

Rio Tinto releases third quarter production results

18 October 2022

Rio Tinto Chief Executive Jakob Stausholm, said: “Delivering the full potential of our assets remains a priority: production improved versus the prior quarter across most of our sites, particularly where we have implemented the Rio Tinto Safe Production System (RTSPS). We progressed our excel in development objective, commissioning some major projects and advancing the next tranche of Pilbara mines, agreeing to enter a joint venture with Baowu to develop Western Range and modernising the joint venture covering the Rhodes Ridge project in the East Pilbara, unlocking a pathway to develop this significant, high quality resource. We also approved growth capital for underground mining at Kennecott, early works funding at Rincon Lithium and continue to progress Oyu Tolgoi. Our proposal to take Turquoise Hill Resources private has unanimous support of the Turquoise Hill Board who have recommended shareholders vote in favour of the transaction.

“We continue to deliver our strategy with decarbonisation at its centre. Last week we announced a partnership with the Government of Canada to invest up to C\$737 million over eight years to decarbonise our Rio Tinto Fer et Titane operations in Québec, and to position the business as a centre of excellence for critical minerals processing.

“We are taking action to transform our culture and rebuild trust, implementing the recommendations of the Everyday Respect report and publishing our second progress report on our Communities and Social Performance practices, which includes increased feedback from Traditional Owner groups, with responses from seven groups compared to four in 2021.”

Production*		Q3 2022	vs Q3 2021	vs Q2 2022	9 MTHS 2022	vs 9 MTHS 2021
Pilbara iron ore shipments (100% basis)	Mt	82.9	-1%	+4%	234.3	-1%
Pilbara iron ore production (100% basis)	Mt	84.3	+1%	+7%	234.7	0%
Bauxite	Mt	13.7	-2%	-3%	41.4	+1%
Aluminium	kt	759	-2%	+4%	2,226	-7%
Mined copper	kt	138	+10%	+9%	390	+8%
Titanium dioxide slag	kt	310	+48%	+6%	876	+11%
IOC** iron ore pellets and concentrate	Mt	2.8	+28%	+7%	7.8	+8%

*Rio Tinto share unless otherwise stated

**Iron Ore Company of Canada

Q3 2022 operational highlights and other key announcements

- In the last quarter we exceeded four years without a fatality on a managed site. However, our all-injury frequency rate of 0.43 has deteriorated from the third quarter of 2021 (0.40), and from the prior quarter (0.36). We continue to prioritise the safety, health and wellbeing of our workforce and communities where we operate.
- Pilbara operations produced 84.3 million tonnes (100% basis) in the third quarter, 1% higher than the third quarter of 2021, and 7% higher than the prior quarter with continued commissioning and ramp-up of Gudai-Darri and Robe Valley. Shipments were 82.9 million tonnes (100% basis), 1% lower than the third quarter of 2021, and 4% higher than the prior quarter despite two unplanned rail outages on the Yandicoogina and Gudai-Darri lines. The investigation into the Gudai-Darri derailment is ongoing. Full year shipments are expected to be at the low end of the original 320 to 335 million tonne range.

- On 14 September, we [agreed](#) to enter a joint venture with China Baowu Steel Group Co. Ltd with respect to the Western Range iron ore project in the Pilbara, investing \$2 billion (\$1.3 billion Rio Tinto share¹) to develop the mine. Its annual capacity of 25 million tonnes will help sustain production of the Pilbara Blend, with construction expected to begin in early 2023 and first production anticipated in 2025. The transaction with Baowu is subject to satisfaction of various conditions precedent, including approvals from Rio Tinto shareholders, the Australian Government, Chinese Government regulatory agencies and the Western Australian Government, among others.
- We have agreed, together with Wright Prospecting Pty Ltd, to modernise the joint venture covering the Rhodes Ridge project in the East Pilbara, Western Australia. The joint venture updates an existing agreement between the two parties dating back to 1972 and now provides a pathway for the development of the Rhodes Ridge deposits utilising Rio Tinto's rail, port and power infrastructure. The participants have commenced an Order of Magnitude study, to be conducted by Rio Tinto, which will consider the development of an operation before the end of the decade with initial plant capacity of up to 40 million tonnes annually, subject to the receipt of relevant approvals.
- Bauxite production of 13.7 million tonnes was 2% lower than the third quarter of 2021 due to equipment reliability issues at Gove.
- Aluminium production of 0.8 million tonnes was 2% lower than the third quarter of 2021, and 4% higher than the prior quarter as the Kitimat smelter continues to ramp up and Boyne smelter cell recovery efforts progress as expected. The Kitimat pot restarts are progressing but structural issues with the alumina conveyor system caused disruptions through the quarter slowing the rate of pot restarts. We continue to focus on full recovery during the course of 2023.
- Mined copper production of 138 thousand tonnes was 10% higher than the third quarter of 2021 due to higher grades and recoveries at Kennecott, partly offset by lower grades and recoveries at Oyu Tolgoi as a result of planned mine sequencing. Refined copper production guidance has been reduced to 190 to 220 thousand tonnes (previously 230 to 290 thousand tonnes), given further downside risk associated with Kennecott's smelter and refinery performance, until we undertake the largest rebuild in nine years which is planned for the second quarter of 2023.
- On 27 September, we [announced](#) approval of \$55 million in development capital to start underground mining and expand production at Kennecott. This will initially focus on the Lower Commercial Skarn area, which will deliver a total of around 30 thousand tonnes² of additional copper through the period to 2027 alongside open cut operations. The first ore is expected to be produced in early 2023, with full production in the second half of the year. Underground battery electric vehicles are currently being trialled at Kennecott to improve employee health and safety, increase productivity and reduce carbon emissions from future underground mining fleets.
- On 5 September, we [entered](#) into a binding agreement to acquire all of the remaining shares of Turquoise Hill Resources that Rio Tinto does not currently own, subject to shareholder approval. The transaction delivers significant value to Turquoise Hill minority shareholders with the certainty of an all-cash offer of C\$43 per share (with a total cash consideration of \$3.3 billion), and provides greater certainty of funding for the long-term success of the Oyu Tolgoi project.
- Titanium dioxide slag production of 310 thousand tonnes was 48% higher than the third quarter of 2021, due to community disruptions at Richards Bay Minerals in South Africa in 2021, and continued improved performance of operations at Rio Tinto Fer et Titane (RTFT), Canada.
- Iron Ore Company of Canada (IOC) production of pellets and concentrate was 28% higher than the third quarter of 2021 due to improved operational performance as well as timing of the planned annual maintenance shutdown (seven days) which was successfully completed in June (this work was completed in September in 2021).
- This quarter marked 12 months since we began the roll-out of the Rio Tinto Safe Production System (RTSPS). We now have 22 deployments at 13 sites and 63 rapid improvement projects (Kaizens) completed or in progress. We are on track to meet our 2022 target of 30 deployments at 15 sites.

