

# **BHP**

## **Western Australia Iron Ore update**

### **Presentation & Speech**

**3 October 2022**



To those joining us today in Perth, good afternoon everyone, and I also extend a very warm welcome to those joining us via webcast.

I understand that many of you have busy schedules, and some have travelled long distances to join us.

By way of introduction, I am Brandon Craig, the Asset President for BHP's Western Australia Iron Ore business, or what we more commonly refer to as WAIO.

I have been with BHP for close on 23 years now, mainly in operational leadership roles across our various commodities, with my earlier years in aluminium and nickel and more recently in metallurgical coal and now iron ore.

We have a great team here in WAIO, a team fully committed to safe ways of working, laser focussed on improving productivity, and delivering exceptional results for our shareholders and stakeholders.

Our people are the heart and soul of our business, and are the driving force behind the outstanding results we deliver.

We have really been looking forward to hosting this visit and sharing with you an update on our business, as well as sharing more about the achievements of our people and teams – something that we are very proud of.

# Disclaimer

## Forward-looking statements

This presentation contains forward-looking statements, including: statements regarding our strategy, our values and how we define success; our expectations of a competitive advantage for our business or certain products; our commitment to generating social value; our commitments under sustainability frameworks, standards and initiatives; our intention to achieve certain sustainability-related targets, goals, milestones and metrics; statements regarding trends in economic outlook; commodity prices and currency exchange rates; demand for commodities; medium-term guidance; production forecasts; operational performance; expectations, plans, strategies and objectives of management; climate scenarios; assumed long-term scenarios; potential global responses to climate change; the potential effect of possible future events on the value of the BHP portfolio; closure or divestment of certain assets, operations or facilities (including associated costs); anticipated production or construction commencement dates; capital expenditure or costs and scheduling; operating costs, including unit cost guidance, and shortages of materials and skilled employees; anticipated productive lives of projects, mines and facilities; provisions and contingent liabilities; and tax and regulatory developments.

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

The forward-looking statements are based on the information available as at the date of this presentation and/or the date of the Group'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 in this presentation 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 release. BHP cautions against reliance on any forward-looking statements or guidance, particularly in light of the current economic climate and the significant volatility, uncertainty and disruption arising in connection with the Ukraine conflict and COVID-19.

For example, our future revenues from our assets, projects or mines described in this release 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, costs or production output and anticipated lives of assets, mines or facilities include our ability to profitably produce and transport the minerals and/or metals extracted to applicable markets; the impact of foreign currency exchange rates on the market prices of the minerals or metals we produce; 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; changes in environmental and other regulations; the duration and severity of the Ukraine conflict and the COVID-19 pandemic and their impact on our business; political uncertainty; labour unrest; and other factors identified in the risk factors discussed in section 9.1 of the Operating and Financial Review in the Appendix 4E and BHP's filings with the U.S. Securities and Exchange Commission (the 'SEC') (including in Annual Reports on Form 20-F) which are available on the SEC's website at [www.sec.gov](http://www.sec.gov).

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 data

Unless specified otherwise: operations includes operated assets and non-operated assets; total operations refers to the combination of continuing and discontinued operations; continuing operations refers to data presented excluding the impacts of Onshore US from the 2017 financial year onwards and excluding Petroleum from the 2021 financial year onwards; references to Underlying EBITDA margin exclude third party trading activities; data from subsidiaries are shown on a 100 per cent basis and data from equity accounted investments and other operations is presented, with the exception of net operating assets, reflecting BHP's share; medium term refers to our five year plan. Numbers presented may not add up precisely to the totals provided due to rounding. All footnote content (except in the Annexures) is contained on slide 32.

## Non-IFRS information

We use various Non-IFRS information to reflect our underlying performance. For further information please refer to Non-IFRS financial information set out in section 11 of the Operating and Financial Review in the Appendix 4E for the year ended 30 June 2022.

## 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

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## BHP and its subsidiaries

In this release, the terms 'BHP', the 'Company', the 'Group', 'BHP Group', 'our business', 'organisation', 'we', 'us', 'our' and 'ourselves' refer to BHP Group Limited and, except where the context otherwise requires, our subsidiaries. Refer to note 28 'Subsidiaries' of the Financial Statements in the Appendix 4E for a list of our significant subsidiaries. Those terms do not include non-operated assets. This release covers BHP's functions and assets (including those under exploration, projects in development or execution phases, sites and closed operations) that have been wholly owned and/or operated by BHP or that have been owned as a joint venture operated by BHP (referred to in this release as 'operated assets' or 'operations') during the period from 1 July 2021 to 30 June 2022.

BHP also holds interests in assets that are owned as a joint venture but not operated by BHP (referred to in this release as 'non-operated joint ventures' or 'non-operated assets'). Notwithstanding that this release may include production, financial and other information from non-operated assets, non-operated assets are not included in the BHP Group and, as a result, statements regarding our operations, assets and values apply only to our operated assets unless stated otherwise.

1. References in this release to a 'joint venture' are used for convenience to collectively describe assets that are not wholly owned by BHP. Such references are not intended to characterise the legal relationship between the owners of the asset.

## Acknowledgement of Country



Before we begin today, I would like to acknowledge and pay my respects to the Whadjuk Noongar people who are the Traditional custodians of the land and waterways on which we meet today.

I would also like to acknowledge and pay my respects to the Kariyarra, Banjima, Nyiyaparli, Palyku, and Njamal people who are the Traditional custodians of the land and waterways on which WAIO operations are located across Western Australia.

I pay my respect to the Elders both past and present, and to the emerging leaders, and extend that respect to other Aboriginal and Torres Strait Islander persons both present and online today.

Since leading WAIO, I've spent a lot of time on country with Traditional Owners including Elders, talking to them and hearing their stories about the things that are most important to them.

I've been personally interested in this, and fascinated by what I've learnt, especially in relation to the richness of Indigenous culture and heritage that exists in the Pilbara and the absolute importance of our role in helping protect it.

I'll talk more about this a little later in the presentation.

# Western Australia Iron Ore site tour: 3 days at a glance



Western Australia Iron Ore site tour  
3 October 2022

### Meet the team

DAY 1				
 Brandon Craig Asset President WAIO	 Anna Wiley Vice President Planning and Technical	 Huw McKay Vice President Market Analysis and Economics	 Rod Dukino Vice President Sales and Marketing Sustainability	 Kristy Heal Head of Finance WAIO
DAY 2		DAY 3		
 Steve Campbell General Manager South Flank	 Andrew Buckley General Manager Mining Area C	 Cindy Dunham General Manager Port	 Warren Wellbeloved General Manager Rail	



I'm looking forward to today's discussion.

I'll take you through an overview of our WAIO business, including some of our outstanding productivity improvements and achievements, delivered through our operating system and the capability of our teams.

Anna Wiley, our Vice President Planning and Technical is also joining me today and will talk shortly about our decarbonisation initiatives.

After a short break, Huw McKay, BHP's Chief Economist and Rod Dukino, Vice President of Sales and Marketing Sustainability will provide an update on our outlook for iron ore and steel, our latest views on steel decarbonisation pathways, and how our partnerships are helping to progress this.

We'll then have a joint question and answer session where we will be joined by our Head of Finance in WAIO, Kristy Heal.

Tomorrow we'll head to our newest mine at South Flank where you will hear from Steve Campbell, General Manager South Flank, and Andrew Buckley, General Manager of Mining Area C on how we've delivered this US\$3.6 billion project as well as our future plans.

On Wednesday, we will travel to Port Hedland, which is home to our rail and port operations. There, Cindy Dunham, General Manager Port and Warren Wellbeloved, General Manager Rail will share in more detail, information around our debottlenecking programs, both planned and underway.

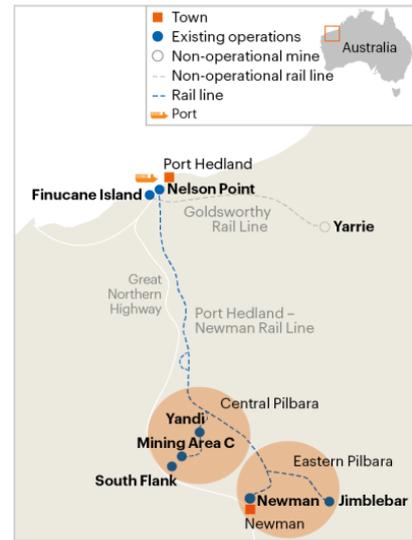
Of course, Warren, Cindy, Steve, Andrew and Kristy are just a few of our senior leadership team in WAIO, all of whom have broad and significant experience in mining and minerals processing across functions, commodities, and the global supply chain.

The team brings together a large-scale workforce which has established a strong track record for WAIO, as a consistent and reliable low-cost producer of high-quality iron ore.

# Western Australia Iron Ore snapshot

An interconnected system bringing resources and people together to build a better world

- Workforce of ~8,000 employees – 29% female and 11% Indigenous
- Four processing hubs supported by five mines, all located in the Pilbara
  - Processing hubs are Newman, Jimblebar, Yandi and Mining Area C (including South Flank)
  - 220 trucks in operation; >30% autonomous
  - ~1,000 km of rail track
  - 182 locomotives; ~10,500 ore cars
  - Each train has an average length of ~2.8 km
  - Port operations at Nelson Point and Finucane Island include five car dumpers and eight shiploaders
  - Loading ~1,500 ships per year (or one every six hours)



Western Australia Iron Ore site tour  
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For those of you who are less familiar with our WAIO business, let me give you a quick snapshot.

Like every operation within BHP, in iron ore safety is our highest priority.

As you'll see throughout this presentation and for those who will be travelling with us to South Flank and Port Hedland, safety is fundamental and essential to the way we work.

In WAIO, we have a strong safety culture and track record.

We constantly ask our people to think and talk about safety. To deeply understand the risks and controls. To take the time to get the basics right, and always maintain safe ways of working. Nothing is more important.

