

PALLADIUM

AUTOCATALYST

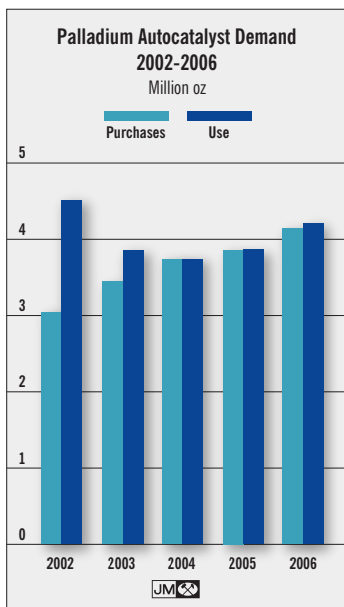
Purchases of palladium for use in autocatalysts are forecast to increase by 7 per cent in 2006, from 3.87 million ounces to 4.14 million ounces. Tightening legislation and ongoing efforts to reduce costs by replacing platinum in gasoline three-way catalysts have boosted palladium demand in Japan, North America and the Rest of the World region. However, demand from European car manufacturers will fall once again, due to a decrease in production and sales of gasoline vehicles.

Europe

Palladium demand in the European autocatalyst sector is expected to fall by 5,000 oz to 965,000 oz in 2006. The continuing increase in diesel's market share has affected sales of gasoline vehicles despite modest growth in the light duty automotive market.

Nonetheless, high prices have encouraged a shift of some of the platinum still used in gasoline cars to cheaper palladium, supporting palladium demand. The introduction of Euro IV legislation in January 2006 provided the opportunity for this change, which is increasing palladium loadings per gasoline vehicle slightly. Some of this growth is due to the introduction of the first diesel catalysts using palladium alongside platinum. Further use of this technology is expected in 2007.

Palladium purchases by the auto makers have fallen below metal use, due to a reduction in working stocks.



North America

Consumption of palladium by the North American auto industry is forecast to increase in 2006 to 1.51 million ounces, 5 per cent higher than in the previous year.

US emissions legislation continues to tighten, forcing some metal loadings higher despite ongoing efforts to thrift precious metal. Most manufacturers are also replacing platinum as much

as possible in their three-way catalysts, raising the average palladium content per vehicle and increasing overall demand compared with 2005. Some of the growth in palladium demand is due to its introduction alongside platinum in diesel catalysts.

Despite a steep decrease in domestic manufacture by the Big Three, continued growth in North American output from Asian car manufacturers has limited the drop in overall vehicle production to only 2 per cent.

Of longer term interest, a trend towards greater fuel efficiency may be developing, driven by high fuel prices. This could allow smaller vehicles and diesel technology to increase their market share, both of which would tend to reduce palladium usage.

China

The Chinese automotive industry is expected to consume 205,000 oz of palladium in 2006, a jump of roughly a fifth from 2005. The number of light duty vehicles manufactured in China should grow from 5.2 million in 2005 to 6.2 million, contributing to much of this rise. More effective higher-loaded catalysts are also being fitted by foreign manufacturers in this market.

Rest of the World

Autocatalyst demand for palladium in the Rest of the World region is forecast to rise 65,000 oz to 700,000 oz in 2006. Vehicle production outside the traditional regions continues to increase. Growth rates in many areas are significantly above those in Europe, Japan and North America, with sales rising by double digit percentages this year in India and Argentina.

Palladium Demand: Autocatalyst '000 oz		
	2005	2006
Europe	970	965
Japan	665	765
North America	1,430	1,505
Rest of the World		
China	170	205
Other	635	700
Total	3,870	4,140
Autocatalyst Recovery	(630)	(805)

Autocatalyst Recovery

Palladium recovered from the recycling of catalytic converters is likely to increase by more than 25 per cent, from 630,000 oz last year to 805,000 oz in 2006. Volumes of metal recovered in Japan will be unchanged but the amount reclaimed elsewhere will grow significantly.

North American recovery should experience healthy growth due to increased scrapping of vehicles fitted with palladium catalysts around the middle of the last decade. European recovery is expected to be even stronger, increasing by over 30 per cent, driven by new legislation forcing recycling of end-of-life cars and by the higher palladium content of scrapped vehicles.

DENTAL

Palladium uptake by the dental sector is expected to be stable in 2006, at 815,000 oz. North American consumption is expected to rise but Japanese demand will drop by 10,000 oz.

Japan remains the major dental market, consuming over half of the metal used in this application. Increasing palladium prices in the first half of the year pushed the cost of dental alloys used above the level of the government subsidy, reducing metal consumption. We expect the subsidy to be increased above the alloy price later in the year, making the use of palladium attractive to dentists and reinvigorating interest. Full year demand should show a modest fall to 465,000 oz.

The other main market for dental alloys, North America, will grow by 4 per cent in 2006. Unlike in Japan, there is no state subsidy and demand is more readily affected by price. Palladium's continued cost advantage over gold has ensured healthy purchases of the white metal. In Europe, low relative prices are expected to maintain palladium demand at 75,000 oz.

Palladium Demand: Dental '000 oz		
	2005	2006
Europe	75	75
Japan	475	465
North America	250	260
Rest of the World	15	15
Total	815	815

ELECTRONICS

The electronics industry is expected to consume 1.06 million ounces of palladium in 2006, up 90,000 oz on the year before. This strong performance

reflects healthy demand for consumer electronics and palladium's use in a number of applications.

The multi-layer ceramic capacitor (MLCC) sector continues to be important, representing over half of all palladium consumption in electronics. Although substitution of nickel for palladium has been occurring in this market since 2001, it is expected to slow as many of the remaining applications are very much performance-driven and therefore less price-sensitive. The number of passive components per device, including MLCC, is rising rapidly as many new

computers have multiple processors and each requires its own infrastructure. With consumer purchases of electronics growing strongly, total MLCC production will increase in 2006 and palladium consumption will rise for the first time in six years.