- In the third quarter, we entered into additional partnerships and progressed initiatives to decarbonise our business and our value chains, including entering strategic partnerships with Volvo Group and Ford Motor Company. We also joined the First Movers Coalition, a global initiative to help commercialise zero-carbon technologies by harnessing purchasing power and supply chains.
- On 11 October, we [announced](#) a partnership with the Government of Canada to invest up to C\$737 million over the next eight years to decarbonise our Rio Tinto Fer et Titane operations in Sorel-Tracy, Québec, and to position the business as a centre of excellence for critical minerals processing. The partnership will also support projects including BlueSmelting, a low-carbon ilmenite smelting technology, increasing scandium production, and adding titanium metal to the portfolio. The Government of Canada is investing up to C\$222 million over the next eight years through its Strategic Innovation Fund which supports large-scale, transformative, and collaborative projects that will help position Canada to prosper in the global knowledge-based economy. There is no impact to our current capital guidance.
- On 20 July, we [announced](#) we reached agreement with the Australian Taxation Office (ATO) on all tax matters in dispute. As part of this agreement, in August we paid the ATO additional tax of A\$613 million for the period from 2010 to 2021. Over this period, Rio Tinto paid nearly A\$80 billion in tax and royalties in Australia.
- On 2 August, we [completed](#) the sale of a royalty on an area including the Cortez mine operational area and the Fourmile development project in Nevada to RG Royalties LLC, a direct wholly-owned subsidiary of Royal Gold Inc., for \$525 million in cash.
- In October, we entered into a definitive agreement with Uranium Energy Corp (UEC) pursuant to which UEC will acquire 100% of Rio Tinto's wholly owned Roughrider uranium development project located in Saskatchewan, Canada for total consideration of \$150 million comprised of \$80 million in cash and \$70 million in UEC stock. The transaction completed on 14 October.
- On 29 September, we [noted](#) the independent valuation report released by Energy Resources of Australia (ERA) on 26 September 2022, to determine a valuation of the company as it seeks to address material cost and schedule overruns on the critical Ranger rehabilitation project in Australia's Northern Territory. Our consistent position is that the terms of any ERA funding solution should reflect fair value having regard to: the material cost overruns and interim funding requirements; funds raised will be dedicated strictly to rehabilitation and not any future development; and the Traditional Owners, the Mirarr People's consistently publicly stated opposition to developing the Jabiluka uranium deposit.
- On 6 October, we [welcomed](#) ERA's announcement that it will renew its independent board committee to introduce new perspectives to address the material cost and schedule overruns on the critical Ranger rehabilitation project. We remain committed to ensuring the rehabilitation is completed to a standard that will establish an environment similar to the adjacent Kakadu National Park and continues to provide technical support to the project.
- 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.

¹Rio Tinto share includes 100% of funding costs for Paraburdoo plant upgrades.

²Lower Commercial Skarn production targets referred to in this release are reported as recoverable copper and are underpinned as to 100% by Probable Ore Reserves. These estimates of Ore Reserves were reported in a release to the Australian Securities Exchange (ASX) dated 31 August 2022 "Rio Tinto Kennecott Mineral Resources and Ore Reserves" (Table 1 Release) and have been prepared by Competent Persons in accordance with the requirements of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 (JORC Code).

2022 guidance

Rio Tinto share, unless otherwise stated	2021 Actuals	2022 Sept. YTD	2022 Previous	2022 Current
Pilbara iron ore (shipments, 100% basis) (Mt)	322	234.3	320 to 335	320 to 335 ¹
Bauxite (Mt)	54	41.4	54 to 57	Unchanged
Alumina (Mt)	7.9	5.6	7.6 to 7.8	Unchanged
Aluminium (Mt)	3.2	2.2	3.0 to 3.1	Unchanged
Mined copper (kt)	494	390	500 to 575	Unchanged
Refined copper (kt)	202	158	230 to 290	190 to 220
Diamonds ² (M carats)	3.8	3.3	4.5 to 5.0	Unchanged
Titanium dioxide slag (Mt)	1.0	0.9	1.1 to 1.4	Unchanged
IOC ³ iron ore pellets and concentrate (Mt)	9.7	7.8	10.0 to 11.0	Unchanged
Boric oxide equivalent (Mt)	0.5	0.4	~0.5	Unchanged

¹At the low end of the range.

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 and excludes COVID-19 response costs.
- Copper C1 unit cost guidance in 2022 has been revised to 150-170 US cents/lb (previously 130-150 US cents/lb), following the reduction of the refined copper guidance range.

Investments, growth and development projects

- We progressed our excel in development objective, safely commissioning some of our major projects in the period. We expect our share of capital investment to be around \$7.0 billion in 2022, reduced from \$7.5 billion previously, due to the stronger US dollar and reassessment on timing of decarbonisation investment. Our best estimate of the investment required to decarbonise the business remains at \$7.5 billion until 2030.
- Exploration and evaluation expense in the first nine months of 2022 was \$593 million, \$77 million (15%) higher than the first nine months of 2021, with continued ramp-up of activities in Guinea, Argentina and Australia.

Pilbara mine projects

- We safely commissioned our Pilbara projects in the period despite challenging conditions with COVID-19 labour and supply chain disruptions. The focus now moves to the next tranche of Pilbara mines starting with Western Range.
- At Gudai-Darri, the ramp up is progressing as planned and the full capacity run rate is expected to be achieved during 2023.
- At Robe Valley, the Mesa A rectification works were successfully completed with the plant operating at full design rates. The final train load out tie-in works at Mesa J were completed with first ore achieved in August.
- The Western Range Iron Ore project is a \$2 billion (\$1.3 billion Rio Tinto share¹) joint venture between Rio Tinto (54 per cent) and China Baowu Steel Group Co. Ltd (46 per cent). Once completed, Western Range's annual production capacity of 25 million tonnes will help sustain production of the Pilbara Blend from Rio Tinto's existing Paraburdoo mining hub. Early works commenced in September following receipt of Western Australian Government State Agreement approval, with construction of the mine expected to begin in early 2023 and first production anticipated in 2025. The construction phase will support approximately 1,600 jobs and once operational, the mine will require approximately 800 ongoing roles which are expected to be filled by existing workers transitioning from other sites in the Paraburdoo mining hub.
- The Greater Paraburdoo Iron Ore Hub proposal, inclusive of the Western Range Iron Ore project, was approved under the Western Australian Environmental Protection Act 1986 in August. As part of this approval process, we worked closely with the Traditional Owners on whose country Western Range is situated, the Yinhawangka People, to co-design a Social and Cultural Heritage Management Plan to protect significant cultural and heritage values in the project area. The plan, which was announced earlier this year, outlines protocols for joint decision-making on environmental matters and mine planning. We also continue to actively work with the Yinhawangka People in relation to approvals required under the Western Australian Aboriginal Heritage Act 1972 and Western Australian Aboriginal Cultural Heritage Act 2021.

