

# **BHP**

## **Operational decarbonisation investor briefing**

### **Q&A transcript – Session 2**

**22 June 2023**

**Introduction**

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

I will quickly run through some key points in the presentation, and then we will open up the line for questions.

First, here is a traditional disclaimer slide. I would like to highlight the nature of the information in the presentation is inherently forward-looking and in an area that is rapidly changing. It is not a guarantee or prediction of future performance. Our plans include the reliance on technological developments, and the relative economics of these, regional and global policy developments, and a range of other uncertainties and risks. The only thing that is certain is that our plans will change but, in this briefing, we wanted to highlight our current thinking on how we hope to achieve our goals, as well as some of the risks and opportunities that we may see along the way.

Let me summarise a few of the key points of the presentation. We hope we have been able to convey the positive reality of BHP's commitment to operational emissions reduction. Our progress compares well to our competitors, and we expect our path to be real but also lumpy. We are committed to our target and goal, and we are planning and spending for abatement beyond 2030 in this decade. We do face challenges, but they are familiar to many in the sector and the pace of innovation and technological advancement is encouraging.

Overall, we want to be clear that we expect that our plan will achieve the aims of reducing emissions and remaining productive and financially responsible, while supporting BHP to continue to produce the commodity the world needs to decarbonise and provide a higher standard of living to a global population. With that, I will hand over to questions.

**Questions and Answers**

**MYLES ALLSOP (UBS)**

Maybe in terms of your operational decarbonisation, can you just talk to the big steps you have made so far in terms of moving to decarbonised power? South America have obviously moved on with progress and there has been progress in Australia. Then could you just highlight the next few steps in terms of achieving your near-term targets?

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Sure. I am going to hand over to Anna. Myles, hopefully you have had an opportunity to watch the actual video and the presentation but, Anna, over to you.

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

Hi, Myles. That is a great point and when we think about decarbonisation, we do think about it in the three key areas where we have exposure, such as the opportunity of our power, which is the electricity that we use across all of our assets. In the first case, the first area that we have worked to decarbonise is our grid-connected assets. We have achieved 100% decarbonisation of our incoming supply in Chile which, as you can see from the data in the presentation there, has an enormous impact on our overall position.

Then, for all of our grid-connected assets that we have in Australia, we have a power purchasing agreement in place for up to 50%. That will get us to 50% reduction in emissions by 2025. The key outcome there is that that has delivered about 1.2 Gigawatt (GW) of new generation assets into Australia to support that. Not only are we able to decarbonise, but we are also empowering the broader grid.

In the presentation, we mentioned that our electricity requirements will move up in both Australia and Chile as we take the diesel out of our operations and replace that with a battery electric fleet. We will be looking for more power in the future, and so having such a strong start in power is really important to us. We will then move to the diesel displacement phase, where we have trials now happening in 2024 across the key elements of fleet, inclusive of haul trucks, excavators and locos. This is the next phase. At the same time that we are doing that, Myles, we are also working hard on our methane, which we have exposure to, and our coal operations. We believe that we can abate up to 50% of our methane across our operations using the methods available to us today, and we are moving to learn more and implement that as soon as we can.

Those are the three key areas: power where we are grid connected, diesel displacement, and then onto methane. There has been strong progress across all of those areas.

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

It is worth looking at slide six of our presentation. We feel that we have come off from a very strong base relative to some of our competitors. As you can see, despite the fact that we are the largest mining company, we have amongst the smallest absolute emissions. As you can see on slide nine, we have had strong progress over the last couple of years, and so that puts us in a great place but we are not resting on our laurels. Back to you, Myles.

**MYLES ALLSOP (UBS)**

Obviously, the NPV impact from power decarbonisation has been pretty positive overall. When we think about diesel displacement, how are the economics from a mining perspective likely to move? Are our battery electric trucks going to be less efficient and more expensive? Should we expect higher capex and opex, but then you get the benefit in terms of lower carbon when it is properly costed? Do you think we can have the same net neutral to slightly positive dynamic from decarbonising the fleet?

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Good question. I am first of all going to hand over to Anna, and then I am going to ask Patrick. Anna, maybe you want to just guide Myles to the specific slide that you have within the presentation.

