

Rio Tinto releases second quarter production results

15 July 2022

Rio Tinto Chief Executive Jakob Stausholm, said: "We strengthened our operational performance at a number of sites, which we will now replicate across the portfolio. The delivery of first ore at Gudai-Darri, our first greenfield mine in the Pilbara for over a decade, increases mine capacity and supports production of our flagship Pilbara Blend™. We also fired the first draw bell at the Oyu Tolgoi underground project in June, and started producing scandium and tellurium. These critical minerals are being extracted from existing waste streams at our titanium operation in Quebec and copper operation in Utah, without the need for new mining.

"We are committed to transforming our culture and building better relationships. In May, we signed a Heads of Agreement with the Puutu Kunti Kurrama and Pinikura (PKKP) people which will guide the co-management of PKKP country where mining takes place.

"We made progress against our four objectives during the first half and we are determined to further strengthen Rio Tinto while investing to grow in the commodities needed for the energy transition, decarbonise our portfolio, be a partner and employer of choice, maintain our tight capital allocation and continue to pay attractive dividends."

Production*		Q2 2022	vs Q2 2021	vs Q1 2022	H1 2022	vs H1 2021
Pilbara iron ore shipments (100% basis)	Mt	79.9	+5%	+12%	151.4	-2%
Pilbara iron ore production (100% basis)	Mt	78.6	+4%	+10%	150.3	-1%
Bauxite	Mt	14.1	+3%	+4%	27.8	+2%
Aluminium	kt	731	-10%	-1%	1,467	-9%
Mined copper	kt	126	+9%	+1%	252	+7%
Titanium dioxide slag	kt	293	-2%	+7%	566	-2%
IOC iron ore pellets and concentrate	Mt	2.6	-4%	+8%	5.0	-1%

*Rio Tinto share unless otherwise stated

Q2 2022 operational highlights and other key announcements

- We are focused on the safety, health and wellbeing of our workforce and communities where we operate. Our all-injury frequency rate of 0.35 is an improvement from the second quarter of 2021 (0.42), and in line with the prior quarter (0.35). We have seen an overall decline in COVID-19 cases, with spikes at some of our operations. We continue to monitor the situation and remain vigilant.
- [Gudai-Darri delivered first ore](#) from the main plant in June. As it ramps up, we expect increased production volumes and improved product mix in the second half, with Gudai-Darri capacity to be reached in 2023. Pilbara operations produced 78.6 million tonnes (100% basis) in the second quarter, 4% higher than the second quarter of 2021. While significantly higher than average rainfall in May impacted mine production, continued focus on mine pit health and commissioning of Gudai-Darri supported a stronger second quarter. Shipments were 79.9 million tonnes (100% basis), 5% higher than the second quarter of 2021. Full year shipments guidance remains unchanged at 320 to 335 million tonnes.
- Bauxite production of 14.1 million tonnes was 3% higher than the second quarter of 2021 due to strong operational performance at Weipa as a result of improved plant reliability at Amrun.

- Aluminium production of 0.7 million tonnes was 10% lower than the second quarter of 2021 due to reduced capacity at our Kitimat smelter in British Columbia following the strike which commenced in July 2021. A controlled restart began at the end of the second quarter of 2022, with ramp-up progressing subject to plant stability. Production at Boyne smelter in Queensland was impacted due to process instability following COVID-19 related unplanned absences. Production has been stabilised and the cells that have been taken offline are being ramped up over the next 12 months. All of our other smelters continued to have stable performance. Guidance has been lowered to 3.0 to 3.1 million tonnes (previously 3.1 to 3.2 million tonnes).
- Mined copper production of 126 thousand tonnes was 9% higher than the second quarter of 2021 due to higher material movement and higher grades and recoveries at Kennecott and Escondida, partly offset by lower grades and recoveries at Oyu Tolgoi as a result of planned mine sequencing.
- On 18 May, we [announced](#) we had agreed to amend the funding plan with Turquoise Hill Resources (TRQ) in order to provide liquidity of up to \$400 million in short-term early advances, while the Special Committee of TRQ evaluates our C\$34 per share all-cash proposal to acquire the approximately 49% of the issued and outstanding shares of TRQ that Rio Tinto does not currently own. The deadline in the funding plan for TRQ to conduct an initial equity offering of at least \$650 million has also been extended from the end of August to the end of 2022.
- Titanium dioxide slag production of 293 thousand tonnes was 2% lower than the second quarter of 2021 with steady performance at Richards Bay Minerals in South Africa and improved stability of operations at Rio Tinto Fer et Titane, Canada. There were some operational disruptions at QIT Madagascar Minerals following cyclones in Madagascar.
- Iron Ore Company of Canada (IOC) achieved milestones in May including record safety performance year to date (0.26 AIFR versus 0.73 in 2021) and monthly records for concentrate production and total material moved. Production of pellets and concentrate was 4% lower than the second quarter of 2021 due to the planned annual maintenance shutdown (seven days) which was successfully completed in June (this work was completed in September in 2021).
- In the second quarter, we continued to successfully roll out the Rio Tinto Safe Production System (RTSPS) and now have 15 deployments across the business at 11 sites, with 30 rapid improvement projects (Kaizens) either completed or in progress. In the half, there has been a 9% year on year improvement in average operating time across processing plants and drills at deployment sites versus the same period of 2021. We are on track to meet our 2022 target of 30 deployments at 15 sites.
- In the second quarter, we entered into additional partnerships and progressed initiatives to decarbonise our business and our value chains. These include a Memorandum of Understanding with Salzgitter to work together towards carbon-free steelmaking, and a strategic equity investment in Nano One - a clean technology innovator in battery materials.
- As the result of Queensland Alumina Limited's (QAL) activation of a step-in process following sanction measures by the Australian Government, Rio Tinto has taken on 100% of capacity for as long as the step-in continues. This results in use of Rusal's 20% share of capacity by Rio Tinto under the tolling arrangement with QAL. This additional output is excluded from the production tables in this report as QAL remains 80% owned by Rio Tinto and 20% owned by Rusal.
- Higher rates of inflation have increased our closure liabilities with an impact to underlying earnings. In the first half of 2022, this resulted in increased charges of approximately \$400 million pre-tax within underlying earnings compared with the first half of 2021, including a \$300 million increase in amortisation of discount, with the remainder impacting underlying EBITDA.
- All figures in this report are unaudited. All currency figures in this report are US dollars, and comments refer to Rio Tinto's share of production, unless otherwise stated.

2022 guidance

Rio Tinto share, unless otherwise stated	2021 Actuals	H1 2022 Actuals	2022 Previous	2022 Current
Pilbara iron ore ¹ (shipments, 100% basis) (Mt)	322	151.4	320 to 335	Unchanged
Bauxite (Mt)	54	27.8	54 to 57	Unchanged
Alumina (Mt)	7.9	3.8	8.0 to 8.4	7.6 to 7.8
Aluminium (Mt)	3.2	1.5	3.1 to 3.2	3.0 to 3.1
Mined copper (kt)	494	252	500 to 575	Unchanged
Refined copper (kt)	202	104	230 to 290	Unchanged
Diamonds ² (M carats)	3.8	2.1	5.0 to 6.0	4.5 to 5.0
Titanium dioxide slag (Mt)	1.0	0.6	1.1 to 1.4	Unchanged
IOC ³ iron ore pellets and concentrate (Mt)	9.7	5.0	10.0 to 11.0	Unchanged
Boric oxide equivalent (Mt)	0.5	0.3	~0.5	Unchanged

¹Pilbara shipments guidance remains dependent on risks around ramp-up of new mines and management of cultural heritage.

²Reflects 100% ownership of Diavik (previously 60%) from 1st November 2021.

³Iron Ore Company of Canada.

- Iron ore shipments and bauxite production guidance remain subject to weather and market conditions.
- Our guidance assumes development of the COVID-19 pandemic does not lead to government-imposed restrictions and widespread protracted cases, which could result in a significant number of our production and maintenance critical workforce and contractor base being unable to work due to illness and/or isolation requirements. This risk extends to prolonged interruption of service from a key partner or supplier which could lead to severely constrained operational activity of a key asset or project.
- Pilbara shipments guidance remains dependent on ramp-up of Gudai-Darri and Robe Valley, availability of skilled labour and management of cultural heritage, including any impacts from the Aboriginal Cultural Heritage Act 2021.

Operating costs

- Pilbara iron ore 2022 unit cost guidance of \$19.5-\$21.0 per tonne remains unchanged. Operating cost guidance is based on A\$:US\$ exchange rate of 0.71 (previously 0.75) and excludes COVID-19 response costs.
- Copper C1 unit cost guidance in 2022 is unchanged at 130-150 US cents/lb.