Oyu Tolgoi underground project

Technical progress

- Current on-site workforce levels are in line with the 2022 reforecast². There have been seven drawbells fired at the end of the quarter. The undercut and draw bell progression remains on track to achieve first sustainable production from Panel 0 in the first half of 2023.
- At September, shafts 3 and 4 sinking reached 288 metres and 410 metres below ground level respectively, with both sinking rates and achieved depths roughly in line with 2022 reforecast. Construction of the final major stage of materials handling infrastructure commenced in the second quarter of 2022 including civil and underground works for the conveyor to surface.
- Study work for Panels 1 and 2 (which are required to support the ramp-up to 95,000 tonnes of ore per day) remains on track 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

- At the Resolution Copper project in Arizona, the US Forest Service continues work on the Environmental Impact Statement as part of the federal permitting requirements for the project. We continue to consult and partner with local communities and Native American tribes, as we progress our mine studies to further shape our understanding of the orebody.
- At the Winu copper-gold project in Western Australia, we are committed to a pathway that prioritises the highest standards on environmental and cultural heritage, and strengthening Traditional Owner relationships. The pathway is expected to take longer than originally anticipated and remains subject to regulatory and other required approvals.
- At the Simandou iron ore project in Guinea, discussions continue on the shareholders agreement, finalising cost estimates and funding, and securing all necessary permits and approvals regarding the project infrastructure. This follows the incorporation of the joint venture company in July (La Compagnie du Transguinée) between the government of the Republic of Guinea, Winning Consortium Simandou (WCS) and Rio Tinto Simfer to further progress plans to co-develop the multi-purpose, multi-user infrastructure for the project. We progressed early works and hiring for critical roles with a significant focus on Guinean local businesses, ahead of mobilisation of a larger workforce over the coming months. Work at the mine site recommenced with the re-mobilisation of teams following the lifting of the stop work order issued by the Government of Guinea in August.
- 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.
- At the Rincon lithium project in Argentina, we are progressing early works including construction of a camp and airstrip. We are also developing a three thousand tonne per annum lithium carbonate starter plant to accelerate market entry by the first half of 2024, and de-risk the planned full scale operation. We continue to engage with communities, the province of Salta and the Government of Argentina to ensure an open and transparent dialogue with stakeholders about the works underway. Detailed studies for the full scale operation are progressing.

¹Rio Tinto share includes 100% of funding costs for Paraburdoo plant upgrades.

²A cost and schedule reforecast was performed in June 2022 and estimates that \$7.06 billion is required to complete the Hugo North 1 project (an increase of \$0.3 billion beyond the 2020 Definitive Estimate). The 2022 Reforecast excludes impacts of COVID-19 restrictions arising after June 2022. The 2022 reforecast remains subject to Oyu Tolgoi Board approval.

Sustainability highlights

We are implementing the 26 recommendations of the Everyday Respect report including leadership training where we are on track to meet our target of 80% by the end of the year, with 75% completion rate as of 30 September. All sites have completed safe and inclusive facilities self-assessments with initiatives to be rolled out through next year, while safety rectifications are on track to be completed this year. The Business Conduct Office is developing a discrete unit which will consist of a team of specialists who deliver safe, confidential and caring support to those impacted by harmful and disrespectful behaviours. We are currently designing a pilot for Mongolia and Western Australia as the initial recipients of the discrete unit.

Communities & Social Performance (CSP)

To share our progress on the actions we have taken to improve our cultural heritage approach and Indigenous participation and leadership, in the quarter we [published](#) our second progress report on our CSP practices, which includes direct feedback from Traditional Owners and details the actions the company has taken to rebuild relationships with Indigenous peoples and external stakeholders. We have seen increased engagement with feedback from seven Traditional Owner groups compared to four in 2021 - which will enable us to continue to learn and improve.

In June 2021, Environmental Resources Management (ERM) were engaged to conduct independent cultural heritage management audits across our business globally. They conducted audits at Australian assets in 2021 and during 2022 the focus has been on assets outside Australia. ERM has published a summary of insights and common findings from our Australian businesses. These insights from the independent audit have informed reviews of our Communities and Social Performance Standard, the Cultural Heritage Management Group Procedure and guidance documentation.

On 28 July, we [announced](#) a commitment of A\$75 million across 10 years to renew our partnerships with the Shire of Ashburton and the City of Karratha to continue the delivery of a range of important community projects across the two regions. The renewed partnerships will build upon and further strengthen Rio Tinto's relationship with local government partners.

In August, we announced a partnership with the Cheslatta Carrier Nation, a First Nation in British Columbia, on an archaeological project that aims to better understand the history of Indigenous communities and human migrations in North America. The Cheslatta-led project will survey and excavate a variety of sites of cultural and historical significance, some of which possibly span the past 10,000 years or more. We will contribute C\$2.8 million dollars to this Indigenous-led research initiative, which builds on the New Day agreement signed in 2020 between the Cheslatta Carrier Nation and the company to promote the social and economic well-being of the Cheslatta community.

On 6 October, we [announced](#) the signing of a Memorandum of Understanding (MOU) with the Mayor's Office of Ulaanbaatar City and National Amusement Park LLC to undertake a restoration project in the National Amusement Park. Under the partnership, Rio Tinto Mongolia will restore 10 hectares of land, between the Children's Palace and the Sun Road, located in the western section of the National Amusement Park.

In the quarter, Rio Tinto representatives met other members of the Panguna Impact Assessment Oversight Committee in person for the first time in Buka, Bougainville. The consulting firm to undertake the impact assessment is expected to be engaged in October 2022 with the first phase planned to take 18 to 24 months. In advance of the impact assessment formally commencing in the fourth quarter of this year, technical consulting firm Tetra Tech Coffey has been on the ground in Bougainville investigating priority issues relating to the levee between the Jaba and Kawerong rivers.

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 third quarter working to decarbonise our business and actively develop technologies to decarbonise our value chains.