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

Yes, absolutely happy to do that. Myles, we did release some new information as part of the presentation to help address this. I shared in the speech that the modelling that we have at this stage suggests that we will be equal or slightly better in our opex when it comes to the transition to battery electric.

Let me touch a little bit on the drivers of that. As you would expect, the diesel and the price of carbon comes out of the model, so they take us down. We will obviously have an uptick when it comes to purchase power, but the truck efficiency is better, as is the unit cost of the incoming fuel, so we expect that not to be as high as the cost that has been removed from the diesel cost. We see improvements in maintenance spend, as there are just fewer mechanical components to maintain which puts us in a better position there. We do not have the mechanical drive train or the diesel engine in the trucks, so in both of those cases there is a slightly better position for us in terms of the fleet.

Then the big unknown is related to the batteries and then the haul cycles of the fleet. In the webcast, we also covered some modelling that we have been doing to really start to understand how the transition will play out in our operations. If you are familiar with mines and trolley systems, what we are aiming to do in the future where we need to install those trolley systems is use them to dynamically charge the trucks, which means that we are under the trolley system using the trolley power, and dynamically charging at the same time. If we are able to do that, we are able to keep them in-cycle for much longer. Where we are not able to put as much in as we like, we will have to move to some static charge points.

Ultimately, the final piece of the puzzle will come together as we better understand the capacity of the batteries and the ability for us to stay under the dynamic charge for much longer as part of the whole cycle. Patrick, I might hand over to you.

**PATRICK COLLINS, (HEAD OF DECISION EVALUATION, TRANSFORMATION PORTFOLIO & PERFORMANCE)**

Just a quick one to add on that, for most of these diesel ones, they are at the very early stage of development. On your point around NPV, as you know, it is highly sensitive to your assumptions around the carbon price and what that is going to go to in the different regions around the world. Most of these displacement projects, particularly the fleet electrification that we are seeing at the moment, does require some level of carbon price support to become NPV break-even or positive. At this early stage, we are seeing a range of costs and benefits across our assets, which is not unusual given the tech maturity and the early stage of the study.

You would have heard in the presentation as well which Alejandro spoke to, each of our assets are operationally very different which can drive some ranges in there as well, in terms of the mining method and pit design as well as the solutions that are available to them such as trolley assists. That is why it is so important that we are investing in these early phase studies and trials to understand that a lot more, so we can optimise these costs before we get nearer to a final investment decision.

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Thanks, Pat. Myles, just another thing that I would highlight is that in Patrick's slide there are some references to US\$50 a tonne carbon price. That is not our assumption of what the carbon price is going to be. It is merely an illustration, partly for our Australian counterparts where AU\$75 are the safeguard mechanism. Do not assume that \$50 flat is our carbon assumption, but it just avoids the confusion around a rising carbon price and the impact on the opex savings, if there was any.

**YASER SURVÉ (NINETY ONE)**

I have two questions. The first one is to do with the reduction of emissions down to 2050. I fully appreciate that there are many difficulties especially around technology to get the emissions to net zero by then, but the one thing that we would like to see as shareholders is being able to check your progress with respect to the many initiatives that you have been involved in, such as the funding of research or JVs of shipping partners. If I could just request that you provide disclosure on the things that you are involved in and are doing, and what the progress is on those various initiatives every year so that we can actually track that journey over time. It makes it much easier for us to hold the company accountable, so that is maybe just one request rather than a question.

The second one is to do with governance and project skills on the board. The sustainability committee has very good experience in the industrial mining and energy sectors, but would it be useful to have specific skills that are on renewables, EVs, and especially around organisational change, because it is such a big change for the company, and it involves people and changing their job specs? Would it be useful to have someone that has that experience in significant organisational change on your sustainability committee, or the board for that matter? Thank you.

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Great points. I am going to hand over to Fiona Wild, who will probably make comments on both of those. Your first comment was well made. Over to you, Fiona.

