Dr Chris Baker
August 2025

Southern Palladium Ltd (ASX:SPD, JSE:SDL A$0.615/sh. Market cap A$65.8m)

A low cost, long mine life project with a financeable path to +400koz PGMs. Conceptual valuation >A$4.00/share

Investment view: *The Bengwenyama project genuinely seems to be one of the "jewels' of the Eastern Limb of the Bushveld. Viability of this long mine life, low cash cost project has been further enhanced with recent price moves by the platinum group metals (PGM) driven by on-going supply deficits and what to us looks like emerging strong investment and jewellery demand out of Asia. These price moves, sustainable in our view, underpin the attractiveness of SPD's 70%-owned Bengwenyama project.*

SPD's recently published Optimised Prefeasibility Study (OPFS) has demonstrated a highly attractive ramp-up in two stages, ultimately to a production rate of around 400kozpa. Both stages offer first (ie lowest) quartile cash costs. The capital intensity is significantly lower than that of the earlier PFS, suggesting an easier pathway to financing. Incorporating OPFS inputs to our model, together with BSCP commodity and FX assumptions, has resulted in a base-case valuation (NPV$_8$ after tax, 100% basis) of US$943m and an IRR of 28% (against SPD's own NPV$_8$ of US$857m). Preproduction capex is estimated at US$241m with a peak funding requirement of US$279m.

Further capital savings might be available should the company secure a contract for third party ore processing. This could halve pre-production capex (ca. US$130-140m), much more manageable for a company the size of SPD. However lower capex would likely be offset by increased milling costs. Based on our modelling reduced up-front capex and a 40% milling/haulage cost premium results in an NPV$_8$ comparable to the base case. However, the project's IRR expands dramatically to around 36%. As we discuss in this report, the toll milling model is not currently employed in the South African PGM industry. Furthermore, local community issues will need to be navigated carefully.

We have prepared a conceptual valuation for SPD and its 70% holding in this potentially world class project. Assuming project level gearing of 50% debt/capex, the sell-down of 19.9% equity of the project by SPD to a strategic partner at a 50% discount to NPV (leaving SPD with a 50.1% holding) together with an equity raise, we derive a valuation for SPD of A$4.23/share. A conceptual valuation of the "third party" option expands to around $4.61/share, with SPD retaining 70% equity in the project.

We continue to believe that the Bengwenyama project is one of the most attractive undeveloped PGM projects globally. Northern Limb projects in South Africa are being limited by smelting issues. The large, low grade PGM/base metal projects in Australia and Brazil have yet to convince us of their viability. SPD is by far the least expensive of the PGM pre-development plays globally, currently with a market capitalisation per reserve and resource ounce, a fraction of its peer group. For example, Chalice offers an EV/resource ounce of between A$159/oz and A$35/oz for its Gonneville high grade (3.9g/t 3E) and low grade (0.79g/t 3E) resource bases respectively. SPD's 70%-owned Bengwenyama project contains a resource base of 21.7Moz UG2 (7.1g/t 4E), with ounces capitalised at under A$4/oz.

Final environmental approvals have now been obtained for Bengwenyama and the grant of a Mining Right seems to be little more than a formality. The next 12 months should see completion of a DFS, finalisation of a funding plan (for which debt and equity advisors have been appointed) and the appointment of a project development team. FID is scheduled for mid-2026. We see progressive rerating of SPD as these critical hurdles are crossed.

SPD's cash position is now around A$10m following a recent capital raise which will allow a definitive feasibility study to be advanced.

The Optimised Pre-Feasibility Study (OPFS)

SPD's recently released OPFS demonstrates the opportunity for a lower initial capital intensity at the Bengwenyama project. The earlier 2024 PFS, while offering extremely attractive economics (+US$1bn NPV_8, 28% IRR at sensible commodity prices), could be a struggle to finance by SPD with peak funding requirements of US$452m.

To deal with this, SPD's consultants have proposed a staged project, initially targeting ca. 200kozpa PGMs until Year 9, then, funded by internal cashflows, a modular expansion to +400kozpa**. This case results in a significant drop in peak capex, from US$452m to US$279m**. (Pre-production capex in the early study was US$383m; in the staged approach it is now estimated at US$219m).

This delivers an attractive economic outcome for the project: a headline NPV_8 (after tax) of US$857m (ca. A$1.3bn) and an IRR of 26.4%. **This is some 14% lower than the NPV_8 for the 2024 PFS, but it comes with a peak funding requirement price tag some 38% less.** Looks like a no-brainer to us.

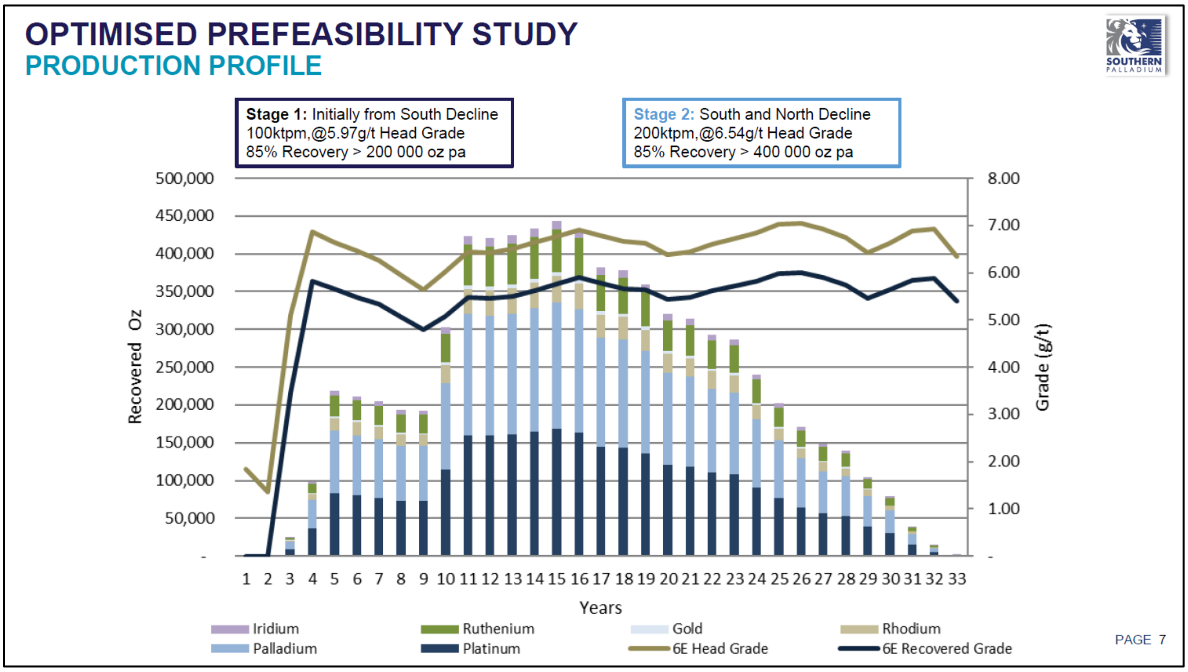
The OPFS also considers two other options:

- **"Stage 1" which could deliver a bankable stand-alone project at reduced production levels.**
- **"Third party milling" involving the haulage of ore to a neighbouring plant, further reducing the up-front capital budget.**

Both opportunities are discussed in this report.