- On 21 July, we [signed](#) a non-binding global MOU with Ford Motor Company to jointly develop more sustainable and secure supply chains for battery and low-carbon materials to be used in Ford vehicles. The multi-materials partnership will support the transition toward a net-zero future by supplying Ford with materials including lithium, low-carbon aluminium and copper.
- On 26 August, we [announced](#) an investment of \$29 million to build a new aluminium recycling facility at our Arvida Plant in Saguenay-Lac-Saint-Jean, Quebec, to expand its offering of low-carbon aluminium solutions for customers in the automotive, packaging and construction markets. The facility will make Rio Tinto the first primary producer in North America to incorporate recycled post-consumer aluminium into aluminium alloys.
- On 13 September, we [announced](#) we had signed an MOU with Volvo Group to create a strategic partnership where Rio will supply responsibly sourced low-carbon products and solutions to Volvo Group and the companies will work towards decarbonising our operations through piloting Volvo Group's sustainable autonomous hauling solutions.
- On 20 September, we [announced](#) we would join the First Movers Coalition (FMC), a global initiative to help commercialise zero-carbon technologies by harnessing purchasing power and supply chains. The initiative is led by the World Economic Forum and the US Government and targets sectors including aluminium, aviation, chemicals, concrete, shipping, steel, and trucking, which are responsible for 30 per cent of global emissions. We have joined the shipping, trucking and aviation categories working closely with the FMC team to determine how it practically integrates the intent of the commitments in the context of Rio Tinto's global operations.
- On 22 September, we [announced](#) an MOU with Shougang Group, one of the world's top 10 steel producers, to promote research, design and implementation of low-carbon solutions for the steel value chain. The MOU's focus areas include low-carbon sintering technology, blast furnace and basic oxygen furnace optimisation, and carbon capture and utilisation.
- On 25 September, Tomago Aluminium Company, New South Wales, Australia called for Expressions of Interest to develop, invest in or procure long-term traceable renewable energy and dispatchable firm power generation projects or contracts, to underpin its decarbonisation strategy and net-zero ambition. Tomago Aluminium is an independently managed joint venture 51.55 per cent owned by Rio Tinto.
- On 29 September, we [announced](#) we had started producing spodumene concentrate, a mineral used in the production of lithium for batteries, at a demonstration plant in our metallurgical complex in Sorel-Tracy, Canada. The plant will demonstrate at industrial scale a new spodumene concentration process that provides lithium oxide grades and recoveries well above the industry average.
- On 6 October, we [announced](#) an agreement with international energy company Voltalia and local Black Economic Empowerment (BEE) partners, to supply renewable solar power at our Richards Bay Minerals (RBM) operation in KwaZulu-Natal, South Africa. The power plant is scheduled to be complete by 2024 and is expected to cut RBM's annual greenhouse gas emissions by at least 10 per cent (compared to 2018 baseline emissions), or 237kt CO₂e per year.
- On 11 October, we [announced](#) a partnership with the Government of Canada to invest up to C\$737 million over the next eight years to decarbonise our Rio Tinto Fer et Titane operations in Sorel-Tracy, Québec, and to position the business as a centre of excellence for critical minerals processing. The partnership will also support projects including BlueSmelting, a low-carbon ilmenite smelting technology, increasing scandium production, and adding titanium metal to the portfolio. The Government of Canada is investing up to C\$222 million over the next eight years through its Strategic Innovation Fund which supports large-scale, transformative, and collaborative projects that will help position Canada to prosper in the global knowledge-based economy. There is no impact to our current capital guidance.

Our markets

Commodity prices continued their downward trend during the quarter and there are further downside risks to demand as the global economy slows. Labour markets are holding up relatively well although consumer confidence has waned. Fears of recession are emerging on the implementation of aggressive interest rate hikes in the US and Europe, while a weak property sector continues to weigh on China's economy. Freight rates are falling amid slowing global trade as global supply chains show signs of improvement.

- China's economy has been challenged by ongoing COVID-lockdowns, power shortages in summer, and continued weakness in the property market. Even as the government maintains a dynamic zero-COVID policy, it has increased policy support to help relieve industries and restore confidence. The recovery has been uneven across sectors, with the policy-induced acceleration in infrastructure spending, car sales and exports providing key drivers of growth during the quarter. However, slowing global demand poses downside risks to China's strong exports, while consumers remain cautious of the property market.
- The US economy is showing more signs of a slowdown even though employment trends are still holding up positively. Consumers are spending more cautiously, industrial production growth is more subdued and corporate profits have edged lower. Inflation remains elevated despite easing gasoline prices. This has prompted a more hawkish position by the Federal Reserve, which is expected to continue its aggressive rate hikes even after three consecutive 75 basis point hikes this year.
- The Eurozone's economic growth outlook has deteriorated, as inflation climbed further, and the latest data points suggest the region's economy could be already in contraction. The European Central Bank is expected to continue its rate hikes to curb inflation, while industrial output could be further curtailed if energy shortages persist.
- Iron ore Platts CFR prices trended down from \$120/dmt to \$96/dmt during the third quarter (averaging \$103/dmt, down from \$138/dmt during the second quarter) as the loss of confidence in China's property market and COVID-related disruptions to construction activity curtailed China's steel production and consumption by ~9% August year to date versus the same period of 2021. The major iron ore producers shipped the same aggregate volume during the first three quarters of 2022 as they did over the same period of 2021. With supply from other producers down 17% year to date – due to, among other factors, the war in Ukraine and export taxes in India – total seaborne supply contracted 4.5% during August year to date versus the same period of 2021.
- The LME aluminium price extended further losses, dropping 20% over the quarter, averaging \$2,354/t. Additional smelter curtailments in Europe and China on high power prices and low hydropower generation, respectively, were insufficient to offset the weak macro environment. Aluminium demand has deteriorated, especially in Europe, which placed downward pressure on prices. Shipments in the US and Canada have been resilient and there are signs of improvement in demand in China.
- The copper LME price dropped 7% over the third quarter to \$3.47/lb. A strong US dollar, tightening monetary policy and challenging economic outlook weighed on market sentiment. Nevertheless, prices have been partly supported by supply concerns and low exchange inventories, which currently remain at multi-year lows.
- The electric vehicle (EV) market continues to experience strong growth, supported by government policies, while EV producers roll out new models to take market share at the expense of internal combustion engine vehicles. Lithium carbonate prices remain elevated on strong demand. Power rationing in China's Sichuan province (a key lithium supply hub) also led to production cuts and market tightness during the quarter.

