

PGM Investor Day
Session 1 & 2
(presentations 1,2&3)
23 September 2021

Neal Froneman

Good afternoon and good morning to our international investors. Welcome to our second investor day. And as you can see it's our PGM investor day. First of all, like all our presentations, please take note of the safe harbour statement. There are forward looking statements. And I'm not going to ask you to read this like Richard did last time. Today I will again be assisted by a number of executives and senior managers of our organisation. As you know I rate the importance of people and specifically our people very highly. And today you will again get significant exposure to both the competence and the depth of management within our organisation. I'm pleased to kick-start the session with a brief introduction on our PGM journey.

So let's have a look at that on the next slide. So just a bit of a refresh. To me it's always important to remember where you've come from. In 2014 we announced our intention to enter the PGM business based on the fact that our core competency at that time, being medium and deep level underground mining and of course rock breaking, was very similar in the PGM business. Of course you cannot move into another commodity unless you fully understand the fundamentals related to the supply and demand of that particular commodity. So we conducted a very thorough and detailed analysis of the PGM market and of course fundamentals that underpin the PGMs, which led us to developing a leading PGM business at a low point in the cycle.

That was not the only thing. I think being new entrants to the market we looked at things very differently and we very specifically for a period have built up a large exposure to palladium and rhodium. That was not by mistake. That was based on some of the fundamentals that we understood at that time. And the net result is that we have built a leading global – and I want to emphasise the word global – PGM mining and recycling position. And we established that between 2016 and 2019. And of course that was very swift and decisive action. And we always represent our strategic thinking in sigmoid curves.

And you can see how we built off our gold base, which we discussed at the last investors day. And you can see how we first acquired Aquarius, Rustenburg, and in fact Lonmin was meant to be the third acquisition and it moved out to the fourth because we recognised the changing palladium market dynamics and we also wanted to become global. That's a critical point. We're not just based in southern Africa. We're not just based in Russia. We are a global PGM company. And we acquired Stillwater as our third step which also gave us a very significant exposure to recycling. So it was rapid, well timed and obviously external and acquisitive growth.

If you look at the timing of these acquisitions I also at the same time want to cover how they were financed because we tend to forget. If you look at these graphs, we used to use them often in our results updates. But as I said on the previous slide Aquarius and Rustenburg transactions were announced within six weeks of each other. Aquarius was a very vanilla transaction. It was designed to give us a basis of a PGM management team. And it did that very well. The second transaction, being Rustenburg, was very specifically targeted to be done based on the synergies of these two assets. And of course that was one way of reducing the risk. And let's not forget about the synergies between the assets that we bought. It was well considered and part of the rationale and reducing the cost base.

We then acquired Stillwater. As I said, that was actually going to be the last transaction, but palladium we recognised was going to increase in price substantially. We moved that forward. We also realised that Lonmin was going to get cheaper. There was no appetite to buy PGM assets at that point in the cycle. And that is all now history. If you look it was a total investment of R44 billion or \$3.3 billion. And that amount of investment was covered by our 2020 adjusted EBITDA. One year of adjusted EBITDA has paid for all these transactions. I think that's unsurpassed in any recent or any exposure I've had to the mining industry. I cannot remember such a successful M&A strategy.

So very important as I said that these transactions and acquisitions were all identified and done in a very strategic way. As I said, Rustenburg and Aquarius were done to realise synergies. Lonmin was done at a low point in its history, and again is on the boundary of Rustenburg. And you will get more on this today from other presenters. What that has allowed us to do is build up a PGM business which is large, material, but actually sits on the right side of the cost curve. And as you can see, many of our operations are moving into the lower quartile. The Stillwater operations once the capex is completed, once we've had the ramp-up, will move definitely into the lower quartile. But these acquisitions which I think are often perceived as non-core assets to other companies and second-rate PGM assets, are clearly not. They are material in size. They are low cost. And they are long life. That is a key message that I hope you see and understand and buy into today.

