INVESTING IN AFRICAN MINING CONFERENCE 2003

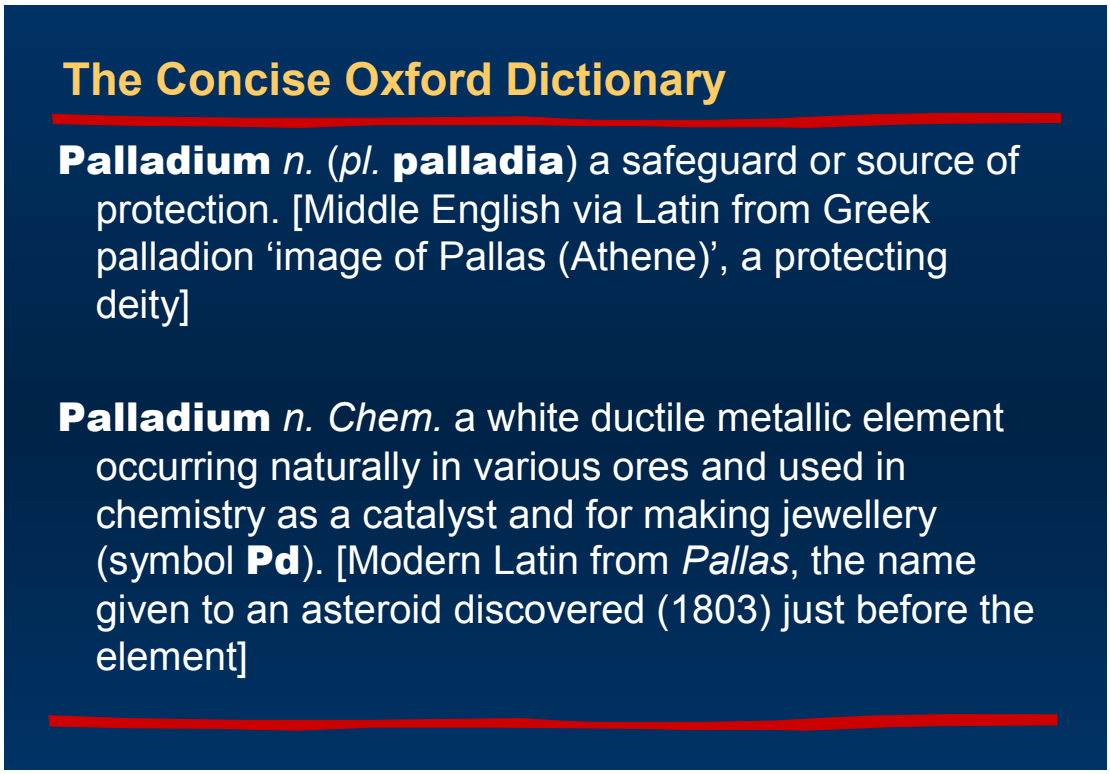
CAPE TOWN

Honourable Ministers, distinguished guests, ladies and gentlemen, good morning.

You may ask why on earth bother with palladium. It was a minor PGM, it will always be a minor PGM. Well, the fact of the matter is that in 2000, calendar 2000, palladium contributed around 30% of the revenues of the platinum group metal producers in South Africa. And it therefore became a metal of great importance in the income statement.

We only have 20 minutes this morning to cover what has been a quite extraordinary situation in the palladium market in the past 10 years. And as commodities go, this palladium story has been quite exceptional. Doing some research for this little talk this morning again was also fascinating. Looking back 10, 12, 15 years to some of the forecasts that were made not only for palladium but for the other platinum group metals, and comparing those forecasts with reality was quite interesting. Now, palladium in terms of volume has always been a major PGM to the South Africans, not to mention the Russians. Because, in 1988, the total palladium demand in that year constituted 3.4 million ounces as compared with a platinum market of 3.7 million ounces. So, in volume terms, they were much the same size. But of course the South Africa producers produced at least twice as much platinum as palladium, and the