IRON ORE

Rio Tinto share of production (Million tonnes)	Q3 2022	vs Q3 2021	vs Q2 2022	9 MTHS 2022	vs 9 MTHS 2021
Pilbara Blend and SP10 Lump ¹	21.3	+8%	+10%	57.7	+3%
Pilbara Blend and SP10 Fines ¹	32.6	+6%	+8%	88.5	+1%
Robe Valley Lump	1.4	-2%	+18%	3.6	-8%
Robe Valley Fines	2.2	-6%	+15%	5.7	-10%
Yandicoogina Fines (HIY)	13.5	-14%	+1%	41.5	-2%
Total Pilbara production	71.0	+1%	+7%	197.0	0%
Total Pilbara production (100% basis)	84.3	+1%	+7%	234.7	0%

Rio Tinto share of shipments (Million tonnes)	Q3 2022	vs Q3 2021	vs Q2 2022	9 MTHS 2022	vs 9 MTHS 2021
Pilbara Blend Lump	15.3	+18%	+21%	38.8	0%
Pilbara Blend Fines	31.6	+9%	+26%	78.5	-8%
Robe Valley Lump	1.3	+33%	+32%	2.9	0%
Robe Valley Fines	2.4	-7%	+4%	6.4	-10%
Yandicoogina Fines (HIY)	13.5	-9%	-5%	42.2	-1%
SP10 Lump ¹	1.6	-66%	-63%	9.9	-12%
SP10 Fines ¹	3.8	-7%	-44%	17.6	+80%
Total Pilbara shipments ²	69.5	0%	+4%	196.4	-1%
Total Pilbara shipments (100% basis) ²	82.9	-1%	+4%	234.3	-1%
Total Pilbara Shipments (consolidated basis) ^{2, 3}	71.4	0%	+5%	201.3	-1%

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

We produced 84.3 million tonnes (Rio Tinto share 71.0 million tonnes) in the third quarter, 1% higher than the corresponding period of 2021, and 7% higher than the prior quarter with continued commissioning and ramp-up of Gudai-Darri and Robe Valley. We produced less SP10 this quarter compared to the prior quarter.

Third quarter shipments of 82.9 million tonnes (Rio Tinto share 69.5 million tonnes) were 1% lower than the third quarter of 2021, and 4% higher than the prior quarter despite two unplanned rail outages on the Yandicoogina and Gudai-Darri lines. The investigation into the Gudai-Darri derailment is ongoing. Full year shipments are expected to be at the low end of the original 320 to 335 million tonne range.

There were some encouraging performance trends in the third quarter in relation to mine material movements, build-up of run of mine ore stocks and continued ramp up of new projects. Deployment of the Rio Tinto Safe Production System continues to see positive results at West Angelas, Yandicoogina, Tom Price, and Brockman 4.

Approximately 11% of sales in the nine months 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 29% of sales in the third quarter were made on a free on board (FOB) basis, with the remainder sold including freight.

China Portside Trading

We continue to increase our iron ore portside sales in China, with 19.5 million tonnes of sales in the first nine months of 2022 (8.9 million tonnes in the first nine months of 2021). At the end of the September, inventory levels are 5.5 million tonnes, including 3.0 million tonnes of Pilbara product. In the first nine months of 2022 approximately 77% of our portside sales were either screened or blended in Chinese ports.

ALUMINIUM

Rio Tinto share of production ('000 tonnes)	Q3 2022	vs Q3 2021	vs Q2 2022	9 MTHS 2022	vs 9 MTHS 2021
Bauxite	13,680	-2%	-3%	41,437	+1%
Bauxite third party shipments	9,049	-10%	-6%	28,783	+1%
Alumina	1,838	-5%	-1%	5,603	-6%
Aluminium	759	-2%	+4%	2,226	-7%

Bauxite

Bauxite production of 13.7 million tonnes was 2% lower than the third quarter of 2021 due to equipment reliability issues at Gove.

We shipped 9.0 million tonnes of bauxite to third parties in the third quarter, 10% lower than the same period of 2021, due to vessel loading constraints at Weipa.

Alumina

Alumina production of 1.8 million tonnes was 5% lower than the third quarter of 2021. The Yarwun refinery successfully completed planned shutdowns in the third quarter and improved its operating stability. Queensland Alumina Limited (QAL) was impacted by lower operational stability as a result of equipment reliability.

As the result of 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 0.8 million tonnes was 2% lower than the third quarter of 2021, and 4% higher than the prior quarter as the Kitimat smelter continues to ramp up and Boyne smelter cell recovery efforts progress as expected. The Kitimat pot restarts are progressing but structural issues with the alumina conveyor system caused disruptions through the quarter slowing the rate of pot restarts. We continue to focus on full recovery during the course of 2023.

The LME aluminium price extended further losses, dropping 20% over the quarter, averaging \$2,354/t, while raw materials and energy prices remained at the same levels of the second quarter, putting more pressure on margins.

Boyne Smelter has been increasingly impacted by the significant coal price escalation in Queensland, Australia for its 50% exposure to spot thermal coal prices. Coal contracts will be renewed for 2023 onwards.

COPPER

Rio Tinto share of production ('000 tonnes)	Q3 2022	vs Q3 2021	vs Q2 2022	9 MTHS 2022	vs 9 MTHS 2021
Mined copper					
Kennecott	50.7	+19%	+50%	131.7	+20%
Escondida	75.1	+10%	-9%	225.6	+7%
Oyu Tolgoi	12.2	-13%	+19%	32.6	-22%
Refined copper					
Kennecott	39.2	+10%	+20%	112.2	-5%
Escondida	14.9	+1%	-11%	46.0	+4%

Kennecott

Mined copper production was 19% higher than the third quarter of 2021, and 50% higher than the prior quarter with significant progress into higher grades following the transition to the south wall (averaging 0.54% in the first nine months), higher recoveries and strong mill performance driving higher ore milled.

Refined copper production guidance has been reduced to 190 to 220 thousand tonnes (previously 230 to 290 thousand tonnes), given further downside risk associated with Kennecott's smelter and refinery performance, until we undertake the largest rebuild in nine years which is planned for the second quarter of 2023.

Escondida

Mined copper production was 10% higher than the third quarter of 2021 mainly due to expected higher concentrator feed grade and higher recoverable copper in ore stacked for leaching mainly due to higher material stacked in both oxide and sulphide leach.

Oyu Tolgoi

Mined copper production from the open pit was 13% lower than the third quarter of 2021 due to lower copper grades and recoveries as a result of planned mine sequencing. Mined copper was 19% higher than the prior quarter with higher milled ore and slightly higher copper grades. Gold grades were significantly lower than the third quarter of the prior year (0.22% vs 0.63%), due to mine planning sequence.

