

**RioTinto**

# Investor Seminar

## Performance, strategic direction and shareholder returns

20 October 2021

Gobi desert, Mongolia



# Cautionary and supporting statements

This presentation has been prepared by Rio Tinto plc and Rio Tinto Limited (together with their subsidiaries, "**Rio Tinto**"). By accessing/attending this presentation you acknowledge that you have read and understood the following statement.

## Forward-looking statements

This presentation includes "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. All statements other than statements of historical facts included in this report, including, without limitation, those regarding Rio Tinto's financial position, business strategy, plans and objectives of management for future operations (including development plans and objectives relating to Rio Tinto's products, production forecasts and reserve and resource positions), are forward-looking statements. The words "intend", "aim", "project", "anticipate", "estimate", "plan", "believes", "expects", "may", "should", "will", "target", "set to" or similar expressions, commonly identify such forward-looking statements.

Such forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of Rio Tinto, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Such forward-looking statements are based on numerous assumptions regarding Rio Tinto's present and future business strategies and the environment in which Rio Tinto will operate in the future. Among the important factors that could cause Rio Tinto's actual results, performance or achievements to differ materially from those in the forward-looking statements include, but are not limited to: an inability to live up to Rio Tinto's values and any resultant damage to its reputation; the impacts of geopolitics on trade and investment; the impacts of climate change and the transition to a low-carbon future; an inability to successfully execute and/or realise value from acquisitions and divestments; the level of new ore resources, including the results of exploration programmes and/or acquisitions; disruption to strategic partnerships that play a material role in delivering growth, production, cash or market positioning; damage to Rio Tinto's relationships with communities and governments; an inability to attract and retain requisite skilled people; declines in commodity prices and adverse exchange rate movements; an inability to raise sufficient funds for capital investment; inadequate estimates of ore resources and reserves; delays or overruns of large and complex projects; changes in tax regulation; safety incidents or major hazard events; cyber breaches; physical impacts from climate change; the impacts of water scarcity; natural disasters; an inability to successfully manage the closure, reclamation and rehabilitation of sites; the impacts of civil unrest; the impacts of the Covid-19 pandemic; breaches of Rio Tinto's policies, standard and procedures, laws or regulations; trade tensions between the world's major economies; increasing societal and investor expectations, in particular with regard to environmental, social and governance considerations; the impacts of technological advancements; and such other risks identified in Rio Tinto's most recent Annual Report and accounts in Australia and the United Kingdom and the most recent Annual Report on Form 20-F filed with the United States Securities and Exchange Commission (the "SEC") or Form 6-Ks furnished to, or filed with, the SEC. Forward-looking statements should, therefore, be construed in light of such risk factors and undue reliance should not be placed on forward-looking statements. These forward-looking statements speak only as of the date of this report. Rio Tinto expressly disclaims any obligation or undertaking (except as required by applicable law, the UK Listing Rules, the Disclosure Guidance and Transparency Rules of the Financial Conduct Authority and the Listing Rules of the Australian Securities Exchange) to release publicly any updates or revisions to any forward-looking statement contained herein to reflect any change in Rio Tinto's expectations with regard thereto or any change in events, conditions or circumstances on which any such statement is based.

Nothing in this presentation should be interpreted to mean that future earnings per share of Rio Tinto plc or Rio Tinto Limited will necessarily match or exceed its historical published earnings per share.

## Disclaimer

Neither this presentation, nor the question and answer session, nor any part thereof, may be recorded, transcribed, distributed, published or reproduced in any form, except as permitted by Rio Tinto. By accessing/attending this presentation, you agree with the foregoing and, upon request, you will promptly return any records or transcripts at the presentation without retaining any copies.

This presentation contains a number of non-IFRS financial measures. Rio Tinto management considers these to be key financial performance indicators of the business and they are defined and/or reconciled in Rio Tinto's annual results press release, Annual Report and accounts in Australia and the United Kingdom and/or the most recent Annual Report on Form 20-F filed with the SEC or Form 6-Ks furnished to, or filed with, the SEC.

Reference to consensus figures are not based on Rio Tinto's own opinions, estimates or forecasts and are compiled and published without comment from, or endorsement or verification by, Rio Tinto. The consensus figures do not necessarily reflect guidance provided from time to time by Rio Tinto where given in relation to equivalent metrics, which to the extent available can be found on the Rio Tinto website.

By referencing consensus figures, Rio Tinto does not imply that it endorses, confirms or expresses a view on the consensus figures. The consensus figures are provided for informational purposes only and are not intended to, nor do they, constitute investment advice or any solicitation to buy, hold or sell securities or other financial instruments. No warranty or representation, either express or implied, is made by Rio Tinto or its affiliates, or their respective directors, officers and employees, in relation to the accuracy, completeness or achievability of the consensus figures and, to the fullest extent permitted by law, no responsibility or liability is accepted by any of those persons in respect of those matters. Rio Tinto assumes no obligation to update, revise or supplement the consensus figures to reflect circumstances existing after the date hereof.

# Agenda

BST	AEDT	Topic	Presenter
08:00 - 08:15	18:00 - 18:15	Strategy and execution	Jakob Stausholm, Chief Executive Mark Davies, Chief Technical Officer
08:15 - 08:40	18:15 - 18:40	Panel Culture and People: Becoming best operator	James Martin, Chief People Officer Kellie Parker, Chief Executive, Australia Arnaud Soirat, Chief Operating Officer
		Decarbonisation: Impact on commodity markets	Vivek Tulpule, Chief Economist
08:40 - 09:10	18:40 - 19:10	Our own business and impact of green steel	Mark Davies, Chief Technical Officer
		Commercial opportunities from decarbonisation	Alf Barrios, Chief Commercial Officer
09:10 - 09:40	19:10 - 19:40	Q&A session 1	Jakob Stausholm   Mark Davies   James Martin   Kellie Parker   Arnaud Soirat   Vivek Tulpule   Alf Barrios
09:40 - 09:55	19:40 - 19:55	BREAK	
09:55 - 10:15	19:55 - 20:15	Pilbara Iron Ore	Simon Trott, Chief Executive, Iron Ore
10:15 - 10:35	20:15 - 20:35	Aluminium	Ivan Vella, Chief Executive, Aluminium Bold Baatar, Chief Executive, Copper
10:35 - 11:00	20:35 - 21:00	Panel Excel in development	Mark Davies, Chief Technical Officer Sinead Kaufman, Chief Executive, Minerals
11:00 - 11:10	21:00 - 21:10	Financials	Peter Cunningham, Chief Financial Officer
11:10 - 11:40	21:10 - 21:40	Q&A session 2	Jakob Stausholm   Ivan Vella   Mark Davies   Sinead Kaufman   Peter Cunningham
11:40 - 11:45	21:40 - 21:45	Closing remarks	Jakob Stausholm, Chief Executive

RioTinto

©2021, Rio Tinto, All Rights Reserved





Welcome and thanks for joining us, in person and virtually.

I have been in this role almost 300 days. It has been busy and challenging. But it has also been enjoyable. Rio Tinto is a truly great company to lead.

When I was appointed Chief Executive, my immediate focus was to stabilise the company after the tragedy of Juukan Gorge; to start to repair



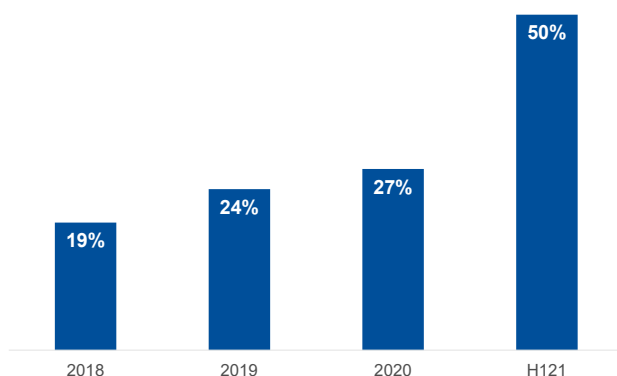
damaged external relationships, particularly in Australia; and set the overall direction to make Rio Tinto stronger.

Looking back over the last twelve months. We have completed the biggest management change in Rio Tinto's history. I also believe that we are extracting the full learning from Juukan Gorge and have made an important and significant shift in how we see ourselves and the external world.

We are becoming more humble, more human and more empathetic. Strengthening our relationships with society more broadly, is clearly a multi-year journey. But it starts with us changing, which we are doing.

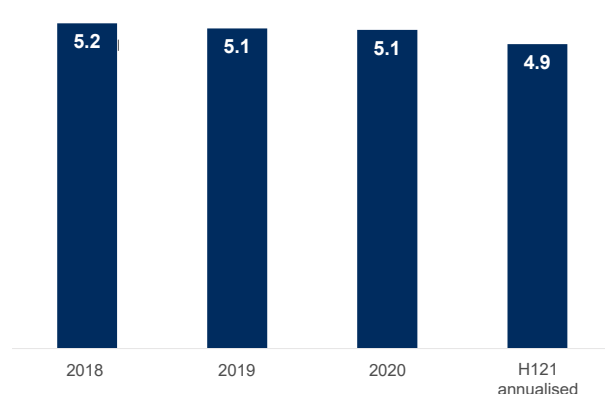
## Outstanding financials but operational improvement needed

Return on Capital Employed



\*Excludes divested assets

Copper equivalent production\*  
Million tonnes



©2021, Rio Tinto, All Rights Reserved

5

In the first half of 2021, we reported the best financial results in Rio Tinto's history, with net income of \$12.2 billion and ROCE of 50%, demonstrating the strength of the amazing portfolio of assets Rio Tinto has built over many decades. However, our operational performance this year has not been good enough. We must address this and we absolutely will. We will approach this in a systemic, sustainable way – not taking shortcuts. You will hear more today about how the product groups will work with Arnaud to embed it for the long term.

But today is not about the next three, six or twelve months, or setting 2022 guidance. It is about addressing the medium to long term strategic direction of Rio Tinto.

## The team



**Bold Baatar**,  
Chief Executive  
Rio Tinto Copper



**Alf Barrios**  
Chief Commercial  
Officer



**Peter Cunningham**  
Chief Financial  
Officer



**Mark Davies**  
Chief Technical Officer



**Sinead Kaufman**  
Chief Executive  
Rio Tinto Minerals



**James Martin**  
Chief People  
Officer



**Kellie Parker**  
Chief Executive  
Australia



**Arnaud Soirat**  
Chief Operating  
Officer



**Jakob Stausholm**  
Chief  
Executive



**Simon Trott**  
Chief Executive  
Rio Tinto Iron Ore



**Vivek Tulpule**  
Chief  
Economist



**Ivan Vella**  
Chief Executive  
Rio Tinto Aluminium

○ Executive Committee



©2021, Rio Tinto, All Rights Reserved

6

Since I appointed the new executive team in late January, we have worked together to build an effective team and address the issues we face. However, we must look beyond addressing yesterday's issues alone and grasp opportunities. As a team we therefore conducted an extensive strategy process, not only visualising how we see the future, but also making important choices that will define Rio Tinto.

After extensive discussions with our Board during September, we are really excited today to share this strategy with you – our investors, the owners of Rio

Tinto. For many in the team it is the beginning of an important dialogue.

You will today hear from each member of the executive team, see the breadth of talent and capabilities they have and experience the team dynamics of the Exco. I have also invited Vivek, our chief economist, because nobody at Rio can provide better insights into some key industrial matters.



## Four areas of immediate focus



In essence, we will today address:

Firstly, how we become the 'best operator' by implementing the Rio Tinto Safe Production System. Ensuring we do this is about restoring Rio Tinto's DNA. Arnaud will provide some new insights on our progress.

Secondly, how we will achieve impeccable ESG performance, from our community work to addressing climate change. You will hear how we

are making a step-change in decarbonising our business, in line with societal expectations and essential to achieving impeccable ESG performance.

Thirdly, after a decade where Rio Tinto in aggregate has not grown, we will outline options to unlock growth. We call it 'Excel in Development'. This is essential to ensure our portfolio remains relevant and is well placed to meet the commodity needs of future generations. Bold, Mark and Sinead will share their perspectives on how we are building capabilities in business development and project execution.

Fourthly, addressing the above in the right way, combined with being more outward and in-tune with societies will strengthen our social licence. This is of huge importance for our long-term future. We have invested significant time and effort over the last 10 months, which Kellie will outline. We will continue doing this day-in-day-out to secure and maintain our social licence.

Our ability to drive these changes will be driven by our leadership. Therefore the next item on the agenda today will be: Culture & People – not the

usual topic at an Investor Day, but, I say to you, nothing is more important for Rio Tinto.

I am very excited to share what we are doing to drive change internally, to enable and empower our great people. Unleashing their full potential will happen through fostering a high-achieving and caring environment with a bottom-up culture as opposed to top-down target setting.

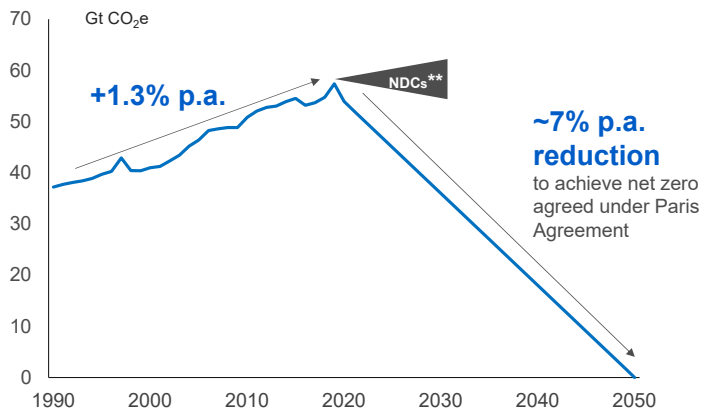
This is further emphasised by the launch today of a new set of 'Values' for Rio Tinto. These are expressed in just three important human values: Care, Courage, Curiosity.

At the heart of this is putting trust in our people. We need to enable those who are the experts to drive change and take accountability. To make a real difference across the board, we need to drive outcomes not just set targets.

These are all essential components in helping us deliver on our long-term vision for Rio Tinto. A vision that the entire team is committed to delivering, with the full support of the Board. This will ensure Rio Tinto thrives in the decades to come.

## The world faces a major challenge

Annual global GHG emissions\*



\*The source of the historic data is: Trends in global CO<sub>2</sub> and total greenhouse gas emissions: 2020 report. Netherlands Environmental Assessment Agency. The annual decline rate is an illustrative straight-line rate and not a forecast or scenario. | \*\*Nationally Determined Contributions

RioTinto

©2021, Rio Tinto, All Rights Reserved

8

Limited action so far. The world has more than doubled cumulative GHG emissions since the early '90's

Momentum changing. Countries are setting ambitious targets and enacting policies

China, the world's largest consumer and a significant producer of commodities, has set clear objectives

While there has been broad consensus on the need to tackle climate change, there has not been sufficient action. Since the world started discussing the challenge in the early 1990s, emissions have more than doubled. So, to meet the goals of the Paris Agreement, global emissions need to reduce by 7% a year between now and 2050.

But things are changing fast. Governments are setting more ambitious targets, and taking action. China's commitment is particularly significant, given that it consumes over 50% of the world's

commodities and is also a major, energy-intensive producer. We have seen similar determination for action from the US to Canada, from Japan to Korea and we expect additional momentum on the back of COP26.

Society at large is also demanding and driving change. From switching to EVs or green energy providers to putting pressure on companies to produce goods in a carbon neutral way or boycotting companies that don't.

For Rio, this presents a challenge, but in my view an even bigger opportunity. We must meet this challenge and work closely together with governments, suppliers, customers and partners - like never before to drive change. As the Prime Minister of Australia said in April, "We are going to meet our ambitions with the smartest minds, the best technology and the animal spirits of our business community."

Rio is up for this challenge. We will need to raise our ambitions and take genuine actions. We must switch to renewables at scale, electrify everything we can electrify, work across our entire value chain and



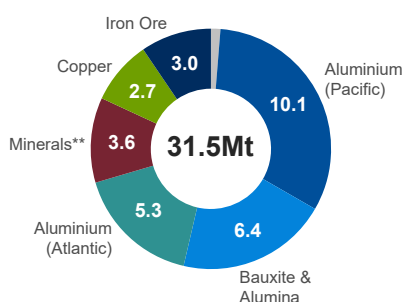
accelerate the development of new technology.

## A large carbon footprint today

Global commodity value chain carbon emissions and intensities

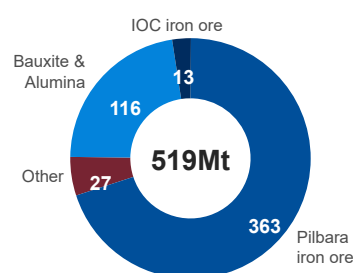
Global	CO <sub>2</sub> emissions	Production	CO <sub>2</sub> intensity
Copper*	86 Mt	21 Mt	4 tCO <sub>2</sub> /t
Aluminium*	~1.0 Gt	66 Mt	15 tCO <sub>2</sub> /t
Crude Steel	~3.3 Gt	1,850 Mt	1.8 tCO <sub>2</sub> /t

Our 2020 Scope 1 and 2 emissions by operations (equity basis)  
Total CO<sub>2</sub>e



\*Primary production | \*\*Iron Ore Company of Canada (IOC) included in Minerals

Our 2020 Scope 3 emissions  
Total CO<sub>2</sub>e



RioTinto

©2021, Rio Tinto, All Rights Reserved

9

We also recognise that we have a major carbon footprint, significant scope 1 & 2 emissions and very material indirect scope 3 emissions. We are therefore addressing this with urgency.

## All our commodities are vital – today, towards 2050 and beyond



Ongoing population growth and urbanisation provides base demand for metals

Additional demand for all our products from decarbonisation and global energy transition

Often no alternatives to steel, aluminium, copper and minerals from primary sources even with circular economy

Creates opportunities for us to deliver value-adding growth

RioTinto

©2021, Rio Tinto, All Rights Reserved

10

The transition to a lower carbon world offers a unique opportunity for us to grow and remain an attractive investment for decades to come.

For over a century, the main drivers of commodity demand have been population growth and urbanisation. We expect this to continue but not at the same levels we saw in China last few decades.

Looking ahead, the race to net zero will create additional demand for our commodities. All the

materials we produce are fundamental.

Copper, lithium, aluminium and minerals are the obvious ones.

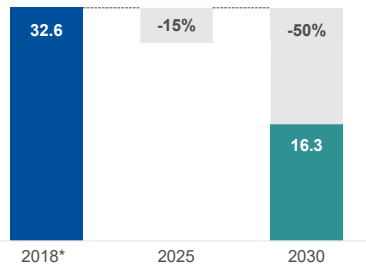
But let's be clear, high-quality iron ore is also essential, not only for ongoing urbanisation, but also in the drive to net zero. A large scale move to renewable energy will create additional demand for steel for example for the construction of wind turbines. Steel, particularly green steel, has a bright future. That is why we at Rio Tinto continue to love steel, a product for the future. It just needs to be decarbonised, which is not easy but it will happen.

Crucially, there are often no alternatives to the commodities we produce.

## Delivering our strategy

### 50% reduction in our emissions by 2030

New targets for our Scope 1 & 2 emissions  
(Mt CO<sub>2</sub>e equity basis)

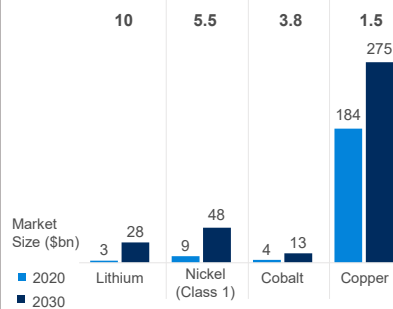


### Accelerate R&D and beyond

- Advantaged renewables position
- Accelerate R&D
- ELYSIS™
- Studying Canadian DRI
- High-quality iron ore
- Partnerships
- Crack the code on Pilbara iron ore
- Delivering our Scope 3 goals

### Ambition to double investment in growth

Growth to 2030 (multiple of current size)\*\*



~\$7.5bn\*\*\* investment in decarbonisation from 2022-2030 plus indirect expenditure

Double growth capex up to \$3bn per year from 2023

\*2018 Scope 1 & 2 emissions baseline has been adjusted for divestments. \*\*Market size is for primary market only. Recycling is expected to take a larger share of total demand in the future for most commodities. \*\*\*Conceptual view of capital requirements at October 2021. Marginal Abatement Cost Curves (MACC) will be updated on an annual basis. Sources: Rio Tinto Market Analysis, UBS, CPM Group | DRI = Direct Reduction Iron

To underline our commitment to take actions, today we are announcing new targets. We will bring forward our 2030 target of reducing our scope 1 and 2 emissions by 15% to 2025. We are also more than trebling our 2030 target, increasing it to a 50% reduction in our scope 1 and 2 emissions. We are starting an internal race that will activate all our staff, not least all our engineers, to think differently about energy solutions.

We are also engaging and taking responsibility for the wider emissions from the supply chain we are



part of, particularly the steel chain. You will hear from my colleagues about our plans to address scope 3 emissions.

We are committing direct investments of \$7.5 billion in decarbonisation from 2022 to 2030 inclusive. But our decarbonisation actions will result in much more investments by others. And I'd say to you, investors and owners of Rio Tinto, I am convinced it will, in aggregate, be valuable investments, future-proofing Rio Tinto, while also enabling us to be part of the solution the world is looking for.

We are doubling our investment in growth capex from \$1.5 billion to \$3.0 billion annually. But rest assured; we will maintain our capital discipline.

So how are we going to achieve this?

Our starting point is unique as we are not in fossil fuel extraction and we have extensive hydropower for our most energy intensive business, our aluminium smelters. However, we must do much more.

Firstly, we will accelerate our own decarbonisation, switching to renewable power, electrifying processing and running electric mobile fleets.

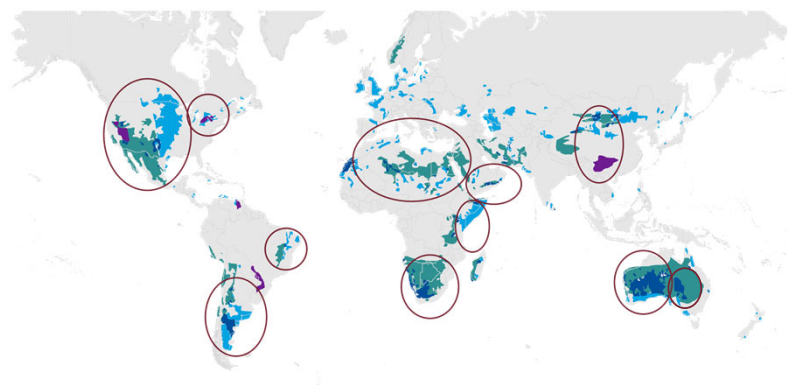
Secondly, we will increase our investment in R&D to speed up the development of technologies that will enable our customers to decarbonise. Clearly technology and partnerships have a key role to play.