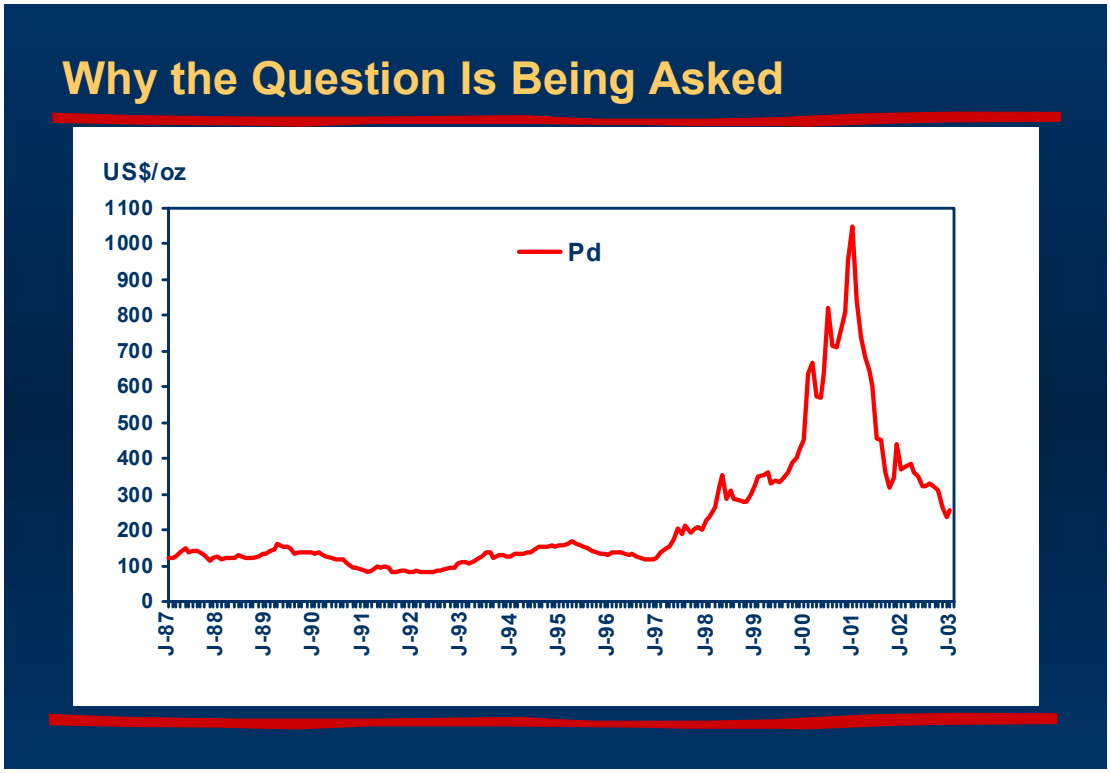
platinum price was four times higher than the palladium price. So platinum of course was much more important. But between 1988 and 2001, that situation changed very, very dramatically indeed.



What is palladium? Well, there was one wag in the automobile industry, a senior executive, who only a couple of short years ago described palladium as 'unobtantium'. Now the same chap changed that definition last year to 'plentium'. And that just demonstrates what's happened to this metal. But as far as the Concise Oxford Dictionary's concerned, there are really two roots to the word palladium. One is Greek and the other is Latin. As far as the Greek one is concerned, it comes from the "image of Pallas (Athene)" – Athene ' was a protecting deity, so she gave to the name palladium the meaning of a safeguard or a source of protection. And I guess in the autocatalyst application that's probably quite applicable.

