

## Rio Tinto Iron Ore – Investor Presentation Script

### Chris Salisbury

#### Opening

Thank you, Natalie and good afternoon to you all.

Welcome to the Rio Tinto Iron Ore investor presentation and site visit.

I would like to acknowledge the Traditional Owners of this land, the Whadjuk people of the Noongar nation, and pay my respects to their elders, past, present and emerging.

I would also like to acknowledge the Traditional Owners of the Pilbara on whose land our operations are based.

I'm delighted to be here today to showcase to you our Pilbara operations, the world's premier iron ore business.

#### **Slide 1 – Iron Ore - Delivering value from flexibility and optionality**

The theme of today's presentation is to demonstrate how we are building a flexible market driven production system that we believe will continue to deliver outstanding value to shareholders.

#### **Slide 2 and 3 – Cautionary and supporting statements**

I will take the cautionary and supporting statements slides as read.

#### **Slide 4 - Our value over volume strategy maximises free cash flow**

When I joined Iron Ore two years ago, I had a mandate to safely deliver optimal value from our fully integrated system.

This mandate is unchanged, and we continue to focus on creating additional value - a major part of which is building a system truly capable of responding to the market, and customer requirements.

Our strategy is built on a portfolio of world class assets; our highly valued Pilbara Blend product and an exclusive, fully integrated system. Of course, our strategy would not be possible without our highly skilled and engaged people, and supportive partners.

It is this foundation which enables us to maximise cash from our assets by pursuing a value -over- volume approach.

In every decision we make the focus is on value.

For example, decisions about how we build our project pipeline and develop capital projects, which mine we expand or extend, how we blend ore from each mine, what products we are delivering to our customers, and how we operate our assets, are all driven by value.

Today, you will hear how each team continues to maximise value in their part of the business, and how this links to the overall value that we can create from our integrated system.

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### **Slide 5 - Health and safety come first**

Underpinning everything we do is the priority we place on health and safety. They remain a core value and will always come first at Rio Tinto.

We have a balanced approach to continuing to improve our safety performance, with a business wide focus on fatality elimination, reducing injuries, catastrophic event prevention (also known as process safety) and supporting positive health in the workplace.

As discussed earlier with my safety share, our fatality elimination programme is focused on critical risk management, and we are seeing continuing strong safety performance. The entire Iron Ore team, and everyone who works with us, are relentless in the pursuit of zero harm.

We also continue to implement technology to reduce risk exposure for our employees and contractors. Automation continues to reduce the number of people exposed to hazards, reduces the number of critical risk scenarios, and improves the level of control effectiveness by implementing engineering controls.

### **Slide 6 - World class assets, fully integrated and agile network**

Our task sounds simple, we find iron ore; drill and blast; haul it, crush and sort it, and then ship it to customers.

This is of course an oversimplification.

And as you'll hear today and see over the next few days, the Pilbara is a world-class, highly sophisticated, technologically advanced, fully integrated system.

We are managing a network of 16 iron ore mines, 4 port facilities, a 1,700 kilometre rail network, and over 11,500 employees, together with a significant amount of supporting infrastructure such as power stations, airports, camps and towns.

Rio Tinto owns, or operates on behalf of our Joint Venture partners, all of the assets and has exclusive use of our fully integrated rail and port system. This unique advantage offers us great optionality in how we run the system day to day.

Today, our Pilbara operations are being transformed to dynamically flex in line with market conditions.

Put simply, we want to create an ability to respond rapidly to change.

The operations centre in Perth is our real time nerve centre, running around the clock, 365 days a year, optimising the system and allowing us to make immediate decisions, and take actions to unlock value.

How we respond, the speed of the response and accuracy of our decisions - drives value. We look to extract improvement through planning and co-ordination, debottlenecking, and productivity gains. From the incremental second to the big win of a minute ..... it all adds up in a business of our scale. Particularly when we are able to replicate improvements across the system.

Along with system improvements, we are also leveraging value from automation and technology. From example - autonomous trains, trucks and drills, to the advanced systems at the operations centre.

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### **Slide 7 - Priority remains to optimise infrastructure capacity and build flexibility**

We remain focused on optimising our full system infrastructure – 360 million tonnes per annum nameplate at the port, with flex either side, dependent on the value proposition, and delivering a consistent blend for our customers.

Mine capacity of around 360 million tonnes per annum, will come from productivity gains in the existing mines, plus the additional capacity from our newest mine, Silvergrass, once it is fully ramped up. This will be similar to our nameplate capacity at our four ports. In December 2017, we were able to test our port sprint capacity and achieved a record throughput run rate of approximately 390 million tonnes per annum demonstrating the inherent upside capability in these outstanding assets.

Working on increasing flexibility within the system through removing our bottleneck in rail remains a key priority and Ivan will tell you more about how we are tackling this. This work is progressing well and rail and mine capacity should be in line with nameplate port capacity by the end of 2019. We will continue to optimise the system to provide the flexibility to respond to market conditions. But I must stress – as we have said many times before, capacity is not the same as tonnes shipped. How we use the capacity of our integrated will be dynamic, in line with a strict value over volume approach.

Our aim is to be more responsive to short term market conditions, with the ability to flex to deliver the right product, to the right customer at the right time. This is the essence of our value over volume strategy.

### **Slide 8 – Global macro indicators remain supportive**

Now, let me now take a step back and discuss the macro backdrop in which we are operating today.

Around the globe, there is increased volatility and uncertainty. However, the general outlook remains solid, and there are positive indicators for global growth in most geographies. In fact, the recent IMF data indicates that 2018 could be the strongest year since the global financial crisis.

If we turn to China, our biggest customer, there is continued supportive external demand linked to good global conditions, and we remain cautiously optimistic about the medium term outlook. However, as we flagged in December last year, Chinese growth is showing a measured and controlled deceleration from the strong rates seen in 2017.

Demand for high quality iron ore is still strong, supported by Chinese policies around environmental controls, and we will cover this in some detail later.

Turning now to supply.

### **Slide 9 - Seaborne supply response remains muted...**

As you all know there is still additional seaborne supply being added to the market. This is the tail end of expansions which are well known.

For 2018, we expect that there will be additional seaborne supply of approximately 40 million tonnes, including increased shipments from Rio Tinto, which is in line with our guidance.

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However, this additional supply is being mostly offset by disruptions at Minas Rio, India and at our own IOC mine in Canada which was impacted by a now resolved strike, along with tonnage exiting in Australia, and in Sierra Leone.

Overall in 2018, we are expecting very little net additional supply.

Inventories at Chinese ports have remained reasonably steady at around 160 million tonnes. These stockpiles predominantly comprise of lower quality ores and, despite absolute volume fluctuations the proportion of high quality ore in the stockpiles has remained consistent and range bound. It's worth noting that included in the growth of stockpiles are additional amounts of working capital as a result of Vale's blending strategy.

### **Slide 10 - ...and Chinese domestic production remains steady**

China's domestic iron ore production remains steady.

After relatively sharp price declines, domestic supply declined from greater than 400 million tonnes in 2013, to around 230 million tonnes in 2016. Although we observed a modest rise in production last year, pollution controls and safety inspections have triggered a contraction towards ~240 million tonnes per annum rates in 2018 year to date.

Output declines in recent years were primarily from private mines, while SOE mine output remained relatively stable. SOEs now account for over half of domestic iron ore supply (despite accounting for less than 40% of capacity), and as SOE's share of output increases, the elasticity of domestic supply to price has gradually diminished.

Lower elasticity to price was also observed last year, due to a combination of higher SOE output, environmental-related restrictions, more stringent mining license approvals, as well as a general policy push to shut smaller mines.

Just a few days ago, the city of Tangshan in Hebei province announced the closure of 226 mining companies which did not have legitimate operational licences – more than half of these companies were iron ore miners.

In summary, following years of rapid iron ore supply growth, we are now seeing both lower net additions in the seaborne market, coupled with structural reductions in Chinese domestic supply.

### **Slide 11 – Our Iron Ore consistently generates superior margins**

Our assets in the Pilbara are world class.

But it's not just about having the best assets, it's how they are run.

The results are clear.

Strong EBITDA margins have been a feature of our iron ore business over many years and through many cycles. This business generates the strongest margins in the industry, 68 per cent in 2017 and has achieved an average margin of greater than 50% since we started mining 50 years ago.

Over the last 10 years, our Iron Ore business has consistently generated the highest EBITDA margin across the sector, with an average margin of over 69%.

And whilst value delivery is all about margin, we have not taken our focus off managing costs, and these remain in the first quartile.

### **Slide 12 – Multiple low cost, value accretive capital options**

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We have leading operating margins and we also are focused on the capital intensity of new and replacement mines.

We have a pipeline of robust development options. We have many low cost, high value, replacement or growth options.

When we think about capital allocation, the first port of call for capital is sustaining, or “stay in business” capex. This is the cost of maintaining our existing assets, trucks, plant and other kit.

Following the recent expansions across the business and the new equipment, we have benefited from a short term lower sustaining capital cost, and in the past few years this amount has been averaging around \$2 per tonne.

We are now seeing this spend starting to increase as we move further away from the recent expansions, but it is vital that we ensure our large asset base remains well protected.

Over the next 3 years, we expect to spend around \$1 billion per year or approximately \$3 per tonne on sustaining capital. We will however, actively manage our portfolio of capital work, utilising risk assessment and prioritisation, and seek to optimise our capital spend across our system.

We will also need to invest in replacing depletion across the portfolio. Over the next three years, 2018 – 2020 we expect to spend around \$2.2 billion on replacement mines.

In the near term that sees a number of our mines (such as Yandi, West Angelas and Robe Valley) requiring access to new deposits within their existing mining areas. In most cases these developments leverage off existing footprints and plant infrastructure making them low in capital intensity.

Koodaideri, however, is different as this involves the development of a new hub which requires additional infrastructure. Koodaideri is a large scale, low cost, high quality replacement project. The ore body is 50km long and up to 5km wide. It is a Brockman type ore and will be part of the Pilbara Blend. Subject to approval, construction is scheduled to commence in 2019, with the first tonnes expected to be delivered in 2021.

It will be a new production hub which will be a key feature of the Pilbara for many years to come.