Aluminium modelling

To assist with modelling of aluminium operating costs during a volatile price environment for raw materials we provide the following breakdown and sensitivities for the alumina and aluminium metal segments (Primary Metal and Pacific Aluminium). This excludes the effect of intra and inter segment eliminations on group profit. Higher raw material prices are also increasing inventory balances.

Alumina refining

Production cash cost (%)	FY 21	H1 22
Bauxite	38	32
Conversion	34	33
Caustic	14	22
Energy	14	13
Total	100	100

Input costs (nominal)	H1 21 Index price	H2 21 Index price	H1 22 Index price	FY 22 Annual cost sensitivity impact on underlying EBITDA
Caustic soda ¹ (\$/t)	274	535	675	\$10m per \$10/t
Natural gas ² (\$/mmbtu)	2.85	4.59	6.02	\$4m per \$0.10/GJ
Brent oil (\$/bbl)	64.6	76.3	105.9	\$2m per \$10/bbl

¹North East Asia FOB | ²Henry Hub

Aluminium smelting

Production cash cost (%)	FY 21	H1 22
Alumina	41	41
Power	21	20
Conversion	21	20
Carbon	15	17
Materials	2	2
Total	100	100

Input costs (nominal)	H1 21 Index price	H2 21 Index price	H1 22 Index price	FY 22 Annual cost sensitivity impact on underlying EBITDA
Alumina ¹ (\$/t)	288	369	395	\$64m per \$10/t
Petroleum coke ² (\$/t)	373	491	667	\$11m per \$10/t
Coal tar pitch ³ (\$/t)	748	818	1,103	\$2m per \$10/t

¹LME Australia | ²US Gulf FOB | ³North America FOB

Investments, growth and development projects

- We continue to proactively manage COVID-19 and prioritise work across critical projects. The easing of various interstate and international border restrictions during the first half of 2022 has enabled increased movement of people and goods to our sites, and at some sites improved access to skilled resources. Capital expenditure for 2022 for our existing operations remains unchanged at around \$8.0 billion. Capital expenditure for 2023 and 2024 is still expected to be between \$9.0 and \$10.0 billion annually, which includes the ambition to invest up to \$3.0 billion in growth per year, depending on opportunities. The guidance includes cumulative investment of \$1.5 billion to decarbonise our assets from 2022 to 2024.
- Exploration and evaluation expense in the first half of 2022 was \$367 million, \$43 million (13%) higher than the first half of 2021, with ramp-up of activities in Guinea, Argentina and Australia.

Pilbara mine projects

- At Gudai-Darri, first ore via the main plant was delivered in June and all major elements of the process plant have been commissioned. Production from the mine will continue to ramp up through the remainder of this year, reaching full capacity in 2023.
- At Robe Valley, Mesa A wet plant performance stabilised throughout the period and rectification works remain on track for completion in the third quarter.

Oyu Tolgoi underground project¹

Technical progress

- A cost and schedule reforecast was completed in June 2022 resulting in a total project cost estimate of \$7.06 billion, which remains under review by the Oyu Tolgoi Board. This is an increase of \$0.3 billion against the 2020 Definitive Estimate, which is largely related to COVID-19 disruptions. The 2022 reforecast assumes there are no further COVID-19 disruptions from June 2022.
- The first drawbell of the Hugo North underground mine was fired in June. The undercut progression remains on track to achieve first sustainable production from Panel 0 in the first half of 2023.
- Shafts 3 and 4 have been delayed due to COVID-19 restrictions and reprioritisation of the mobilised workforce, as previously reported. However progress has been made in the quarter and the shafts are now at depths of 174 metres and 276 metres, respectively. Both shafts are now expected to be commissioned in the first half of 2024, 15 months later than the 2020 Definitive Estimate (previously nine months delay).
- Study work for Panels 1 and 2 (which are required to support the ramp-up to 95,000 tonnes of ore per day) is expected to be completed in the first half of 2023 and will incorporate any ventilation impacts due to the shaft 3 and 4 delays.

Other key projects and exploration and evaluation

- The Zulti South project in South Africa remains on full suspension.
- At the Kemano hydropower tunnel project in British Columbia water flow was achieved through the second tunnel powerhouse in June following completion of tunnel construction works. This project will ensure the long-term, sustainable operation of the Kitimat aluminium smelter.
- At the Resolution Copper project in Arizona, we are working with the US Forest Service to progress the Final Environmental Impact Statement (FEIS) and complete actions necessary for the land exchange. We also continue to advance partnership discussions with several of the federally-recognised Tribes that are participating in the formal consultation process on the FEIS and land exchange. We are aware of the Ninth Circuit's decision to uphold the lower court ruling denying Apache Stronghold's request for injunctive relief. We are encouraged by the significant local support for the project but respect the views of groups who oppose it, and will continue our efforts to address and mitigate these concerns.
- At the Winu copper-gold project in Western Australia, a programme of work is ongoing to supplement our understanding of the deposit and the environmental and cultural heritage impacts in advance of submitting the regulatory approval requests. We also continue to strengthen our partnerships with Traditional Owners and advance agreement making.

- At the Simandou iron ore project in Guinea², project activities have stopped following an order from the Government of Guinea to all parties to stop work. Engagement with the Government and WCS continues towards the resumption of formal negotiations and project activities. We remain committed to delivering Simandou in accordance with international ESG standards, ensuring that the project results in sustainable benefits to Guinea and its people, along with our shareholders and customers.
- At the Jadar lithium-borate project in Serbia, we are continuing to explore all options. We acknowledge the concerns from local communities and are engaging meaningfully to explore ways to address them.
- The acquisition of the Rincon lithium project in Argentina was completed at the end of March 2022, and integration is well underway. We are undertaking engagement with communities, the province of Salta and the Government of Argentina to ensure an open and transparent dialogue with stakeholders about the work planned, including possible pathways for a smaller start-up to accelerate market entry. Detailed studies are progressing.

¹The submission of Oyu Tolgoi LLC's updated Mongolian Feasibility Study remains under discussion with the Ministry of Mining, the Minerals Council and the Technical Working Group appointed by the Ministry of Mining.

²Correction to the statement in the quarterly report publication on 20 April 2022 which incorrectly quoted board approval in May rather than March. 'In March, the Rio Tinto Board provided in-principle approval of this path forward and we continue to progress jointly with WCS to deliver a definitive agreement within 60 days of the framework agreement'.

Sustainability highlights

We continue to focus on becoming a more outward-looking and humane company, ensuring that everyone at Rio Tinto can count on a safe, respectful and inclusive workplace. We are on track to achieve our target to increase female representation (including in senior leadership) by two percentage points each year. In the first half, representation of women increased by one percentage point to 22.6% of total workforce, or 11,300, a 11% increase versus December 2021. To date, over 57% of our leaders have either registered for or completed the Everyday Respect training. We are also in the process of setting up our new Business Conduct Office to enable a more human centric investigation response.

On 7 June, we [announced](#) that more than 3,000 women across Australia and New Zealand had applied for roles with Rio Tinto, following the launch of recruitment campaigns targeting women who had not previously worked in the mining industry. In Western Australia, the Transferable Pathways campaign, which launched in May, attracted about 1,600 responses.

On 23 June, we [released](#) our 2021 Statement on Modern Slavery. The report is our sixth in line with United Kingdom modern slavery reporting legislation and our second under Australian legislation. It highlights how we are identifying and addressing modern slavery risks throughout Rio Tinto and our supply chain and is part of our commitment to respect human rights, which includes freedom from all forms of modern slavery.

Communities & Social Performance (CSP)

In the second quarter, we recognised two years since the destruction of the rock shelters on the land of the Puutu Kunti Kurrama and Pinikura (PKKP) people at our Brockman iron ore mine in the Pilbara. We are committed to transforming our culture, building better relationships and ensuring cultural heritage is understood, valued and better protected. In May, the PKKP Aboriginal Corporation entered a co-management Heads of Agreement with Rio Tinto. This agreement is an important step towards rebuilding our relationship with the PKKP people and sets out how we will work together in partnership on a co-management approach to mining activities on PKKP Country. We also continue to work to remediate and protect the Juukan Gorge area under the guidance of the Puutu Kunti Kurrama Traditional Owners.

We continued to build on our relationship reset in Mongolia, with the Oyu Tolgoi Board approving a \$50 million five-year funding programme to support the long-term, sustainable development of Khanbogd town - our neighbouring host community in the South Gobi region.

In July, we signed a Memorandum of Understanding (MOU) with four Weipa region Traditional Owner groups detailing an agreed consultation process around closure planning for the East Weipa bauxite mine. The MOU was jointly developed by Traditional Owners and Rio Tinto and lays a path regarding the eventual return of their lands after mining at East Weipa ceases operation in 2024.