Bengwenyama Stage 1+2: the Base Case

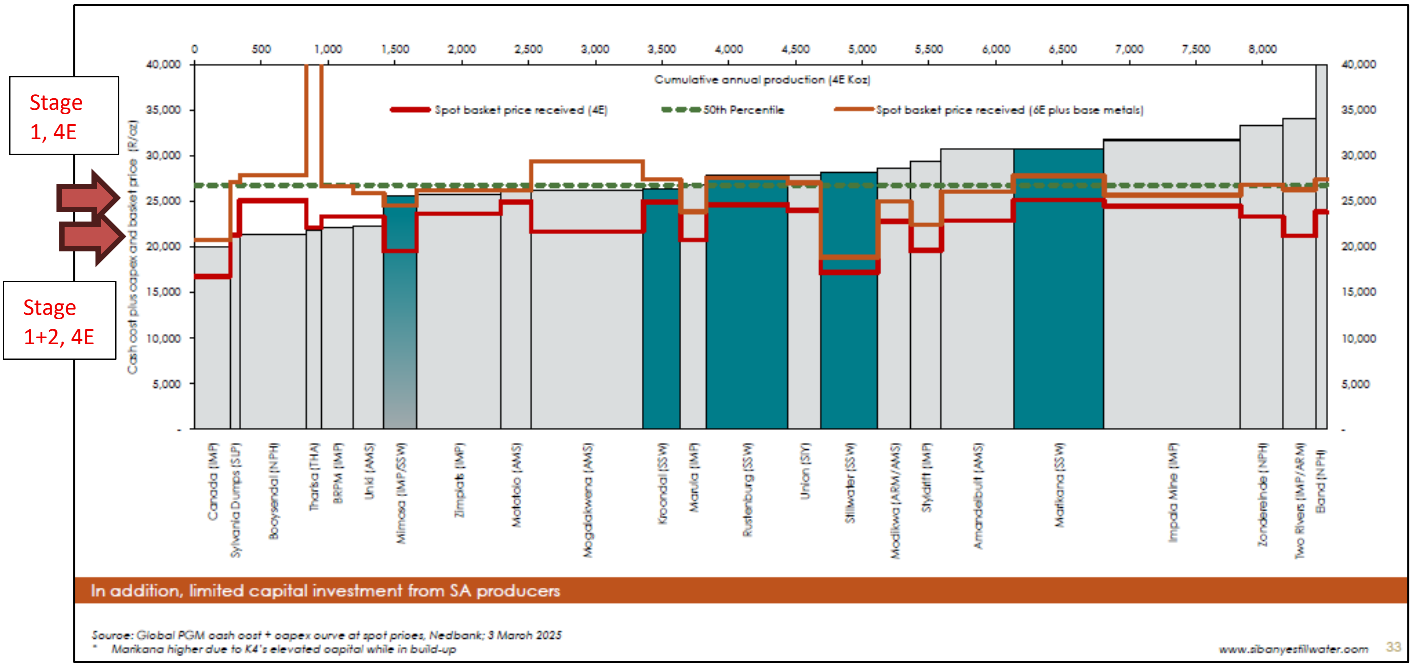
The following chart shows the proposed production build-up for Stages 1 and 2 at the Bengwenyama project:



Source: SPD

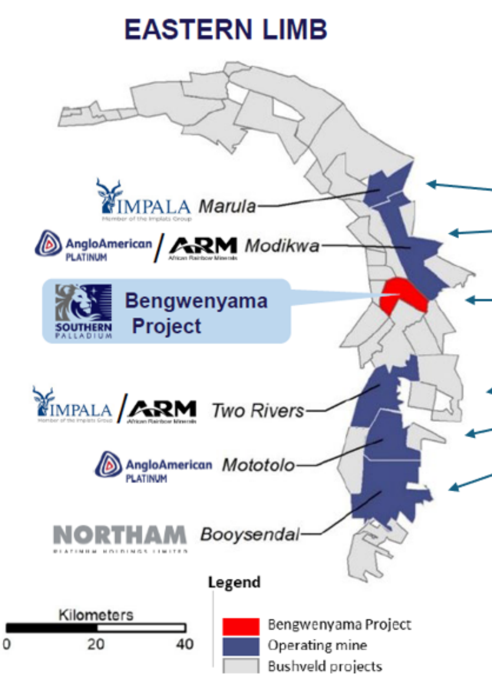
Production and capital staging relates to the timing of two proposed declines, followed by mill duplication to achieve a rate of 2.4Mtpa. With the initial mining and processing derived solely from a southern decline (where first ore is at a depth of under 100m) production ramps up to ca. 200koza (still a very significant mine for the PGM sector) and then some 7-8 years after first production, a ramp up to over 400kozpa.

With Bengwenyama's shallowness and high grades (reserves at over 6g/t 6E) both Stage 1 and Stage 2 of the project remain within the lowest quartile of the PGM cost curve.



Source Sibanye Stillwater July 2025.

At the proposed production level of Stage 1, the Bengwenyama underground would demonstrate production rates similar to that of Implat's high-cost Marula mine, located within the northern section of the Eastern Limb. At a milling rate of around 2.4Mtpa, Stages 1+2 are forecast to produce around 400kozpa PGMs but not until 7-8 years after the start of production, based on the current proposal. **This would have Bengwenyama as one of the largest and lowest cost PGM producers on the Eastern Limb.**



Approximate production rates and costs for the Eastern Limb producers including results from Bengwenyama OPFS

	PGM production (Kozpa)	AISC (US$/oz)
Marula	200	1100
Modikwa	270	1100
Bengwenyma (OPFS)		
Stage 1	**200**	**970**
Stage 1+2	**400**	**820**
Two Rivers	300	870
Mototolo	270	1000
Booysendal	510	1050

Note:
- Approximate annual production rates based on last reported periods.
- Cash costs also based on last reported periods. AISC reported on a 6E basis except for Mototolo (3E) and Booysendal (4E).
- Booysendal production from both the UG2 and Merensky Reefs. All other mines are 100% UG2. The Merensky development at Two Rivers is currently on care and maintenance.