Koodaideri capital has previously been communicated at around \$2.2 billion and we are currently in the process of finalising the feasibility study. The work that we are doing on this includes an up to date review of the scope of the project and the support infrastructure required.

Kellie will take you through how we manage our growth pipeline and plan the sequence of our replacement mines, but of course it goes without saying that any decision around capital allocation will be based on value over volume.

### **Slide 13 - Sustainable long term low cost position underpinned by our world class assets**

Whilst demonstrating that best in class margins is where value is created, we have not taken our focus off operating costs.

Our recent performance demonstrates this well, as we have been able to reduce our costs, despite underlying internal and growing external cost pressures.

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Since 2013 we have reduced our operating costs to \$13.40 per tonne. This is despite salary escalation and general inflation, increases in cyclical maintenance, and longer haul distances, which add to our load and haul cost headwinds as our pits become further away from the crusher.

We have also seen increased costs as the proportion of material mined below the water table increases. This ore is more difficult to process, showing that our work on reducing costs has been successful.

We have improved productivity across the business. This has been achieved through a lot of hard work by our teams, and it does not come easy. We have done this by:

- Streamlining our organisation from a peak of ~14,000 FTE in 2014, to around 11,500, this has been done by ensuring the right work takes place in the right locations, automation, removing management layers and improving our labour productivity.
- Optimising the performance of existing equipment and infrastructure – we have increased the capacity of our haul trucks, put more ore onto our trains, and have made our trains longer. By working with our OEMs and ensuring the right maintenance strategies exist, we are able to do more with the assets we have. Matt and Ivan will talk more about this later, and you will see this for yourself on site in the next few days.
- We have worked with our suppliers to provide more efficient services in areas which are not core to our business – such as our contract with Sodexo to manage our camps; catering and general transport; or consolidating our services agreements with Workpac. These examples alone have saved more than \$75 million across 2016 and 2017.

These are just three examples where we can demonstrate clear results.

Maintaining our current cost position is getting harder however, and both Rio Tinto and the industry in general, is seeing increasing cost pressures across a number of areas.

Of course, there are the regular movements in the cost of diesel. Just this year, diesel has increased by almost 19% compared to the similar period in 2017. Diesel and energy costs make up around 14% of our costs. A 10% increase in the price of diesel adds \$35m to our operating costs.

Since I talked to you in December, we are also starting to see labour and contractor rates increase.

These of course are nowhere near the levels of costs that we saw during the boom period. However, in the last 18 months, the hourly rates for plant and mobile equipment operators and fitters have increased by up to 10%.

With a business of our size, at any point in time we also run up against peaks in cyclical maintenance. The benefit of our scale is that we can often “smooth” the maintenance work required across our mines and infrastructure to ensure that our overall maintenance costs each year remain relatively consistent, but this isn’t always possible.

Our mining fleet, consists of more than 1000 mobile assets, with an average major equipment component life of around 5 years. As our fleet ages, maintenance cycles and rebuilds occur. For example, at Greater Hope Downs this year we will complete 19 engine change-outs, whereas last year we only did 6.

These headwinds are why our productivity programme is so important. It’s about trying to protect our margins against inflation and deliver more free cash flow from our assets.

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### **Slide 14 - Productivity options to continue to deliver cash benefits**

Across Iron Ore, we have a productivity programme which is driving performance, or PDP as we call it. Launched in 2016, PDP is a programme that forms a critical aspect of our operating model. It is driving a culture of cost discipline, productivity and innovation.

We are driving cost management and productivity at the mine face, and making it part of what each and every one of our employees works on.

We are currently have more than 4,500 initiatives. Initiatives which have been developed from the shop floor, as well as from the top down.

The PDP programme follows a weekly cadence – with participation from myself, all the way to initiative owner. The regular meetings are important to provide a structured stage gate process, ensuring disciplined initiative execution. The meetings also provide a regular opportunity to recognise improvement effort across the business.

Put simply, PDP is the tool which we use to ensure that Iron Ore delivers on our contribution to the broader Rio Tinto target of \$5 billion of additional free cash flow by 2021 with an exit run rate of \$1.5 billion per year.

Iron ore's contribution to the group \$1.5 billion target is around \$500 million of additional free cash flow each year from 2021. This is a tough target, as we don't adjust for the increasing input costs that we've already talked about, or take credit for additional volume generated through major capital investment but I'm confident that with the support of our employees we can achieve this.

You'll hear quite a lot more about our PDP programme over the next few days and get a chance to talk to those on the ground at our operations about how they are looking at each and every opportunity to improve performance. This slide illustrates just some of the initiatives in the pipeline.

### **Slide 15 – Supported by our people and partners**

Underpinning our performance and returns for our shareholders are our four priorities. We are focused and committed to our:

- World-class portfolio.
- Excellence in performance, including safety;
- Having the right people developing industry leading capabilities;
- And strong relationships with our partners whether they are our customers, suppliers, investors, governments or communities.

Integral to our business is our commitment to generate significant benefits across Australia and in particular for the local communities that host our operations.

Australia is home to about half of Rio Tinto's global assets. We continue to invest in Australia, with new developments, not just in iron ore but across Rio Tinto. Of the \$5.1 billion the Rio Tinto Group paid in taxes and royalties in 2017, \$3.8 billion was paid nationally across our Australian assets and, \$1.3 billion in state royalties were paid right here in Western Australia. A significant contribution by any measure.

11,500 employees and thousands of contractors support our business. Our diverse people are our business, and they play a vital role in delivering additional value for our shareholders. We are a large private sector Indigenous employer and we are building workforce capability to support, develop and

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retain our people.

### **Slide 16 – Iron ore is consistently generating superior shareholder returns**

Our strategy is to build a flexible market-driven production system – delivering on our Value over Volume commitment

We have a strong operating model and a culture of productivity, driving performance which will continue to increase the value derived from our assets right across the business.

We will continue our focus on how we can optimise our integrated system, reduce our costs, and improve our equipment utilisation from the mines through to the ports, and leverage technology and automation.

The outstanding mineral resource base we control supports a pipeline of replacement mines with competitive capital intensity and operating costs.

Our world class system will continue to generate sector-leading returns for decades to come.

I will now hand you over to Simon Farry – VP Sales and Marketing.



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### **Slide 17 – Simon Farry – Introduction Slide**

Thanks Chris and welcome everyone.

### **Slide 18 - Controlled deceleration in Chinese growth**

Before we start talking specifically about our customers and our products, I'm sure you'll be interested to hear a bit more about the current market and pricing environment.

As Chris said, back in December we talked about the potential for a slowdown in the first six months of 2018 and in particular, that growth in construction, infrastructure and automotive demand may weaken. This is what we are currently seeing playing out in the market.

Chinese GDP growth slowed slightly but remained strong at 6.8% in the first quarter, well ahead of the 2018 target of 6.5%. Improved profitability and stronger export demand due to the global recovery are helping to offset the effects of ongoing deleveraging efforts and a slowing property market.

For Iron Ore, what matters is the demand that we are seeing coming out of the key sectors of infrastructure, property, manufacturing and automotive.

Improved profitability, supported by the ongoing supply side reforms, has been positive for manufacturing investment as industrial production stabilises. While property sales growth is weakening, housing starts remain healthy due to low inventories.

The government has also made it clear that it will intervene if domestic demand growth weakens. Measures, including a tax cut for manufacturers and SMEs have already provided positive support to domestic business sentiment

All in all, the near term outlook for China remains quite healthy, with only a modest slowdown likely this year. China's heavy industrial sectors are in good shape due to the ongoing positive economic environment.

As Chris has already mentioned, demand for high quality iron ore remains robust, and I will turn now to the steel industry fundamentals.

### **Slide 19 – Supply-side reform and tightening environmental policy has driven structural changes**

China's capacity elimination programme has arguably been one of the most impactful events in the history of the modern steel industry. China has achieved in a small number of years what the OECD has grappled with for decades and that is the removal of excess steelmaking capacity. China is set to become the first major economy to emerge from its early phase of industrialisation without a steelmaking capacity hangover.

Having addressed a number of imbalances in its coal market, starting in 2016 China's government launched the implementation of a number restructuring initiatives in the steel industry. These specifically targeted the elimination of excess steel capacity, the restoration of steel mill profitability and the reduction of debt ratios and non-performing liabilities.

The supply-side reforms coincided and were reinforced by the vigorous and uncompromising implementation of long-existent, but previously circumvented pollution and emissions controls. Initially focused on delivering an improvement in North-East China air quality during the winter heating-season, pollution controls have since become the new normal irrespective of region or time of year.

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As recently as the 4th of June, Shanghai announced that it will curb output from industries like petrochemicals, steel, cement and shipbuilding during days of heavy pollution.

The impact of environmental policy implementation coupled with supply-side reforms, has resulted in a step-change to higher capacity utilisation and higher profitability in China's steel industry. That in turn, underpinned the focus on steel mill profitability and the preference for higher quality iron ore products which has been that are so clearly evidenced in the market.

In the absence of any rationale for the Chinese authorities to reverse or relax the enforcement of their industry and environmental policies, we expect the productivity focus to remain in place for the foreseeable future. This will sustain iron ore quality differentials well above the levels that were previously observed during periods of surplus production and negative profitability.

In our view, there is clear evidence of structural change in the iron ore market. Let's now review this in more detail.

### **Slide 20 - China's supply-side reform and environmental policy have created a more efficient industry...**

In 2016, the reported 65 million tonnes of steelmaking capacity closures had a relatively muted impact on the industry, with much of this capacity reported to be already idled. However, further capacity closures in 2017, coupled with the removal of approximately 140 million tonnes of unreported induction furnace capacity, has had a material impact on the industry dynamics.

While steelmaking capacity has reduced, steel demand has continued to be robust. As a result, capacity utilisation rates of steel mills in China rose from below 70% in 2016 to close to 90% last year, well above the 2017 global steel industry average of 72%.

This shift was reflected in Chinese steel prices, which bottomed out in early 2016 and have since rebounded significantly towards multi-year highs.

### **Slide 21 – ...causing a structural shift towards productivity**

This sharp rise in capacity utilisation rates has driven a marked improvement in steel industry profitability, both in China and globally. This has in turn changed in how steel mills value their raw materials.

The focus on steel mill productivity has become the key driver for iron ore product premiums and discounts.