As I said, the acquisition strategy was unparalleled in terms of value creation with short paybacks. And many of you will sit there and say but you were lucky. You had the wind in your sails from the increase in commodity prices. Remember what I said right at the beginning. We actually took a very conscious decision based on the research that we had done to move into this market in a very aggressive way so that we could capture what we could see as looming deficits. I'm not going to go through this table in detail, but if you follow it line by line and really just go to the last column, payback on investment, you can see Aquarius has done it 4.3 times in five years, Rustenburg 3.8 times in four and a half years, Stillwater because of the heavy capital expenditure 0.7 times if you exclude the stream, 0.8 times including the stream in four years. So it has nearly paid for itself. And Lonmin amazingly has paid for it six times in the two years that we've owned it. The payback on the total investment is just over two times during this period.

Again let me recap what made this successful. It was a rapid delivery and execution of a clearly defined strategy. This was not speculating. This was well designed and carefully considered. Each transaction was carefully considered and the risks related to each one of these steps had to be explained and covered with our board. We use quite dynamic financing and disciplined financing approaches to ensure that both the acquisitions were successful and it created value. You would remember that Rustenburg was based on a structure where we paid for the assets out of future profits. You would remember a substantial part of Stillwater was paid back through a stream. And we are very happy with those structures that we put in place. We have proven through the acquisition sequence that we can integrate, and today we can certainly engage with just about any company and talk about a track record of proven integration.

The move down on cost curves, we've shown that there has been significant cost synergies which were identified. And many of you will know that we far exceeded our original intentions. This was a very agile and decisive approach, and that approach is a competitive advantage. And I want to go to the next slide and just also cover off on what the relevance of that statement is. Although today we're not going to talk about a green metal

strategy or go into too much detail, it's a clear evolution of exactly what I've just presented. It's a natural evolution of our value creation strategy. And again I want to say just like we did in PGMs before we made our first move it's been in planning for at least two years. That strategic intention was announced more than two years ago.

It started with the acquisition of SFA Oxford in Q1 2020 when it was closed. And remember we had already done some of our own work. And that acquisition was really based on getting assistance and capacity to determine the most likely battery chemistries. And that we've done. We have confidence in our selection and you've now seen it starting to play out. We're expanding our exposure to green metals through the battery metals as a start, and of course I have mentioned the latent uranium potential that we discussed in the first investor day. We are also expanding and diversifying our existing recycling and tailings retreatment business. Today of relevance there will be a discussion on recycling. And I remember there were some questions at the previous investor day on recycling, and we can certainly pick that up with today's session.

We have made three battery metals related acquisitions in 2021, the very strategic acquisition of Keliber in Finland, the very strategic acquisition of a nickel refinery in France, and then more recently the joint venture with Loneer on the Rhyolite Ridge project. And we will in the not too distant future as we add on a few more of our intended acquisitions have a very specific focus on an investor battery day perhaps even at the next announcement. So again nothing different to what we did in PGMs. And I think the track record is established. We will be very disciplined in moving forward in this area. But I have the same good feeling about our entry into battery metals and building a green metals portfolio that I had when we made the entry into PGMs. So the strategy is a consequence of conscious planning and positioning. Thank you. With that I'm going to hand over to Richard Stewart who will take us into the PGM market outlook. Thank you, Richard.

Richard Stewart

Thank you very much, Neal, and good afternoon to all our listeners and good morning to any of those who might be abroad. I think really looking forward today to sharing with you what I certainly believe is a world class PGM business that we have built over the last few years. And as we know, it all starts with the market outlook. Our presentation does have several forward looking statements, so I would urge you all to consider the safe harbour statement at your leisure. I guess just to kick off, when I reflect on when we got into the PGM industry we were always asked why we were getting into it. And there were three fundamental answers to that which we will address all of today in one form or another.

The first answer was that we had studied extensively the PGM market and were firmly convinced of the fundamentals of this market not only for the immediate few years ahead but in the longer term. And that is certainly what we look forward to sharing with you in this initial presentation. When we consider the PGM market – and I think we've said it on many occasions – PGMs are unique in so many ways. In this particular instance and as it relates to markets, PGMs are by far the most precious of the precious metals.

