

## A lucrative copper play near production

Metals & Mining

Hillgrove Resources (ASX: HGO) is an Australian mining company focused on the operation of the Kanmantoo Copper Mine in the Adelaide Hills of South Australia. The mine site is located less than 55km from Adelaide in SA. After the completion of open pit operations in 2020, HGO is planning to resume production in 2024 through an underground mining project. Given all the required infrastructure and funding in place, we think HGO is well-positioned to become Australia's next copper producer in early 2024.

### A near-production project with low risks

With all the required infrastructure and a processing plant in place, the first copper sales from the Kanmantoo Underground Stage 1 Project are expected in early 2024. Years of copper production from the area has significantly de-risked the project's technical aspects and has left the Project with established logistics routes and marketing solutions for the sale of the expected products to international markets. Subject to shareholder and Foreign Investment Review Committee (FIRB) approval, the project is also fully-equity funded to production, and it will also have enough funds for undertaking further drilling programs to expand resources and increase the mine life.

### Decarbonisation megatrend driving demand for copper

Copper's applications in energy transition technologies, such as EVs, are set to catapult the base metal's demand in the next several years. While each internal combustion engine uses around 23kg of copper, each EV on average uses more than 60kg of copper. On top of that, there will be a huge demand for copper to build EV charging points and to upgrade the distribution network. On the supply side, dwindling copper reserves and lower ore grades at some of the world's largest mines means that a new deposit would just be replacing the existing output, leading to a long-term supply deficit forecast for copper.

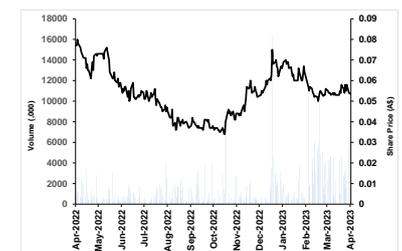
### Valuation range of A\$0.107–0.136 per share

Using the DCF approach and conservative assumptions on commodity prices, exchange rates and operating costs, we have valued HGO at A\$0.107 per share in a base-case scenario and A\$0.136 per share in a bull-case scenario. Our target price range represents a Price/NAV of 0.44x, which we believe provides enough upside potential given the low-risk profile of the stock. We have assumed HGO to successfully raise A\$38m at A\$0.053 per share to fully equity fund the Kanmantoo UG Stage 1 Project. The key risks to our investment thesis include commodity price risk, funding risk and project delay risk.

Year end (A\$m)	FY 21	FY 22	FY 23e	FY 24e	FY 25e
Revenue	0.1	0.1	0.1	49.6	170.4
EBITDA	(5.3)	(4.4)	(5.9)	14.4	62.4
EBITDA Margin (%)	NM	NM	NM	29.0%	36.6%
EPS (A\$ cents)	(0.6)	(0.5)	(0.3)	0.5	2.4
FCF	(13.3)	(13.0)	(30.3)	10.3	52.5
P/E (x)	NM	NM	NM	10.8x	2.2x
EV/EBITDA (x)	NM	NM	NM	5.9x	0.5x
EV/Sales (x)	NM	NM	NM	NM	0.2x

Date	28 April 2023
Current Price (A\$)	0.053
Target Price (A\$)	0.107-0.136
Price / NAV (x)	0.44x
Market Cap (A\$m)	82.2
52-week H/L (A\$)	0.033 / 0.082
Free Float (%)	64.5%
Bloomberg	HGO AU
Reuters	HGO.AX

### Price Performance (in A\$)



### Business description

Hillgrove Resources Limited (HGO) operates as a mining company in Australia. The company explores for copper, gold, and silver deposits. HGO's flagship project is Kanmantoo Copper mine located approximately 55km from Adelaide, South Australia. Hillgrove Resources Limited was incorporated in 1952 and is headquartered in Unley, Australia. After the completion of open pit operations in 2020, Hillgrove is now planning to resume production in early 2024 through an underground mining project at the Kanmantoo Mine site.

### Analyst

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## Investment Rationale

Listed on the ASX, Hillgrove Resources (ASX: HGO) is a copper and gold development company that owns the Kanmantoo Copper Mine in the Adelaide Hills of South Australia. From 2011 to 2020, HGO produced 137k tonnes of copper and 56k ounces of gold from several open pits at the Kanmantoo Mine. After the completion of open pit operations in 2020, Hillgrove is now planning to resume production in early 2024 through an underground mining project.

### **Kanmantoo Underground Project offers multitude of strategic benefits**

Kanmantoo Underground Project is planned to extract the same lodes that were mined and processed for almost a decade in the open pit, leading to significantly lower geological, metallurgical recovery and other technical risks compared to mining start-ups. In addition, the project's location, 55km from Adelaide and 3km from the main dual carriageway leading to the export port of Port Adelaide, brings inherent operating and capital cost advantages. The project has all the necessary infrastructure in place, including a 3.6Mtpa processing plant that is being maintained in such a manner that it can be restarted quickly with very little refurbishment costs. The planned mining operation will only require 40% of the processing plant capacity, allowing the company to quickly ramp up production in response to changing copper prices to maximise the value of the resource. The current resource is only based on two of nine mineral systems in the Project's area, leaving significant upside potential for further resource expansion as HGO has already commenced exploration drilling at some of those mineral zones.

***Kanmantoo Underground Stage 1 is a low-risk project located in a tier 1 jurisdiction ready to take off with all the required infrastructure place***

Subject to shareholder and Foreign Investment Review Committee (FIRB) approval, the Project is fully equity-funded, minimising financial risks. With c. \$235m in carried forward tax losses and c. \$17.5m in franking credits and no debt, HGO will be able to bring forward the timing of fully franked dividends. Early development works undertaken in 2021/22 have also established two portals, an underground drilling platform and have intersected high-grade mineralisation, enabling a fast track to production on the finalisation of project financing and mobilisation. Logistics and marketing of the to-be-produced material from the project are already sorted as well. HGO, along with its life of mine offtake partner, Freepoint Metals and Concentrates LLC (Freepoint), marketed and sold similar products from the Kanmantoo Mine to international markets from 2011 to 2020, and they'll be using the same established marketing and logistics methods to sell the Project's expected products.

### **Updated Economic Assessment depicting robust project economics**

Hillgrove released its Kanmantoo Underground Stage 1 Updated Economic Assessment (UEA) on 27 February 2023. As per the finding of the UEA, Kanmantoo Underground Stage 1 project is a massively de-risked project, in terms of regulatory risks, technical risks and financial risks, with significant upside potentials to the project's economics through increasing resource size and increasing annual throughput at minimal additional cost. (UEA 2023) increased certainty surrounding the project's economic viability after introducing the increased costs to the project's financial model in the EA realised in December 2021. The high inflation rates since the beginning of 2022 have considerably increased the operating and capital costs of virtually all mining projects. However, the Kanmantoo UG Project's economics were minimally impacted by the increased costs thanks to all the required infrastructure and the processing plant already in place.

### **Hillgrove rapidly moving towards production**

Following the receipt of Tranche 1 Placement capital of \$15.6m on 9 March 2023, Hillgrove wasted no time in commencing work towards both the underground development at Kanmantoo to get back to production as well as mine life expansion drilling. The company has engaged specialised contractors to commence early work activities in preparation for the commencement of underground development. Hillgrove is working towards a smooth mine ramp up, ensuring that as equipment arrives it can immediately commence mine development. With the portals already established, HGO's miners can walk in on day one and take development cuts. Underground development to access ore is scheduled to commence in 4Q23 (June quarter), and it expects to commence copper production in early 2024, potentially making Hillgrove Australia's next copper producer.

***With the A\$15.6m Tranche 1 Placement capital raised on 9 March 2023, HGO has already commenced on-site works***

## **A massive exploration target at Kanmantoo has been declared**

*A massive exploration target of 10-20 mt with a target grade of 0.9%-1.3% Cu and 0.1 g/t Au has been indicated at Kanmantoo Copper Mine.*

Following successful extensional from-surface drilling results at Kanmantoo in February 2023, Hillgrove updated its Kanmantoo exploration target in conjunction with commencing the underground development at the Kanmantoo mine, indicating an approximated exploration target of between ten and twenty million tonnes with a target grade of 0.9% and 1.3% Cu and 0.1 g/t Au. The Exploration Target is based on six of the nine higher grade copper-gold ore zones that have already been mined in the open pit or intersected by Hillgrove's exploration drilling. Hillgrove has had an exploration strike rate of above 100% as it has recorded 143 copper-gold intersections of economic grade and width from only 122 holes. This increases our confidence in the company's future resource growth potential.

## **Very bullish outlook for copper and gold prices**

*Very bullish outlook for copper and gold prices as the decarbonization megatrend is set to catapult demand for copper and the economic uncertainty drives demand for gold.*

Copper's variety of usage in different industries has turned it into the third most widely used metal in the world, and its applications in energy transition technologies are set to catapult demand for the base metal in the following decade as the decarbonisation trend accelerates. Copper has the highest conductivity of any non-precious metal, and plays an important role in all energy production, but it's particularly important for future sustainable technology applications such as electric vehicles and solar photovoltaic (PV) surfaces, and is itself a sustainable material as it's 100% recyclable without loss of properties. While most cars currently on the roads use internal combustion engines that require up to 23kg of copper, a hybrid electric vehicle uses 40kg of copper, a plug-in hybrid electric vehicle uses 60kg, a battery electric vehicle 83kg, and a hybrid electric bus 89kg. A battery-powered electric bus can use 224-369kg of copper, depending on the size of the battery used. The EV demand increase is predicted to catapult demand for copper in the next several years. On top of this, each EV charger will add 0.7kg of copper use, and if they're fast chargers, they can add up to 8kg of copper use each, which will then bring about the need for more copper to develop and upgrade transformers and distribution networks. On the supply side, dwindling copper reserves and lower ore grades at some of the world's largest mines also means that a new deposit would just be replacing the existing output, leading to a long-term supply deficit forecast for copper.

The gold product from the Kanmantoo Underground operations only adds to the attractiveness of the Project, in our opinion. Gold is an asset known to almost constantly growing in price over the long-term as its uses and market desire keep growing, while the fact that it's an asset that's scarce limits its supply growth. The current uncertain macroeconomic environment and high inflation rates add extra attractiveness to gold as investors seek gold to protect the value of their assets.

## **HGO offers a low-risk and high-potential investment opportunity**

*Volatility in commodity prices and the requirement for funding approval pose risks to our investment thesis*

We value HGO at A\$0.107 per share in a base-case scenario and A\$0.136 per share in a bull-case scenario using a DFC valuation approach at a discount rate (WACC) of 12.8%. Our target price range indicates substantial upside potential to the current share price of A\$0.054 per share. Given the low-risk nature of the Kanmantoo UG Project and the nearness of the project to production, we believe that HGO is currently undervalued. In addition, our very bullish outlook for copper and gold prices adds significant attractiveness to investment in HGO, in our view.

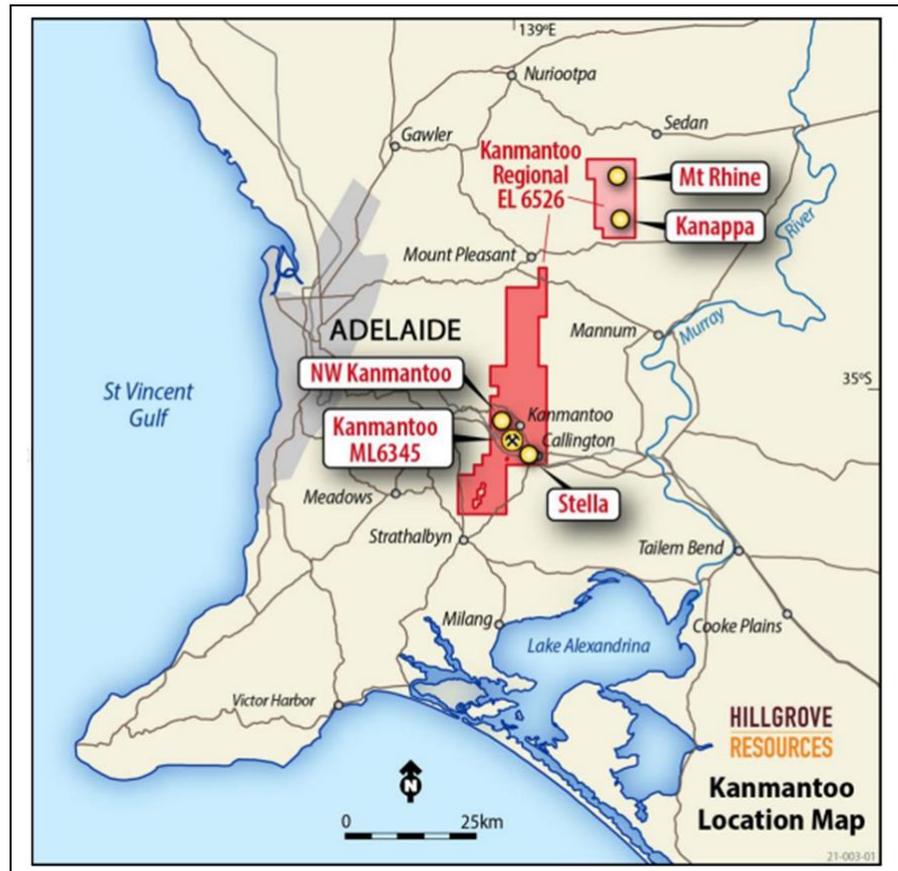
The key risks to our investment thesis include volatility in commodity prices due to the current uncertain economic conditions and funding risks as HGO still needs shareholder and Foreign Investment Review Committee (FIRB) approval for a further c. \$20m equity capital it needs to raise for funding the project development. Project delays are also another key risk to investment in HGO as the underground nature of its operations has inherent technical complexities.

We believe HGO's share price can potentially re-rate towards our target price in the next twelve months as the company meets certain milestones, including shareholder and FIRB approval for the capital raising, increases in indicated and inferred reserves through exploration drillings, and a successful commencement of copper production.

# Kanmantoo Underground — Hillgrove’s flagship project

The original Kanmantoo Copper Mine open pit was in operation from 1970 until 1976 on the Kavanagh copper zones. Approximately 4.1Mt @ 0.9% Cu was mined from the open pit before operations closed in 1976 due to low copper prices. In 1976, Kanmantoo Mines drilled and developed an underground operation around the Kavanagh and East Kavanagh copper lodes, but the low copper prices resulted in its abandonment before underground production began.