Processing of lower quality ores reduces blast furnace capacity. It also requires higher amounts of coke, PCI and fluxes and incurs costs associated with slag management. Our analysis shows that around 70% of the low grade iron ore discount must be attributed to the Chinese steel mills' focus on productivity rather than the costs or usage of raw materials.

Let's examine this in more detail.

### **Slide 22 - Northern China is driving structural change to iron ore pricing**

I would like to discuss some observations from our frontline sales and marketing team and comment on the link between iron ore quality, steel mill productivity, and iron ore discounts.

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Northern China is a key market for price setting. There is more steel produced in North China than the rest of Asia combined and North China has about double the installed steel capacity vs South China. 70% of our spot sales go to North China, supporting price formation.

It is the inland, smaller, more flexible and often private mills that dictate iron ore prices. It is these mills that are the ones under increasing environmental scrutiny.

Compared with other regions, these blast furnaces tend to be smaller and less efficient, having higher slag production and higher fuel consumption. Capacity reforms have seen the average blast furnace size increase to well over 1000 cubic meters this remains small in comparison to our East Asian customers who operate with 4000 cubic meter blast furnaces.

Northern China also consumes significantly more low grade iron ore than other regions. On the left is a typical blast furnace in Northern China. Hebei and Liaoning provinces produce most of China's domestic iron ore in the form of concentrate. Steel Mills in North China use this low alumina, higher grade domestic concentrate, in the form of sinter or pellets, to leverage the use of higher alumina, lower grade iron ore.

In Southern China, the use of lower grade iron ore is constrained by steel mill technical parameters such as slag or sinter alumina, as well as limited access to higher grade domestic concentrates. For reference, we observe that steel mills in Northern China use around 30% more low grade iron ore compared to a typical Southern China steel mill. Steel mills in East Asia only use very small volumes of low grade iron ore in their sinter feed as minimising slag production is a key driver.

If we rewind only a few years, northern steel mills saw higher value in lower grade iron ore as the use of these products did not impact their production. An excess of sinter capacity meant that sinter production was not the bottleneck. Steel Mills could consume this lower iron sinter and maintain production by running their small blast furnaces aggressively. With recent changes in steel and environmental policy, which have impacted both sinter and blast furnace capacity, producing more sinter and running blast furnaces aggressively is no longer an option.

The productivity of North China steel mills is very sensitive to iron ore grade. For a typical North China steel mill, we would expect a 1% increase of iron in sinter to result in an increase of over 2% in hot metal production. This sensitivity to iron ore grade, combined with sustained steel mill profitability, supports the use and the value of higher grade iron ore in this key price setting market.

Looking forward we expect that ironmaking practices will become more efficient and similar to practices in southern China or East Asia. Even then, production remains sensitive to iron ore grade and together with sustained steel mill profitability will drive a continued preference for higher grade iron ore.

### **Slide 23 – China's supply-side reforms are here to stay and will continue to be driven by tightening environmental policy**

The combination of supply-side reforms, the increasing focus on emission controls and energy minimisation, the gradual transition to larger more efficient blast furnaces and the continued industry consolidation are shaping the future of the Chinese steel industry.

Under the winter production restrictions, large-scale cuts of up to 50% of sintering and hot metal output were implemented across Northern China.

Nevertheless, coming out of the winter heating season this year, it has become evident that the increased focus on environmental protection has become the new normal.

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In recent months, environmental restrictions have persisted, with some regions announcing output cuts throughout the non-winter heating season.

The new environment ministry recently unveiled draft plans to enforce stringent new ultra-low emission standards on the whole steel industry by 2025. The proposed plans see all blast furnaces below 1,000m<sup>3</sup> being shut down, and a requirement that at least 80% of transportation in the industry be via rail or pipeline.

Further, environmental protection was marked as one of the top three policy priorities for the central government, along with control of financial risk and poverty alleviation.

And more recently the Standing Committee of the National People's Congress, has been publicly calling for more thorough enforcement of centrally-set environmental standards.

Separately, the government's capacity replacement programme aims to prevent any growth of net steel making capacity. Smaller inefficient steel mills are to be replaced by larger more efficient mills, and geographically relocated out of main residential areas and towards southern and coastal regions.

Evidence suggests that this change is structural - environmental policy will continue to be tightened, and supply-side reform will continue to limit excess capacity and drive steel industry profitability.

### **Slide 24 – Scrap usage in China gradually increasing from a low base, but will face headwinds**

The gradual increase in scrap usage will also contribute to reducing the environmental footprint of China's steel industry.

Domestic scrap supply has grown at a 3% CAGR since 2013. We forecast this growth rate to approximately double over the coming five years, albeit from a very low base. With the conclusion of the early stages of rapid industrial production growth, China's domestic scrap generation will be primarily driven by rising obsolete scrap.

It is quite logical that Chinese scrap consumption will rise over the long-term. It is supported by the central government's steel capacity replacement policy, which encourages scrap use as well as EAF capacity growth. But while policy is set to remain supportive of the further build-out of EAF capacity, the ramp-up of EAF production will be gradual and constrained by a number of headwinds in the near to medium term.

The limitations on near-term scrap availability are demonstrated by the relative price performance of scrap versus iron ore, with the ratio currently trending to record highs. High electricity tariffs and the spike in graphite electrode costs have all eroded the competitiveness of EAF producers.

The creation of a liquid and standardised nationwide scrap market in China will take a number of years, while scrap transportation costs are relatively high.

A key driver for the relative appreciation of scrap price has been the increase in scrap consumption by China's integrated steel mills. Increasing volumes of scrap are being used in their converters, which also stemmed from their pursuit of productivity and the control of emissions.

On balance, operating costs for EAF producers have been consistently higher than for those integrated steel mills. In recent months, Chinese steel mills, even in the North, where environmental restrictions have been tighter, have been running their existing EAFs at very low utilisation rates due to the poorer economics relative to using their blast furnaces.

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CISA, the China Iron and Steel Association has also recently emphasised that the transition to EAF steelmaking will be a gradual process over a number of years.

So in summary, whilst we do expect that scrap usage in China will increase gradually from a low base, the rate at which this is occurring will be impacted by significant headwinds.

### **Slide 25 - Rio Tinto Commercial bridges our assets and our customers**

In January 2018, Rio Tinto strengthened its commercial organisation in Singapore. This shift has brought together Sales & Marketing, Procurement, and Marine & Logistics into one fully integrated team.

Iron Ore Sales and Marketing is headquartered in Singapore, with our customer-facing teams located in key markets. Our technical marketing team is optimally located both in our markets and close to our assets.

We are on a journey to become a truly customer centric organisation. The iron ore market has changed significantly over the last two years and will continue to evolve at a rapid pace, particularly on the back of continued supply side reform in China. In this context it has never been more important to be close to our customers.

We pride ourselves on the time we spend engaging with customers and familiarising ourselves with their operations and their challenges. Our teams undertake an average of four technical or commercial customer visits every working day – that is more than 1000 visits every year and I truly believe that this differentiates Rio Tinto in our industry.

Our technical teams alone make more than 230 visits to our customers' every year. We are not only a reliable supplier with the right products, but we are also on the ground in the markets, working with our customers to find solutions to the problems they have today and those they may face in the future.

These interactions with our customers, and the insights they provide us are absolutely critical. The voice of our customers enables a feedback loop straight back to the way we run our operations today and we how we should invest in our operations for the future.

We also engage the industry to collaborate and address industry level challenges. At Rio Tinto's 11th technical forum at Kunming in August last year we had over 220 customers from 100 Steel Mills participate in a number of technical discussions and knowledge exchanges. This forum provided critical insights on upcoming winter environmental restrictions, several months before their actual implementation, enabling both Rio Tinto and our customers to prepare for that scenario.

### **Slide 26 - We have a Tier 1 customer base...**

We are a tier one business, and underpinning our success is a tier one customer base. We service close to 90% of the largest 30 steel mills in Asia and 24 out of the largest 25 steel mills in China. . In some cases our customer relationships extend more than 50 years

Our traditional markets will continue to sustain and absorb most of our iron ore supply. Looking forward, future incremental growth in iron ore demand will largely be driven by South East Asia. With our tier one assets, our commercial and technical expertise and our close proximity to the region, we are well positioned to capture this growth opportunity. We have already secured supply contracts with new steel mills in both Malaysia and Vietnam, and are working with future steel mills in Indonesia.

### **Slide 27 - We understand every customer is different....**

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Through our close engagement we know that every customer is different and there are a wide range of factors that determine how they make their raw material purchasing decisions.

Technical factors include the operating objectives of our customers' steelworks. It can include equipment size and flexibility as well as their targets for hot metal quality. For example, a customer with a constrained yard, would not have the capacity to purchase and blend multiple products and would therefore be more sensitive to variability in iron ore quality.

The location of a steel mill goes to the heart of raw material cost and availability. Even between neighbouring provinces the cost of iron ore and the availability of fluxes and coal can be different.

Different steel mills are exposed to different regulatory environments. Whilst steel mills in Japan have been subject to the highest levels of environmental scrutiny, we are now seeing regions in China evolve and in some instances exceed international benchmarks.

Lastly there are strategic considerations including steel market sector, production flexibility, and pricing and contract periods which may impact how our customers value different products and different commercial terms.

### **Slide 28 - And we sell our product on different contracts...**

We provide our customers with flexibility around their contractual terms.

For example, for customers that require more certainty around their procurement costs, we provide the flexibility to purchase iron ore on a Quarter Lag or Quarter actual basis.

Additionally, long term contracts serve customers who require certainty of supply, while short term or spot contracts provide optionality for customers to manage their incremental volume requirements.

Timely delivery of product is important to enable our customers to properly manage their planning, operations and working capital.

To make this happen, around two thirds of our volumes are supplied on a delivered basis. Controlling the shipping enables us to manage our dedicated ports effectively maximize port throughput, and provide delivery reliability to our customers.

Our understanding of our customers and their specific requirements is particularly important with respect to what I will come to next – our products.

### **Slide 29 - ... we produce five products in the Pilbara to meet their needs**

We produce five products in the Pilbara. The Pilbara Blend, a combination of lump and fines, makes up over 70% of our product portfolio. Pilbara Blend is the world's most recognised brand of iron ore. It is the most liquid product in the market today known for its consistency and quality.