Thirdly, we will prioritise growth capital in commodities that are essential for the drive to net zero. We will look to grow further in copper, battery materials and high-quality iron ore. We will also target our exploration spend to supplement our projects.

## Well placed to deliver

### We operate in three out of the eleven advantageous regions for renewable energy

■ Ideal for wind ■ Ideal for solar ■ Ideal for solar and wind ■ Existing major hydropower ○ RES\* endowed region



\*RES = Renewable Energy System

RioTinto

©2021, Rio Tinto, All Rights Reserved

### Advantaged positions

Large power producer and consumer. Uniquely positioned in advantaged green energy locations – Pilbara, Quebec and Queensland

### Assets and people

Long-life orebodies with superior orebody knowledge. Talented workforce

### Technology

Metallurgy, geology, mining equipment, processing, energy

### Cash flow and balance sheet

Disciplined capital allocation. Cash flow through cycle. Ability to invest and pay an attractive dividend – in line with our policy

I appreciate many are sceptical about the ability of a business like mining to deliver on the climate front, beyond issuing ambitious and long-dated targets. That is why we are sharing a clear pathway to material reductions by the end of the decade.

We are already a large consumer of energy, a large producer of renewable electricity, and an experienced manager of energy infrastructure. This will help us to determine and drive our own energy transition. We also have very large land positions in three out of the eleven global regions that are most

advantaged for renewable energy at scale

Our operational, exploration, technological and commercial knowledge positions us strongly to identify additional opportunities. We already have a lot of wins under our belt, from automation, discovery of new minerals like Jadarite, and progressing game-changing technologies like Elysis. And we are partnering widely with some of the best brains globally.

This is all underpinned by a strong balance sheet and assets that generate stable cash flows in any economic environment.

We therefore have the capacity to invest in decarbonising our business, securing valuable growth while also continuing to pay attractive dividends.

With that, I would now like to introduce our first of today's panels on Culture and People.

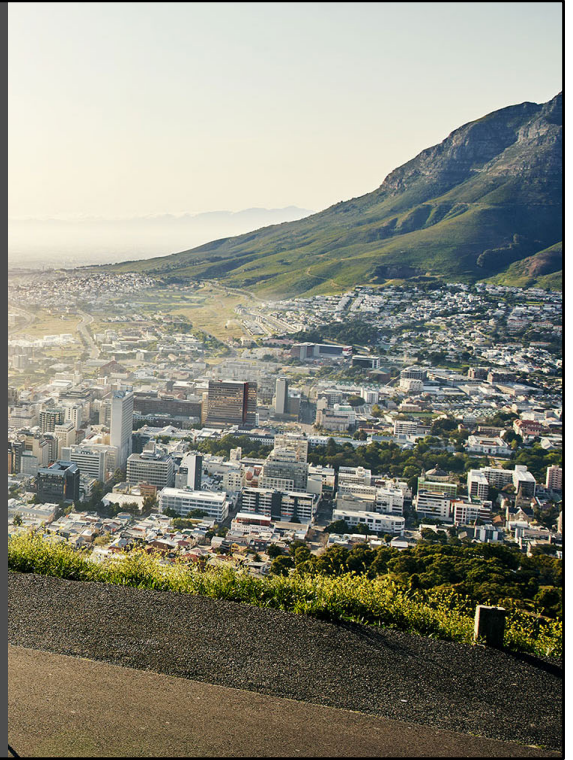
The panel consists of our Chief Operating Officer, Arnaud Soirat, our Chief Executive of Australia,

Kellie Parker, our Chief People Officer, James Martin and our Chief Technical Officer, Mark Davies moderated by Menno. Over to you Menno.



# Vivek Tulpule

## Decarbonisation: Impact on commodity markets



# Transitioning towards net zero emissions



## Low-carbon policies

- Net zero by 2050<sup>1</sup>
- Net zero by 2050<sup>2</sup>
- Carbon neutral by 2060<sup>3</sup>

## Scrap use

Cannibalises some demand for primary material

Al	Steel	Cu
4-6%	1-3%	3-4%

Annual growth to 2040



## Electrification

2.5x electrification growth from now to 2050 in net zero scenario

Average per capita electricity demand will more than double



## Renewables

Renewable energy from 10% to 70% of energy mix by 2050

- 16x wind increase
- 30x solar increase



## Power storage

Battery capacity additions for electric vehicles will grow over 30x by 2050

Stationary storage will grow with intermittent renewable generation



## Hydrogen

A critical part of the fuel mix in industry and heavy transport

6% of final energy mix by 2050

<sup>1</sup> EU Updated Nationally Determined Contribution (NDC), Dec 2020, United Nations Framework Convention on Climate Change (UNFCCC) | <sup>2</sup> As per section 4.a(ii).b, The United States of America Nationally Determined Contribution, April 21 2021 | <sup>3</sup> Official Statement in 75th Session of The UN General Assembly, Sep 2020 Source: Net zero statistics from International Energy Association (IEA)

Achieving the ultimate environmental goal of the Paris agreement will require the world to move toward net zero greenhouse gas emissions over the next 30 years.

This would necessitate nothing less than a green energy revolution leading to profound shifts in almost every aspect of global economic activity and policy making.

Most importantly, the world will need to engineer a

wholesale replacement of carbon-based fuels with bioenergy, green hydrogen and fossil-free electricity.

The greatest absolute shifts will occur in power generation.

In the IEA's net zero scenario, electrification mostly replaces direct combustion of fossil fuels.

And the share of electricity in final energy consumption rises from 20% today to nearly 50% by 2050.

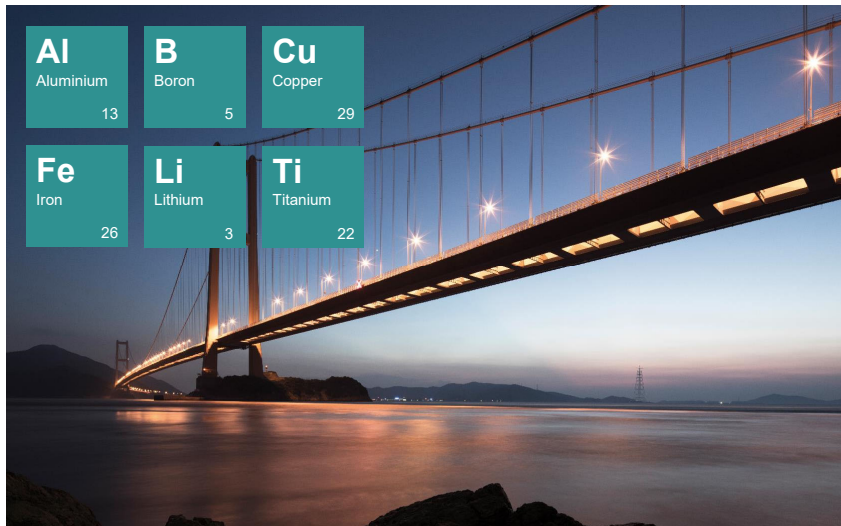
At the same time wind power increases 16-fold, while solar power rises by almost 30 times as renewables replace coal - and eventually gas - in electricity generation.

These shifts will require enormous amounts of battery storage, partly to deal with intermittency, but especially as electric vehicles replace the internal combustion engine.

Advanced urban mining methods will optimise the collection and processing of scrap in a rapidly advancing circular economy.

And green hydrogen and ammonia will become critical inputs to a range of industrial processes including steel production and heavy transport.

## All our commodities are vital – today, towards 2050 and beyond



Green aluminium lowers carbon input

Green steel supporting low-carbon urbanisation

Copper supports rapid renewable electrification

Lithium is an essential battery technology mineral

All our commodities are vital in this green economic revolution.

For example, the competitiveness of green aluminium relative to fossil fuel based aluminium will escalate in a carbon-constrained world.

In the construction sector the replacement of cement with green steel will allow substantial reductions in greenhouse gas emissions.

Copper demand will rise with the renewable electrification of energy.

And lithium ion batteries will be the preferred storage technology for EVs and they will also be important contributors to renewable grid firming.

I will take you through some more detailed analysis of these points in a moment.

But first, it is important to acknowledge that the transition toward net zero will not be smooth.

The large investments needed to construct a carbon-free economy will not happen overnight.

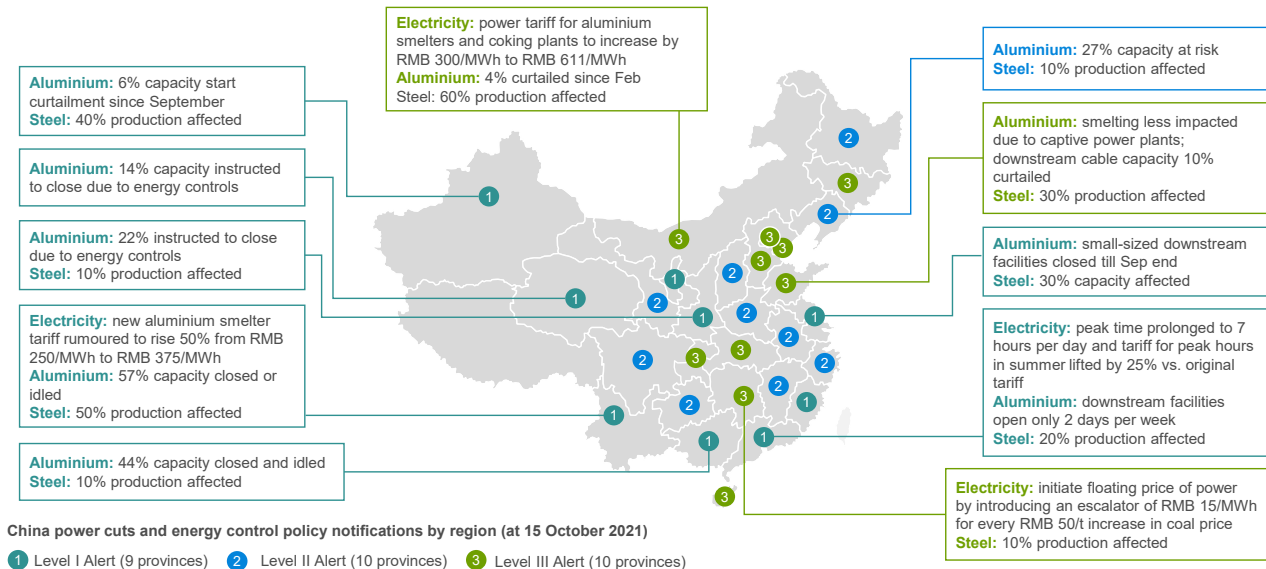
Aggressive policy frameworks to discourage fossil fuel use will be necessary at a global level.

Already we see examples of this around the world including taxes on carbon, border adjustment taxes, emission quotas and administrative restrictions on carbon-intensive industries, including their inputs.

In this context, as investment in fossil fuels winds down, there will be mismatches between supply and demand across energy and industrial value chains.

We are seeing this right now, whereby efforts to limit growth in fossil fuel-based energy are intersecting with the effects of economic stimulus to create shortages in energy markets.

## China is targeting peak emissions by 2030



China power cuts and energy control policy notifications by region (at 15 October 2021)

1 Level I Alert (9 provinces)    2 Level II Alert (10 provinces)    3 Level III Alert (10 provinces)

RioTinto

©2021, Rio Tinto, All Rights Reserved

16

China provides an important example of recent energy shortages, with the impacts shown in this chart.

The shortages have led to curtailments in aluminium as well as reduced utilisation rates in electric arc furnaces for steel making.

The broader strategic context, however, is China's impressive progress toward achieving peak emissions by 2030 and carbon neutrality by 2060.



Power and steel are priority sectors given their large share in total greenhouse gas emissions.

In the case of power considerable progress has already been made.

Total installed capacity of renewable energy grew by more than 85% between 2016 and 2020, and now accounts for more than 30% of total generation.

In the case of steel, China's carbon emissions rose as production increased from around 800 million tonnes in 2016 to over 1 billion tonnes in 2020.

But there was progress on carbon intensity with emissions per tonne of steel declining by around 10 per cent over the same period.

Technological developments will be a key feature of China's approach to the climate challenge.

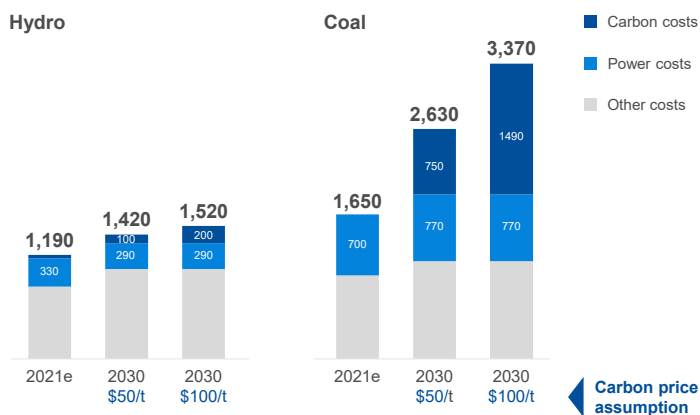
There will be a focus on reducing battery costs and on the initiation of hydrogen-based industrial

ecosystems including for green steel production.

The importance of achieving cost effective carbon capture and storage will begin to escalate, especially beyond 2030.

## Competitive advantage for low-carbon smelters

### Aluminium smelter all-in cash costs (Real US\$2021 per tonne)



All non-carbon costs are regional weighted averages from CRU, 2021 (long-run uses 2030 costs). Hydro costs are based on a weighted average of Canadian smelters. Coal costs are based on a weighted average of coal-fired Chinese smelters. Costs do not include CO<sub>2</sub> charges from alumina refineries.

RioTinto

©2021, Rio Tinto, All Rights Reserved

17

60% of world's aluminium production in 2020 powered by coal

China accounted for ~75% of capacity growth over 2010-20

Carbon intensity of coal smelters is over 7x that of hydro smelters

Inert anodes could enable zero-carbon smelting

Looking to the longer term, our low-cost hydro-based aluminium smelters will grow their distinct structural advantage as we move toward a net zero world.

Since 2000, coal-based smelters have accounted for more than 70% of the growth in primary aluminium production.

And the carbon footprint of the industry has more than doubled from 300 to 700 million tonnes.

These trends will need to be reversed.

The main operating cost differentiator in aluminium has always been access to competitively priced power from any source.

But as carbon is penalised this differentiator will increasingly become competitively priced green power.

The chart shows that with long-run carbon penalties, there is a widening cost difference between aluminium based on competitive hydro versus aluminium from coal-fired power.

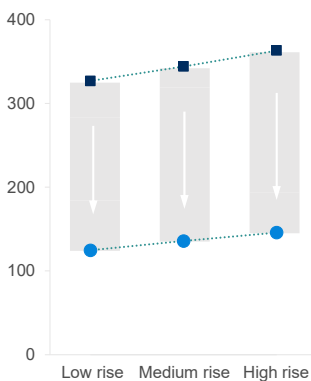
More generally, net zero policies will drive smelters away from fossil fuels putting pressure on future supply.

This is because the global availability of hydro is limited and nuclear power for smelting will be expensive.

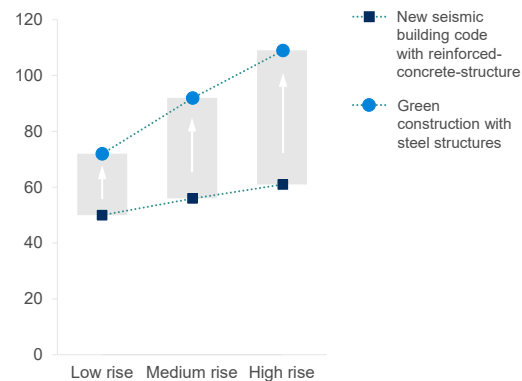
At the same time the inherent variability of wind and solar generation will make running a smelter exclusively on these power sources challenging with today's technologies.

## Green steel structures can reduce emissions

**Total carbon emissions**  
Kg per m<sup>2</sup> (China)



**Steel intensity**  
Kg per m<sup>2</sup> (China)



Building construction is responsible for about 30% of China's carbon emissions

New China building code will require higher seismic precautionary intensity

A shift to green construction and steel structures will reduce carbon emissions by ~60%

Moving to steel structures contributes up to a third of the total emissions reduction

Steel intensity of construction increases by ~45-80% across low to high rise buildings

Source: Tsinghua School of Civil Engineering, 2021. Green construction with steel structures includes the shift to green concrete and green steel in addition to the move from current reinforced concrete structures to steel structures.

The next slide illustrates the power of steel, or more specifically green steel, to drive carbon emission reductions in the construction sector.

Around 50 per cent of China's carbon emissions are attributable to buildings.

30 percentage points are from the materials used in construction - primarily steel and cement while the remainder is attributable to heating and cooling.

This means that the building sector is likely to become an increasingly important focus of China's emission reduction policies.

At the same time, however, there has been an emphasis on improving building standards.

And this has increased the intensity of steel use per square meter of construction.

The policy conundrum is that this has also led to higher carbon emissions.

But with a shift to green steel, this equation could be turned on its head.

By replacing reinforced concrete with green steel structures, carbon emissions can be reduced by up to 60%.

At the same time the shift in construction method would lead to an increase of up to 80 per cent in the

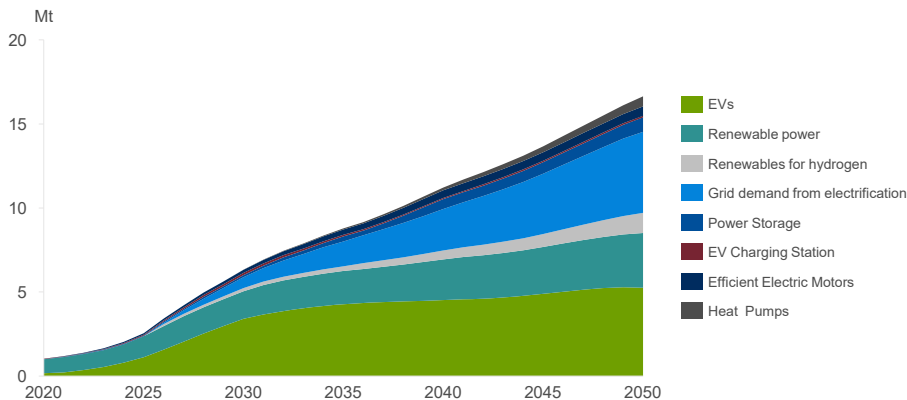
steel intensity of some buildings.

This would be a potential win for the environment, for steel and for iron ore - especially higher grade material.



# Decarbonisation is a big driver of copper demand

Net additional demand\* in a net zero carbon scenario



Net demand after deducting copper consumption using traditional technologies in these segments. Net zero carbon scenario is an internal based view where developed countries reach net zero emissions by 2050, large emerging markets, including China, by 2060 and all other countries by 2070. Average intensity data from International Copper Association (ICA). \*Global semis

Additional green demand expected to account for over one quarter of total demand in the net zero carbon scenario

Rapid electrification of grid adds ~5Mt in copper demand by 2050

Solar and wind generation consume ~3-6 tonnes of copper per MW respectively vs ~1 tonne per MW for thermal power

Electric vehicles contain ~80kg of copper vs 20kg in an internal combustion engine

Copper demand benefits directly from the green energy revolution.

Over one quarter of copper consumption in 2050 would be attributable to the additional demand associated with a transition to net zero.

Key aspects of the green energy revolution such as the increasing share of electricity, including additional electricity for green hydrogen, would add substantially to copper grid demand.

At the same time, the electrification of transport and the transition to renewables entails an increase in copper intensity across the automotive and power sectors contributing even further to demand.

For example, an average EV can contain four times more copper than an average internal combustion engine car.

Solar power systems consume about 4 tonnes of copper per megawatt of installed capacity versus around 1 tonne for thermal power.

And the copper intensity of wind power ranges from 3 to 6 tonnes per megawatt.

The positive implications for copper demand from these higher intensities is amplified because more renewable capacity is needed to replace thermal capacity given relatively low average utilisation rates for renewables.

The green demand growth shown in the chart would

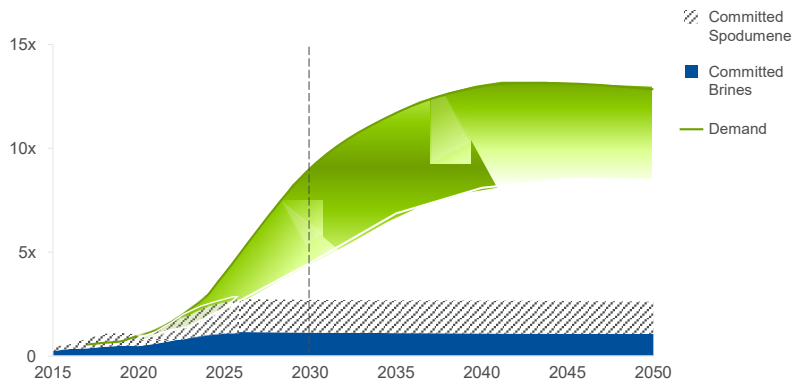
ensure a persistent emerging supply gap for copper.

And this will only be filled by incentivising the development of high-cost projects, mine life extensions and the uncertain discovery of new ore bodies.

## Significant supply gap emerging for lithium

### Lithium demand and supply in net zero carbon scenario

(Multiple of 2020 demand levels, Lithium Carbonate Equivalent)



Net zero carbon scenario is an internal based view where developed countries reach net zero emissions by 2050, large emerging markets, including China, by 2060 and all other countries by 2070.

RioTinto

©2021, Rio Tinto, All Rights Reserved

By 2030, electric vehicles will account for up to 55% of annual light vehicle sales

Lithium is the preferred material in electric vehicle batteries and has potential upside in emerging solid state battery chemistry

Supply gap will require over 60 Jadar projects

- Committed supply and capacity expansions contribute ~15% to demand growth over 2020-50
- Remaining 85% would need to come from new projects

20

Finally, I would like to turn to Lithium which is already experiencing rapid demand growth on the back of accelerating EV uptake.

In a trajectory toward net zero, the global share of light vehicle sales for EVs could exceed 50% as early as 2030 reaching up to 65 million units.

This would imply around 3 million tonnes of lithium demand compared with just 350,000 tonnes today.

Lithium will remain the preferred basis for battery chemistries in EVs.

And the expected future development of solid-state batteries with improved energy density and safety performance could provide further upside, by increasing lithium intensity per kilowatt by over 30%.