Nuton™

Rio Tinto made a \$25 million investment in McEwen Copper Inc. through its copper leaching technology venture, Nuton. In connection with the investment, a Nuton Collaboration Agreement allows the parties to test Nuton technologies at McEwen Copper's Los Azules development project in Argentina.

MINERALS

Rio Tinto share of production (million tonnes)	Q3 2022	vs Q3 2021	vs Q2 2022	9 MTHS 2022	vs 9 MTHS 2021
Iron ore pellets and concentrate					
IOC	2.8	+28%	+7%	7.8	+8%

Rio Tinto share of production ('000 tonnes)	Q3 2022	vs Q3 2021	vs Q2 2022	9 MTHS 2022	vs 9 MTHS 2021
Minerals					
Borates - B ₂ O ₃ content	130	+6%	-5%	391	+5%
Titanium dioxide slag	310	+48%	+6%	876	+11%

Rio Tinto share of production ('000 carats)	Q3 2022	vs Q3 2021	vs Q2 2022	9 MTHS 2022	vs 9 MTHS 2021
Diavik ¹	1,192	+43%	+4%	3,333	+24%

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

Iron Ore Company of Canada (IOC)

Iron ore production was 28% higher than the third quarter of 2021, due to improved operational performance as well as timing of 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 third quarter was 6% 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 continued to experience logistical challenges with high congestion at the Port of Los Angeles and shipping rates at elevated levels due to high wait times on containerships.

Iron and Titanium

Titanium dioxide production was 48% higher than the third quarter of 2021, due to community disruptions at Richards Bay Minerals in South Africa in 2021, and continued improved performance of operations at Rio Tinto Fer et Titane, Canada. The energy situation in South Africa is a critical risk and we are monitoring the situation closely.

Diamonds

At Diavik, our share of carats was 43% higher than the third quarter of 2021 due to the benefit of our increased share of production since taking 100% ownership of Diavik from November 2021.

EXPLORATION AND EVALUATION

Pre-tax and pre-divestment expenditure on exploration and evaluation charged to the profit and loss account in the first nine months of 2022 was \$593 million, compared with \$516 million in the first nine months of 2021. Approximately 39% of this expenditure was incurred by Copper (includes Simandou), 31% by central exploration, 22% by Minerals and 8% by Iron Ore.

Exploration highlights

Rio Tinto has a strong portfolio of projects with activity in 18 countries across seven commodities in early exploration and studies stages. The bulk of the exploration expenditure in the third 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.

In October, we entered into a definitive agreement with Uranium Energy Corp (UEC) pursuant to which UEC will acquire 100% of Rio Tinto's wholly owned Roughrider uranium development project located in the Athabasca Basin in Saskatchewan, Canada for total consideration of \$150 million comprised of \$80 million in cash and \$70 million in UEC stock. The transaction completed on 14 October.

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:

Commodities	Studies Stage	Advanced projects	Greenfield/ Brownfield programmes
Bauxite		Amargosa, Brazil*, Sanxai, Laos*	Melville Island, Australia Cape York, Australia
Battery Materials	Rincon Lithium, 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, 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			9 Months		% change		
		2021 Q3	2022 Q2	2022 Q3	2021 9 MTHS	2022 9 MTHS	Q3 22 vs Q3 21	Q3 22 vs Q2 22	9 MTHS 22 vs 9 MTHS 21
Principal commodities									
Alumina	('000 t)	1,937	1,864	1,838	5,983	5,603	-5%	-1%	-6%
Aluminium	('000 t)	774	731	759	2,393	2,226	-2%	+4%	-7%
Bauxite	('000 t)	13,967	14,131	13,680	41,231	41,437	-2%	-3%	+1%
Borates	('000 t)	123	137	130	371	391	+6%	-5%	+5%
Copper - mined	('000 t)	125.2	126.4	138.0	361.2	389.9	+10%	+9%	+8%
Copper - refined	('000 t)	50.5	49.4	54.1	161.9	158.2	+7%	+9%	-2%
Diamonds	('000 cts)	834	1,149	1,192	2,692	3,333	+43%	+4%	+24%
Iron Ore	('000 t)	72,074	68,640	73,726	203,995	204,832	+2%	+7%	0%
Titanium dioxide slag	('000 t)	209	293	310	787	876	+48%	+6%	+11%
Other Metals & Minerals									
Gold - mined	('000 oz)	94.5	52.5	58.2	271.0	179.3	-38%	+11%	-34%
Gold - refined	('000 oz)	44.5	20.9	30.5	144.9	83.6	-31%	+46%	-42%
Molybdenum	('000 t)	0.4	0.4	0.8	6.6	2.3	+82%	+95%	-65%
Salt	('000 t)	1,508	1,030	1,674	4,377	4,299	+11%	+63%	-2%
Silver - mined	('000 oz)	1,110	846	1,040	3,039	2,898	-6%	+23%	-5%
Silver - refined	('000 oz)	733	290	571	2,155	1,438	-22%	+97%	-33%

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	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
ALUMINA								
Production ('000 tonnes)								
Jonquière (Vaudreuil)	100 %	325	338	334	325	336	1,026	996
Jonquière (Vaudreuil) specialty Alumina plant	100 %	29	28	25	30	30	79	85
Queensland Alumina	80 %	738	727	704	697	662	2,237	2,062
São Luis (Alumar)	10 %	75	99	94	91	95	267	280
Yarwun	100 %	770	719	745	721	715	2,374	2,180
Rio Tinto total alumina production		1,937	1,911	1,901	1,864	1,838	5,983	5,603
ALUMINIUM								
Production ('000 tonnes)								
Australia - Bell Bay	100 %	48	48	46	44	46	141	137
Australia - Boyne Island	59 %	75	75	73	61	65	224	199
Australia - Tomago	52 %	77	78	75	75	76	228	226
Canada - six wholly owned	100 %	343	325	318	323	341	1,119	981
Canada - Alouette (Sept-Îles)	40 %	64	63	62	63	64	188	188
Canada - Bécancour	25 %	29	30	28	29	29	86	86
Iceland - ISAL (Reykjavik)	100 %	52	52	50	50	51	151	151
New Zealand - Tiwai Point	79 %	67	67	66	66	67	197	199
Oman - Sohar	20 %	20	20	19	20	20	59	59
Rio Tinto total aluminium production		774	757	736	731	759	2,393	2,226
BAUXITE								
Production ('000 tonnes) (a)								
Gove	100 %	3,067	2,787	3,093	2,637	2,905	8,976	8,636
Porto Trombetas	12 %	332	416	240	308	393	950	941
Sangaredi	(b)	1,763	1,704	1,765	1,946	1,953	5,405	5,663
Weipa	100 %	8,805	8,188	8,527	9,240	8,429	25,900	26,197
Rio Tinto total bauxite production		13,967	13,095	13,625	14,131	13,680	41,231	41,437