**FIONA WILD (GROUP CLIMATE & SUSTAINABILITY OFFICER)**

Thanks very much, Tristan. Thanks for the question, Yaser. On the reductions to 2050, you are absolutely right, we need to make sure that we continue to disclose our progress against the targets that we are setting and the goals that we have set out for 2050. There are a couple of different ways that we do that. We have been setting targets and reporting on our progress since the mid-1990s, so every year we disclose our greenhouse gas emissions and what has driven those reductions in emissions that may have been delivered. You will see that in the annual report every year.

The other thing I would just draw your attention to as well is that we also released a Climate Transition Action Plan in FY21. That went to the AGM in FY21, and that outlined our commitments, targets, goals and our progress that we are making. We have a commitment to come back and put another Climate Transition Action Plan to our shareholders in FY24. That is annual progress updates in the annual report, but also the three-yearly opportunity to look at how we are tracking in our Climate Transition Action Plan, and also to give our shareholders an opportunity to vote on that through a say on climate.

Just on the issue around the skills of the board, obviously we need to look for a broad skill set for board members of BHP. You are absolutely right, we have people who have great experience in the mining industry, other industries, technology, and a whole range of different areas. I think we have looked at opportunities to bring in specialised skillsets. A few years ago, there was a strong flavour around bringing in climate-related directors for certain organisations. Our view is that all of our directors need to have an understanding of the material sustainability issues for the mining sector, and so that is the basis on which we make those decisions, but climate and sustainability are core competencies that we look for in directors.

For example, you will see that we have directors who have been running energy companies for many years. For example, Catherine Tanna (Director of BHP Group Limited) has fantastic experience in thinking through the energy transition. So there is both managerial and governance-related experience around sustainability and climate change.

The other couple of things I would just mention on that is we have something called the Forum on Corporate Responsibility that has been in place at BHP since the early 2000s, and that is a group of civil society leaders with experience across a whole range of different issues, including climate change. They have regular conversations with the management team and the board to make sure that we are really bringing the outside in, to test some of our assumptions inside BHP, to challenge some of our approaches, and to make sure that we are not missing information and signals that we might need from outside the organisation. They meet regularly with management and they meet regularly with the board, so there is an opportunity for some of that more diverse thinking to come into the organisation on a very regular basis. As I mentioned, that has been in place now for almost 20 years.

**RONNIE LIM (ROBECO)**

Thank you, everyone. My question relates to slide 28 of your presentation on the marginal abatement cost curve (MAC curve). Just so I understand it correctly, broadly speaking for any project to essentially achieve that FY30 target, it is only positive when it is quite a wide range of carbon prices. Can I ask what the prevailing carbon price is then for over \$60 a tonne? That would obviously mean an NPV negative project, is that correct? If that is the case, what is BHP's capital allocation policy and the position likely to be?

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

With that, I am going to hand over to Patrick Collins. Patrick, maybe you could remind on the capital allocation framework briefly and then MAC Curve.

**PATRICK COLLINS, (HEAD OF DECISION EVALUATION, TRANSFORMATION PORTFOLIO & PERFORMANCE)**

Of course, we have a decarbonisation spend in the capital allocation framework with our maintenance capital, and that is because we see decarbonisation spend being an absolutely critical enabler to our overall strategy. This is critical to making BHP a sustainable business long term. Like the rest of our social value pillars, we see it as a great way to mitigate emerging risks, in this case climate change, but also providing us access to future opportunities, be that access to resources, partnerships, and markets, as well as to talent in the industry and capital, of course. That is why it sits within that maintenance capital area in our capital allocation framework.

Moving on to your question around the MAC Curve, it is important to recognise that that curve captures more projects that are outside of the FY23 period. There are a number of projects on the far right of that curve that do not sit within our \$4 billion spend. The question about the \$60 average is an average carbon price to make that portfolio of projects to reach our 2030 target NPV positive. Yes, you are right, that means that there are a number of projects that are NPV positive at that level, and a few that will be NPV negative to get the average or will require more carbon price support than \$60 a tonne to be NPV break-even. Importantly, we have shown a range there. Depending on how our trials go, through various equipment and the operating cost savings, we can see that break-even point being as low as \$20 a tonne.

Importantly, through that capital allocation framework, I think it is important to talk through our process for how we allocate spend. Our decarbonisation plan, and that allocated spend, is really focused on those low cost or cost-effective high abatement technology-ready solutions first, and of course the big opportunities there are the reducing emissions through our electricity, which you have seen great progress on through the presentation that Anna and Alejandro spoke about through our PPAs, both in Chile and Australia.