It's a very small market. In total primary PGM production is less than 15 million ounces a year. When we compare that to next most precious metal of gold, your primary gold production is around 109 million ounces a year. And if you compare that to silver, silver is over 900 million ounces of primary production a year. So PGMs really are a small market. But what makes them even more unique is it's underpinned by industrial uses. These are such

special, such unique metals that play such a critical role in the world that we live in today. But it's a small market driven by industrial uses. And those two factors are what really drove the way we wanted to position ourselves in the market and in the supply chain.

In particular our approach to our metals is not about just being a supplier and trying to trade our metals for a small premium of a couple of Dollars here and there. It's really about embedding ourselves in the supply chain, working closely with our customers to help them solve their solutions, but also about managing the overall balance between such rare metals, and not only the balance of total supply but also the balance of the basket as we've discussed on so many occasions. What this has meant from our side is that we have developed an extensive customer network and base we work with. It's a global network. It's a global customer base and it crosses many different industries. We deal with OEMs, car OEMs. We deal with the autocat fabricators and manufacturers. We deal with electronics and fuel cell companies. And this will continue to grow. I think as we've also seen more recently, we've recognised that part of solving our customers' solutions is also looking at battery metals. And that too is a market that we've studied extensively and drives some of our thinking around the PGM markets as well.

How all of this thinking translates into our marketing and sales strategy is that we have really focussed on longer term contracts. Most of our sales are done with our customers on a long-term basis. And that again is done specifically so that we can jointly manage a responsible supply. We do short-term spot sales as well on some of our metal. And that is critical both to provide us with a level of operational flexibility but also so that we can keep our finger on the pulse of what is going on in the short-term tactical markets. But really what these long-term contractual relationships have done and the value it brings to us is that we do work closely understanding from our customers what is driving their long-term trends, their long-term strategies and where demand is likely to go in terms of the strategies they are working on to deliver on what their customer bases ultimately require.

Of course we are sitting on the supply side of that curve. Supply is something we understand well. We understand the barriers of entry to this market. We also understand the barriers of exit to this market and what it takes to bring a new project online. I dare say when we look at our markets we look at the fundamentals. A year ago we were asked how we saw COVID impacting on PGM markets. And the conclusion we came to was that we saw some extreme risk for volatility in the short term. That outlook was driven by the fact that we saw differentials in the way the supply was coming back on line due to COVID lockdowns. We also saw differentials across the globe in terms of how demand was re-establishing itself in different regions.

And our concern was at the time that if you had a mismatch between supply coming on line and demand coming on line, that could lead to extreme volatility in the market. And I dare say that that has been even more extreme than what we thought could be the case at the time. There have been additional drivers I don't think anybody anticipated. And that led to a perfect storm earlier this year in terms of a shortage of supply and a significant increase in demand. And the pendulum has now swung the other way. But I dare say when we look at what is happening in the market today, we have some of the most resourced research houses who are changing their forecasts on a weekly basis, who do not all agree with each other's outlooks.

This is not a time when you can use what's happening in the market today to make long-term fundamental predictions. Our positioning in the market, our relationship with our customers, our fundamental review of the

markets and what drives the long term we do not think has changed significantly. And that is what underpins our long-term thinking and strategic drivers. I look forward to sharing with you what some of that fundamental analysis is. Thank you very much.

Kleantha Pillay

Thank you, Richard, and good morning and good afternoon to everyone. I'm Kleantha Pillay and I'm responsible for PGM sales and marketing. We are quite careful to distinguish short-term volatility from longer term sustainability. Let's first address the short-term volatility in the market. Since early 2020 there have been a number of disruptions. On the supply side we had the Anglo ACP outage as well as COVID-19 related shutdowns impacting on South African supply. Earlier this year we also saw the flooding in concentrator incident at Norilsk. During these periods of supply disruption we had producers in the market as buyers driving up prices.