Pilbara Blend Fines forms the base load for sinter blends across China, while Pilbara Blend Lump is the most widely available lump product in the market.

Although Yandicoogina has an iron content of 58%, it has low impurities, and it calcines to a higher grade. Our Yandicoogina product is highly valued by our customers in East Asia and Southern China who rely on it as the base load in their sinter blend.

## **Rio Tinto Iron Ore – Investor Presentation Script**

Robe River products, which account for around 10% of our product mix also have a lower iron content but are valued by its customer base who tend to be producers of niche steel products and who value its low phosphorus content.

### **Slide 30 – Pilbara Blend is the world’s most recognised brand of iron ore**

Pilbara Blend has been produced for over a decade.

It remains in high demand throughout industry cycles, and has become the product of choice for China’s steel industry. It is a product that consistently meets the needs of our customers.

The liquidity of Pilbara Blend Fines offers our customers significant procurement flexibility, helping them manage inventory positions, currency risk and working capital.

As the most liquid physical iron ore product in the market, both on a seaborne basis and at China’s ports, Pilbara Blend Fines is the product that underpins the 62% iron price indices. Our unrivalled capability to blend at our own ports produces a reliable and consistent product. It is this consistency which is so highly valued by our customers, and as a result, Pilbara Blend fines forms the base load of the sinter blend for steel mills across China. In the new world of productivity, having confidence in the consistency of product, shipment after shipment, becomes increasingly more important.

Pilbara Blend lump is sold as base load across China and East Asia and is a key component of our offering to new mills in South East Asia.

Demand for Pilbara Blend Lump will continue to strengthen as our customers seek productivity in the ever-increasing face of environmental restrictions.

## **Rio Tinto Iron Ore – Investor Presentation Script**

### **Slide 31 - Yandicoogina, Robe Valley products are placed with customers who value them most**

Our niche products are targeted to steel mill customers who value them the most. It is for this reason these products are rarely sold on the open spot market where value-in-use pricing cannot be achieved.

Understanding the value of certain products requires a high degree of technical interaction with our customers. A great example is with our Yandicoogina Fines.

Our Yandicoogina customers understand that when they drive off chemically bound water, Yandicoogina fines produce a high iron sinter, with low alumina and low phosphorus. It is also valued for its sizing and metallurgical performance. It is for these reasons that despite having an iron content of 58%, our Yandicoogina fines achieves prices comparable to our 62% Pilbara Blend Fines product.

### **Slide 32 - Creating a flexible supply chain allows agility to respond to customer needs and market conditions**

As Chris has already discussed, we are building additional flexibility into the system.

Flexibility to respond quickly to changes in customer demand and market dynamics will unlock considerable value.

We are now evolving from a traditional push system to a truly market-led supply chain. We already have a number of examples of the additional value that can be generated when we are able to respond to the market in a dynamic way.

In late 2017 we established a targeted approach to bring forward the supply of Pilbara Blend Lump when premiums were at an all-time high, extracting around US\$10 million of additional value. We have now developed a systemised approach, underpinned by data analytics and real time data visualisation that enables an agile response to market demand for lump.

Another example is a change we have driven together with operations on the shipping of Yandicoogina fines. The benefit of the flexibility that we have built in the supply chain is two-fold. Firstly, it means that we can deliver product when the customer needs it without impacting mine production. Secondly, additional volume can be carefully managed to ensure we are only placing Yandicoogina Fines with those customers who value its use.

As Ivan and his team continue to remove the rail bottleneck we will have a greater ability to respond to market conditions. Driven by value over volume, we will be able to surge and retreat, and adjust product mix, in line with market demand.

### **Slide 33 - Technology will improve the customer experience and generate market insights**

You will hear more from Kellie, Matt and Ivan about how technology is advancing and improving our business. Technology is also an important driver for sales and marketing, delivering market insights and improving our agility from our ports to our customers.

We are investing in robotic technology to streamline and automate manual documentation tasks. Along with the use of e-docs, these developments will bring increased documentation and payment efficiency as well as lower risk.



## **Rio Tinto Iron Ore – Investor Presentation Script**

We are currently experimenting with machine learning and predictive analytics to anticipate market conditions and enable better decision making.

Real-time data visualisation has supported tighter linkages between our Pilbara operations and our Sales & Marketing hub in Singapore, increasing our agility from mine to market.

### **Slide 34 – Our commercial approach maximises the value of our products**

We are far more than the product that we dig out of the ground.

We are moving towards becoming a truly customer centric organisation, focused on growing value for all, underpinned by a highly valued product portfolio.

We have a deep understanding of our customers and the industry. Our technical knowledge and our highly valued suite of products ensure we are well positioned to meet the requirements of the steel industry for the foreseeable future.

We will drive full system value by increasing flexibility in the supply chain, supplying the right customer, with the right product, at the right time.

We strive for commercial excellence, a value over volume approach coupled with strategic and careful placement of our products with the customers who value them the most.

I will now handover to Kellie.

### **Slide 35 – Kellie Parker - Introductory Slide**

Good afternoon. My name is Kellie Parker, I am, Managing Director Planning, Integration and Assets.

As you have heard from Chris and Simon our value over volume strategy is delivering and my team play an instrumental role in optimising Iron Ore's large integrated system.

I've been in a fortunate position over 17 years with Iron Ore to see first hand the once in a generation growth cycle in the Pilbara and how we embraced new technology to operate differently. Such as the adoption of automation in our mines, robotics in our labs and smart charge trucks in our blast patterns.

Along with asset changes we have significantly progressed in how we plan and how we integrate our plans to get better system outcomes from ore body to ship. I witnessed the laying of the foundations of the Operations Centre ten years ago, to today's position where we continue to fine tune our dynamic system – where we optimise every step in our process to drive value for the short, medium and long term.

I look back on the past and am proud to have been involved in many firsts for our industry – the first fully autonomous haul truck and drills and most recently the first fully autonomous heavy haulage rail system. It is this spirit which motivates my team to be the pioneers of tomorrow.

Whether that be adopting best practice, implementing the latest technology, driving Artificial Intelligence to support our decisions, or developing future skills and roles for our operations.

Underpinning these advancements is our world class resource.

### **Slide 36 – Highly value product suite, sustained by significant resources**

## **Rio Tinto Iron Ore – Investor Presentation Script**

We have a significant Inferred resource base which provides potential long range developments. It also provides short term near mine opportunities. These are assessed through ongoing drilling and studies programs.

Pre-feasibility and feasibility level studies provide the opportunity to convert these new Mineral Resources into Ore Reserves.

We have a solid foundation which underpins our Pilbara operations, and it provides a framework to enable system optimisation.

We start with a first class resources base and to be frank, Rio Tinto's Pilbara endowment is enormous.

We have 3.7 billion tonnes of ore reserves, sustaining our current mining operations, and development projects, like Koodaideri.

Our Pilbara blend, Yandicoogina and Robe valley products, are incorporated into our Resource to Reserve conversion processes ensuring that quality saleable ore is integral to the planning and scheduling from mine to market.

Over the past five years, we have managed to replace our Ore Reserves, at, or near, the rate of mine production, which is continuously adding to our operational life.

In addition to the Ore Reserves, our Mineral Resources in the Pilbara total 22.5 billion tonnes. Our product target grades underpin the definition of Mineral Resources. This large resource base enables us to support studies which optimise our future mine sequence.

Over the past 5 years our Mineral Resources have grown, as a result of the enormous effort put in by our technical teams and our drilling partners. Our total resources, in addition to those converted to Reserves, has increased by 13% in the past 5 years. Over the same period, we have seen a 19% increase in our Inferred resources.

Pre-feasibility and feasibility level studies provide the opportunity to convert these new Mineral Resources into Ore Reserves.

### **Slide 37 – Continuing to grow the pipeline of future resources and exploration options**

Despite our large resource and reserve base we are not standing still and we continue to grow the pipeline for future resource options. This year our drilling programme is significant, aiming to ensure ongoing reserve replenishment and provide optionality to optimise the mine sequencing.

Approximately 700km is scheduled for drilling at various operational hubs near existing mines including exploration on new leases.

We use a combination of local and international drilling companies to complete our programme which is made up of a combination of reverse circulation drilling, diamond drilling and hydro drilling.

Our priority is to safely increase drilling to:

- Discover new mineralised inventory;
- Create options in our mining sequences and hence study profile;
- Maintain tenure security; and
- De-risk our 5 year plan by increasing the confidence in the mine plans.

The power of data and understanding what we have in the ground supports our strategic production planning process. Which we commonly refer to as SPP.

### **Slide 38 - Extensive pipeline of options**

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SPP is a matrix decision making tool that helps inform development options on multiple complex scenarios. Scenarios which can easily run into their hundreds. SPP enables my team to challenge resource optimisation, to assess product strategy against market strategy and to provide the direction for study options.

Options which can take some eight to ten years, to move through the pipeline from exploration and evaluation to final construction and ramp up.

The pipeline shown here today is a snapshot in time. Study projects will be reshaped and reordered based on SPP value assessments. However, what stays constant, is maintaining high volume of optionality at concept and order of magnitude levels. Once we move to PFS we are locking down the study options and at feasibility study we are refining the details for the business case.

Keeping options open at the start can also help us find options for potential drilling disruptions. With some judgement we look at potential drilling that could strengthen or disrupt a plan, this helps our resource base and strengthens our optionality to meet customer requirements.

For instance, we are currently using the tool to test what blending ore bodies we will use with Koodaideri phase 2 and what these options look like at different volumes and different blends...but more on Koodaideri shortly.

### **Slide 39 - Best in class quality delivered through system blending**

As Simon highlighted, Pilbara Blend is a combination of lump and fines making up over 70% of our product portfolio. It is the world's most recognised brand of iron ore and it is the most liquid product in the market, a product which is renowned for its consistent quality, hence we maintain a strong pipeline to support it.

Other than Yandicoogina and Robe Valley the rest of our mines contribute to Pilbara Blend, through contributions of Marra Mamba or Brockman Ores. The ore is railed to Cape Lambert or Dampier, unloaded and stacked. When there are the right number of Mara Mamba and Brockman trains stacked, the stockpile is ready to be reclaimed. As the bucket wheel of the reclaimer moves through the pile it mixes the ore to Pilbara Blend specification.

As you can see from the variance graphs, what is mined is very different to what our end specifications are on the ship.