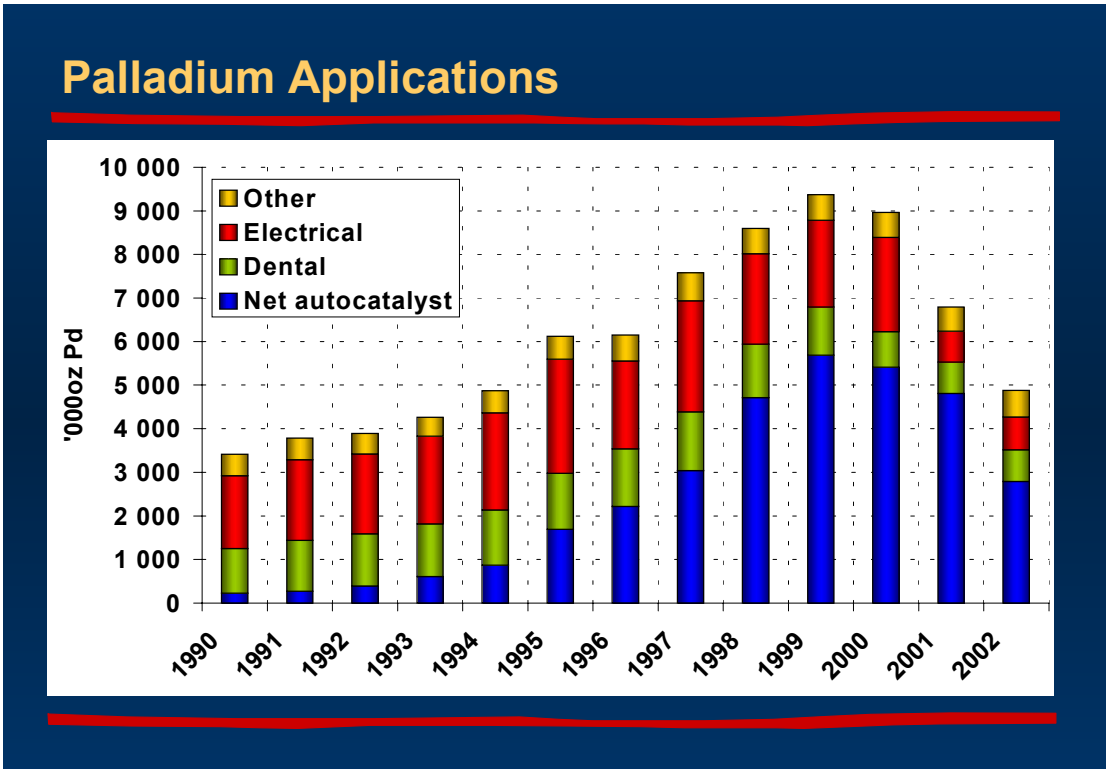
Personally, I prefer the other word that came from the Latin, 'Pallas' – the name that was given to an asteroid in 1803 when it was first discovered, and certainly the ride in the palladium market in the past ten years has been more akin to the path of an asteroid than anything else. And it's also described in the dictionary as a metal used in jewellery.

Now of course palladium is used as a bit of a filler in platinum jewellery from time to time, and it is also used in the conversion of yellow gold into white gold. In fact, only 10% of palladium is sufficient to turn yellow or red gold permanently white when that metal is pretending to be something that it is not.



Now, when did this ride begin? Not much to say prior to 1998. The Russians of course built huge stocks of palladium during most of the 20th century when their production far exceeded the size of the palladium market. They didn't do anything to try and develop that market. They simply stockpiled the palladium that they were unable to sell. And built enormous quantities of stock.

Now, on the 14th of December 1988 (I remember the date very well - it's the date I went on holiday) my boss phoned me in the afternoon and said, "Have you seen the ticker?" (We still had tickers in those days). And I said, "No, why?" He said, "Well, the president of the Ford motor company has just made an announcement that Ford has developed an autocatalyst that does not use platinum." Now the platinum price on that day was around US$625. And within two days it was down to $490, as a consequence of this statement. What the president of the Ford motor company did not say was that the catalyst they'd developed was in fact a palladium catalyst.



Now in 1988 the total market as I've said earlier for palladium was 3.4 million ounces. Of which the electronics sector consumed 1.7 million, the dental sector 1 million, other applications around 400 000, and autocatalysis a measly, miserable 235 000 ounces.