Our people are critical to our success and we have a large-scale workforce of around 8,000 full time employees and more than 1,000 contractors.

The culture and capability within our teams is our strength, and together with our structured operating system, reliable assets and extensive infrastructure, we are able to deliver outstanding results.

So here are some statistics to give you a sense of the size and scale of our business.

Our operations are based in the Pilbara region of Western Australia, with our Port located approximately 1,600 kilometres north-east of Perth and our nearest mine at Newman, almost 1,200 kilometres north-east of Perth.

We have an integrated system of four processing hubs and five mines.

Across our mines, we operate approximately 220 trucks, of which more than 30% are fully autonomous.

From there, we transport iron ore across our rail network, which comprises around 1,000 kilometres of track, to Port Hedland.

On average, our trains are around 2.8km long, include four locomotives and have more than 260 ore carriages.

At the Port, we operate in two areas – Nelson Point and Finucane Island, from where we ship our high-quality product around the world – mostly to customers in Asia - with approximately one ship leaving Port Hedland every six hours.

# WAIO is a significant contributor to BHP

## An example of a large, long-life, low-cost asset

- Value unlocked through embedded growth optionality over the long asset-life and first quartile cost performance
  - Return on Capital Employed (ROCE)
    - FY22: 75%
    - 10 year average: 41%
- Consistent strong performance underpins significant contribution
  - EBITDA
    - FY22: US\$21.8bn
    - 10 year average: US\$13.0bn
  - EBITDA margin
    - FY22: 71%
    - 10 year average: 64%; consistently >50%
  - Free cash flow
    - FY22: US\$20.4bn
    - 10 year average: US\$10.8bn
- Increased production >50%, and lowered unit costs by ~40% in the past decade

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3 October 2022

Asset returns since investment in 1985  
(annualised, %)



EBITDA margin<sup>1</sup>  
(%)



We've been operating in Western Australia for over 50 years.

Over the last decade, we've demonstrated a track record in delivering reliable operational performance, which has provided strong cash flows to BHP. During this time, WAIO's production has increased by more than 50%, while we've lowered our unit costs by approximately 40%.

We've delivered an average of US\$13 billion of EBITDA over that period, at an average margin of 64% - a truly remarkable performance.

On the back of a strong operational performance and high commodity prices in the 2022 financial year, these numbers were even more impressive, with WAIO contributing US\$21.8 billion in EBITDA, more than half of the Group's total EBITDA, at a margin of 71%.

These strong financial results are also reflected in our Return on Capital Employed, which was a massive 75% in the 2022 financial year.

This Asset is a great example of how investments in large, long-life, low cost, expandable operations advantage BHP shareholders.

# Consistent delivery of superior returns

Safer, lower cost, more reliable, more productive

 <b>Operational excellence</b> <hr/> <ul style="list-style-type: none"><li>Safe operations</li><li>Stable and reliable</li><li>Continuous improvement mindset</li></ul>	 <b>Strong margins</b> <hr/> <ul style="list-style-type: none"><li>Strong price realisations relative to benchmark</li><li>Lowest cost iron ore producer<sup>2</sup></li><li>Large, high quality resources close to existing hubs</li></ul>	 <b>Value and returns</b> <hr/> <ul style="list-style-type: none"><li>Social value embedded in our approach</li><li>Clear growth pathway to &gt;300 Mtpa; studies underway for 330 Mtpa</li><li>Disciplined capital allocation</li></ul>
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These exceptional figures haven't happened by chance or by luck.

They are the result of decades of hard work and planning.

And you'll hear over the next couple of days... this is underpinned by our approach to operational excellence... the quality of our resources... and our focus on social value and financial returns.

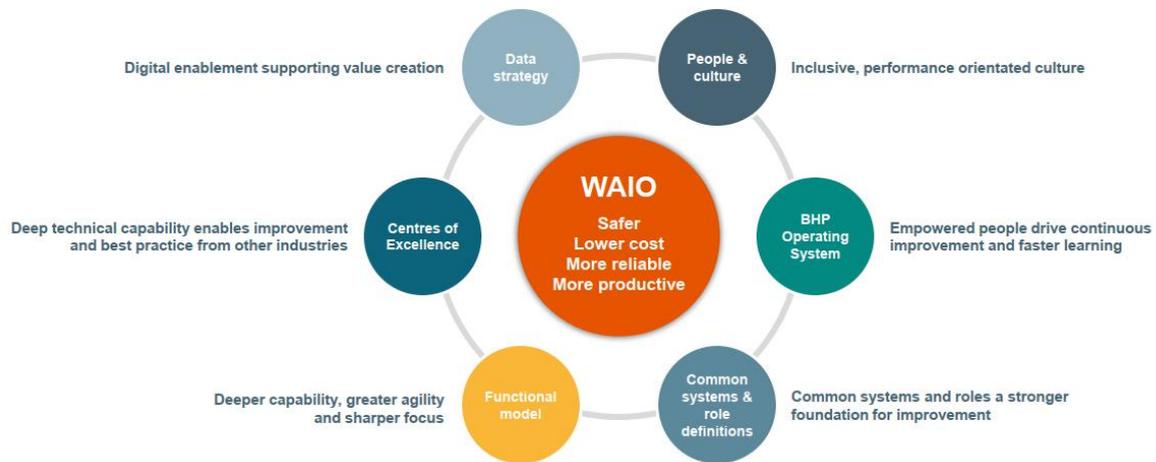
Safety and operational excellence go hand in hand. We are proud of our achievements in both, and we are in a strong position to build on this with our focus on continuous improvement.

Combined with our large, high-quality resource base, this provides a strong platform to generate some of the best margins in our sector.

And, as you've come to know and expect from BHP, everything we do filters through our capital allocation and social value frameworks... meaning that shareholder returns... and value for both shareholders and all our stakeholders... is always front of mind.

# Our strategy is underpinned by the way we work

Enabling our people to contribute to their full potential to achieve operational excellence



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There are a number of critical, strategic elements that guide the way we work, and ultimately underpin our operational results.

These are represented in the outer circles on this slide starting at the top and working clockwise – our people and culture, our operating systems, our functional support model, the deep technical capability provided through our centres of excellence and our approach to innovation and technology.

How we bring our people and culture together with our systems, processes and technology, is setting us apart – unlocking potential and growing value.

It's a mutually reinforcing system, and over the past decade, we've been laying these foundations across our business.

Let's start with people and culture....we are focused on creating and supporting an inclusive, performance orientated culture and our experience is that diversity is driving better outcomes. In WAIO, we currently have approximately 29% female representation, and approximately 11% of our workforce identifying as Indigenous, and we are actively working to increase diverse representation across our business. We are also engaging and empowering our people to adopt a continuous improvement mindset and as a result, we are reaping the rewards.

Through the BHP Operating System, we have empowered our teams to participate directly in improving the work they do, and we have reduced frontline supervisor spans of control to enable supervisors to spend more time – ~75 per cent – in the field with their teams. We have deployed standardised work across more than 2,000 maintenance activities, and in FY22 we delivered productivity improvements of more than A\$400m.

Through Operations Services, we have developed specialised teams across critical categories of work such as conveyor belt maintenance, and have brought almost 3,700 roles in house – and over the next 12 months we expect more than 200 apprentices and 170 trainees to enter the Future Fit Academy. And upon successful completion of their programs, these graduates will be offered roles across the business including Iron Ore.

In addition, our functional support model together with our Centres of Excellence provide deep capability and allow us to problem solve complex problems and sustainably improve. For example, through our Maintenance Centre of Excellence, we are driving sophisticated preventative maintenance strategies which are the foundation of our reliability.

The use of data and innovative technology is also driving strong productivity improvements and results across our business. By continuously capturing real time data and performance, we are able to develop strategies and approaches to improve efficiency not only within our asset, but globally.

**Our strategy is underpinned by the way we work (continued)**

At Newman Operations and South Flank, we've accelerated our autonomous haulage deployments, and this is creating more efficient, more productive and safer operations. While still in implementation, you will see some of these autonomous trucks while visiting South Flank.

We are also leveraging the Integrated Remote Operations Centre (known as IROC) to optimise our supply chain.

The centre was introduced over 10 years ago to monitor and direct operations across the entire supply chain, with all operators working in concert from the same control room in Perth 24/7, to solve problems faster and improve throughput.

The integrated way we manage our supply chain is a significant enabler of value, allowing us to unlock significant additional capacity without the need for capital investment

# WAIO values safe operations above all else

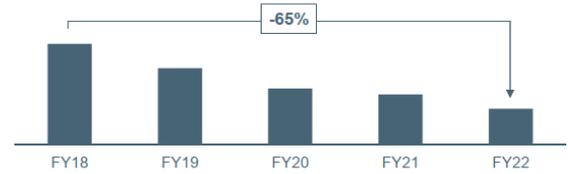
Empowering our workforce through culture, systems and controls

- Over 11 years fatality free; fatal potential events down 65% since FY18
- Disciplined approach to material risk management (e.g. COVID-19)
- Focus on eliminating sexual harassment, racism and bullying
- Technology and automation supporting improved safety performance
- Frontline engagement through BOS and field leadership program

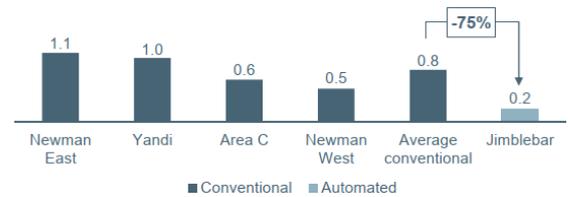
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Events with fatal potential<sup>3</sup>  
(#, index FY18 = 100)



Automation reducing safety events  
(# of reported "SME Collision Incident" events / total movement)



Source: Events Management, Surface Mobile Equipment (SME) interactions actual, hazard and near miss events for CY2020. Newman East has since transitioned to autonomous trucks.