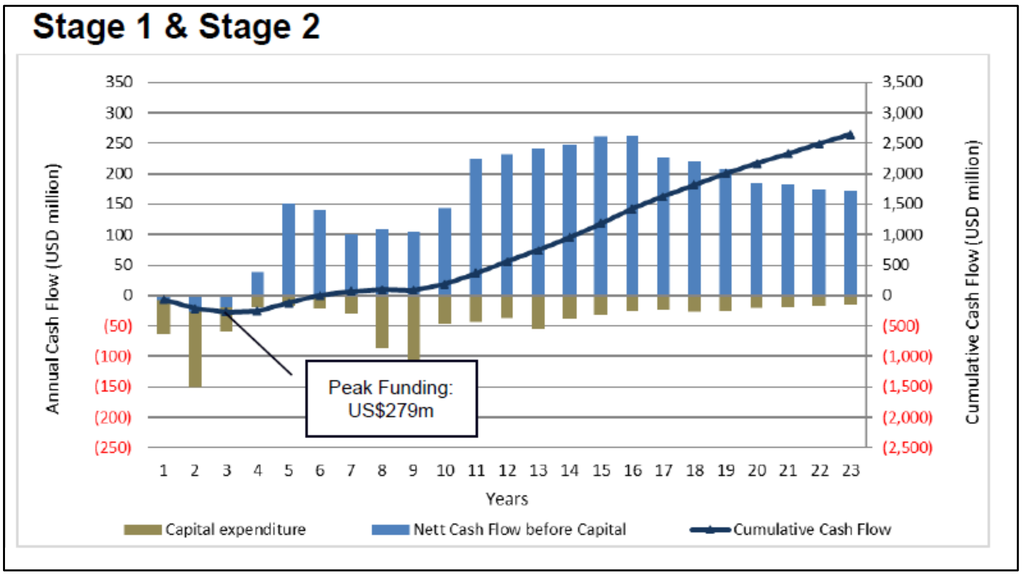
Source: SPD presentation and company reports

Note that the Merensky Reef is also mined at Northam's Booysendal operation and is included in the production figures above. Two River's Merensky operation is currently on care and maintenance.

Bengwenyama's valuation

The following chart summarises SPD's capex and cashflows for the company's "base case", an expansion from 1.2mtpa to 2.4mtpa, with a doubling of PGM production to around 400kozpa. In this model incremental capex for Stage 2 totals US$278m which is funded by internal cashflows from the project. Again, a contingency of around 16% has been assumed in the OPFS.

This generates a project level after tax NPV_8 of US$857m with an IRR of 26.4%, based on the conservative commodity price assumptions of SPD's consultants.



Source: SPD

(It should be noted that these valuations are undertaken at a project level. Additional capital is likely to be required by the owners to fund additional costs such as EPC/EPCM charges, owner's costs and an overrun facility. These are included in our corporate valuation, below).

We have modelled the Stage 1+2 base case for the Bengwenyama project with detail provided in the OPFS release, and can largely replicate the published valuation estimates. For this report, we have used slightly different commodity price assumptions than those adopted by SPD and its consultants: slightly higher PGM prices (largely in line with current spot prices), offset by a stronger currency.

PGM	Grade (g/t)	Prill split	Basket Price, SPD US$/oz	%	Basket Price, BSCP US$/oz	%
Platinum	2.34	38.0%	1200	29%	1300	28%
Palladium	2.33	37.8%	1100	27%	1200	26%
Rhodium	0.48	7.8%	6190	31%	7500	33%
Gold	0.07	1.1%	1950	1%	3000	2%
Iridium	0.16	2.6%	4650	8%	5000	7%
Ruthenium	0.78	12.7%	450	4%	500	4%
TOTAL/Basket price	6.16	100.0%	1557	100%	1759	100%
ZAR/USD			19.6		18.5	

Our US$ basket price is 13% higher than that used by SPD's consultants in the OPFS. In ZAR terms, this drops to a 7% premium.

These assumptions generate the following valuations for the project and demonstrate the strong valuation leverage to discount rate, reflecting the mine's +30 year life and relatively low capital intensity.

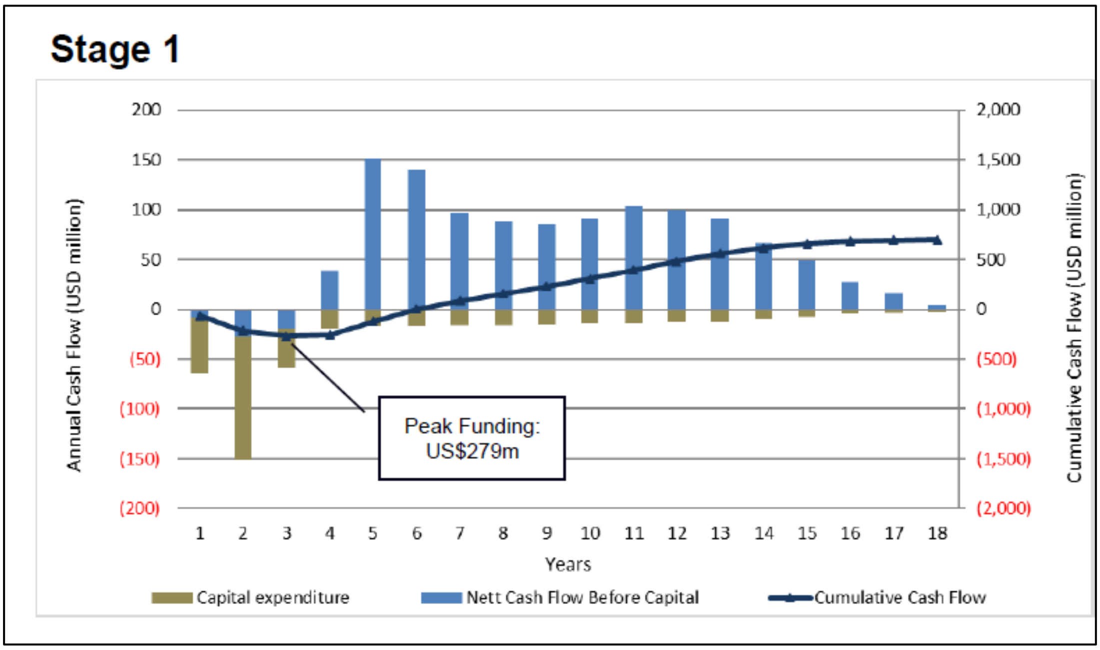
An NPV_8 of US$943m is used in our conceptual corporate valuation for SPD, below.

Bengwenyama valuation (100% basis, after tax)	
	US$m
NPV_{10}	$675
NPV_8	**$943**
NPV_5	$1,572
NPV_0	$3,861

Source: BSCP estimates

Stage 1 alone: could be commercially attractive.

