

Anglo Platinum: Taking Advantage of the Current Metal Prices and shortage of Platinum

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Platinum metal prices have risen significantly during the past 18 months, and have remained at elevated levels. Driving these bullish prices are sustained jewellery demand, mainly from the Far Eastern markets, and ongoing autocatalyst usage in response to ever more demanding global environmental legislative requirements.

Within South Africa, the areas north and south of the Steelpoort River in the Eastern Bushveld are well known for their significant resources of platinum. The bulk of the resources have lain dormant in anticipation of the very situation that is currently occurring in the marketplace.

Anglo Platinum is the largest primary platinum producer in the country, and is uniquely positioned to take advantage of the current elevated metal prices and shortfall in supply of platiniferous metals. In addition to its production capabilities, Anglo Platinum holds an extensive portfolio of mineral reserves and resources which underpin its ability to implement expansion projects to continue growth in platinum group metal production. It also has access to, and is actively expediting, the exploration of a range of properties where the company can further expand current production capacity or supplemented depleted production levels.

Current market demand

The supply and demand profile for platinum is different from other precious metal demand characteristics. Demand is driven primarily by tightened vehicle emission legislation, autocatalyst consumption as well as demand for platinum jewellery. Other industrial demand comprises a wide range of applications, such as glass, electrical, and chemical products.

Depletion of the Russian stockpiles of platinum occurred during the late 1990s, while significant palladium stockpiles, the magnitude of which remain a state secret in Russia, will continue to overhang the palladium price for some time into the future.

Demand for platinum has been driven over time by the successive introduction of new uses for the metal. Initially it was underpinned by the petroleum refining sector, then by Japanese jewellery and petrol autocatalyst development, followed by Chinese jewellery and, more recently, diesel autocatalyst development.

While 100% of the primary supply of platinum is Southern Africa-based, by-product production accounts for approximately 20% of metal reaching the market. The proportion of recycled platinum metal currently comprises 11% of demand, and is expected to grow. The year 2005 recorded the seventh successive year of deficit in supply. This represents a compound growth in demand of some 3.5% since 1995. (See Figures 1 and 2.)

The relative demand by region has shifted over time, possibly as a reflection of global growth dynamics. The increase in demand in Europe and 'the Rest', mostly China, is illustrated in Figure 3, which shows a substantial growth, principally in Chinese jewellery demand.

The 6.63 million ounces (moz) produced in 2005 is split between a range of uses. The categories shown in Figures 4

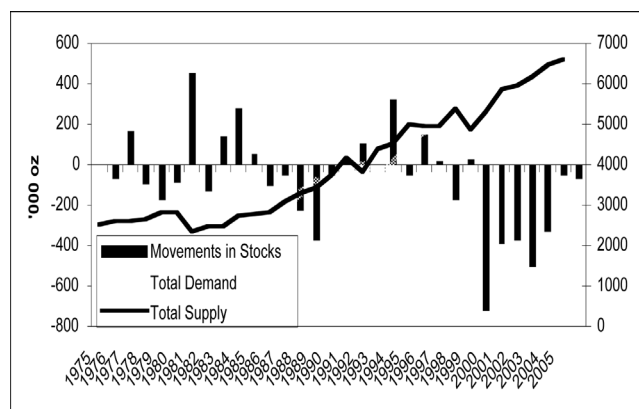


Figure 1. Platinum demand and supply relative to movement in stocks from 1975–2005