Figure 1: Kanmantoo location Map

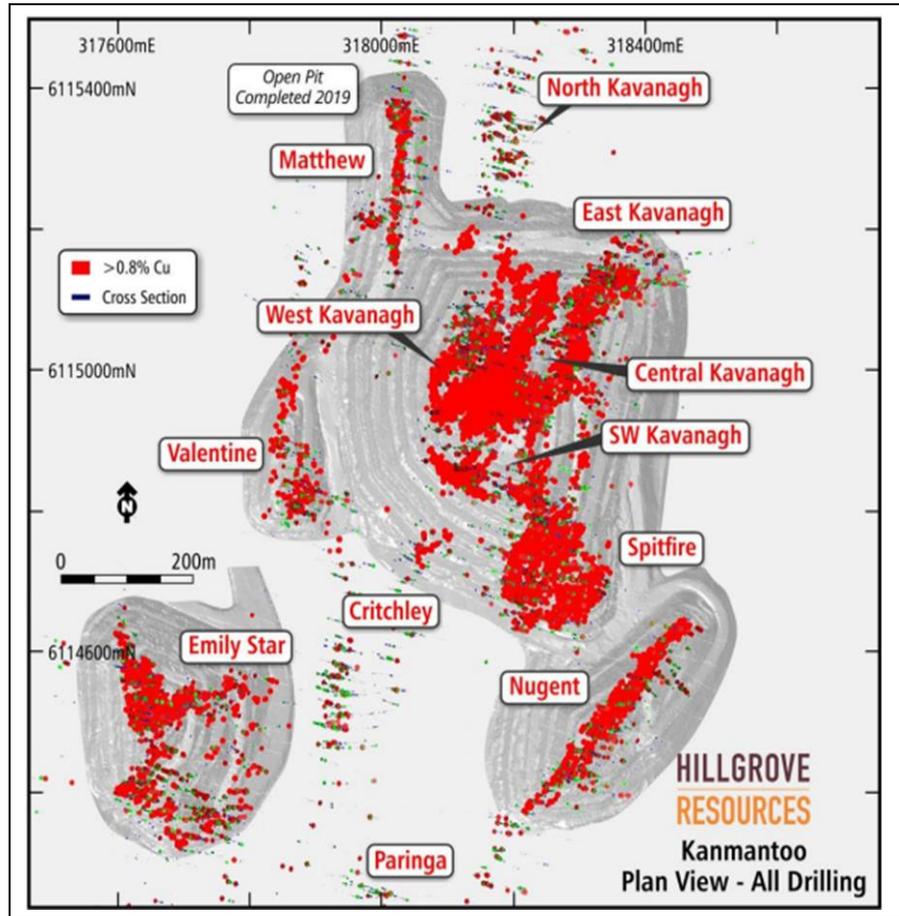


After producing 137kt of copper and 56koz of gold from open-pit operations at Kanmantoo, HGO is now moving operations underground to mine the extensions of the same lodes.

Source: Company

Hillgrove undertook exploration work at the site from 2004, which proved up additional mineral resources adjacent to and below the historical Kavanagh open pit. This led to Hillgrove commencing open pit mining on the Kavanagh, Valentine, Matthew, Emily Star, Spitfire and Nugent lodes, and processing ore on the site from 2011. Mining of the main open pit – Giant – was completed in May 2019 with final ore from the depth extensions of the West Kavanagh lode. The processing of the stockpiled ore concluded in March 2020. From 2011 to 2020, the operation produced 137k tonnes of copper and 56k ounces of gold from several open pits. After the completion of open pit operations in 2020, Hillgrove is now planning to resume production in early 2024 through an underground mining project.

Figure 2: All Drillings at Kanmantoo Mine



Source: Company

## Strategic benefits of the Kanmantoo Underground Project

Kanmantoo Underground project offers multitude advantages, i.e. favourable location, existing infrastructure and very-well understood geology, amongst others. These factors offer multitude advantages, making HGO a low-risk and high potential play.

### I. Very-well understood geology

As a fully permitted brownfield project, there is relatively low risk compared to other mining start-ups. The project extracts the same lodes that were mined and processed for almost a decade in the open pit. This materially reduces the technical risk around geology interpretation, ground support requirements, and metallurgical recovery.

The pelitic meta-sedimentary rocks of the Cambrian Kanmantoo Group in the Adelaide Geosyncline are host to numerous copper, gold, lead, zinc, silver, pyrite deposits over a 300km N-S strike length of which Kanmantoo is the largest. The copper-gold deposits at Kanmantoo are hosted within meta-pelites that are regionally thermally altered to andalusite – sillimanite grade schists. The mine sequence is characterised by an abundance of andalusite dominant schists interbedded with quartz biotite schists. The Cu-Au mineralisation is emplaced post peak-metamorphism and syn to post peak deformation of the Delamerian Orogen from magmatic fluids in a structurally controlled shear system.

*Extracting the same lodes that were mined for more than a decade through the open pit operations massively reduces the Project's technical risks.*

**II. Favourable location and well-maintained existing infrastructure**

The project’s location, 55km from Adelaide and 3km from the main dual carriageway leading to the export port of Port Adelaide, brings inherent operating and capital cost advantages. This includes low-cost grid electricity, water, transport and labour due to there being no requirement for a fly-in, fly-out workforce. The mine’s location in the Adelaide Hills – one of Australia’s most attractive settings - also helps to attract and retain a high-quality workforce who predominantly live within the region.

The project has all the necessary infrastructure in place, including a 3.6Mtpa processing plant that is being maintained in such a manner that it can be restarted quickly with very little refurbishment costs. The electricity and water contracts have been maintained, and water is pumped through the system daily, whilst each week the mill, crushing and conveying system is operated. All critical spares required to mitigate lengthy operational downtime are stored at the site. **The planned mining operation will only require 40% of the processing plant capacity.**

In addition, **the tailings storage facility is operational and has approximately 3Mt more permitted capacity than the current mine plan**, providing additional tailings as drilling continues to identify further resources and grow the mine plan without further permitting.

**Figure 3: Overhead View of Key Site Infrastructure**



*Source: Company*

**III. High-quality mineral resource base with significant upside potential**

In June 2019, Hillgrove commenced diamond drilling to test the continuity of the Central and East Kavanagh lodes below the eastern wall of the mined Giant open pit. Since then, drilling programs have been completed in 2020 and 2021/2022 to test the extents of Kavanagh, Spitfire and Nugent Cu-Au zones. Mineral Resource Estimates (MRE) have been released for the Kavanagh mineral system in 2019, 2020, 2021 and 2022, and for the Nugent mineral system in 2020 and 2022. Figure 4 summarises the 2020 Nugent MRE and the Kavanagh March 2022 MRE (incorporating the Kavanagh and Spitfire zones) which are the basis of the Updated Economic Assessment (UEA) 2023.

The 2020 Nugent MRE and the 2022 Kavanagh MRE are Stage 1 of the kanmantoo Underground Project, with further drilling currently being undertaken to improve the confidence in the Mineral Resources and to drill test additional Cu-Au mineral zones.

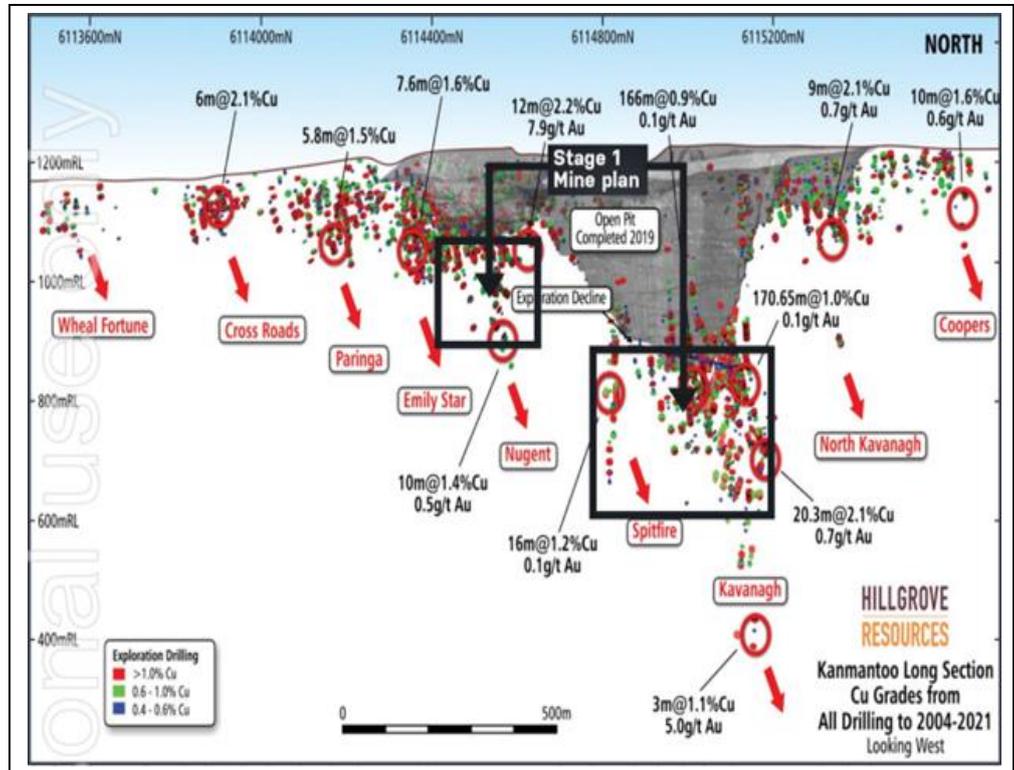
**Figure 4: Underground Mineral Resource Estimate**

Deposits	JORC 2012 Classification	Tonnage (kt)	Cu (%)	Au (g/t)	Cu Metal (kt)
Kavanagh 2022 (0.6% Cu COG)	Measured	780	1.28	0.10	9.9
	Indicated	3,640	1.03	0.06	38
	Inferred	1,300	1.0	0.1	10
	<b>Sub-Total</b>	<b>5,750</b>	<b>1.10</b>	<b>0.10</b>	<b>61</b>
Nugent 2020 (0.8% Cu COG)	Indicated	202	1.4	0.47	2.8
	Inferred	457	1.3	0.7	6
	<b>Sub-Total</b>	<b>659</b>	<b>1.32</b>	<b>0.61</b>	<b>8.7</b>
<b>Totals</b>	<b>Measured</b>	<b>780</b>	<b>1.28</b>	<b>0.1</b>	<b>9.9</b>
	<b>Indicated</b>	<b>3,840</b>	<b>1.05</b>	<b>0.09</b>	<b>40.4</b>
	<b>Inferred</b>	<b>1,800</b>	<b>1.1</b>	<b>0.2</b>	<b>19</b>
	<b>Total</b>	<b>6,405</b>	<b>1.09</b>	<b>0.12</b>	<b>69.6</b>

Source: Company

The current resource only includes Kavanagh (East, Central, West, and South-West) and the upper levels of Nugent and Spitfire. There are no resources included in the Stage 1 mining inventory for the North Kavanagh and Emily Star areas, as these have not yet been converted into MRE for underground purposes. There are also no resources included for Nugent below 900mRL. Drilling has identified the continuation of the Kavanagh Cu-Au mineral zones to approximately 380mRL, which is 500 meters below the completed Giant open pit. All areas drilled to date, including Kavanagh and Nugent, remain open at depth.

**Figure 5: Copper Grades from All Drillings at Kanmantoo**

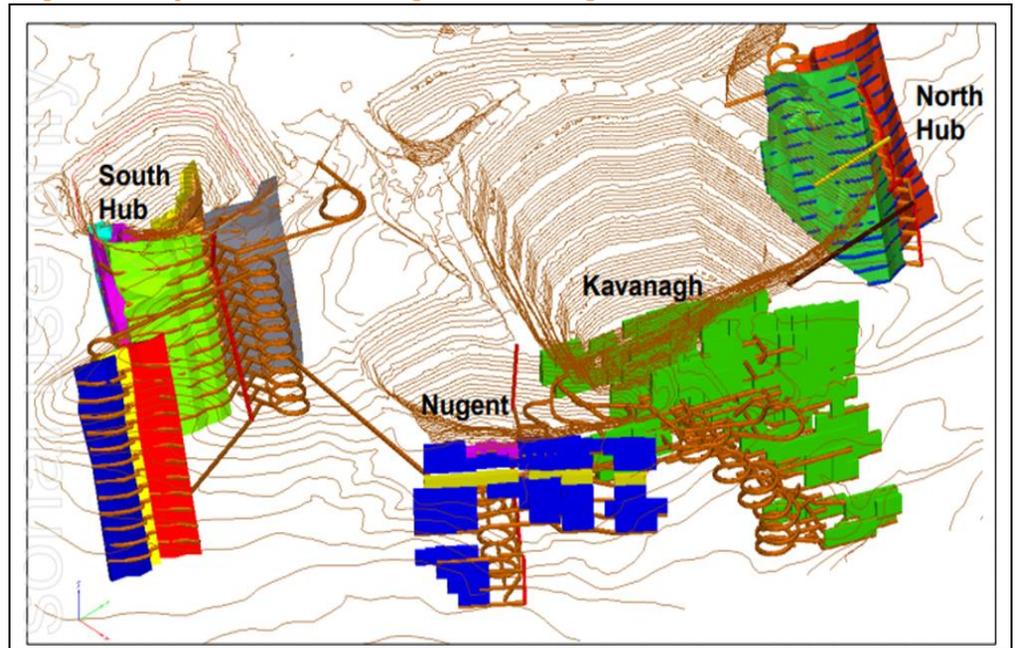


Source: Company

*Current mine plan includes only 2 of 9 known lodes within the permitted mining lease.*

In addition to the depth and strike extensions of the Kavanagh and Nugent lodes, there are a number of other mineralised zones within the permitted lease that were either mined or drilled during the previous open pit operations. In late 2022, drilling commenced in two of these areas with a view to demonstrate depth continuity below historic drilling and mining. Pending drill results, there's potential to bring these zones to the mine plan as separate work areas in order to increase annual copper production. As processing plant infrastructure operates at 40% of capacity, annual throughput can be increased with no additional permitting or capital expenditure. Figure 6 shows the conceptual underground mine designs, including the existing plan (Nugent and Kavanagh), as well as the possible addition of South Hub and North Hub to the plan for low incremental cost (pending successful confirmatory drilling).