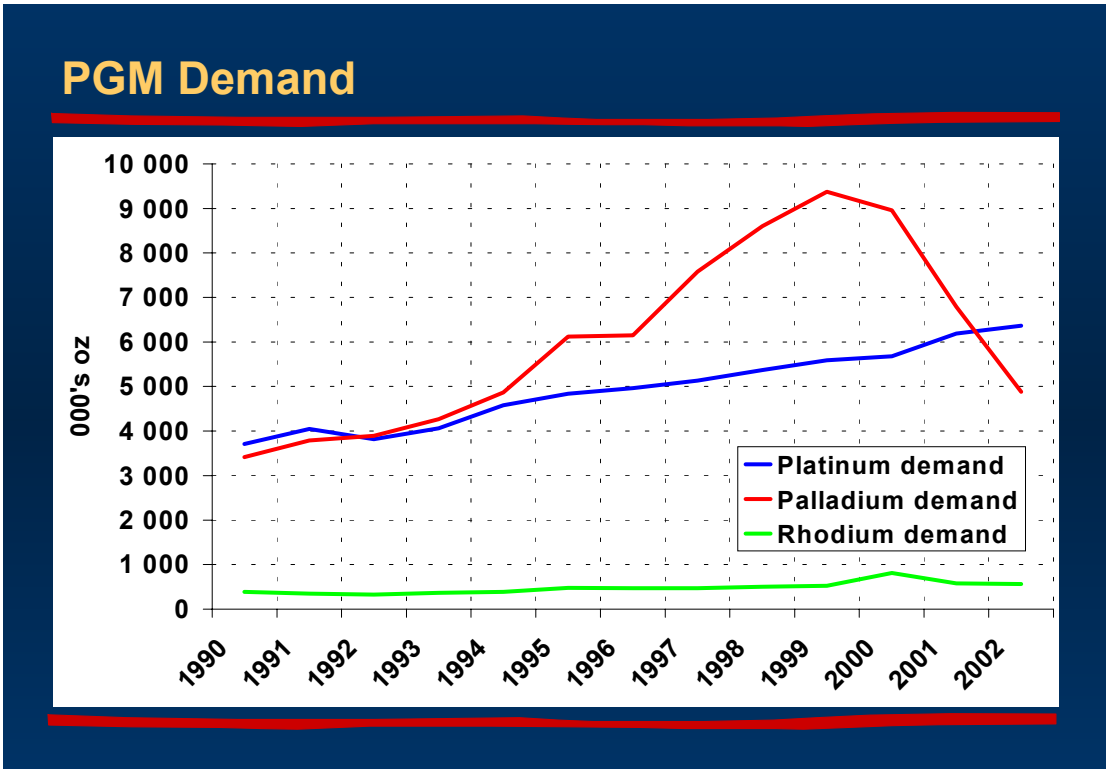
And this was one of the interesting little bits that I found in my research. It was in one of our documents. And it went as follows. *"Any significant growth in palladium usage will not occur until the late 90s, if at all."* How prophetic that was as far as the first part of the statement is concerned.

Because quite phenomenal growth certainly did occur in the late 90s, and it happened with a vengeance, as this graph shows us. And I certainly remember since 1988 when I first became involved in this industry, that we hit a low for palladium at $55 an ounce some time during that period - I guess in the early 90s - and of course it peaked a couple of years ago at over $1,000 dollars an ounce.

Now I wonder how many of you remember Fleichmann and Ponds? In 1989, these two gentlemen were doing scientific research into cold fusion using a palladium electrode. They left the laboratory one night, and when they returned the next morning, clearly something dramatic had happened. I don't know what it was. They never properly explained it. But they claimed that they had created cold fusion. Well, nobody was able, themselves included, to repeat the experiment, and of course the

whole thing fizzled out. But in the period 1987 through to 1997 you can see from that graph that the palladium price traded in a fairly flat range, and nothing very exciting was happening, on the surface anyway.

Where are we headed now? Is palladium going to resume, having reached this price peak, its by-metal status? Or are we going to see some sort of resumption of life?