Palladium usage in plating connectors and leadframes is expected to firm, with demand rising by 8 per cent in 2006. Here palladium is benefiting from substitution for other materials such as gold and lead on cost or environmental grounds.

Booming mobile phone sales and the increasing use of electronics in automobiles should push palladium consumption in resistors higher by 10 per cent.

These demand figures are reported net of recycling. The amount of palladium recovered from end-of-life electronics is expected to fall by around 10 per cent this year, due to the continuously decreasing palladium content of each component recycled.

Palladium Demand: Electronics '000 oz		
	2005	2006
Europe	80	100
Japan	260	275
North America	195	190
Rest of the World	430	490
Total	965	1,055

JEWELLERY

Net global purchases of palladium for use in jewellery manufacture are forecast to fall by 310,000 oz from last year's 1.43 million ounces to 1.12 million ounces in 2006. Despite palladium's low price relative to both gold and platinum, demand from the Chinese market is expected to drop 28 per cent from the peak of 1.2 million ounces a year ago. In the USA, palladium jewellery has started to attract interest from retailers and manufacturers.

Purchases of palladium by Chinese jewellery manufacturers are expected to decrease sharply to

860,000 oz this year, 28 per cent below 2005 levels. Analysis of imports into China via Hong Kong suggests smaller flows into the jewellery sector. Reports from the trade indicate reasonable levels of manufacturing but purchases of new metal have been negatively affected by recycling. Retail orders are down because of high inventories, the result of the very large amount of industry purchasing in 2005. Consumer interest in and awareness of palladium remains a key variable.

On its introduction into China in 2004, palladium jewellery was initially sold in the form of Pd950 (95 per cent purity) but manufacturers moved to Pd990 (99 per cent pure palladium) within a year. Market indications are that significant amounts of this earlier metal stock have been returned for refining this year, reducing our estimates for net demand.

Palladium jewellery is mainly being manufactured for the fashion sector in the form of cheaper, relatively lightweight pieces, rather than bridal rings. Its lower cost, compared to platinum, has made it more accessible to consumers outside major Chinese urban centres, where it is being sold alongside platinum, white gold and yellow gold pieces.

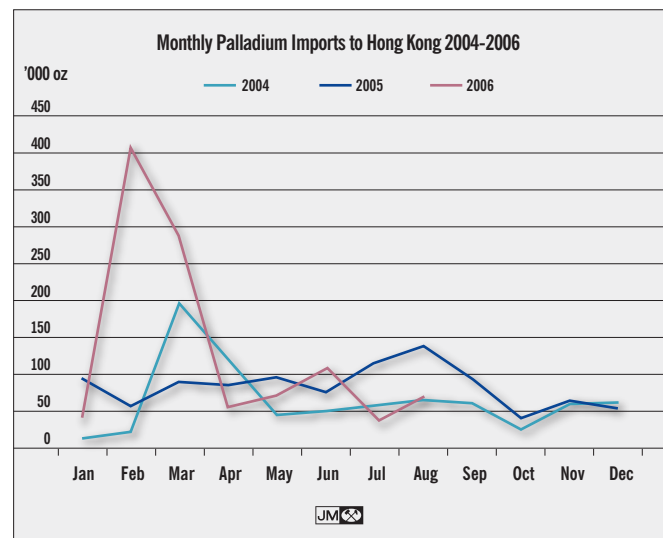
Most Chinese manufacturers now have the technical ability to work with palladium and are producing

jewellery from it as well as from platinum. A sustained price differential between these metals has driven the market. In combination with low palladium lease rates, this allows cheaper metal financing and greater profits, especially for retailers.

In North America, interest in palladium and other novel materials has been growing, due to the recent exceptionally

volatile behaviour of gold and platinum prices. Although consumption in this market will be relatively low this year, at around 40,000 oz, this could well increase in 2007 as manufacturer and retailer involvement continues to gather momentum.

Elsewhere, palladium's main use in jewellery is as a whitening agent in white gold alloys, particularly in Europe and Japan. This segment of the global jewellery market continues to contribute a steady annual demand of around 200,000 oz.



OTHER

Demand for palladium in other applications is expected to drop to 525,000 oz, compared to 810,000 oz in 2005. Physical investment will fall, with higher prices driving demand lower and stimulating disinvestment. In the chemical industry, metal consumption in process catalysts will dip but will increase in nitric acid production.

New information has led us to revise our 2005 demand total for physical palladium investment upwards to 400,000 oz, significantly above the previously reported figure of 220,000 oz. In 2006, however, demand is expected to plummet to 120,000 oz, mostly in North America. Fewer new coins have been issued this year, while the higher average price for palladium has encouraged many retail investors to sell metal back into the market.

Palladium use in chemical catalysts is forecast to drop by 10,000 oz this year. Expansion of manufacturing capacity for purified terephthalic acid (PTA) in Asia is continuing but at a slower pace than in previous years.

Palladium demand for catchment gauze used in nitric acid manufacture has increased. These are used to absorb platinum displaced from the main catalyst gauze and their use should grow this year due to the increased value of platinum.

Imports of palladium to Hong Kong were particularly high in the first quarter of 2006, although much of this metal does not appear to have reached the jewellery trade.

Palladium Demand: Jewellery '000 oz		
	2005	2006
Europe	35	40
Japan	145	150
North America	20	40
Rest of the World		
China	1,200	860
Other	30	30
Total	1,430	1,120

Palladium Demand: Other (including Chemicals) '000 oz		
	2005	2006
Europe	95	100
Japan	35	35
North America	520	235
Rest of the World	160	155
Total	810	525