**Figure 6: Conceptual Kanmantoo Underground Mine Designs**



Source: Company

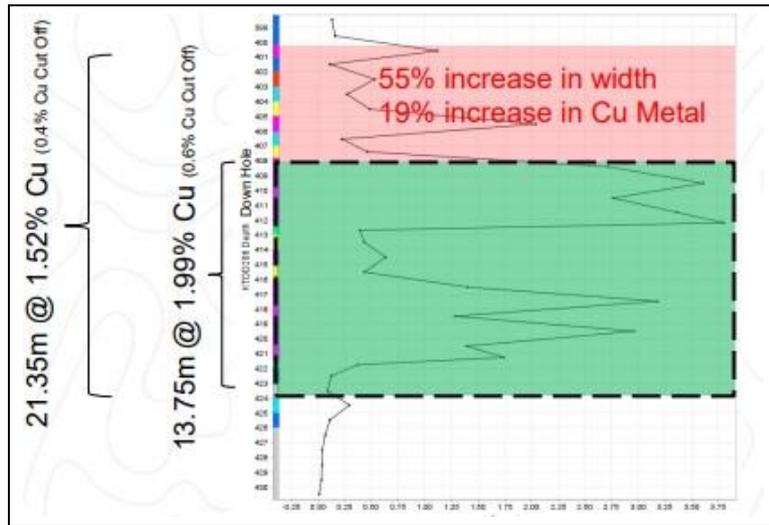
**IV. Ability to quickly respond to changing copper prices to maximise the value of the resource**

*HGO can quickly ramp up production without additional capital costs if copper prices increase further.*

The drilling program completed in 2021 confirmed that many of the higher-grade zones are surrounded by lower-grade haloes, which presents an opportunity to further increase value through a lower-grade bulk mining approach that better utilises the existing mill capacity. The spare processing capacity enables Hillgrove to respond to changing commodity prices by flexing the cut-off grade to maximise value from the Kanmantoo Underground project, without the need for additional capital expenditure. Whilst most other producers would need to consider permitting, capital costs and lengthy construction times to expand production to take advantage of changing prices, the Kanmantoo project can react quickly, which may prove valuable as the world continues to decarbonise, fuelling demand for copper.

Figure 7 shows how as copper price increases, the cut-off grade reduces, enabling additional copper mineralisation to be mined for low incremental cost by simply widening stope width.

Figure 7: Additional Copper Can Be Mined By Simply Widening Stopes

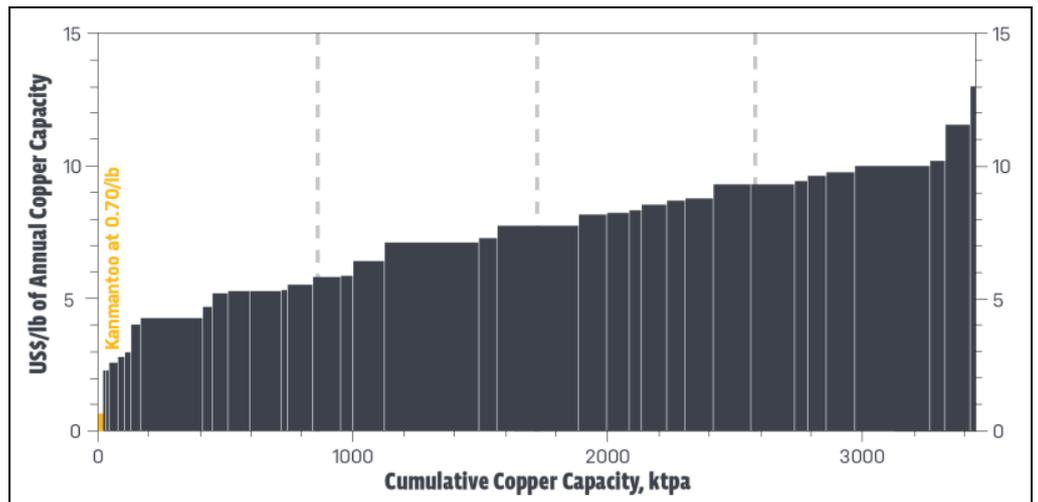


Source: Company

V. One of the lowest capital-cost copper mining projects globally

The project’s location, 55km from Adelaide, and 3km from the main dual carriageway leading to the export port of Port Adelaide, brings inherent operating and capital cost advantages. This includes low-cost grid electricity, water, transport and labour due to there being no requirement for a fly-in, fly-out workforce. The mine’s location in the Adelaide Hills – one of Australia’s most attractive settings - also helps to attract and retain a high-quality workforce who predominantly live within the region. And due to the existing processing facility and tailings storage infrastructure, both of which are being maintained in a ready-to-restart condition, the project requires only \$25m of development capital (excluding contingency). This positions Kanmantoo as one of the lowest capital-intensity copper development projects in Australia at US\$1,290/t of annual copper production in the first three years, well below other development projects, which average over US\$16,000/t<sup>1</sup>.

Figure 8: Kanmantoo is one of the lowest capital-intensity copper projects in Australia



Source: Company

<sup>1</sup> AME, 2017, Copper – Capital Intensity of New Copper Mines

**VI. Fully funded with no debt**

Hillgrove undertook a c. \$38 million institutional placement and share purchase plan in March 2022 to fully equity fund the development of Kanmantoo Underground Copper Project, along with sufficient contingency capital. Proceeds from the capital raising will also be used to fund exploration to continue to expand the Resource and extend the mine plan as well as general working capital purposes.

The massive equity capital raised at a 17.2% discount to the last price and a 17.8% discount to 10-day VWAP led to a drop in the share price through the significant dilution it caused to the shareholder base. Although it wasn't exactly good news for existing shareholders, we think it provides an opportunity for new investors to buy into the stock at more attractive prices. The equity-based funding enables the Kanmantoo Project to start without debt, and it can bring about superior outcomes for a number of reasons, including:

- No debt repayment schedule provides the company with significant operational flexibility.
- The cost of debt has increased with recent interest rate rises and general capital tightening, such that there has been a convergence with the cost of debt and the cost of equity.
- No debt covenants reduce restrictions on the company distributing dividends, thereby potentially bringing forward the timing of fully franked dividend payments (the company has \$235m in carried forward tax losses and \$17.5m in franking credits).

*Kanmantoo UG Project is fully equity funded and therefore has minimal financial risks.*

**VII. A strong shareholder and offtake partner onboard**

\$17.2 million of the \$39 million equity capital raised in March 2023 was through a share placement to Freepoint Metals and Concentrates LLC, Hillgrove's long-term logistics and marketing provider and a company's significant shareholder. Concurrent with the capital raising, Freepoint and Hillgrove entered into a binding term sheet for a mutually agreeable hedging program for AUD copper, covering at least 16,000 tonnes of copper on a defined schedule, approximating 50% of the first 2 years of production. Subject to the satisfaction of standard conditions for transactions of this nature, the hedging program will assist HGO to achieve pricing stability for its copper product and underpin the financials of the mine plan.

**VIII. Early decline development brings forward first copper production**

Early development works undertaken in 2021/22 established two portals, intersected high-grade mineralisation and an underground drilling platform. This has enabled the early establishment of infrastructure at the ventilation and primary access portals, including water supply lines, fuel storage, electrical infrastructure, secondary ventilation fans, ablution, crib, office and emergency response facilities. This primes the project for rapid and low-cost ramp-up to first copper. **According to the company, first copper production is expected only 7 months after the project financing and mobilisation.**

**IX. Logistics and marketing sorted**

HGO, along with its life of mine offtake partner, Freepoint Metals and Concentrates LLC (Freepoint), have significant experience in marketing concentrates of varying qualities, including the material which was produced as part of the Kanmantoo open pit between 2011 and 2020. The concentrate product from Kanmantoo UG Project is similar to that produced between 2011 and 2020 from the Kanmantoo open pit, which was acceptable to smelters. The concentrate product is expected to be saleable internationally to various markets through established logistics routes to export ports.

Concentrate will be trucked to the port of Adelaide in specially designed containers previously used for the project. The full containers will be stacked at the port and concentrate from the containers will be loaded onto ships using an onshore crane with a rotainer attachment. Hillgrove has been exporting concentrate through Port Adelaide under the same proposed method since

*HGO will use the same logistics and marketing solutions it used since 2011 to export its concentrate product.*

2011. Port Adelaide has permits to handle, store and load copper concentrates and has sufficient infrastructure and capability in place to export Kanmantoo concentrates. HGO's life of mine offtake agreement with Freeport includes metal payable levels, treatment charges, and refining charges in line with industry standards.

## UEA depicts robust project economics

Hillgrove released its Kanmantoo Underground Stage 1 Updated Economic Assessment (UEA) on 27 February 2023. The main highlights of the assessment are:

- Initial 45 months mine plan of 4.5Mt, targeting production of 43.5k tonnes of copper and 11.5k ounces of gold.
- Plan based on Mineral Resource Estimate of **6.4Mt @ 1.09% Cu and 0.12 g/t Au**. However, additional drilling in Nugent has increased this **by a further 6kt contained copper, which is not included in this Economic Assessment**.
- First copper sales within **7 months** of final investment decision.
- **Low capital costs of only A\$25m**, resulting in one of the lowest capital intensity projects in the world, at just US\$1,290/t of annual copper produced. Capex is predominantly working capital, with infrastructure already in place.
- **All in sustaining cost of A\$8,051/t copper** (US\$2.56/lb), providing good margins at current and projected copper price. Opex is based on tendered costs for mining and contracts as well as historical costs for processing.
- Low regulatory risks as the mine site is **located in a Tier 1 jurisdiction** with all permitting in place.
- Low technical risks with **the geology as well as Geotech and metallurgy of the mining area very well understood** as the plan is focusing on extensions of the same lodes that were previously mined and processed in the open pit.
- Impressive project financials, including a post-tax free-cash-flow of A\$205m and **an NPV8 of A\$165m<sup>2</sup>. An internal rate of return (IRR) of 231% with a payback period of only 9 months** post completion of pre-production works.
- **Significant upside potential to the resource size** through ongoing drilling programs in additional lodes within the permitted mine site after the commencement of the initial mine plan.
- **Ability to increase annual throughput with no additional permitting or capital expenditure** as the processing plant infrastructure operates at only 40% of capacity, uniquely positioning Hillgrove to be able to respond quickly to changing commodity prices to maximise shareholder value.

As per the finding of the UEA, Kanmantoo Underground Stage 1 project is a massively de-risked project, in terms of regulatory risks, technical risks and financial risks, with significant upside potentials to the project's economics through increasing resource size and increasing annual throughput at minimal additional cost.

### UEA vs. EA

As per the Kanmantoo Underground Stage 1 Project Economic Assessment (EA), released in December 2021, the project was forecast to generate post-tax free cash flow of A\$196m with an NPV8 of A\$166m, producing 35.6kt of copper and 9.9koz of gold from mining 3.3Mt of ore at a grade of 1.17% Cu and 0.17g/t Au through a planned mine life of 36 months. Since then, an updated mine plan and project financial model have been completed based on additional geological data, further detailed mine engineering and firm equipment and contractor costs.

*Kanamantoo UG Stage 1 Project is massively de-risked and has robust economics with significant upside potential.*

<sup>2</sup> Assumptions: Cu (US\$9,450/t), Au (US\$1,750/oz), Ag (US\$22/oz), AUD/USD (0.70)

The results of the recent Updated Economic Assessment (UEA 2023) increased certainty surrounding the project's economic viability after introducing the increased costs to the project's financial model. The high inflation rates since the beginning of 2022 have considerably increased the operating and capital costs of virtually all mining projects. However, the Kanmantoo UG Project's economics were minimally impacted by the increased costs thanks to all the required infrastructure and the processing plant already in place.

The Updated Economic Assessment outlined a post-tax free cash flow generation of A\$205m with an NPV8 of A\$165m, producing 43.5kt of copper and 11.5koz of gold from mining 4.5Mt of ore at a grade of 1.05% Cu and 0.15g/t Au through a planned mine life of 45 months. UEA 2023 project financial model used the same copper and gold price assumptions used in the EA 2021. Figure 9 shows the variances between the EA 2021 and the UEA 2023.

**Figure 9: UEA vs. EA**

Economic Assessment		EA 2021	UEA 2023
<b>Financial</b>	Free Cash Flow	A\$196M	A\$205M
	NPV 8%	A\$166	A\$165
	IRR	389%	231%
	AISC (All In Sustaining Costs)	A\$6,991	A\$8,051
<b>Production</b>	Mine Life	36 months	45 months
	Ore Mined	3.3MT	4.5MT
	Copper Grade	1.17%	1.05%
	Copper Production	35.6 kt	43.5 kt
	Gold Grade	0.17g/t	0.15g/t
	Gold Production	9.9 koz	11.5 koz
<b>Pre-production capital requirements</b>	Mining	A\$21M	A\$16M
	Infrastructure	A\$2M	A\$3M
	Processing	A\$1M	A\$1M
	Other	A\$2M	A\$5M
	<b>Total</b>	<b>A\$26M</b>	<b>A\$25M</b>
	Capital Intensity	US\$1,550/t	US\$1,290/t
<b>Costs (A\$/t milled)</b>	Mining	A\$46	A\$47
	Processing	A\$13	A\$13
	Royalties	A\$7	A\$6
	Offtake Changes	A\$7	A\$8
	Logistics	A\$5	A\$5
	General and Administration	A\$2	A\$3M
	<b>Total</b>	<b>A\$81</b>	<b>A\$82</b>

Source: Company and East Coast Research

## Hillgrove rapidly moving towards production

Following the receipt of Tranche 1 Placement capital of \$15.6m on 9 March 2023, Hillgrove wasted no time in commencing work towards both the underground development at Kanmantoo to get back to production as well as mine life expansion drilling.

The company has engaged specialised contractors to commence early work activities in preparation for the commencement of underground development. This includes geotechnical remediation of the pit walls, haul road preparation and pit dewatering. This early preparation enables underground development to commence immediately on mobilisation. On 17 March 2023, the company mentioned that contracts for equipment, personnel and services for the development are nearing finalisation.

**HGO expects to commence copper production in early 2024.**

Hillgrove is working towards a smooth mine ramp up, ensuring that as equipment arrives it can immediately commence mine development. With the portals already established, HGO’s miners can walk in on day one and take development cuts. Underground development to access ore is scheduled to commence in 4Q23 (June quarter), and it expects to commence copper production in early 2024, potentially making Hillgrove Australia’s next copper producer.