In June, we made a \$1 million donation to UNICEF to support global equitable access to COVID-19 vaccines. We worked with UNICEF to better understand where our support could be utilised, focusing on countries where we have a close connection to the local communities and where there are weaker health systems. These countries include Mongolia, South Africa, Madagascar and Guinea. This is the final amount from our \$25 million commitment announced in 2020.

In late 2021, a joint Committee was formed to oversee a detailed independent impact assessment of the Panguna mine in Bougainville, Papua New Guinea, to identify and better understand the environmental and human rights impacts of the mine. The Committee, which includes representatives from the Autonomous Bougainville Government, Papua New Guinea Government, community members and landowners, the Human Rights Law Centre, Bougainville Copper Limited and Rio Tinto, has met three times since its establishment and the meetings have been constructive and collaborative. In the second half of the year, the Committee plans to finalise selection and endorsement of the consulting firm to undertake the impact assessment over the ensuing 18-24 months.

Key highlights from the quarter are outlined above, with further information available on our [website](#).

Climate change, product stewardship and our value chain

We progressed initiatives in the second quarter working to decarbonise our business and actively develop technologies to decarbonise our value chains.

- We continued extensive planning and study work to identify preferred locations for wind and solar energy developments to be integrated into our Pilbara microgrid. We are progressing detailed planning for further engineering, environmental and heritage studies on these sites, with a particular focus on our proposed solar farm of around 100MW near Karratha, one of the initial sites within our 1GW programme. We continue to engage with the Western Australian Government, Traditional Owners and other stakeholders.
- On 6 May, we [announced](#) we had produced a first batch of high purity scandium oxide at our Rio Tinto Fer et Titane commercial scale demonstration plant in Sorel-Tracy, becoming the first North American producer of this critical mineral, which is notably used in solid oxide fuel cells and in aluminium alloys.
- On 11 May, we [announced](#) we had started producing tellurium at our Kennecott copper operation in Utah, becoming one of only two United States producers of the critical mineral used in advanced thin film photovoltaic solar panels.
- On 12 May, we [announced](#) eight technology innovators' submissions have been selected to progress beyond the Charge On Innovation Challenge. The global challenge, launched by BHP, Rio Tinto and Vale, seeks to accelerate commercialisation of effective solutions for charging large electric haul trucks while simultaneously demonstrating there is an emerging market for these solutions in mining. The winners are collaborating with interested mining companies, Original Equipment Manufacturers and investors to accelerate the technology development to support the future roll-out of zero-emissions fleets.
- On 23 May, we [announced](#) a one-year biofuel trial with bp to help reduce carbon emissions from Rio Tinto's marine fleet. Under the trial, bp is supplying Rio Tinto with marine biofuel for approximately 12 months. The fuel will be trialled on Rio Tinto's RTM Tasman vessel on a mix of Transatlantic and Atlantic-Pacific routes, in one of the longest-duration marine biofuel trials to date. The results of the trial will help Rio Tinto study ways to reduce its carbon emissions from its marine fleet and inform its future biofuel strategy.
- On 7 June, we [announced](#) a Memorandum of Understanding (MOU) with Salzgitter to work together towards carbon-free steelmaking. Under the MOU, Rio Tinto and Salzgitter will explore optimisation of iron ore pellets, lump and fines for use in hydrogen direct reduction steelmaking. The companies will also explore the potential for greenhouse gas emission certification across the steel value chain.
- On 8 June, we [announced](#) a call for proposals to develop large-scale wind and solar power in Central and Southern Queensland to power our aluminium assets, help meet our climate change ambitions and further encourage renewable development and industry in the region. We are looking for up to 4GW of renewable energy to support the repowering of our aluminium assets in Gladstone. This is an outcome of the Statement of Cooperation signed with the Queensland Government in October 2021.
- On 9 June, we [announced](#) a strategic equity investment of \$10 million in Nano One - a clean technology innovator in battery materials. This partnership and funding will accelerate Nano One's multi-cathode commercialisation strategy and support cathode active materials manufacturing in Canada for a cleaner and more efficient battery supply chain for North American and overseas markets.
- On 29 June, we [announced](#) in partnership with Corona Canada, the launch of Canada's first specially-marked, low carbon beverage can, manufactured by Ball Corporation. The cans, now available through a pilot in Ontario, were made using aluminium from Rio Tinto and leveraging ELYSIS™ technology. As part of this limited release, 1.2 million cans were produced with a QR code to inspire consumers to learn more about the cans' low carbon footprint.

Our markets

The economic outlook is weakening due to the Russia-Ukraine war, tighter monetary policy to curb rising inflation, and targeted COVID-19 restrictions in China. Prices for our commodities decreased in the quarter, amidst growing recession fears and a decline in consumer confidence. Trade disruptions, food protectionism and the global focus on securing energy supplies continue to put pressure on supply chains, which will need to be significantly eased before inflationary pressures subside.

- China's industrial activity troughed in May amid COVID-lockdowns. June recovered but uncertainties remain given the potential for ongoing outbreaks. Economic stability is a focus, but headwinds are considerable from restricted labour and goods movement and a slowing external environment. There has been a more accommodative policy stance to support growth, and more easing measures are expected to support the property, infrastructure, and consumer sectors.
- The US economy has been resilient, on the back of healthy consumer spending and a strong labour market. However, the Federal Reserve is moving more aggressively to curb rising inflation expectations. There is therefore increasing risk that a rapid hike in interest rates will subdue demand.
- The Eurozone industrial sector has been impacted by supply bottlenecks, higher inputs costs and weakening consumer sentiment, even though the services sector has been positive. Energy security will be a key priority for the region, with measures taken to avert a potential shortfall in energy.
- Iron ore Platts CFR prices trended downwards to \$120/dmt at the end of the second quarter, even though the average prices were just below \$140/dmt year to date. The downward pressure was driven by extended COVID-19 restrictions that impacted China's downstream steel demand to a greater extent than steel production and iron ore consumption.
- The aluminium LME price declined sharply, down 32% at the end of the second quarter to \$2,397/t. Following record high prices in the first quarter, the expected disruption to Russian aluminium production did not materialise. Strong aluminium supply and weaker domestic demand in China shifted it to a net export position for aluminium in the first half of 2022. Alumina shifted to a net export position over the same period due to strong growth in domestic refining. The outlook for demand growth has also been dampened by COVID-19 restrictions in China and the reduced consumer sentiment in developed markets. Nevertheless, reported inventories continue to decline and high power prices are limiting production growth outside China.
- The copper LME price dropped 20% at the end of the second quarter to \$3.74/lb. After reaching a record quarterly average price in the first quarter, prices started trending down in late April, as a wave of uncertainty surrounding the global economy and China's COVID-zero policy weighed on the prospects for copper demand. Exchange inventories remain at multi-year lows, and mine supply continues to face disruptions, although mine project start-ups in the second half should help alleviate market tightness.
- The electric vehicle market continues to enjoy firm growth, despite rising raw material costs and general supply chain issues in the automotive market. After sharp price increases in the previous quarters, lithium carbonate prices stabilised in the second quarter, as supply starts to keep pace with demand. Mine supply growth is expected to pick up further in the second half as idled mine capacity and new projects come online.

Average realised prices achieved for our major commodities

	Units	H1 22	Q2 22	Q1 22	H1 21	FY 21
Pilbara iron ore	FOB, \$/wmt	110.9	110.7	111.1	154.9	132.3
Pilbara iron ore	FOB, \$/dmt	120.5	120.3	120.8	168.4	143.8
Aluminium*	Metal \$/t	3,808	3,727	3,916	2,626	2,899
Copper**	US cents per pound	447	441	453	415	424
IOC pellets	FOB, \$/wmt	199.0	206.3	191.2	218.3	214.4

*LME plus all-in premiums (product and market)

**Average realised price for all units sold. Realised price does not include the impact of the provisional pricing adjustments, which negatively impacted revenues in the first half by \$140 million (first half 2021 positive impact of \$202 million).