At the same time, lithium consumption per EV is growing as battery sizes increase to improve vehicle range, addressing a key consumer concern.

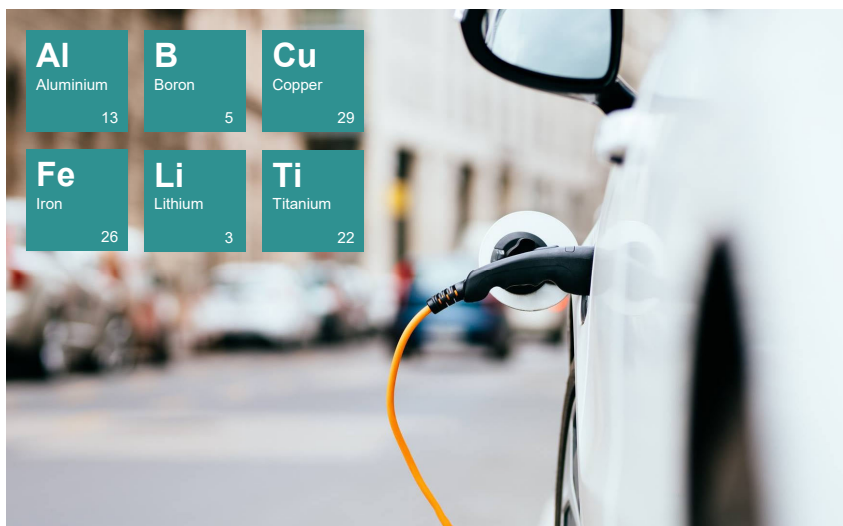
On the supply side there are a variety of sources available and there's room for all of them.

Recycling will start to make a substantial contribution only after 2040 as vehicles that are currently being purchased are scrapped.

Existing operations and projects will contribute just 1 million tonnes to lithium supply implying that a substantial gap will need to be filled within the next

ten years.

## Energy and industrial transition drives demand for our products



Limiting the impact of climate change requires a green revolution

This social-industrial change will profoundly shift the energy and industrial landscape

Green metals and minerals will be key enablers

In conclusion, the world's journey toward achieving the environmental goals of Paris will require nothing less than a green energy revolution.

In turn this will necessitate a three-decade transformation in the world's industrial systems, in its mobility systems and in its urban environments.

The minerals and metals produced by Rio Tinto and its customers are vital ingredients in this change.

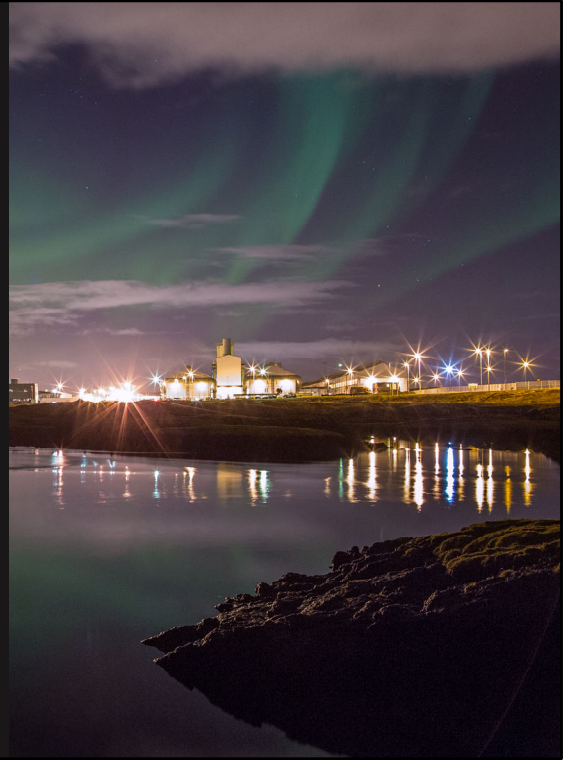
Now over to Mark who will speak about how we will decarbonise our own business.



**Mark Davies**

**Decarbonising our own  
business and the impact  
of green steel**

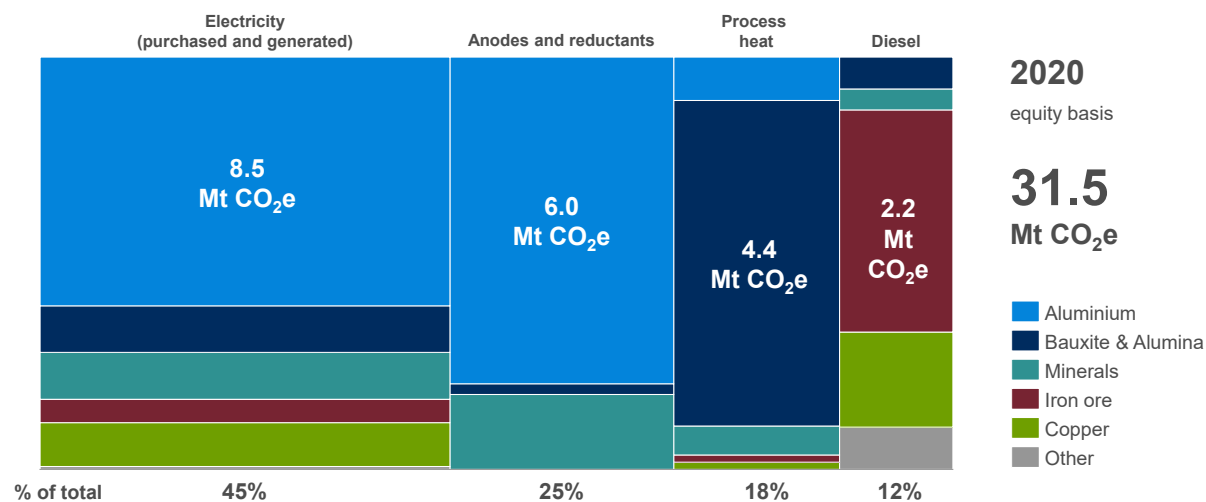
ISAL Aluminium smelter, Iceland



Thank you Vivek.

I'm going to discuss what the energy transition  
means for our business.

## Our Scope 1 & 2 carbon footprint today



Let's start by looking at our position today. Our Scope 1&2 carbon footprint is equivalent to 31.5 million tonnes of CO<sub>2</sub> on an equity basis and here we've broken that down by commodity into four areas: electricity; anodes and reductants; process heat; and diesel.

Electricity accounts for 45% of the total, despite 75% of consumption at our managed operations coming from renewables. The combustion of carbon anodes in our aluminium smelters emits about 2 tonnes of CO<sub>2</sub> per tonne of metal produced and is

our second highest contributor, while emissions from process heat for our alumina refineries are the third largest. Despite having one of the lowest carbon intensity aluminium businesses in the world, 70% of our total emissions are from our aluminium, bauxite and alumina operations.

The final area is diesel and more than half of the emissions are from mobile fleet and rail in the Pilbara.

## Taking actions to address our emissions

### Electricity

#### Growing renewables from 75%<sup>1</sup>

- Gudai-Darri (34MW), QMM (20MW) and Weipa (4MW)
- Large scale (1GW) Pilbara renewables
- Switching Boyne Island and Tomago smelters to renewables
- Signed statement of cooperation with Queensland Government

### Anodes & Reductants

#### Developing technologies

- Construction of first ELYSIS™ commercial-scale cell at Alma
- Increasing R&D

### Process heat

#### Redesigning processes

- Yarwun hydrogen calcination pilot
- Plasma torches trials

### Diesel

#### Partnering with industry

- Komatsu and Caterpillar zero-emission truck partnerships
- Charge On Innovation Challenge

### Offsets

Building capacity and capability including new technology partnerships

<sup>1</sup>Share of renewables in 2020 across our managed operations

RioTinto

©2021, Rio Tinto, All Rights Reserved

24

We're taking a range of actions. We have made progress and are stepping up our efforts.

Today 75% of the electricity in our managed operations is from renewables and to further grow that share we have approved solar projects at Gudai-Darri, Madagascar and Weipa. These projects are only a start and we are committed to scaling up their deployment.

For the remaining three areas, investing in new technologies and R&D is essential. Some examples

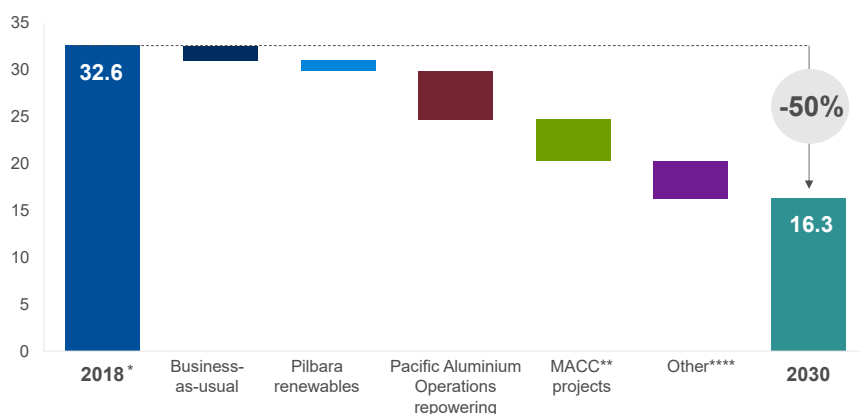
include:

- Elysis, which Ivan will talk more about later;
- Hydrogen pilots; and
- Cross-sector partnerships to develop zero-carbon trucks.

Our priority is to reduce our emissions through abatement projects. Although carbon offsets will remain an option of last resort, we are developing our internal capability to create a portfolio of offsets, including both technology and Nature-Based-Solutions. For example, we are starting to explore carbon capture and mineralisation options leveraging our exploration expertise and nature-based solutions based on our extensive land holdings.

## Raising our decarbonisation target from 15% to 50% by 2030

Our Scope 1 & 2 emissions (Mt CO<sub>2</sub>e equity basis)



Accelerate delivery of existing 15% emissions reduction target to 2025

2030 target from 15% to 50% reduction

Increase decarbonisation investment of our own assets to ~\$1.5bn over next three years and total investment of ~\$7.5bn from 2022 to 2030\*\*\*

Incentivise MACC projects with internal carbon price of \$75/t CO<sub>2</sub> initially

\*2018 Scope 1 & 2 emissions baseline has been adjusted for divestments. | \*\*Marginal abatement cost curve, see slide 28 | \*\*\*Conceptual view of capital requirements at October 2021. MAC curves will be updated on an annual basis | \*\*\*\*Includes energy efficiencies, ELYSIS™ and carbon offsets

RioTinto

©2021, Rio Tinto, All Rights Reserved

25

It's clear that we can, and we must, accelerate the decarbonisation of our operations.

We're pleased to announce today some new Scope 1&2 targets to strengthen our alignment with the Paris Agreement and our long-term ambition of achieving net zero emissions by 2050.

We are bringing forward to 2025 the delivery of our existing target of a 15% reduction in emissions, and we are more than tripling our 2030 target from a 15% to a 50% reduction against our 2018 equity

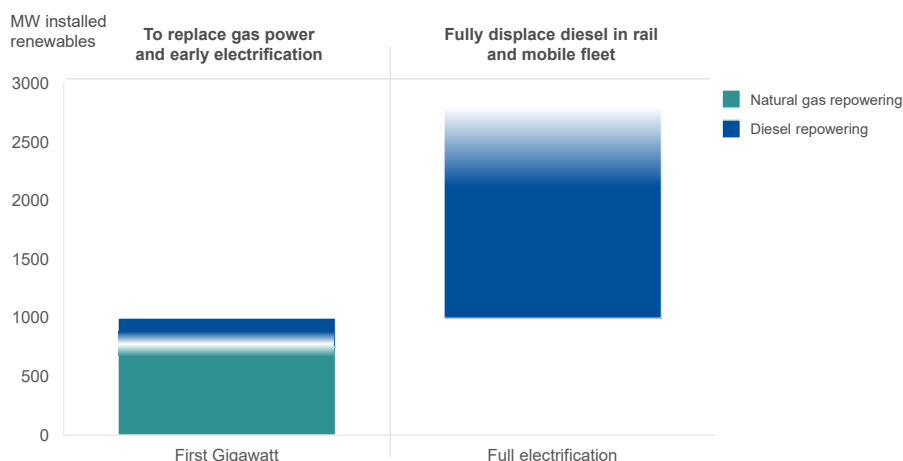
baseline.

We'll achieve this through:

- Developing 1GW of solar and wind power in the Pilbara;
- Green energy solutions for the Boyne and Tomago smelters; and
- Introducing an internal carbon price of \$75 per tonne of CO<sub>2</sub>.

The introduction of this internal carbon pricing will provide the incentive to accelerate the delivery of abatement projects. As a result of this, we expect to increase our decarbonisation spend to around \$1.5bn over the next three years, and around \$7.5bn overall to the end of the decade.

## Switching the Pilbara to renewables



Rapid deployment of ~1GW solar and wind renewables, supported by storage

Abates ~1Mt CO<sub>2</sub> Scope 1 emissions, mostly from gas-based power for fixed plants

Full electrification and decarbonisation of Pilbara system require further deployment of renewables at scale

Exploring development partnerships

In the Pilbara, we have one of the world's largest micro grids, underpinned by 480 megawatts of gas-based power capacity. The solar plant we approved at Gudai-Darri in 2020 is expected to come online next year. We want to accelerate the transition by targeting the rapid deployment of one gigawatt of wind and solar renewables.

This will replace gas power to meet demand from our fixed plants and infrastructure, as well as support the early electrification and






decarbonisation of our mobile fleet.

This will abate about one million tonnes of CO<sub>2</sub>, or around one third of the carbon emissions from our Pilbara operations.

The full electrification of our Pilbara system, including all trucks, mobile equipment and rail operations, will require further gigawatt scale renewable deployment combined with advances in fleet technologies.

## Progressing renewable power options for Australian smelters

Assets in coal-based grids	Ownership	Power (100% basis)	Contract expiry
 <b>Tomago smelter</b>	51.6%	960MW (demand)	2028
 <b>Boyne Island smelter</b>	59.4%	810MW (demand)	2029
 <b>Gladstone power station</b>	42.1%	1,680MW (capacity)	

Catalyst for regional renewable energy deployment and development of industry

Signed Statement of Cooperation with Queensland Government

Requires deployment of 5GW+<sup>1</sup> of solar and wind power with robust firming solution

<sup>1</sup> Equity share



©2021, Rio Tinto, All Rights Reserved

27

The Boyne smelter and Gladstone power station in Queensland and the Tomago smelter in New South Wales all operate in coal-based power grids. These facilities account for 27% of our Scope 1&2 emissions and more than half of our emissions from electricity use. Green repowering solutions are essential to the long-term sustainability of these operations.

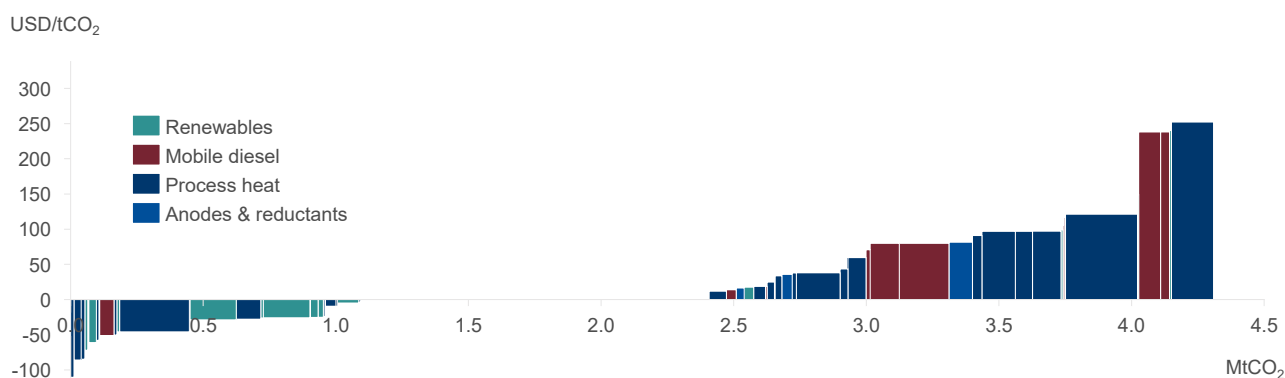
Last week, we announced a partnership with the Queensland government to develop central Queensland into an industrial and advanced

manufacturing hub, helping to deliver a more sustainable future for the area by fast tracking renewables and attracting new green industries.

## Accelerating current abatement projects

### Our Marginal Abatement Cost Curve for Scope 1 & 2 emissions

(excl. Pilbara and Pacific Operations repowering, ELYSIS™, energy efficiency and carbon offsets)



As of 30 September 2021



©2021, Rio Tinto, All Rights Reserved

28

In 2019 we completed a bottom-up, asset-by-asset, analysis of mitigation options to inform our 2030 targets and long-term decarbonisation pathways.

This gave us our first Group-wide marginal abatement cost – or MAC – curve.

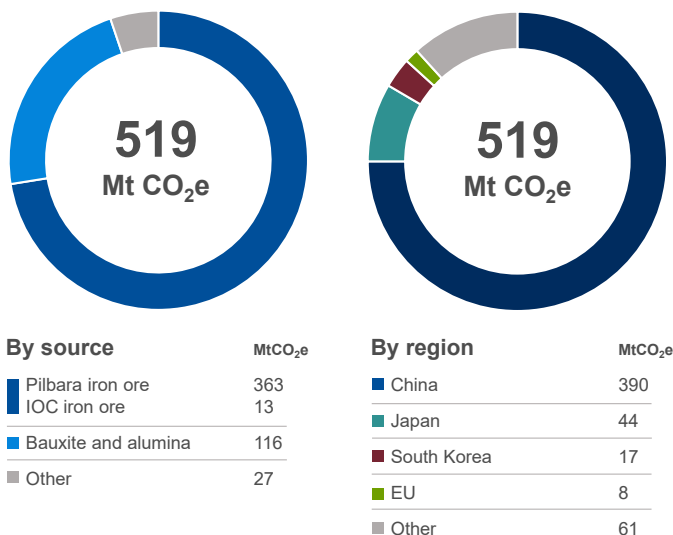
We're using this in our planning process to prioritise carbon abatement projects, align our climate-related spend and track progress against targets.

This shows our latest MAC curve, excluding the

projects I've just discussed in the Pilbara and our Australian smelters.

As you can see it covers projects across all four sources of emissions, and about half of these are NPV positive at a zero-carbon price. With an initial carbon price of \$75 per tonne of CO<sub>2</sub> we aim to accelerate these projects and incentivise efficiency and abatement.

## Developing green products for our customers



### Scope 3 goals

- 1 Technology for reductions in steelmaking carbon intensity of at least 30% from 2030
- 2 Breakthrough technologies to deliver carbon neutral steelmaking pathways by 2050
- 3 Anticipate that ELYSIS™ technology will reach commercial maturity in 2024
- 4 Net zero emissions from shipping our products by 2050

RioTinto

©2021, Rio Tinto, All Rights Reserved

29

As Jakob mentioned in his introduction, our products are essential today as enablers of the energy transition and a net zero world.

As well as decarbonising our assets we need to develop products that can help our customers decarbonise.

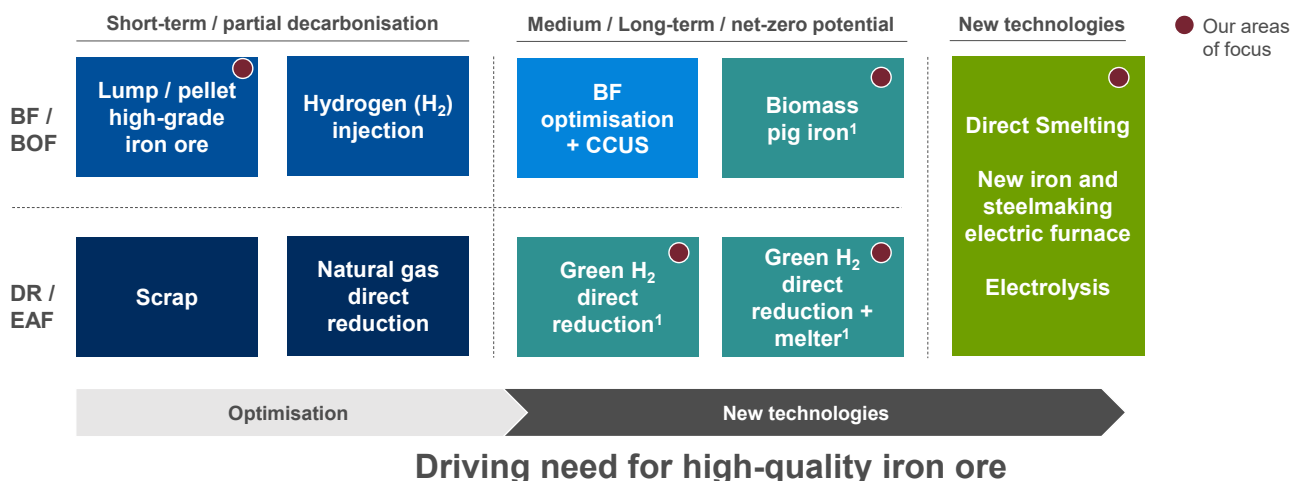
Our Scope 3 emissions are nearly 520 million tonnes of CO<sub>2</sub> and around 95% of this is from the processing of iron ore, bauxite and other products

by our customers.

87% of these emissions take place at our customer facilities in China, South Korea and Japan. Korea and Japan have pledged to reach carbon neutrality by 2050, China by 2060.

Just as we are stepping up our Scope 1 & 2 reduction efforts, we are also sharpening our focus on our Scope 3 goals.

## A shift to greener steelmaking technologies



<sup>1</sup> These products can be used in an EAF or BOF | BF = Blast furnace, BOF = Basic oxygen furnace, DR = Direct reduction, EAF = Electric arc furnace, CCUS = carbon capture, utilisation and storage

RioTinto

©2021, Rio Tinto, All Rights Reserved

30

Steel is one of the best construction materials available and as Vivek shared earlier, it has an essential role to play in decarbonising buildings.

The carbon intensity of steel is similar to that of hydro-based aluminium today, but steel is a much bigger market, with total emissions of ~3.3 billion tonnes of CO<sub>2</sub> which accounts for about 8% of global carbon emissions.

The transition of the steel value chain towards net



zero will need new technologies and we believe there will be at least three phases of transformation.

Firstly, blast furnace optimisation. This means the use of higher-grade ores, including more lump and pellets, and new processing techniques such as the use of hydrogen in the blast furnace instead of pulverised coal injection (PCI). Optimisation and cost-effective carbon capture will be key to achieving net zero here.