Of course, the next big challenge is this diesel displacement. You are correct, there is a wide range of cost outcomes that we are seeing there across these diesel projects. We spoke to that in one of the earlier questions, both in terms of the tech maturity and the early phase of study, as well as the operational differences around these assets. Even broadly, when we allocate capital, this is not just for the final investment decision, it is about how we allocate funds earlier to studies and trials to learn more, optimise the cost, and essentially de-risk these projects before you do get to that point of committing all the capital. Importantly, it is all going to flow through the capital allocation framework to make sure that we are making value maximising decisions.

**MYLES ALLSOP (UBS)**

I have a follow-up question on diesel displacement and the battery electric route versus the hydrogen route. I see on your slide that you are saying that the overarching efficiency, fuel to wheel, is dramatically lower for the electricity versus the hydrogen. Is your view that hydrogen trucks are going to be inefficient relative to battery-electric vehicles? Is that the conclusion you have got to, or is this still an ongoing debate? Obviously, other corporates are going down a slightly different route, prioritising hydrogen over the electric route.

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

Yes, our view is that a battery-electric fleet will be more efficient, in all ways, than hydrogen, and that is the pathway we are taking. I can expand a little bit on the slide and what we have put there in relation to efficiency. As we have tried to share in this speech, if we have a unit of power as it comes in, our preference would be that, if we took that unit of power and we were able to transmit it straight into the truck and then straight through to the wheel, because the fleet is electric and the wheels are electric drive, that power will make its way through to the drive systems very efficiently.

Then if we look at that compared to hydrogen, when we take a hydrogen approach, we need to take the same unit of power and transform it into hydrogen. Then we need to store it, transport it, move it onto the truck, use a fuel cell to put it back into electricity and then through to those same wheel motors. That is why you see that dramatic drop in efficiency. That means that, at the other end of things, we will need a lot more electricity generated because of those losses to get to the same amount of electricity to the wheel. There are some offsets to that. I will be transparent on that, and I mentioned those in the presentation. That means we are more dependent on long-duration energy storage or storage throughout the day cycle so that we can keep the power in the system versus storing it in the hydrogen, but even with that offset, we still believe this is the most cost-efficient way to go.

**MYLES ALLSOP (UBS)**

That is very interesting. This is a question you probably do not have an answer to at this stage. There is one other question, if I can squeeze it in afterwards. In terms of battery chemistry, do you have a sense as to what is going to work best in the mining industry?

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Anna, maybe you could remind everyone around the dynamic charging as well.

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

Yes, that is a good point. I normally include that. Let me talk about the charging system, as I touched on at the beginning. We believe that we want to keep the trucks under dynamic charge as long as possible. That is what I mentioned. Whether it is in Chile at Escondida pits or even our Australian pits, we will look to keep the trucks charging dynamically.

From an innovation perspective, that is important. People think of trolley as the conventional trolley. Conventional trolley has come a long way in the last few years, but we are also very excited about the innovation that is flowing towards creating a lower-cost, more moveable solution to transfer energy on to the fleet while it is in cycle, so there is also quite a lot of innovation happening there too.

In relation to the batteries, at this stage we are working with all our vendors. Lithium-ion is the technology that people are looking to at the minute. Unlike fixed storage or the best large systems that are moving into play, we have some constraints on the haul truck. We need the battery to be able to be small and compact. We want it to be as light as possible. We want it to be able to work in rugged conditions. That leaves us with fewer technologies available than perhaps elsewhere. Those are the types of considerations that we are thinking about.

The other point I would make, out of interest, for the system side of things is that, if you think about it, we want to keep the batteries as light and as small as we can in that system as we design the mining systems, because otherwise payload starts to become a factor. We do not want to start losing payload. Those are a few points on batteries. We will have more to say on batteries in the future. We have not put as much in today, but it is definitely an important part of where we are going. It will make a difference in the overall economics of the mine.

**MYLES ALLSOP (UBS)**

That is very interesting.