IRON ORE

Rio Tinto share of production (Million tonnes)	Q2 2022	vs Q2 2021	vs Q1 2022	H1 2022	vs H1 2021
Pilbara Blend and SP10 Lump ¹	19.3	+6%	+13%	36.4	0%
Pilbara Blend and SP10 Fines ¹	30.2	+5%	+18%	55.9	-2%
Robe Valley Lump	1.2	-3%	+12%	2.2	-12%
Robe Valley Fines	1.9	0%	+9%	3.6	-12%
Yandicoogina Fines (HIY)	13.4	0%	-8%	28.0	+4%
Total Pilbara production	66.0	+4%	+10%	126.1	-1%
Total Pilbara production (100% basis)	78.6	+4%	+10%	150.3	-1%

Rio Tinto share of shipments (Million tonnes)	Q2 2022	vs Q2 2021	vs Q1 2022	H1 2022	vs H1 2021
Pilbara Blend Lump	12.7	-1%	+17%	23.5	-8%
Pilbara Blend Fines	25.2	-9%	+16%	46.9	-17%
Robe Valley Lump	1.0	+4%	+44%	1.6	-16%
Robe Valley Fines	2.3	+5%	+33%	4.0	-12%
Yandicoogina Fines (HIY)	14.2	+4%	-2%	28.7	+3%
SP10 Lump ¹	4.5	+19%	+16%	8.3	+29%
SP10 Fines ¹	6.8	+140%	-4%	13.8	+141%
Total Pilbara shipments ²	66.6	+4%	+10%	126.8	-1%
Total Pilbara shipments (100% basis) ²	79.9	+5%	+12%	151.4	-2%
Total Pilbara Shipments (consolidated basis) ^{2, 3}	68.1	+4%	+10%	129.9	-2%

1 SP10 includes other lower grade products.

2 Shipments includes material shipped from the Pilbara to our portside trading facility in China which may not be sold onwards by the group in the same period.

3 While Rio Tinto has a 53% net beneficial interest in Robe River Iron Associates, it recognises 65% of the assets, liabilities, sales revenues and expenses in its accounts (as 30% is held through a 60% owned subsidiary and 35% is held through a 100% owned subsidiary). The consolidated basis sales reported here include Robe River Iron Associates on a 65% basis to enable comparison with revenue reported in the financial statements.

Pilbara operations

First half shipments of 151.4 million tonnes (Rio Tinto share 126.8 million tonnes) were 2% lower than the first half of 2021 due to skilled labour supply constraints, COVID-19 disruptions, first quarter delays of mine replacement projects and significantly higher than average rainfall in May. We are currently experiencing elevated levels of unplanned absences at our Pilbara operations due to COVID-19 case spikes in Western Australia.

We produced 150.3 million tonnes (Rio Tinto share 126.1 million tonnes) in the first half, 1% lower than the corresponding period of 2021. While significantly higher than average rainfall in May impacted mine production, continued focus on mine pit health and commissioning of Gudai-Darri supported a stronger second quarter.

Gudai-Darri delivered first ore from the main plant in June. As Gudai-Darri continues to ramp-up, we expect increased production volumes and improved product mix in the second half. Full year shipments guidance remains unchanged at 320 to 335 million tonnes.

Deployment of the Rio Tinto Safe Production System continues to see encouraging results at West Angelas, Yandicoogina, Tom Price and Brockman 4.

Approximately 10% of sales in the second quarter were priced by reference to the prior quarter's average index lagged by one month. The remainder was sold either on current quarter average, current month average, average of two months, forward month or on the spot market. Approximately 27% of sales in the second quarter were made on a free on board (FOB) basis, with the remainder sold including freight.

Achieved average pricing in the first half of 2022 was \$110.9 per wet metric tonne (\$154.9 in the first half of 2021) on an FOB basis (equivalent to \$120.5 per dry metric tonne, at 8% moisture assumption). This compares to the average first half price for the monthly average Platts index for 62% iron fines converted to an FOB basis of \$128.2 per dry metric tonne.

China Portside Trading

We continue to increase our iron ore portside sales in China, with 14.2 million tonnes of sales in the first half of 2022 (5.4 million tonnes in the first half of 2021). At 30 June, inventory levels are 6.5 million tonnes, including 4.5 million tonnes of Pilbara product (11.4 million tonnes at the end of 2021, including 8.8 million tonnes of Pilbara product). In the first half of 2022 approximately 75% of our portside sales were either screened or blended in Chinese ports.

ALUMINIUM

Rio Tinto share of production ('000 tonnes)	Q2 2022	vs Q2 2021	vs Q1 2022	H1 2022	vs H1 2021
Bauxite	14,131	+3%	+4%	27,757	+2%
Bauxite third party shipments	9,599	+1%	-5%	19,734	+7%
Alumina	1,864	-7%	-2%	3,765	-7%
Aluminium	731	-10%	-1%	1,467	-9%

Bauxite

Bauxite production of 14.1 million tonnes was 3% higher than the second quarter of 2021 due to strong operational performance at Weipa as a result of improved plant reliability at Amrun.

We shipped 9.6 million tonnes of bauxite to third parties in the second quarter, 1% higher than the same period of 2021.

Alumina

Alumina production of 1.9 million tonnes was 7% lower than the second quarter of 2021. The refineries in the Pacific (Yarwun and Queensland Alumina Limited) have been impacted by a range of challenges in the first half including significant COVID-19 absenteeism, above average rainfall in Eastern Australia, and some unplanned outages and plant reliability. Production at the Vaudreuil refinery in Quebec was impacted by overruns on key shutdowns.

Alumina guidance is now expected to be 7.6 to 7.8 million tonnes (previously between 8.0 and 8.4 million tonnes). The focus for the second half is on producing at stronger rates with a more stable environment and improved asset reliability.

As the result of Queensland Alumina Limited's (QAL) activation of a step-in process following sanction measures by the Australian Government, Rio Tinto has taken on 100% of capacity for as long as the step-in continues. This results in use of Rusal's 20% share of capacity by Rio Tinto under the tolling arrangement with QAL. This additional output is excluded from the production tables in this report as QAL remains 80% owned by Rio Tinto and 20% owned by Rusal.

Aluminium

Aluminium production of 0.7 million tonnes was 10% lower than the second quarter of 2021 due to reduced capacity at our Kitimat smelter in British Columbia following the strike which commenced in July 2021. A controlled restart began at the end of the second quarter of 2022, with ramp-up progressing subject to plant stability. Production at Boyne smelter in Queensland was impacted due to process instability following COVID-19 related unplanned absences. Production has been stabilised and the cells that have been taken offline are being ramped up over the next 12 months. All of our other smelters continued to have stable performance. Guidance has been lowered to 3.0 to 3.1 million tonnes (previously 3.1 to 3.2 million tonnes).

Average realised aluminium prices including premiums for value-added products (VAP) increased 45% to \$3,808 per tonne in the first half of 2022 (first half 2021: \$2,626 per tonne). The LME price increased by 37% to \$3,082 per tonne (first half 2021: \$2,246), whilst the mid-west premium duty paid improved 72% to \$801 per tonne in the first half of 2022 (first half 2021: \$467 per tonne), which is 58% of our total volumes (55% in the first half of 2021). Our VAP sales improved to 52% of primary metal sold in the first half of 2022 (first half 2021: 50%). Product premiums for VAP sales increased, averaging \$422 per tonne of VAP sold (first half 2021: \$207 per tonne).

On 13 July, we [announced](#) an investment of \$188 million to increase the production capacity for low-carbon, high value aluminium billets at our Alma smelter in Lac-Saint-Jean, Quebec by 202,000 metric tonnes. Around half will come from non value-added products being converted to billets, with the rest from the conversion of already value-added products. The existing casting centre at our Alma plant will be expanded to accommodate new state-of-the-art equipment, including a casting pit and furnaces, allowing a larger portion of the aluminium produced to be converted to higher value billets. Construction will begin in May 2023 and commissioning is expected in the first quarter of 2025.

COPPER

Rio Tinto share of production ('000 tonnes)	Q2 2022	vs Q2 2021	vs Q1 2022	H1 2022	vs H1 2021
Mined copper					
Kennecott	33.9	0%	-28%	81.0	+21%
Escondida	82.3	+18%	+21%	150.5	+6%
Oyu Tolgoi	10.2	-17%	+1%	20.4	-26%
Refined copper					
Kennecott	32.7	-11%	-19%	72.9	-11%
Escondida	16.7	+9%	+16%	31.1	+6%

Kennecott

Mined copper production was in line with the second quarter of 2021, with higher grades (averaging 0.53% in the first half) and higher recoveries following the transition to the south wall which was completed in 2021. Mine copper versus the prior quarter was impacted by a planned shutdown in May that extended into June on one of the SAG mills.

Refined copper production was 11% lower than the second quarter of 2021 mainly due to the impact of unplanned downtime and labour shortages at the smelter. Refined copper production was 19% lower than the prior quarter due to the planned annual smelter shutdown, which has since restarted.

Escondida

Mined copper production was 18% higher than the second quarter of 2021 mainly due to 13% expected higher concentrator feed grade and 8% higher throughput which was previously impacted by workforce absenteeism due to COVID-19. Refined production was 9% higher than the corresponding period mainly due to higher ore feed to both leaching processes.

Oyu Tolgoi

Mined copper production from the open pit was 17% lower than the second quarter of 2021 due to lower copper grades and recoveries as a result of planned mine sequencing and feed from low grade stockpiles. Gold grades were significantly lower than the prior year (0.26% vs 0.50% in 2021).

The force majeure declared on shipments from 30 March 2021 has been lifted.