We flex the system daily to deliver the Pilbara Blend. As we can now plan and schedule according to pits and not just mine specifications.

The controlled approach we adopt to manage quality is what drives the Pilbara blend to be synonymous with reliability and creates high demand throughout market cycles. It is a product which consistently meets the needs of our customers and maintaining its consistency is my team's number one priority when scheduling.

Yandicoogina and Robe Valley, as I mentioned, are dedicated products with Yandi mine achieving the quality specifications at mine and Robe Valley lump and fines being blended at Cape Lambert Port. These 3 products are shipped from Cape Lambert A.

### **Slide 40 - Dynamic market driven integrated planning system...**

As a large volume business, we have multiple plans across different horizons. Our mine plans are built to create value from our ore bodies and we use market signals to flex our production mix.

The integrated plan ensures we have the right quality, to the right customer at the right time. So planning starts with the customer requirements.

## **Rio Tinto Iron Ore – Investor Presentation Script**

Integrated planning takes inputs from mining but also, maintenance, rail, port, and shipping schedules.

Let me give you a few examples of integrated planning.

We can schedule large track maintenance windows linked with dumper and train load out shuts, to ensure the ship queue is not impacted.

We can also optimise our shipping schedule because we know what cargo, will go to which customer on what ship. We can do this as we own all the port infrastructure. We have now include integrated GPS tracking of ships to our ship schedule so we know exactly when the ship will arrive. This allows us to reduce demurrage but also ensures the largest ships with the biggest draft can be scheduled into the deepest berth pockets.

Through system analysis, we can also target certain mines for different options that gives us maximum value over volume. For instance short haul, low cost sites can be prioritised over high cost or lower grade mines in the daily dynamic schedule. We use our Advance Planning System that can run multiple scenarios on tonnes and grade. We implemented this system in 2017 and what use to take 3-4 weeks in scheduling can now be done in 48 hours. This creates the ability to respond to short term market signals and to maximise value over volume

Another example of our integrated planning is that we can optimise our blocks across pits to establish the Pilbara Blend.

This optimisation tool and thinking allowed us to reduce total material moved by 30 million tonnes in 2017 and we can build this optimisation into the longer term through variable cut off grades. This means for some blocks we mine they can be stockpiled for a future date to ensure they are blended for consistency. This allows us to use higher grade blocks with lower grade blocks throughout the mining process and extends the life of the mine.

As the market is changing we need to become more agile.

Creating this agility will require us to further optimise the system from the customer through to the assets, for the right quality and value.

Underpinning the integrated planning system are four levers driving continuous improvement.

Our operating management system, allows the centralised planning team to see the system as a whole and then to think about how we can operate this in an unconstrained way. We have hundreds of ideas and opportunities and these form the basis of the options for the operations teams. This allows us to highlight areas of opportunities for the sites to improve productivity and Matt and Ivan will speak to tonnes per car, plant performance and payload which all provide options to increase tonnes, take out costs or provide agility on our products.

To continue to challenge our performance and strive for improvement, we use a number of decision support tools. There is a vast amount of data that comes to the OC and we need to ensure there is reliable data that feeds the decision support tools. This is ongoing work as we have seen a step change in data flow from the operations as we increase automation on our decision support tools.

System optimisation is focussed on how we can increase value over volume whilst still meeting customer requirements. For instance, we know that some sites have a greater value within the Pilbara blend than others so we looked at how we can maximise their output. This is then matched this to rail capacity and materials handling.

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The fourth lever is technology and automation. Autonomous Drills, trucks and trains can improve one function in our system and they stand on their own business case. However when machines are linked through their control systems, it has a multiplier effect in productivity.

For example, we saw an opportunity to reduce the truck queue at the crusher through linking the truck dispatch system to the plant control. This ensured the fleet was used efficiently and the plant throughput could be maximised. Normally this would be done through the pit and plant controller talking to each other, however now it is automatic. Whilst initially this idea was applied to the autonomous trucks it is now used with manned and unmanned trucks.

### Slide 41 – ...supported by three improvement streams

We recognise, to achieve full potential we need to accelerate how we make decisions and use automation and technology to unlock value.

We are pioneers in mining but we are also learning from other industries.

There are three drivers underpinning the success and speed at which we will achieve full system potential. These are people, processes and technology. All are interconnected and together they will deliver a more fully automated and integrated system, mine to customer, delivering maximum value.

We are training our operators with the skills for the future and in Perth, we are building a centre of excellence for surface mining to attract and maintain talent for future roles. We are also broadening how we connect our subject matter experts with industry leading practice in automation, analytics and robotics

We continue to broaden the use of **technology** in our business and advance the type of technology we adopt, such as artificial intelligence and other big data analytical programmes.

The dynamic schedule of the future will be underpinned by many advancements in technology. We are developing the systems of tomorrow with partners. One example is our customer platform being linked to our advanced planning system.

Simply put, picture a future dynamic system which learns to adapt and change a schedule based on past experience and lessons learned and also integrates customer needs. A system which has the power to assess multiple scenarios to make a decision instantly. A system which understands in a micro-second how to manage an unplanned event by assessing past experiences and uses market intelligence to ensure value over volume. For example we could schedule based on the grade of the block and if a digger was digging outside of the block the system could automatically assess if the grade can be accommodated or if the digger needs to be stopped.

Along with technology, we are advancing our **processes** by codifying our decision support and automation tools.

We have automated all our ship ETA's using a repeatable process automation bot and we have made the process 20% more efficient.

We have codified our learnings from the lump maximisation that Simon talked to so our planning system can learn and respond automatically with adjusted schedules to production and shipping quotas.

We are also trialling augmented asset health tools to see the plant in 3D in real time and check on the plant conditions. We can then apply cognitive technology to further assess and predict asset health conditions, this is the next step from predictive maintenance. Imagine predicting a potential maintenance issue and then being able to check on the asset condition through augmented reality.

The list is endless, however all are driving towards achieving automated end to end scheduling.

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### Slide 42 – Industry leading technology driving productivity....

The pace of implementation in our Pilbara Operations is rapid. Today you will see a mixture of manned and autonomous machines.

The mines in our study pipeline, such as Koodaideri, will be established with leading edge technology, including automated trucks, drills and trains but also, as I discussed earlier, for the first time systems connecting all components of the dynamic schedule, from customer right through to ore body planning.

We are advancing towards a networked future where machines can talk to machines, reducing variability through the system.

Building on experience of linking truck dispatch to plant rates, we are now linking our drill and blast process to plant performance.

Through ADS, the drill and blast to control loop is being developed to optimise the drill hole position and depth, which allows enables smart explosives loop to optimise the amount of charge for required rock fragmentation for the plant. The drill and blast loop has already improved system efficiency. ADS is just the first step in this change and Matt will speak more about this later.

The Mine Automation system or MAS collects and harnesses all the data created by our mine machines. RTVis takes this extremely large data set and translates this into a readable form. From this we can make and execute decisions. Through these systems we see the opportunity to network our machines.

### Slide 43 - ...with Koodaideri being our first intelligent mine

Koodaideri will adopt many new processes and technologies and will deliver world first performance by being safe, smarter and more productive than any other mine.

As Chris highlighted earlier, we are in the process of finalising the feasibility study. We are assessing over 100 innovation opportunities which will make this our first intelligent mine.

One such initiative is digital twinning. We are building a replica digital plant that collects all the data on the plant from design, build, commissioning and operation. This allows work to change through augmented reality.

Koodaideri sits on a massive orebody. Imagine being on the 20<sup>th</sup> floor of a tall building and trying to look out for 50 kilometres. That is how big the orebody is for this mine development.

Let me show you.

(Start the film)

Approximate Time	Element or Scene	Description
00:00	Start of Video	
00:05	Primary Crusher	Firstly the visualisation tool you see here is invaluable for plant familiarisation and training – in this short clip we have also developed a training platform replicating the real life behaviour of field machines, which in future will link directly to operation of equipment.

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00:25	Approach to screen house	The digital twin is a living model which is linked to a data lake with a number of pieces of static and dynamic information contained within. This includes both operational and environmental data relevant to operating our plants.
00:39	Screen house data menu	From a field or remote location our operators will have access to this data, and coupled with analytics and machine learning, will drive business related outcomes in a shorter time and with greater accuracy. Importantly, this data is the heart of our digital twin – and is also used to simulate plant operation and to optimise the plant control systems parameters.
01:09	Top of screen level (safety icon)	One of the new data classes we are adding to our model includes safety data – again allowing us to make better informed decisions by using leading indicator data, warning operators of risks in the area and learning from historic events.
01:19	Screen house substation and high voltage training clip	By utilising VR training in conjunction with our model, operators and maintainers have access to a range of interactive modules relating to the activities to be undertaken in that area.  A number of VR modules are being developed for a range of complex maintenance activities. This allows a highly interactive and engaging method of training which ensures better task retention and competency from our operators.
02:05	Workshop and 360 video	In addition to VR we are also investing in 360 degree capture of complex tasks as in the example you see here. This will also be available ‘on demand’ for our workers who want to access this at any time.  What you are seeing is an example of how we apply this technology in our workshop. In this video our competent maintainer is instructing trainees on the task while completing this in real time. Utilising a virtual reality headset, the trainee is able to move around and view any area of the activity being completed.

(Film ends)

As I said, this is just a snapshot of a couple of our new innovations for Koodaideri – our new iron ore mining hub that will pioneer the future of mining.

### Slide 44 – Optimised system maximising value

It's an exciting time ahead.

Our significant resource base underpins our future. It provides development optionality which will enable us to continue to deliver our highly valued product suite.

And our new mines and rapidly advancing systems will drive even greater value and productivity.

We will now take a short break for 20 minutes, before Matt, takes you through the work in the mines and how his team are optimising value.

## **Rio Tinto Iron Ore – Investor Presentation Script**

### **Slide 45 – Matthew Holcz - introduction slide**

Welcome back. My name is Matthew Holcz and I am acting Managing Director – Pilbara Mines. This role has accountability for the safe and efficient delivery of high quality ore across our network of integrated mines.

### **Slide 46 - World class assets, fully integrated and agile network**

We operate 16 iron ore mines in the Pilbara. We have a fleet of just over 370 haul trucks of which 95 are now fully autonomous. Of our 55 production drills, a fifth are now autonomous.