**Figure 10: Mapping of the exploration decline portal face (left) and the established portal (right)**



Source: Company

**A massive exploration target at Kanmantoo has been declared**

Following successful extensional from-surface drilling results at Kanmantoo in February 2023, Hillgrove updated its Kanmantoo exploration target in conjunction with commencing the underground development at the Kanmantoo mine, indicating an approximated exploration target of between ten and twenty million tonnes with a target grade of 0.9% and 1.3% Cu and 0.1 g/t Au. The Exploration Target is based on six of the nine higher grade copper-gold ore zones that have already been mined in the open pit or intersected by Hillgrove’s exploration drilling (Figure 11).

**Figure 11: Summary of Exploration Target by zone.**

Deposit	Exploration Target			
	Max RL Depth	Tonnage Range (Mt)	Grade Range (Cu %)	Grade Range (Au g/t)
Kavanagh	400	4 - 6	1.0 - 1.4	0.1 - 0.3
Nugent	600	2 - 4	0.8 - 1.3	0.3 - 0.5
Emily Star	600	1 - 4	0.8 - 1.2	0.1 - 0.2
Paringa	600	1 - 2	0.8 - 1.2	0.2 - 0.3
North Kavanagh	600	1 - 2	0.8 - 1.2	0.1 - 0.2
Coopers	600	1 - 2	0.8 - 1.2	0.1 - 0.2
<b>TOTAL MINE LEASE</b>		<b>10 - 20</b>	<b>0.9 - 1.3</b>	<b>0.1 - 0.3</b>
South Kanmantoo (EL6526)	600	2 - 4	0.8 - 1.2	0.1 - 0.3
Stella (EL 6526)	600	2 - 4	0.8 - 1.2	0.1 - 0.3

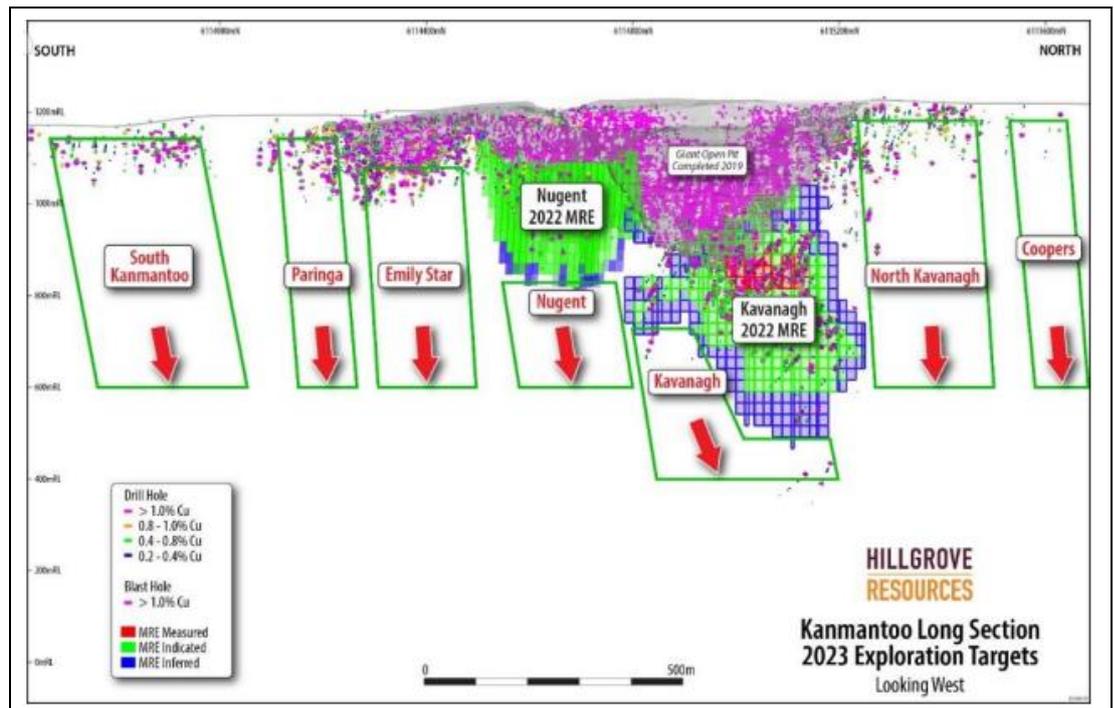
Source: Company

Hillgrove’s recent drilling at Emily Star and North Kavanagh (announced on 27 February 2023) confirmed the location of Cu-Au mineralisation proximal to the existing underground mine plan, and gave HGO the

confidence to continue to identify future underground copper resources with the objective to expand the company’s copper production profile and mine life.

As a result, Hillgrove has recently secured a drill rig to continue to explore the Exploration Target. The drilling will target mine life extensions down dip of the existing mine design at Nugent and Kavanagh and will also target the strike extensions and parallel Cu-Au lodes with the aim to increase annual copper production. **This is noteworthy that Hillgrove has had an exploration strike rate of above 100% as it has recorded 143 copper-gold intersections of economic grade and width from only 122 holes. This increases our confidence in the company’s future resource growth potentials.**

**Figure 12: Longitudinal section of the Exploration Targets by zone**



Source: Company

### The production schedule for Kanmantoo Underground Stage 1

Mine development is forecast to ramp up to full rates of 750 metres per month (25 metres per day) by month 16 of the schedule, with the first stope material being mined at month 7. The relatively slow development ramp-up reflects the time it takes to open up sufficient working headings to maintain a high production rate. Maximum ore production of 140k tonnes is expected to be reached in month 30.

Processing operations are scheduled to commence in month 7 when sufficient material is stockpiled, and a sustainable mining production profile is achieved to accommodate monthly processing. Monthly plant feed grades range between 0.8% and 1.3% copper. Monthly copper production is expected to range from 400 tonnes to 1,600 tonnes.

In terms of resource category, 74% of the contained copper metal in the plan is in the indicated category and the remaining 26% is in the inferred category. Figure 13 provides the annual profile of production metrics for the project.

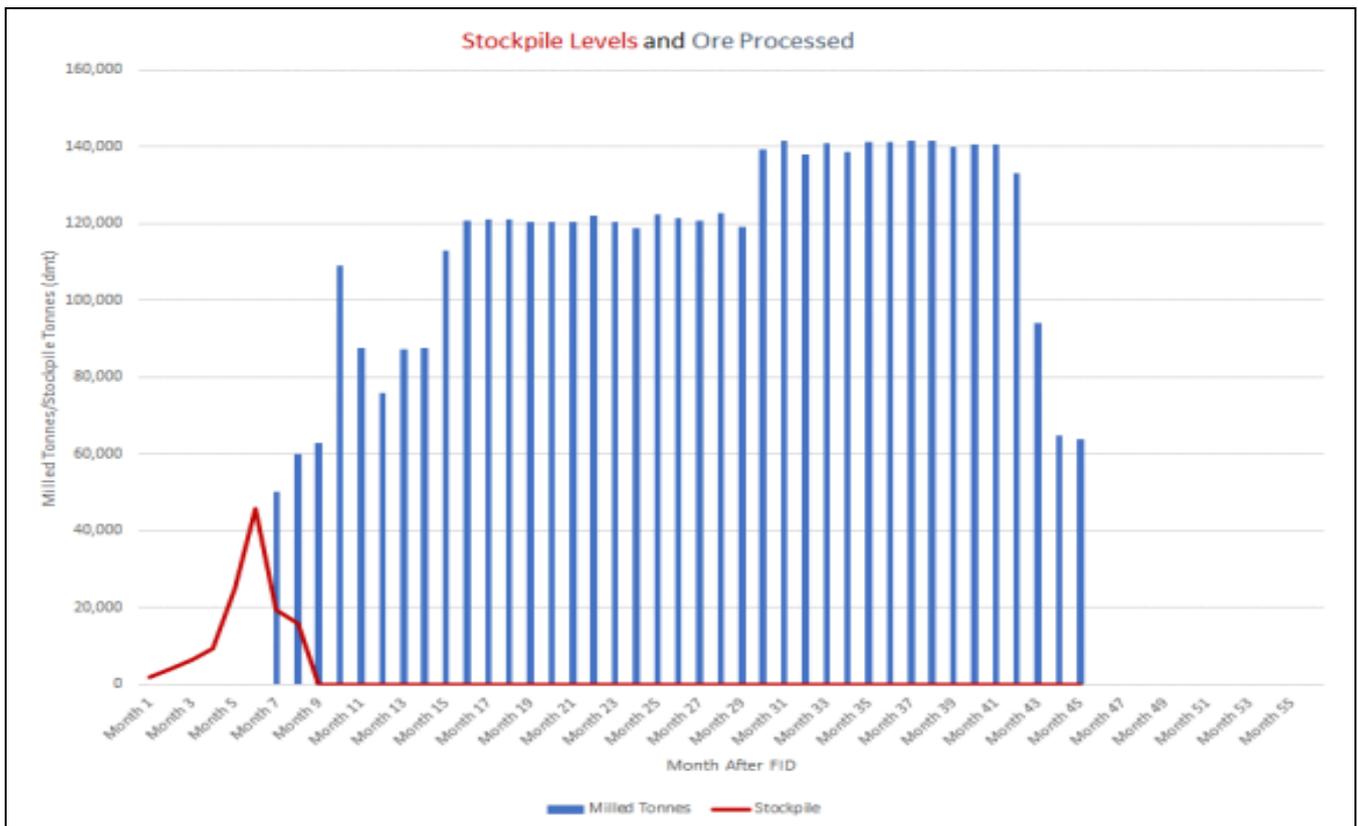
**Majority of the resources in the Kanmantoo UG Stage 1 Project’s mining plan is in the indicated category.**

Figure 13: Annual production forecasts

Metric	Year 1	Year 2	Year 3	Year 4 (9 months)
Processed (MT)	0.45 MT	1.4 MT	1.6 MT	1.1MT
Feed Grade (%)	1.07%	1.02%	1.05%	1.07%
Copper recovery (%)	93.2%	93.1%	93.2%	93.2%
Copper Produced (kt)	4.4	13.0	15.5	10.5
Gold Produced (koz)	1.8	4.5	4.7	0.4