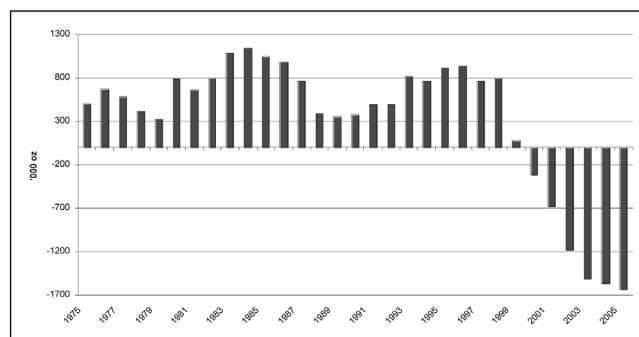


Figure 2. Cumulative platinum stocks from 1975–2005

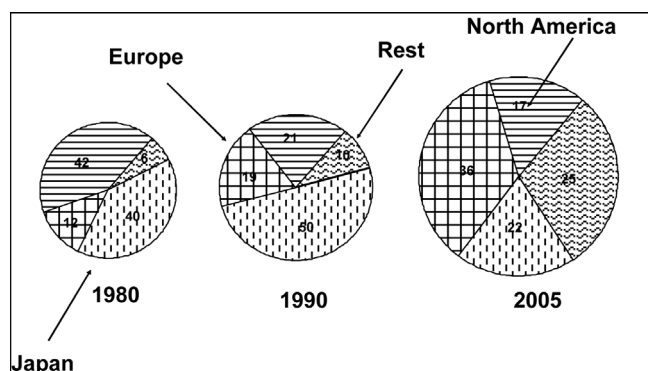


Figure 3. Relative shifting in global demand by region

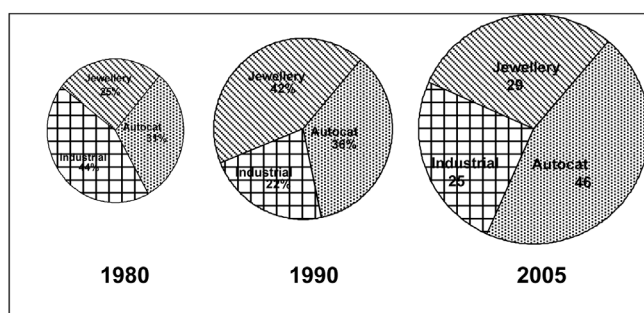


Figure 4. Relative changes in global demand by category

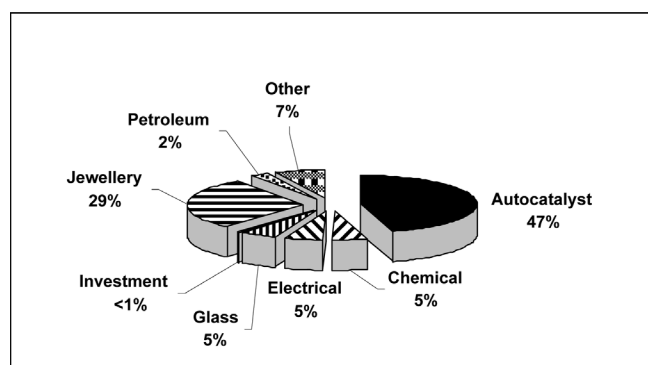


Figure 5. End user pattern of usage in 2005

(PGM) demand in the last four years, despite the continued reduction in metal per autocatalyst, primarily as a result of the growing popularity of light duty diesel vehicles in Europe. Figure 9 reflects the increased relative demand for platinum over other PGMs in autocatalysts.

Industrial demand in the glass sector, while strong, has a high proportion of recycling, as does the chemical industry. This demand is based on the unique physical and chemical properties that make platinum the preferred metal.

Outlook

The primary driver of Anglo Platinum's strategy is the growth in demand for PGMs. Success in developing

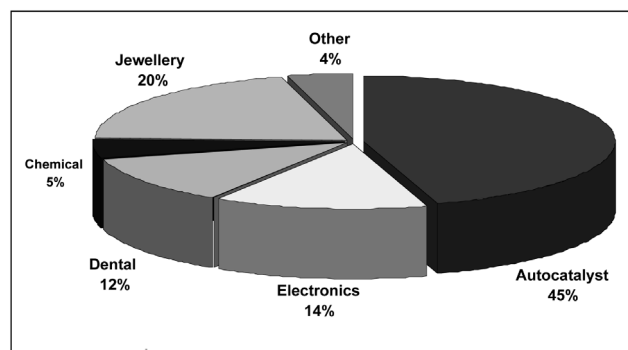


Figure 6. Palladium demand by sector in 2005

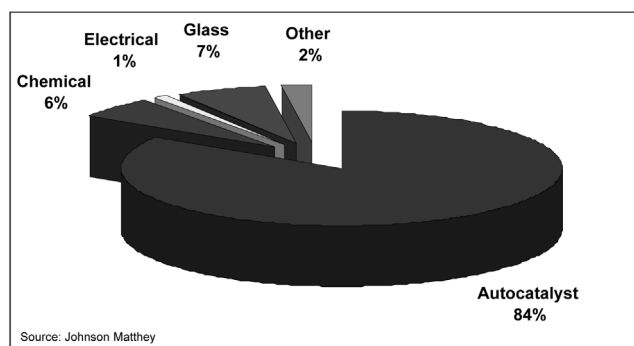


Figure 7. Rhodium demand by sector for the 812 000 ounces purchased in 2005

and 5 represent the known metal uses, and are presented as percentages of total demand.