On the demand side we saw COVID-19 impacting on auto, industrial and jewellery demand. Supply chain constraints and the global chip shortage continue to impact auto production even today. Producers are flooding the market with spot metals, pushing prices even lower. We've also seen unprecedented number of changes to the vehicle forecast recently, which indicates to me a really high level of uncertainty certainly around the short term. Short-term volatility requires very tactical responses. We have navigated this well with insights and intelligence from our strong customer relationships and this has informed our short-term inventory planning and placement of metal into the market.

Now changing gears to the much longer term, we believe that the internal combustion engine will not disappear come 2035 and in fact will still make up the lion's share of the light vehicle car park. Announced bans by various cities and countries will impact just over a quarter of the 110 million light vehicles produced in 2035. What does this mean for battery metal demand come 2035? Our long term analysis of the critical battery metals suggests that battery electric vehicle growth may well be tempered. By 2035 lithium demand will be 900% higher than this year's level and current deficits will continue to deepen. Nickel demand grows from 250,000 tonnes this year to over a million tonnes by 2035 with nickel deficits forecast by the end of the decade. And cobalt demand grows fourfold from this year with deficits forecast from 2026 onwards.

In contrast to the short-term dynamics, our ten year PGM market outlook is underpinned by solid fundamentals, which in turn informs strategic decision making for the business. We understand primary and secondary supply very well given our positions in these markets. And we also understand the auto market well, supported by our strong customer partnership and insights. So let's dive into our ten year forecast starting with supply. Given the lack of investment in South Africa, primary platinum supply drops from 6 million ounces in 2019 to 5.7 million ounces by 2030 with just our K4 project and some very modest Platreef volumes coming to market in the second half of the decade. Although secondary supply is expected to see some modest growth of 200,000 ounces over the period, overall supply declines by a CAGR of 0.1% per year from 2019 over the decade.

Moving on to palladium. We expect primary palladium supply to remain fairly flat from 2019 levels with North American and Russian supply compensating for declining South African supply. Palladium recycling is expected to grow from 2.9 million ounces in 2019 to just over 4 million ounces by the end of the decade. Overall supply grows at a CAGR of 1.4% per year driven by a growth in recycling. Recycling is expected to make up 40% of total

supply by the end of the decade. The primary rhodium supply mirrors that of platinum with primary supply declining 9% over the period.

Growth in secondary supply results in recycling making up around 40% of total supply at the end of the decade. Recycling supply is impacted by a number of factors, but particularly by PGM prices and steel prices, palladium and rhodium, both largely auto metals, are most sensitive to price with platinum less so currently. As substitution of palladium with platinum in gasoline autocats gains momentum, prices will shift, impacting incentives to return different metals to market. Because of this we see some downside risk to our palladium and rhodium recycling forecasts.

Now moving on to the other half of the market equation and looking at demand. Palladium and rhodium remain largely dependent on auto demand, which makes up close to 80% of demand. Historically 20% of palladium was consumed in industrial uses, and this has reduced over the years as a result of deficits and higher prices. As demand for palladium in autocatalysts reduced through substitution, industrial demand could well return. 80% of platinum demand is split pretty much evenly between auto and industrial uses with the rest used in jewellery.

There have been a number of revisions to light vehicle forecasts since early 2020 just as the impact of COVID-19 and supply constraints began to be felt around the world. In just a short year between Q3 2020 and Q3 2021 absolute light vehicle production forecasts have in fact increased, driven by upgrades to light commercial vehicles. However, looking at the chart on the right, in the same short one-year period battery electric vehicle market share forecasts have increased significantly. Take 2027 for example. Battery electric vehicle market shares have increased from 9% up to 17%. Although during this period there were many political announcements around the banning of ICE vehicles and OEMs responding with aggressive electrification targets and investment targets, we haven't really seen any fundamental changes during this period to warrant such significant changes to battery electric forecasts.

There is very little variance in absolute light vehicle forecasts over the decade, and this is in fact the key driver for auto demand. However, and as you can see in this chart, there is a significant divergence in forecasts for battery electric vehicle market shares from around 2023 onwards with some forecast as high as 40% by the end of the decade. Our forecast in this dotted turquoise line is not too dissimilar from others. We are looking at 12% battery electric vehicles by 2025, up to 22% by 2030.