(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	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
BORATES								
Production ('000 tonnes B₂O₃ content)								
Rio Tinto Borates - borates	100 %	123	117	123	137	130	371	391
COPPER								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100 %	42.8	49.7	47.1	33.9	50.7	109.7	131.7
Escondida	30 %	68.4	69.6	68.2	82.3	75.1	209.9	225.6
Oyu Tolgoi (b)	34 %	14.1	13.0	10.2	10.2	12.2	41.6	32.6
Rio Tinto total mine production		125.2	132.3	125.5	126.4	138.0	361.2	389.9
Refined production ('000 tonnes)								
Escondida	30 %	14.7	14.5	14.4	16.7	14.9	44.0	46.0
Rio Tinto Kennecott (c)	100 %	35.7	25.5	40.2	32.7	39.2	117.8	112.2
Rio Tinto total refined production		50.5	40.0	54.7	49.4	54.1	161.9	158.2

(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 4.8 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 %	834	1,155	991	1,149	1,192	2,692	3,333
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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 %	38.1	34.7	37.8	22.8	32.5	104.8	93.1
Escondida	30 %	12.6	12.9	10.9	13.7	11.5	35.6	36.1
Oyu Tolgoi (b)	34 %	43.8	26.3	19.8	16.0	14.3	130.6	50.1
Rio Tinto total mine production		94.5	73.9	68.5	52.5	58.2	271.0	179.3
Refined production ('000 ounces)								
Rio Tinto Kennecott	100 %	44.5	31.5	32.2	20.9	30.5	144.9	83.6

(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	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
IRON ORE								
Production ('000 tonnes) (a)								
Hamersley mines	(b)	55,634	55,049	47,678	52,636	56,650	155,281	156,965
Hope Downs	50 %	6,500	6,567	5,830	6,385	6,264	18,076	18,480
Iron Ore Company of Canada	59 %	2,163	2,498	2,404	2,603	2,776	7,229	7,783
Robe River - Pannawonica (Mesas J and A)	53 %	3,721	3,196	2,774	3,054	3,540	10,317	9,368
Robe River - West Angelas	53 %	4,056	5,252	3,779	3,961	4,496	13,093	12,237
Rio Tinto iron ore production ('000 tonnes)		72,074	72,561	62,465	68,640	73,726	203,995	204,832
Breakdown of Production:								
Pilbara Blend and SP10 Lump (c)		19,742	20,374	17,081	19,309	21,317	56,057	57,708
Pilbara Blend and SP10 Fines (c)		30,825	32,081	25,658	30,240	32,592	87,866	88,490
Robe Valley Lump		1,423	1,152	1,051	1,180	1,389	3,950	3,619
Robe Valley Fines		2,297	2,044	1,724	1,874	2,151	6,367	5,749
Yandicoogina Fines (HIY)		15,623	14,412	14,548	13,433	13,501	42,526	41,482
Pilbara iron ore production ('000 tonnes)		69,910	70,063	60,061	66,037	70,951	196,766	197,049
IOC Concentrate		829	1,009	962	1,282	1,237	2,854	3,480
IOC Pellets		1,335	1,489	1,442	1,321	1,539	4,375	4,302
IOC iron ore production ('000 tonnes)		2,163	2,498	2,404	2,603	2,776	7,229	7,783
Breakdown of Shipments:								
Pilbara Blend Lump		13,018	12,832	10,809	12,684	15,301	38,690	38,794
Pilbara Blend Fines		28,901	24,308	21,698	25,156	31,597	85,261	78,452
Robe Valley Lump		962	1,061	675	971	1,281	2,921	2,926
Robe Valley Fines		2,567	2,237	1,731	2,309	2,392	7,158	6,433
Yandicoogina Fines (HIY)		14,906	14,121	14,487	14,201	13,530	42,768	42,219
SP10 Lump (c)		4,826	4,841	3,827	4,456	1,647	11,237	9,930
SP10 Fines (c)		4,063	10,684	7,067	6,775	3,766	9,803	17,609
Pilbara iron ore shipments ('000 tonnes) (d)		69,242	70,084	60,295	66,552	69,515	197,837	196,363
Pilbara iron ore shipments - consolidated basis ('000 tonnes) (d) (f)		71,131	71,972	61,818	68,114	71,379	203,189	201,310
IOC Concentrate		1,054	989	600	1,083	1,316	3,122	3,000
IOC Pellets		1,374	1,711	1,412	1,484	1,443	4,154	4,339
IOC Iron ore shipments ('000 tonnes) (d)		2,428	2,700	2,012	2,567	2,759	7,276	7,339
Rio Tinto iron ore shipments ('000 tonnes) (d)		71,671	72,784	62,307	69,119	72,274	205,113	203,701
Rio Tinto iron ore sales ('000 tonnes) (e)		70,967	69,489	66,683	71,258	74,587	203,664	212,528

(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	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
MOLYBDENUM								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100 %	0.4	1.1	1.1	0.4	0.8	6.6	2.3

(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 %	1,508	1,471	1,595	1,030	1,674	4,377	4,299
SILVER								
Mine production ('000 ounces) (a)								
Bingham Canyon	100 %	639	589	561	385	591	1,639	1,537
Escondida	30 %	387	439	381	393	363	1,153	1,137
Oyu Tolgoi (b)	34 %	84	80	71	67	86	248	224
Rio Tinto total mine production		1,110	1,108	1,012	846	1,040	3,039	2,898
Refined production ('000 ounces)								
Rio Tinto Kennecott	100 %	733	516	577	290	571	2,155	1,438

(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 %	209	228	273	293	310	787	876

(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 September 2022.