Palladium demand, by contrast, was for some 7.04 moz in 2005. Figure 6 reflects the divisions into its respective sectors of demand.

Rhodium demand in 2005 accounted for some 812 000 ounces, and can be split into the sector categories illustrated in Figure 7.

The outlook for continued growth is strong, with the market continuing to show robust demand and growth, on the back of ever more stringent air pollution legislation and global broadening of the base of that legislative footprint. This, coupled with the ever-increasing motor vehicle population, particularly in the developing world, is set to maintain and enlarge this sector of demand (see Figure 8).

The demand for platinum autocatalytic converters has grown as a relative proportion of the platinum group metals

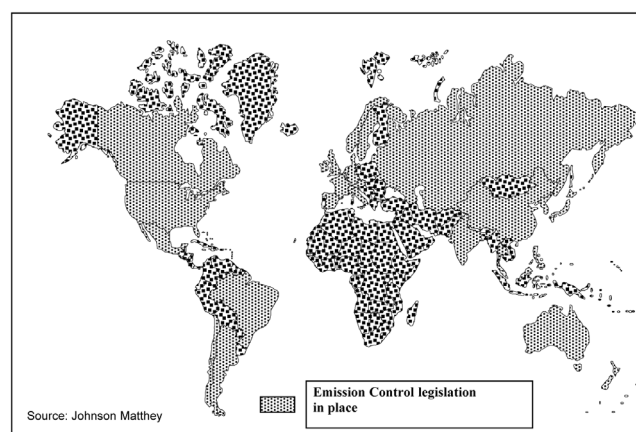


Figure 8. Vehicle emission legislation control in 2005

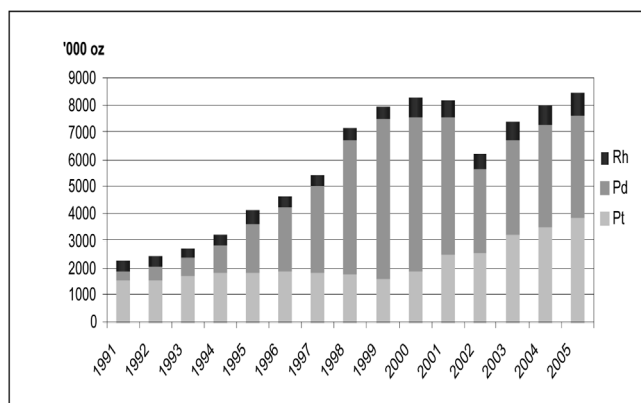


Figure 9. Proportion of PGM in autocatalyst demand over time

demand for platinum jewellery has been achieved via Platinum Guild International (PGI) and funded by the three largest South African producers. Co-funding research and development for new applications with customers has also contributed to the strong demand fundamentals currently prevailing.

Several years of upward strength in the metal price have been underpinned by growth in a number of sectors. The market can be divided into three sectors:

- autocatalyst
- jewellery
- industrial, including petrochemical, glass, electrical and chemical products.

The growth of the Far Eastern economies in recent years that has fuelled the market for PGE metals is not expected to diminish in the short term. This applies particularly to China, but also takes into account the Korean peninsula, the Indian subcontinent and the reviving Japanese economy.

If the high environmental standards that characterize western economies are imposed on the already burgeoning vehicle populations, the demand for platinum will probably increase even more substantially, and for a sustained period.

Supporting this theory, China has already imposed Euro I emission control regulations. Moves are afoot to increase the specifications to conform with those adopted by western nations.

From the evidence presented above, it would appear that the current boom in prices that the platinum industry is experiencing is sustainable into the medium term.