We also expect to see an increase in the use of scrap in Electric Arc and Basic Oxygen Furnaces, with stronger growth in China as the scrap pool rises, although this will be quality and quantity dependent.

As a second phase, we see the accelerated development of green direct reduction iron. This is a technology available today, using natural gas, and the industry is working to switch to hydrogen to create a net zero pathway. Using sustainable biomass with iron ore could also provide a green product, as announced just last week with our low-carbon research project.

The last phase of transition will be new technologies. This will include direct smelting as well as more speculative technologies such as electrolysis, which requires a number of technical breakthroughs. The shift to new, green, technologies will require more high-quality iron ore and we are seeking to bring additional tonnes of high-grade iron ore to market from IOC and Simandou.

## Our focus areas for iron and steel decarbonisation



DRI = Direct reduction iron, CSIRO = Commonwealth Scientific and Industrial Research

We've built a dedicated Rio Tinto steel decarbonisation team to support transition by:

- Continuing to work closely with our customers on blast furnace optimisation.
- 'Cracking the code' to find future pathways for Pilbara ores, which Simon will speak to later.
- We're also committed to developing our high-grade Simandou deposit in Guinea. The resources contain a significant proportion of ore that can meet Direct Reduction specifications.
- Lastly, we're studying building a hydrogen-

based hot briquetted iron plant in Canada. The plant will have access to high-grade Direct Reduction pellets from IOC, and renewable electricity, with the prospect of producing green hydrogen.

No one company alone will solve the decarbonisation challenge. It will require deep collaboration across our industry and beyond, including partnerships with customers, technology providers, research institutes, government, and other stakeholders.

I'll now hand over to Alf, who will talk about our customer approach.



# Alf Barrios

## Commercial opportunities from decarbonisation

Amrun, Queensland

## Sustainable future across the value chain

### Leveraging insights across the value chain

Assets

Customers

Suppliers

Markets

Communities

**1** Partnering with our suppliers and developing sustainable supply chains

**2** Working together with our customers to provide products & services for a more sustainable future

**3** Innovating with our customers to enable them to decarbonise

RioTinto

©2021, Rio Tinto, All Rights Reserved

33

Thank you, Mark. Greetings everyone and great to be talking with you today from Singapore.

Climate change is one of the biggest challenges facing our customers and our supply chains. It will take a coordinated effort to make meaningful progress. We have an important role to play on this journey.

Our commercial business is part of an ecosystem. We are the primary interface with our markets,

customers and suppliers – local, regional and global. We have a network of 37,000 suppliers and 1,700 customers. We can utilise our insights across the value chain and our deep relationships to form partnerships to build a more sustainable future.

It is fundamental to our values, is critical to staying relevant with our customers...and it makes good business sense. We are delivering on our strategic priorities by: partnering with our suppliers to accelerate the decarbonisation of our assets and developing sustainable supply chains; working closely with our customers to provide products and services for a more sustainable future; and innovating with our customers to enable them to decarbonize.

As mentioned by Mark, we are collaborating with steel mills, research institutes and technology providers, focused on both Blast Furnace optimisation and green steel pathways. Simon will cover the focus for our Pilbara ores later. I will take you through some of the key actions we are taking to lead this change.

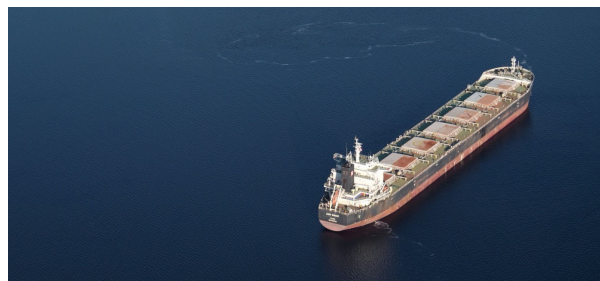
## Partnering with suppliers and developing sustainable supply chains



### Driving innovation through supplier partnerships

- Collaborating on a mining decarbonisation pathway
  - 2025 Piloting zero emission trucks and locomotives
  - 2030 No new diesel-powered trucks and locomotives
- Supporting local and Indigenous supplier development

<sup>1</sup> From our own and time chartered fleet | <sup>2</sup> Delivery from H2 2023  
IMO: International Maritime Organisation, LNG: Liquefied Natural Gas



### Accelerating shipping decarbonisation

- Reduced emissions intensity<sup>1</sup> >30% by end 2021, vs IMO target of 40% by 2030
- Chartered 9 LNG dual-fuel Newcastlemax vessels<sup>2</sup>
- Net zero emission vessels by 2030

**RioTinto**

©2021, Rio Tinto, All Rights Reserved

34

Rio Tinto spends around \$20 billion annually on goods and services. And we are a major dry bulk charterer with over 230 vessels on charter at any given time. This scope and scale creates opportunities to play a leading role in decarbonisation.

We are driving our partnerships to fast-track the development of zero-emission haulage – hosting a Komatsu pre-production trial and targeting the world's first deployment of 35 Caterpillar zero-emissions autonomous haul trucks at our Gudai-



Darri site in the Pilbara. By 2025 we will be piloting both zero-emissions haul trucks and locomotives with the goal to stop buying new diesel haul trucks and locomotives before 2030.

More broadly, we have embedded greenhouse gas emissions in our sourcing criteria and are expanding to include other ESG factors. We are also supporting the communities where we operate, through investing in supplier development, and substantially increasing our local and Indigenous spend.

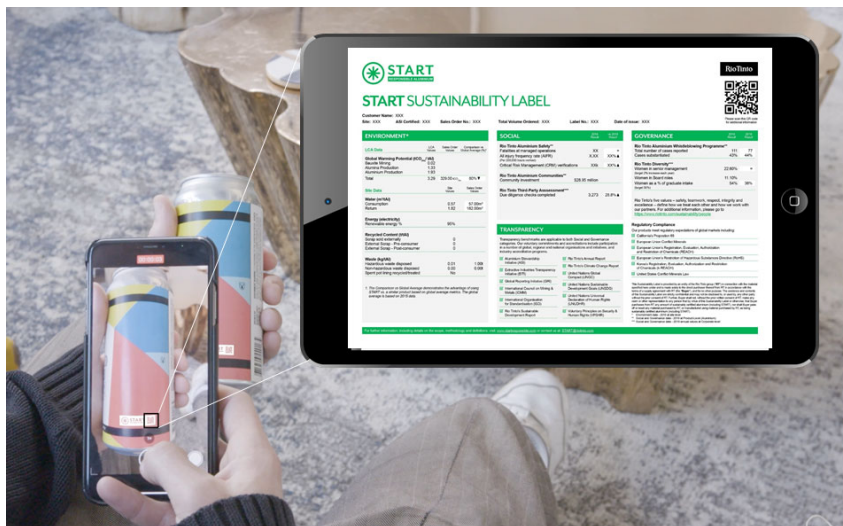
Similarly, we are accelerating delivery of our climate commitments on shipping.

We have already delivered 30% intensity reduction on our owned and time-chartered fleet and will exceed the IMO's 2030 targets by 2025. We have done this with the use of more efficient vessels supported by tools such as weather routing and scheduling optimisation.

And we expect further gains in the short-term as we explore broader efficiency solutions and the integration of alternative fuels, such as the use of biofuels and our investment in nine LNG dual-fuel vessels this year. And on our ambitions to be net

zero from shipping by 2050, we will Introduce net-zero emission vessels into our portfolio by 2030; and support development of enabling technologies using net-zero carbon fuels.

## Working with customers to meet societal demands



Government policy  
and markets responding  
to end-user demand

### ESG transparency through START

- Transparency and traceability from mine to market
- Secure platform, built on blockchain
- Enabling consumers to make ESG-informed decisions, beyond carbon

RioTinto

©2021, Rio Tinto, All Rights Reserved

35

As our supply chains change, we also expect an evolution in market mechanisms, be it a “green premium”, or an emerging advantage for low carbon offerings.

To stay relevant and capture market opportunities, we must be at the forefront of meeting customers’ needs.

We are already seeing the change, with a growing number of our customers requiring products to be responsibly produced and willing to pay a premium.

Not only to meet climate change targets and consumers' increasing expectations, but also for example, to access favorable green financing or participating in infrastructure tenders that mandate green credentials.

And price reporting agencies have started to publish “green aluminium premia”.

Added to this, the expanding enactment of new green government policies are advancing these developments. As we accelerate our decarbonisation, we are also moving rapidly to enable our customers and their customers to lead the transition.

We are working with them on carbon and beyond – across all ESG metrics. And in some products, as in aluminium, we have been the industry leader. Since 2016 we delivered the world's first low-carbon aluminium RenewAl the first Aluminium Stewardship Initiative certified product in 2019 the first ELYSIS zero carbon aluminium was sold to Apple; the following year we formed our partnership with world's largest brewer AB Inbev ...

And in Copper, our Kennecott operations and OT

became the world's first producers to be awarded the Copper Mark in 2020. And more recently our multi-product partnership with Schneider Electric.

START, launched earlier this year for our aluminium products, is the next step on this journey. Delivering transparency and traceability. It is the nutrition label of our products on a blockchain technology, capturing 10 key ESG metrics, facilitated by digital transparency. In combining ESG credentials with provenance, we allow our customers to make informed choices that affect the value chain; and enable them to demonstrate they are meeting their goals and evolving regulatory requirements.

## Solutions for a more sustainable future



### Products for a greener world

- Aluminium alloys for giga-casting in electric vehicle manufacturing
- Collaborating with InoBat across the full lithium lifecycle, from mining through to recycling

Li = Lithium, Sc = Scandium, Te = Tellurium, Se = Selenium

**RioTinto**

©2021, Rio Tinto, All Rights Reserved



### Circular solutions to reduce emissions

- Partnering with ABInbev to reduce emissions from packaging
- Multi-product collaboration with Schneider Electric for infrastructure and electric vehicles
- Optimising market placement for critical minerals (Li, Sc, Te, Se) extracted from our waste streams

36

Leveraging the expertise of our research centres, we are creating solutions that meet our customers' needs for a greener future.

As an example, we have worked with industry partners to enable large-scale Giga casting for EVs. A section of the car which required 70 different parts built separately can now be made as one single part. This means the next generation of EVs can be built more efficiently with a reduced carbon footprint.

And... as we transition to a low-carbon economy, a key component is the Jadar lithium project, that Sinead will cover later. We are also growing the battery ecosystem working with InoBat, an innovative partnership to accelerate the establishment of a battery manufacturing and recycling value chain in Serbia.

In addition, we are providing holistic solutions for the circular economy.

Our partnership with AB Inbev is a great example of leveraging ELYSIS and our low carbon aluminium, combined with beverage can scrap recycled in our own cast houses, to create slab products for cans with a 30% lower carbon footprint.

And, we have recently announced investments in two Canadian aluminium recycling facilities, in our own casthouse and in partnership with Shawinigan Aluminium, where we create custom alloys combining the lowest carbon metal with our customers' scrap.

Our multi-product partnership will see Schneider

Electric use our responsibly produced materials. Our products go into each other's value chains to reduce scope 1, 2 and 3 emissions.

We also continue to leverage our technical and commercial capabilities to extract critical minerals from our waste streams, such as scandium, tellurium, selenium and rhenium, and develop pathways to market these materials which are essential in solar panels, electric vehicles and wind turbines.

Such as scandium, tellurium, selenium and rhenium, and develop pathways to market these materials which are essential in solar panels, electric vehicles and wind turbines.

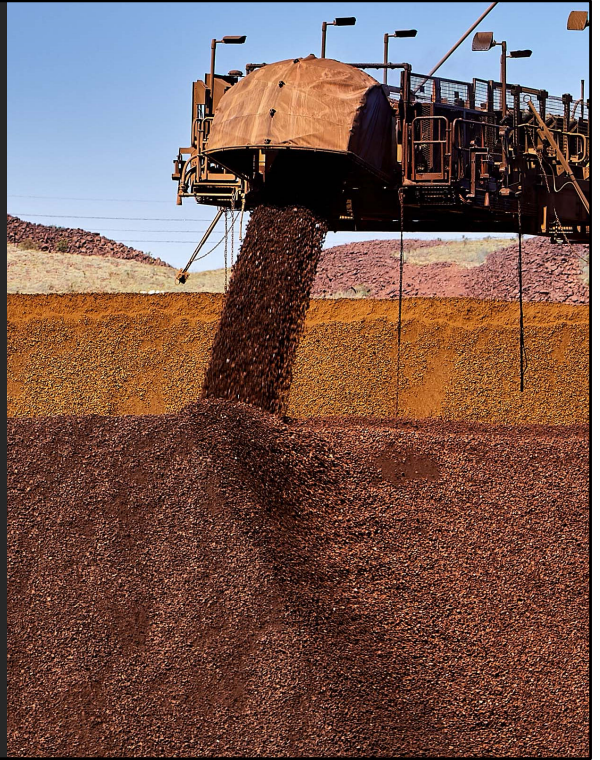
Another illustration is the development of a new high-strength, lightweight aluminium-scandium alloy supplied to a new customer in Australia, used in their breakthrough 3D printing for aerospace. The alloy is made in Canada with our low-carbon aluminium and high-purity scandium oxide produced from waste streams using an innovative process developed at our Iron & Titanium R&D Centre in Quebec.



To conclude, this is a long journey, but we are already moving forward at pace. Our commercial team plays a critical role in partnering with our customers and suppliers, to ensure we remain market leaders, staying relevant and delivering value, whilst working together to create a more sustainable future. I'll now hand back to Jakob for our first Q&A session.

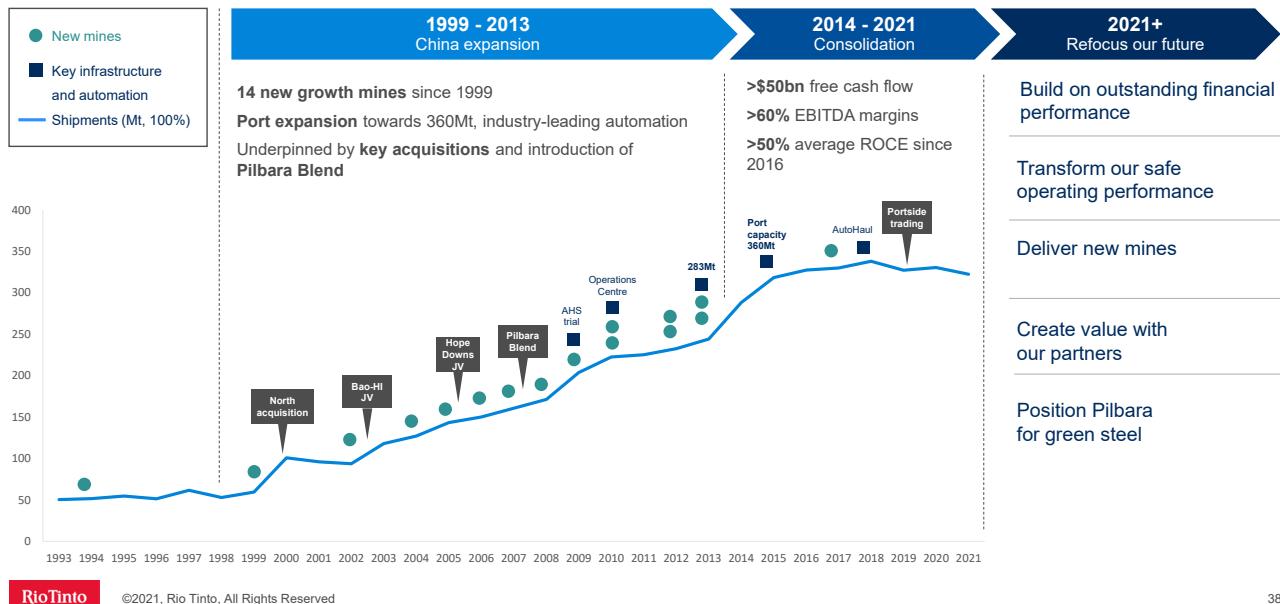
# Simon Trott

## Iron Ore



Welcome back. I'm joining you today from Perth, on the land of the Whadjuk people of the Noongar nation, who are the traditional custodians. I would like to acknowledge their leaders, past, present and emerging, and I extend that acknowledgement to all Indigenous peoples where Rio Tinto operates. As First Peoples, I recognise their unique connection to the land, waters and environment.

# Pilbara Iron Ore set for even stronger performance



Over the past decades our business has gone through a number of phases of growth

When I first joined Rio Tinto at the end of the 1990s, we were producing a bit over 50 million tonnes per annum of iron ore and moving into the first phase of development as China's expansion accelerated.

We then commissioned 14 new growth mines, acquired North with its Robe River assets, and then expanded our infrastructure towards 360 million

tonnes per annum of capacity, with a combined investment of over US\$40 billion dollars.

We created innovative partnerships with the first Indigenous Land Use Agreements with Traditional Owners. We also led the industry with innovations such as the creation of Pilbara Blend, automation of our truck fleet, the first operations centre and more recently, AutoHaul, our driverless trains.

This has led to more than \$50 billion dollars of free cash flow over the last 7 years, EBITDA margins in excess of 60 percent, and average Return on Capital Employed of more than 50 percent.

We have a fantastic business – great people, a proud history, deep resource base and amazing assets. But the past few years have been challenging. Whilst financial returns have been exceptional, we have not met our own standards or values. None more so than at Juukan Gorge last year.

Our mine planning and development schedule, variable operating performance and transactional approach with Traditional Owners have impacted our partners and reduced our ability to respond to

market demand.

As our recent Third Quarter Operations Report showed, we have a lot of work to do to stabilise and improve our performance. We are at a pivotal point. A point where we must refocus around 4 main pillars to build the business we need to take us forward.

We must:

Firstly, Transform our safe operating performance

Secondly, Deliver the new mines of the future;

Thirdly, Create value with our partners; and

Finally, Position Pilbara ores for a green steel future

To achieve this, we are putting people at the heart of our business. By unleashing their full potential, and ensuring we have a workplace that is safe, respectful and inclusive for everyone, we will achieve our goals.

## Raising our system capacity

	Prior best performance			Estimated Capacity
	Max month* Mt	Max quarter* Mt	Max annual Mt	Mid term** Mt
<b>Mine</b>	370	349	338	345-360
<b>Rail</b>	362	351	338	350-360
<b>Ports</b>	393	357	338	360+
<b>System</b>	362	351	338	345-360

System capacity will be delivered by:

- Rio Tinto Safe Production System driving improved productivity
- Improved interface efficiencies across mine, plant, rail and ports
- Modest capital investment, including two additional rail consists

Requires commissioning of replacement mines, including Western Range, Bedded Hill Top and Hope Downs 2 and Brockman Syncline 1 to reach and sustain capacity

\*Annualised rates | \*\* Mid-term defined as upon completion of the next tranche of new and replacement mines

So, let me tell you how we will transform our operating performance. The latest review shows that our system capacity over the medium term is between 345 and 360 million tonnes per annum.

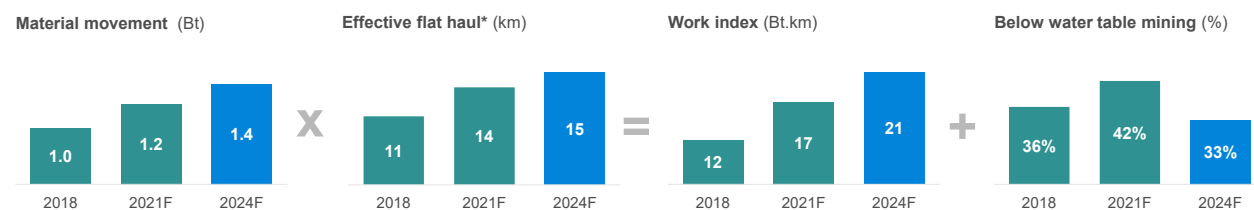
Port capacity is in place. We have Rail capacity in excess of 350 million tonnes. Autohaul is really starting to deliver and will take us beyond this. The most significant constraint we face is at the mines.

To address this, we're doing four things –

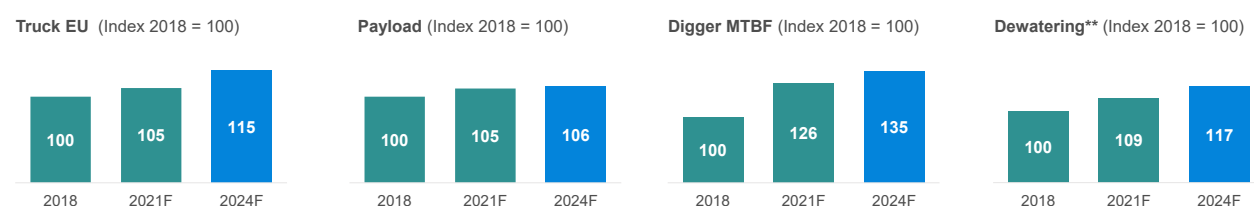
- Firstly, we're commissioning 90 million tonnes of brownfield mines in 2021 that replace depleting orebodies
- Secondly Gudai-Darri, our first greenfield mine in more than a decade, will be completed in Q1 2022. This will replace depleting orebodies, plus provide some incremental capacity. These projects combined are more than 40 percent of our existing mine capacity. This is the largest replacement programme in our history. And to safely achieve this during COVID is an exceptional outcome by the team.
- Thirdly, to reach and sustain the upper end of the range requires the next tranche of replacement mines due between 2025 and 2027.
- And finally I need an uplift in operating performance which I'll talk to now.

## Mine productivity to mitigate higher work index

The work index of our mining operations is increasing



Initial gains in productivity – targeting further improvement



\*Average haul distance travelled by each truck – adjusted for gradient | \*\* Dewatering volumes increase as pit deepens | EU = Effective utilisation, MTBF = Meantime between failure

RioTinto

©2021, Rio Tinto, All Rights Reserved

40

Turning to our mines. Our brownfield expansions over the last decade have delivered growth and a significant return on capital. However, timing of new mine developments and waste movement has been behind what was needed. Changes to heritage management and Covid restrictions have compounded this challenge.

Our work index has increased by around 40 percent over the last three years with higher strip ratios and longer haul distances. Our mining related costs, which make up around 30-40 percent of costs, are



subject to this work index escalation.

Focusing on waste movement and maintaining pit health is a priority. The amount of waste we need to move each year is increasing. Our strip ratio, was 1.4 in 2018 and has increased year on year to 1.8 in 2021, placing upwards pressure on our mining costs and reinforcing the importance of our productivity programme.

Improvements in fleet productivity have offset some of these impacts.