SPD suggests that Stage 1 alone is likely to be economically attractive in its own right, with a pre-production capex bill of US$219m (including a 16.5% contingency), and with ongoing capex for the remaining life of Stage 1 of just $22m. Peak funding, which also includes working capital in the early years, totals US$279m. In a recent presentation SPD presents elements from its cashflow modelling for Stage 1 of the project. Collectively these figures generate an NPV_8 of around US$256m (after tax) with an IRR of 21.8% (using SPD's commodity price assumptions).



Source: SPD

This we think undervalues the potential for Stage 1 as a stand-alone opportunity. Stage 1 as presented in the OPFS has been designed to integrate with the start of Stage 2 involving the eventual doubling of production.

Recognising the significant reserve position for the Bengwenyama project, we have modelled a case where production continues for a further 5 years for an **18 year mine life**. This assumes around 3.5Moz of the 6.3Moz (6E) reserve is extracted. Suitably conservative in our view.

These assumptions generates **a significant upgrade to the valuation of Stage 1, to just under US$450m**. We would be very surprised if this large orebody was unable to support this level of production from the first (southern) decline and **we look forward to more work being done by SPD regarding the "Stage 1 stand-alone opportunity.**

The main message here is that the Bengwenyama project does not necessarily need the second (or expansion) stage to generate a commercial outcome.

Third party processing: an even lower capital possibility

SPD states in its recent release that there may be an option of processing of Bengwenyama ore using existing mineral processing infrastructure in the area (ie third party or toll treating).

The OPFS estimates that the milling/concentration plant for Stage 1 makes up around US$138m of pre-production capital, or 50% of total. This would be offset by higher opex, haulage costs and a margin payable to the 3rd party. Given that Bengwenyama's highly attractive cost structure, the ability to further reduce capex could be a very attractive option. This could be quite a game changer, but clearly depends on a deal that can be done with a neighbouring mill. Toll milling, as is common in Australia, is not yet employed in the South African PGM industry. This may change if mature/high cost mines continue to struggle.

This could make the financing of Bengwenyama significantly easier, with total capex potentially halved (US$279m down to perhaps US$140m).

We have modelled a scenario incorporating the following:

- Peak capex of US$140m.
- Toll treatment costs at a 40% premium to those assumed for the Stage 1+2 base case.

This generates an NPV_8 for the project (post tax, 100% basis) of US$966m, almost the same as the base case) but with an IRR of 33%, reflecting the lower up-front capital charge.

Life of mine average cash costs are around US$60-70/oz higher than the base case at just under US$900/oz. This would still leave Bengwenyama in the lowest cost quartile.

What are the 3rd party options? We've been watching Bengwenyama's neighbours, and it's fair to say that several have been struggling, especially with depressed PGM prices. We note in recent quarterlies the Marula mine of Implats (under 100km to the north) appears unable to fill its 1.8Mtpa UG2 mill. The mine has been under threat of closure, although the recent rally in PGM prices will likely have assisted mine economics.

We also note that both the Two Rivers (ARM/Implats) and Modikwa (Valterra/ARM) mines (south and immediately north respectively) are having their own production issues in the UG2.

We are also aware that the Platmin operations on the Western Limb are now on care and maintenance. This is likely too far to truck ore. However there may be other opportunities in the Bushveld.

One issue which will need to be considered relates to that of the local communities and potential conflicts which could arise. This is a layer of complexity which will need to be thought through carefully.

Still very early days, and we'd expect that serious negotiations will not start until the grant of the Mining Right.

Southern Palladium valuation, base case

We have incorporated our Stage 1+2 US$943m NPV_8 into a conceptual NPV/share for SPD. Our assumptions include the following:

- Total pre-production capital of US$300m, allowing for working capital, and a cost overrun facility. It is assumed SPD fully funds its own equity and together with the 30% held by the local community. The community's share is then repaid over the following 7 years.
- Debt funding of 50% of the peak capex charge.
- Sell-down of 19.9% of the project to a strategic investor, leaving SPD controlling 50.1%.
- An equity raise (at 60c assumed) by SPD prior at FID in mid 2026 to top up capital requirements. This leaves the company with around $20m for working capital at a corporate level. (Note our valuation is highly sensitive to the pricing of this equity raise).

This results in a conceptual valuation of A$4.23/share. To stress, this is not a share price target, but does illustrate the depth of value currently embedded in SPD.

Southern Palladium, conceptual valuation			
Bengwenyama (NPV8), post tax, 100% equity	A$m	$1,347.16	
Bengwenyama (NPV8), post tax, 70% equity	A$m	$1,161.90	BEE debt recovered over 10 years
Add back capex (70%)	A$m	$300.00	
Bengwenyama (NPV8), unfunded, 70% share	A$m	$1,461.90	Unfunded NPV
Project debt, 100% basis	A$m	-$214.29	50% debt/capex, SPD to fund 100% of debt
NPV less debt	A$m	$1,247.61	
Current ownership	A$m	70%	
Final ownership by SPD	A$m	50%	Sell down to 50.1% at a 50% discount to NPV
SPD equity post sell-down		$891.15	
Proceeds of sale of equity in MUM	A$m	$116.19	Equivalent of raising at 86c/share
Implied SPD equity	A$m	$1,007.34	
Cash	A$m	$10.30	As at July 2025
PV of corporate costs	A$m	-$50.00	Estimate, post tax
Other exploration	A$m	$0.00	A conservative assumption
Corporate NAV	A$m	$967.64	
Number of shares, current	m	107.0	Incl. founders shares, excl. options
New equity required	A$m	$85.00	Estimate
Number of new shares	m	141.7	Issued at 60c/share
Total number of shares	m	248.6	
Conceptual valuation adding new cash	A$m	$1,052.64	
Conceptual valuation/share	A$	$4.23	

Source: BSCP estimates. AUDUSD 0.70.

It must be stressed that this is a conceptual valuation and depends on the ability of the company to attract a strategic investor to take a 19.9% position at the project level. Given several of the PGM's are now classified as "critical minerals" we believe there could be good interest in this minority stake. (Note that PGM predevelopment company Platinum Group Metals [TSX, PTM] has taken on Implats as a 15% shareholder at project level in exchange for a concentrate offtake contract. This was put in place some years ago).

It is worth noting that this valuation is greatly enhanced by the small number of shares currently on issue. SPD has done an excellent job getting the project to such an advanced stage with a total spend of around $20m. The total spend to the completion of a BFS is likely to be around $30m.

SPD valuation, assuming 3rd party ore treatment

We have undertaken a similar conceptual analysis incorporating a third party ore treatment option, as discussed above. The attraction of this option is that the up-front capital requirement is likely to be significantly less than for Stage 1, which would make the project that much easier to finance. The trade-off is of course higher cash costs but as we discuss above, we estimate the cash costs to remain at under US$1000/oz (4E).