History

Anglo Platinum is a company that has evolved out of a series of mergers of various companies. The original company, started in the 1920s, was Potgietersrust Platinums Limited (PPL). This was a small platinum producer operating near Potgietersrust which started an additional section of its mine in the Rustenburg area. Records of meetings refer to the success of the Rustenburg section where, water, electricity and skilled miners were somewhat more readily available than in Potgietersrust.

P.C. Wagner's book *Platinum Deposits of the Bushveld Complex* (1929) refers to the erection of a treatment plant and workings by Potgietersrust Platinums Ltd on the farm Klipfontein. The Kroondal facies, a Merensky Reef type, showed significant promise following the opening up of a decline to a depth of some 300 ft (roughly 100 m) vertical

depth, given the shallow dip and lateral persistence of this orebody. 'It is of extraordinary regularity both as to constitution and platinum content. The Kroondal-Klipfontein Mine has exceeded all expectations in regard to the uniformity of distribution of the platinum metals in it...' Wagner goes on to list the companies then operating in the area as being Transvaal Consolidated Lands and Exploration Company Limited (TCL) in the Brakspruit area and the Boschkopje and Waterval (Rustenburg) Platinum Mines operating on the farm Waterval.

Following the market collapse of the Great Depression, consolidation of the then dispersed separate companies resulted in the formation of Rustenburg Platinum Mines (RPM). This included the incorporation of the then Platinum Exploration Company Limited with assets on Turfbult and Swartklip, which later became the Swartklip or Union Section of RPM. The shrewd forward thinking of the management of Barney Barnato's organization, Johannesburg Consolidated Investment Co Ltd (JCI) at the time placed many of the current assets which now represent the strength of Anglo Platinum in a division of JCI, then a gold, base metals and commercial property conglomerate.

The subsequent shift in focus of the PPL company's activities to the Rustenburg area and the organic growth it exhibited from those humble beginnings pales in comparison with the dimensions and geographical extent of the mineral resource base that Anglo Platinum has subsequently secured.

From the early consolidation of the Rustenburg properties, mineral rights holdings have been systematically acquired, explored, and developed over many years. An example of this approach was the development of the massive Amandelbult section of RPM in 1972. The subsequent addition of the Lebowa Platinum Mines followed the acquisition of a somewhat strange venture between Anglo Transvaal and the then OK Bazaars (a retail supermarket chain) into mining, which took the form of a small operation called ATOK in the Eastern Bushveld. Through foresight and planning, substantial ground holdings were obtained in both the Eastern and Western Bushveld in anticipation of the current market position. Properties were exploited in a systematic manner with the development of the PPL Sandsloot mine in 1993 and subsequently the Bafokeng Rasimone Platinum Mine (BRPM) mine in 1995. Recent developments at PPL have seen significant expansion of that mine. The very recent first blast of the PPL North project was recorded in August 2006. Several other projects and joint ventures are at advanced stages, some pending financial approval prior to progression into full development phase.

The original JCI survived until its unbundling in 1995, with the formation of Amplats and the subsequent name changes to Anglo American Platinum in 1998 and Anglo Platinum in 2005. Anglo Platinum continues to grow supply in line with its strategy to develop the market demand for PGM and to conduct business in a cost-effective and competitive manner.

Current mineral rights holdings

A very obvious strength of Anglo Platinum in the current market conditions lies in its substantial reserves and resources (see Figure 10). This, combined with several projects that are ready to move into production, provides room for rapid expansion to exploit current market conditions.