Provisional pricing

At 30 June 2022, the Group had an estimated 267 million pounds of copper sales that were provisionally priced at 415 cents per pound. This compares with 201 million pounds of open shipments at 31 December 2021, provisionally priced at 436 cents per pound. Provisional pricing adjustments negatively impacted revenues in the first half by \$140 million (first half 2021 positive impact of \$202 million). This includes mark to market adjustments in respect of shipments open at the period end and final adjustments in respect of shipments for which the price was settled during the period.

MINERALS

Rio Tinto share of production (million tonnes)	Q2 2022	vs Q2 2021	vs Q1 2022	H1 2022	vs H1 2021
Iron ore pellets and concentrate					
IOC	2.6	-4%	+8%	5.0	-1%

Rio Tinto share of production ('000 tonnes)	Q2 2022	vs Q2 2021	vs Q1 2022	H1 2022	vs H1 2021
Minerals					
Borates - B ₂ O ₃ content	137	+9%	+12%	260	+5%
Titanium dioxide slag	293	-2%	+7%	566	-2%

Rio Tinto share of production ('000 carats)	Q2 2022	vs Q2 2021	vs Q1 2022	H1 2022	vs H1 2021
Diavik ¹	1,149	+35%	+16%	2,140	+15%

¹Reflects 100% ownership of Diavik (previously 60%) from 1st November 2021.

Iron Ore Company of Canada (IOC)

IOC achieved major milestones in May including record safety performance year to date (0.26 AIFR versus 0.73 in 2021) and monthly records for concentrate production and total material moved. Iron ore production was 4% lower than the second quarter of 2021, due to the planned annual maintenance shutdown (seven days) which was successfully completed in June (this work was completed in September in 2021).

Borates

Borates production in the second quarter was 9% higher than the corresponding period of 2021 with strong production rates and higher grades as well as improved equipment reliability versus the same period in 2021. We expect logistical challenges to continue with elevated congestion at the Port of Los Angeles and shipping rate escalation. Port and rail labour availability is also posing a threat to supply chain stability.

Iron and Titanium

Titanium dioxide production was 2% lower than the second quarter of 2021, but 7% higher than the prior quarter with steady performance at Richards Bay Minerals in South Africa and improved stability of operations at Rio Tinto Fer et Titane, Canada. There were some operational disruptions at QIT Madagascar Minerals following cyclones in Madagascar.

Diamonds

At Diavik, our share of carats were 35% higher than the second quarter of 2021 due to the benefit of our increased share of production since taking 100% ownership of Diavik from November 2021, partially offset by maintenance deficit build-up following COVID-19 disruptions. The maintenance deficit build-up and first quarter impacts of COVID-19 has impacted performance in the half and diamonds guidance is now expected to be 4.5 to 5.0 million carats.

EXPLORATION AND EVALUATION

Pre-tax and pre-divestment expenditure on exploration and evaluation charged to the profit and loss account in the first half of 2022 was \$367 million, compared with \$324 million in the first half of 2021. Approximately 39% of this expenditure was incurred by Copper (includes Simandou), 34% by central exploration, 18% by Minerals and 9% by Iron Ore.

There were no significant divestments of central exploration properties in the first half of 2022.

Exploration highlights

Rio Tinto has a strong portfolio of projects with activity in 19 countries across seven commodities in early exploration and studies stages. Rio Tinto Exploration was recognised by the global mineral exploration industry in the quarter as it collected the prestigious Thayer Lindsey Award from the Prospectors and Developers Association of Canada. The award, for the discovery of Winu, recognises an individual or a team of explorationists credited with a recent significant mineral discovery anywhere in the world.

The bulk of the exploration expenditure in the second quarter of 2022 focused on copper in Australia, Peru, Zambia and the United States, diamonds in Canada and Angola, and nickel in Canada and Finland. Mine-lease exploration continued at Rio Tinto managed businesses including Pilbara Iron in Australia, Diavik in Canada and Cape York in Australia. The Falcon Project in Saskatchewan, Canada, will remain in care and maintenance until the end of 2022 during which time Rio Tinto will consider alternative commercial options, including potential exit. A summary of activity for the quarter is as follows:

A summary of activity for the quarter is as follows:

Commodities	Studies Stage	Advanced projects	Greenfield/ Brownfield programmes
Bauxite		Amargosa, Brazil*, Sanxai, Laos*	Melville Island, Australia Cape York, Australia
Battery Materials	Lithium: Rincon, Argentina Lithium borates: Jadar, Serbia Nickel: Tamarack, US (3rd party operated)		Nickel Greenfield: Australia, Canada, Finland, Peru Lithium Greenfield: US, Australia
Copper	Copper/molybdenum: Resolution, US Copper/Gold: Winu, Australia	Copper: La Granja, Peru, Pribrezhniy, Kazakhstan Calibre-Magnum, Australia	Copper Greenfield: Australia, Brazil, Canada, Chile, China, Colombia, Finland, Kazakhstan, Namibia, Nicaragua, Laos, Peru, Serbia, US, Zambia
Diamonds	Falcon, Canada*		Diamonds Greenfield: Canada, Angola Diamonds Brownfield: Diavik
Iron Ore	Pilbara, Australia Simandou, Guinea	Pilbara, Australia	Greenfield and Brownfield: Pilbara, Australia
Minerals	Potash: KL262*, Canada Heavy mineral sands: Mutamba, Mozambique		Heavy mineral sands Greenfield: Australia, South Africa

*Limited activity during the quarter

FORWARD-LOOKING STATEMENT

This announcement 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 announcement, 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 and any statements related to the ongoing impact of the COVID-19 pandemic), are forward-looking statements. The words "intend", "aim", "project", "anticipate", "estimate", "plan", "believes", "expects", "may", "would", "should", "could", "will", "target", "set to", "seek", "risk" 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 are levels of actual production during any period, levels of demand and market prices, the ability to produce and transport products profitably, the impact of foreign currency exchange rates on market prices and operating costs, operational problems, political uncertainty and economic conditions in relevant areas of the world, the actions of competitors, activities by governmental authorities such as changes in taxation or regulation, the risks and uncertainties associated with the ongoing impacts of COVID-19 or other pandemic and such other risk factors 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. The above list is not exhaustive. Forward-looking statements should, therefore, be construed in light of such risk factors and undue reliance should not be placed on forward-looking statements, particularly in light of the current economic climate and the significant volatility, uncertainty and disruption caused by the outbreak of COVID-19. These forward-looking statements speak only as of the date of this announcement. 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 announcement 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.

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This announcement is authorised for release to the market by Steve Allen, Rio Tinto's Group Company Secretary.

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Classification: 3.1 Additional regulated information required to be disclosed under the laws of a Member State

Rio Tinto production summary

Rio Tinto share of production

		Quarter			Half Year		% change		
		2021 Q2	2022 Q1	2022 Q2	2021 H1	2022 H1	Q2 22 vs Q2 21	Q2 22 vs Q1 22	H1 22 vs H1 21
Principal commodities									
Alumina	('000 t)	2,012	1,901	1,864	4,047	3,765	-7%	-2%	-7%
Aluminium	('000 t)	816	736	731	1,619	1,467	-10%	-1%	-9%
Bauxite	('000 t)	13,699	13,625	14,131	27,264	27,757	+3%	+4%	+2%
Borates	('000 t)	126	123	137	248	260	+9%	+12%	+5%
Copper - mined	('000 t)	115.5	125.5	126.4	236.1	251.9	+9%	+1%	+7%
Copper - refined	('000 t)	52.3	54.7	49.4	111.4	104.1	-5%	-10%	-7%
Diamonds	('000 cts)	851	991	1,149	1,858	2,140	+35%	+16%	+15%
Iron Ore	('000 t)	66,241	62,465	68,640	131,922	131,105	+4%	+10%	-1%
Titanium dioxide slag	('000 t)	298	273	293	577	566	-2%	+7%	-2%
Other Metals & Minerals									
Gold - mined	('000 oz)	80.1	68.5	52.5	176.5	121.0	-34%	-23%	-31%
Gold - refined	('000 oz)	43.6	32.2	20.9	100.4	53.1	-52%	-35%	-47%
Molybdenum	('000 t)	1.1	1.1	0.4	6.1	1.5	-63%	-61%	-76%
Salt	('000 t)	1,458	1,595	1,030	2,869	2,625	-29%	-35%	-8%
Silver - mined	('000 oz)	925	1,012	846	1,930	1,858	-9%	-16%	-4%
Silver - refined	('000 oz)	609	577	290	1,421	867	-52%	-50%	-39%

Throughout this report, figures in italics indicate adjustments made since the figure was previously quoted on the equivalent page or reported for the first time. Production figures are sometimes more precise than the rounded numbers shown, hence small differences may result between the total of the quarter figures and the year to date figures.