At BHP, nothing is more important than safety, and that’s certainly the case across our WAIO operations.

We’ve recently achieved 11 years without a fatality - the result of significant effort and focus over many years.

Our lagging and leading safety indicators are also trending in the right direction, with some big improvements in the past five years.

The continued roll-out of technology and automation across our business is also having a positive impact on our safety, including the Surface Mobile Equipment anti-collision program.

We know from the safety performance at Jimblebar, autonomous trucks have resulted in 75% fewer collision incidents than at our non-autonomous mines.

We are accelerating autonomy deployment across our operations. All our production drills across our 4 hubs are already fully autonomous, and in line with our fleet replacement strategy, ore haulage will be approximately 85% autonomous within the next 4 years with Yandi the only exception as the site nears end of life.

These exciting next steps in our autonomous journey are expected to deliver further and significant safety, production and cost improvements as well as new job and development opportunities for people.

With respect to COVID-19, the pandemic has undoubtedly challenged us, but the way our teams responded to the added controls and ways of working through the pandemic was something we are very proud of.

Not only did it keep our people and our communities safe but enabled WAIO to achieve record results.

We continue to assess, and escalate or de-escalate COVID controls as required.

Of course, our strong focus on safety and health has also included our effort to eliminate sexual harassment, racism and bullying from BHP.

Our position is clear. We want our workplaces to be safe and inclusive for all. To achieve this, we are determined to do whatever it takes to eliminate these behaviours in our workplaces.

We have been working on this for some time, but know that there is still much more to do.

We continue to take strong action – investing A\$300 million in upgrades to security at accommodation villages, enhancing training programs (including for both leaders and bystanders), and improving support services.

In 2022, we actively participated in Western Australia’s Parliamentary Inquiry into sexual harassment against women in the mining industry and action has been taken to address the Committee’s recommendations.

We are thankful to all our people and stakeholders for their ongoing feedback and recommendations – their insights continue to inform our approach.

# Social value embedded in our approach

Helps enable sustainable operations long term and positions us to access future opportunities

Decarbonisation	Healthy environment	Indigenous partnerships	Safe, inclusive and future ready workforce	Thriving, empowered communities	Responsible supply chains
<p>Contributing to the world's climate ambitions</p> <p>One of the lowest GHG emissions-intensity iron ore producers<sup>4</sup></p> <p>Trialling four battery electric locomotives scheduled for delivery in late 2023</p> <p>Port renewable power purchase agreement with Alinta</p>	<p>Delivering nature-positive<sup>5</sup> outcomes</p> <p>A\$300m Pilbara Air Quality Program (including wind fences)</p> <p>Focus on responsible water management</p>	<p>Building relationships based on trust, respect and mutual benefit</p> <p>Co-creating plans with Traditional Owners</p> <p>Pilbara Aboriginal Health Alliance</p> <p>Yandi land rehabilitation partnership</p>	<p>Enhancing safety diversity, capability, and wellbeing</p> <p>~29% female representation in FY22</p> <p>~11% Indigenous representation in FY22</p> <p>Considerable investment for security and physical upgrades at camps</p>	<p>Contributing to long-term prosperity and resilience</p> <p>A\$324m paid to local suppliers through Local Buying Program in FY22</p> <p>362 entry pathway roles in FY22</p> <p>Childcare and wellbeing services</p>	<p>Supporting ethical, sustainable and transparent supply chains</p> <p>Working closely with customers, including our partnerships on Scope 3 emissions</p> <p>Jimblebar beneficitation in studies</p>

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Our commitment to social value is reinforced through BHP’s new Social Value framework announced in June this year. This framework sets direction, rigour and discipline to our efforts across the six pillars on this slide.

I wanted to discuss some of the elements of what Social Value looks like at an Asset level in WAIO.

In relation to decarbonisation, WAIO is already one of the lowest carbon emissions-intensity iron ore producers for seaborne iron ore.

We have some exciting plans to further reduce operational greenhouse gas emissions... but I’ll leave this to Anna to cover shortly.

Our teams are progressing initiatives to further improve our environmental performance, including our air quality and dust emission initiatives at Port Hedland and Newman and water stewardship across the Pilbara.

I’ll talk in detail shortly on our focus on building partnerships with our Indigenous stakeholders and the importance of relationships based on trust and respect.

Another important part of our framework is to help support thriving and empowered communities.

We utilised the services of 290 local business over the course of FY22, including spending \$60.7 million with small, local businesses through the Local Buying Program.

We have partnered with Child Australia to help improve childcare services in Newman and Port Hedland, and provided funding for Pilbara Aboriginal Medical Services, COVID-19 vaccination support and other health initiatives across regional and remote communities.

This support is helping create more services, local jobs and training opportunities in Western Australia, particularly regional areas.

Many of our Western Australian employees either live in or commute to regional communities or our nearby operations in the Pilbara.

In WAIO, creating social value for the communities, governments and partners that support us is a key focus area in our business and is not only the right thing to do – it is essential to our business and creates a competitive advantage.

By considering the social, environmental and economic impacts of the decisions we make, we best position ourselves to create the most value.

# Indigenous partnerships

Building relationships based on trust, respect and mutual benefit

## Emphasis on co-creating plans and high-quality relationships

8 Traditional Owner Groups across our portfolio

Ongoing commitment to consultation on heritage and the development of Cultural Heritage Management Plans

Heritage protection through strengthened systems and processes

## Creating mutual value and long-term, sustainable change

More than doubling spend with Indigenous businesses

**>A\$300m**

by FY24



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Increasing Indigenous employment from

**~11%**

in FY22



Supporting workforce participation and training

**25%**

of entry pathway roles are Indigenous



Support for Western Australia's **Aboriginal Cultural Heritage reform**



Earlier, I briefly spoke about the importance of spending time together with Traditional Owners and Indigenous stakeholders, to build understanding, respect and importantly strong, long-lasting relationships.

For many years we have been engaging and working with Traditional Owners to gain a deeper understanding on issues important to them, including heritage protection and land access, and we are continuing to incorporate this into the way we operate our business.

We are currently working together on new Cultural Heritage Management Plans that modernise key structures in preparation for the incoming Aboriginal Cultural Heritage Act in Western Australia and our processes and subsequent activities are already strongly aligned to the new Act.

We want to do much more to build sustainable, profitable and enduring partnerships with Traditional Owner and Indigenous businesses across our operations. We are working hard at all levels of our business to make this happen.

We also remain focused on increasing Indigenous participation in our workforce and creating new entry pathways.

We are working together to create opportunities for Traditional Owner and Indigenous business to directly participate in supporting our operations. This is very important to them, and we are making it happen.

This can be seen in our commitment to award more than A\$300 million per year in contracts to Indigenous businesses by the end of FY24 – up from A\$140 million across 70 Indigenous businesses in FY22.

One particular example I would like to highlight is the maintenance of the semi mobile crushing and screening plant at our MAC site. This is Banjima people, operating a Banjima business on Banjima country.

We are also passionate about increasing the pipeline of contracts and helping support the growth of Indigenous enterprise and innovation and creating new opportunities for those businesses to support their own communities – something we believe Indigenous business does best.

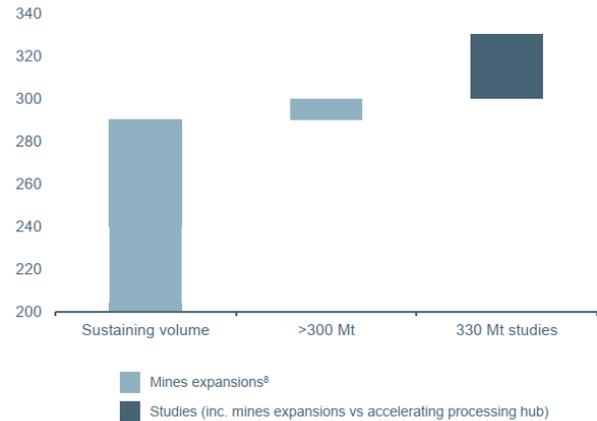
We're pleased with our progress to date, and will be announcing a pipeline of contracts in the year ahead.

# Large resource base in proximity to existing infrastructure

Enables capital efficient volumes over the next few decades

- 30 Bt Mineral Resources<sup>6</sup>
- Currently operate four processing hubs supported by five mines
- ~95% of Mineral Resources<sup>7</sup> within 50 km of existing processing hubs
  - Estimated average hub life of 40-60 years
- Includes low-cost development options adjacent to existing hubs
  - Attractive future options in Central Pilbara
- Characteristics of our deposits support low-cost operations
  - Mining strip ratio expected to remain stable at ~1.3 over the next five years
  - Majority of mining above the water table. Increased below water table mining over the medium term

Mines replacement to achieve 330 Mtpa run rate<sup>7</sup>  
(Mtpa, peak capacity)



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Now, to our operations.

WAIO is favoured with an amazing endowment.

This includes 30 billion tonnes of iron ore resource, of which approximately 95% is concentrated within 50 kilometres of existing infrastructure.

With existing processing hubs having estimated average lives of between 40 – 60 years, this proximity underpins capital efficient development options to continue utilising this capacity and we are working hard to establish the best and most efficient pathways to bring this ore to the hubs.

Our hubs are big! To give an indication of scale, one of our larger competitors has around 10-12 hubs for 320 to 350 million tonnes per annum.

We have four processing hubs which today support a production level of approximately 290 million tonnes per annum, and we have announced our plans to progress to 300 million tonnes per annum.

Our South Flank and Mining Area C operations will soon be one of the world’s largest and most productive hubs at 145 million tonnes per annum alone.

This structural setting enables simpler, more standardised operations, a lower mine replacement cycle, industry leading sustaining capital efficiency and unit cost benefits.