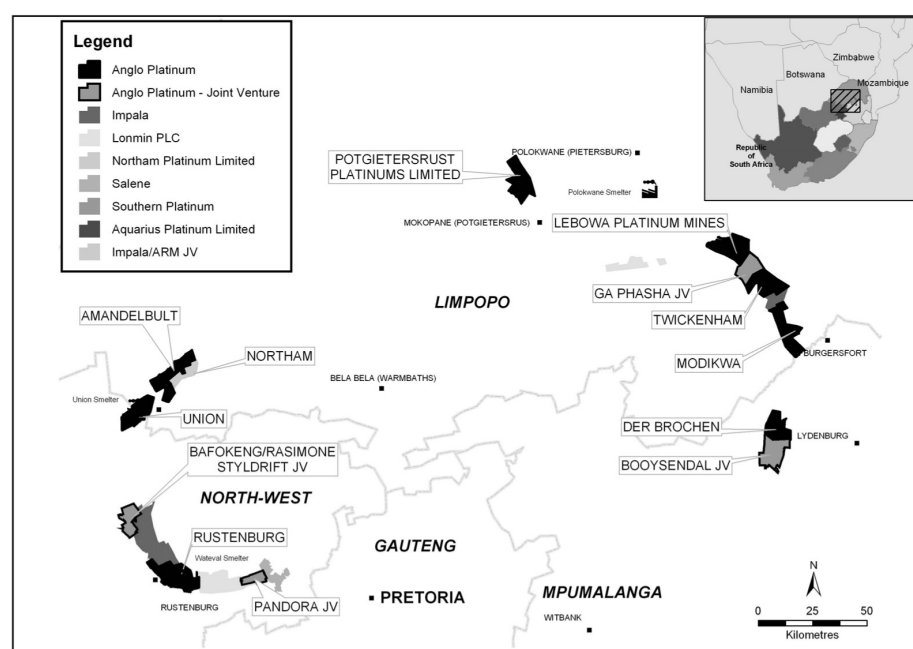


Figure 10. Location of the resource base of Anglo Platinum within South Africa relative to those of its competitors

Years of considered and careful exploration and resource delineation have allowed a project pipeline to be developed to the point where the growth of the company can be planned and executed in a considered and consistent manner. This results from robust and interrogative project design and planning work that yields a ranking system in terms of which the relative merits of projects are interactively matched with the perceived growth strategy within the organization.

Several properties with substantial mineral resources identified during the early Merensky exploration era are now being developed to meet the market challenge.

While the Bushveld remains the primary resource target for Anglo Platinum, it is not the sole focus. Anglo Platinum has implemented a strategy to engage with and observe all other sources of platinum and palladium globally, with a view to determining the risk or opportunity that these resources and showings might offer.

Currently Anglo Platinum has a project in development phase in Zimbabwe, as well as a project in Canada, which could be activated if palladium prices continue to grow. It has prospects in Russia, Brazil and, for a few years now, in China.

These reserves and resources provide investors and the market with the assurance that Anglo Platinum will be around for a considerable period, and will continue to grow and produce PGMs well into the future.

Production:

The Bushveld Complex contains the largest supply of platinum reserves and resources, accounting for some 77.7% of primary global sources. Proven and probable reserves of platinum in the Bushveld are estimated at some 247 moz, with an additional conservative estimate of some 1450 moz of potential resources locally and worldwide.

Anglo Platinum produced 2.453 moz of platinum in 2005, which constitutes approximately 37% of the global supply. This compares with total global annual demand of some 6.7 moz.

In addition, Anglo Platinum produces some 1.353 moz of palladium and 328 koz of rhodium with a wide range of other commodities that are by-products of the platinum production. For example Anglo Platinum produced some 19 000 tonnes of nickel and some 10 500 tonnes of copper in 2005.

Southern African production accounts for some 79% of the global Pt production. The next largest international contribution comes from Russia. Russian production is a by-product of nickel production and accounts for some 13% of global platinum supply.

Global production is centred in relatively few localities, dominated by the Southern African sources. (See Table I.)

Table I
Annual global production of platinum (2005)

Producer	Pt Moz
Anglo Platinum	2.453
Impala Platinum	1.85
Lonmin	0.916
Aquarius	0.131
Northam	0.196
Southern Platinum	0.45
Zimbabwe	0.156
North American Palladium	0.285
Noril'sk	0.89
Stillwater	0.36

Table II
Known platinum resources and reserves by country

Country	Percentage of known Platinum Resources and Reserves
South Africa	63%
Zimbabwe	17%
Russia	8%
Canada	1%
Finland	7%
North America	4%
China	0%

Table III
Platinum market suppliers by source

Platinum 2005 Supply	Percentage
South Africa	69%
Zimbabwe	2%
Russia	12%
North America	5%
Other	2%
Recycle	10%

Table IV
South African producers' relative proportion of platinum production

Producer	Relative proportion of South African production
Anglo Platinum	73%
Impala Platinum	13%
Lonmin	9%
Aquarius	2%
Southern Platinum (Lonmin)	2%
Northam	1%

Table IV reflects the relative proportions of the main contributors to the South African supply, which is dominated by Anglo Platinum. Anglo Platinum has the ability to grow from within by improving the efficiency of current operational performance and transferring skills to new operations as it expands. This has enabled it to take up the market challenge of higher metal prices and the current shortage of metal.