Rio Tinto share of production

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
ALUMINA								
Production ('000 tonnes)								
Jonquière (Vaudreuil)	100 %	349	325	338	334	325	701	659
Jonquière (Vaudreuil) specialty Alumina plant	100 %	28	29	28	25	30	50	55
Queensland Alumina	80 %	756	738	727	704	697	1,499	1,401
São Luis (Alumar)	10 %	97	75	99	94	91	192	185
Yarwun	100 %	782	770	719	745	721	1,604	1,465
Rio Tinto total alumina production		2,012	1,937	1,911	1,901	1,864	4,047	3,765
ALUMINIUM								
Production ('000 tonnes)								
Australia - Bell Bay	100 %	47	48	48	46	44	93	91
Australia - Boyne Island	59 %	75	75	75	73	61	149	134
Australia - Tomago	52 %	75	77	78	75	75	150	150
Canada - six wholly owned	100 %	391	343	325	318	323	776	641
Canada - Alouette (Sept-Îles)	40 %	63	64	63	62	63	125	124
Canada - Bécancour	25 %	29	29	30	28	29	57	57
Iceland - ISAL (Reykjavik)	100 %	51	52	52	50	50	99	100
New Zealand - Tiwai Point	79 %	65	67	67	66	66	130	132
Oman - Sohar	20 %	20	20	20	19	20	39	39
Rio Tinto total aluminium production		816	774	757	736	731	1,619	1,467
BAUXITE								
Production ('000 tonnes) (a)								
Gove	100 %	3,030	3,067	2,787	3,093	2,637	5,909	5,731
Porto Trombetas	12 %	364	332	416	240	308	618	548
Sangaredi	(b)	1,755	1,763	1,704	1,765	1,946	3,642	3,710
Weipa	100 %	8,550	8,805	8,188	8,527	9,240	17,095	17,768
Rio Tinto total bauxite production		13,699	13,967	13,095	13,625	14,131	27,264	27,757

(a) Mine production figures for metals refer to the total quantity of metal produced in concentrates, leach liquor or doré bullion irrespective of whether these products are then refined onsite, except for the data for bauxite and iron ore which represent production of marketable quantities of ore plus concentrates and pellets.

(b) Rio Tinto has a 22.95% shareholding in the Sangaredi mine but benefits from 45.0% of production.

Rio Tinto share of production

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
BORATES								
Production ('000 tonnes B₂O₃ content)								
Rio Tinto Borates - borates	100 %	126	123	117	123	137	248	260
COPPER								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100 %	33.7	42.8	49.7	47.1	33.9	67.0	81.0
Escondida	30 %	69.5	68.4	69.6	68.2	82.3	141.6	150.5
Oyu Tolgoi (b)	34 %	12.3	14.1	13.0	10.2	10.2	27.5	20.4
Rio Tinto total mine production		115.5	125.2	132.3	125.5	126.4	236.1	251.9
Refined production ('000 tonnes)								
Escondida	30 %	15.3	14.7	14.5	14.4	16.7	29.3	31.1
Rio Tinto Kennecott (c)	100 %	36.9	35.7	25.5	40.2	32.7	82.1	72.9
Rio Tinto total refined production		52.3	50.5	40.0	54.7	49.4	111.4	104.1

(a) Mine production figures for metals refer to the total quantity of metal produced in concentrates, leach liquor or doré bullion irrespective of whether these products are then refined onsite, except for the data for bauxite and iron ore which represent production of marketable quantities of ore plus concentrates and pellets.

(b) Rio Tinto owns a 33.52% indirect interest in Oyu Tolgoi through its 50.79% interest in Turquoise Hill Resources Ltd.

(c) We continue to process third party concentrate to optimise smelter utilisation, including 2.9 thousand tonnes of cathode produced from purchased concentrate in year-to-date 2022. Purchased and tolled copper concentrates are excluded from reported production figures and production guidance. Sales of cathodes produced from purchased concentrate are included in reported revenues.

DIAMONDS

Production ('000 carats)

Diavik (a)	100 %	851	834	1,155	991	1,149	1,858	2,140
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(a) On 17 November 2021, Rio Tinto's ownership interest in Diavik increased from 60% to 100%. Production is reported including this change from 1 November 2021.

GOLD

Mine production ('000 ounces) (a)

Bingham Canyon	100 %	30.5	38.1	34.7	37.8	22.8	66.7	60.6
Escondida	30 %	11.7	12.6	12.9	10.9	13.7	23.1	24.6
Oyu Tolgoi (b)	34 %	37.9	43.8	26.3	19.8	16.0	86.7	35.8
Rio Tinto total mine production		80.1	94.5	73.9	68.5	52.5	176.5	121.0

Refined production ('000 ounces)

Rio Tinto Kennecott	100 %	43.6	44.5	31.5	32.2	20.9	100.4	53.1
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(a) Mine production figures for metals refer to the total quantity of metal produced in concentrates, leach liquor or doré bullion irrespective of whether these products are then refined onsite, except for the data for bauxite and iron ore which represent production of marketable quantities of ore plus concentrates and pellets.

(b) Rio Tinto owns a 33.52% indirect interest in Oyu Tolgoi through its 50.79% interest in Turquoise Hill Resources Ltd.

Rio Tinto share of production

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
IRON ORE								
Production ('000 tonnes) (a)								
Hamersley mines	(b)	50,333	55,634	55,049	47,678	52,636	99,647	100,315
Hope Downs	50 %	5,960	6,500	6,567	5,830	6,385	11,576	12,215
Iron Ore Company of Canada	59 %	2,721	2,163	2,498	2,404	2,603	5,066	5,007
Robe River - Pannawonica (Mesas J and A)	53 %	3,090	3,721	3,196	2,774	3,054	6,596	5,828
Robe River - West Angelas	53 %	4,137	4,056	5,252	3,779	3,961	9,037	7,740
Rio Tinto iron ore production ('000 tonnes)		66,241	72,074	72,561	62,465	68,640	131,922	131,105
Breakdown of Production:								
Pilbara Blend and SP10 Lump (c)		18,265	19,742	20,374	17,081	19,309	36,315	36,391
Pilbara Blend and SP10 Fines (c)		28,796	30,825	32,081	25,658	30,240	57,042	55,898
Robe Valley Lump		1,219	1,423	1,152	1,051	1,180	2,527	2,230
Robe Valley Fines		1,871	2,297	2,044	1,724	1,874	4,070	3,598
Yandicoogina Fines (HIY)		13,369	15,623	14,412	14,548	13,433	26,903	27,981
Pilbara iron ore production ('000 tonnes)		63,520	69,910	70,063	60,061	66,037	126,856	126,098
IOC Concentrate		1,154	829	1,009	962	1,282	2,025	2,244
IOC Pellets		1,567	1,335	1,489	1,442	1,321	3,041	2,763
IOC iron ore production ('000 tonnes)		2,721	2,163	2,498	2,404	2,603	5,066	5,007
Breakdown of Shipments:								
Pilbara Blend Lump		12,830	13,018	12,832	10,809	12,684	25,672	23,493
Pilbara Blend Fines		27,795	28,901	24,308	21,698	25,156	56,360	46,855
Robe Valley Lump		934	962	1,061	675	971	1,959	1,645
Robe Valley Fines		2,190	2,567	2,237	1,731	2,309	4,591	4,040
Yandicoogina Fines (HIY)		13,640	14,906	14,121	14,487	14,201	27,862	28,689
SP10 Lump (c)		3,748	4,826	4,841	3,827	4,456	6,411	8,283
SP10 Fines (c)		2,817	4,063	10,684	7,067	6,775	5,740	13,843
Pilbara iron ore shipments ('000 tonnes) (d)		63,953	69,242	70,084	60,295	66,552	128,595	126,847
Pilbara iron ore shipments - consolidated basis ('000 tonnes) (d) (f)		65,627	71,131	71,972	61,818	68,114	132,058	129,931
IOC Concentrate		1,048	1,054	989	600	1,083	2,067	1,683
IOC Pellets		1,303	1,374	1,711	1,412	1,484	2,780	2,896
IOC Iron ore shipments ('000 tonnes) (d)		2,352	2,428	2,700	2,012	2,567	4,847	4,580
Rio Tinto iron ore shipments ('000 tonnes) (d)		66,305	71,671	72,784	62,307	69,119	133,442	131,427
Rio Tinto iron ore sales ('000 tonnes) (e)		67,145	70,967	69,489	66,683	71,258	132,697	137,941

(a) Mine production figures for metals refer to the total quantity of metal produced in concentrates, leach liquor or doré bullion irrespective of whether these products are then refined onsite, except for the data for bauxite and iron ore which represent production of marketable quantities of ore plus concentrates and pellets.