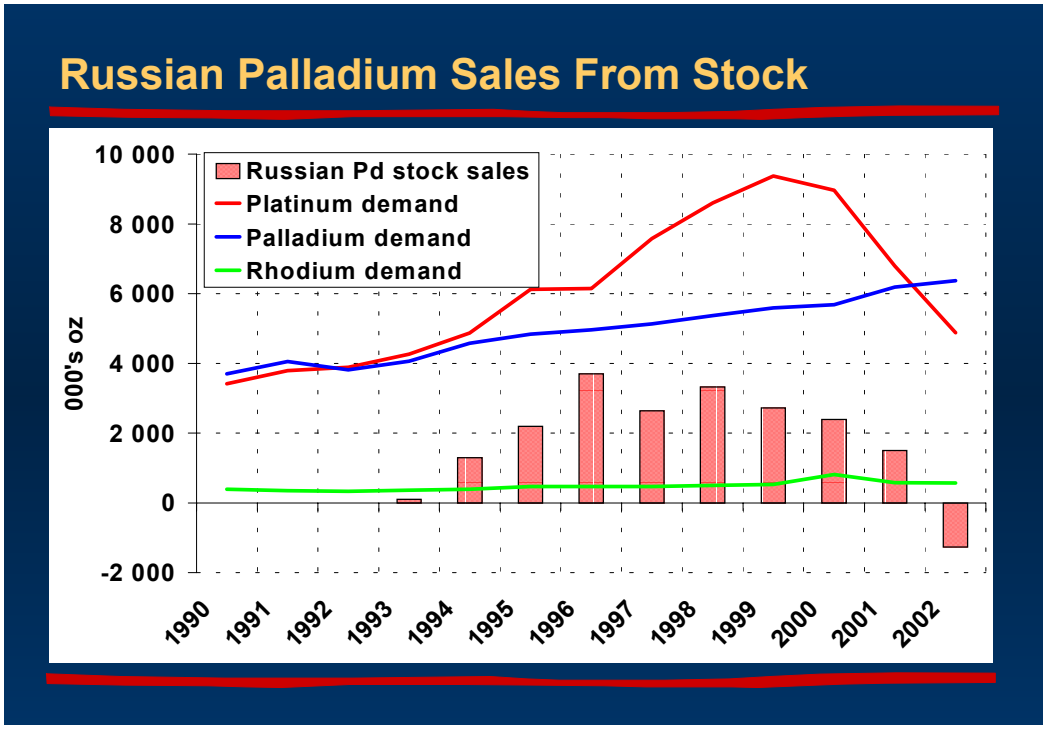
Just a little more history first – the dynamics of the market since the Ford announcement. If you look at this graph - in 1990. The blue bar is the palladium usage in autocatalysts, net of recovery of palladium from recycled autocats. And nothing really happened until 1993. It was only in 1994 that this move into palladium with autocatalysis commenced, and then it gained enormous momentum. The market for palladium in total, between the period 1992 and 1999, in seven years, it grew by more than two and a half times, from 3.9 million ounces to 9.4 million ounces. What a performance. And within that, the auto catalyst market over the same period grew by more than ten times from half a million ounces to 5.9 million ounces in 1999. What a ride that was!

It took four years from the original Ford announcement for this swing to palladium and autocatalysis to gain momentum. And through the 90s, as more automobile companies and autocat companies researched this metal properly, it began to develop an identity of its own, in terms of its technical performance, particularly dealing with hydrocarbons. And what had been motivated by a need to have more

flexibility in the use of PGM's in autocatalysis now became justified purely on the metal's technical performance. And that original motivation of flexibility became a stampede as every automobile company started to move into palladium catalysis.

By the end of the 90s, the automobile companies were buying close on 100% of the newly-mined palladium – not that supplied from stock. They were close to purchasing all of the primary production every year. Which left the other major sectors of demand, electronic and dental, effectively being supplied from Russian stocks. That was an untenable situation, something had to give, and it certainly did. This graph simply shows us the three major PGM's in the period 1990 to 2002. The red line is the palladium. You can see how dramatically that fell off. The green line is rhodium: it's been pretty flat in terms of its demand over the period, with a little spike in 2000. And just to mention platinum, which we're not talking about this morning, as you can see from the blue line how good and solid that growth has been over the period. And that's why we've got such good, firm platinum prices today.

I just want to make three points here: the phenomenal growth in palladium demand and its falling off the cliff, flat rhodium, and the platinum situation, the benefits of which we're enjoying today.



Superimposed on that graph now are the bars, the pink bars, which show what has been sold out of Russian stock over this period. Primary production simply could not keep up with the growth in palladium demand, and metal was sucked out of the