While several other sources of platiniferous metals within Southern Africa are significant, none match those of the Bushveld. Economic platiniferous horizons within the Bushveld are principally restricted to three main sources, although several others are under review. The main source of platinum is the Merensky Reef, closely followed by the Upper Group Number 2 chromitite seam (UG2). These are followed by the Platreef, which is frequently palladium-dominant.

Taking the Rustenburg Merensky Reef as the type area for the Merensky Reef, the ratio of metals contained is very attractive to a platinum-hungry market. Platinum constitutes some 59% of the contained metal, while palladium constitutes 25% of the 6 PGEs. The relative proportions of precious metals by reef type are reflected in Table V.



Figure 11. First blast at the new PPRust North Pit

The project pipeline

Anglo Platinum (also referred to as 'the Group') remains confident of the long-term growth outlook for PGM demand. The company is committed to increasing production in order to take advantage of the increased demand.

Anglo Platinum's expansion and replacement programme is constantly monitored against key market conditions to ensure that the Group's investment profile aligns with the Group's strategic objectives for all stakeholders over the long term. (Anglo Platinum 2005 Annual Report.)

Several projects have already been announced which will add significantly to the Group's metal output as they advance towards full production. Recently the Group announced three new mining ventures:

- a second pooling and sharing agreement with Aquarius Platinum in the Marikana area, with an anticipated additional 145 000 ounces produced by this project
- the Mototolo joint venture with Xstrata South Africa, establishing a new mine in the eastern limb of the complex, which is expected to produce 132 000 ounces of platinum and 82 000 ounces of palladium towards the end of 2006 at steady state
- the Potgietersrust Platinums (PPRust) North project, which will yield 200 000 ounces of refined platinum per annum to replace the current level of production at PPRust, and an expansion component which will add an additional 230 000 ounces per annum by 2009. (See Figure 11.)

Capital expenditure of between R4.0–R6.0bn has supported Anglo Platinum's recent growth in production. It will continue at these levels for the next few years.

Exploration

Anglo Platinum decided several years ago to explore and evaluate the resources at its disposal with a view to ranking the opportunities they represented. The project evaluation

Table V
Relative metal proportions in the different ore types

Metal	Merensky Reef	UG2 ore	chromitite	Platreef ore
Platinum (Pt)	59%	51%		43%
Palladium (Pd)	25%	23%		44%
Rhodium (Rh)	4%	8%		3%
Osmium (Os)	1%	2%		1%
Iridium (Ir)	1%	3%		1%
Ruthenium (Ru)	7%	12%		3%
Gold (Au)	3%	1%		5%