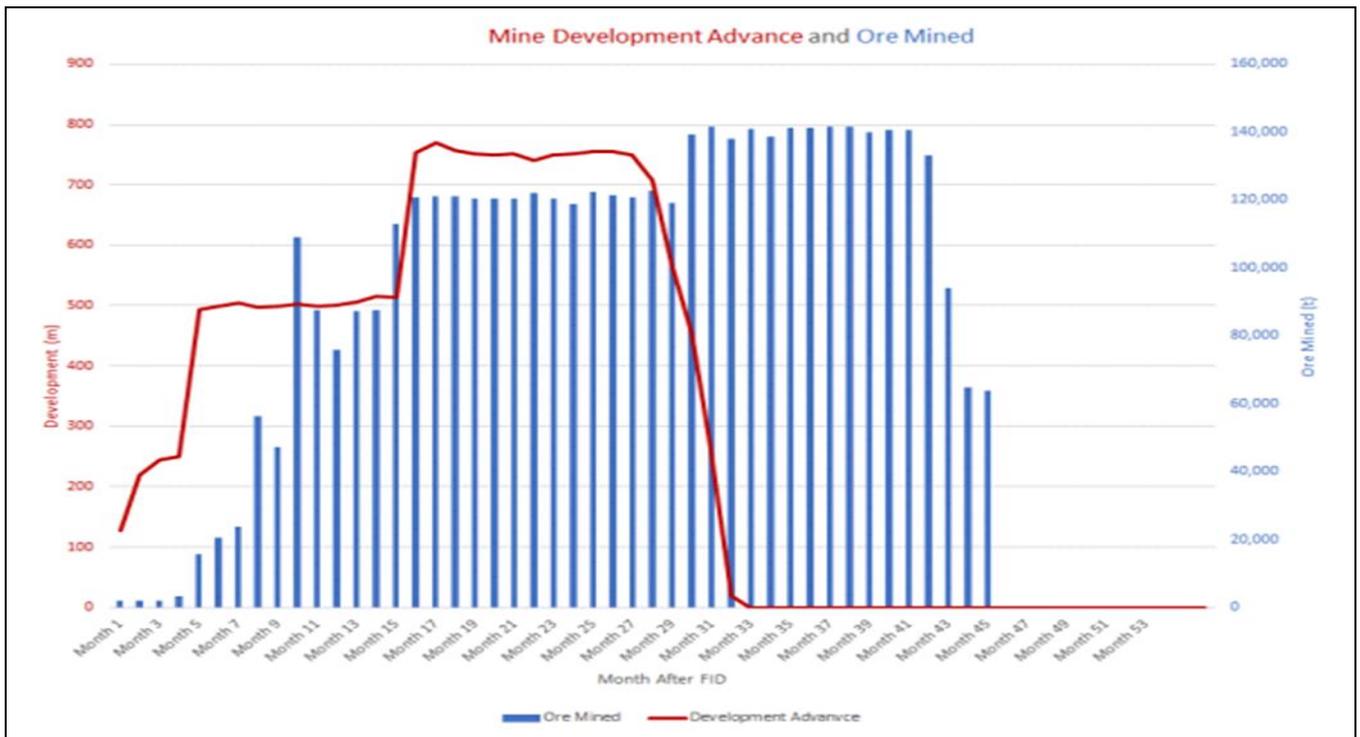
Source: Company

Figure 14: Monthly stockpile levels and ore processed



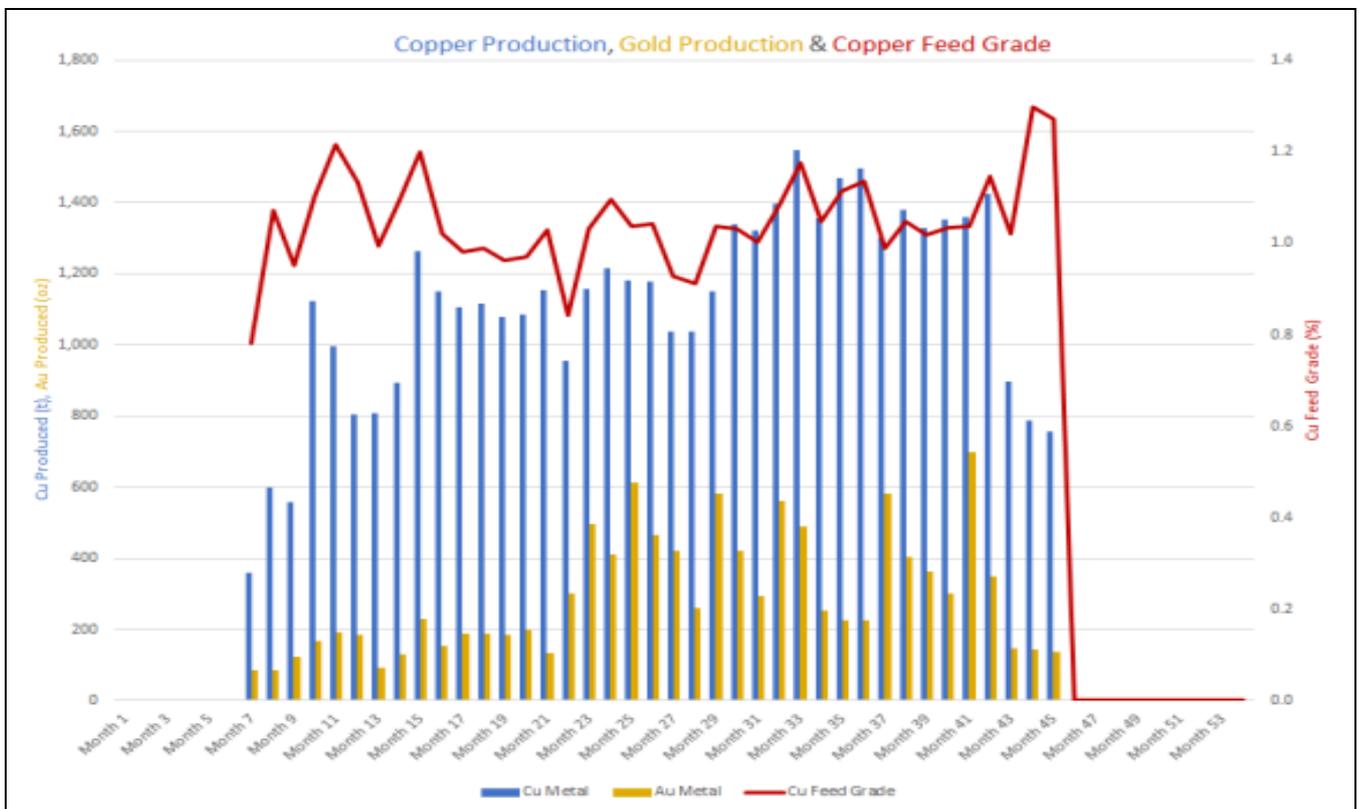
Source: Company

Figure 15: Monthly mine development advance and ore mined



Source: Company

Figure 16: Monthly copper production, gold production and copper feed grade



Source: Company



Figure 18: Processing assumptions used in the UEA 2023

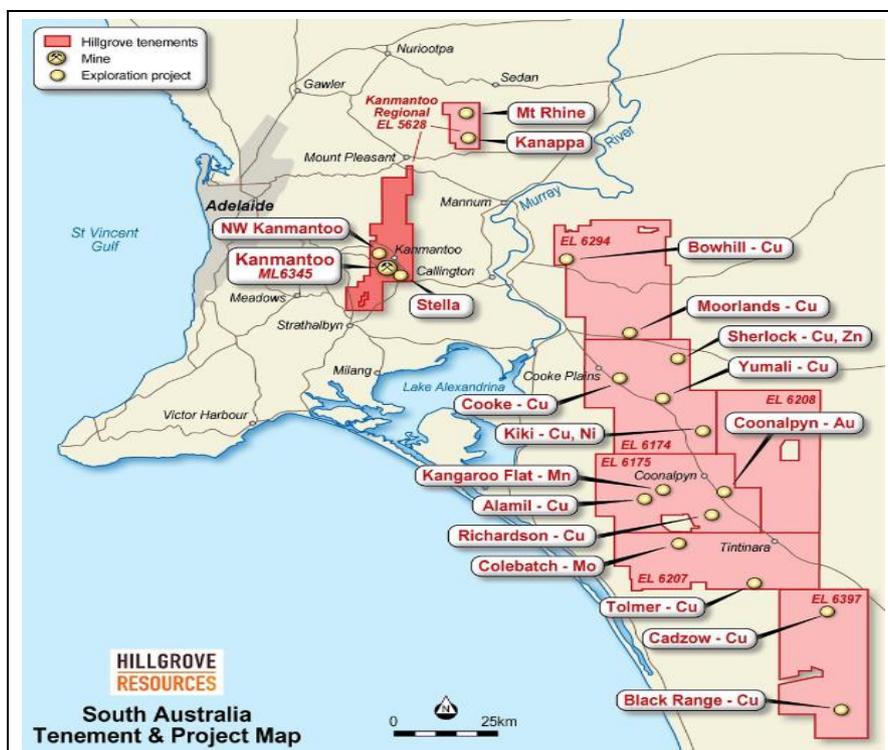
<b>Milled Tonnes</b>	1.4 million tonnes per annum (ave)
<b>Milling rate:</b>	Circa 350 tonnes per operating hour (tpoh)
<b>Primary Grind Size P80</b>	212 um
<b>Flotation Residence Time</b>	22 minutes
<b>Copper Recovery</b>	Average 93.1% (tail model based on feed grade)
<b>Gold Recovery</b>	55%
<b>Concentrate Copper Grade</b>	24%
<b>Processing Costs</b>	Fixed cost of \$595k per month plus \$7.78 per tonne processed variable cost. Average unit cost \$13.10 per tonne

Source: Company

## Hillgrove's non-core assets

In addition to Kanmantoo operation, Hillgrove holds over 6,150kms<sup>2</sup> of granted exploration licences in south eastern South Australia which are highly prospective for discovery of economic copper deposits within a variety of geological settings. The company's tenements are all located within the Delamerian orogen. According to the Geological Survey of South Australia<sup>3</sup>, there are similarities between the geology of the Delamerian orogen in South Australia and the geology of the large Porphyry Cu-Mo-Au deposits in south-east China, e.g. Dexing with an MRE of 9.7Mt of Cu and 265t Au. These observations support Hillgrove's exploration activities in the Delamerian orogen for large-scale Cu-Au deposits.

Figure 19: Hillgrove's tenements, mine and exploration projects in South Australia



Source: Company

<sup>3</sup> <https://www.energymining.sa.gov.au/industry/geological-survey>

*HGO has exploration projects in the vicinity of its Kanmantoo processing plant.*

Hillgrove’s high priority exploration projects outside the Kanmantoo project area are the ones in proximity of the Kanmantoo processing plant and include the following:

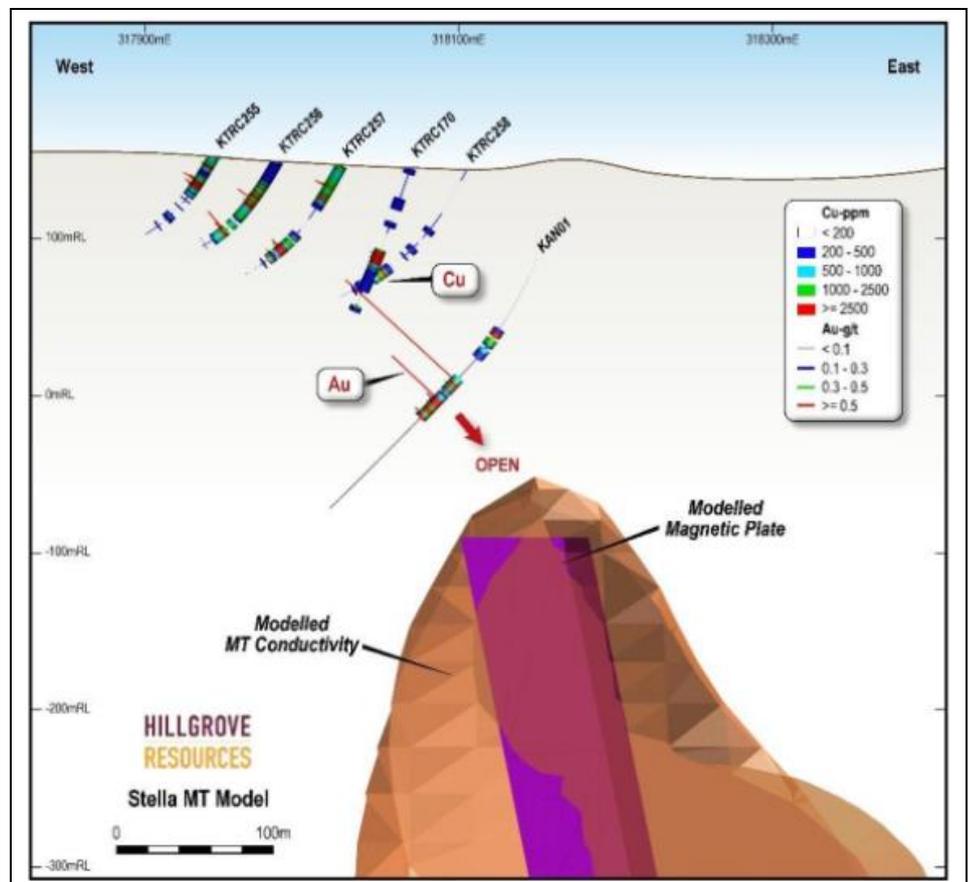
**North West Kanmantoo:** Located 4.5kms north west of the Kanmantoo processing plant and covers a 2.3 km long zone of copper-gold anomalism associated with Fe gossans and breccias.

**Stella:** Located around 1.5 km southeast of the Kanmantoo processing plant. At Stella, Hillgrove has defined a large conductive geophysical anomaly beneath historic drilling, which has intersected broad zones of alteration with copper-gold mineralisation. The closest drill hole to the geophysical anomaly, KAN001, intersected the following:

- 3.6m @ 0.39% Cu, 2.43 g/t Au, from 156.4 metres, including 0.9m @ 9.28 g/t Au, 0.18% Cu from 156.4 meters, and
- 6.56m @ 0.77% Cu, 0.84 g/t Au from 173 metres.

The strong gold endowment within close proximity to Kanmantoo processing plant makes Stella a priority target for follow-up.

**Figure 20: Cross section through the Stella target**



Source: Company

In addition, Hillgrove owns agricultural land and over 2.25Lpa of water supply for agri-business development opportunities.

# A very bullish outlook for copper prices bodes well for HGO

Historically, copper was the first metal to be worked by people. The discovery that copper could be hardened with a little tin to form the alloy bronze gave the name to the Bronze Age. Traditionally it has been one of the metals used to make coins, along with silver and gold. All US coins are now copper alloys. Most copper is used in electrical equipment such as wiring and motors. This is because it conducts both heat and electricity very well and can be drawn into wires. It also has uses in construction (for example roofing and plumbing), and industrial machinery, such as heat exchangers.

Copper’s variety of usage in different industries has turned it into the third most widely used metal in the world, and its applications in energy transition technologies are set to catapult demand for the base metal in the following decade as the decarbonisation trend accelerates.

Copper has the highest conductivity of any non-precious metal, and plays an important role in all energy production, but it’s particularly important for future sustainable technology applications such as electric vehicles and solar photovoltaic (PV) surfaces, and is itself a sustainable material as it’s 100% recyclable without loss of properties.

*The ongoing decarbonization megatrend is set to catapult demand for copper in the following decade.*

**Figure 21: Critical mineral needs for clean energy technologies**

	Copper	Cobalt	Nickel	Lithium	REEs	Chromium	Zinc	PGMs	Aluminium
Solar PV	●	●	●	●	●	●	●	●	●
Wind	●	●	●	●	●	●	●	●	●
Hydro	●	●	●	●	●	●	●	●	●
CSP	●	●	●	●	●	●	●	●	●
Bioenergy	●	●	●	●	●	●	●	●	●
Geothermal	●	●	●	●	●	●	●	●	●
Nuclear	●	●	●	●	●	●	●	●	●
Electricity networks	●	●	●	●	●	●	●	●	●
EVs and battery storage	●	●	●	●	●	●	●	●	●
Hydrogen	●	●	●	●	●	●	●	●	●

Relative importance of minerals for a particular clean energy technology: High: ● Moderate: ● Low: ●

Source: International Energy Agency

## Electric Vehicle adoption to drive demand for copper

Electric vehicles (EVs) use a substantial amount of copper in their batteries and in their windings and copper rotors used in electric motors. A single car can have up to six kilometres of copper wiring. The metal is also required for busbars, used to connect modules and cells in battery packs, and in charging infrastructure.

**While most cars currently on the roads use internal combustion engines that require up to 23kg of copper, a hybrid electric vehicle uses 40kg of copper, a plug-in hybrid electric vehicle uses 60kg, a battery electric vehicle 83kg, and a hybrid electric bus 89kg. A battery powered electric bus can use 224-369kg of copper, depending on the size of the battery used.**

The demand for EVs is forecast to increase significantly over the next ten years as technology improves, the price gap with petrol cars is closed and more electric chargers are deployed. The EV demand increase is predicted to catapult demand for copper in the next several years. On top of this, each EV charger will add 0.7kg of copper use, and if they’re fast chargers, they can add up to 8kg of copper use each.

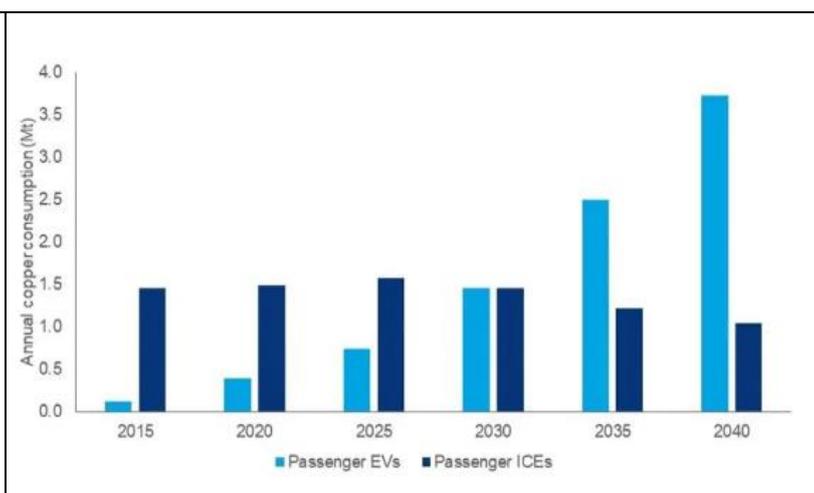
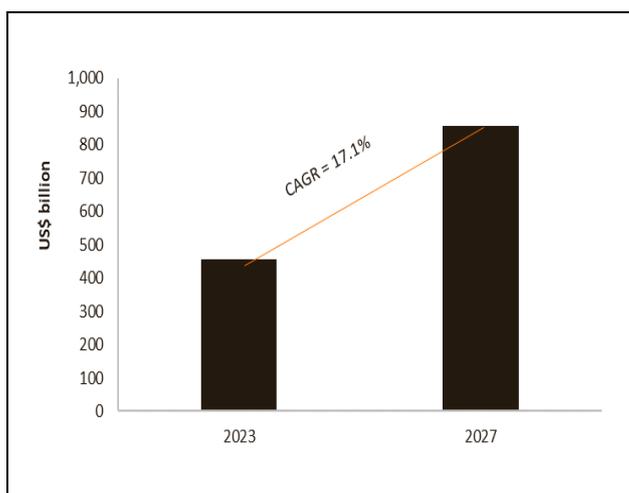
*EVs use large amounts of copper.*

Copper’s demand from EVs could grow even higher as energy-independent vehicles (EIV) enter the market. These EVs use solar photovoltaic (PV) surfaces on the roof to provide power from solar energy. The PV systems also rely on a considerable quantity of copper to operate.