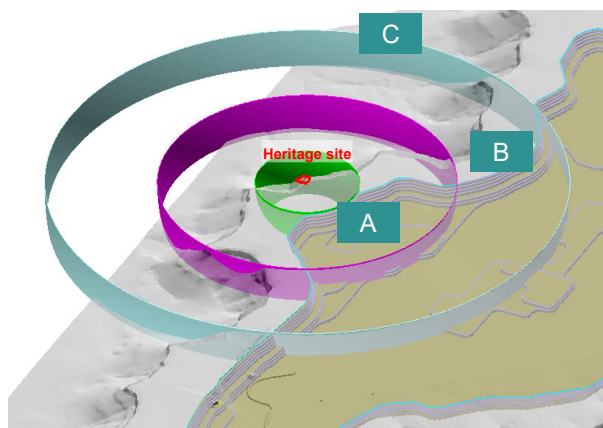
- In the last three years, our haul truck effective utilisation has improved by 5% as well as better use of maximum payload.
- This year we will commission more autonomous haul trucks than in any prior year, meaning around 80% of our fleet will be autonomous by next year.
- The commissioning of Gudai-Darri, will help moderate the increase in strip ratio, and the proportion of mining below the water table.

There is much more to do to lift our mine performance. In addition to load and haul fleet productivity, I am expanding our focus to mine

development activities, including drill and blast – where we are focusing on improving broken stocks to build resilience. I will cover this in more detail later.

# Adjusting our operating practices to protect heritage

## Heritage site example

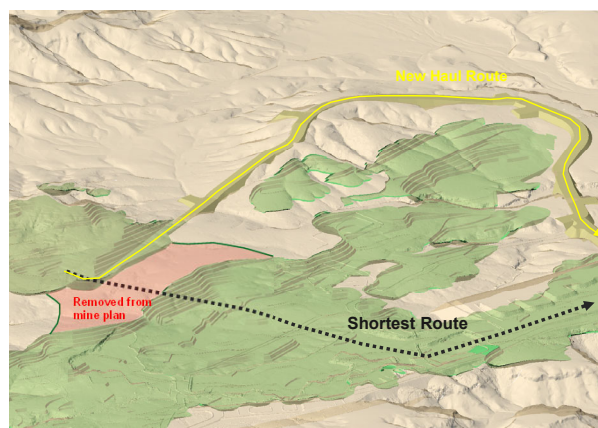


A. 70 metre exclusion zone | B. 200 metre blast management zone | C. 350 metre blast management zone

**RioTinto**

©2021, Rio Tinto, All Rights Reserved

## Responding to new information



Turning to heritage, we have redesigned our blasting practices to ensure we protect heritage sites. This slide shows two examples.

The image on the left, illustrates where we have a heritage site that needs to be protected for vibration. For these cases, we use a 70-metre stand-off distance where no mining activity occurs, as demonstrated by the inner green ring. In this example this resulted in a slight change to the boundary of the pit, to ensure the stand-off

distance is maintained.

Beyond the 70-metre exclusion zone, we have implemented Blast Management Plans, with different restrictions depending on whether the blast is within 200 or 350 metres of a significant site. The purpose is to manage both vibration and fly rock, to ensure a site is protected. To achieve this, we typically include a combination of smaller diameter drill holes, reduced bench heights and lower powder factors.

These measures protect heritage sites.

Impacts to our operations include:

1. Sterilised ore due to pit design changes
2. Lower drill and blast productivity due to the use of smaller drills
3. Reduced bench heights that impact loading unit productivity, and
4. Poorer rock fragmentation from lower powder factors causing more oversized material at the crushers.

The graphic on the right is an example of how mine plans might change in order to respond to new information regarding a heritage site. The shaded

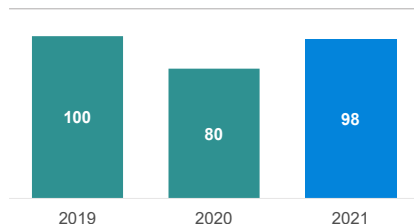
red area outlines the land within which no mining activity will occur. There are two impacts; ore within the boundary being sterilised, and the haul road being lengthened.

Making these changes is absolutely vital. We have learnt a great deal over the last twelve months about how we can mine more efficiently, ensuring we respond to new information. This means better protection of heritage.

## Improving plant performance

### Maintenance impacted by labour constraints

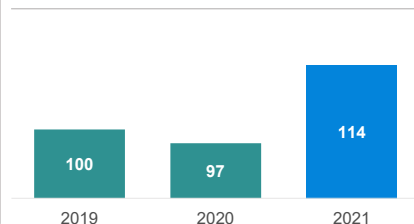
Hours, Index 2019 = 100



- COVID-19 restrictions impacted available labour in 2020 reducing maintenance hours
- 2021 labour availability improved but still constrained

### Increased planned shutdowns

Hours, Index 2019 = 100



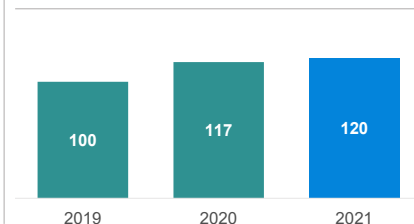
Focus areas to address maintenance backlog:

- Shutdown alignment across system
- Improved maintenance tactics and simplified maintenance schedules
- Improved conveyor reliability through better rock breaking and targeted asset improvements

Completing the brownfield mine tie-ins will further improve plant performance

### Stabilising and addressing maintenance backlog

Outstanding hours, Index 2019 = 100



Moving to our plants, we have experienced challenges relating to our processing plant reliability over the last 18 months. Improving this is an immediate focus.

We have had to ramp up maintenance to address under investment from previous years, which was compounded by labour shortages during Covid and the closure of interstate borders.

As part of the Rio Tinto Safe Production System we will enhance our plant performance by

- Addressing the maintenance debt.
- Improving shutdown alignment across the system
- Optimising maintenance tactics and schedules
- Improving conveyor reliability through better rock breaking

This will be assisted by completion of the brownfield tie in projects.

Our focus is on improving overall asset health and reducing maintenance debt. I will not compromise on this work and expect to see benefits from late 2022.

# Maximising productivity from port and rail

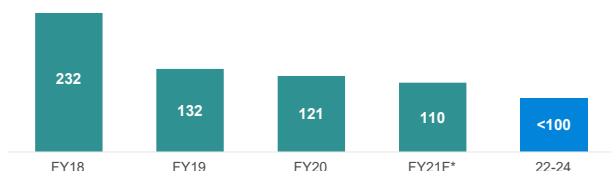
## Rail performance

### Focus on asset health, including ballast and turnout replacement

AutoHaul delivering operational and safety improvements:

- Reduction in driver change-over delays from 90 minutes per train to zero
- One in 250 journeys require a driver to operate the train
- Reduction of 1.5 million kilometres each year in light vehicle travel

### Track speed restrictions cycle time impact (in minutes)



\*At October 2021 | \*\*Includes all full and partial weeks in Q3 2021

RioTinto

©2021, Rio Tinto, All Rights Reserved

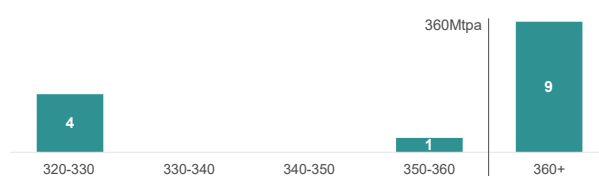
## Port productivity

### Our ports are our competitive advantage

Focus areas:

- Optimising shut durations for capacity needs
- Reclaimer replacements 2024+
- High density ore upgrades 2022+
- Car Dumper 1 at Cape Lambert end of life 2022

### Weekly outload capacity in Q3 2021 (Weeks\*\*)



Turning now to infrastructure. In order to optimise our rail network, we require an efficient operation and a healthy asset base.

Let's start with AutoHaul where the benefits have exceeded original expectations. It provides the following benefits:

- Adds extra capacity through more efficient use of our consists – mainly because we have eliminated driver changeovers.
- It provides more flexibility for how we manage



trains. For example, during a shut we can move a large number of trains through, both before and after the shut

- Through more consistent operation there has been a significant decrease in train separations
- We are more resilient to labour challenges for example skills shortages and COVID impacts
- As we continue to refine AutoHaul through its next phase of transformation, we expect to better integrate our maintenance strategy with how we operate our train schedules, as well as improve our driving strategy to reduce wear and tear on our assets.

Our port capacity is a competitive advantage.

- It provides us with optionality: just last quarter we had capacity in excess of 360 million tonnes for 9 of the 14 weeks.

We will invest in sustaining capital work to futureproof the port.

- Key initiatives over the next three years include high density ore upgrades in 2022, replacing the Parker Point reclaimer in 2024 to optimise capacity beyond the end of this decade.

## How we are improving our business

	Operational Readiness	Rio Tinto Safe Production System			
Focus area	Commission and ramp up new assets	Reduce wait for feed at the crusher	Reduce materials handling losses	Reduce fixed plant unscheduled loss	Improve rail capacity and resilience
Priorities	Gudai-Darri	Dewatering	Fragmentation	Conveyor reliability	Asset health
	Robe Valley Sustaining	Drill and blast	Feed strategy	Shutdown productivity	Cycle time
	West Angelas C&D				
	Western Turner Syncline Phase 2	Load and haul	Engineering and technology	Asset management	Digital and technology
Value chain	Mine				Rail
		Port			

Bringing it all together – we will improve operational performance and drive productivity improvements via the Safe Production System, which Arnaud spoke about earlier. For me it provides the blueprint for how we run our business, how we do maintenance, embrace simplicity and replicate best practice. It is centered on our people, who are our greatest asset. I believe unleashing our people's full potential will lead to our success.

I have five key focus areas.

- The first is successfully commissioning and ramping up our brownfield and greenfield projects.
- The second is improving our mining productivity to reduce wait for feed at our primary crushers, including dewatering, load and haul, and drill and blast activities. For example, we have already completed a detailed improvement project on dewatering at Yandicoogina that has delivered a 10% uplift in performance, drawing in teams from across our sites together with Arnaud's team. This is now being replicated. We have also commenced drill and blast initiatives at West Angelas to pursue similar improvements and incorporate and codify learnings.
- The third is materials handling, which will focus on fragmentation and feed strategies, including the deployment of technology and minor capital upgrades to improve our material flow.
- The fourth is achieving improved fixed plant reliability. The focus areas here are conveyor reliability, shutdown efficiency and improved maintenance tactics and execution.
- And finally the resilience of our port and rail network.

# Operating and sustaining capital cost outlook

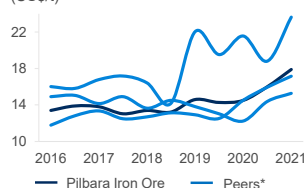
## Outlook for 2022

2021 cost guidance of \$18-18.5/t

Cost pressures continue:

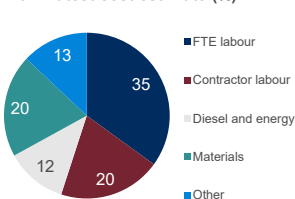
- Work index increase of 12% (from 2021 forecast)
- Continued investment in asset health and reliability
- Tight labour market driving higher rates
- Diesel price (+23%, 2021F v 2020)
- Cost of materials due to strong construction market and COVID-19 restrictions

Unit cost history (US\$/t)



\*Unit cost for peers are based off publicly available sales, revenue and EBITDA data, with adjustments made for comparison to RTIO's reporting method and products

2021 latest cost estimate (%)



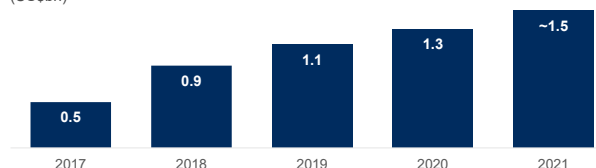
FTE = full time equivalent

## Investing in our assets

Key focus areas:

- Asset reliability
- Plant and rail asset health
- Accommodation / camps
- Systems including IT

Sustaining capital investment (US\$bn)



RioTinto

©2021, Rio Tinto, All Rights Reserved

45

On operating costs, over the past 3 years we have faced work index pressures, more below water table material, and underinvestment in the underlying health of our assets, in particular at our processing plants.

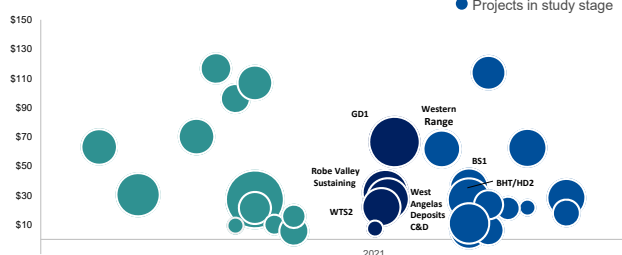
This, combined with increasing input costs from a tightening labour market in Western Australia, increased energy prices, and COVID-related supply restrictions, has meant that we have seen unit costs increase to our current guidance range of between

US\$18 dollars and US\$18.50 in 2021.

In 2022, we expect the trajectory of a number of these factors to continue upward. Whilst we will continue to strive to improve productivity, we will not put at risk the integrity of our asset health, and we will continue to undertake sustainable investment in our communities.

## Mine project pipeline

**Capital Intensity**  
(\$/t Real 2021)

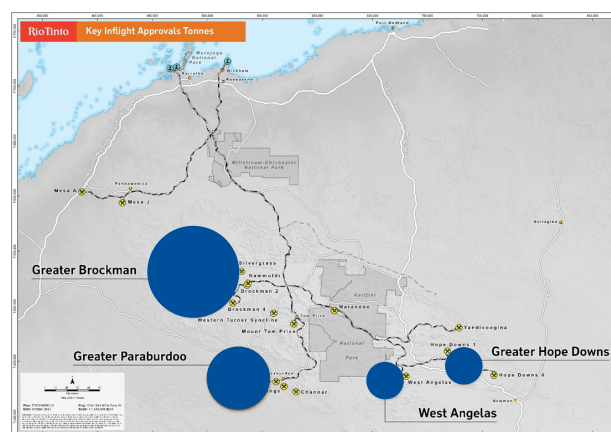


**Studies being progressed. Commissioning from 2025:**

- Western Range
- Bedded Hill Top and Hope Downs 2
- Brockman Syncline 1

Approvals timeline risk has increased

**High volume of environmental approvals for new mines**



**RioTinto**

©2021, Rio Tinto, All Rights Reserved

46

Moving to our longer-term outlook. We are close to completing a tranche of new mines and we will be ramping up each of these up in 2022.

Over the next 12 months, we will look to progress the next tranche of options required to deliver the overall system capacity which we are working so hard to optimise.

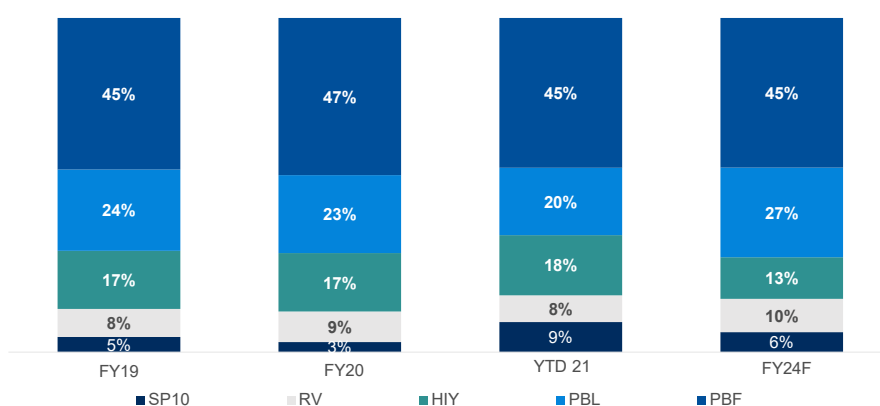
We have a number of studies underway, with key projects of Western Range, Bedded Hill Top and

Hope Downs 2 as well as Brockman Syncline 1 to be delivered between 2025 and 2027.

We face a high volume of environmental approvals for new mines, and an increased risk to approvals timelines. We will continue to engage with and work closely with our communities, Traditional Owners, and governments to achieve the right outcome.

## Ongoing focus on quality and product mix

Shipments by product (%)



RV = Robe Valley, PBL: Pilbara Blend Lump, PBF: Pilbara Blend Fines | 2021 YTD at 30 September 2021

Consistent quality remains key for our Pilbara Blend. Demand remains strong, and will continue to underpin our product strategy

Pilbara Blend quality maintained by:

- Blending different ore sources to tight specifications
- Producing lower quality products (including SP-10) as required

Gudai-Darri sets a new standard for mine developments, and supports our product mix over the medium term.

The Pilbara Blend is the market benchmark. It has acted as the baseload for our customers in China, and will continue to underpin our product strategy. We work hard to maintain its quality, which requires the blending of different ores to ensure tight specifications are maintained.



In order to achieve this, we also mine products like SP-10, which is a bleed product. We will continue to produce SP10, forecasting around 6% in 2024. With the introduction of portside trading, we are also able to use some of this product in our global blending strategies, utilising our position at Iron Ore Company of Canada and potentially Simandou.

# Positioning Pilbara ores in a green steel world

Working with customers to decarbonise the blast furnace mostly capped at ~20-30% emission reduction

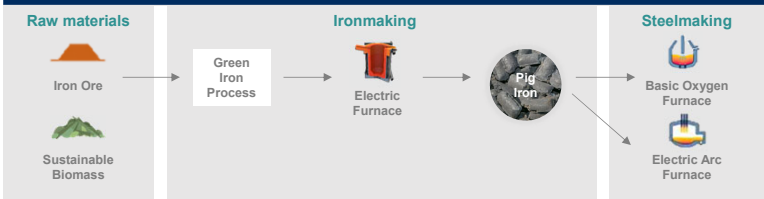
Options to more cost effectively beneficiate Pilbara ores are being developed

Working on new processing routes to crack the code for Pilbara ores

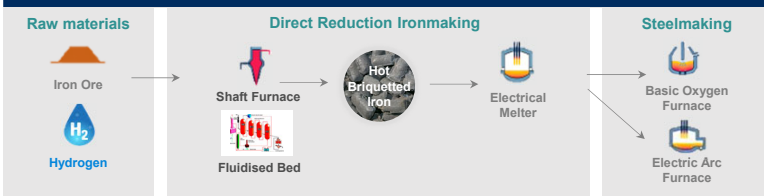
Two examples shown – both early stage development but showing promise

Steel making process routes to move to 'net neutral'

## Pilbara Pathway 1: Low-carbon research project



## Pilbara Pathway 2: H<sub>2</sub> Hot Briquetted Iron + melter



RioTinto

©2021, Rio Tinto, All Rights Reserved

48

Turning now to green steel. Steel is a bedrock of urbanisation, and will now support the world's decarbonisation. It is currently responsible for 8% of global CO<sub>2</sub>. This needs to change.

New technology and processing routes are required to fully decarbonise. Steel recycling will play a role but there are quality and supply limitations.

So what does green steel mean for Pilbara Ores and how will we crack the code?

Pilbara ores are relatively high in impurities. These must either be removed via beneficiation or during processing. This is costly using current technology so we are exploring ways to beneficiate more cost effectively, with universities and research institutes.

We are also working on opportunities to process Pilbara ores in a different way. For example, this slide shows two potential innovations. Both are at an early stage of development but are showing some promise.

Pathway 1 is a low-carbon research project, announced last week, which uses sustainable raw biomass and microwave technology to reduce Pilbara ores and produce green iron. This is our own Intellectual Property.

Pathway 2 is via Hydrogen direct reduced iron, plus an electric melter, which enables the removal of impurities in the form of slag, making Pilbara ores usable. The combination of some beneficiation technology and new processing routes will allow us to 'crack the code' for the Pilbara, and provide a

pathway to net neutral steel.

## Strengthening partnerships



### Traditional Owners

Working together to build a better future through employment, business and caring for country and culture

Embedding cultural competency and heritage management into The Way We Work

Asset General managers now responsible for Traditional Owner relationships

Modernising agreements



### Local Communities

Supporting thriving communities through economic development and employment:

- Direct shipping into Dampier
- Automation qualifications and education pathways

Partner with State Government to provide logistics support for COVID-19 vaccinations across the Pilbara



### Western Australia

Building local capacity - using local suppliers to build rail ore cars, a first in the industry

Long-term partnerships and outcomes such as the partnership with Royal Flying Doctor Service

The last few years have been a wakeup call.

I have been reflecting deeply on how we interact outside the mine gate, how we connect externally and how we contribute to society. For me, it's about relationships, how we interact with others, how we treat others and what we leave behind.

For Traditional Owners - placing accountability for these relationships at the heart of our assets means we can create a direct and long-term partnership. Key to our relationship is embedding a

deep respect and understanding of culture and heritage.


I am committed to genuinely and meaningfully working with our Traditional Owners to modernise and strengthen our Agreements and working towards co-management of country. I am grateful to Traditional Owners for the time they have spent with me as I have moved into this role.

Last week, in the Pilbara, I opened a regional office at one of our centres as a statement of our intent to engage more deeply. By facilitating a direct shipping service into Dampier, we are supporting small business in the Pilbara and the City of Karratha's vision to reduce the cost of business and lower the cost of living.

We are excited about creating and supporting local supply chains. For example, through the recent release of a tender for the manufacture of rail cars locally in Western Australia.

We support long-term community programmes such as enabling improvement in state-wide access to emergency response through the WA Royal Flying Doctors Service and we are also partnering with the Western Australian government to provide

logistics for COVID vaccinations for communities in the Pilbara.



## Becoming the most valued resource business

<b>Best operator</b>  <b>Transform our safe operating performance</b>  Empower our workforce through Rio Tinto Safe Production System	<b>Impeccable ESG credentials</b>  <b>Position Pilbara for green steel</b>  Decarbonise the Pilbara and position our ores to participate in Green Steel	<b>Excel in development</b>  <b>Deliver new mines of the future</b>  Optimise Pilbara capacity, product mix and development sequence
<b>Social licence</b> Create value with our partners Connect, partner and restore trust with the community		<b>People at our heart</b> Shift from 'asset focus' to 'people focus'

RioTinto ©2021, Rio Tinto, All Rights Reserved

In summary – I believe we have great people and a great business. We know what we need to do, we know where we need to focus. Our strategy is fully aligned with the strategic pillars Jakob has outlined earlier.

1. Transforming our safe operating performance
2. Delivering the new mines of the future
3. Creating value with our partners; and
4. Positioning Pilbara ores for a Green Steel future



Through this work we will build the business we need to take us forward.

Many thanks for listening and with that I will hand over to Ivan.