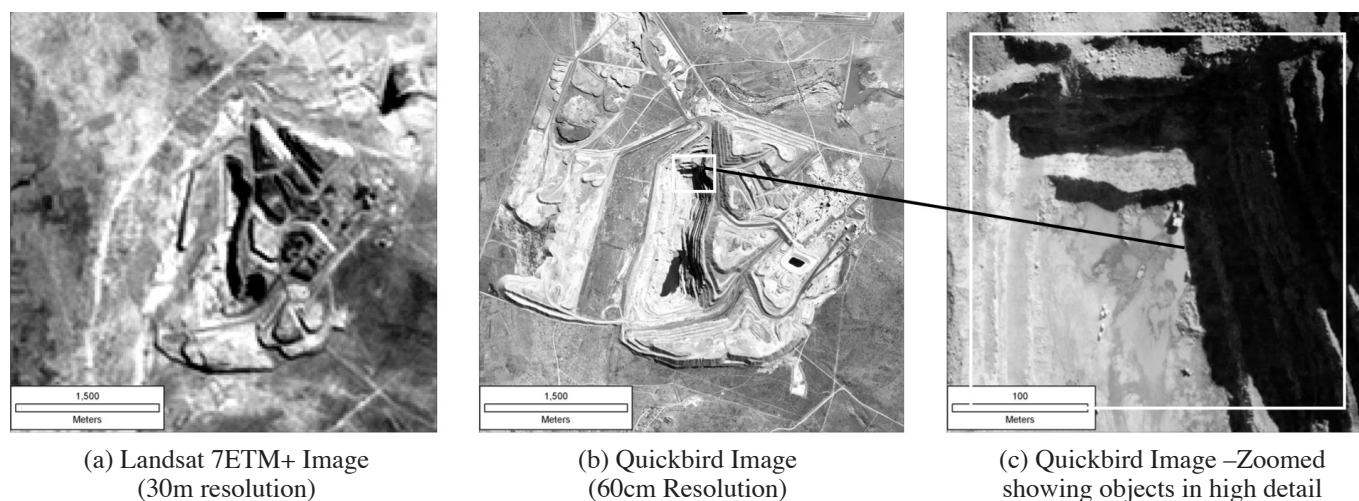


Figure 12. Landsat 7 ETM+ and Quickbird imagery

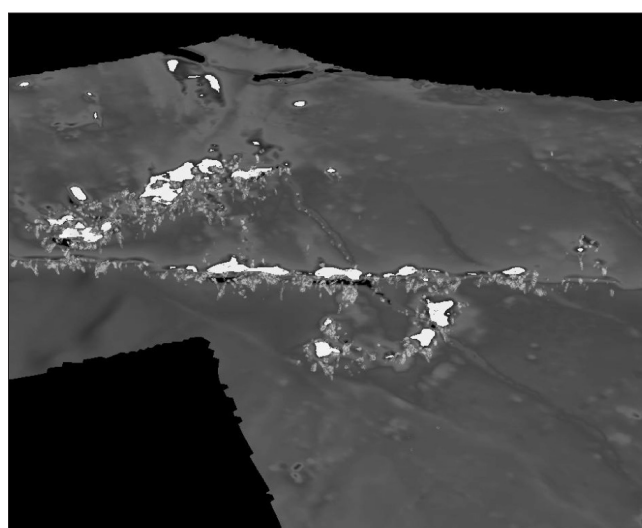


Figure 13. Image of 3D SQUID magnetic data

methodology was standardized and systematically applied. The ability to utilize a variety of exploration methods has placed Anglo Platinum in a unique position to gain maximum benefit from the sustained high prices of metal. Traditionally exploration has been viewed by many mining houses as an expense rather than an investment. It has taken both ingenuity and innovation to ensure that the exploration investment in the future is well directed.

Apart from traditional field work, mapping, and the subsequent drilling, Anglo Platinum employs geophysical and remote sensing techniques to aid the exploration effort. Furthermore, airborne magnetic surveys have been an important factor in finding interferences such as dykes and iron-rich ultramafic pegmatite (IRUPs). The 3D Seismic strategy used over the last five years was particularly successful. It contributed substantially to the understanding of the structure of the ore bodies in the near mine exploration, and facilitated efficient mine planning.

Optimal resource extraction planning for 30-year title increments has been greatly aided by this and other innovative techniques. An example would be Landsat and/or Aster satellite imagery, the use of which has become a standard in Anglo Platinum as an essential supplement for any field-mapping exercise. More recently the availability of

either Quickbird or Ikonos high-resolution imagery has assisted exploration to trace outcrop, rock type, alteration and most importantly structural trends better (see Figure 12). The most important innovation has been the meaningful integration of all data sets, leading to robust 3D orebody models and comprehensive interpretations thereof.

Anglo Platinum has recently embarked on utilizing full 3D environment software to display and interpret the acquired datasets. 3D models have been established for most projects within Anglo Platinum, to assist in the geotechnical field and facilitate better mine design and production assurance. Innovative airborne technology is under development, and testing will provide state-of-the-art geophysical datasets (see Figure 13).

Conclusions

Anglo Platinum's dominant role in the supply of platinum to global markets, coupled with its extensive reserves and resources, have given capacity to benefit from the current market opportunity. The resilience of jewellery demand at the current high price levels has resulted in buoyant and robust demand fundamentals. Anglo Platinum is well positioned to add value to its mineral resources by implementing its strategy to expand in the face of strong market fundamentals.