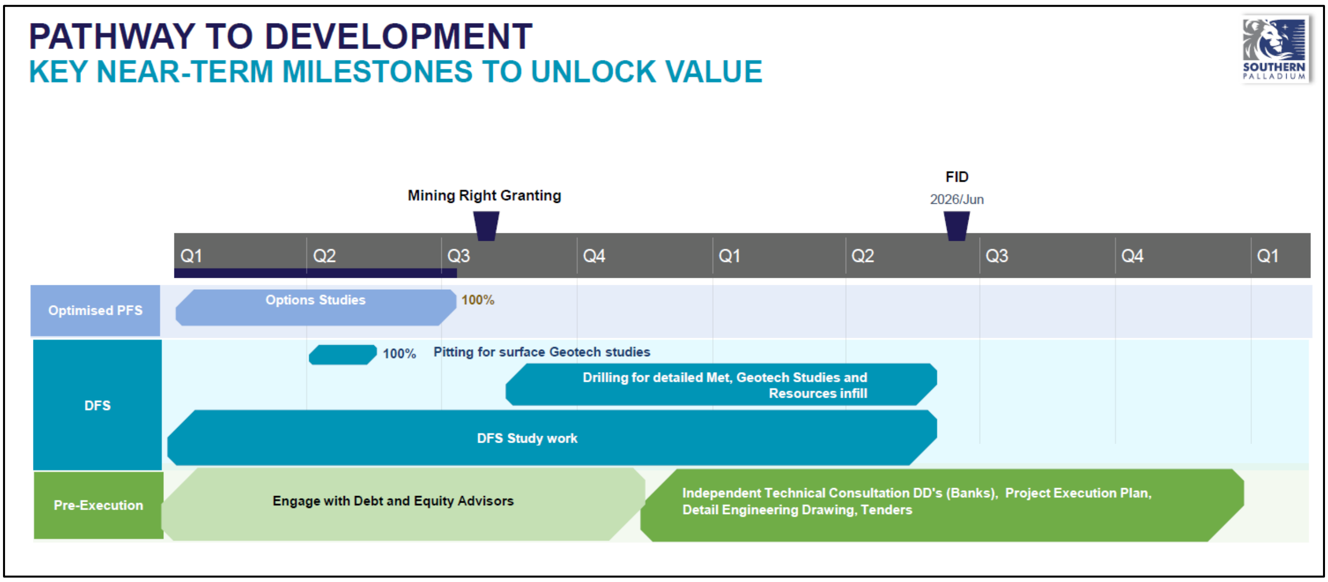
Our assumption for this case include:

- Pre-production capex of US$140m.
- Operating costs a 40% premium to base case assumptions for milling cost.
- NPV_8 (after tax) of US$966m.
- No sell-down of project equity to a "strategic investor", so SPD retains 70% f the project.
- Equity issue of A$10m to complete DFS.
- A further issue of A$100m (at 60c/share) to satisfy additional equity requirement to fund the project.

This results in a conceptual valuation of A$4.61/share, only modestly higher than our "base case" valuation.

It must be stressed again that these are estimates based on BSCP assumptions.

So where to next?



Source: SPD

SPD provides the next steps in the development of the Bengwenyama project in its recent release:

- Issue of a Mining Right.
- Completion of required drilling (metallurgical test work, geotechnical and hydrogeological).
- Completion of a Definitive Feasibility Study.
- Final investment decision (which will accompany equity and debt funding solutions).
- Mine development.
- Construction.
- Commissioning and ramp-up.

Issuance of the Mining Right is of course critical. This was to happen in the June quarter, but delays in environmental and other approvals have slowed the bureaucrats. All the environmental approvals have now been obtained and we believe there are no show-stoppers. It now seems likely to be granted in the current quarter.

The recent $8m capital raise should get the project toward the completion of a DFS, although it's likely a little more capital will be required. Then comes the question, how will the project be funded? We can only speculate, but with the up-front capital burden now less, the project looks to be a lot easier to fund. It may still likely need a strategic partner, which is what we've assumed in the valuation analysis above. These discussions will likely await granting of the Mining Right.

We see a progressive re-rating of the SPD share price as critical hurdles are crossed. These are likely to include:

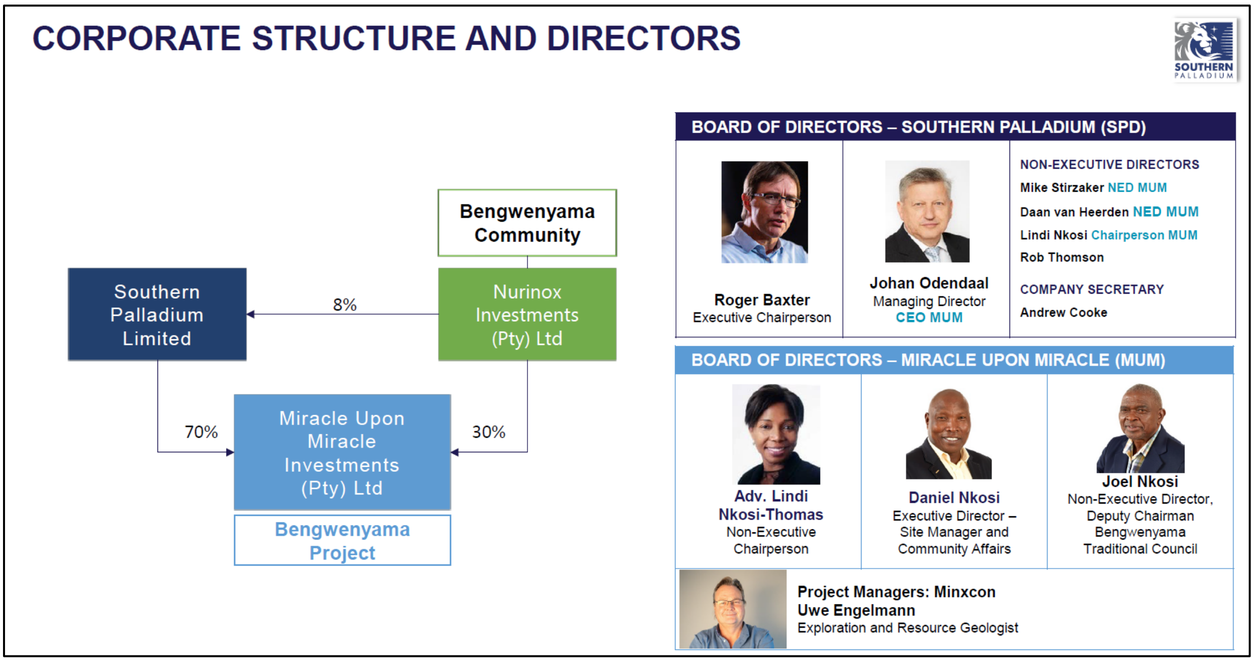
- **Granting of the Mining Right, in our view a very important hurdle, given the complex historical ownership of the project. The Mining Right will provide investors with full certainty of the ownership of the project.**
- **Further refinements of the OPFS, including the possibility of access to third party processing with the potential for further capex reduction.**
- **The move toward completion of a bankable feasibility study which will include concentrate offtake agreements with one of the smelters in South Africa. This we think will represent an important validation of the project's viability.**
- **Securing a strategic investor for ca. 20% equity in the project.**
- **Finalisation of a debt facility for the project.**

Based on SPD's projections the next 12 months will be a busy period for the company and potentially a rewarding period for shareholders. As we discuss below, the outlook for the platinum group metals has improved dramatically over the past 4-6 months, and provides an encouraging environment for a positive outcome for the Bengwenyama project.