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Also, Myles, I was just going to comment that it is worth looking at Alejandro's slide on Escondida and how there is stage 1, where it is trolley assist with the diesel-electric trucks, and then into the early stage of the next decade where we move to full electric trucks with trolley. Also, it is worth saying that the 30% reductions for emissions at stage 1 is for the whole of the mine, not per truck. It is worth remembering that. Then you see 100% emissions abatement for stage 2.

**MYLES ALLSOP (UBS)**

On the same sort of topic, thinking back, how much power is going to be needed to decarbonise BHP? Is it credible that there will be enough renewables? I presume it is largely renewables that you will be looking to tap into, whether in the Pilbara or in Chile. Could you give us a sense of the GW and the investment required to decarbonise your fleet?

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Anna, maybe I will hand over to you, but it is probably worth mentioning Chile and the statistic that Alejandro had in his presentation, as well as Australia.

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

Thank you, Tristan. We have put those in. In Chile, Alejandro, who was unable to join us tonight, has included that he thinks there will be an increase of 70% by FY33, just for the work that is going in in the early phase. That is where they are at.

In Australia, as the transition occurs, we are probably looking at three to four times our existing power for the full transition as we remove the diesel. I can take that to a more localised example to put it into context. In the Pilbara, Yarnima is about 190 megawatts. As we remove the diesel from the system, over time there is potential for that to increase three to four times. It is not unfeasible that we can supply that level of renewable. We are below a GW there. Then, if you look to a lot of the other decarbonisation happening globally across all the grids, that is relatively small compared to the types of numbers that are being considered elsewhere.

On the build on that, though, it is probably the first time that any of us have worked in a scenario that involves the entire world, not just ourselves here in Australia or in the mining industry. As everybody on this call knows, every industry and government is trying to make this shift at the moment. It is unusual that we are all trying to do the same thing at the same time. That means we have a lot to do to ensure that we have access to the supply lines and materials, and that we have good plans in place so that we have a robust pathway and the power ready when we need it.

**JIM XU (BARRENJOEY)**

I have a couple of questions. The left chart on slide 9 shows that, even in 2050, BHP expects a similar level of fugitive emissions to today. Clearly, offsets will be required for BHP to reach net zero by 2050. What is your strategy with regard to offsets? Are you thinking about just purchasing third-party voluntary regulatory credits? Can you provide any update on the potential to offset emissions with the Mount Keith Tailings Dam or any other opportunities BHP has?

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Graham, I am going to hand it over to you, but it is probably worth commenting on the comments that Anna made. Maybe you can ask Anna about addressing our fugitive emissions. We have made an assumption in those slides, so perhaps you want to address that as well as talking about the offsets.

**GRAHAM WINKELMAN (HEAD OF CARBON MANAGEMENT, SUSTAINABILITY & CLIMATE CHANGE)**

Thank you, Tristan. I will lead off with a few comments for Jim and then I will hand over to Anna after that. Jim, we have a focus on structural abatement as an organisation, and that has been something we have expressed for a number of years now, to the point that we have a pretty high level of confidence that we will not be requiring offsets to meet our 2030 target. You correctly point out that, given the persistent nature of some of the hard-to-abate emissions within the organisation, there will likely be the opportunity to use offsets in the latter part of our decarbonisation pathway to net zero in 2050, to net off those hard-to-abate emissions.

We are lucky to access a broad range of the market to feed that demand for offsets in the future, whether that is on the stock market, through offtake agreements with projects, direct investment in projects or, as you also correctly point out, the potential to generate offsets within our own operations. That could be on our land, but it could be within some of the more innovative pathways for locking carbon up, including mineral carbonation at a Nickel West site as well. I do not have a specific update on the progress of that project. It remains a compelling opportunity in the future. We recognise that there are barriers, both with regard to the technical nature of the opportunity, as well as methodologies that allow us to validate the amount of carbon that is taken out of the atmosphere as a result of those reactions and the tailings dam.

We look forward to providing further updates. It is an opportunity that remains compelling for the organisation as demand for offsets within the organisation increases over time. I will hand over to Anna now to speak specifically to the opportunities to reduce methane over the coming decades.