(b) Includes 100% of production from Paraburdoo, Mt Tom Price, Western Turner Syncline, Marandoo, Yandicoogina, Brockman, Nammuldi, Silvergrass, Channar and the Eastern Range mines. Whilst Rio Tinto owns 54% of the Eastern Range mine, under the terms of the joint venture agreement, Hamersley Iron manages the operation and is obliged to purchase all mine production from the joint venture and therefore all of the production is included in Rio Tinto's share of production. Rio Tinto's ownership interest in Channar mine increased from 60% to 100%, following conclusion of its joint venture with Sinosteel Corporation upon reaching planned 290 million tonnes production on 22 October 2020.

(c) SP10 includes other lower grade products.

(d) Shipments includes material shipped to our portside trading facility in China which may not be sold onwards in the same period.

(e) Represents the difference between amounts shipped to portside trading and onward sales from portside trading, and third party volumes sold.

(f) While Rio Tinto has a 53% net beneficial interest in Robe River Iron Associates, it recognises 65% of the assets, liabilities, sales revenues and expenses in its accounts (as 30% is held through a 60% owned subsidiary and 35% is held through a 100% owned subsidiary). The consolidated basis sales reported here include Robe River Iron Associates on a 65% basis to enable comparison with revenue reported in the financial statements.

Rio Tinto share of production

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
MOLYBDENUM								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100 %	1.1	0.4	1.1	1.1	0.4	6.1	1.5

(a) Mine production figures for metals refer to the total quantity of metal produced in concentrates, leach liquor or doré bullion irrespective of whether these products are then refined onsite, except for the data for bauxite and iron ore which represent production of marketable quantities of ore plus concentrates and pellets.

SALT								
Production ('000 tonnes)								
Dampier Salt	68 %	1,458	1,508	1,471	1,595	1,030	2,869	2,625
SILVER								
Mine production ('000 ounces) (a)								
Bingham Canyon	100 %	476	639	589	561	385	1,000	945
Escondida	30 %	370	387	439	381	393	766	774
Oyu Tolgoi (b)	34 %	79	84	80	71	67	164	138
Rio Tinto total mine production		925	1,110	1,108	1,012	846	1,930	1,858
Refined production ('000 ounces)								
Rio Tinto Kennecott	100 %	609	733	516	577	290	1,421	867

(a) Mine production figures for metals refer to the total quantity of metal produced in concentrates, leach liquor or doré bullion irrespective of whether these products are then refined onsite, except for the data for bauxite and iron ore which represent production of marketable quantities of ore plus concentrates and pellets.

(b) Rio Tinto owns a 33.52% indirect interest in Oyu Tolgoi through its 50.79% interest in Turquoise Hill Resources Ltd.

TITANIUM DIOXIDE SLAG								
Production ('000 tonnes)								
Rio Tinto Iron & Titanium (a)	100 %	298	209	228	273	293	577	566

(a) Quantities comprise 100% of Rio Tinto Fer et Titane and Rio Tinto's 74% interest in Richards Bay Minerals (RBM).

ERA ceased processing operations on 8 January 2021, as required by the Ranger Authority. No data for these operations are included in the Share of production table.

Production figures are sometimes more precise than the rounded numbers shown, hence small differences may result between the total of the quarter figures and the year to date figures.

Rio Tinto percentage interest shown above is at 30 June 2022.

Rio Tinto operational data

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
ALUMINA								
Smelter Grade Alumina - Aluminium Group								
Alumina production ('000 tonnes)								
<i>Australia</i>								
Queensland Alumina Refinery - Queensland	80 %	945	922	909	880	871	1,874	1,751
Yarwun refinery - Queensland	100 %	782	770	719	745	721	1,604	1,465
<i>Brazil</i>								
São Luis (Alumar) refinery	10 %	968	748	993	940	910	1,920	1,850
<i>Canada</i>								
Jonquière (Vaudreuil) refinery - Quebec (a)	100 %	349	325	338	334	325	701	659
<i>(a) Jonquière's (Vaudreuil's) production shows smelter grade alumina only and excludes hydrate produced and used for specialty alumina.</i>								
Speciality Alumina - Aluminium Group								
Speciality alumina production ('000 tonnes)								
<i>Canada</i>								
Jonquière (Vaudreuil) plant – Quebec	100 %	28	29	28	25	30	50	55

Rio Tinto percentage interest shown above is at 30 June 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
ALUMINIUM								
Primary Aluminium								
Primary aluminium production ('000 tonnes)								
<i>Australia</i>								
Bell Bay smelter - Tasmania	100 %	47	48	48	46	44	93	91
Boyne Island smelter - Queensland	59 %	127	125	126	123	103	251	226
Tomago smelter - New South Wales	52 %	146	150	150	145	145	292	291
<i>Canada</i>								
Alma smelter - Quebec	100 %	117	119	119	117	121	234	237
Alouette (Sept-Îles) smelter - Quebec	40 %	157	159	157	154	157	312	311
Arvida smelter - Quebec	100 %	42	42	43	42	42	83	84
Arvida AP60 smelter - Quebec	100 %	15	15	15	14	14	30	28
Bécancour smelter - Quebec	25 %	117	115	119	111	117	229	228
Grande-Baie smelter - Quebec	100 %	57	58	58	57	58	113	115
Kitimat smelter - British Columbia	100 %	97	46	25	25	26	191	50
Laterrière smelter - Quebec	100 %	63	63	64	63	63	125	125
<i>Iceland</i>								
ISAL (Reykjavik) smelter	100 %	51	52	52	50	50	99	100
<i>New Zealand</i>								
Tiwai Point smelter	79 %	82	84	85	83	83	164	166
<i>Oman</i>								
Sohar smelter	20 %	99	100	100	97	98	196	195

Rio Tinto percentage interest shown above is at 30 June 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
BAUXITE								
Bauxite production ('000 tonnes)								
<i>Australia</i>								
Gove mine - Northern Territory	100 %	3,030	3,067	2,787	3,093	2,637	5,909	5,731
Weipa mine - Queensland	100 %	8,550	8,805	8,188	8,527	9,240	17,095	17,768
<i>Brazil</i>								
Porto Trombetas (MRN) mine	12 %	3,033	2,764	3,469	2,000	2,569	5,150	4,569
<i>Guinea</i>								
Sangaredi mine (a)	23 %	3,899	3,919	3,786	3,922	4,323	8,093	8,245
Rio Tinto share of bauxite shipments								
Share of total bauxite shipments ('000 tonnes)		13,602	14,201	13,031	13,876	14,054	27,046	27,930
Share of third party bauxite shipments ('000 tonnes)		9,493	10,091	8,988	10,135	9,599	18,517	19,734

(a) Rio Tinto has a 22.95% shareholding in the Sangaredi mine but benefits from 45.0% of production.

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
BORATES								
Rio Tinto Borates - borates	100 %							
<i>US</i>								
Borates ('000 tonnes) (a)		126	123	117	123	137	248	260

(a) Production is expressed as B₂O₃ content.

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
COPPER & GOLD								
Escondida	30 %							
<i>Chile</i>								
Sulphide ore to concentrator ('000 tonnes)		31,903	33,528	35,787	30,235	34,318	64,556	64,553
Average copper grade (%)		0.78	0.73	0.71	0.81	0.87	0.78	0.84
Mill production (metals in concentrates):								
Contained copper ('000 tonnes)		202.8	201.2	203.6	191.5	239.5	410.7	430.9
Contained gold ('000 ounces)		38.9	42.0	42.9	36.3	45.8	76.8	82.1
Contained silver ('000 ounces)		1,234	1,291	1,462	1,270	1,311	2,552	2,581
Recoverable copper in ore stacked for leaching ('000 tonnes) (a)		28.7	26.7	28.4	35.9	34.8	61.2	70.7
Refined production from leach plants:								
Copper cathode production ('000 tonnes)		51.1	49.0	48.4	48.1	55.7	97.8	103.8

(a) The calculation of copper in material mined for leaching is based on ore stacked at the leach pad.