Capital structure

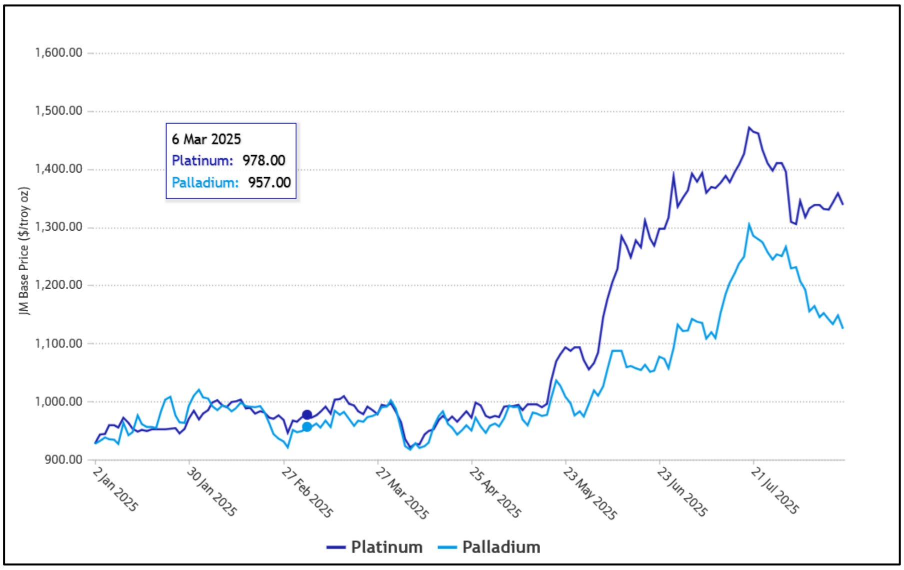
Shares issued	m	106.95
Share price	A$	0.615
Market capitalisation	A$m	65.8
Share price	ZAR	690
Market capitalisation	ZARm	738.0
ZAR/AUD	x	11.38
ZAR market capitalisation	A$m	64.85
Difference (ZAR vs AUD)		-1%
Cash (July 2025)	A$m	10.3
Share prices as at 25/8/25 (ASX close, JSE open)		
Options, T1[1]	m	7.33
Options, T2[2]	m	0.875
Major shareholders		
Top 20 holders		71%
Directors and management		15%
Note 1. Exercise price of 87.5c, expiring June 2026		
Note 2. Exercise price of 70c, expiring September 2027		

Corporate structure and directors



COMMODITY COMMENTARY

Following in the path of gold's extraordinary run in recent years, the platinum group metals have been on a similar trajectory. Since the start of the year, platinum is up over 40% and palladium up around 20%. Following a strong price move over the last 2 months, rhodium – which peaked at nearly US$30,000/oz in the last cycle – is up an impressive 66%.

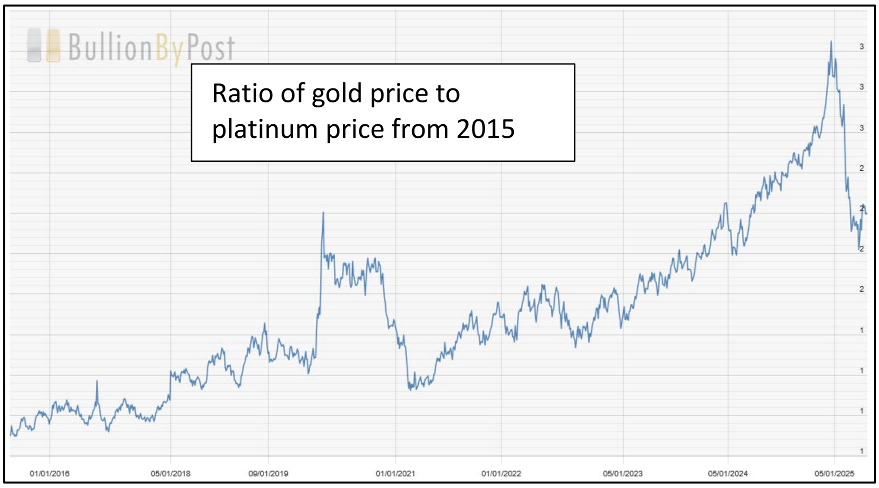


Source: Johnson Matthey

We have undertaken a review of the supply and demand elements associated with the PGMs. Much of this has been completed with the assistance of work by the World Platinum Investment Council (WPIC). This group has been formed by several of the world's leading PGM producers to develop the market for platinum investment demand. Of all the commodity experts we can access, the WPIC appears to be the best informed. Particularly challenging is the ability to gain information regarding investment and jewellery demand. WPIC seems to be well connected in this regard.

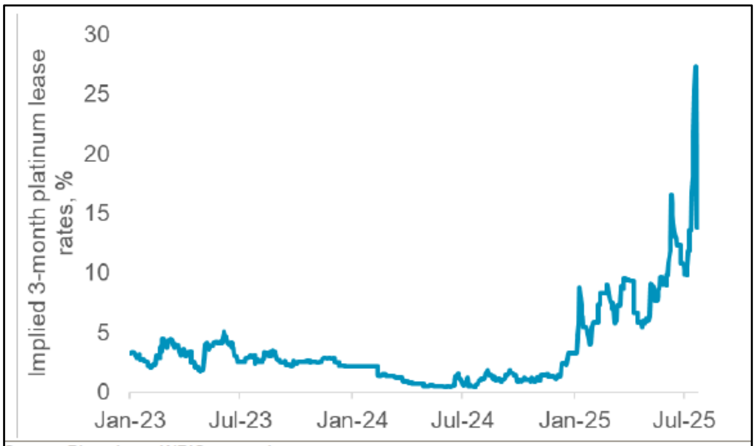
In its recent quarterly the WPIC concludes that there is a growing appreciation of the extent to which platinum's strong supply/demand fundamentals, resulting in the structural deficit, are underpinning a compelling investment case. This is further boosted by platinum's robust and diverse drivers of existing demand, not to mention the emergence of a new demand driver for platinum through its use as a critical mineral in technologies that enable the use of hydrogen in the energy transition. At the same time, platinum's wide price discount relative to gold and its current undervalue relative to its own historical levels present investors with an interesting opportunity.