Let's go back though and just put this into perspective. Last year battery electric vehicle sales were 15% higher than they were in 2019 largely driven by incentives and subsidies in China and Europe. Going even further back, battery electric vehicle sales grew at a huge 82% CAGR between 2010 and 2020, of course off a very small base. Our forecast implies a sustained annual growth rate of 26% every year for ten years in order to hit these battery electric vehicle forecasts. This won't be easy to achieve, and therefore we actually see some downside risk for BEVs as well.

Our light vehicle production forecast grows over the decade, and despite the growing battery electric vehicle market share, internal combustion engine production peaks at 88 million cars in 2027, much higher than even the 2019 levels of 85 million cars. Internal combustion engine vehicle production remains stable over the decade in the light vehicle segment. Heavy vehicle production is also forecast to grow over the decade with ICE

continuing to dominate the engine mix. 6.2 million combustion engine vehicles are produced in 2030 compared to just 5.8 million in 2019.

We are also quite bullish on fuel cell vehicles towards the end of the decade, forecasting a 7% market share by 2030. With longer driving ranges that heavy vehicles require and comparable refuelling times to diesel vehicles, fuel cell engines are much more suitable in heavy duty vehicles. Recent announcements on deployment of fuel cell busses and truck fleets as well as hydrogen refuelling infrastructure rollout and further targets, particularly in China, Japan, South Korea, California and the EU, have also been very encouraging. As hydrogen refuelling infrastructure is deployed to support route-bound heavy fleets, light vehicles will also be able to take advantage of this infrastructure. So overall the number of ICE vehicles remains robust throughout the decade, supporting PGM demand.

Tightening emissions legislation in both heavy and light vehicle segments is also supportive of PGM loadings and hence demand over the decade. As you can see from these graphs, average loadings rise to meet regulations followed by periods of thriftiness to reduce costs while still meeting emissions standards. It is expected that Euro 7 will be the last set of internal combustion engine emissions standards around 2027, and it is also expected that the US and China will also follow suit.

Moving on to substitution, following a very successful project to substitute palladium with platinum in gasoline autocats, uptake of the substituted autocat was faster than expected, and this was largely driven by the ability to self-certify catalysts in China. Substitution levels of 20% to 50% are being requested by OEMs. We are forecasting 1.5 million ounces of platinum added and palladium removed from auto demand by mid-decade. In the medium term this creates a far more sustainable 2E demand that is far better aligned with the supply basket.

Of course having the pendulum swing too far is not ideal. Our project with BASF took three to four years from research and development to commercialisation. The resulting tri-metal catalyst has been approved and certified such that tweaks to the ratios of the three PGMs don't require recertification. Going forward the timeframes to adjust catalyst composition are more likely to be in the six to 12 month range, which will allow for far more controlled substitution in the latter half of the decade as price incentives change.

I also mentioned earlier that we are a lot more bullish on our fuel cell electric vehicle forecast in the heavy vehicle segment, and this drives platinum demand, moving up to just over a million ounces by the end of the decade. I think the most important thing to point out here is that auto and stationary fuel cells can be fuelled by grey and blue hydrogen as well as by hydrogen-containing fuels such as methanol. Fuel cell demand is therefore not necessarily coupled to green hydrogen and electrolyser demand and certainly not in the next decade while green hydrogen costs remain high. Demand for green hydrogen and hence PGMs in electrolyzers becomes relevant post 2030. Similar to our approach on battery metals, we are doing our homework to understand the entire green hydrogen value chain and identify opportunities for us.

Overall platinum demand increase as a result of substitution as well as growth in fuel cell electric vehicles. We forecast declining platinum jewellery demand while industrial demand grows at a steady 1% CAGR over the period. Palladium demand declines almost 2 million ounces over the period as a result of substitution and as ICE vehicles begin to taper at the very back end of the decade. Tightening emissions legislation is supportive of

rhodium demand through the period despite thriving in both the auto and industrial segments. Similar to palladium, demand tapers at the very back end of the decade as battery electric vehicle market share increases.