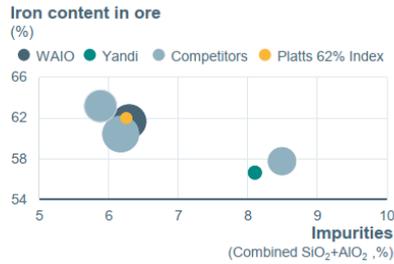
At production levels exceeding 300 million tonne per annum, an increase in sustaining mine development is required. We are continuing studies into mine expansion through crusher and conveyor infrastructure, including the possibility of wet processing infrastructure likely to be required at Newman to manage the increasing below water table ore.

Studies are also under way as to what an increase to 330 million tonnes looks like, and we have a number of attractive options in the Central Pilbara.

# Competitive advantage

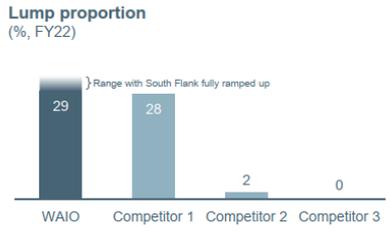
High-grade ore and percentage of lump drives superior price realisation

## Index quality ore



- High-quality, low-impurity ore
- South Flank will increase overall portfolio grade to ~62% (from ~61%); some grade variability over the next couple of years during ramp-up<sup>9</sup>
- Studying options to beneficiate Jimblebar product to increase value

## Increasing lump proportion



- Sector leading lump product mix
- South Flank is expected to increase the portion of lump in the portfolio to 30-33% when fully ramped up<sup>9</sup>
- Lump is highly sought after in a decarbonising steel industry

## Premium price realisation



- Strong customer relationships and technical expertise drives strong price realisations
- We have outperformed our competitors in price performance, achieving ~98.5% of the Platts 62% benchmark in FY22<sup>10</sup>

Note: Competitors include Rio Tinto, Vale and FMG; bubble size represents production volumes; production volumes, grade and price comparison excludes pellet. BHP average product grade excludes Yandi. Studies are underway on the optimal growth pathway above 300 Mt and the resultant grade and lump contributions.

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3 October 2022

As well as being in close proximity to existing infrastructure, our resource consists of high quality, low impurity ore and a high proportion of lump.

Our average grade across the portfolio is approximately 61% Fe, which will increase with the addition of South Flank as it ramps up.

As part of our decision to re-consult with Traditional Owners, we have opened more areas of the mine, and some short-term grade variability will be inherent through the mine ramp up period which we have formerly outlined as 3 years.

We are also studying beneficiation at Jimblebar with the aim of further improving the portfolios grade, with potential first production in the latter half of this decade.

We already have the highest proportion of lump compared to our competitors – at just under 30 per cent and this will increase to between 30 and 33% when South Flank is fully ramped up.

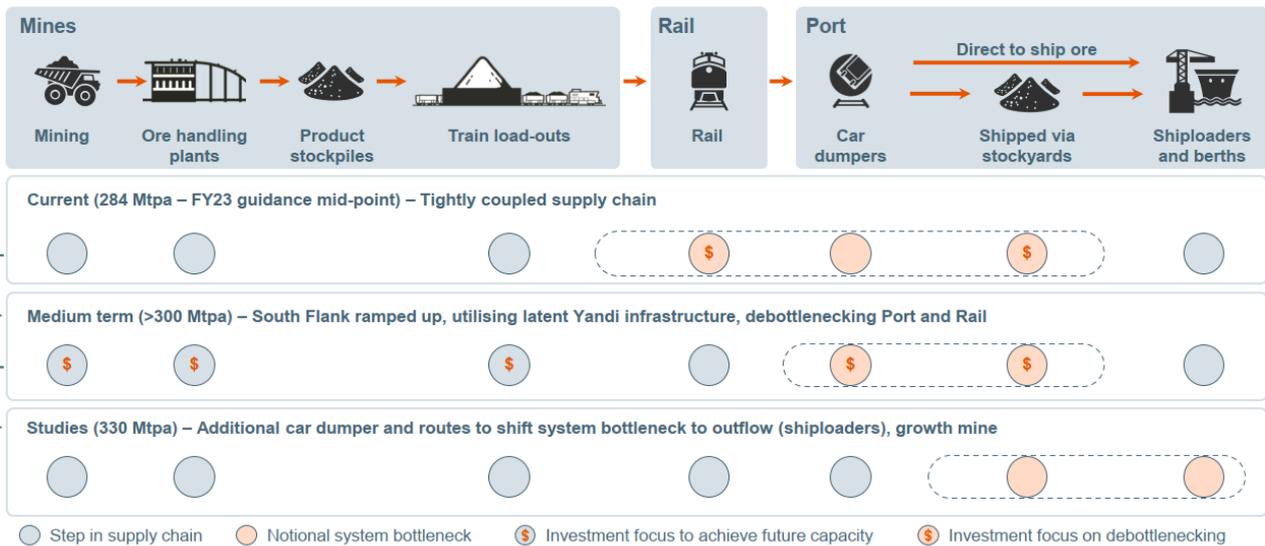
Lump is highly sought after in a decarbonising steel industry, as it increases the productivity of the blast furnace, therefore lowering the emissions intensity of steel production. And important to our shareholders, it also attracts a price premium.

Our premium product, combined with strong customer relationships and technical expertise, has enabled us to achieve the highest price realisations in comparison to our competitors.

In FY22, we achieved approximately 98.5% of the Platts 62% benchmark.

# Unlocking capacity across the value chain

Disciplined investment to shift the bottleneck to the port over the medium term



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As many of you may recall, our last major project Rapid Growth Project 6 – or RGP6 - which included our inner harbour debottlenecking, Jimblebar expansion and Port blending and rail yard facilities, was delivered in 2013 and lifted WAIO nameplate capacity to 240 million tonnes per annum.

Since then, we have been systematically improving through productivity and debottlenecking of the supply chain through low cost, targeted, capital efficient investments... addressing rail, mines and more recently at the port with our car dumpers.

Despite COVID headwinds, this has enabled us to creep sales to above 280 million tonnes over each of the past three years, including a record 284 million tonnes last year.

Today, we have a tightly coupled supply chain - extremely efficient, but with limited ability to sprint, or manage major maintenance.

While maintaining this efficiency, we are allocating capital throughout the value chain to unlock capacity and shift the bottleneck to the port, which is our designed bottleneck.

This slide shows where the bottlenecks are today, where they will move to at 300 Mtpa medium term guidance, and at a potential 330 Mtpa rate.

Broadly, to get from where we are today, to production levels greater than 300 Mtpa will take some investment in both the port and rail... as illustrated by the dollar signs inside the circles. These projects are underway and you will see PDP1 works on your tour of Port Hedland.

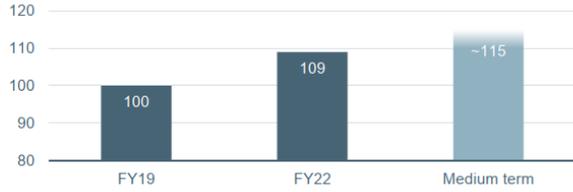
And while still in study, we expect that getting to 330 Mtpa will require additional investment in our mines, and port – and will most likely require an additional car dumper.

However, as is always the case, our first lever is productivity, supported by our embedded systems and processes. I'd like to touch on a few productivity achievements now.

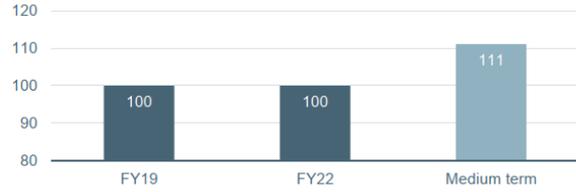
# Delivering productivity at Mines

Productivity mitigating expanding deposits and increased haul cycle times

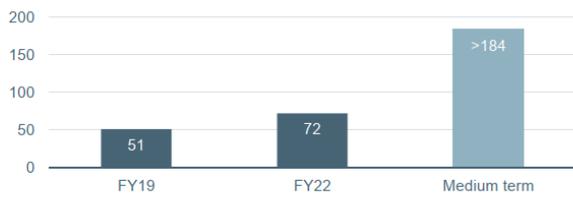
**Greater truck payload increasing production**  
(t, index FY19 = 100)



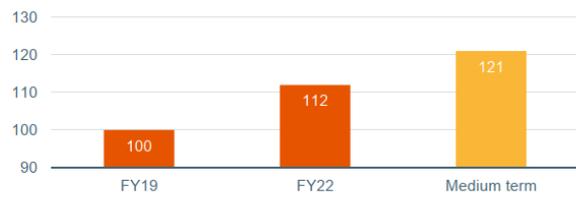
**Productivity driving improved truck hours**  
(hours, index FY19 = 100)



**Accelerating autonomous truck roll out**  
(Number of autonomous trucks)



**Mine life driving higher haul cycle times**  
(min, index FY19 = 100)



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Across WAIO, we have more than 1,000 units of equipment including 220 haul trucks.

As shown in the top left chart, since FY19, we have safely increased truck payload by 9% by introducing lightweight trays across our fleet, allowing trucks to carry additional tonnes per cycle.

With a strong focus on improved equipment maintenance strategies developed by our Maintenance and Engineering Centre of Excellence – and more efficient ways of working, over the past three years we have increased annualised truck hours by 6% to approximately 6,200 hours as shown by the chart in the top right.

As I showed earlier, we are also making good progress on automation, with ~190 trucks expected to be autonomous in the medium term.

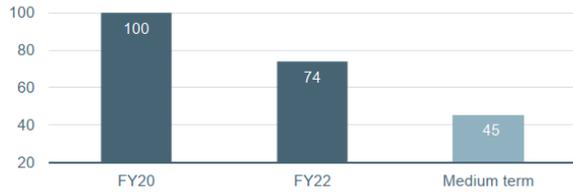
Our autonomous fleet is achieving availability of 89% and haulage costs 20% below the WAIO average.