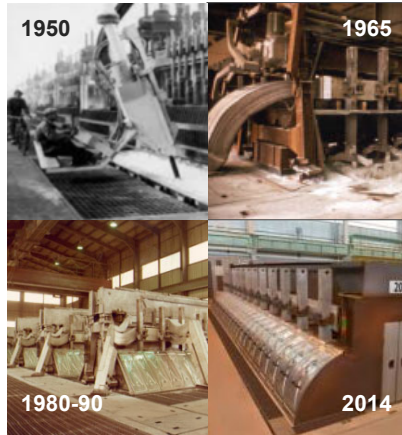
# Ivan Vella Aluminium



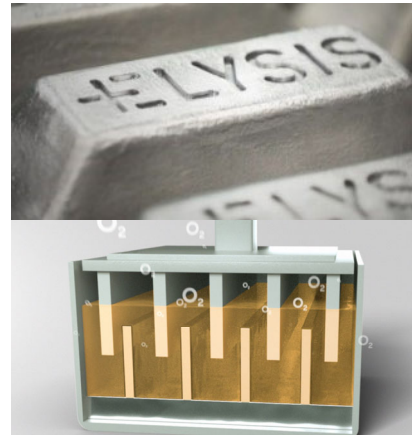
## Over a hundred years of aluminium expertise



**Engineering  
excellence**



**Technological  
expertise**



**Partnership  
and innovation**

**RioTinto**

©2021, Rio Tinto, All Rights Reserved

52

While I have only spent 6 months in our Aluminium business, I have quickly learned that this business has a very proud and strong history. What has really captured me is the capacity to solve the most significant challenges.

The genesis of Alcan predates the first world war. Since this early stage our business has evolved with some very courageous and bold steps. One of the moments that really stand out for me was the decision to start building hydro power facilities over 100 years ago. The vision and sheer determination

to build extraordinary projects like the Nechako reservoir and Kemano power station, a project that took over 10,000 workers 10 years to construct in the 1950s.

Over several decades our technical teams have delivered industry leading improvement of our smelting technology that saw the energy required to make a tonne of aluminium drop dramatically.

Then over the last decade the business had to transform and demonstrate resilience as the market became much more challenging as China rapidly developed new supply and put margins under pressure.

More recently, in partnership with Alcoa, we are progressing the incredibly challenging technical development of Elysis to produce a zero-carbon aluminium.

The breakthrough of Elysis will help us address the paradox that Aluminium represents. Aluminium is an essential material in a low carbon world but it is currently one of the most carbon and energy intensive materials to produce.

The DNA of our business, its engineering excellence and sheer courage is exactly what we need to solve

these kinds of problems as the world decarbonises.

Today I am excited to share more of our progress on this ambition.

## A structurally advantaged integrated business



### Bauxite

4 bauxite mines

56.1Mt\*

Australia, Brazil  
and Guinea



### Alumina

4 alumina refineries

8.0Mt\*

Australia, Brazil  
and Canada



### Energy

7 hydro plants

4.1GW

Supporting our  
assets in Canada



### Aluminium

14 aluminium smelters,  
80% renewables

3.1Mt\*

Australia, Canada, Iceland,  
New Zealand and Oman

\*2020 production



©2021, Rio Tinto, All Rights Reserved

53

Our aluminium business is unique and structurally advantaged. We stand out in the industry with our integrated value chain, strong suite of assets, outstanding technical capability and a market position that is unrivalled.

Bauxite is one of the most ubiquitous minerals in the earth's crust. However not all bauxite is made equal and we have an enviable suite of tier 1 resources. We are the largest seaborne bauxite exporter and, through the long-standing relationships with our customers, we provide

technical support to ensure they can achieve the very best value in use. We have options for replacement and expansion in two of the world's best and most strategically located resources, Weipa in Northern Australia and the CBG joint venture in Guinea.

In Alumina we have an integrated globally balanced supply chain and one of the largest alumina books. This gives us both flexibility and market insight. Our primary focus is to ensure that our smelters have the right quality and quantity of Alumina at the right time.

In Canada, all of our smelting capacity is hydro powered. Collectively they operate in the first decile of the cost curve and produce the lowest carbon aluminium in the world. Over the past 10 years in the Atlantic region we have consolidated our portfolio of smelters. We have focused on those with hydro power and the ones best positioned to perform throughout the commodity cycle. Our integrated set of smelters in the Saguenay predominantly serve the North American market and provide a lot of flexibility for customers. Their shared infrastructure help underpin their low costs.

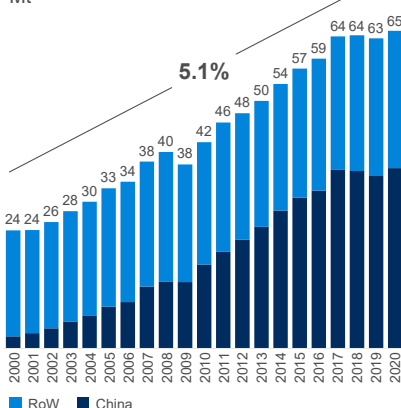
Energy is fundamental to the production of aluminium. In a decarbonising world we are very well placed because 80% of our aluminium is produced with green power.

Our hydro facilities in Canada are unique with their water rights. Collectively they have just over 4GW of capacity. They rely on enormous water sheds of several hundred thousand km<sup>2</sup>. In these regions we continue to build our relationships with First Nations. These partnerships are critical to our future success.



## The most profitable integrated Aluminium business

Historic supply growth created challenging conditions Mt

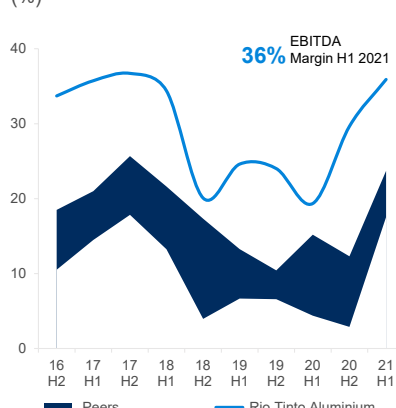


Source: Rio Tinto Market Analysis and peer disclosures



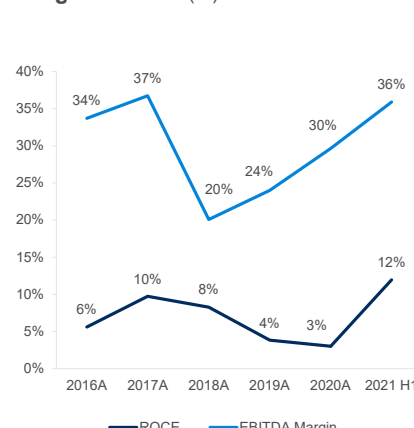
©2021, Rio Tinto, All Rights Reserved

Integrated Upstream<sup>1</sup>  
EBITDA Margin (%)



<sup>1</sup>Upstream assets includes bauxite, alumina and primary metal

Integrated EBITDA  
Margin & ROCE (%)



The industry has been challenging over the past 10 years. The incredible supply growth, driven primarily by the Chinese, has kept the market largely in surplus and margins quite suppressed. The industry is capital intensive and with China's ability to rapidly construct smelting facilities, they have built a formidable advantage. This is further underpinned by their relatively cheap captive thermal coal power sources.

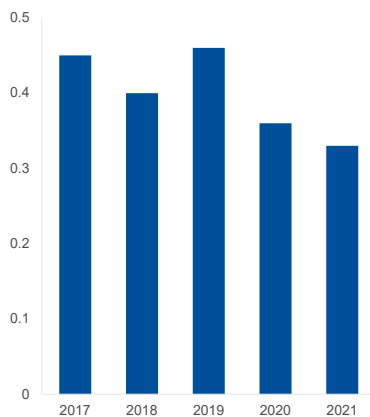
Despite this challenging context our business has performed well and delivered sector leading Ebitda margins. However the high capital intensity of this

industry, and low relative returns has resulted in modest ROCE when compared to other materials such as Iron Ore and Copper.

Of course, this has changed rapidly with the recent shift in the market, allowing our business to prosper and deliver favourable returns.

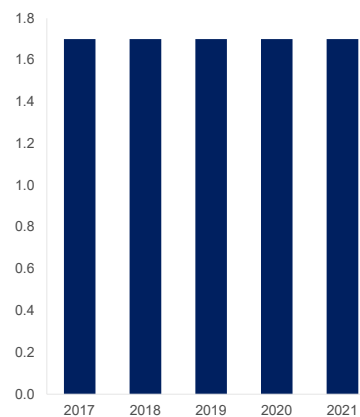
## Proven operational resilience

Global All Injury Frequency Rate



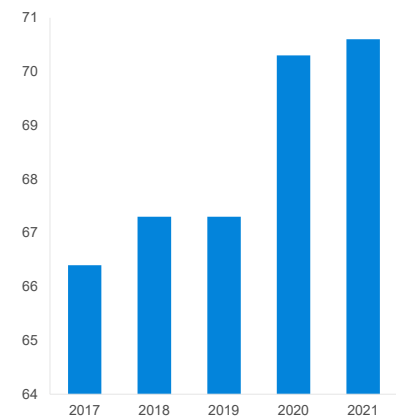
Pot Productivity\*

Tonnes per operating pot per day



Asset Utilization rate

Casthouse\*



\*Atlantic managed operations

RioTinto

©2021, Rio Tinto, All Rights Reserved

55

We continue working hard to improve and refine our performance. Safety has continued to improve over the last 5 years. A stable, well attended smelter will safely produce more metal of superior quality with a lower environmental footprint. Our aluminium management system helps sustain these routines and disciplines.

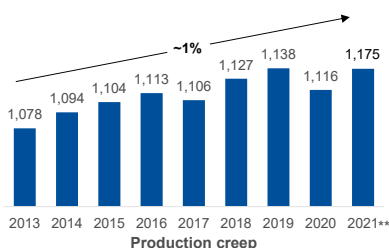
The rollout of the RT safe production system will take this to the next level. While aluminium has been no stranger to this type of management operating system we are excited to see the

production system focusing heavily on the insights that the operators and maintainers can bring to our business. With the rollout of the system across our operations we expect to further improve our productivity and reduce variability.

This year has been challenging in our Bauxite business. In both Gove and Weipa our operations have lacked stability. We have had a strong focus on improving this and are recovering some asset debt. We expect that operations will be stable in 2022 and reestablish their consistent performance.

## Continuing to improve our business

### 1<sup>st</sup> decile hydro-powered smelters\*



Positioned for low CO<sub>2</sub> metal demand  
Access to structurally short US market

Optimising business through data analytics  
and advanced process control

Saguenay integrated operations centre

\*Includes managed operations in Saguenay region.  
\*\*9 months annualised

### 1<sup>st</sup> quartile bauxite mines leveraging R&D

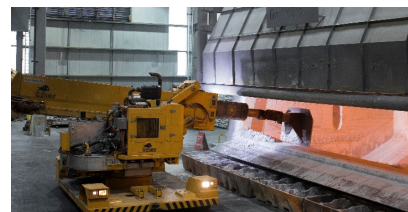


Processing technology development  
in the areas of impurities

Exploratory work on alternative  
technologies for silica

Processing technology to reduce  
product moisture

### Automating our casting process



Using machine learning and automation  
to maximise scrap remelting opportunities

Further leveraging data analytics

Flex power – modulating smelter power  
demand

RioTinto

©2021, Rio Tinto, All Rights Reserved

56

Across our value chain we continue to focus on productivity and incremental improvement. Our smelters have continued to “creep” or steadily increase the amount of metal produced each year. In the smelters in the Saguenay this has translated to around 1% per annum of increased production.

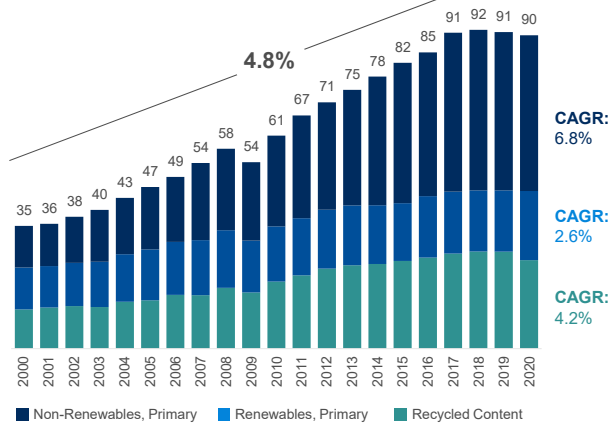
We have also been optimising our operations using data analytics to improve process control. In areas such as our cast houses we have started to utilise machine learning and automation to reduce waste and optimise the process. Learning from the

experiences in our Iron Ore business we have also implemented integrated operations centres that remotely oversee and optimise our operations.

A final example I want to share is called “Flexpower” – this is a developing technology that allows us to modulate the power required to run a smelter without disrupting the smelting process. In a world that is more dependent on renewable energy this type of flexibility in energy demand could make smelters an even more valuable and critical component of a stable and low-cost energy grid.

## Potential for positive structural change in the market from energy and smelting caps in China

Aluminium supply by source (global)  
Mt

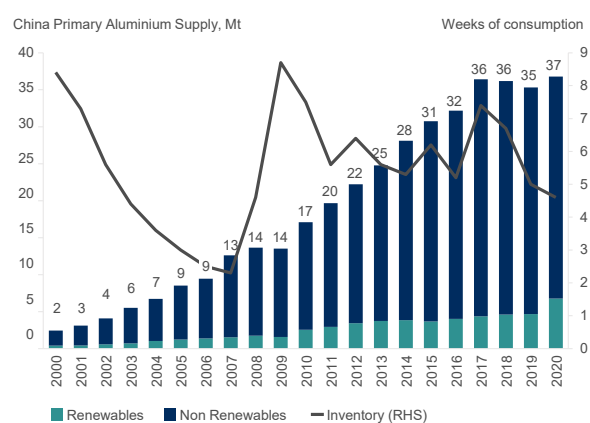


Sources: Rio Tinto Market Analysis, CRU, IAI.  
Renewables include hydropower and other renewables. Non-Renewables include coal, gas, and nuclear.

RioTinto

©2021, Rio Tinto, All Rights Reserved

Primary Aluminium supply (China)  
Mt



Sources: Rio Tinto Market Analysis, CRU, IAI

Over the past 12 months there has been a shift in the market with both supply and demand side pressures. A variety of changes and challenges in China have affected their market balance and more recently they have been a net importer for the first time since 2001.

Most of the growth in supply in the last 20 years has not only been in China but also powered by fossil fuels. Currently about 60% of all smelting capacity globally is fossil fuel powered. The ability to continue growing at the same rate will be quite

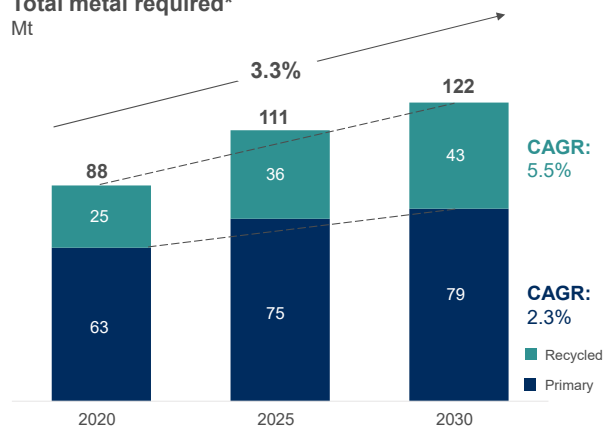
challenging given current pressures on fossil fuel sourced energy.

Aluminium businesses operating with access to existing hydropower will be better positioned to justify any growth.



## New coal-powered smelting likely to be challenged

Total metal required\*  
Mt

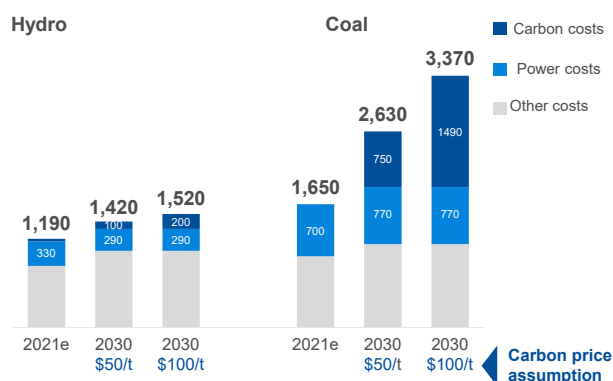


Sources: Rio Tinto Market Analysis, CRU \*Global semis production including melt loss

**RioTinto**

©2021, Rio Tinto, All Rights Reserved

Aluminium smelter all-in cash costs  
(Real US\$2021 per tonne)



All non-carbon costs are regional weighted averages from CRU, 2021 (long-run uses 2030 costs). Hydro costs are based on a weighted average of Canadian smelters. Coal costs are based on a weighted average of Chinese smelters from Shandong, Shanxi, Xinjiang and Inner Mongolia.

58

We expect to see continued increases in demand from packaging and energy transition-related sectors, including vehicles. Our projections see average market growth over the next decade of 3.3% per annum. Meeting this extra demand, when combined with the need to move away from fossil fuel energy will be very challenging.

The secondary market will continue to develop and mature as an important component of supply to meet the gap. However, scrap collection and sorting

is still evolving.

China has indicated an intent to implement a production cap at around 45mt. We also see indications that governments will be discerning to how they export green energy during the transition. Governments will likely want to deliver strong benefits beyond the immediate GDP, such as more high-paying jobs, regional development and other flow on industry. Collectively these factors are all creating headwinds to new production capacity.

## Switching our Australian smelters to renewables

Smelting requires uninterrupted energy, increasing the technical difficulty of a transition without hydro-power...

Typical energy requirements for large-scale aluminium smelter

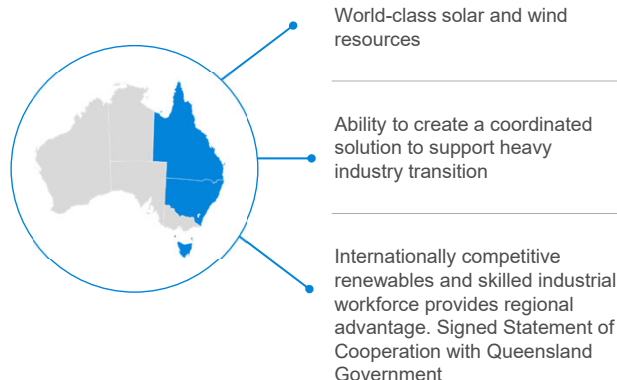


<sup>1</sup> Renewables requirements vary by region, mix of wind and solar and system design

RioTinto

©2021, Rio Tinto, All Rights Reserved

...but regions with high-quality renewables and a coordinated approach can create value in the transition



59

In producing aluminium, firm or dispatchable power is required. There is no question, shifting to interruptible renewables will be challenging. The firming of wind and solar will add cost and complexity. To put this in context, 1GW of hydro is equal to roughly 4GW of wind and solar in a good location, firmed with power from the grid or large, long duration battery storage.

While we recognise this challenge in using wind and solar energy for our smelters, we believe the large stable demand they offer can help as a catalyst for

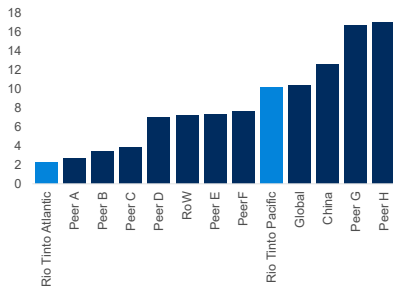
accelerating the broader energy transition in Australia. Our smelters are located in structurally advantaged regions for wind and solar capacity.

We have been working for a win-win solution with government to find the best pathway to repower these smelters, make them more competitive and sustainable, while protecting the important economic contribution they make in these critical regions.

As you saw in the announcement with the Queensland government last week we are committed to playing our part in developing these renewable energy based industrial hubs.

# Decarbonising the aluminium supply chain

## Already lowest CO<sub>2</sub> emissions



2021 - Total emission tCO<sub>2</sub>/t

Producing the lowest CO<sub>2</sub> per tonne

Lowest footprint alumina refinery in the world

The graph is on an equity basis for Rio Tinto and all the other individual producers  
Source: CRU includes direct emissions (Scope 1) and indirect from electricity generation (Scope 2)

## Hydrogen calcination



Green hydrogen a substitute to natural gas

Potential to underpin 10% Rio Tinto group-wide decarbonisation

## Commercialising ELYSIS™



P1020 metal grade or better

On track for commercial scale technology in 2024

Our aluminium is already the lowest CO<sub>2</sub> per tonne in the world, but we continue to focus on several areas to further decarbonize the aluminium supply chain.

- Developing the inert anode electrolysis technology to remove carbon from the process
- Fuel replacement and electrification – removing natural gas and diesel from other parts of our operations.
- Exploration of the potential of carbon capture and storage through mineralization

Two weeks ago Jakob and I visited the Elysis project team in the Saguenay. It was so exciting to see the team making progress on this ground breaking project. While this is still late stage R&D and very complex I have high confidence in our talented team working with our partner Alcoa. This breakthrough work is reinventing over 100 year old technology for producing aluminium.

Elysis technology produces P-1020 grade metal. To our knowledge no one else has been able to produce P-1020 carbon free. The team have started constructing the first commercial-scale prototype cells of the inert anode technology, at Rio Tinto's Alma smelter in the Saguenay.

The partnership with Alcoa and the Governments of Quebec and Canada is critical to delivering this significant piece of innovation. I can't wait for the next update from the team on their progress.

## Green materials need to be more than carbon free

### Carbon free

Zero carbon through the full lifecycle of production



**ELYSIS**

Decarbonisation of Australian Smelters

### Responsible

Produced with respect and care for host communities, partners, first nations and environment



### Traceable

Materials identifiable and traceable throughout lifecycle



### Circular

Recyclable material that retain its properties

Recycling pilots in Quebec

The carbon footprint of aluminium is not our only area in focus. For our aluminium to be truly green it must have several other characteristics.

- **Responsible** – this includes addressing all the impacts through the full value chain. Areas such as environmental impacts, water management, partnership with host communities and first nations, contributing to small business and regional development and health, safety and care for our workforce.
- **Traceable** – ability to identify and trace the characteristics of our material throughout the

lifecycle. Alf talked about START a little earlier. This work is continuing to build momentum with our customers.

- Circular – aluminium is 100% recyclable and more and more uses lend themselves to recycling. We need to play a bigger role in this space and work closely with our customers and partners as secondary supply will grow at about double the pace of primary for the next decade.

We have made considerable progress against each of these areas. While all materials will need to demonstrate these characteristics in time, our aluminum is leading the way.