Revenue in the EV market is projected to reach US\$457 billion in 2023 and is expected to show a compounded annual growth rate (CAGR) of 17% to reach US\$858bn in 2027, where EV unit sales are expected to reach 16.21 million vehicles in 2027, from around 2 million in 2020<sup>4</sup>. The rapid pace of EV adoption has led analysts at Wood Mackenzie to predict that passenger EVs will consume more than 3.7 million tonnes of copper every year by 2035, while passenger internal combustion engine (ICE) vehicles will need just over 1 million tonnes.

**Figure 22: EV’s Global market value**

**Figure 23: Annual copper consumption in EVs and ICE vehicles**



Source: Statista and East Coast Research

Source: Wood Mackenzie

## Electrification trend to grow demand for copper

As EVs become more common, the fear that a vehicle might not have the power to reach the next available charging station is a potentially important issue affecting the success of any transition to EVs. Larger and higher-performance batteries will be an important part of the solution; however, battery improvements alone will likely not ensure that consumer demand for convenient and flexible charging is realised.

A global infrastructure revolution will be required to achieve the sales targets that are rapidly being adopted by policymakers and auto manufacturers alike. According to CRU’s study<sup>5</sup>, in a reference scenario, the global number of EV charge points will reach 176 million by 2035, whilst a “high EV diffusion” scenario is estimated to result in 340 million charge points by the same year.

This build-out in EV charging infrastructure will drive increases in global copper demand, but the scale of the effects also depends upon the type of charging infrastructure developed. If consumers are impatient, have limited access to hookups at home or work, or if battery technologies disappoint, highly copper-intensive “fast chargers” – designed to recharge vehicles in minutes rather than hours – can be expected to see soaring demand.

## The impact of electrification demand on copper markets

Electricity distribution has long been a key market for copper producers. **Forward-looking copper producers and investors looking to appraise the potential market impacts of EVs need to consider**

<sup>4</sup> Statista, Electric Vehicles market worldwide.

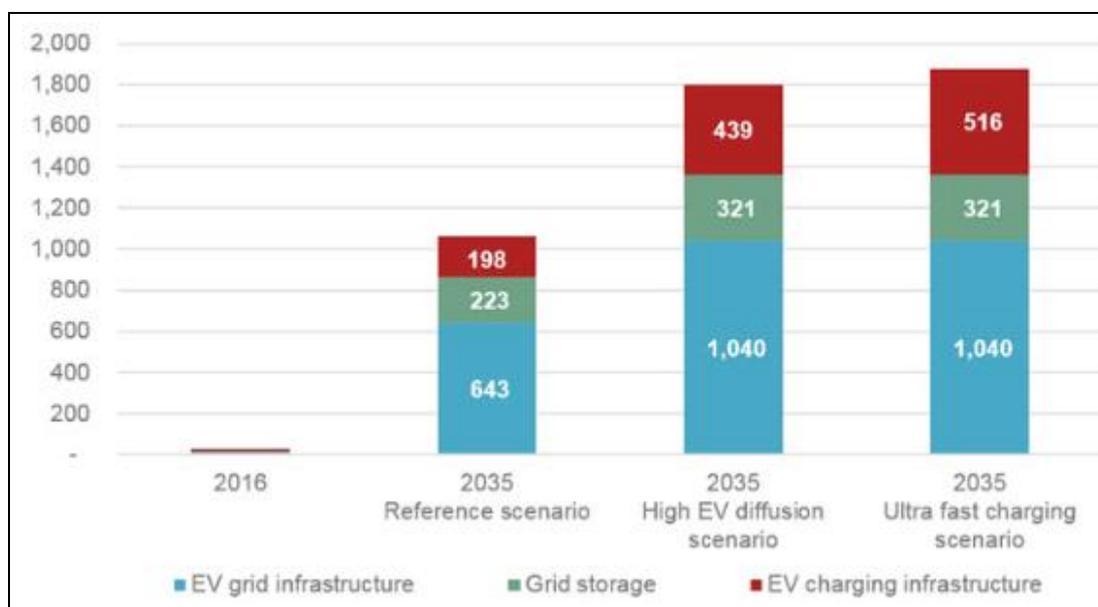
<sup>5</sup> CRU Group, Analysing the impact of EVs infrastructure build out.

**EVs Charging points and distribution network upgrades require large amounts of copper.**

**the potential demand – not just from higher copper loadings in the vehicles themselves – but also the metal needed for EV infrastructure. This will be both for EV charging points, but also to develop and upgrade transformers and distribution networks.**

Based on CRU’s analysis, in a baseline assumption, by 2035 global copper demand in charging and distribution upgrades will reach almost 1.1 million tonnes per annum. However, there are substantial upside potentials to the baseline assumptions. Consumers may be unwilling to accept the inflexibility associated with extended charge times, and the physical availability of home or workplace charging facilities may be restricted, particularly in high density cities, leading to substantially more fast charging facilities required relative to the baseline assumption. Such a scenario has a material impact on copper demand due to fast chargers’ greater copper loadings, but also significantly increases copper demand through the additional requirements to upgrade transformers and power distribution networks. Under such an assumption, CRU’s analysis suggests that by 2035 global copper demand in charging and distribution upgrades could reach almost 1.8 million tonnes per annum. In CRU’s “ultrafast charging scenario,” in which consumers have access to 350kW public fast charging stations (compared to c.200kW currently), global copper demand in infrastructure development and upgrades reaches nearly 1.9 million tonnes in 2035.

**Figure 24: Global copper demand associated with EV-related infrastructure (kt)**



Source: CRU Group

### Supply deficit to drive copper prices

Although near-term predictions for copper prices are mixed, with some pundits anticipating a burst of new supply to temporarily weaken market fundamentals near-term, and some, such as Goldman Sachs, seeing a short-term deficit by an expected recovery in China’s demand and the current low copper inventory levels, almost everyone agrees that a huge copper deficit is looming in the long term. The long-term outlook for copper is defined by the ongoing fifth commodity Supercycle that started in 2021, which is expected to last for the next 15 to 20 years and is driven by the renewable energy transition and electrification mega-trend.

**We agree with analysts at Goldman Sachs that the current copper prices have failed to reflect the huge looming deficit, and this has inhibited enough investments in the industry to ensure enough future supply of the metal needed to support the decarbonisation megatrend. Therefore, we anticipate a strong copper market and copper prices in the long term.**

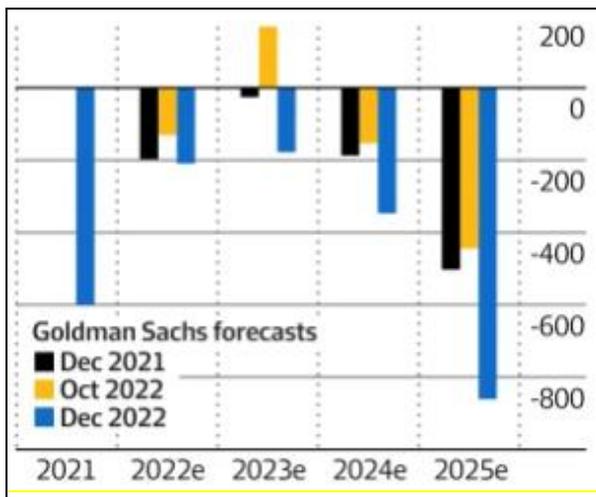
According to Kitco, higher copper prices would also reflect years of underinvestment within the mining industry dating back to the 2000s, leading to a lack of new projects and a stagnant metal supply. Dwindling copper reserves and lower ore grades at some of the world’s largest mines also means that a new deposit would just be replacing the existing output. Thus, even if a new project comes online, it may not contribute to supply growth at all. Over 200 copper mines are expected to run out of ore before 2035, with not enough new mines in the pipeline to take their place, CRU estimates.

**Increasing demand and dwindling supply is expected to increase copper prices in the medium to long term.**

Some of the largest copper mines are seeing their reserves dwindle; they are having to dramatically slow production due to major capital-intensive projects to move operations from open pits to underground. Examples include the world's two largest copper mines, Escondida in Chile and Grasberg in Indonesia, along with Chuquibambilla, the biggest open pit mine on Earth. These cuts are significant to the global copper market because Chile is the world's biggest copper-producing nation — supplying 30% of the world's red metal. Adding insult to injury, copper grades have declined about 25% in Chile over the last decade, bringing less ore to market. A report last year by Goehring & Rozencwajg Associates also found that both greenfield and brownfield reserve additions are expected to disappoint through the decade. All these research reports confirm our extremely tight copper market forecast for the next decade and beyond.

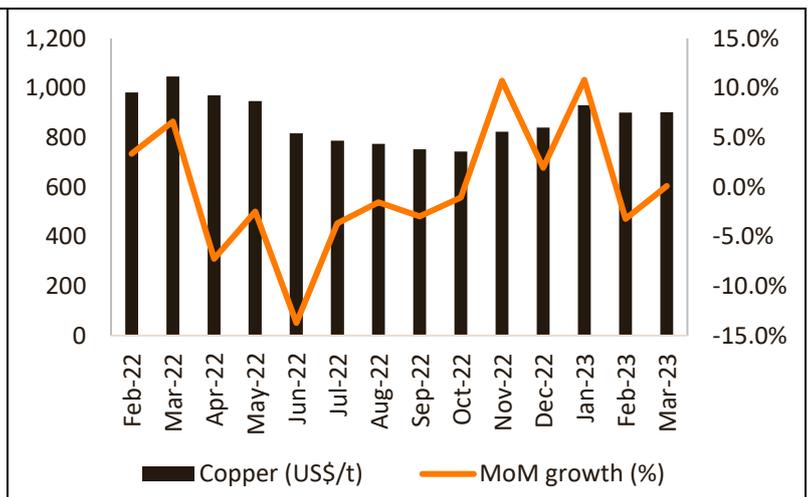
Price of copper has dropped c.17% from a record high of US\$10,845 per tonne in March 2022 to the current price of c.US\$9,000 due to recession fears and an economic slowdown in China caused by the country's strict COVID policies. But Goldman Sachs forecast that copper prices will exceed their record high to see US\$11,000 per tonne by the end of 2023, implying a 22% medium-term upside potential to the current prices. Goldman Sachs further expects copper prices to average US\$12,000 per tonne in 2024. The broker's strong copper price expectations came after it cut its global mine supply forecasts for 2023 due to lower guidance from operations in Chile, and increased its demand forecast for the metal following the China reopening.

**Figure 25: Shows how Goldman Sachs' supply deficit forecast increased in one year (kt)**



Source: Goldman Sachs

**Figure 26: Copper prices have started to recover**



Source: World Bank and East Coast Research

## It's never a wrong time to become a gold producer

**There are reasons for gold prices to perform in both good and bad economic times.**

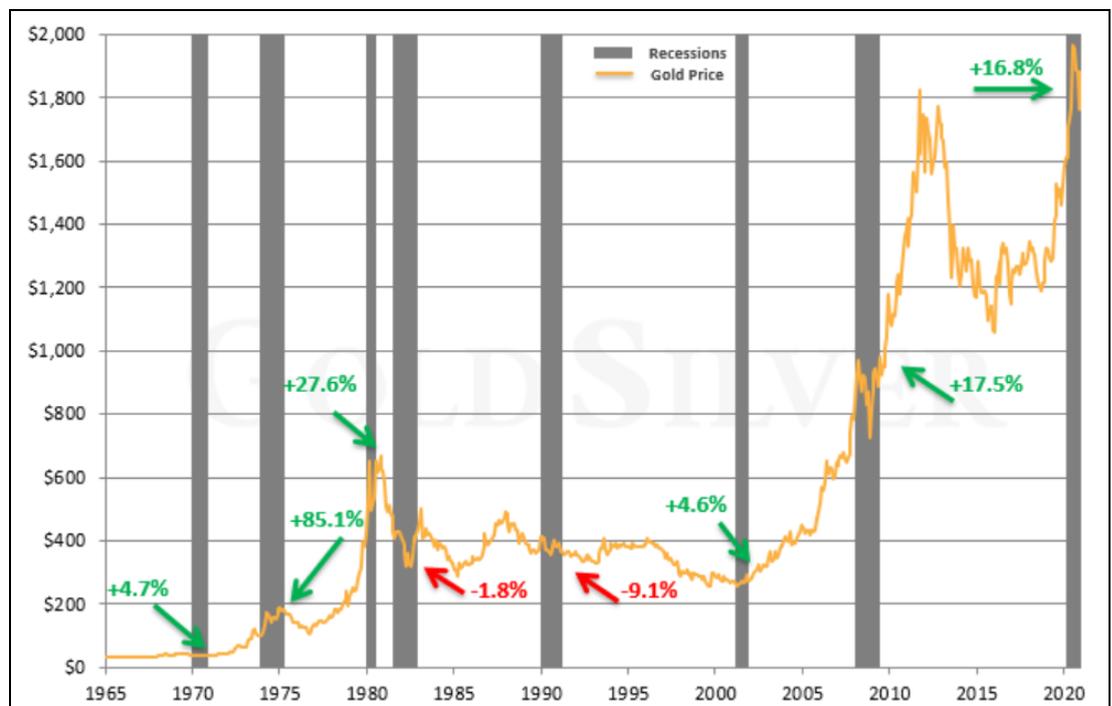
The gold product from the Kanmantoo Underground operations only adds to the attractiveness of the Project, in our opinion. Demand for gold comes from four major sources, jewellery fabrication, technology, investment and central banks. While gold demand for jewellery fabrication and technology products, such as consumer electronics, increases during periods of economic expansion and decreases during periods of economic recession, gold demand from investors and central banks behaves in the opposite manner. Investors and central banks tend to see the precious metal as a safe haven during periods of economic recession and uncertainty, while tend to sell it during periods of economic expansion as there will be more lucrative investment opportunities than gold available. In the following, we'll discuss the factors that are most likely to impact gold prices in the next few years.