Of course, as our mine footprint expands our haul cycles increase, but our productivity improvements are more than offsetting the impact of this.

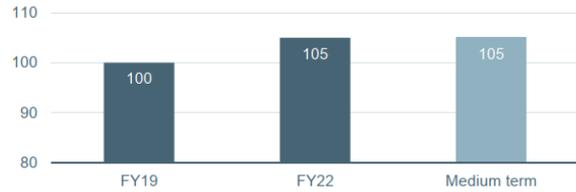
# Delivering productivity at Rail and Port interface

## Debottlenecking Port and Rail increases productivity

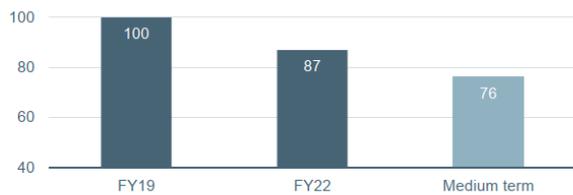
**Track speed restrictions impact on cycle time**  
(mins, index FY20 = 100)



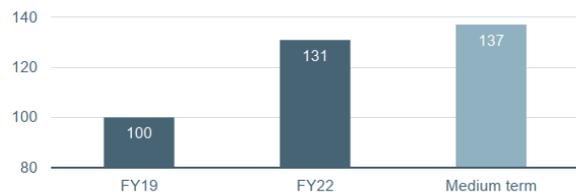
**Five car dumper (CD) availability**  
(%, index FY19 = 100)



**Pre-dump cycle time**  
(hours, index FY19 = 100)



**Number of days operated in 5CD mode**  
(%, index FY19 = 100)



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We're also making great progress on unlocking additional capacity at our Rail and Port operations.

Our rail reliability work program involving diagnostics by industry experts, removal of high-risk welds on track and a targeted track renewal program has reduced track speed restrictions by more than 25% in the past three years resulting in improved cycle times. Warren will speak to you more about rail and track speed restrictions on Wednesday.

With our focus on productivity and continuous improvement, we've reduced the number of unplanned events at our car dumpers, therefore increasing reliability, as can be seen by the 13% improvement in rail pre-dump cycle times.

Standardising work through the BHP Operating System has also enabled us to improve the efficiency of the rail / port interface and we are targeting further efficiencies in the medium term.

At Port in FY20 we initiated a major maintenance program to lift performance, leveraging both our BHP Operating System and Centres of Excellence.

Since then, our five car dumpers have undergone significant overhaul.

This has lifted availability by an average of five per cent as well as resulting in a 31% increase in the number of days all five car dumpers have been online simultaneously.

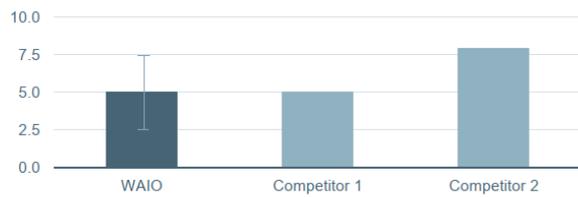
This is important because when in four car dumper mode, the car-dumpers are the system bottleneck. Continuing with the success of this program, in Q1 of FY23, we completed the major maintenance on car dumper four.

## Sector leading free cash flow performance

**Lowest cost iron ore producer, with low sustaining capital intensity**

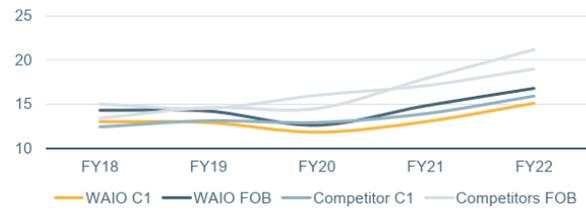
- FY23 unit cost guidance of US\$18-19/t FOB, decreasing to <US\$17/t FOB in the medium term (both @ \$0.72 FX)
  - Supply chain reliability, BOS and Operations Services provide strategic advantage
- Low sustaining capital intensity of ~US\$5/t in the medium term (+/- 50% in any given year)
  - Supported by larger ore bodies connecting to four processing hubs

**Among lowest sustaining capital requirements<sup>11</sup>**  
(\$US/t)

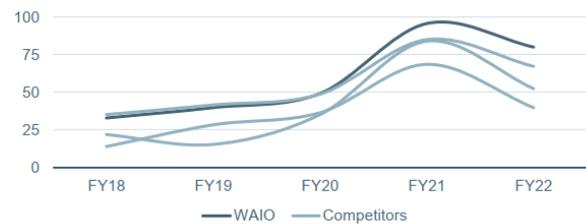


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**Lowest cost producer for four consecutive years<sup>12</sup>**  
(\$US/t)



**Leading free cash flow performance<sup>13</sup>**  
(\$US/t)



Our relentless focus on productivity, our people and our systems has positioned us as the lowest cost iron ore producer.

We have also consistently outperformed our competitors on price realisations.

And this has underpinned our solid track record of delivering industry leading margins and free cash flow performance.

This means a greater contribution to the strong returns that our shareholders benefit from, as well as the strong Group balance sheet.

This performance underpins our ability to further invest in the business and grow value.

# Technology is a key enabler

Improving safety, equipment reliability and increasing productivity across the value chain

Autonomous haulage	Rail Technology Project (RTP)	Shiploader automation
<ul style="list-style-type: none"> <li>• Jimblebar and Newman East embedded</li> <li>• South Flank on track to be completed by end CY23</li> <li>• Studies underway for Newman West and Mining Area C</li> <li>• Accelerating autonomous pathway to ~85% in medium term</li> </ul>	<ul style="list-style-type: none"> <li>• Replaces end of life rail signalling systems with new technology</li> <li>• Moving block technology (communications based train control) to reduce train separation</li> <li>• Enables material risks reduction</li> </ul>	<ul style="list-style-type: none"> <li>• Currently testing two shiploaders, with plans to fully automate all eight by the end of 2023</li> <li>• Artificial Intelligence in surveying ships, with world first, 3D laser scan technology</li> <li>• Eliminating risks from manual operation and reducing loading time</li> </ul>
		
Value chain integration		

- Improvements in scheduling and decision support to optimise flow through the supply chain

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The introduction and expanding use of technology and innovation across WAIO is a key lever for us to unlock the productivity potential within the system.

In 2016, we started our remotely operated blast hole drilling program at Yandi – managed from the IROC. Today, we now have one of the biggest autonomous drilling fleets in the world, with 26 rigs across our five operational sites.

Our autonomous haulage journey has delivered safer, more reliable, and productive operations, starting at Jimblebar in 2017 and expanding to Newman East in 2020.

At South Flank, our autonomous fleet is growing with 10 trucks currently operating autonomously. In the year ahead, we'll convert the remainder of the South Flank haul truck fleet.

Our Newman East operation is already fully autonomous. Studies are in progress to deploy automated trucks at Mining Area C and Newman West as we move towards having approximately 85% of the fleet automated by the end of FY27, capitalising on the significant benefits of improved safety and productivity outcomes.

I also wanted to touch on our Rail Technology Project (RTP). This project provides an option to replace our end of life signalling system, and leverage technology that will shift our rail network from the current fixed block signalling system to a moving block, improving the safety and integrity of the system, and unlocking capacity by reducing the following distance between trains, increasing throughput along our rail network to the port.

We are also currently trialling two automated shiploaders and have plans to transition towards becoming fully automated later this year. Once completed, these will be operated from IROC.

Cindy and Warren will expand on these when you visit the Port on Wednesday.

# Growing to >300 Mtpa in the medium term

## Focus on debottlenecking the Inflow system (Port and Rail)

- The supply chain is highly interconnected with limited sprint capacity
- Capital intensity of between US\$45 – US\$60/t

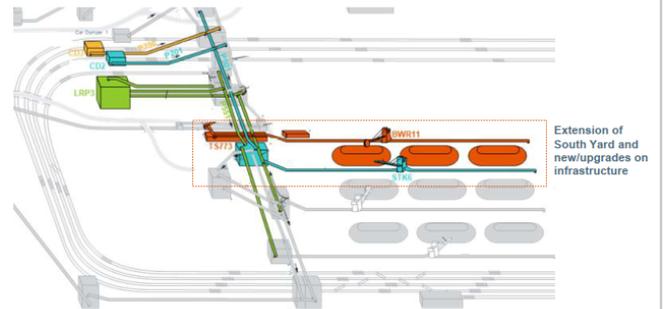
### Port

- Port Debottlenecking Project (PDP1), completion in FY24, includes a yard extension and rate increases on our shiploader routes

### Mines

- South Flank ramped up by FY25
- Potential to utilise latent Yandi infrastructure with proximate orebodies and remnant ore
- Continued productivity improvements supported by BOS and MECoE strategies and progressive roll-out of autonomous haulage trucks

Phase 1 – Maximising capacity through port five car dumpers system



We recently announced our 300 million tonnes per annum medium term target.

If I work backwards through the supply chain...

We are progressing our Port Debottlenecking Project, which we refer to as PDP1, to increase port capacity through conveyor upgrades and a new reclaimer and stockpiles. This will increase our Port capacity from 290Mtpa today, to greater than 300 Mtpa, and is expected to be completed in 2024.

The RTP project which I touched on earlier, will support unlocking rail capacity with replacement of the end of life signalling system.

At our mines, while Yandi will continue to provide supply chain flexibility for several more years, we also have the potential to use proximate ore bodies to support production at this run rate.

All in, we expect a relatively low capital intensity of between US\$45 and US\$60 per tonne to get from where we are today, to beyond 300 Mtpa in the medium term at our mines and port.