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

In relation to methane, where we can work to abate it today, we will. We are using existing technology such as our underground mine, Broadmeadow, where we flare the methane today, dramatically reducing its impact. We are also looking at options on open cut. I mentioned that at the beginning. We think we have a pathway to about 50% using today's technology. Then we are still looking for the other 50% to move into newer methods of technology. Over time, we expect to see that we will work as hard as possible on the methane side. We will use a similar technique to that which we are deploying in diesel. We will deploy existing technology and then move into working with innovation partners on where they can help us with the final piece.

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

It is worth reminding people that the 50% reduction that Anna is talking about is not factored into that chart on slide 9. Is that correct?

**GRAHAM WINKELMAN (HEAD OF CARBON MANAGEMENT, SUSTAINABILITY & CLIMATE CHANGE)**

That is correct, Tristan.

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Then the other aspect is that Alejandro, in his presentation, talked about Jansen. There is a significant element of natural gas for process heat. We intend to address that, but at the moment there is still perhaps greater uncertainty than on diesel abatement, so again, we have not included that element of opportunity in that slide. We are saying that there is an upside case towards the end of that period.

**JIM XU (BARRENJOEY)**

What is BHP's view on nuclear power and the role it should play in decarbonisation? Could small modular reactors work well in remote locations like the Pilbara, and what have you done towards advancing that?

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

Obviously, Jansen is one element.

**GRAHAM WINKELMAN (HEAD OF CARBON MANAGEMENT, SUSTAINABILITY & CLIMATE CHANGE)**

BHP has had a long-term position on technology agnosticism, which is that it does not make sense for us, as an organisation, to exclude any particular source of energy or, in this particular case, any source of power. Where nuclear can compete, we think it should compete, and there will be examples. It already competes in certain jurisdictions globally, in areas of industry and of municipal power, so we recognise the role that nuclear can play. Having said that, the analysis that we presented over the last 24 hours indicates that our economic analysis suggests that renewable power is likely to be the leader in terms of deploying electrons to our facilities over the coming decades, to power not just existing facilities, but the increase in power that we will require over the coming years, as Anna has spoken about.

There are perhaps some opportunities to consider across the organisation. Again, these are at a very early stage and include things like small modular reactors and other forms of power. I might hand over to Anna to speak specifically to that, but I will remind us all that these are very early-stage and speculative discussions around the role of renewables within BHP's operations. As I said, the focus right now is on the deployment of renewables, because we think that favours the organisation economically and operationally.

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

That is right. I am not sure I have too much more to add. Alejandro mentioned it because we are in some early-phase discussions as part of our Jansen operations in Canada. That is probably the first set of conversations we are having in relation to that. Also, I would reemphasise the point that Graham has made on timing. We need to recognise that we need to move now. We need to put the solutions in place that are available to us today. Where there is a technology that is ready, we will deploy that. To the point that Graham mentioned, we are watching with interest the development of these alternative technologies, remaining technology-agnostic to those in the future.

**JASON FAIRCLOUGH (BANK OF AMERICA)**

In terms of Intellectual Property (IP), I am thinking about the technologies that are being developed with all your technology partners, such as Caterpillar, Komatsu or Wabtec. How do we think about this? Is there IP that gets developed here that ends up being uniquely for BHP, or are you just participating and then the entire industry benefits from your leadership? Again, I am thinking about what happened here with the whole autonomous thing, where a couple people led the way, and then we had a bunch of fast followers and everybody had it. How do we think about that?

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

It is a great question. We are working hard with our existing providers to develop the right technologies. Where we are looking for some interoperability, we are also working with some organisations such as the Charging Interface Initiative (CharIN) organisation. They are a global organisation that looks at battery connector interfaces. What is interesting there is that, when we think forward, what we do not want, to be super simplistic about it, is the Apple-Google problem with plugs. If we are having charging solutions deployed in our operations, we want those to be standardised across industry from a type perspective.

We are working with some international organisations to help do that across industry. With CharIN, there are over 60 participants in that particular initiative to try to deploy, for mobile equipment, a standard that everybody can work to. The reason we like some of those standards also is that it helps innovation. We want to have some standards globally where other companies can also innovate and participate in solutions and some of those critical interfaces. That is helpful.