Putting our supply and demand together, let's look at our market balances. Taking into account the ability to more closely control the rate of substitution in shorter timeframes and our view of the downside risk to recycling, we present our base case as well as these two scenarios. Looking at the chart on the left the grey columns show our base case with platinum moving into deficit through the decade. As substitution rates respond to changing PGM price incentives we expect to see a more sustainable deficit for platinum from 2026 onwards. And you will see we have modelled this in the turquoise column. Similarly we show both base case and controlled substitution for palladium balances on the right-hand side. And here you will see palladium surpluses reducing as substitution is more controlled on the turquoise bars. We also show our scenario where palladium recycling forecast are reduced by just a small 10% from mid-decade onward, which results in a further reduction to the expected surpluses towards the end of the decade.

Moving on and looking at our 2E balances, we forecast a sustainable market balance in our 2E base case. Taking into account the downside risk to palladium recycling results in a much tighter 2E market balance with more modest deficits from 2025 to 2028 before moving into small surpluses post that. Then looking at the chart on the right, the rhodium market is forecast to remain in deficit from 2022 to 2029 in our base case. Our reduced recycling scenario, however, results in deeper deficits through the second half of the decade with rhodium moving closer to balance by 2030.

So putting all of this together and just summarising what we've looked at, we understand supply extremely well given our position in the primary and secondary market. Primary PGM supply declines over the decade particularly for platinum and rhodium. However, supply is supported by forecast growth in recycling, but downside risk does remain. The internal combustion engine underpins auto demand throughout the decade. ICE vehicle forecasts remain well supported over the decade due to a growing car park despite increases in market share for battery electric vehicles in the light vehicle segment. In the growing heavy vehicle segment ICE continues to dominate the engine mix. And adoption of fuel cell engines in the heavy vehicle segment will accelerate in the second half of the decade, supporting platinum demand. Tightening emissions regulations support PGM loadings over the decade.

Over the medium term up to mid-decade substitution of palladium with platinum in gasoline vehicles helps balance the 2E basket. Overall we forecast a sustainable 2E balance over the decade with palladium moving into surplus and platinum moving into deficit in the second half. Rhodium remains in relatively small deficit through to 2029. Timeframes to change metal ratios in tri-metal catalysts have reduced significantly, and this will allow for faster responses to catalyst formulations as metal price incentives change. Ultimately this will result in an even more sustainable 2E balance over the second half of the decade. Modest reductions in palladium and rhodium recycling in the second half of the decade will reduce palladium surpluses even further, better balancing the 2E basket while moving rhodium into deficit out to 2029. Our operations are ideally placed to deliver into this PGM market that we understand well. I will now hand us over to James for questions.

James Wellsted

Thank you. Thanks Kleantha. Thank you, Richard and Neal. We're just going to go through a couple of questions before we have a break. The first question directed to Neal I think is from Arnold Van Graan at Nedbank. Do you believe you can get the same type of leverage from battery metals as you did in PGMs, which you bought for knockdown prices at the bottom of the cycle? Is it not harder to deliver value in battery materials given that many other companies are chasing the same assets? Neal.

Neal Froneman

Thank you, James. Hello Arnold. Your point is spot on in that I think it would be very unrealistic to assume that we'll achieve exactly the same type of returns, recognising that with the PGM strategy we had very little competition. But I have to say that there are many similarities and I would go as far as to say we will create value. How much value we will create remains to be seen, but you've just heard from Richard and Kleantha and 900% anticipated increase in lithium is enormous. And of course we don't believe that the penetration rates of battery electric vehicles are as high as others might say. So I think we have a very realistic view. But also when we acquired Aquarius, Rustenburg, we used current spot prices which were depressed. We have been very conservative on our battery metal assumptions, which I again believe are conservative for the very reason you've seen in the supply demand analysis and some of the comments that Kleantha specifically made. And when we acquire we make sure that even under those conditions we have a suitable internal rate of return to ensure that we create value. So I dare say we will create value, but I think the PGM strategy and the net results of that are unsurpassed and will be very difficult to beat. Thanks James.