# Studying options for growth to 330 Mtpa

Shifting the system constraint to design bottleneck at Outflow (shiploaders)

- Studies expected to be completed in FY25

## Port

- Further debottlenecking the Port, likely through an additional car-dumper, routes and yard expansion

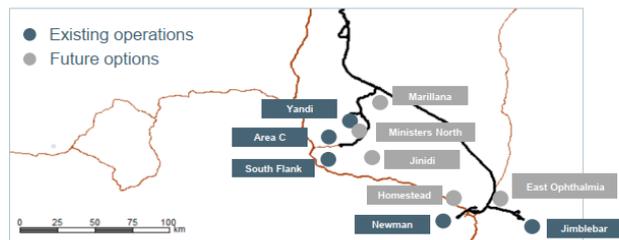
## Rail

- Further rail optimisation, capitalising on reduced train separation from moving block technology
- Increased ore carried per train via longer trains

## Mine

- Ability to leverage existing infrastructure (e.g. Yandi) and beneficiate will be key considerations, trade-off against new processing hub
- Mine options include Ministers North, Jinidi, Homestead, East Ophthalmia and Marillana

Phase 2: Enable a stable future proof supply chain



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We are also studying options to expand production to 330 million tonnes per annum – supported by the regulatory approval we’ve received from the Western Australian Environmental Protection Authority for our Port operations.

Right now, we are progressing a range of studies looking at what this would require, particularly at our mines and port, and we expect to complete those studies in FY25.

That said, at the Port, we know we will likely need an additional car dumper, routes and yard expansion, essentially shifting the bottleneck to the ship loaders.

Inland, we may need to expand our mining operation footprint.

An increase of an additional 30 Mtpa provides us with an opportunity to re-think delivery of both sustaining mines and growth requirements in the most efficient way... and our long-life, large deposits gives us that optionality.

We’re cognisant that we are ramping down production at Yandi, and that the existing hub infrastructure could also be utilised for future growth... but this is not the only option we are exploring.

We have already started to look at areas including Ministers North, Jinidi or Marillana – all close to Yandi.

And we are also looking more closely at our Newman hub, for example Homestead and East Ophthalmia, which would require wet processing facilities to unlock the grade benefits of these particular deposits.

Whether we have the ability to beneficiate ore to improve grade is an important consideration and we know that quality will be key in the future as steel mills look to decarbonise.

As always, any decision we make will take into consideration a wide range of factors including the external environment and a full assessment through the Capital Allocation Framework on how this investment would compete for capital.

# Consistent delivery of superior returns

Safer, lower cost, more reliable, more productive

 Operational excellence	 Strong margins	 Value and returns
<ul style="list-style-type: none"><li>Safe operations</li><li>Stable and reliable</li><li>Continuous improvement mindset</li></ul>	<ul style="list-style-type: none"><li>Strong price realisations relative to benchmark</li><li>Lowest cost iron ore producer<sup>2</sup></li><li>Large, high quality resources close to existing hubs</li></ul>	<ul style="list-style-type: none"><li>Social value embedded in our approach</li><li>Clear growth pathway to &gt;300 Mtpa; studies underway for 330 Mtpa</li><li>Disciplined capital allocation</li></ul>

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I'd like to recap with a few key points:

We believe the size and quality of our WAIO resource and its proximity to existing infrastructure, provides a competitive advantage to BHP.

Our people, culture, systems and processes are improving productivity, and delivering safe and reliable operations.

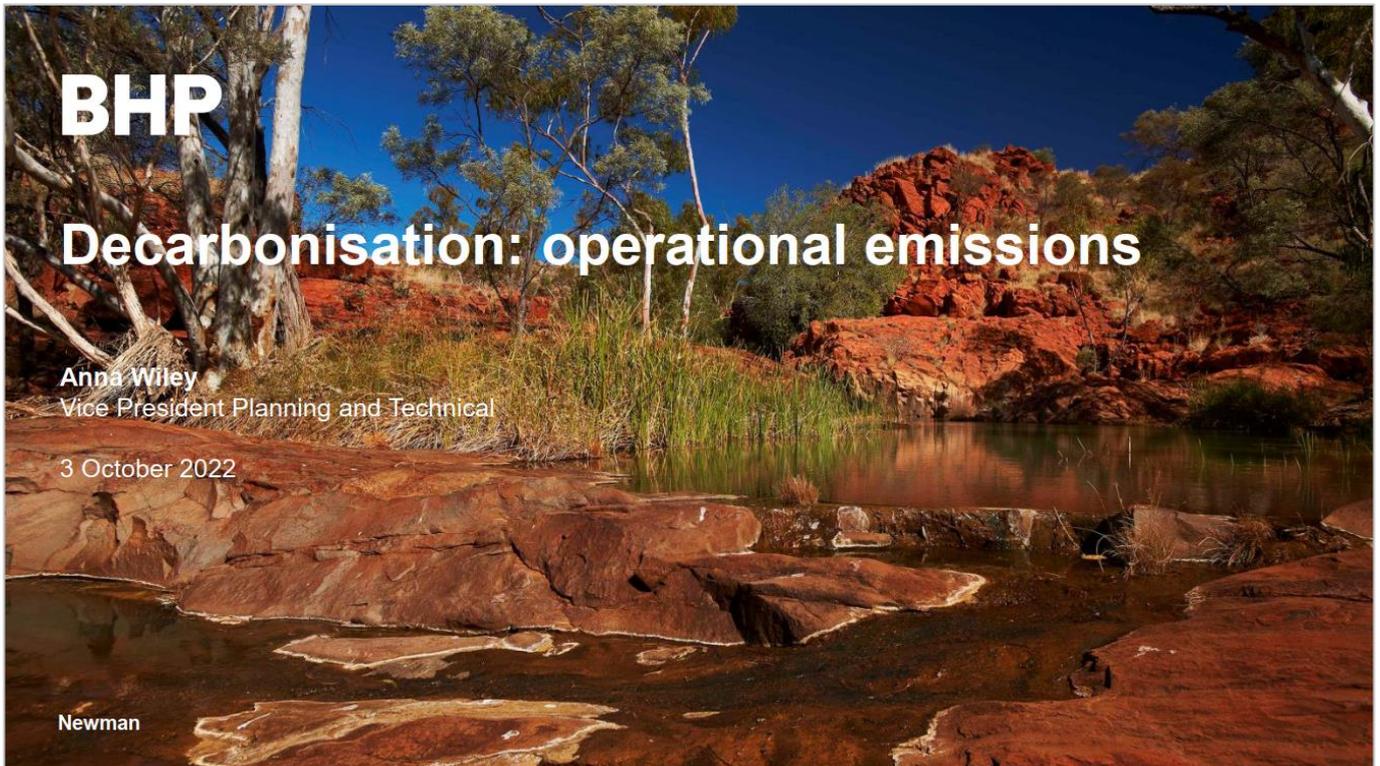
These elements are the driving force behind our performance as the lowest cost producer with the lowest sustaining capital intensity and highest price realisation – which together consistently deliver strong margins and leading free cash flow generation per tonne.

Creating Social Value is deeply embedded in our approach – from the co-creation of plans with Traditional Owners, through to creating opportunities for small, local and regional businesses, to supporting the communities in which we operate.

We will pursue, the most efficient pathway to grow volumes over the medium term and these investments will compete for capital through the Group's Capital Allocation Framework

We've had an outstanding few years in WAIO and I'm even more confident about what we can achieve going forward with the plans we have for the future.

I'd now like to hand over to Anna, who will take you through our decarbonisation plans before we head to a break.



Thanks Brandon and good afternoon everyone.

For those of you who I haven't met before, let me take a minute to introduce myself.

I have been working in the mining industry for over two decades in a wide variety of roles, including Capital Projects, Finance and Operational General manager roles in Copper and Iron Ore.

For the last five years I have been with BHP, initially as Head of Asset Management in our global Maintenance function, before commencing in my current role as Vice President, Planning and Technical, Minerals Australia just over a year ago.

While working in Asset Management I had accountability for, amongst other things our life of Asset planning, maintenance systems and our mobile fleet strategy.

In my current role my broader team is responsible for preparing our next generation of operating sites including, completing early phase studies, approvals, managing our land tenements, leadership of our heritage teams and delivering on our decarbonisation commitments.

And it is this final area of decarbonisation that I am excited to have the opportunity to speak to you about today.

## Decarbonisation: operational emissions

WAIO is on track to deliver our plans to lower operational emissions, with further upside potential as new technologies emerge

WAIO is one of the lowest carbon intensity iron ore producers globally<sup>4</sup>

Renewable PPA to lower electricity greenhouse gas emissions at Port Hedland by 50%<sup>14</sup>

Yarnima power station to provide firm power while technology evolves

Large proportion of our Pilbara operations' power generation planned to come from renewables by 2040

Working with OEMs to replace our diesel locomotives and trucks with battery electric technology

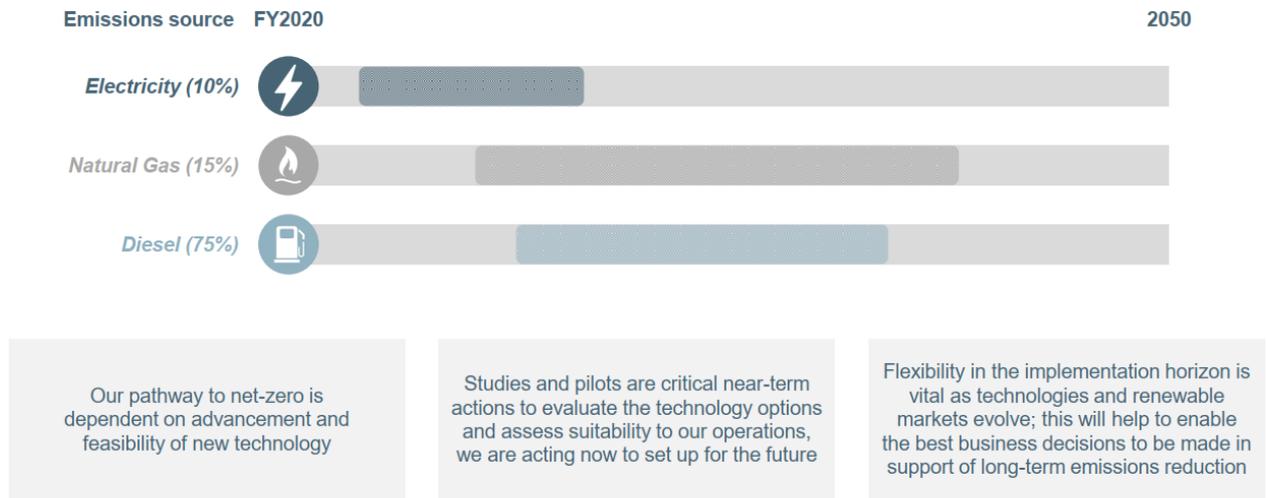


Over the next fifteen minutes or so, I'm going to run through:

- an overview of WAIO's greenhouse gas emissions reduction pathways,
- more information on the Power Purchase agreement we recently signed at Port Hedland,
- how we are using our gas fired power station, Yarnima, to provide low emission firm power for our mines in the Pilbara,
- how we plan to transition away from this gas to renewable power, and
- how we are working closely with our equipment manufacturers, across rail and mines, to trial new technology and eliminate the use of diesel.