The ore we mine is processed through 17 different processing plants, to produce five primary products: Pilbara Blend Fines and Lump, Robe Valley Fines and Lump, and Yandicoogina Fines. These products are then loaded onto a train through one of our 15 train load out facilities at the mines.

On the map, I would highlight Silvergrass, Nammuldi, Brockman 2 and Brockman 4 in the western Pilbara. These assets form the Greater Brockman region where many of you will be visiting tomorrow. I would also point out Koodaideri in grey to the East. As Kellie mentioned, this is our next major development and is currently at feasibility stage.

### **Slide 47 – Further opportunity exists to optimise mines**

Today I will showcase our performance across the value chain within the Pilbara Mines: from mining, to processing, and on to the train load out, which is our interface with rail. The key themes will be reliability, productivity and how we are leveraging technology and automation to accelerate our progress.

By driving better performance out of our assets, we can continue to build our mine capacity and offset cost headwinds from increasing haul distances and more below water table mining. Better asset performance also drives greater flexibility and optionality and I will share a practical example of the value this can unlock. I will also provide a brief update on Silvergrass, our most recent growth project

### **Slide 48 - More productive and engaged workforce**

As a foundation, increasing value delivery requires a productive and engaged workforce. In the first graph, you can see the year on year progression of our labour efficiency, as measured by our saleable ore product per employee. The employee numbers include all of our fixed contractor roles.

This improvement has been driven by productivity initiatives in both our fixed plant and mobile mining assets, supported by a strong focus on continuous improvement at all levels of our organisation. Our partnerships with local suppliers including Linkforce, Monodelphous and Workpac, are also starting to deliver mutual benefits, with increased labour agility and access to specialised skills.

While automation is delivering productivity benefits, we are also improving our employee engagement. In our three most recent people surveys, from the start of 2017 to last month, we have seen an increase in our employee satisfaction in the Pilbara Mines. The improvement has been driven by focussing on key engagement levers, including recognition and personal growth.

It is true that automation is reducing some roles, but it is also creating other higher skilled roles. Transition of our workforce to these roles is supported by our recently announced partnership with TAFE to provide vocational educational training for both emerging and future technologies. Our site



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swap program and increasing proportion of even time rosters is also providing our people with more lifestyle options.

### **Slide 49 - Significant improvement achieved across our mines...**

Now to focus on mining itself. Simplistically, we have two levers to drive shareholder value: increasing performance of our mobile fleet and reducing operating costs.

The first graph shows that our truck fleet effective utilisation has increased by 8 per cent over the last two years. This means we are getting on average an additional 29 days of work out of every truck over a calendar year: almost an additional month.

This has been achieved by systematically sharing and replicating leading practice to improve availability and optimise the time spent on activities such as refuelling, crewing, spotting, loading and tipping.

In the second graph, you can see that we have also increased the average payload. This has been facilitated by working with our suppliers to safely increase loading limits, and through technology that provides dig unit operators with real time feedback on payload. We estimate we have created 15 million tonnes of mining capacity through improving payload alone.

Not only are we replicating leading practice within iron ore, we are also leveraging learnings from other Rio Tinto operations. A great example of this, is from our Kennecott operation in the United States to improve mean time between failure. You can see in the third graph this has increased by 31 per cent over the last two years. This means our truck fleet is running longer before unplanned failures, improving reliability and reducing maintenance costs.

We are also implementing smarter maintenance strategies to reduce life cycle costs. A great example of this is through extending engine life. Applying this to one truck type at one mine reduced the number of engine change outs by 28 per cent, saving \$5 million last year, without compromising asset health.

### **Slide 50 - ...with automation delivering significant advantages**

In addition to systematically sharing and replicating leading practice, our technology and automation pathway is continuing to deliver significant benefits.

In the first graph, you can see a comparison of the effective utilisation we are achieving between manned truck fleet and our autonomous truck fleet. You can clearly see the benefits: our autonomous trucks are in production an additional 11 per cent of calendar time, which is equivalent to an additional 40 days each year.

However, it is important to note that autonomous technology is not just plug and play. We are still refining and improving both the hardware and software, while our people are still learning how we can optimise the system, both on site and in our Operations Centre. In the second graph, you can see the year-on-year progression our Yandicoogina operation, which is now in its third year of having a fully autonomous truck fleet. We will continue to deploy autonomous trucks where there is a strong value case: we have recently approved retrofitting existing Komatsu and Caterpillar fleets at Brockman 4 and Marandoo

We are also starting to see tangible benefits from our autonomous drill technology.

In comparison to our manned fleet, we have seen a step change in effective utilisation, meaning our autonomous drills are actively in production more of the time. Furthermore, with real-time access to

## **Rio Tinto Iron Ore – Investor Presentation Script**

information regarding ground conditions and drill performance, we are able to continuously optimise operating parameters, improving the penetration rate. This means our autonomous drills are achieving more drill metres in a shift. We are increasing our autonomous drill fleet from 11 rigs to 20 rigs by the end of 2018. Many of you will have an opportunity to see these in action at the Operations Centre later in the week.

### **Slide 51 – Fixed plant reliability and productivity**

We are also improving performance of our fixed plant assets. Again, the focus has been on both reliability and productivity.

Firstly, I will talk about reliability. At the heart of this, is doing the right maintenance work, to the right standard, at the right time. As you can see in the first graph, last year we reduced scheduled loss by 8 per cent. This means we conducted less planned maintenance on our assets. Importantly, less planned maintenance did not mean more unplanned maintenance. If we are focussed on doing the right work, to the right standard, at the right time, we can also reduce unscheduled loss.

In the second graph, you can see we reduced our unscheduled loss, by 10 per cent. The net effect of these two improvements is that our fixed plant assets are available more of the time.

I also wanted to share some improvements on productivity on a site specific basis. Greater Brockman is a great example: it is our largest mining region on a volume basis and also offers one of our shortest rail routes to our ports.

Greater Brockman consists of four processing plants: Brockman 2, Brockman 4, Nammuldi above water table, and Nammuldi below water table.

The graph is based on the Asset Utilisation Ratio, which is a very thorough metric: it assesses how effectively an asset is being used, relative to both calendar time and maximum demonstrated rates. You will see that during 2017 we increased the Asset Utilisation Ratio at each of the four Brockman plants by between two and eight per cent on a year-on-year basis. This means these assets were not only running for longer, but they were doing so at rates closer to their maximum capacity more often.

This improvement helped deliver an additional 5.1 million tonnes in 2017 from one of our highest margin assets.

### **Slide 52 – Creating a flexible value driven mine production system**

We continue to unlock value at every opportunity and a practical example is shown here today.

This example centres on another of our high volume regions, Yandicoogina, which is 100 per cent owned and produces a stand-alone product. This slide is reasonably detailed, so I will take some time to talk through it.

In the first graphic, you can see the simplified processing flow chart for Yandicoogina. Effectively there are four different routes. Two of these routes use dry processing, the other two routes are also capable of wet processing. A balance of dry and wet processing is required to maintain product quality.

From the 2016 data, you can see that within the two dry processing routes, one route is more cost efficient than the other. The same can be said for the two wet processing routes.

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In 2017, the strategy was to maximise production from the more efficient assets. For PC4, the effective utilisation was increased by 3 per cent and the operating rate by 7 per cent. This allowed PC4 to consume almost all of the common dry plant capacity, meaning the PC1 route could be effectively turned off. Similarly in the wet plants, for PC3, effective utilisation was increased by ten per cent, and the operating rate by 9 per cent, and yield by 5 per cent. This then allowed the less cost efficient PC2 route to be dialled down significantly. Importantly though, because the PC2 route has an independent plant, we can dial this up when required.

Overall, total production was maintained, however site unit costs were reduced by six per cent year-on-year. This cost reduction was despite headwinds from increasing haul distances and more below water table mining.

Importantly, four million tonnes of additional, flexible annual production capacity was also created. This provides the flexibility to dial production up and down as required.

This is a practical demonstration of what we looking to achieve across our system as a whole. By driving productivity and reliability improvements from more cost effective assets, we can improve unit costs, as well as unlock additional flexible production.

When rail capacity is available and market conditions are favourable, we then have the opportunity to exploit additional production. If not, we can turn assets off and strip out maintenance and operating costs. This is a true example of value over volume in action.

### **Slide 53 - Mines supporting rail to unlock capacity**

The mines also have a part to play in increasing the capacity of rail. Here, we are focused on two primary levers and you can see that with the scale we have in our iron ore business, even incremental improvements can deliver significant benefits.

The first lever is maximising the tonnes we load into each car, allowing us to make the most of every train. We are progressively rolling out automated train loading across our sites and deploying expert control systems to enable dynamic tuning. In 2017, we delivered a two per cent increase, which is roughly an additional half a tonne of iron ore in every train.

The second lever is minimising the time it takes to load a train, contributing to a shorter cycle time, effectively meaning we can pass more trains through our system. Improvements in stockpile management, reclaimers efficiency and train load out reliability have reduced the average cycle time by two minutes per train.

As mentioned, even incremental improvements over a large scale can deliver value. Through focussing on the interface with rail, we have unlocked an additional 6 million tonnes of annual rail capacity for a negligible cost.

### **Slide 54 - Silvergrass delivered on time and on budget**

I also wanted to provide an update on our Silvergrass operation. Many of you are travelling to Brockman and Silvergrass tomorrow and Scott Wilkinson and his team will provide you with more detail, however I will cover off on a few high level points now.

Following commissioning of the mine in August last year, first ore was delivered on time in late 2017.

The total spend was under budget, meaning that the additional tonnes from Silvergrass and Nammuldi incremental tonnes have a capital intensity of less than \$30 per tonne. We are also proud that all construction projects were awarded to Western Australian companies.

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Combined with the Nammuldi Incremental Tonnes infrastructure, the Silvergrass facility has capacity of 21 million tonnes per year. Importantly, Silvergrass will supply low-phosphorus, high grade Marra Mamba ore to support the quality of our Pilbara Blend product. You can see in the graphic, the ramp up in production during the last quarter of last year and the first quarter of this year. The timing of when we achieve full rates will depend on market conditions, rail capacity, and the grade balance from our other Pilbara Blend operations.