As shown in the following chart, gold has spectacularly outperformed platinum, but this trend turned in April/May 2025 as gold prices flattened and platinum began its current rally. Even assuming the Au/Pt moves back to levels last seen in 2022, this could imply a Pt price of around US$1,600-1,700/oz, assuming no move in the gold price. Recall as well that 10 years ago gold and platinum traded close to parity.



Platinum's structural deficit

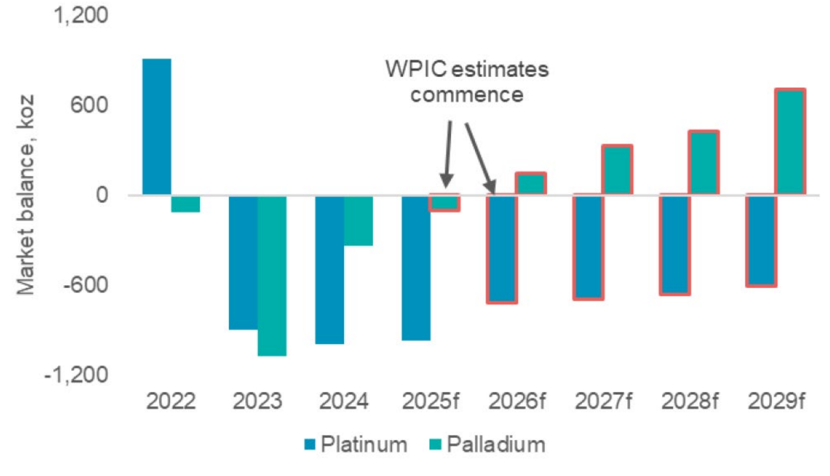
- Total platinum supply is expected to fall below 7 Moz in 2025 which the lowest level in the WPIC data series going back to 2013 (excluding the period impacted by COVID).
- Mine supply is projected to be at multi-year lows and there are few new mines to help fill the gap.
- Recycling volumes have struggled to return to historical levels, but in general recycling is a palladium and rhodium industry. Pd and Rh prices have been sufficiently low to disincentivise recycling.
- Demand is projected to be down 4% year-on-year in 2025, partly due to cyclicality within the glass manufacturing industry with significantly fewer new Chinese glass (and fibreglass) production facilities due to be commissioned in 2025. This we understand was quite a large volume: a delta of perhaps 350Koz has been suggested to us.
- The structural deficit in the platinum market is embedded and continues to deplete above ground stocks which are expected to fall to around three months of demand by the end of this year. This is thought to be an unsustainably low level. It is believed that the bulk of the world's above ground stocks are now held by China.
- This is leading to market tightness, which is currently reflected in elevated lease rates. Elevated lease rates have the effect of encouraging the lending of platinum to end users (and investors), which acts as a temporary source of supply until such time as the borrowers need to return metal to close out the loans. It's possible that this trade – partially driven by an expectation of tariff imposts for US imports – has drawn to a close, and that long positions amongst speculators are being closed out.



Source: Bloomberg, WPIC research

- The following chart illustrates WPIC estimates for platinum and palladium market balances. Platinum remains in deficit to the turn of the decade.
- On WPIC numbers, palladium reverts to a surplus from 2026, but that assumes recycling rates revert to normal levels. As discussed elsewhere, the recycling business is under significant margin pressure and appears to be delivering less metal to market.

Figure 1. Platinum and palladium market balances 2022 to 2029f

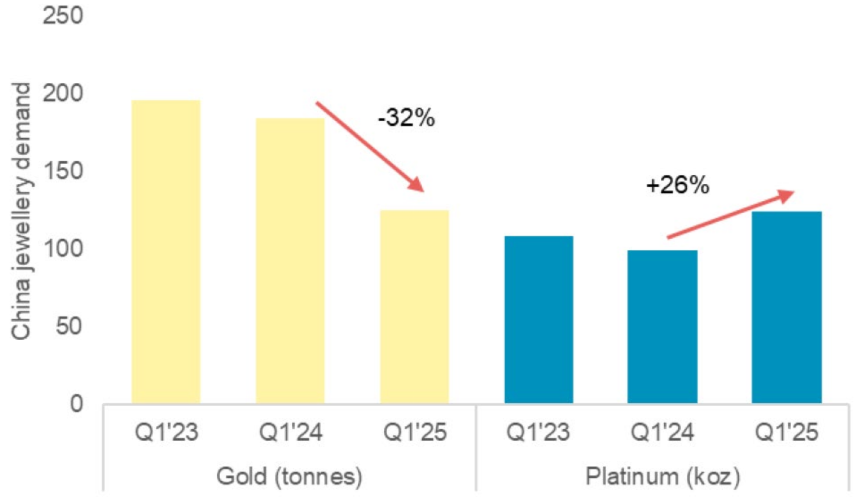


Source: Metals Focus 2022 to 2023 (palladium) and 2022 to 2025f (platinum), Company guidance, WPIC Research

The drivers of demand – investment and jewellery demand the key drivers

- The WPIC believes there is potential for demand growth beyond its own estimates, driven mostly by investment and jewellery demand.
- Six to 9 months ago, the global platinum jewellery trend was for steady demand growth in the world outside of China balancing declining demand within China.
- The high price of gold appears to be having an impact on gold jewellery sales, which were down 32% year-on-year in China in 1Q25. This has been partly offset by strong platinum jewellery fabrication demand which increased 26% year-on-year for the same period.

Figure 12. Chinese platinum and gold jewellery fabrication diverged during Q1 2025



Source: World Gold Council, Metals Focus, WPIC Research

- The WPIC reports on rapid growth of platinum-dominated retail outlets in China during 2025. This growth appears to be on-going, with a strong presence of 'influencers' persuading customers to buy platinum chain jewellery (which, as gold, is an effective investment means).
- What is China's capacity to increase its holding in platinum? Peak demand for platinum in China for investment and jewellery demand was 2 million ounces in 2014, we understand. This year it is forecast to be around 450koz. A move back toward peak demand would have a dramatic effect on the ca. 7Moz platinum supply industry.
- The WPIC is cautious regarding the sustainability of investment and jewellery demand, and it remains a "what this space" issue.

Positives for palladium as well….