# WAIO's decarbonisation pathway

Delivering structural abatement of emissions through technological advancement



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Before we dive into WAIO and the detail on the slide, let me recap on BHP's plans as a whole.

Reducing greenhouse gas emissions is a key component of our climate change strategy and 2030 social value scorecard.

In 2020, we set a medium-term target to reduce Group operational emissions by at least 30 per cent from FY2020 levels by FY2030, and we also set a long-term goal to achieve net zero operational emissions by 2050.

We will significantly reduce greenhouse gas emissions on a global scale, but to do so, we need to take on one of the most challenging transformations our industry has seen and address problems that have not yet been solved, and WAIO plays a big part in this transition.

Overall WAIO accounts for around a quarter of BHP's total greenhouse gas emissions but the source of these emissions differs from the rest of BHP Group as a whole.

As I'm sure you will have seen on previous charts we have released, in FY20 roughly 40 per cent of BHP's total Group emissions came from electricity, 40 per cent from diesel and the remaining 20 per cent from other sources.

At WAIO, it's 10 per cent from electricity we purchase, 15 per cent from the natural gas we use to generate electricity, and 75 per cent from diesel and, as many of you will know, it is currently much harder to reduce emissions from diesel consumption than it is from electricity.

That is why the decarbonisation pathway here non-linear and heavily reliant on technology development, we can't just make small incremental gains, we need to completely transform our mining operations through a highly integrated abatement program, closely following the technical maturity of each component of the strategy.

Furthermore, as Brandon spoke about earlier, options are being studied to increase production at WAIO over the coming years, meaning that structural abatement solutions will be vital to make sure we account for any additional operational emissions that occur.

Moving to the slide, you can see that our decarbonisation plan at WAIO has three focus areas. The darker shaded bars are indicative of the timing of each of these phases.

The first is to decarbonise our purchased electricity supplies at Port Hedland.

This is a relatively low-risk step that can be achieved in a capital-efficient manner by leveraging commercial solutions, such as Power Purchase Agreements.

The second is to increase the renewable power sources available to our Pilbara Operations.

And the third is to eliminate our emissions from diesel by electrifying our truck and locomotive fleets.

**WAIO's decarbonisation pathway (continued)**

This last step not only requires us to completely change our fuel source and the delivery network around it, but this transformation will significantly increase our electricity demand.

Eliminating diesel becomes an even more complex task, when you consider the technology isn't yet commercially available.

We are working in close partnership with our OEMs to test and develop new technologies for this, but the lead time for implementation is long and we have large fleets.

I will talk more about both later.

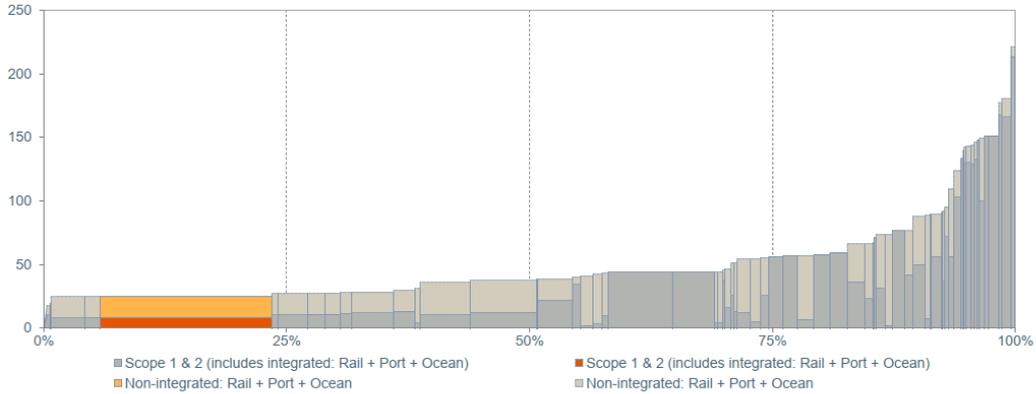
Our plan represents a balance between rapid implementation of renewable energy and advancement of diesel displacement in a way that preserves optionality and sets us up to achieve net zero emissions by 2050.

It's aspirational, but achievable.

# WAIO is one of the lowest carbon intensity producers

WAIO represents around 22% of BHP's overall operational emissions (Scope 1 and Scope 2)

2021 Carbon Intensity – Seaborne Iron Ore<sup>15</sup>  
(Kilograms CO<sub>2</sub>-equivalent per tonne of iron ore (wet))



Source: Skarn Associates, BHP.  
Western Australia Iron Ore site tour  
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So that is where we are headed, but we are also starting from a very strong place.

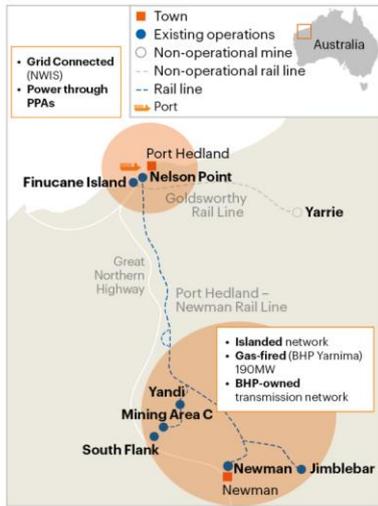
Like many of BHP's assets, WAIO is already one of the lowest carbon intensity emitters among our global iron ore competition, that's how much carbon we emit per units of production.

We are bottom quartile, as you can see in the chart here, this position is highly influenced by our world class resources, our highly efficient gas power generation and our proximity to infrastructure.

While this is encouraging it will not change our decarbonisation ambitions.

# New PPA to reduce emissions at Port Hedland

Alinta agreement expected to deliver a 50% reduction in emissions at Port



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⚡ ~75 MW demand (Port)  
~150 MW demand (Pilbara)

🌐 ~610 kt CO<sub>2</sub>-e GHG emissions<sup>16</sup>  
(~25% of WAIO total)

## Port

- Integrating a 45 MW solar farm, 35 MW battery energy storage system and low emissions intensity thermal power
- Scheduled to be fully operational in late 2024
- The PPA is expected to deliver cost savings, provide optionality to improve network redundancy and maintain firm power supply as well as providing a 50% reduction in reported emissions from electricity at our Port facilities<sup>14</sup>
- BHP and Alinta Energy have also entered into a memorandum of understanding in relation to the development of the Shay Gap Wind Farm. The Shay Gap Wind Farm is currently planned to be 45 MW, with a potential first-generation date of 2027

## Pilbara

- Pilbara requires a more complex solution as it is an islanded network

Moving to how we will achieve these ambitions. As I mentioned earlier, understanding our power supply and demand is essential.

The power consumption at WAIO can be split into two areas as can be seen on the map here:

In the North, at Port Hedland, our Port Operations. They account for approximately 10 per cent of WAIO's operational emissions and are connected to the North West Interconnected System (or N-WIS).

And in the Pilbara, our mining operations, they account for around 15 per cent of WAIO's operational emissions and are an islanded network.

Being connected to a grid at Port allows for simpler, commercial pathways to decarbonisation, so I'll start there.

In September, WAIO signed a Power Purchase Agreement (a PPA) with Alinta to purchase 100 per cent of the energy produced by a solar farm that will be constructed near Port Hedland and which will be operational by the end of 2024.

This solar battery hybrid project is expected to be the first large-scale renewable facility at Port Hedland and will support the expansion of the renewable energy industry in Western Australia.

Once completed, it will supply 100 per cent of the forecast average daytime energy requirements at Port. The remainder of our power will come from an integrated battery energy storage system and gas power station facilities.

The PPA will halve our Port Hedland emissions based on current demand and compared to FY20.

It also offers cost savings and will provide optionality to improve network redundancy and maintain firm power supply.

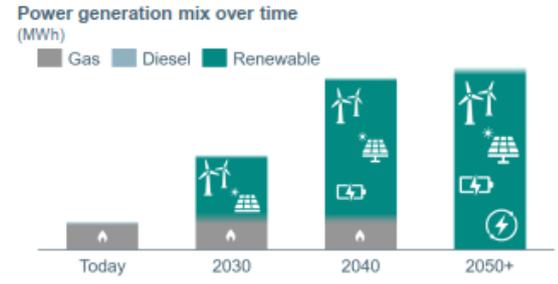
To achieve net zero emissions at Port Hedland, which we would like to do by 2030, we will need more renewable generation capacity within the grid.

