tendencially upward trend – wait for a pull-back, which is then going to provide a much better buying opportunity.**
- **What makes hedging currently additionally unattractive is a relatively high interest-driven premium (contango) in the forward purchase price. Though this would please mining companies (if they find the courage to sell forward), it is an added burden to the industrial buyer. For example a 2.5 year forward gold purchase will today cost approximately \$90 an ounce over the spot price, leading to a final price relatively close to \$1,000 an ounce.**

Silver in Detail –  
Times as a Trend-setter gone  
once again ; eyes now on Gold.

## Silver 2007: new records, but no where near historic highs

- **This year again silver could not decouple itself from gold and establish itself again as the trendsetter, like it had done in 2006 after the successful establishment of the then freshly issued Exchange Traded Funds (ETFs).**
- **The white metal started the year at \$12,80 an ounce; still well above the previous six months average. And by March it even had climbed up to \$14,70 an ounce, however then by August it had zigzagged its way down to its years low of \$11 an ounce.**
- **The massive surge in the gold price in the following months took silver up with it and in November it was trading at \$16,30 an ounce; a new 28-year high. That move was once again followed by profit-taking, though by the year-end again recovered to \$ 14,80 an ounce. Propelled by the booming gold price it managed to climb then in early January above the high seen last November and the metal reached temporarily a high of \$16.60 an ounce.**

### Silver - The charts



## The supply side: enough and still growing

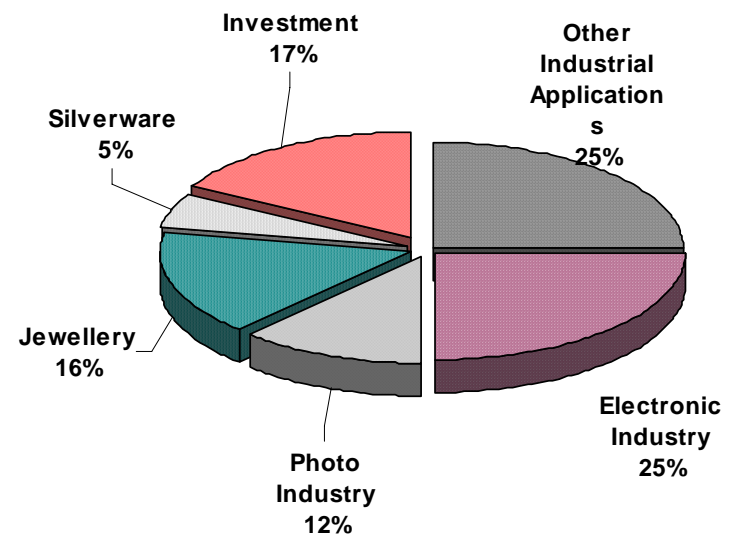
- **In contrast to the production problems the other precious metal were facing, silver production sailed on smoothly. One reason for this is that silver production, geographically and by source is far more diversified. In addition to the 25 per cent produced by the primary mines, silver is a by-product, among others, of gold, copper and lead production.**
- **In the coming years especially the production of base metals is expected to grow, and thereby more new silver will come onto the market. We anticipate silver supply to grow at 3 per cent p.a.**
- **Currently the annual new silver production is around 20,500 tonnes, a further 7,800 tonnes coming from silver-scrap and official reserves.**

## The mix is important: silver as industry and investment metal

- **Relative to other precious metals, demand for silver is spread more evenly amongst various sectors, whereby the industrial applications, despite the success of the now three important ETFs, still have a greater say. They, including the receding demand from the photo-industry, make up for 65 per cent of the total demand. The largest single-sector demand in 2007 – without being overtly dominant – came again from the electronic industry.**
- **Relatively new applications for silver, though with comparatively low demand volume, but with enormous growth-potential, were in the plasma-screen segment, solar industry, RFID-sector and water-purification processes. All four areas promise an increasing demand for silver in future.**

## The mix is important: silver as industry and investment metal

- **Jewellery and silver-ware made up for 20 per cent of total demand. In the past years demand in this sector has been reducing and given the relative high average price last year, this should also be the case in 2007. In 2008 we expect a further decline of around 5 per cent within this segment.**
- **During the course of 2007 investors have bought up a massive quantity of over 5,300 tonnes of silver, 30 per cent in the form of coins, bars, ETFs and futures contracts, and the rest mainly as structured products.**



### Forecast for 2008 and thereafter

- **While demand from the photo-industry will decline further in 2008 and 2009, demand from other industrial application is set to grow. Also investors will at least initially continue to buy; however on the other hand they will have a growing supply from new production to contend with.**
- **We therefore expect that silver will by and large orient itself to the moves in gold while the volatility of the price should - as in the last 12 months - remain higher than the one of the yellow metal. In the first half of the year the price could climb as high at \$17.90, a move that could then be followed by losses.**

<b>Silver</b>	2003	2004	2005	2006	2007	<i>Q1 2008</i>	<i>2008</i>	<i>2009</i>
High	\$6.00	\$8.42	\$9.24	\$15.17	\$16.21	\$16.75	\$17.90	\$15.00
Low	\$4.35	\$5.43	\$6.32	\$8.67	\$11.06	\$14.75	\$13.50	\$11.00
Average	\$4.89	\$6.66	\$7.31	\$11.54	\$13.38	\$15.90	\$14.80	\$13.75

## A strategy for the future for industrial end-user

- **In view of a longer-term restrained scenario we would not enter into price-hedging at the current levels.**
- **In comparison to that staggered forward purchases, starting at the \$15 an ounce level, appear to be a more promising strategy.**
- **Silver's high volatility makes it feasible to consider sale of put-options. Though this way the industrial end-user does not get any protection against fast rising prices, he can get however a decent price-subvention on his running demand through the premium intake.**

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