## Strengthening our social licence



### First nations and communities

Mutual Respect Agreement with Mashteuiatsh for 20 years

Joint business opportunities with First Nations in Quebec and British Columbia

Long-term relationships with Traditional Owners in Weipa and Gove



### Vaudreuil filter press

Reduce red mud waste volume

Eliminate slurry pond storage

Stable red mud disposal sites



### Turning waste into valuable resources

Treatment technology developed by RTA

Treat spent pot lining of the Canadian Al industry and reuse in the cement industry

Convert Anhydrate by-product into a fertiliser used in blueberry crops

RioTinto

©2021, Rio Tinto, All Rights Reserved

62

The destruction of the Juukan rock shelters triggered deep reflection on our relationships with First nations and Traditional Owners across the world and in particular in Canada, Australia and New Zealand.

Our relationships with Traditional owners in Northern Australia – both Gove and Weipa are long standing and deeply held. We are proud of this history but are also clear that there is more to do in creating economic and employment opportunity and also supporting the protection and celebration

of their culture.

In the last year we have strengthened our connections with First nations across Canada. We have made positive progress with the Nechako first nations on the flows from the Nechako reservoir that feed the river they depend on. This relationship has been strained for decades and it pleasing to see the partnership now emerging.

On a different front our teams are invested in finding ways to valorise waste from our production processes. One example is making cement from the refractory materials that we use to line the cells in our smelters. Another example is producing fertilizer from other waste from our smelting process.

## Opportunities to leverage our attractive foundation

Tier 1 bauxite resource with options to expand and improve cost position

Deep technical and processing expertise

Growing smelting capacity requires more green power

Working with customers to meet their specific needs

Improve capital intensity of future investments

ELYSIST™ commercial maturity in 2024

Recycling is an opportunity to enhance our profitability and relevance to customers



©2021, Rio Tinto, All Rights Reserved



As we look forward there are opportunities to leverage our business strength, demonstrate resilience through the cycle and also pursue targeted investment as the market structure shifts.

Some of the areas that we will look to invest for increased profitability and growth are:

- Investment that can reduce our costs in our Tier 1 bauxite resources and in technology that can maximise value from the processing of our bauxite.

- ELYSIS™ represents an incredibly exciting opportunity. While we still have some complex problems to solve, as you would expect we are planning for the next phase once we reach commercial maturity.
- Any growth in our smelting capacity will demand more green power. Our presence and relationships in key advantaged regions are fundamental to unlocking this opportunity.
- Our commercial team continues to work with our customers to ensure we are agile in meeting their specific needs. We will continue to differentiate our product based on its industry leading credentials.
- Recycling is another important area that could enhance our profitability and service offering to customers.

## Positioned to thrive in a low-carbon environment

Strong foundation	Clear strategy	Attractive future	
<ul style="list-style-type: none"><li>- Integrated business with Tier 1 assets</li><li>- Advantageous renewables position</li><li>- Strong history with world-class technical expertise</li><li>- Operational stability</li></ul>	<ul style="list-style-type: none"><li>- Accelerate zero carbon, zero waste</li><li>- Empowering our people to be the Best Operator</li><li>- Optimise capital intensity</li><li>- Build strong connections with our partners and stakeholders</li><li>- Pursue options for increased profitability or growth</li></ul>	<ul style="list-style-type: none"><li>- Potential structural change in the market</li><li>- ELYSIST™ – net zero aluminium smelting</li><li>- Switching Australian smelters to renewables</li><li>- Long-life Tier 1 resource in bauxite</li><li>- Long-life hydropower assets</li><li>- Well positioned for North American market</li></ul>	
Best operator	Impeccable ESG credentials	Excel in development	Strengthening our social licence

Aluminium is a critical material in a decarbonising world and we expect that demand will continue to grow while supply is more challenged.

The pressure of addressing carbon is impacting the structure of market. The global energy transition is creating uncertainty across all energy intensive industries and this is pronounced for aluminium.

While it is too early to be definitive about how the market may shift and the pace of this change, our

deep technical expertise and strong competitiveness will give us an unrivalled position in this growing market.

In this context we are extremely well positioned with our unique, integrated assets, centred around our hydro facilities in Canada. They have been resilient through the last decade and are ready to perform in this shifting context. As I look forward I see more opportunity as we pursue productivity in line with our ambition to be the best operator.

We are working to make our aluminium truly green. While we already produce the lowest carbon aluminium in the world, we need to complete Elysis and produce zero carbon aluminium at scale. Work is continuing to ensure that our aluminium is also responsible, traceable and circular.

The strength of our business allows us to lead on driving technological advancements such as Elysis and Hydrogen calcination, and also working with governments and partners to find a path to repowering our Australian smelting assets.

We are also well placed regardless of how the market evolves. We have options to grow our business but also recognise the need to address our capital intensity.

I am optimistic about our aluminium business and the critical role it will have as the world faces the climate challenge. It offers real promise and positions us to deliver attractive long-term returns.

Thank you.

# Peter Cunningham

## Performance, investment and shareholder returns



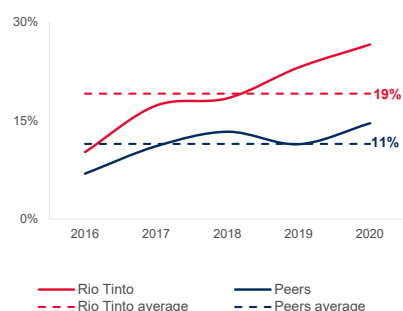
The Saguenay, Canada

Thanks Menno. Good morning and good evening everyone.

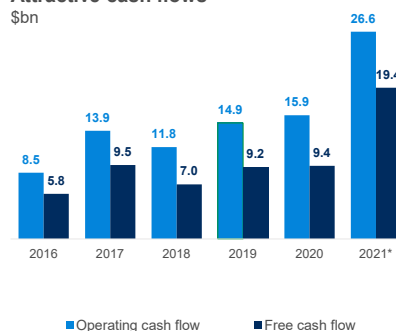


## We are in very robust financial health

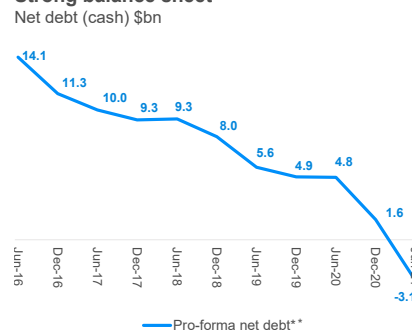
### ROCE (post-tax) – outperforming our peers



### Attractive cash flows



### Strong balance sheet



Investing consistently and with discipline through the cycle

Maintain a strong balance sheet. Focus on “Single A” credit metrics

We can grow and invest in decarbonisation whilst continuing to pay attractive dividends to shareholders – in line with our policy

Peers: BHP, Vale, Anglo American and Glencore | \*Consensus (Visible Alpha, 15 October 2021) | \*\*Pro-forma net debt (cash) adjusts for the remainder of previously announced buy-backs from operations, lags in shareholder returns from disposal proceeds, Australian tax lag (December only) and disposal-related tax lag and the impact of IFRS 16 Leases accounting change for the prior periods. This lease accounting change is reflected in the June and December 2019 reported net debt

RioTinto

©2021, Rio Tinto, All Rights Reserved

66

I’d now like to demonstrate what this all means in financial terms.

We are starting from a position of outstanding strength, having significantly outperformed our peers over the last five years; cash flow generation is exceptionally attractive; and our balance sheet is very strong.

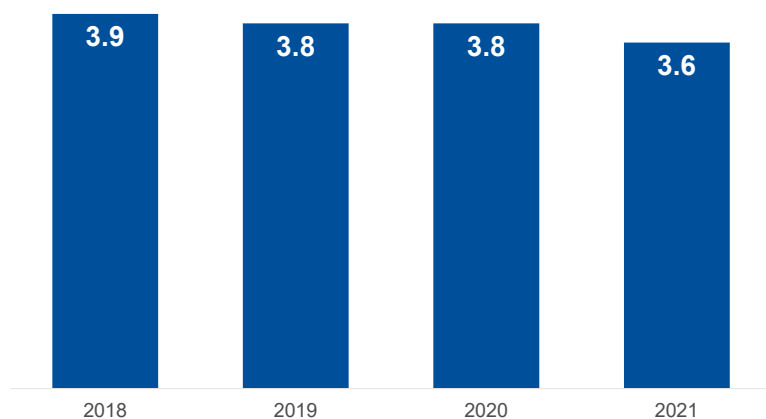
Our financial discipline will remain consistent and there are few material updates to our guidance today. Now, we’ve chosen not to have a net debt

target but a single A credit rating that puts us well within our comfort zone. Should a value-accretive opportunity arise, then we would be prepared to drop below single A but only where there is a clear pathway back.

Our balance sheet strength and world-class assets mean that we can invest in growth and decarbonise at a faster pace while continuing to pay attractive dividends in line with our policy.

## Actions in place to improve our performance

Copper equivalent production for the nine months to September\*  
Million tonnes



Operating performance not where we want it to be

Rigorous performance management

Deploying Rio Tinto Safe Production System

Building capability across the organisation

Increasing our capital allocation towards sustaining

Focused on risk management

RioTinto

©2021, Rio Tinto, All Rights Reserved

\*Excludes divested assets

67

Although our financial position is strong and stable, we are not satisfied with our operating performance.

Our teams are doing a good job adapting to very difficult conditions with COVID-19 still prevalent and creating significant restrictions on availability of labour and supply chains. Nevertheless, our YTD performance is clearly not where it could be or where we want it to be.

The Rio Tinto Safe Production System has a long-term focus to ensure we properly embed the gains for the future, including enhancing operating and leadership capabilities. However, we are not ignoring the near term and are already rolling out this significant improvement programme as Arnaud alluded to.

We're fully aware that we do need to prioritise maintenance. This is reflected in our increased guidance for sustaining capital, which I will come onto shortly.

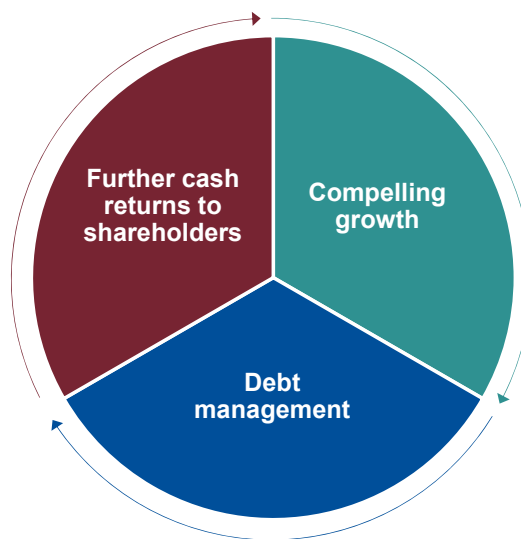
We will focus on the highest risk areas and ensure that all capital is deployed with discipline.

## Disciplined allocation of capital remains at our core

**1** | Essential capex  
*Integrity, Replacement, Decarbonisation*

**2** | Ordinary dividends

**3** | Iterative cycle of



RioTinto

©2021, Rio Tinto, All Rights Reserved

68

There is one thing that will not change at Rio Tinto, and that is our approach to capital discipline.

This does not mean NOT investing, but rather investing consistently through the cycle, balancing near-term returns to shareholders with reinvestment and de-risking future cash flows. It involves carefully testing all opportunities and taking controlled risks.

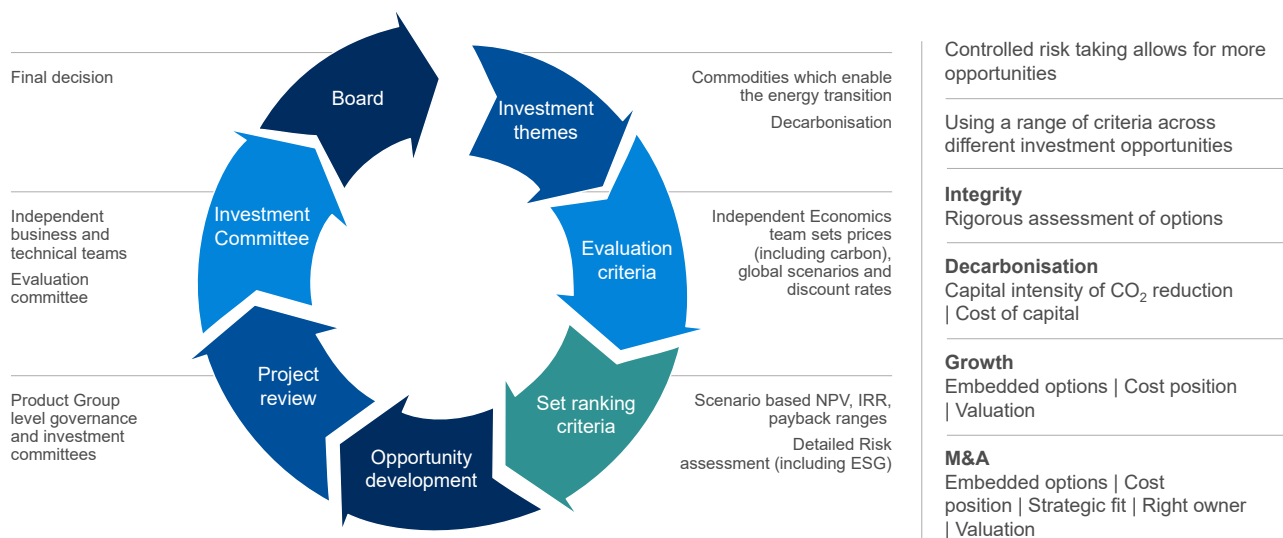
Essential capex to maintain future cashflows

remains our priority for capital allocation. It includes sustaining capex to ensure the integrity of our assets, high-returning replacement projects and investment to increase and accelerate decarbonisation.

This is followed by ordinary dividends within our well-established returns policy.

We then test investment in compelling growth against debt management and additional cash returns to shareholders.

## Maintaining our rigorous approach to investments



RioTinto

©2021, Rio Tinto, All Rights Reserved

69

I'd now like to give you more insight into the rigour that we apply to all our investment proposals.

Our stage-gate approval process ensures that we prioritise the best opportunities that align with strategy and generate the highest returns.

There are three key inputs.

It starts with the development of investment themes, such as the relative appeal of each product, market size and structure. Commodities

which enable the energy transition and decarbonisation are now front and centre. We constantly look at new options, both organic and inorganic, and are opportunistic rather than trying to spend some pre-determined budget.

Secondly, we evaluate each opportunity using our global scenario assumptions on commodity prices and carbon with the appropriate discount rate, as determined by our independent Economics team.

And finally, we apply a set of ranking criteria centred around standard metrics such as IRR and NPV but supplemented by risk profiling and value ranges. For decarbonisation, a key requirement would be efficient use of capital to reduce carbon intensity. For growth, we would also review embedded optionality and position on the cost curve.

Finally, for M&A, we would also assess strategic fit, whether we are the right owner and of course valuation. To be clear, we are very much open to growing externally, but remain mindful that the most value-accretive growth does tend to be internal.

There is also an independent review. Our business



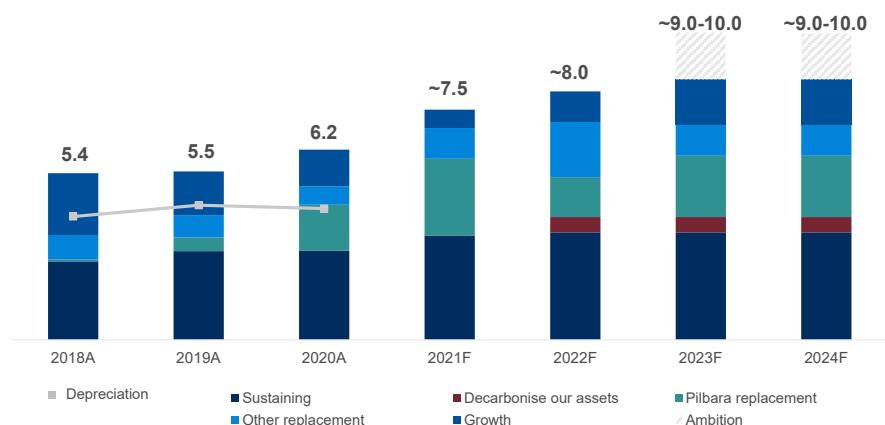
evaluation team assesses the commercial and strategic appeal of an investment, while our technical team confirms the geology of the asset, its risk profile, operational challenges and any new processing flow sheet, which is likely to be more prevalent in a decarbonising world.

It is then the turn of the Evaluation Committee, which I chair, to review each project followed by the Investment Committee - chaired by Jakob – and finally the Board, who make the ultimate judgement on major projects.

This model supports controlled risk taking but it is important to do it at pace in order to not stifle investment or lengthen the process. We are committed to quickly exiting projects with fatal flaws, which would only be addressed with expensive or uncertain engineering solutions. Our preference will be for small starter cases with optionality.

## Reinvesting for growth and decarbonisation

Capital expenditure profile  
\$bn



Sustaining capital of ~\$3.5bn per year including Pilbara Iron Ore of ~\$1.5bn

~\$0.5bn per year to decarbonise our assets from 2022 to 2024

Total decarbonisation investment of ~\$7.5bn\* from 2022 to 2030, predominantly in second half of decade

Ambition to grow and decarbonise reflected in 2023-24 capex of up to ~\$9-10bn including up to \$3bn in growth spending, depending on opportunities

Replacement spending unchanged at \$2-3bn per year

\*Conceptual view of capital requirements at October 2021. Marginal Abatement Cost Curves (MACC) will be updated on an annual basis

RioTinto

©2021, Rio Tinto, All Rights Reserved

70

So let's now turn to our capital forecast. We still expect to invest around \$7.5 billion in 2021 with essential sustaining capital of around \$3.5 billion. We expect that level of sustaining capex to repeat in the coming years.

Additionally, we now expect to invest around \$500 million in each of the next three years on decarbonisation projects, mainly relating to the repowering of the Pilbara. This will accelerate from 2025, bringing our best estimate to around \$7.5 billion this decade. But, rest assured, we will apply

the same rigour. These projects deliver a range of economic outcomes but in aggregate are value accretive at a very modest carbon price. But most importantly they safeguard the integrity of our assets over the longer term and reduce the risk profile of our cash flows.

As you have heard today, we believe that the low-carbon transition will drive additional demand for our commodities. By prioritising Excel in development, we aim to double our growth capital to around \$3 billion per year from 2023, developing new options and finding innovative ways of bringing projects onstream faster. But let's put this in perspective: we are a \$100 billion + company: we won't be betting the shop here and again the same discipline will apply.

So, in all, we expect a modest increase to around \$8 billion of capital next year and somewhere between \$9 and \$10 billion in 2023 and 2024. And I would stress that any M&A would be in addition.

Now, if we cannot develop or find value-accretive options then we will simply not spend the money but will follow our well-established capital allocation

policy.

## Broad-based funding model for decarbonisation

### Capital expenditure ~\$7.5bn over 2022-30

Pilbara energy system | ELYSIS™  
implementation capital | MACC projects

### Operating expenditure

New capability | Energy efficiency | R&D

### Long-term contracts

Pacific Aluminium smelters and refineries  
Kennecott

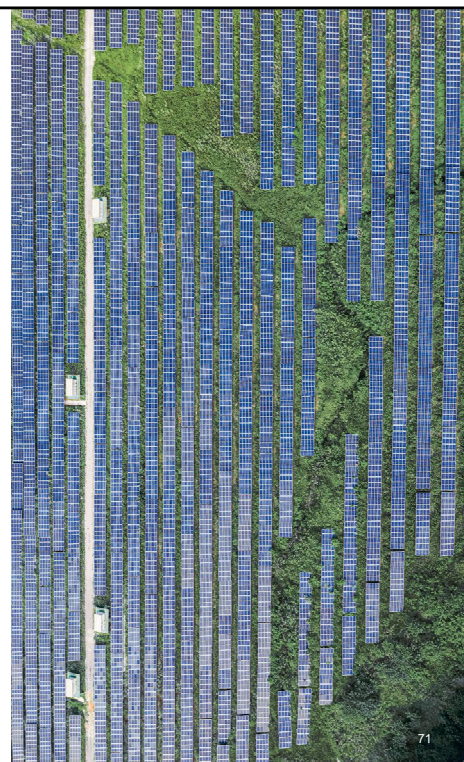
### Partnerships\*

Green steel: 25 existing R&D partnerships –  
more targeted

Examples provided under each category of funding is not an exhaustive list and options for decarbonisation will continue to evolve.  
\*Funding model to be determined. MACC = Marginal Abatement Cost Curve

**RioTinto**

©2021, Rio Tinto, All Rights Reserved



We are clearly very focused on decarbonisation. Our \$7.5 billion best estimate to 2030 includes full decarbonisation of the Pilbara energy system, an initial deployment of Elysis and other capital projects, for instance around redesigning industrial processes.

There will be incremental operating expenditure on building new capabilities, energy efficiency initiatives and R&D in the order of \$200 million a year. After the first few years we would expect this spend to reduce as energy efficiency work matures.

For the avoidance of doubt, this does not include spend for the replacement of carbon-intensive opex with zero-carbon alternatives. We have also not included any funding for offsets as we expect to be able to deliver our targets through operational improvements.

We will also work with third parties through long-term contracts. For our standalone Pilbara system, at least initially, it makes sense for us to fund renewables, but we may leverage third party investments particularly where our assets are grid connected. This is the more likely solution for our two coal-powered smelters in Australia. These will of course go through the same investment process I outlined earlier and we will remain open-minded about the right mix of investment and third party contracts.

As Mark said earlier, it would require the deployment of 5GW of solar and wind power with robust firming to decarbonise the two Pacific smelters on an equity basis. That equates to capex of around \$5-7.5 billion based on current prices.

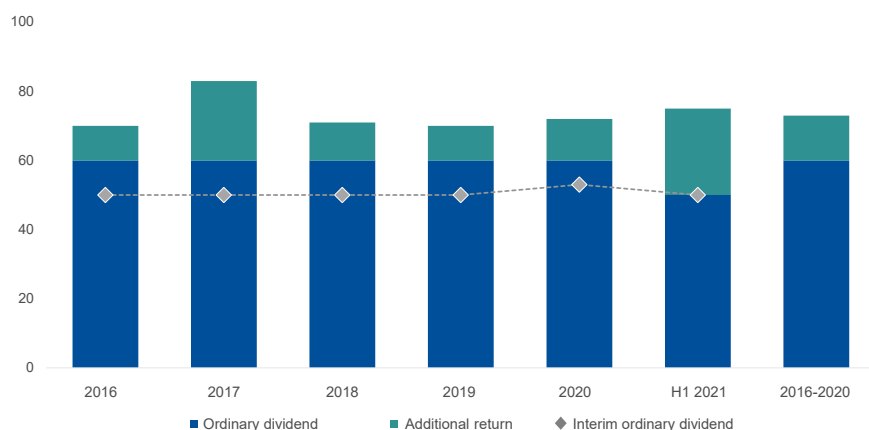
We are also forming multiple new partnerships,

around 25 so far in green steel alone. Some will not proceed, whereas others will lead to success, a bit like our exploration programme. In general, business and funding models for successful programmes are yet to be determined. Clearly, the dollars needed for green steel at scale would dwarf the numbers above.