**Inflation:** Gold and inflation work together as inflation is one way in which money can quickly devalue, and when this happens, people would rather have their money kept in something that would grow in value instead, such as gold. Therefore, in times when inflation remains high over a longer period, gold becomes a tool to hedge against inflationary conditions. This pushes gold price forecasts higher in an inflationary period.

The US CPI index peaked at 9.1% in June 2022, and while the Fed has kept increasing interest rates since March 2022, the US inflation index has still remained above 7%, substantially higher than the Fed's target rate of 2%. As inflation has proven itself to be incredibly sticky, we can see a long period of high inflation rates ahead, acting as a positive force behind gold prices.

**Recession:** Because gold is seen as a highly effective portfolio diversifier due to its low to negative correlation with all major asset classes, its demand often picks up in times of economic uncertainty and recession. Historically, it can be seen that in most cases, gold prices have risen during recessions and uncertain times, including the last several months.

**Figure 27: Gold prices normally increase during recessions (US\$/oz)**

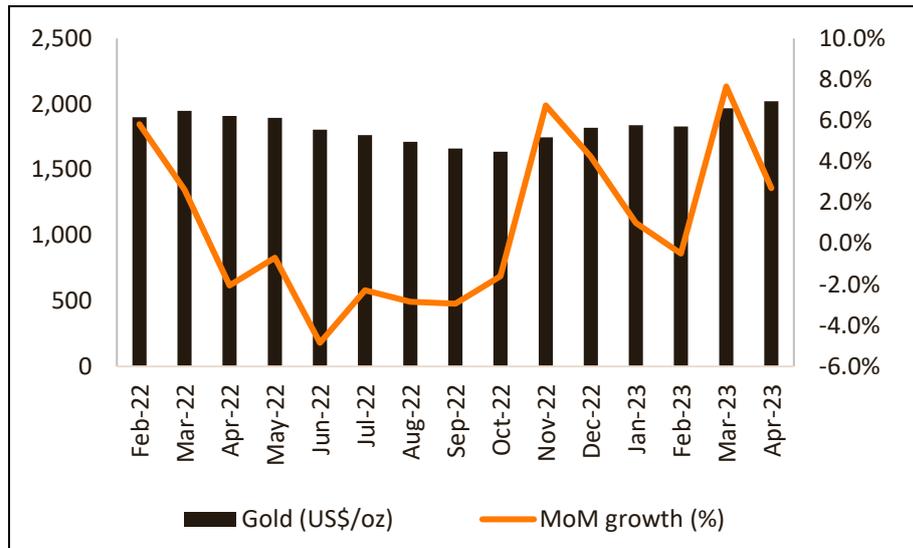


Source: LBMA, Thomson Reuters, Federal Reserve

**Interest rates:** According to some pundits, there's a negative correlation between interest rates and the price of gold. This is because when interest rates decrease, the opportunity cost of holding gold decreases, encouraging investment in the precious metal. On the other hand, interest rates normally decline during times of economic uncertainty, when a run to safety is likely to increase the price of gold.

Although the currently rising interest rates do not bode well for gold prices, its impact has been less than enough to offset the effects of the other two aforementioned factors on the gold price. In addition, increasing recession fears and soaring interest payments on the massive US government debt have led some experts to believe the peak for interest rates is close.

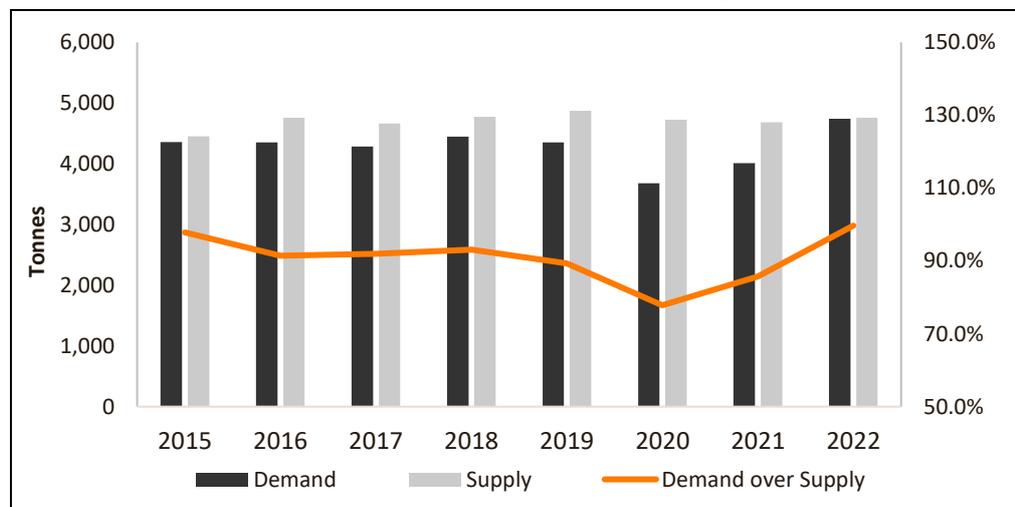
**Figure 28: Gold prices have started a revival in the last several months**



Source: Yahoo Finance and East Coast Research

*Gold is an asset known to almost constantly growing in price over the long-term as its uses and market desire keep growing, while the fact that it's an asset that's scarce limits its supply growth.*

**Figure 29: Global demand for gold has recently started to exceed its supply**



Source: World Gold Council and East Coast Research

Overall, the combination of factors indicates multiple catalysts that could push gold prices higher in both short-term and long term. The consensus estimate of analysts from large investment banks and research houses points to a price target of US\$3,000 per ounce of gold in 5 years.

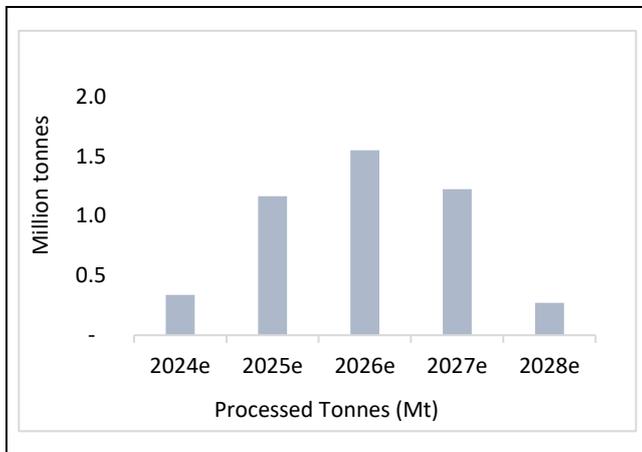
## Valuation: DCF-based approach indicates significant upside potential

We value HGO at A\$0.107 per share in a base-case scenario and A\$0.136 per share in a bull-case scenario. Our target price range indicates substantial upside potential to the current share price of A\$0.057 per share. Our basic valuation methodology has the following key indicators:

- Our DCF model for the Kanmantoo Underground Stage 1 Project is broadly based on the assumptions of UEA released in February 2023. We have assumed the mining operations to continue beyond 45 months as HGO expands its operations to other mineral lodes at the Kanmantoo mine site and develops its non-core assets near the Kanmantoo processing facility.
- The company has mentioned it expects to commence production in early CY2024. To account for a possible delay in the finalisation of funding plans, we have assumed that BML will start production in Q2 2024.
- We have assumed forecasted revenues to be net of royalty. The volume of mined ores has been forecasted in line with project economics.
- We have assumed a discount rate (WACC) of 12.8% and a terminal growth rate of 2%.
- We have assumed HGO will be able to raise a further A\$20m at A\$0.053 to fully fund the Project.
- Other assumptions included a 0.0% corporate tax rate for the first 4 years of the mining operations as the company has c. A\$235m in carried forward tax losses and over A\$17m in franking credits.

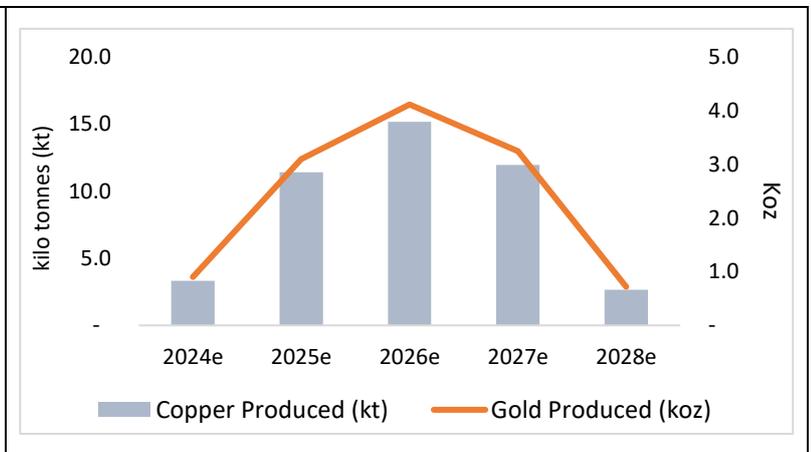
**Ores extracted and production:** We have used the total measured, indicated and inferred resources for our assumption. For both scenarios, the volume of extraction and has been kept in sync with the UEA released in February 2023.

Figure 30: Ore Processed (Mt)



Source: Company and East Coast Research

Figure 31: Copper and gold production projection



Source: Company and East Coast Research

**Commodity price:** We are bullish on both gold and copper prices for the next several years. In the base case scenario, we have used the company's price assumptions in the UEA of US\$9,450 per tonne for copper and US\$1,750 for gold and an exchange rate of US\$0.70 per A\$1, all constant throughout the mine life. Current copper prices are almost 5% lower than the UEA assumption and around US\$9,000, while gold prices are currently around US\$2,000/ounce, almost 14% higher than the UEA assumption. The current AUD/USD exchange rate is almost 5% lower than the UEA assumptions, helping the economics of the project. Therefore, we assume that the higher gold prices and lower exchange rates will offset the impact of lower current copper prices compared to the price used in the UEA.

In the bull case scenario, we have used the fixed copper and gold prices of US\$10,000/t and US\$2,000/oz, respectively, as well as a lower exchange rate of US\$0.68/A\$1, closer to the current exchange rate of US\$0.67/A\$1. These assumptions are based on our strong bullish outlook for copper and gold prices in the medium to long term.

**Operating costs:** Across both scenarios, we have assumed an average total operating cost of A\$82/t of processed ore in 2023 and increasing at a rate of 5% each year to reflect inflation impacts on costs. This is more than the management’s fixed costs assumption in the UEA for the entire life of mine. This includes mining costs, processing costs, royalty costs, offtake charges, logistics costs as well as general and administration costs.

**Capital costs and project funding:** Our model assumes a pre-production capital cost of A\$25m to be incurred in 2023. We have assumed that HGO will successfully raise an additional A\$20m in 2023. Post the commencement of production, the company should be able to fund its operations through internally generated cash flow.

Below is the summary of our final valuation range (figure 32). We have not considered the option to acquire more tenements and assets. We believe this will be undertaken by the management at a suitable time in a long time frame. In addition, based on the assumed production schedule, the processing plant will be operated at a reduced hourly throughput rate resulting in a finer grind and improved metallurgical performance. This increase in metallurgical performance is not currently factored into the recovery model and remains an upside.

The target price range represents a Price/NAV of 0.44x, which we believe provides significant upside potential for potential investors. The intrinsic value is highly sensitive to changes across WACC, exchange rate and the metal prices movement. The sensitivity across these key indicators has been represented below (Figures 33, 34 and 35).

**Figure 32: DCF-based valuation for HGO (post equity dilution)**

HGO Valuation	Base Case	Bull Case
Present value of FCF	108.2	145.3
PV of Terminal FCF	104.8	126.0
Net deb (cash)	1.9	1.9
Firm value (A\$ m)	<b>211.1</b>	<b>269.4</b>
Diluted Shares (m)	1,979.9	1,979.9
Implied price (A\$ cents)	10.7	13.6
Current price (A\$ cents)	5.3	5.3
Upside (%)	101.1%	156.7%
<b>Mid-point Target Price (A\$ cents)</b>	<b>12.1</b>	
Price / NAV (X)	0.44x	

Source: East Coast Research

**Figure 33: Sensitivity of intrinsic share price to discount rate and terminal growth rate**

		WACC						
		11.3%	11.8%	12.3%	12.8%	13.3%	13.8%	14.3%
Terminal Growth Rate	10.7	12.1	11.5	11.0	10.5	10.1	9.6	9.3
	1.7%	12.2	11.6	11.0	10.6	10.1	9.7	9.3
	1.8%	12.3	11.7	11.1	10.6	10.1	9.7	9.3
	1.9%	12.3	11.7	11.2	<b>10.7</b>	10.2	9.8	9.4
	2.0%	12.5	11.9	11.3	10.8	10.3	9.9	9.4
	2.2%	12.7	12.0	11.4	10.9	10.4	9.9	9.5
	2.4%	12.7	12.1	11.5	10.9	10.4	10.0	9.6
	2.5%							

Source: East Coast Research

Figure 34: Valuation sensitivity to copper prices and exchange rate

		Copper Price (US\$/t)						
		8,950	9,050	9,150	9,450	9,750	9,800	9,850
AUD : USD	10.7	8,950	9,050	9,150	9,450	9,750	9,800	9,850
	0.64	11.88	12.23	12.57	13.61	14.66	14.83	15.00
	0.66	10.89	11.22	11.56	12.57	13.58	13.75	13.92
	0.68	9.95	10.28	10.61	11.59	12.57	12.73	12.89
	0.70	9.07	9.39	9.71	10.66	11.61	11.77	11.93
	0.72	8.24	8.55	8.86	9.79	10.71	10.87	11.02
	0.74	7.46	7.76	8.06	8.96	9.86	10.01	10.16
	0.76	6.71	7.00	7.30	8.17	9.05	9.20	9.34

Source: East Coast Research

Figure 35: Valuation sensitivity to gold prices and exchange rate

		Gold Price (US\$/oz)						
		1,575	1,625	1,675	1,750	1,850	1,950	2,050
AUD : USD	0.0	1,575	1,625	1,675	1,750	1,850	1,950	2,050
	0.64	13.09	13.27	13.44	13.61	13.79	13.96	14.14
	0.66	12.07	12.23	12.40	12.57	12.74	12.91	13.08
	0.68	11.10	11.26	11.42	11.59	11.75	11.91	12.08
	0.70	10.18	10.34	10.50	10.66	10.82	10.98	11.14
	0.72	9.32	9.48	9.63	9.79	9.94	10.09	10.25
	0.74	8.51	8.66	8.81	8.96	9.11	9.26	9.41
	0.76	7.73	7.88	8.03	8.17	8.32	8.47	8.61

Source: East Coast Research

## Where do our assumptions stand differently?

Compared with the UEA presentation, we have a few key differences:

- **Metal prices:** In our bull case scenario, we have used c.6% higher copper prices and c.14% higher gold prices compared to the UEA assumptions, while using a c.3% lower AUD/USD exchange rate assumption. We have used similar metal prices and exchange rates to those of the company's UEA in our base case scenario.
- **Cost Inflation:** We are more conservative on the overall operating costs assumption. Across both of our scenarios, we have assumed that inflation will increase operating costs by 5% each year.