Rio Tinto percentage interest shown above is at 30 June 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
COPPER & GOLD (continued)								
Rio Tinto Kennecott								
Bingham Canyon mine	100 %							
<i>Utah, US</i>								
Ore treated ('000 tonnes)		7,918	9,995	9,809	10,130	6,862	17,972	16,991
Average ore grade:								
Copper (%)		0.48	0.47	0.55	0.51	0.55	0.42	0.53
Gold (g/t)		0.21	0.22	0.21	0.19	0.17	0.21	0.18
Silver (g/t)		2.64	2.80	2.55	2.36	2.39	2.45	2.37
Molybdenum (%)		0.021	0.017	0.020	0.021	0.017	0.042	0.019
Copper concentrates produced ('000 tonnes)		141	180	187	176	136	281	312
Average concentrate grade (% Cu)		23.9	23.7	26.3	26.8	24.9	23.8	26.0
Production of metals in copper concentrates:								
Copper ('000 tonnes) (a)		33.7	42.8	49.7	47.1	33.9	67.0	81.0
Gold ('000 ounces)		30.5	38.1	34.7	37.8	22.8	66.7	60.6
Silver ('000 ounces)		476	639	589	561	385	1,000	945
Molybdenum concentrates produced ('000 tonnes):								
Molybdenum in concentrates ('000 tonnes)		1.1	0.4	1.1	1.1	0.4	6.1	1.5
Kennecott smelter & refinery								
	100 %							
Copper concentrates smelted ('000 tonnes)		103	165	157	213	152	344	365
Copper anodes produced ('000 tonnes) (b)		23.5	35.7	32.9	45.8	27.9	73.9	73.7
Production of refined metal:								
Copper ('000 tonnes) (c)		36.9	35.7	25.5	40.2	32.7	82.1	72.9
Gold ('000 ounces) (d)		43.6	44.5	31.5	32.2	20.9	100.4	53.1
Silver ('000 ounces) (d)		609	733	516	577	290	1,421	867

(a) Includes a small amount of copper in precipitates.

(b) New metal excluding recycled material.

(c) We continue to process third party concentrate to optimise smelter utilisation, including 2.9 thousand tonnes of cathode produced from purchased concentrate in year-to-date 2022. Purchased and tolled copper concentrates are excluded from reported production figures and production guidance. Sales of cathodes produced from purchased concentrate are included in reported revenues.

(d) Includes gold and silver in intermediate products.

Rio Tinto percentage interest shown above is at 30 June 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
COPPER & GOLD (continued)								
Turquoise Hill Resources								
Oyu Tolgoi mine (a)	34 %							
<i>Mongolia</i>								
Ore Treated ('000 tonnes)		9,401	9,336	10,573	9,581	9,685	19,214	19,266
Average mill head grades:								
Copper (%)		0.47	0.53	0.46	0.40	0.40	0.51	0.40
Gold (g/t)		0.50	0.63	0.38	0.32	0.26	0.59	0.29
Silver (g/t)		1.19	1.29	1.27	1.25	1.15	1.24	1.20
Copper concentrates produced ('000 tonnes)		173.2	191.9	182.7	144.3	146.0	375.1	290.3
Average concentrate grade (% Cu)		21.2	21.9	21.3	21.0	20.9	21.9	21.0
Production of metals in concentrates:								
Copper in concentrates ('000 tonnes)		36.7	41.9	38.9	30.3	30.6	82.2	60.8
Gold in concentrates ('000 ounces)		113.1	130.8	78.6	59.2	47.6	258.7	106.8
Silver in concentrates ('000 ounces)		235	249	239	211	201	490	412
Sales of metals in concentrates:								
Copper in concentrates ('000 tonnes)		19.6	46.4	34.4	29.9	35.3	58.6	65.2
Gold in concentrates ('000 ounces)		72.6	149.1	102.2	57.4	67.9	183.4	125.3
Silver in concentrates ('000 ounces)		106	278	192	179	224	313	403

(a) Rio Tinto owns a 33.52% indirect interest in Oyu Tolgoi through its 50.79% interest in Turquoise Hill Resources.

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
DIAMONDS								
Diavik Diamonds (a)	100 %							
<i>Northwest Territories, Canada</i>								
Ore processed ('000 tonnes)		669	643	596	496	537	1,301	1,033
Diamonds recovered ('000 carats)		1,418	1,390	1,356	991	1,149	3,096	2,140

(a) On 17 November 2021, Rio Tinto's ownership interest in Diavik increased from 60% to 100%. Production is reported including this change from 1 November 2021.

Rio Tinto percentage interest shown above is at 30 June 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
IRON ORE								
Rio Tinto Iron Ore								
<i>Western Australia</i>								
Pilbara Operations								
Saleable iron ore production ('000 tonnes)								
Hamersley mines	(a)	50,333	55,634	55,049	47,678	52,636	99,647	100,315
Hope Downs	50 %	11,920	13,000	13,133	11,660	12,771	23,152	24,431
Robe River - Pannawonica (Mesas J and A)	53 %	5,830	7,021	6,031	5,234	5,762	12,446	10,996
Robe River - West Angelas	53 %	7,806	7,652	9,909	7,130	7,474	17,052	14,604
Total production ('000 tonnes)		75,889	83,306	84,122	71,703	78,643	152,296	150,346
Breakdown of total production:								
Pilbara Blend and SP10 Lump (b)		21,946	23,617	24,998	20,827	23,228	43,847	44,055
Pilbara Blend and SP10 Fines (b)		34,743	37,046	38,681	31,094	36,220	69,099	67,314
Robe Valley Lump		2,300	2,686	2,173	1,982	2,226	4,767	4,208
Robe Valley Fines		3,530	4,335	3,857	3,252	3,536	7,679	6,788
Yandicoogina Fines (HIY)		13,369	15,623	14,412	14,548	13,433	26,903	27,981
Breakdown of total shipments:								
Pilbara Blend Lump		15,631	16,710	16,616	13,626	16,043	31,371	29,669
Pilbara Blend Fines		34,607	36,199	31,620	27,915	32,243	70,384	60,158
Robe Valley Lump		1,762	1,814	2,001	1,273	1,832	3,696	3,105
Robe Valley Fines		4,131	4,843	4,221	3,266	4,357	8,663	7,623
Yandicoogina Fines (HIY)		13,640	14,906	14,121	14,487	14,201	27,862	28,689
SP10 Lump (b)		3,748	4,826	4,841	3,827	4,456	6,411	8,283
SP10 Fines (b)		2,817	4,063	10,684	7,067	6,775	5,740	13,843
Total shipments ('000 tonnes) (c)		76,336	83,360	84,104	71,462	79,907	154,128	151,369
	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
Iron Ore Company of Canada								
	59 %							
<i>Newfoundland & Labrador and Quebec in Canada</i>								
Saleable iron ore production:								
Concentrates ('000 tonnes)		1,965	1,411	1,718	1,638	2,183	3,449	3,821
Pellets ('000 tonnes)		2,669	2,273	2,535	2,456	2,250	5,178	4,706
IOC Total production ('000 tonnes)		4,634	3,684	4,254	4,094	4,433	8,627	8,527
Shipments:								
Concentrates ('000 tonnes)		1,785	1,795	1,684	1,022	1,845	3,521	2,867
Pellets ('000 tonnes)		2,220	2,340	2,914	2,405	2,527	4,734	4,932
IOC Total Shipments ('000 tonnes) (c)		4,005	4,136	4,598	3,427	4,372	8,255	7,799
Global Iron Ore Totals								
Iron Ore Production ('000 tonnes)		80,523	86,990	88,375	75,797	83,076	160,923	158,873
Iron Ore Shipments ('000 tonnes)		80,341	87,496	88,702	74,889	84,279	162,383	159,168
Iron Ore Sales ('000 tonnes) (d)		81,097	86,542	85,256	79,194	86,103	161,388	165,297

(a) Includes 100% of production from Paraburdoo, Mt Tom Price, Western Turner Syncline, Marandoo, Yandicoogina, Brockman, Nammuldi, Silvergrass, Channar and the Eastern Range mines. Whilst Rio Tinto owns 54% of the Eastern Range mine, under the terms of the joint venture agreement, Hamersley Iron manages the operation and is obliged to purchase all mine production from the joint venture and therefore all of the production is included in Rio Tinto's share of production. Rio Tinto's ownership interest in Channar mine increased from 60% to 100%, following conclusion of its joint venture with Sinosteel Corporation upon reaching planned 290 million tonnes production on 22 October 2020.

(b) SP10 includes other lower grade products.

(c) Shipments includes material shipped to our portside trading facility in China which may not be sold onwards in the same period.

(d) Include Pilbara and IOC sales adjusted for portside trading movements and third party volumes sold.

Rio Tinto percentage interest shown above is at 30 June 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	H1 2021	H1 2022
SALT								
Dampier Salt	68 %							
<i>Western Australia</i>								
Salt production ('000 tonnes)		2,132	2,206	2,152	2,333	1,507	4,196	3,840
TITANIUM DIOXIDE SLAG								
Rio Tinto Iron & Titanium	100 %							
<i>Canada and South Africa</i>								
(Rio Tinto share) (a)								
Titanium dioxide slag ('000 tonnes)		298	209	228	273	293	577	566

(a) Quantities comprise 100% of Rio Tinto Fer et Titane and Rio Tinto's 74% interest in Richards Bay Minerals' production. Ilmenite mined in Madagascar is being processed in Canada.

Rio Tinto percentage interest shown above is at 30 June 2022. The data represents production and sales on a 100% basis unless otherwise stated.