- Palladium's use is dominated by automotive emission reduction, and dominantly in gasoline engines. Palladium has been favoured as it offers greater durability, and typically trades at a lower price than platinum. That said, a spike in the price of palladium in 2021 (the impact of Russia's invasion of Ukraine and the threat of a supply shock) saw substitution with platinum.
- Should palladium pricing lag platinum (as is happening currently) there may be substitution in autocatalysts. However, price moves lag and typically requires a pricing differential of perhaps US$300-400/oz, we are told. Nonetheless the two key PGM metals appear to have a broad price linkage over the longer term.
- We have learned that a proportion of the new heavy vehicle fleet in China is moving to the use of compressed natural gas as a more efficient fuel source. We've seen numbers of around 150-200,000 new vehicles to be added to the Chinese fleet, which will require palladium loadings of over 20g/catalytic converter. This alone could represent an incremental annual demand of around 100-150koz.
- Major palladium producer, Nornickel, has established the Centre for Palladium Technologies which is examining additional opportunities for the industrial use of palladium. Examples presented at a recent conference by Nornickel include:

- Boosting solar panel efficiency using a Pd layer to minimize light loss.
- Enhancing hydrogen fuel cell performance and lowering costs for green hydrogen production.
- Reducing expenses for conductive components in electronics through palladium-based alloys.
- Replacing costly iridium with palladium in OLED displays.

Recycling – more of a Pd/Rh story – but it's a challenging industry

- Recycling volumes have remained below historical levels.
- Recycling is dominated by palladium and rhodium. Platinum, which dominates heavy diesel engines, can difficult to recover from a refractory substrate.
- WPIC makes the observation that many of the smaller autocats associated with light motor vehicles might not be economic to recover.
- Recycling sounds to us to be a challenging, low margin business (as evidenced by Sibanye's recent commentary). That said, the recent rally in the PGMs may provide an incentive for the recyclers to begin collecting scrap autocats. Another "watch this space" aspect to PGM demand.

Impact of the switch to battery electric vehicles

- We tire of the narrow view of PGM markets by many industry observers: that PGM demand is dead as battery electric vehicles will eventually dominate. We agree that the global drivetrain is expected to continue to electrify and the gradual decline in platinum demand will continue. But it is now thought this will happen at a far slower pace than was anticipated in the past. Outside China the sale of pure BEVs appears to have plateaued.
- This suggests that the pace of change for electrification of the global vehicle fleet is less than some observers would believe and that "higher for longer" automotive demand for the PGMs is a likely scenario.
- We have seen quoted that engines used in hybrid vehicles will typically take 10% additional PGM loadings for the autocats to counter the cooler running of these engines.

A new Chinese market for PGMs, and a potential focus on the hydrogen economy

- We learned from Shanghai Platinum Week last month that the Guangzhou Futures Exchange (GFEX) is close to the regulatory sign-off of a promising new trading framework for PGMs. GFEX is where physically settled platinum and palladium futures have the potential to transform domestic price risk management and uplift demand for platinum products.
- This may pre-empt China's refocus on the hydrogen economy. The mining press is speculating that China will announce a significant policy initiative which may see an expanded commitment to hydrogen as a source of energy storage. This could be particularly positive for platinum and iridium demand.

Rhodium – on-going deficits projected

- In its recent PGM report, Johnson Matthey states that the rhodium market is forecast to record another modest deficit this year, with a return to positive demand in the glass industry predicted to offset lower automotive consumption.

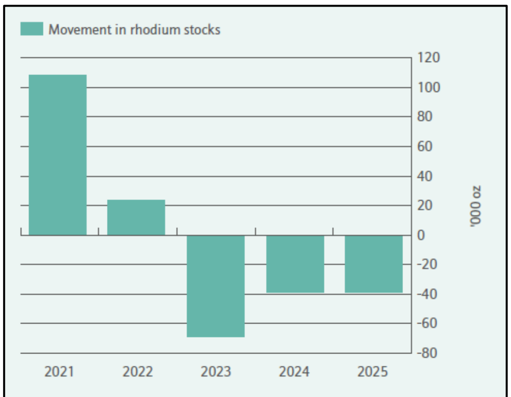


Figure 15 Rhodium market balance

Source: Johnson Matthey

- Industrial consumption of rhodium rose by over 40% to 110,000 oz in 2024 but remained well below pre-Covid levels. The extremely high prices of 2020 – 2023 continue to impact demand: Chinese glassmakers, the main drivers of prices which touched $30,000/oz, significantly reduced the average rhodium content of the platinum alloys used in glass fibre manufacturing equipment.
- Rhodium prices were then hit hard during 2024 as the glassmakers liquidated unwanted inventory.
- Rhodium supply is heavily influenced by scrap recovery. If a fall in US car sales leads to owners keeping old vehicles on the road for longer, this could have a material impact on secondary supplies of rhodium, Johnson Matthey contends.
- This is a very opaque commodity and clearly there is something happening amongst the end-users with Rh prices up nearly 70% over past months.

We also need to watch the platinum (and palladium) ETFs which have been growing. The platinum ETFs now total some 3.3Moz heading toward levels seen in mid-2024. At the right price, these ounces may start to backfill the current physical deficit.

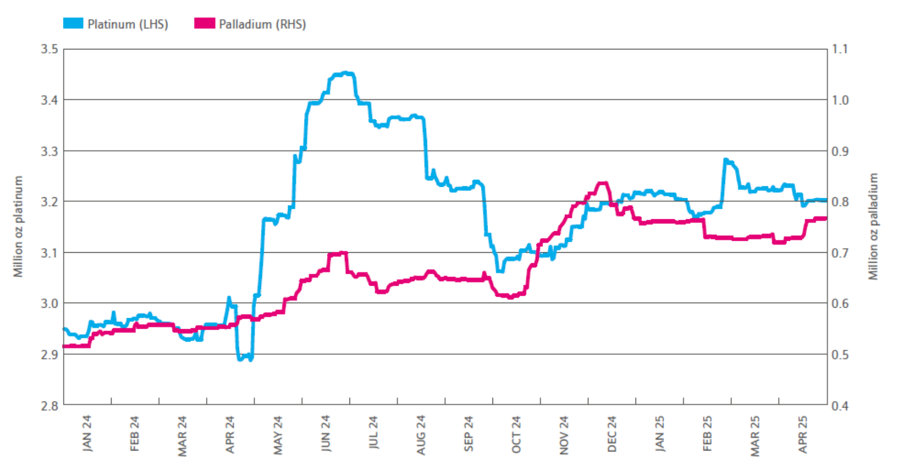


Figure 10 Platinum and palladium ETF holdings

Source: Johnson Matthey

Our view: The global PGM industry has been under extreme cost stress over recent years, which has translated to steadily declining supply over recent years (-1.2% CAGR over the last 10 years). In this mature industry, capex has been constrained and costs have steadily risen. There have been several mine closures over the past 12 months and the lead time for new projects is very long indeed. The combination of 'stronger for longer' demand for PGM's in the automotive space, together with emerging investment and jewellery demand, we see ongoing price strength in amongst the PGMs. We consider our price forecasts as still quite conservative.

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