James Wellsted

Thanks Neal. The next question is from Wade Napier at Avior. And I think it's directed to Kleantha. Is there not upside risk to loading forecasts if OEMs focus more R&D on electrification instead of thrifting? Kleantha.

Kleantha Pillay

Thanks Wade. I think the fabricators are still going to focus on autocat thrifting. Getting the loadings down as much as they can impacts their margins. So I don't think there is going to be too much risk to that. I would imagine that the OEMs would tend to, as they do now, rely on the fabricators for that. Thanks Wade.

James Wellsted

Thank you. The next one is from Chris Nicholson at RMB Morgan Stanley. Could you run through the strategic partnership with Johnson Matthey? What are you aiming to achieve? What are the financial benefits to Sibanye-Stillwater, and are there any costs? I think, Richard, if you will take that one please.

Richard Stewart

Sure. Thank you very much. Chris, good afternoon. Chris, I think as mentioned in the introduction, a lot of our strategy really goes around how we work in the supply chain and ultimately working with our end customers. And this strategic relationship talks directly to that. To answer your question directly, it's not aimed at financial

benefit and there are no costs to us. We obviously have a commercial relationship with Johnson Matthey on many fronts, particularly in the US where they do a lot of our refining for us from Stillwater and recycling, as well as various market development initiatives that we've worked on. So this is really a relationship designed around market development initiatives, new product development, and again understanding long-term supply and demand dynamics and how we can work together to manage that. So it's not a cost or financial benefit. It is more of a strategic benefit for both of us in the supply chain and industry as a whole. Thanks Chris.

James Wellsted

Thanks Richard. The next one again from Chris is for Kleantha I think. Could you explain what drives your downside risk to palladium and rhodium recycling scenarios? Is it collection chains in Asia, recycling capacity or other factors? How likely is this?

Kleantha Pillay

Thanks Chris. Look, I think first off to explain that it is a downside scenario. It's not our base case. Also just to note, we're seeing supply come off. We can't expect to see recycling growing at a significantly higher rate than supply over a long term. So that's just one point to note. But in our downside scenario really what's driving this is the price incentives. So if we assume that palladium and rhodium prices decline over the decade just given the slight drop in combustion engine vehicles, we would expect to see that platinum starts coming back to market faster, just given how that's expected to grow. And that gives us the downside risk on palladium and rhodium. Thanks James.

James Wellsted

The next question is from Nthoko Sithole [?] from SBG Securities. Given tighter emissions requirements expected in the future, could you please explain why average PGM loadings per light vehicle are expected to decline towards the end of the decade? I think that's for you again, Kleantha.

Kleantha Pillay

Thank you. As you would have seen from that chart, the loadings will increase up to 2027 when we expect Euro 7 to come into play. But I think as soon as that happens and the emissions standards are reached, all of the fabricators and OEMs are going to start thrifting out again. And that's what causes that little tail at the end. Thanks.

James Wellsted

The next question is from Bruce Williamson at Integral Asset Management. I hope I pronounced that correctly. Hi. Have you done any research into the thawing of the Arctic Circle permafrost and have you taken any disruptions in Norilsk's future PGM production into account? Neal, could you maybe answer that one?

Neal Froneman

Thanks. Hello Bruce. Look, we factor into our supply a realistic forecast of all projects. And of course mining is our core competency and we are able to assess the likelihood of many of these projects coming on line. So yes. I don't want to be very specific and be critical of any specific projects, but yes, they are factored in. and I think most of these projects are ultimately too late. That's all I'll say. Thank you.

James Wellsted

Thank you. The next one is from John Williams at Rezco. Do you think auto OEMs have been stocking PGMs over the last few months which would represent a short-term supply and demand headwind? Kleantha.

Kleantha Pillay

Thanks James. I don't think there has been too much stocking up. We've seen the fabricators continue buying at normal contract levels and from what we're seeing in the market I would say there is very little incentive for the OEMs to stock up. They are very focussed on working capital. They would have to hedge out quite long term if they're keeping this for next year. So I would say we haven't seen that. And where we have seen fabricators or OEMs taking more metal than they need, they often take this in an ingot form, so less of stocking up and holding this as an investment in the shorter term. Thanks.