To accelerate this, we have also entered into a memorandum of understanding with Alinta in relation for the Shay Gap Wind Farm, with a potential first-generation date of 2027.

Now let's look at powering our mines in the Pilbara.

# Our renewable transition will be supported by Yarnima

Our highly efficient Combined Cycle Gas Power Station will provide firm power in the Pilbara



- Yarnima enables the production of reliable gas power while emitting fewer tonnes CO<sub>2</sub> emissions per MWh produced than our competition
- A further ~900 MW of generation will be required to support growth and the power demands of electrification of trucks and locomotives
- By 2040 we intend to have a large proportion of our electricity generated from renewable sources
- Yarnima's future will be assessed as large-scale carbon neutral firm generation options become commercially available
- Our goal is that 100% of electricity generated will come from net zero greenhouse gas emissions sources by 2050

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Chart is illustrative only, not to scale

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The Pilbara is an islanded network and the power for our WAIO mines is generated by our Yarnima power station.

It is a highly efficient open cycle gas turbine power station with 190MW capacity. It also produces power on a relatively low emissions basis, emitting 40 per cent less kilograms of carbon dioxide per megawatt hour produced than the Australian average and, as the chart on the left shows, significantly less than our competitors in the Pilbara.

Our mining operations require a reliable, consistent base load of power with the flexibility to meet variable peak power demand as required at different times. Yarnima is critical for us in the mid-term to support our journey to renewable energy, it will be able to supply our power base load, 24 hours a day, 7 days a week, it is a very attractive option due to its high efficiency and relatively low emissions.

Today, the power demand from our Pilbara operations is approximately 150MW. But, as I mentioned earlier, this will need to increase significantly to support the electrification of our mines and rail network.

By 2040, we estimate we will need a peak power only demand of around 1GW to do this, approximately 900 MW more than today. We expect this increased demand will be met by a mix of gas and renewables, with the proportion of renewable generation increasing over time - as demonstrated by the chart at the bottom left.

The transition to greater renewable supply will start with proven renewable technology such as wind and solar farms, and we will continue to explore alternative renewable and long duration storage options as technology advances.

It is important to note that gas will continue to have a critical role during the energy transition to provide the base power demand needed to support the energy demand of our operations, even if we don't fully utilise it.

And, as generation from renewables increases, the requirement for gas to provide this base load and stability also increases, it's our essential backup.

We will taper off our gas requirements, as more options for carbon neutral firm power becomes available. To accelerate this we are working with teams across the business including our innovation and ventures teams who are exploring long duration energy storage and other innovation solutions for firming.

So, we are going to need a lot more power down the track, where is it going to come from?

In terms of whether we buy it, or build it, and precisely which sources we use, we are working hard now on these studies and pathways now.

**Our renewable transition will be supported by Yarnima (continued)**

But we do know this:

- 1 our energy demand in the Pilbara will increase significantly... we estimate around seven times our current demand by 2040 as we eliminate the use of diesel across our rail and mining operations,
- 2 a large proportion of this increase will be met by renewable sources,
- 3 the renewable energy sources will need to be built and, as lead times are long, we need to act now.

Now moving onto diesel, and our Rail Operations.

# We are trialling battery electric locomotives

Preparing for the replacement of our diesel powered locomotive fleet



~180 locomotives

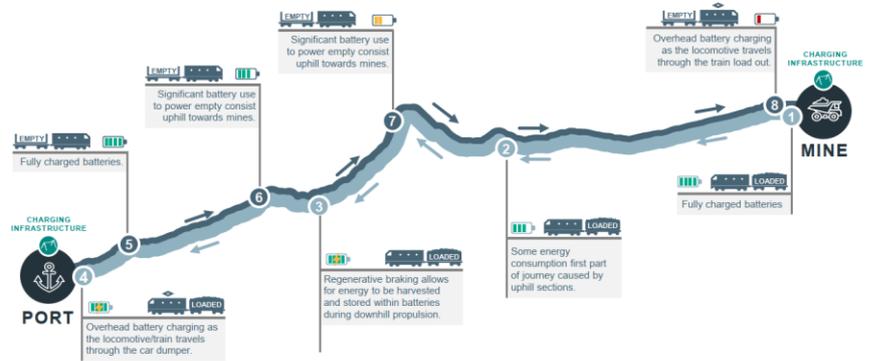


~190 million litres of diesel annually



~490 kt of CO<sub>2</sub>-e GHG emissions (~20% of WAIO total)

- Partnership agreements signed with Wabtec and Progress Rail in January 2022
- Each OEM will supply two battery electric locomotives for an operational trial in Q3 FY2024
- Trial will test the potential of energy recapture using the unique topography of the rail network
- On completion of a successful trial, battery electric locomotives are expected to be delivered from 2027



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The rail network accounts for about 20 per cent of WAIO’s total emissions. We have around 180 locos which use almost 200 million litres of diesel each year while traversing our extensive network of track from the Pilbara to Port Hedland.

In January, we signed partnership agreements with two locomotive manufactures, Wabtec and Progress Rail, to develop battery electric locos.

We are currently aiming to trial the locos, two from each manufacturer, in 2024 and, upon completion of a successful trial, our existing fleet will be replaced from 2027, with full roll out by mid-2030s.

We are targeting battery electric here due to the topography of the run between the mines and Port Hedland. As may be aware the route is downhill almost all the way from mines to Port Hedland, that’s when the trains are heaviest carrying their load.

We can take advantage of this by using regenerative braking to harvest and store energy on that leg, reducing overall power demand by up to a half.

Coming back, it’s uphill, but the trains will be empty and will require less power than if they were full.

This means potentially we only need to charge in two places, at the mine train load-outs and at the port car dumpers, and at both places they are already moving slowly.

So, we can use dynamic charging at these two locations to minimise any potential impact on train cycle times.

We will learn more on the system energy needs as the trials progress

Moving to our other large diesel user, our mines.

# Mines will focus on battery electric technology

Collaborating for large-scale haul truck electrification solutions

~300 haul trucks<sup>18</sup>  
 ~45 excavators  
 ~500 ancillary equipment

~500 million litres  
 of diesel annually

~1,340 kt CO<sub>2</sub>-e GHG emissions  
 (~55% of WAIO total)

- Partnership agreements signed in 2021 with Komatsu and Caterpillar to accelerate development and deployment of Zero Emission Haul Trucks
- Caterpillar battery electric early learner haul truck to be trialed in 2025
- On completion of a successful trial we are aiming for the first battery electric haul trucks to be operational by 2027, with full fleet replaced by mid-2030s
- Where possible current fleet life will be extended to meet the commercialisation of battery electric technology
- Charge-on-Challenge identified need for industry collaboration to standardise charging interfaces for mining equipment



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In WAIO, we have over 800 pieces of mining equipment, using approximately 500 million litres of diesel a year. This accounts for around 55 per cent of WAIO’s greenhouse gas emissions.

We have partnered with two of our current vendors, Caterpillar and Komatsu, to work collaboratively to develop commercially viable zero emissions trucks.

The agreements were signed in August 2021 and a CAT early learner truck will be available for us to trial around 2025, with commercial releases for both vendors expected to follow later in the decade.

We estimate, and it is still too early to be definitive on this, that the first electric haul trucks will be operational on site by 2027, and that all trucks will be replaced by the mid-2030s.

These are estimates only.

In the interim, a diesel haul truck life extension program is underway to bridge the gap until the battery electric trucks are available.

It is not just about buying new equipment though. Replacing diesel as a fuel source requires us to develop a whole new operational ecosystem to surround the fleet. We need to address the way we plan our mines, operate our haulage networks, and consider the additional safety and operational considerations that these change will bring.

We are taking a collaborative approach to make sure we find the right solutions to these problems.

We’ve been working with industries from across the globe in the Charge on Challenge, an initiative that allowed us to review technologies and solutions from around the globe. From this we identified eight key submissions from innovators, on how to expedite the commercialisation of charging solutions for electric haul trucks.

Even more recently, just last week, we announced alongside Rio Tinto, Vale and GHD, that we have established a Mining taskforce with CHARIN. CHARIN is an association with over 280 members worldwide dedicated to promoting interoperability based on the combined charging system as the global standard for charging vehicles of all kinds. The Mining taskforce’s aim will be to make sure any truck charging interfaces across the industry will be standard, regardless of the manufacturer.

So, in summary...

## Decarbonisation: operational emissions

WAIO is on track to deliver our plans to lower operational emissions, with further upside potential as new technologies emerge

WAIO is one of the lowest carbon intensity iron ore producers globally<sup>4</sup>

Renewable PPA to lower electricity greenhouse gas emissions at Port Hedland by 50%<sup>14</sup>

Yarnima power station to provide firm power while technology evolves

Large proportion of our Pilbara operations' power generation planned to come from renewables by 2040

Working with OEMs to replace our diesel locomotives and trucks with battery electric technology



WAIO is already one of the lowest carbon intensity iron ore producers globally, and we are on track to deliver further reductions in operational greenhouse gas emissions by 2030.

We have secured a PPA which is expected to halve our emissions at Port Hedland with a further 45MW of wind currently planned with a potential first-generation date of 2027.

In the Pilbara, we will use our highly efficient Yarnima power station to provide firm power while the technology for carbon neutral firm generation evolves.

By 2040 we expect to require a further 900MW of capacity with a large proportion of our power generation in the Pilbara to come from renewable sources.

We are working closely with equipment manufacturers to replace our diesel locomotives with battery electric technology, and to produce a commercially viable battery-powered haul truck, both are vital long-term, as 75 per cent of WAIO's emissions come from our use of diesel.

As I said earlier we believe our decarbonisation plans are aspirational but achievable, and we will continue to optimise them as new technologies emerge, and commercial applications are better understood.

Thank you for your time, I look forward to meeting you as we continue our tour over the next few days and I will now hand back to Tristan.