With our major vendors, though, they are also putting enormous amounts of engineering effort into solving this problem with us. With those vendors, our pathway has been signing some agreements with them earlier than we ever have. In particular, with Caterpillar we have moved to a different trial structure where we will take an early-learner truck from them sooner than they would normally deploy it to a customer, so we can help collaborate with Caterpillar on the final truck. With Komatsu, we have something similar from a trial perspective.

Rather than wait for the vendors and have them have to go slightly slower, we are trying to help them go as fast as possible. If that means us investing in trial units, which is what we have done, we will do that. If that means working with others in industry, there are a number of forums that we are working in also to try to set standards, particularly around electrical safety as the transition happens. That is also important to us. We are letting the vendors move and develop their own product, but there are some other areas where we are working with industry to set some standards that everybody can collaborate and be a part of.

**JASON FAIRCLOUGH (BANK OF AMERICA)**

Ultimately, then, you think the IP is still going to reside with the vendor. There will not be any BHP ownership of the IP?

**ANNA WILEY (VICE PRESIDENT PLANNING & TECHNICAL, MINERALS AUSTRALIA)**

I think that will be correct. That is similar to how it has worked before. The IP stays with the vendors. We are still buying a product from our vendors, but at interface points, whether that means trolley interface points or charging interface points, where we might see an interface to another vendor system, that is where we work to standardise so that more and more people can participate. We would like to see lots of vendors coming to our industry and able to participate in the industry through standard interfaces.

**TRISTAN LOVEGROVE (GROUP INVESTOR RELATIONS OFFICER)**

I just wanted to thank everyone. First of all, thank you to Graham, Fiona, Anna and Patrick and all those who dialled into the session today. Hopefully, you get a sense of the detail, planning and spend, and how there is a real focus not just on the medium term to 2030, but the spend and planning beyond 2030 as well. With that, we will close the line. Thank you everyone for dialling in.

## Disclaimer

### Forward-looking statements

This presentation contains forward-looking statements, which may include, without limitation, statements regarding: (i) our strategy, our values and how we define success; (ii) our commitment to generating social value; (iii) our commitments under sustainability frameworks, standards and initiatives; (iv) our expectations, commitments and objectives with respect to sustainability, decarbonisation, natural resource management, climate change and portfolio resilience and timelines and plans to seek to achieve or implement such objectives, including our strategies, goals, targets, milestones and metrics to seek to reduce or support the reduction of greenhouse gas emissions, and related perceived costs, benefits and opportunities for BHP; (v) the assumptions, beliefs and conclusions in our climate change related statements and strategies, for example, in respect of future temperatures, energy consumption and greenhouse gas emissions, and climate-related impacts; (vi) trends in commodity prices and currency exchange rates; (vii) demand for commodities and our expectations of a competitive advantage for our business or certain products; (viii) reserves and resources and production forecasts; (ix) expectations, plans, strategies and objectives of management; (x) climate scenarios; (xi) assumed long-term scenarios; (xii) potential global responses to climate change; (xiii) the potential effect of possible future events on the value of the BHP portfolio; (xiv) approval of certain projects and consummation of certain transactions; (xv) closure or divestment of certain assets, operations or facilities (including associated costs); (xvi) anticipated production or construction commencement dates; (xvii) capital costs and scheduling; (xviii) operating costs and supply (including shortages) of materials and skilled employees; (xix) anticipated productive lives of projects, mines and facilities; (xx) provisions and contingent liabilities; and (xxi) tax and regulatory developments.

Forward-looking statements may be identified by the use of terminology, including, but not limited to, 'intend', 'aim', 'project', 'see', 'anticipate', 'estimate', 'plan', 'objective', 'believe', 'expect', 'commit', 'may', 'should', 'need', 'must', 'will', 'would', 'continue', 'annualised', 'forecast', 'guidance', 'outlook', 'prospect', 'target', 'goal', 'ambition', 'aspiration', 'trend' or similar words. These statements discuss future expectations concerning the results of assets or financial conditions, or provide other forward-looking information.