James Wellsted

Thanks Kleantha. The next one is from Raj Ray at BMO Capital Markets, I think for Neal. Do you have a target with regards to commodity mix within our portfolio between PGM, gold and battery energy metals in the medium term? Let's just deal with the first one on the portfolio mix please, Neal.

Neal Froneman

Hi Raj. It's a good question because if you want to get the benefit of any portfolio of metals they've got to be material to your revenue line and your income statement. I would say that in the medium term we would target something like a third gold, a third PGMs and a third battery metals, something in that order. Of course it's not an exact science and we will have to see how it evolves, but certainly each one should be material to our bottom line. Thank you.

James Wellsted

Thanks Neal. The next one I think for Richard. And it's also from Raj Ray. That's the second part of the question. Based on your PGM market research do you see PGM prices going back to record levels seen in H1 2021 once the semiconductor issue gets resolved?

Richard Stewart

Thank you, James, and good afternoon Raj. As mentioned upfront, what we think we're seeing in the market at the moment is extreme volatility. Some of those record prices were driven by the disruptions in supply that we saw both at Anglo and at Norilsk, coupled at the time with demand coming back online a lot stronger than I think most of the market expected. Currently we're seeing exactly the opposite. That supply that was constrained is now really coming out of the bottleneck and coming back into the market. And we are seeing demand being constrained due to the chips. I think we still have a risk of volatility over the next 12 to 18 months. I think we're still going to see some disruptions to supply chains as a result of COVID as we work through the rest of the pandemic. And therefore I think volatility to prices remains something that we need to live with and deal with in the short term. I wouldn't like to speculate as to exactly the levels it could go to. Like I say, I think the levels we've seen were driven by a perfect storm towards the beginning of this year. Could we have more of those short-term storms? Possibly. But to us the fundamentals are really what do the fundamentals look like three, five and ten years out? That's really the key for us in planning our business, and I think that's where we're a lot more confident. Thanks, Raj.

James Wellsted

Thanks Richard. Given the time constraints and the agenda that we've got, there are a few more questions but we'll hold those over to the end of the session if that's okay with everyone. We will just go to the dial-in lines, the phone lines to see if there are any questions there please.

Operator

Thank you. Just a reminder for the participants that dialled in, if you would like to ask a question please press * then 1. The first question comes from Dominic O'Kane from JP Morgan. Please go ahead, Dominic.

Dominic O'Kane

Thanks guys. Thanks for taking my question. Just a quick question on your long-term contracts. You say that the majority of your sales are on long-term contracts. Could you maybe give us a bit of visibility on how that's split across platinum, palladium and rhodium? And critically I guess given the volatility that we've seen over the last six months, are you seeing any change in customer behaviour for long-term offtake? And specifically what I mean is platinum. Given you've got a bullish outlook for platinum, are customers looking to increase their sourcing requirements long term for platinum?

Neal Froneman

Thanks Dominic. Richard, will you take those questions?

Richard Stewart

Dominic, thanks. In terms of our contracts obviously I'm not going to go into the details of it, but I guess to broadly say our contracts roughly reflect the basket that we supply in. and we try and match that basket of course with the needs of our customers. Again I think this is what is so critical in terms of the longer term

strategy we adopt, how we engage with our customers, and how we drive the market development we're working on. So broadly speaking those contracts reflect our supply basket. In terms of have we seen any differences, no radical changes. Again those are contracts that are designed for longer periods of time. We do look at them and tweak them occasionally to work together with our customers. So we constantly see small changes given dynamics in the market. And obviously we also try and balance that with the spot sales we have available. But no, we haven't seen any fundamental changes yet coming into those contract discussions.

Dominic O'Kane

Thanks.

James Wellsted

Thanks everyone. I think we'll take a break now and then we'll start the next session at 14:00 our time sharp, so in about seven minutes. Thank you.

END OF TRANSCRIPT