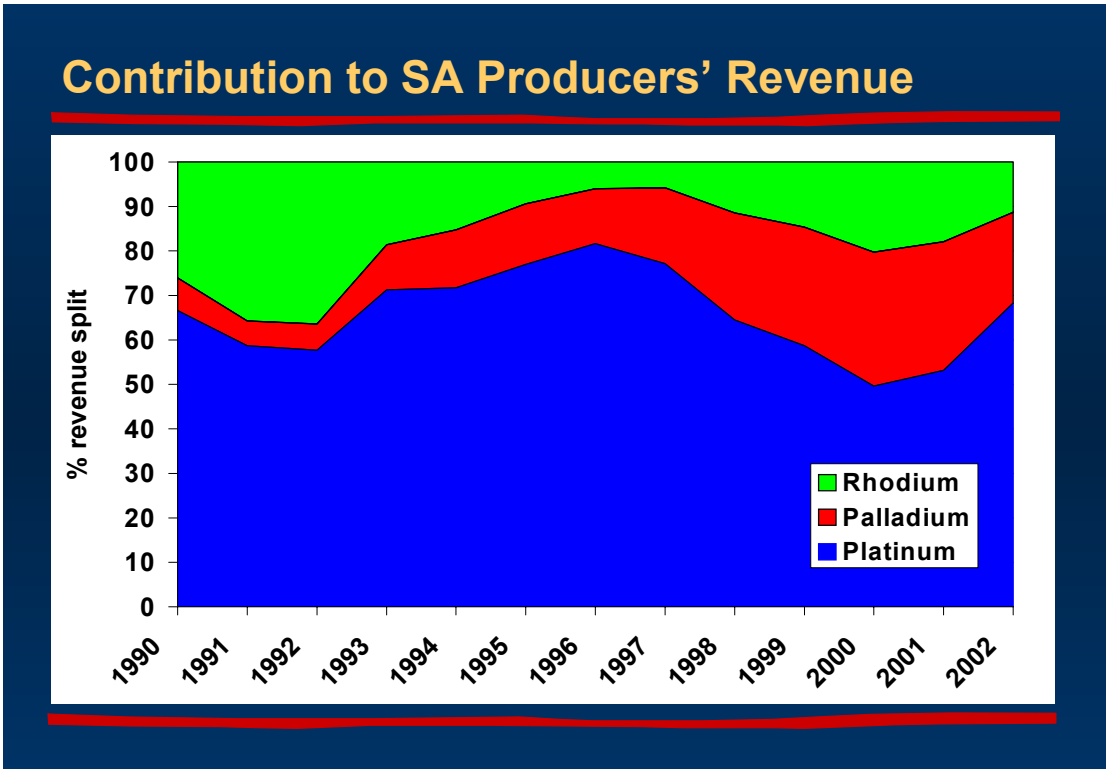
Russian stocks at a huge rate. Now one wonders, with the automobile companies having stampeded into this metal, whether they

(a) were aware of the fact that they were entirely dependant upon Russian stocks,
(b) whether they were comfortable with that fact, and
(c) whether they were surprised when they got stung by that fact.

Without these stock sales from the Russian vaults, of course, the price of the metal would have peaked much earlier. The other sectors - of electronic and dental demand - would have suffered huge damage. And the automobile companies would have been in very serious trouble. So they must have been aware that these stocks existed, and had a pretty fair idea that they would be able to have access to them.