### **Slide 55 - Pilbara mines continuing to deliver productivity improvements**

Our strategy is to build a flexible market-driven production system. Supporting the infrastructure capacity that Ivan will shortly discuss, will be a network of agile mines that produce the products that our customers value.

What you will see tomorrow is our newest mine within the system, Silvergrass, which was delivered on time and on budget, is highly value accretive, and supports our benchmark Pilbara blend product.

We will continue to deliver each of our projects with the same rigour and unrelenting focus on value.

We will also continue to invest in our people, creating more skills and encouraging improvement ideas from all levels of our organisation.

This will allow us to continue to optimise the performance of our assets, generating additional value through improved productivity and reliability.

I will now hand over to Ivan.

### **Slide 56 – Ivan Vella - Introduction slide**

Good afternoon, my name is Ivan Vella and I am the managing director for rail, port and core services.

Our rail system has been the subject of much interest over the past few years. Between AutoHaul® and our railways' status as the bottleneck of our business, it has warranted a lot of attention.

Today, I want to take the opportunity to provide some more background on both of these items. We have made some very good progress through our intensive focus on rail and we have a clear pathway to ensure it is not a bottleneck in the future.

More importantly, I want to give you a deeper understanding of the capability we are developing across our supply chain covering the rail and port facilities. This will give you a better sense of how we are optimising these assets to support the customer centric model that Chris, Simon and Kellie have all discussed.

### **Slide 57 - World class assets, fully integrated and agile network**

For those who aren't completely familiar with our supply chain in the Pilbara – let me take a few minutes to describe the key elements.

We have two interconnected rail systems.

The first we call the 'pooled fleet' which sources ore from 14 mines across the West and East Pilbara. It has a dual track corridor from Emu Junction to Rosella and then generally single track out to each of the mines. This dual track section is about 170km in length.

The average return distance that our pooled fleet trains travel to a mine is approximately 800km. This trip, including the time through the yards and dumping of the train typically takes about 40 hours. We

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currently have 49 consists or trains operating on this part of the network. We have two new consists due to be introduced onto the network later this year.

This is the part of our network that is covered by AutoHaul®.

The second rail system we call the Robe Valley. It connects two mines in the Robe Valley and has single track from the mines to Emu Junction. There are 6 consists operating on this part of the network and this round trip is much shorter being approximately 400km.

As you can appreciate with the shorter cycle we do not need to stop trains for driver changes, which means that we currently operate this network without AutoHaul®.

From the Emu Junction we have dual track to the Cape Lambert Port terminals. At Cape Lambert we have 5 car dumpers – 1 of which is dedicated for the Robe Valley system. We have largely single track into the Dampier Port terminals. Here we have 3 car dumpers.

There are large rail yard operations at each of the ports. In these yards, we receive trains from the network, prepare them to have the ore dumped and then once this is complete we prepare the trains to go back out on the network for another circuit.

The yards are where our workshops and teams are positioned to complete any maintenance on the locomotives and rolling stock.

Later I will talk more about each of these elements and how we are delivering productivity improvements in both operations and maintenance.

### **Slide 58 - Our integrated system allows us to achieve unparalleled levels of utilisation**

Before I talk about how we are reshaping and improving our supply chain it is important to understand the context we are operating in. Our integrated system has many advantages. One of these is our ability to schedule operations and maintenance in a highly coordinated way.

For our rail system, this translates to constant utilisation.

One way to benchmark our utilisation is to compare the number of loaded axles per hour travelling across our network and the load on those axles. As you can see we are already achieving much higher utilisation than our peers in the industry and the other major heavy haul rail operators in Australia and North America.

When looking at axle loads you can see that the highest axle loads anywhere in the world are here in the Pilbara. FMG and Roy Hill are running over 40 tonne axle loads. This reflects the relatively new fleet of wagons they are operating. We are sitting at around 36 tonnes.

The critical issue that must be considered with axle loads is the impact that this has on the integrity of the rail network. Heavier axle loads, more rapidly deteriorate the formation and ballast. While we are looking at opportunities to increase our tonnes carried in each wagon and therefore the axle load, we have to ensure we have optimised the trade-off of capacity benefit and the impact on the formation, ballast and also bridges and culverts.

The other critical aspect of utilisation is the number of axles per hour crossing the network. In this case, we are operating considerably more than our peers and anyone else in the heavy haul rail industry or even passenger rail like the London tube. This is driven by the number of trains, number of wagons and the spacing between trains. Our integrated management of our network allows us to achieve these high levels of utilisation.

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While this performance is class leading there is still opportunity to deliver more productivity from our existing rail assets. AutoHaul® provides a critical platform for us to continue to build on these unparalleled levels of track utilisation. With the significant safety controls and visibility that AutoHaul® brings on our network we can utilise more of the potential train paths without introducing more risk to our operations.

### **Slide 59 - Increased flexibility in our supply chain creates additional competitive advantage**

As has already been discussed we believe that it is critical to reshape our supply chain.

The first step is to grow our rail capacity in excess of the mines and ports. A rail system with capacity greater than the mines can provide considerable flexibility and allow us to deliver more value in a customer centric business, getting the very best from every mine.

Rail should also carry more capacity than the ports so that regardless of any variability in the rail system we never limit the full potential of the port assets – our most capital intensive part of the system.

We believe this reshaped supply chain is critical to our competitive positioning in the evolving market.

Our ports already offer substantial flexibility being able to receive trains from any mine on the pooled fleet network, blend ore from any mine on any stockpile and meet the product specifications expected by our customers. This considerable optionality is further enhanced by the location of our ports. We have no impact from competitor operations and when linked with our integrated railway and the design of our ports we can have blending and operating flexibility that creates a sizeable advantage.

Like any assets there are opportunities for improvements in productivity. In our case we believe there is quite a bit of upside in both the rail and port assets in our system. We have kicked off an improvement programme to deliver this in a coordinated way – naturally with the first focus being on rail.

### **Slide 60 – Optimising rail capacity and improving flexibility**

In early 2017 we commenced the rail productivity programme. The wide-scale improvements are targeting every part of our rail system. This programme will deliver the rail capacity and flexibility to underpin the desired supply chain design I just discussed.

The work can be broken into a few major components.

The first area is the payload that each train carries and the number of trains. Through improvements to our train load out facilities, the bearings in our wagons and maintenance of our track infrastructure we can increase the tonnes in every wagon. The load times at each train load out have also been in focus and help reduce cycle time. We have also worked on extending the length of our trains – now standing at 240 ore cars. These have grown from around 234 ore cars per train over the past 5 years, which is equivalent of around 7 million tonnes per annum of capacity.

The second area of focus is what we call the mainline – or the part of the network from the yards out to the mines and back. There are three major levers that will deliver benefit in the mainline.

The first and key foundation is AutoHaul®. It unlocks other potential.

The second is the network operating strategy which builds on AutoHaul®. This is about how we best manage the complexity of moving trains through the network continuously and meeting the product blending requirements.

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The third lever is rail maintenance – both the track and the rolling stock. This offers considerable opportunity as well – particularly as we improve the track and potential speeds – the AutoHaul® trains can dynamically optimise their driving strategy to get full advantage of this.

The third major area is the yards and the operations and maintenance activities that happen there every time a train passes through to drop ore at the ports. This includes the dumper interface and the performance of the dumper.

In each of these areas we have also identified potential capacity which may come from future technologies and tactics. An example of this is closer train spacing – leveraging the AutoHaul® technology to shorten the gaps between each train and allowing more to pass across the network at any point in time.

### **Slide 61 – Building future system flexibility with AutoHaul®**

As I have explained the AutoHaul® solution has direct benefits and it also enables a number of subsequent improvements.

We are very proud of the pioneering work to build the world's first fully autonomous, long-distance, heavy-haul rail system. For those who don't have much experience with heavy haul it is probably difficult to appreciate just how significant this achievement is.

First and most importantly we have to ensure that AutoHaul® can operate safely under the wide range of conditions we experience in the Pilbara. This includes more than 8 million km of train travel per year, moving across a number of public level crossings in the network.

The second challenge is to integrate the large number of specialist systems that are all required to make a locomotive function.

As you know the AutoHaul® project has been through a tough journey. We have had to work closely with our partners to solve a number of complex challenges in making the wide range of systems work seamlessly together. We are now at a stage of working to refine the reliability of the solution and the commissioning and ramp up since we received regulatory approval. This will take some time and focus and we expect to identify more challenges, however the benefits are very exciting.

The first source of benefit is from the 'driving strategy engine'. This is a component within AutoHaul® that uses machine learning to drive the train to the conditions presented. It has to take into account the topography of the rail network, weight of the train, loading balance, wind, locomotive power differences etc. With all of these factors taken into account it calculates the optimum amount of power or braking to be applied at any point to safely complete the journey.

The driving strategy engine is already driving the trains as well as our best drivers – both in terms of speed and the forces between the wagons as they move over the network. Of course now any improvement in the driving strategy engine can be rolled out to all locomotives as required. This allows us to continue to optimise the performance as we gather more data.

The main direct benefit from AutoHaul® is avoiding the need to stop a train for driver changes. On a typical journey a train stops 3 times. This adds up to more than 1 hour of that train being stationary each time. On top of this you have the time required to slow a 33,000 tonne train down and then get it going again. There is also a saving from avoiding the knock on effects from each time a train stops on the network.

The more that the integrated network flows the more capacity we can extract.

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Removing the need to transport drivers 1.5 million km per annum to and from trains at their shift change also delivers considerable safety benefits. This is a real exposure and it is heavily reduced once AutoHaul® is fully rolled out.

Other important safety controls that are delivered with AutoHaul® include:

- Automatic responses to level crossing operations
- Automatic compliance with track speed limits and geographic limits of authority
- Automatic responses to asset health alarms such as Hot Bearing Detectors

### **Slide 62 - AutoHaul® to complete in 2018**

As I mentioned, we still have ongoing work to improve the reliability and performance of the AutoHaul® system – however it is already delivering benefits. We have been using the solution in what we call attended mode for over 12 months now. This is where the AutoHaul system is driving the train and we are getting the benefits. However, we still have a driver on-board in supervision of the train.

This has delivered more than 2 million tonnes of extra capacity in the last 12 months.

As you have heard, on May 18, we received final approval for driverless operations from Office of National Rail Safety, the national regulator.