Forward-looking statements are based on management's current expectations and reflect judgments, assumptions, estimates and other information available as at the date of this presentation and/or the date of BHP's planning processes or scenario analysis processes. There are inherent limitations with scenario analysis and it is difficult to predict which, if any, of the scenarios might eventuate. Scenarios do not constitute definitive outcomes for us. Scenario analysis relies on assumptions that may or may not be, or prove to be, correct and may or may not eventuate, and scenarios may be impacted by additional factors to the assumptions disclosed.

Additionally, forward-looking statements are not guarantees or predictions of future performance, and involve known and unknown risks, uncertainties and other factors, many of which are beyond our control, and which may cause actual results to differ materially from those expressed in the statements contained in this presentation. BHP cautions against reliance on any forward-looking statements or guidance, including in light of the current economic climate and the significant volatility, uncertainty and disruption arising in connection with the Ukrainian conflict and COVID-19.

For example, our future revenues from our assets, projects or mines which may be described in this presentation will be based, in part, upon the market price of the minerals or metals produced, which may vary significantly from current levels. These variations, if materially adverse, may affect the timing or the feasibility of the development of a particular project, the expansion of certain facilities or mines, or the continuation of existing assets.

Other factors that may affect the actual construction or production commencement dates, revenues, costs or production output and anticipated lives of assets, mines or facilities include (i) our ability to profitably produce and transport the minerals and/or metals extracted to applicable markets; (ii) the impact of foreign currency exchange rates on the market prices of the minerals and/or metals we produce; (iii) activities of government authorities in the countries where we sell our products and in the countries where we are exploring or developing projects, facilities or mines, including increases in taxes and the imposition of or increase in carbon pricing; (iv) changes in environmental and other regulations; (v) the duration and severity of the Ukrainian conflict and any resurgence of the COVID-19 pandemic and their impact on our business; (vi) political or geopolitical uncertainty; (vii) labour unrest; and (viii) other factors identified in the risk factors discussed in section 9.1 of BHP's Annual Report for the year ended 30 June 2022.

Except as required by applicable regulations or by law, BHP does not undertake to publicly update or review any forward-looking statements, whether as a result of new information or future events. Past performance cannot be relied on as a guide to future performance.

### Presentation of information and data

Numbers presented may not add up precisely to the totals provided due to rounding.

Due to the inherent uncertainty and limitations in measuring greenhouse gas (GHG) emissions and operational energy consumption under the calculation methodologies used in the preparation of such data, all GHG emissions and operational energy consumption data or references to GHG emissions and operational energy consumption volumes (including ratios or percentages) in this presentation are estimates. Emissions calculation and reporting methodologies may change or be progressively refined over time resulting in the need to restate previously reported data.

There may also be differences in the manner that third parties calculate or report GHG emissions or operational energy consumption data compared to BHP, which means that third-party data may not be comparable to our data. For information on how we calculate our GHG emissions and operational energy consumption data, see our Methodology tab in our ESG Standards and Databook (for the applicable year), available at [bhp.com](http://bhp.com).

Unless expressly stated, information and data in this presentation does not reflect BHP's acquisition of OZ Minerals Limited on 2 May 2023.

### No offer of securities

Nothing in this presentation should be construed as either an offer or a solicitation of an offer to buy or sell any securities, or a solicitation of any vote or approval, in any jurisdiction, or be treated or relied upon as a recommendation or advice by BHP. No offer of securities shall be made in the United States absent registration under the U.S. Securities Act of 1933, as amended, or pursuant to an exemption from, or in a transaction not subject to, such registration requirements.

### Reliance on third party information

The views expressed in this presentation contain information that has been derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information. This presentation should not be relied upon as a recommendation or forecast by BHP.

### BHP and its subsidiaries

In this presentation, the terms 'BHP', the 'Company', the 'Group', 'BHP Group', 'our business', 'organisation', 'we', 'us' and 'our' refer to BHP Group Limited and, except where the context otherwise requires, our subsidiaries. Refer to note 28 'Subsidiaries' of the Financial Statements in BHP's Annual Report for the year ended 30 June 2022 for a list of our significant subsidiaries. Those terms do not include non-operated assets. Notwithstanding that this presentation may include production, financial and other information from non-operated assets, non-operated assets are not included in the Group and, as a result, statements regarding our operations, assets and values apply only to our operated assets unless otherwise stated.