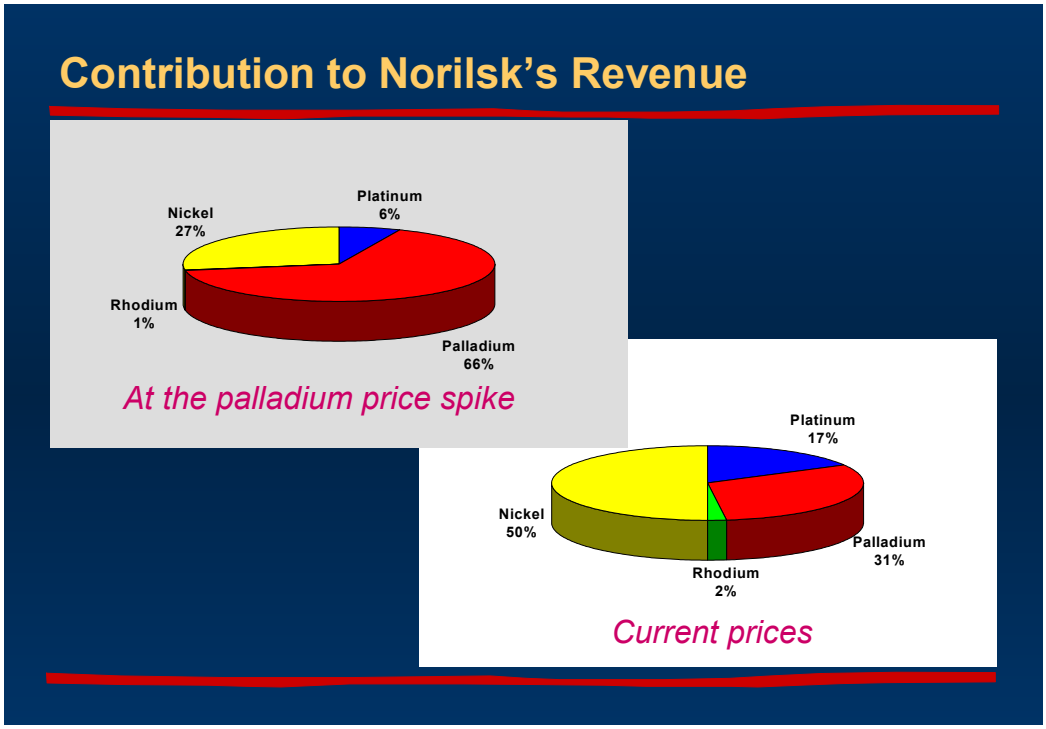
And where are we now? Well, electronic demand for palladium has halved since its peak, because of the volatility in price and the often erratic supplies. Dental demand, too, has halved since its peak, primarily because once again gold became very competitive as the price differential between gold and palladium widened. We have a situation now where the automobile companies who bought significant quantities of palladium to put into stock, are drawing down that stock. South African production of palladium is increasing significantly for two reasons: the one is that the producers are increasing their production of platinum, and the palladium comes with it. And secondly, many of the ore bodies now being exploited for platinum contain higher palladium ratios. So the primary production of the metal is growing quite significantly.

Substitution of palladium by platinum has been taking place in the automobile industry because of the most unpleasant experience which the automobile companies had with palladium, and of course that's one of the reasons for the firm price of platinum currently. Russia still has, we believe, significant stocks of palladium. And I think, certainly during 2002, added to that stock. And I would be surprised if Russia sold all of its production during that year. I think certainly some of the metal was withheld in order to support price firstly, in order also to facilitate new policy of not selling metal on the spot market, but rather attempting to enter into long term contracts for the disposal of the metal. So this erratic supply and this extreme volatility on price has totally undermined consumers' and users' confidence in the metal.



Now this slide just shows for interest more than anything else how important palladium revenues had become in the period 2000 and 2001 to the PGM producers in South Africa. Of course, as I said, they peaked - the palladium revenues. That is at around 30%. But look back to 1991 and '92, look at the green section of that graph. That is the contribution made by rhodium, which peaked as a contribution to total revenues of the South African producers at 36% in that time. And of course, platinum now is back to the position where it is hugely dominant in the equation.

But, to make an interesting point, back in the 90s certain newcomers to the business based their decision to enter on the price of rhodium. Who remembers Rhodium Reefs? Now consigned to history. And I wonder now how many potential entrants to the PGM business are basing their projections of revenue on relatively optimistic prices for palladium.