We are now finalising preparations to commence driverless operations. We expect these to commence in the coming weeks.

### **Slide 63 – Advancements in technology are crucial to the network operating strategy**

We have a project underway to leverage our world class rail systems and data to optimise our network operating strategy. With the real time information generated by AutoHaul® we have the ability establish the most efficient operating tactics and also utilise some predictive capabilities.

The first part focuses on ensuring the best practise tactics are employed consistently across the network by our train control team.

This includes, decisions like:

When to depart or hold a train in a yard or mine due to congestion; optimal paths through our mainline; queuing on the mainline; timing of track obstructions for maintenance; and fleeting and queuing around track obstructions.

The next step is to utilise dynamic optimisation tools to further support the control of the network.

### **Slide 64 – Yard improvements and digital transformation**

In the yards, we have already made some exciting progress – improving both yard operations and train maintenance.

We have delivered improvements through relatively straight forward changes such as aligning work practises.

We are also steadily implementing a number of digital solutions that are transforming our yard operations and maintenance.

These include the Automated Roll-by which is a set of very high speed cameras located about 20km from the yards on the network. They take photographs of the wagons and automatically assess the



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images to determine any maintenance requirements. These are then fed into the team before the train arrives after dumping. These changes not only improve the reliability of our trains but also allow the teams in the yards to be very targeted in their maintenance. They can go directly to the wagons that need maintenance. In a 2.5km long train this is a huge benefit.

RFID technology is also being trialled to help provide visibility of all of our locomotives and wagons across the yards. This work is very promising and we believe as it moves into full scale deployment it will bring a lot of benefit, allowing us to better utilise our assets and streamline the number of movements in our yards.

We have also built a comprehensive yard optimisation model that can dynamically schedule all of the locos and wagons through our yards in the optimum path. Once we have completed integrating this and delivering it via simple tablets that provide directions to the operations team in the field, we will see further material improvements in our cycle time. These benefits will come from the optimisation of a very complex planning process that needs to be managed continuously. There are many permutations of how to get a train through the yard into the right dumper, back out and through maintenance if required and reset for the next trip on the network.

### **Slide 65 – Rail maintenance productivity can unlock new potential**

Sustainably integrating an increased level of track maintenance with an ever increasing production schedule requires a new level of maintenance productivity.

The best way to appreciate this challenge is to consider the growth in demand on the network. The first billion tonnes that we railed took 25 years. The last took just 3 years.

We have more trains that are considerably heavier, running more frequently. This is not only creating more wear and impact on the network but also reducing the windows that we have for rail maintenance.

This created a challenge and we needed a different approach and improved levels of productivity to be successful. Since mid-last year we have taken a number of steps to transform our rail network maintenance tactics and establish a long term approach to “renewals” that can support the demands we are placing on our rail network.

This has resulted in a complete re-design of our rail maintenance organisation, new high impact contractors and a new flexible workforce model will allow us to flex maintenance around production demands.

We have also purchased approximately \$200 million of specialist track maintenance machines to complement our existing fleet. This includes a ballast cleaner, high productivity tampers that help maintain the geometry of our track and other specialist equipment.

On top of this we are placing a lot of focus on lifting the productivity of this team – both in unit cost improvement but more importantly also in the amount of work that can be done in every track possession window. This improved network access strategy and process is one of the core levers to sustain the network health and unlock further capacity.

Where possible we are looking outside of our immediate industry to others in rail globally such as the Class 1's in North America for opportunities to learn from their experience. We also look to utilise the huge amounts of data available from our track infrastructure to move to condition based and predictive maintenance approaches.

Over the past 12 months we have also leveraged the data now available through the active signalling system that has been installed with AutoHaul®. This has allowed us to understand the tonnage impact of any defects in our network. While this helps us prioritise our maintenance it has also helped

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us understand the potential cycle time losses associated with slowing down and speeding up trains, impacts of congestion, etc.

Collectively, this work represents material opportunities to further reduce our cycle times and increase capacity.

### **Slide 66 – Our plan for rail productivity is strong and balanced**

While there are nearly 200 capacity initiatives in our overall rail productivity programme as I have just described you can simplify the work down into a few major categories.

We have already made some good progress and have clearly mapped out the work and interactions between each of the major streams.

This chart shows the major drivers of capacity. For each of these I have included a small pie chart showing the capacity delivered through 2017, the work that is in progress and future potential.

The size of these pie charts is relative and shows the full potential capacity that can be targeted over time and how each of the levers compare.

As you can see even with the considerable improvement we have well underway there is still lot of further potential.

The AutoHaul® project is a critical component both in providing direct value and capacity, but also in unlocking potential in several other areas, and so as you can appreciate there are some dependencies in this work that I have not shown here.

### **Slide 67 - Productivity is key to unlocking further value**

The improvements we are seeing in the underlying performance of rail from work already completed are very exciting.

The yards have been a big focus since the start of 2017. We have continued to accelerate this rate of improvement through 2018 and expect to close the year with more than 30% reduction in yard in and out cycle times. This equates to more than 8mt of capacity.

Our port interface and dumping process is a critical part of our integrated system and we have placed a lot of focus on this. Since we started this work we have delivered considerable improvement.

The key metric we focus on is the time from the tip of the last wagon in a train, to the tip of the first wagon in the next train. This has reduced by nearly 40%, releasing a dumper capacity of over 35 million tonnes. While this doesn't all translate directly into rail capacity or shipped tonnes at this point – it does mean that as we ramp up rail we should not see a bottleneck or impact at the dumpers.

The other big area of improvement that I have already discussed is train payloads. With the increased train lengths we have delivered a further 1.5% improvement – or nearly 1000 tonnes extra per train, per trip. With over 10,000 trains per year you can do the sums on this.

In both Q4 2017 and Q1 2018 you saw the considerable increases in capacity flowing through to the ports. This trajectory is continuing and we are focusing on ensuring these changes are fully sustained. These steps when combined with AutoHaul® continue to move us to the place where rail is no longer the bottleneck in our system.

### **Slide 68 - Unencumbered port facilities with built in optionality**

So far I have talked a lot about our rail. Our ports are also a critical part of our flexible supply chain.

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Our port designs are unique. We can berth and load ships on each side of the jetty. This allows us to achieve much higher levels of utilisation of our assets, particularly the ship loaders and of course we can be berthing a ship while loading on the other side.

Our end to end ownership and control of the supply chain including the marine operations gives us considerable advantage over our competitors operating in the Pilbara. This includes our full control of marine operations and the ability to seamlessly integrate that with our overall operations and shipping activities. We can also much more effectively manage and reduce total time in port and demurrage.

Our stock piles and blending facilities are also very advantageous. We can dump and blend ore from any of our Pilbara Blend mines to any stockpile. Overall, our stockpile capacity is nearly double that of our peers in the Pilbara. We can dual reclaim from the same stockpile or multiple stockpiles to adjust rates and blend for quality in our out-loading process.

These are just a few examples of the considerable optionality we have available in our port facilities.

As we continue to lift our rail and port capacity we could offer customers more flexibility in cargo sizes and different vessel sizes. Our competitors will feel much more impact from this given their structural inefficiencies in their single side berthing and shared port operations.

### **Slide 69 - Improving the capability of our port assets**

As I mentioned we have been working in parallel with rail to improve productivity and performance of our ports. You can see the considerable improvements we have already delivered in areas such as our equipment reliability and asset performance.

This is delivering improved reliability and increased operating rates ultimately unlocking further capacity. As you saw in December 2017, our port facilities have impressive sprint capacity already and as we continue this improvement work we are extending the period for which we can operate at these very high rates.

We are placing a lot of focus on maintenance and operating effectiveness including technology advances such as automated material identification. We are also targeting more straight forward areas such as raising the bar in maintenance discipline.

The interface between the rail and port teams has also been an area of focus with the development of real time metrics for moving trains from rail yard to start of dumping.

### **Slide 70 - Exclusive, fully integrated infrastructure delivers value for shareholders**

In the evolving market we are focused on making our business more resilient and competitive. Our focus is on reshaping our supply chain to extract the capacity and flexibility giving our marketing team new options to be more customer centric.

This work links with our efforts to deliver the full potential from our assets. Not only does this provide the extra capacity I have talked about but it also unlocks productivity and cost savings. We are also focused on ensuring that as much of our costs as practical are flexible and can vary with our production.

Rio Tinto Iron Ore has a unique advantage in the Pilbara through our fully integrated, single user system. With our strong commitment to leveraging technology we can continue to achieve new levels of performance in the integrated operation and maintenance of our production system.

We will continue to improve productivity across the system, which will allow us greater flexibility to generate additional value.

I will now hand back to Chris.

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### **Slide 71 – Chris Salisbury - Summary**

You have heard from my team today that our iron ore business's has a very clear strategy and our foundations are strong.

### **Slide 72 - Iron Ore continues to deliver optimal value**

Our exclusive use and fully integrated mine, rail and port system is run with real-time coordination and decision-making capability from our Operations Centre. We optimise for value and are building agility within the system which will allow us capitalise on market cycles.

Our business consistently delivers superior EBITDA margins throughout the cycle.

Our highly valued product suite, including the benchmark Pilbara Blend, caters to all major Asian steel markets. This product suite is suited to evolving market developments and new markets.

We are investing in technology and innovation, and we will remain pioneers in our industry and deliver the world's first intelligent mine – Koodaideri.

We will continue to be disciplined about putting value ahead of volume and continue to drive value for our shareholders, by investing in low capital intensity mine options.

Iron Ore will deliver at least \$500 million of additional cash flow each year from 2021. This will be achieved by our 11,500 employees driving thousands of initiatives focused on sustainable productivity and cost improvements.

We have a resilient business, world-class assets, committed employees and the right strategy to continue to deliver superior value through the cycle.

### **Slide 73 - Q&A**

And now to the questions.

For the purposes of the webcast, could you please wait until we get a microphone to you.

### **Slide 74 – WRAP UP**

Thank you to the callers, we will now be ending the webcast.

To the audience in the room....thank you for your time today. I hope you enjoyed our detailed presentation and I am sure you have many more questions and you have plenty time with the team over the next few days.

I look forward to hosting you all at Brockman, Cape Lambert port and at our rail operations. It is going to a busy few days.

I will now hand back over to Natalie.