## Re-rating of HGO

HGO's stock is currently trading below our mid-point target valuation. This is our view that achieving the following milestones will enable a re-rating on the stock, thereby increasing the shareholder value:

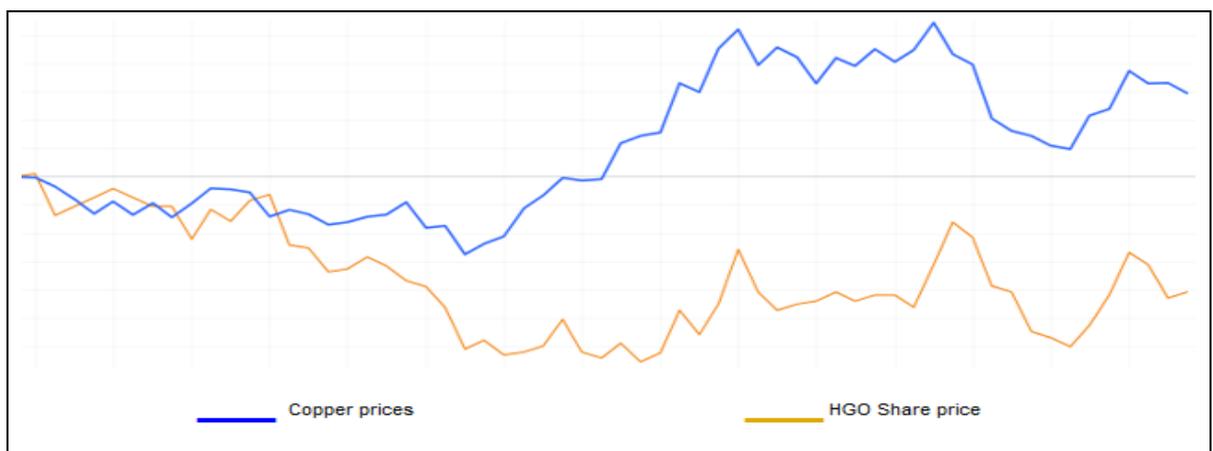
- An announcement of **successful shareholder approval for the capital raising** in the company's AGM, scheduled for 28 April 2023 will reduce the funding risks of the project.
- An announcement of a **successful Foreign Investment Review Board (FIRB) approval** for c.\$12m of the funds being raised.
- **Successful commencement of copper production:** The biggest catalyst for a value uplift would be a successful commencement of copper production at the project, scheduled for early 2024.
- Any increase in copper and gold prices will have a direct impact on the estimated cash flows of the project and its economic profile.
- An **increase in the indicated and inferred reserves** through the ongoing and planned exploration drillings in the project area will expand the life of the mine and therefore enhance the project's value.

## Risks

We foresee the following key risks to our investment thesis for HGO:

- **Underlying commodity price risk:** Historically, HGO's share price has stayed in tandem with the global copper prices (figure 36). This exposes HGO to commodity price risk, which depends on macroeconomic factors and demand and supply dynamics of the underlying metal, i.e., copper and gold. Any prolonged drop in copper or gold prices will be detrimental to our investment thesis.
- **Funding risk:** HGO is raising about \$38m in equity capital, leading to a massive dilution in the shareholding base. The company has already received \$15.6 of the capital needed for funding the Project developments. A further c.\$20m is subject to shareholder approval at the AGM on 28 April 2023, c.\$12m of this is also subject to approval by the Foreign Investment Review Board (FIRB). Failure to receive these approvals will result in a major blow to the Project development schedule and production commencement timeline.
- **Project delays:** Any potential delay in the initiation of mining activity, either due to funding or operational challenges will negatively affect the cash flow and potential shareholder's return. The proposed underground mining method at the Kanmantoo Project is inherently operationally challenging.
- **Geological risk:** For a mining company such as HGO, there exists a perennial risk of downward estimates of reserve figures. There also exists a risk of re-categorisation of the indicated reserves to inferred reserves in further studies. Any such incident will negatively impact the stock's valuation.

**Figure 36: HGO's share price moves in tandem with global copper prices (monthly chart from Apr 2018 to Apr 2020)**



Source: Tradingview and East Coast Research

## Appendix I: HGO SWOT analysis

Figure 37: SWOT analysis

Strengths	Weakness
<p>(1) Kanmantoo Underground Stage 1 is a low risk project as the mining from the area was done for many years and it lowers the technical and operational risks of the project.</p> <p>(2) High-quality mineral resource base with significant upside potential as only two of the nine mineral lodes in the mining area are included in the current plan.</p> <p>(3) The project's location, 55km from Adelaide and 3km from the main dual carriageway leading to the export port of Port Adelaide, brings inherent operating and capital cost advantages.</p> <p>(4) Existing infrastructure and a ready to restart processing plant and tailings storage facility to reduce capital costs and production lead time.</p> <p>(5) Early decline development brings forward the first copper production as two portals to access mineral lodes have already been established.</p> <p>(6) Logistics and marketing sorted thanks to a strong offtake partner with significant experience in marketing products from the Kanmantoo mine site between 2011 to 2020.</p> <p>(7) Highly experienced leadership team in place</p>	<p>(1) Underground mining operations are inherently more costly and riskier than open pit operations.</p> <p>(2) Significant share dilution from all-equity financing to impact future dividend per share payouts.</p>
Opportunities	Threats
<p>(1) Significant regional exploration potential through the company's non-core assets near the Kanmantoo processing facility.</p> <p>(2) Ability to quickly respond to changing copper prices to maximise the value of the resource thanks to the spare processing capacity.</p> <p>(3) Potential to further optimise costs by reducing mining costs and identifying CAPEX and OPEX savings.</p> <p>(4) Possibility for higher metallurgical performance due to the plant operating at a reduced hourly throughput.</p>	<p>(1) Global recession leading to high volatility in copper and gold prices, impacting the economics of the project.</p> <p>(2) Capital raising to fund the project development subject to shareholder and Foreign Investment Review Board (FIRB) approval.</p> <p>(3) Inflationary pressures increasing the cost of the project.</p>

Source: East Coast Research

## Appendix II: Management Team

Figure 38: HGO's management and board members

	Name and Designation	Profile
	<p><b>Mr. Derek Carter</b></p> <ul style="list-style-type: none"> <li>Independent non-executive chairman.</li> <li>Chairman nomination and remuneration committees.</li> </ul>	<ul style="list-style-type: none"> <li>Derek has over 50 years' experience in exploration and mining geology and management.</li> <li>He held senior positions in Burmine Ltd and the Shell Group of Companies where he was responsible for discovering the Los Santos tungsten deposit in Spain, before founding Minotaur Gold NL in 1993 and then resigning as the chairman in November 2016.</li> <li>Derek was awarded AMEC's Prospector of the year award (jointly) in 2003 for the discovery of the Prominent Hill copper-gold deposit, the AusIMM president's award and is a Centenary Medallist.</li> <li>Derek is currently the Chairman of Petratherm Limited (ASX: PTR).</li> </ul>
	<p><b>Mr. Murray Boyte</b></p> <ul style="list-style-type: none"> <li>Independent non-executive director.</li> <li>Chairman audit, risk, treasury, nomination and remuneration committees.</li> </ul>	<ul style="list-style-type: none"> <li>Murray has over 35 years' experience in merchant banking and finance, undertaking company reconstructions and M&amp;As in Australia and internationally.</li> <li>Murray is a member of the Australian Institute of Company Directors.</li> <li>He has held executive positions and directorships in various industries, including transport, horticulture and financial services.</li> <li>Murray is currently the chairman of Eureka Group (ASX: EGH), National Tyre and Wheel (ASX: NTD) and a non-executive director of Eumundi Group (ASX: EBG).</li> </ul>
	<p><b>Mr. Lachlan Wallace</b></p> <ul style="list-style-type: none"> <li>Chief Executive Officer and Managing Director.</li> <li>A member of the Treasury Committee.</li> </ul>	<ul style="list-style-type: none"> <li>Since joining Hillgrove in 2012, Lachlan had various operational roles at the Kanmantoo Copper Mine including general manager before becoming the CEO and Managing Director in 2019.</li> <li>Previously, Lachlan was responsible for developing Stemcor's iron ore and manganese portfolio in India and nickel project in Indonesia.</li> <li>Lachlan has held technical, managerial and consulting roles in Africa and Australia.</li> </ul>
	<p><b>Mr. Joe Stanto</b></p> <ul style="list-style-type: none"> <li>Company Secretary and Chief Commercial Officer.</li> </ul>	<ul style="list-style-type: none"> <li>Joe joined Hillgrove in 2011 and has held a number of roles within the finance team, spanning from commercial and planning to financial control before starting his current role in 2020.</li> <li>Prior to Hillgrove, Joe held a number of roles which included as a corporate finance executive at PwC, commodities trader at Glencore, and as an auditor at KPMG.</li> </ul>

Source: Company

## Appendix III: Financial Statement

<b>Profit &amp; Loss (A\$m)</b>	<b>2021</b>	<b>2022</b>	<b>2023e</b>	<b>2024e</b>	<b>2025e</b>	<b>2026e</b>	<b>2027e</b>
<b>Total Revenue</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>49.6</b>	<b>170.4</b>	<b>226.6</b>	<b>178.8</b>
Mining and Processing cost	0.0	0.0	0.0	(28.1)	(101.5)	(141.8)	(117.5)
Operating expenses	(5.4)	(4.5)	(6.0)	(7.1)	(6.4)	(8.8)	(7.1)
<b>EBITDA</b>	<b>(5.3)</b>	<b>(4.4)</b>	<b>(5.9)</b>	<b>14.4</b>	<b>62.4</b>	<b>76.0</b>	<b>54.2</b>
Depreciation	(0.1)	(0.1)	0.0	0.0	(4.8)	(15.4)	(15.3)
<b>EBIT</b>	<b>(5.4)</b>	<b>(4.5)</b>	<b>(5.9)</b>	<b>9.5</b>	<b>47.0</b>	<b>60.8</b>	<b>46.2</b>
Tax expense	(0.4)	(0.0)	0.0	0.0	0.0	0.0	0.0
<b>Net Profit</b>	<b>(5.9)</b>	<b>(6.0)</b>	<b>(5.9)</b>	<b>9.5</b>	<b>47.0</b>	<b>60.8</b>	<b>46.2</b>
<b>Cash Flow (A\$m)</b>	<b>2021</b>	<b>2022</b>	<b>2023e</b>	<b>2024e</b>	<b>2025e</b>	<b>2026e</b>	<b>2027e</b>
Profit after tax	(5.9)	(6.0)	(5.9)	9.5	47.0	60.8	46.2
Depreciation	0.1	0.1	0.0	4.8	15.4	15.3	7.9
Changes in working capital	(0.3)	(1.9)	0.6	(4.1)	(9.9)	(4.6)	3.9
Other operating activities	1.2	2.1	0.0	0.0	0.0	0.0	0.0
<b>Operating cashflow</b>	<b>(4.9)</b>	<b>(5.8)</b>	<b>(5.3)</b>	<b>10.3</b>	<b>52.5</b>	<b>71.4</b>	<b>58.1</b>
Payments for Property, Plant and Equipment	(8.4)	(7.3)	(25.0)	0.0	0.0	0.0	0.0
Other investing activities	(1.0)	1.7	0.0	0.0	0.0	0.0	0.0
<b>Investing cashflow</b>	<b>(9.4)</b>	<b>(5.6)</b>	<b>(25.0)</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Equity raised (repurchased)	19.4	(0.0)	39.2	0.0	0.0	0.0	0.0
<b>Financing cashflow</b>	<b>19.4</b>	<b>5.9</b>	<b>39.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Net change in cash	5.1	(5.4)	8.9	10.3	52.5	71.4	58.1
<b>Cash at End Period</b>	<b>10.7</b>	<b>5.3</b>	<b>14.2</b>	<b>24.5</b>	<b>77.0</b>	<b>148.4</b>	<b>206.5</b>
<b>Balance Sheet (A\$m)</b>	<b>2021</b>	<b>2022</b>	<b>2023e</b>	<b>2024e</b>	<b>2025e</b>	<b>2026e</b>	<b>2027e</b>
Net Cash	10.7	(1.9)	7.0	17.3	69.8	141.2	199.3
Total Assets	51.3	52.9	85.5	97.3	150.4	214.5	258.7
Total Liabilities	13.4	20.3	19.6	21.9	28.0	31.3	29.3
Shareholders' Funds	37.9	32.6	65.9	75.4	122.4	183.2	229.4
<b>Ratios</b>	<b>2021</b>	<b>2022</b>	<b>2023e</b>	<b>2024e</b>	<b>2025e</b>	<b>2026e</b>	<b>2027e</b>
Total Cash / Total Assets	20.9%	10.0%	16.6%	25.2%	51.2%	69.2%	79.8%
Return on Assets (%)	NM	NM	NM	10.4%	38.0%	33.3%	19.5%
Return on Equity (%)	NM	NM	NM	13.5%	47.5%	39.8%	22.4%

Source: East Coast Research

## Appendix IV: Analyst's Qualifications

Behzad Golmohammadi, the lead analyst on this report, is an equity research analyst at Shares in Value (East Coast Research).

- Behzad has a bachelor's degree in Engineering (Industrial) and a master's degree in Applied Finance (Investing) from Sydney Business School, where he was the top performer in his cohort. He has also passed the first two levels of the CFA Program.
- Behzad has several years of experience working as an Equity Research Analyst and Technical Analyst in Australia and overseas and has a broad knowledge of ASX-listed companies. He has been a speaker at the Australian Technical Analysts Association (ATAA).

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