Consideration of any investment we might make is for another day but under all circumstances we would need to see attractive economics. For now, our interest is in cracking the code on technologies to catalyse investment.

## Attractive dividends remain paramount

**Shareholder returns of 40-60% of underlying earnings on average through the cycle**  
Pay-out ratio (%)



Excluding divestment proceeds returned to shareholders

**RioTinto** ©2021, Rio Tinto, All Rights Reserved

Consistent five-year record of shareholder returns

Pay-out ratio policy de-risks the company

60% average pay-out on **ordinary** dividend over past 5 years

73% average pay-out **in total**

Our financial strength allows us to simultaneously:

- reinvest for growth
- accelerate our own decarbonisation
- continue to pay attractive dividends to shareholders in line with our policy

Moving onto shareholder returns. Our policy, well known to most of you, dates back to 2016. We have committed to returning 40 to 60 per cent of underlying earnings on average through the cycle, with additional returns in periods of strong earnings and cash generation. It is tried and tested and has resulted in record returns. But it is of course a variable policy – in terms of the absolute number – with the denominator moving up and down, mostly in line with commodity prices.

As you can see from this chart, over the last five



years we have paid out at the top end of the range for the ordinary dividend at 60%. And overall, due to our very strong cash flows and modest rates of investment, we have consistently exceeded the policy, with a total pay-out ratio of 73% when you include specials and share buy-backs.

We see the dividend as paramount for maintaining discipline. Our financial strength means that we can reinvest for growth, accelerate our decarbonisation and continue to pay attractive dividends through the cycle.

## Strong foundation for growth, decarbonisation and shareholder returns

Outstanding foundation	Clear strategy	Compelling investment proposition	
<ul style="list-style-type: none"><li>- No fossil fuel extraction</li><li>- Long-life assets producing vital commodities</li><li>- Resilient cash flows through the cycle</li><li>- Capital discipline</li><li>- Robust financial position</li><li>- Advantageous renewables position</li><li>- World-class pipeline of projects and exploration</li></ul>	<ul style="list-style-type: none"><li>- Accelerate our own decarbonisation</li><li>- Grow in materials enabling the global energy transition</li><li>- Develop products and services that help our customers to decarbonise</li></ul>	<ul style="list-style-type: none"><li>- Deliver value-adding growth</li><li>- Continue to pay attractive dividends in line with our policy</li><li>- Attractive partner to our customers and host countries</li><li>- Reduce risks by accelerating our own low-carbon transition</li><li>- Maintain financial strength and resilience</li></ul>	
Best operator	Impeccable ESG credentials	Excel in Development	Strengthening our social licence

So, let me conclude.

We have an outstanding foundation of long-life assets, producing vital commodities for a decarbonising world. Our balance sheet is stronger than ever and we have a world-class pipeline of projects.

This means that we can double our delivery of value-adding growth and accelerate the decarbonisation of our portfolio while continuing to

pay attractive dividends in line with our policy.

By accelerating our own decarbonisation transition, we will de-risk the company; generate growth; maintain our financial discipline and enhance our competitive advantage.

With that, let me pass back to Jakob.



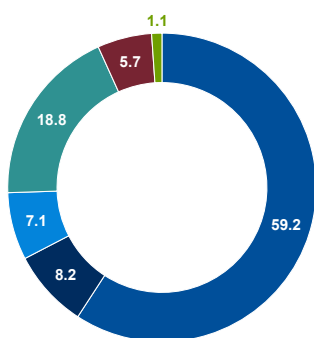
# Appendices

Jadar project, Loznica, Serbia



# Shareholder structure

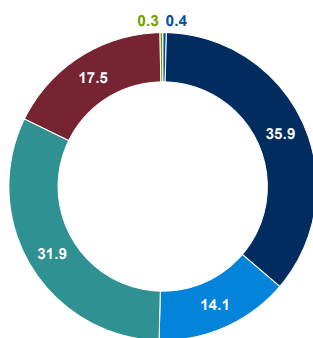
**23%** Rio Tinto Limited  
Shares outstanding: 0.371bn



■ Australia

■ UK

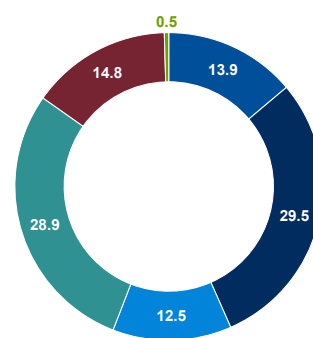
**77%** Rio Tinto PLC  
Shares outstanding: 1.247bn



■ Europe (ex UK)

■ North America

**100%** Rio Tinto DLC  
Shares outstanding: 1.619bn



■ Asia

■ ROW

\*21 September 2021



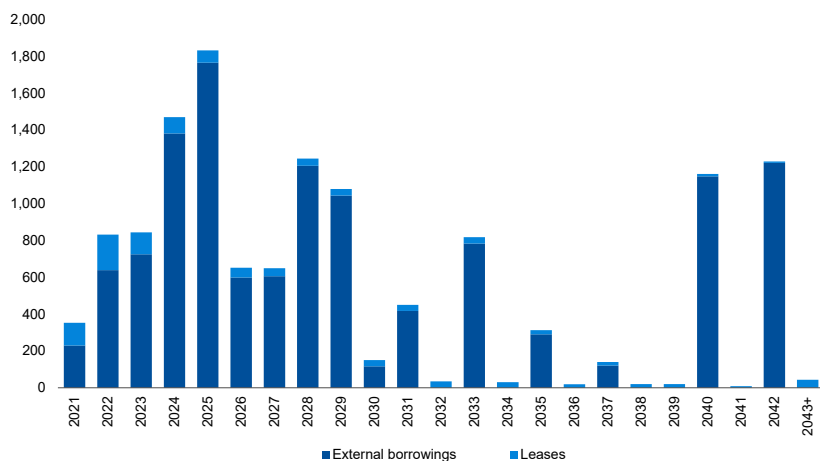
©2021, Rio Tinto, All Rights Reserved

75

# Debt maturity profile

30 June 2021 debt maturity profile\*

\$ million



\*Numbers based on June 2021 accounting value. The debt maturity profile shows \$1.1 billion of capitalised leases under IFRS 16.

Average outstanding debt maturity of corporate bonds at ~12 years (~ 9 years for Group debt)

No corporate bond maturities until 2024

Liquidity remains strong under stress tests

\$7.5bn back-stop Revolving Credit Facility extended to November 2023 and remained undrawn throughout the pandemic

# Group level financial guidance

	FY2021	FY2022	FY2023	FY2024
<b>CAPEX</b>				
Total Group	~\$7.5bn	~\$8.0bn	~\$9.0 – 10.0bn	~\$9.0 – 10.0bn
Sustaining Capex Group	~\$3.5bn	~\$3.5bn	~\$3.5bn	~\$3.5bn
Pilbara Sustaining Capex	~\$1.5bn	~\$1.5bn	~\$1.5bn	~\$1.5bn
<ul style="list-style-type: none"> <li>• \$0.5bn per year to decarbonise our assets from 2022 to 2024</li> <li>• Total decarbonisation investment of ~\$7.5bn* from 2022 to 2030, predominantly in second half of decade</li> <li>• Ambition to grow and decarbonise reflected in 2023-24 capex of \$9-10bn including up to \$3bn in growth spending, depending on opportunities</li> <li>• Replacement spending \$2-3bn per year</li> </ul>				
<b>Effective tax rate</b>	30%			
<b>Returns</b>	Total returns of 40 – 60% of underlying earnings through the cycle			

\*Conceptual view of capital requirements at October 2021. Marginal Abatement Cost Curves (MACC) will be updated on an annual basis

**RioTinto**

©2021, Rio Tinto, All Rights Reserved



77

# Product group level guidance

	2021 production guidance <sup>1</sup>	2021 costs
<b>Iron Ore Shipments</b>	320 – 325mt <sup>2</sup> (100% basis)	\$18.0-18.5/wmt (FOB), based on an Australian dollar exchange rate of \$0.75
<b>Copper</b>		
Mined Copper	~500kt <sup>3</sup>	C1 Copper unit costs 75-80 US c/lb
Refined Copper	190 – 210kt <sup>4</sup>	
<b>Aluminium</b>		
Bauxite	54 – 55mt <sup>6</sup>	Modelling guidance provided for Canadian smelters only (see slide 80)
Alumina	7.8 – 8.2mt	
Aluminium	3.1 – 3.3mt	
<b>Minerals</b>		
TiO <sub>2</sub>	~1.0 <sup>7</sup>	
IOC pellets and concentrate <sup>8</sup>	9.5 – 10.5mt	
B <sub>2</sub> O <sub>3</sub>	~0.5mt	
Diamonds	3.0 – 3.8m carats <sup>5</sup>	

<sup>1</sup> Rio Tinto share unless otherwise stated.

<sup>2</sup> Pitbars shipments guidance remains subject to COVID-19 disruptions including risks around mandatory vaccination for the resources industry in Western Australia as of 1 December, and risks around commissioning of new mines and management of cultural heritage.

<sup>3</sup> Remains subject to COVID-19 disruptions and risks around mine plan sequencing following geotechnical issues at Kennecott.

<sup>4</sup> Reduction reflects a Kennecott smelter incident in September resulting in force majeure on customer contracts.

<sup>5</sup> Diamonds 2021 guidance and actuals are for Diavik only for comparability, following Argyle closure in 2020. Unadjusted Diamonds production for 2020 was 14.7 million carats, including both Diavik and Argyle operations.

<sup>6</sup> Reduction reflects equipment reliability issues and operational instability at the Pacific mines. The focus in the fourth quarter is on the recovery of plant equipment availability and asset health to support 2022 performance.

<sup>7</sup> Full year titanium dioxide slag production guidance has been reinstated following stabilisation of the security situation at Richards Bay Minerals in South Africa and resumption of operations.

<sup>8</sup> Iron Ore Company of Canada.

**RioTinto**

©2021, Rio Tinto, All Rights Reserved



78



# Modelling EBITDA

## Underlying EBITDA sensitivity

	Average published price/exchange rate for 2021 first half	US\$ million impact on full year 2021 underlying EBITDA of a 10% change in prices/exchange rates
Copper	413c/lb	478
Aluminium	\$2,245/t	784
Gold	\$1,805/oz	77
Iron ore realised price (62% Fe CFR freight-adjusted)	\$168.4/dmt	4,180
A\$	0.77US\$	665
C\$	0.80US\$	249
Oil (Brent)	\$65/bbl	112

Note: The sensitivities give the estimated effect on underlying EBITDA assuming that each individual price or exchange rate moved in isolation. The relationship between currencies and commodity prices is a complex one and movements in exchange rates can affect movements in commodity prices and vice versa. The exchange rate sensitivities include the effect on operating costs but exclude the effect of revaluation of foreign currency working capital.

# Modelling aluminium costs

## Canadian\* smelting unit cash\*\* cost sensitivity

(\$/t) Impact a \$100/t change in each of the input costs below will have on our H1 2021 Canadian smelting unit cash cost of \$1,262/t

Alumina (FOB)	\$191
Green petroleum coke (FOB)	\$27
Calcined petroleum coke (FOB)	\$36
Coal tar pitch (FOB)	\$8

\* Canadian smelters include all fully-owned smelters in Canada (Alma, AP60, Arvida, Grande-Baie, Kitimat, and Laterrière), as well as Rio Tinto's share of the Becancour and Alouette smelters

\*\* The smelting unit cash costs refer to all costs which have been incurred before casting, excluding depreciation but including corporate allocations and with alumina at market price, to produce one metric tonne of primary aluminium.

# Jadar project – 100% owned and managed

## Mining and processing

Underground mine using bench stoping  
Co-located beneficiation and chemical processing plant  
Primary products: lithium carbonate, boric acid  
Overall product recoveries: ~80%

## Capex

Capital: \$2.4bn (nominal)  
Construction phase: 2021-2026 (peak 2022-2025)  
LOM sustaining capital: \$30m per year, average (real)

## Production profile<sup>1</sup>

First saleable production: 2026  
Full ramp-up: 2029  
Annual target volumes: up to 58,000 tonnes of battery-grade lithium carbonate<sup>2</sup>, 160,000 tonnes of boric acid (B<sub>2</sub>O<sub>3</sub> units) and 255,000 tonnes of sodium sulphate<sup>3</sup> per annum

## Serbian tax and royalties

Mining royalty: 5% (levied on gross sales minus allowable deductions)  
Corporate income tax rate: 15%  
Withholding tax rate: 5%

## 40 year mine life

Ore reserve:  
16.6Mt @ 1.8% Li<sub>2</sub>O and 13.4% B<sub>2</sub>O<sub>3</sub>  
Mineral resource:  
139.2Mt @ 1.8% Li<sub>2</sub>O and 14.7% B<sub>2</sub>O<sub>3</sub>

## First quartile costs

Dry stacked  
tailings solution

Electric haul trucks

70% water recycling

~2,100 direct jobs  
during construction

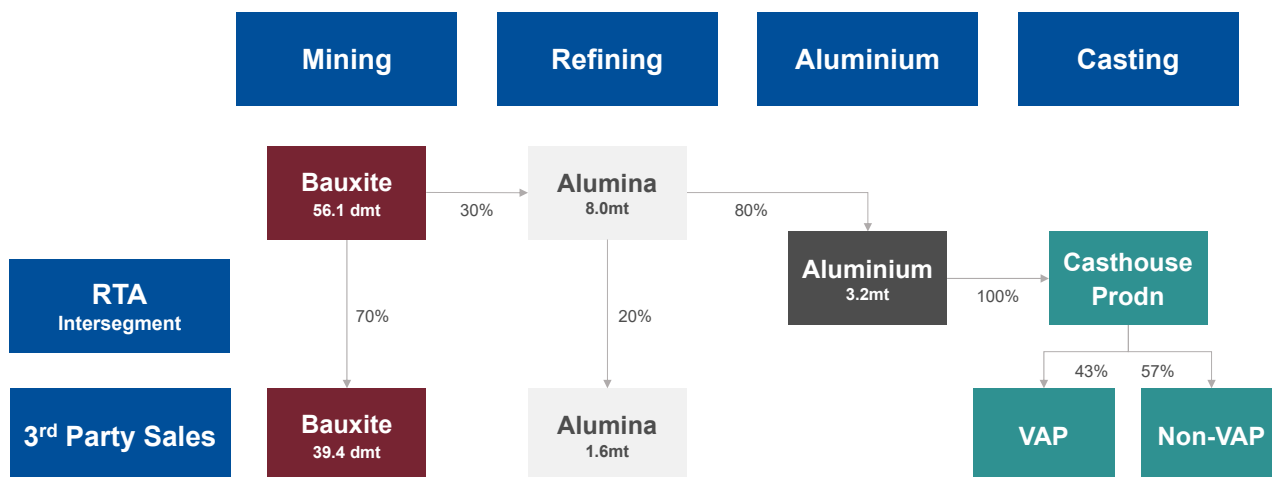
>1,000 ongoing jobs  
when operational

<sup>1</sup> Continuing to work closely with stakeholders in Serbia. Subject to award of final permits and approvals.

<sup>2</sup> These production targets were previously reported in a release to the Australian Securities Exchange (ASX) dated 10 December 2020, "Rio Tinto declares maiden Ore Reserve at Jadar" (for battery-grade lithium carbonate it was 55,000 tonnes). All material assumptions underpinning the production targets continue to apply and have not materially changed.

<sup>3</sup> These resources and reserves were previously reported in the Rio Tinto Annual Report 2020. The material assumptions on which they were based have not materially changed.

## RTA Value Chain – 2020 Actuals



## Common acronyms

**T** = Tonne

**Mt** = Million tonnes

**Gt** = Giga tonnes

**tCO<sub>2</sub>** = Tonne of carbon dioxide

**tCO<sub>2</sub>e** = Tonne of carbon dioxide equivalent

**P.a** = Per annum

**Mtpa** = Million tonnes per annum

**CO<sub>2</sub>** = Carbon dioxide

**GHG** = Greenhouse gas

**Mwh** = Megawatt hour

**MW** = Megawatt

**GW** = Gigawatt

**ROCE** = Return on capital employed

**EBITDA** = Earnings Before Interest, Taxes, Depreciation and Amortisation

**CAGR** = Compound annual growth rate

**USD** = United States dollar

**Bn** = Billion

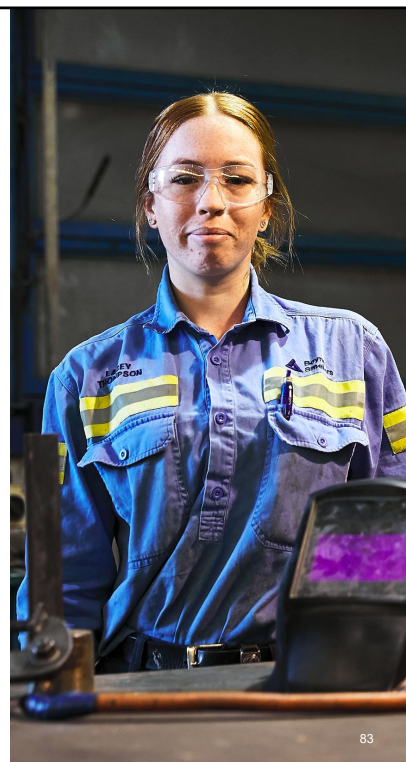
**NPV** = Net present value

**ESG** = Environmental, Social, and Governance

**IRR** = Internal rate of return

**R&D** = Research and development

**VAP** = Value-added product



# Increasing transparency for our stakeholders

## A commitment to reporting on:

**Ongoing progress** against our own commitments and internal work-streams external obligations and recommendations.

The **enhanced governance** arrangements in place to oversee the company's progress against these actions.

How Traditional Owners' views are being sought and considered in shaping these commitments and **Traditional Owners' perspectives** on how successfully these commitments are being met.

How the company is working to **advocate for enhanced sector-wide cultural heritage management** and how this is consistent with our internal standards.



RioTinto

©2021, Rio Tinto, All Rights Reserved

84

## Working to improve in multiple areas

- 1 Remediating and rebuilding our relationship with the PKKP people
- 2 Partnering with Pilbara Traditional Owners in modernising and improving agreements
- 3 Establishing the new Communities and Social Performance model
- 4 Building local capability and capacity to support the site General Manager
- 5 Improving our governance, planning and systems where it relates to communities
- 6 Reducing barriers to, and increasing, Indigenous employment
- 7 Increasing Indigenous leadership and developing cultural competency within Rio Tinto
- 8 Establishing a process to redefine and improve cultural heritage management standards
- 9 Establishing an Australian Advisory Group
- 10 Elevating external consultation
- 11 Elevating employee engagement

**RioTinto**

©2021, Rio Tinto, All Rights Reserved



85

# Establishing an Australian Advisory Group

(previously called Indigenous Advisory Group)

## Specific actions

We are establishing an Australian Advisory Group (AAG) to help shape, influence and support our approach to issues that are important to Indigenous peoples, the Australian community and our business.

---

The AAG aims to:

- Introduce more **diversity and breadth of views**
- Increase the **awareness of leaders** within Rio Tinto to make fully informed decisions
- **Act as a sounding board** for Rio Tinto on knowledge, practices, and perspectives with a particular focus on Indigenous issues
- Provide **coaching, mentoring** and advice to senior leadership
- Identify ways to **improve the culture** within Rio Tinto



# Reducing barriers to and increasing Indigenous employment

## Specific actions

### We have:

Committed to a **US\$50 million investment** to retain, attract and grow Indigenous professionals and leaders in our business

---

**Increased Indigenous leaders** from 6 to 19 across Australia

---

**Increased our 2021 target** to recruit 50 Indigenous leaders

---

Launched a leadership development programme in Australia, with over **200 Indigenous employees** enrolled

---

Implemented a **two-way Indigenous mentoring** programme

---

Launched an Australia-wide **Indigenous employee networking programme**

---

Awarded **Indigenous university scholarships** to students in the fields of environmental science and engineering

# Establishing the new Communities and Social Performance model

## Specific actions

We have:

**Increased number of CSP professionals** from 250 to 300, working in 65 sites and 35 countries

**Restructured reporting lines** so field based CSP professionals report to their line managers

**Established a central CSP Area of Expertise** with technical subject matter experts

**Established a senior leadership team** comprising CSP leaders from all product groups, exploration, projects, closure and Indigenous Affairs



## Partnering with Pilbara Traditional Owners in modernising and improving agreements

### Specific actions

Preliminary discussions with **ten Pilbara Traditional Owner groups** in relation to agreement modernisation

Identified **key principles** for consideration in modernising agreements

Signed **engagement protocols** that provide a scope and framework of the modernisation work with four of the Traditional Owner groups

Continuing to work with Traditional Owners to **enhance benefits** that flow to communities



# Building local capability and capacity to support the site General Manager

## Specific actions

**Iron Ore Chief Executive** has the overall accountability for Traditional Owner relationships and heritage matters for the product group

**Site General Managers** have direct responsibility for TO relationships

**Traditional Owner Engagement Leads** support the mine General Managers by maintaining the day-to-day engagement with the Traditional Owner groups

**Increased capacity across our CSP function** as well as **upgrading CSP systems** to provide improved, linked-up decision-making

A **Traditional Owner Partnerships Committee** has been created to drive improvements and share learnings



# Establishing a process to redefine and improve cultural heritage management standards

## Specific actions

We are increasing both the capabilities and resources of the internal Cultural Heritage teams to increase understanding and delivery of cultural heritage performance.

---

Rio Tinto Iron Ore has almost **doubled the size of its cultural heritage** team to more than 60 people.

---

We are progressing the **Integrated Heritage Management Process** (IHMP) to ensure we do not impact sites of exceptional cultural significance within our existing mine plans. To date, we have:

- Reviewed **2205 heritage sites**
- Reviewed **all sites for 2021** and **95% for 2022**
- Removed approx. **54 million tonnes** of Iron Ore from our reserves as a precautionary measure
- Set up **protective buffer zones** for all sites of high cultural significance