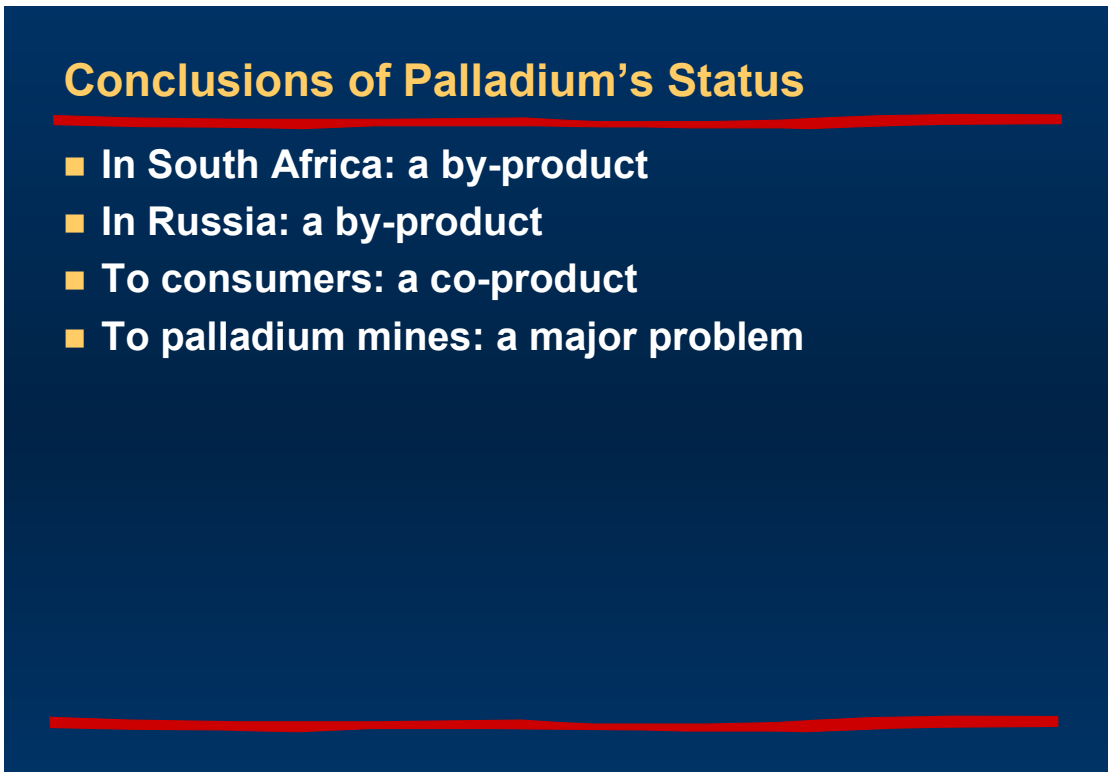
This just shows the situation as far as Norilsk is concerned, and the relative contribution of palladium to Norilsk's revenues relative to nickel. And you can see that that peaked at 66%, and is now back to the normal 50/50 base metal/PGM revenue type ratio.

Now you may say, so what? What does this all mean? We estimate that the level of demand for palladium is currently, and for the medium term will remain, below the level of primary production. So primary production will exceed demand for palladium

in the medium term. There is still a Russian stock overhang, which I believe has been increased during the past 12 months. And of course, as I said earlier, South African production is increasing to the point where I believe that South Africa will overtake Russia in the next few years as the major palladium producer.

What are the conclusions? Russia remains - because of its stock position - in a position to totally undermine the palladium price, if it so wished. I don't for a moment believe that it does wish to do so. But it is in such a position. As I said, the Russian influence in the palladium market is on the wane. Permanent damage has been done to the other major sectors of demand. We will never recover, unfortunately, much of the electronic demand that has been lost. And the dental demand I think will grow a bit, depending on the relative behaviour of the gold and palladium prices. The automobile companies have to stay with palladium. We have to persuade them that palladium continues technically to do a very good job in the autocat, and secondly that there will be plenty of metal around at reasonable prices. And they can once again put their confidence in the metal.

And I think that one of the things that Norilsk is trying to do with its long-term contracts is to allay the fears of the automobile companies, and satisfy them that they are prepared to be continuous, reliable suppliers in quantity at reasonable prices. It's absolutely essential that we achieve that with the auto companies.



To conclude, in the medium term, as far as the South African and Russian palladium producers are concerned, palladium's status as a by-metal is being restored. The ride is over for the foreseeable future. For consumers, they can rely on regular supply, lots of metal around, at reasonable prices. For palladium producers, those who don't have other PGM's in any quantity, I believe there are tough times ahead. For new PGM projects and producers, I would advise caution, on the pricing assumptions made going forward.

And I see a lot of heads nodding, saying "Oh, he would say that wouldn't he? He wants to keep us out of the business."

Well, all I can say to you is that time will tell. For the longer term, this is a truly exceptional metal, palladium. It's not platinum. It's a distant second to platinum, but it's in the same race. It has some extraordinary qualities and properties. Increased reliability of supply at reasonable prices is a very good factor in its favour. And it will have - it must have - an ongoing, very considerable role to play in the automobile industry.

The metal's properties and market position justify the investment of major funding into the enhancement of existing applications and the development of new ones. And I feel sure that we will hear much more of such initiatives in the future.

Thank you for your attention.