Rio Tinto operational data

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
ALUMINA								
Smelter Grade Alumina - Aluminium Group								
Alumina production ('000 tonnes)								
<i>Australia</i>								
Queensland Alumina Refinery - Queensland	80 %	922	909	880	871	827	2,796	2,578
Yarwun refinery - Queensland	100 %	770	719	745	721	715	2,374	2,180
<i>Brazil</i>								
São Luis (Alumar) refinery	10 %	748	993	940	910	946	2,668	2,796
<i>Canada</i>								
Jonquière (Vaudreuil) refinery - Quebec (a)	100 %	325	338	334	325	336	1,026	996
<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 %	29	28	25	30	30	79	85

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

Rio Tinto operational data

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
ALUMINIUM								
Primary Aluminium								
Primary aluminium production ('000 tonnes)								
<i>Australia</i>								
Bell Bay smelter - Tasmania	100 %	48	48	46	44	46	141	137
Boyne Island smelter - Queensland	59 %	125	126	123	103	110	376	336
Tomago smelter - New South Wales	52 %	150	150	145	145	148	441	439
<i>Canada</i>								
Alma smelter - Quebec	100 %	119	119	117	121	122	352	360
Alouette (Sept-Îles) smelter - Quebec	40 %	159	157	154	157	159	471	470
Arvida smelter - Quebec	100 %	42	43	42	42	43	125	127
Arvida AP60 smelter - Quebec	100 %	15	15	14	14	15	45	43
Bécancour smelter - Quebec	25 %	115	119	111	117	116	344	344
Grande-Baie smelter - Quebec	100 %	58	58	57	58	59	171	174
Kitimat smelter - British Columbia	100 %	46	25	25	26	38	238	88
Laterrière smelter - Quebec	100 %	63	64	63	63	64	188	190
<i>Iceland</i>								
ISAL (Reykjavik) smelter	100 %	52	52	50	50	51	151	151
<i>New Zealand</i>								
Tiwai Point smelter	79 %	84	85	83	83	85	248	251
<i>Oman</i>								
Sohar smelter	20 %	100	100	97	98	100	296	295

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

Rio Tinto operational data

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
BAUXITE								
Bauxite production ('000 tonnes)								
<i>Australia</i>								
Gove mine - Northern Territory	100 %	3,067	2,787	3,093	2,637	2,905	8,976	8,636
Weipa mine - Queensland	100 %	8,805	8,188	8,527	9,240	8,429	25,900	26,197
<i>Brazil</i>								
Porto Trombetas (MRN) mine	12 %	2,764	3,469	2,000	2,569	3,275	7,914	7,844
<i>Guinea</i>								
Sangaredi mine (a)	45 %	3,919	3,786	3,922	4,323	4,339	12,011	12,585
Rio Tinto share of bauxite shipments								
Share of total bauxite shipments ('000 tonnes)		14,201	13,031	13,876	14,054	13,294	41,247	41,223
Share of third party bauxite shipments ('000 tonnes)		10,091	8,988	10,135	9,599	9,049	28,608	28,783

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

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
BORATES								
Rio Tinto Borates - borates	100 %							
<i>US</i>								
Borates ('000 tonnes) (a)		123	117	123	137	130	371	391

(a) Production is expressed as B₂O₃ content.

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
COPPER & GOLD								
Escondida	30 %							
<i>Chile</i>								
Sulphide ore to concentrator ('000 tonnes)		33,528	35,787	30,235	34,318	32,894	98,085	97,447
Average copper grade (%)		0.73	0.71	0.81	0.87	0.83	0.76	0.84
Mill production (metals in concentrates):								
Contained copper ('000 tonnes)		201.2	203.6	191.5	239.5	214.6	611.8	645.5
Contained gold ('000 ounces)		42.0	42.9	36.3	45.8	38.2	118.8	120.3
Contained silver ('000 ounces)		1,291	1,462	1,270	1,311	1,210	3,843	3,791
Recoverable copper in ore stacked for leaching ('000 tonnes) (a)		26.7	28.4	35.9	34.8	35.8	87.9	106.5
Refined production from leach plants:								
Copper cathode production ('000 tonnes)		49.0	48.4	48.1	55.7	49.6	146.8	153.4

(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 September 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
COPPER & GOLD (continued)								
Rio Tinto Kennecott								
Bingham Canyon mine	100 %							
<i>Utah, US</i>								
Ore treated ('000 tonnes)		9,995	9,809	10,130	6,862	10,125	27,967	27,116
Average ore grade:								
Copper (%)		0.47	0.55	0.51	0.55	0.56	0.44	0.54
Gold (g/t)		0.22	0.21	0.19	0.17	0.16	0.21	0.17
Silver (g/t)		2.80	2.55	2.36	2.39	2.50	2.58	2.42
Molybdenum (%)		0.017	0.020	0.021	0.017	0.021	0.033	0.020
Copper concentrates produced ('000 tonnes)		180	187	176	136	192	461	504
Average concentrate grade (% Cu)		23.7	26.3	26.8	24.9	26.2	23.8	26.1
Production of metals in copper concentrates:								
Copper ('000 tonnes) (a)		42.8	49.7	47.1	33.9	50.7	109.7	131.7
Gold ('000 ounces)		38.1	34.7	37.8	22.8	32.5	104.8	93.1
Silver ('000 ounces)		639	589	561	385	591	1,639	1,537
Molybdenum concentrates produced ('000 tonnes):								
Molybdenum in concentrates ('000 tonnes)		0.4	1.1	1.1	0.4	0.8	6.6	2.3
Kennecott smelter & refinery								
	100 %							
Copper concentrates smelted ('000 tonnes)		165	157	213	152	166	509	531
Copper anodes produced ('000 tonnes) (b)		35.7	32.9	45.8	27.9	46.2	109.6	120.0
Production of refined metal:								
Copper ('000 tonnes) (c)		35.7	25.5	40.2	32.7	39.2	117.8	112.2
Gold ('000 ounces) (d)		44.5	31.5	32.2	20.9	30.5	144.9	83.6
Silver ('000 ounces) (d)		733	516	577	290	571	2,155	1,438

(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 4.8 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 September 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
COPPER & GOLD (continued)								
Turquoise Hill Resources								
Oyu Tolgoi mine (a)	34 %							
<i>Mongolia</i>								
Ore Treated ('000 tonnes)		9,336	10,573	9,581	9,685	10,685	28,550	29,951
Average mill head grades:								
Copper (%)		0.53	0.46	0.40	0.40	0.42	0.52	0.41
Gold (g/t)		0.63	0.38	0.32	0.26	0.22	0.60	0.27
Silver (g/t)		1.29	1.27	1.25	1.15	1.32	1.26	1.24
Copper concentrates produced ('000 tonnes)		191.9	182.7	144.3	146.0	173.6	567.0	463.9
Average concentrate grade (% Cu)		21.9	21.3	21.0	20.9	20.9	21.9	20.9
Production of metals in concentrates:								
Copper in concentrates ('000 tonnes)		41.9	38.9	30.3	30.6	36.3	124.1	97.1
Gold in concentrates ('000 ounces)		130.8	78.6	59.2	47.6	42.7	389.5	149.6
Silver in concentrates ('000 ounces)		249	239	211	201	256	739	668
Sales of metals in concentrates:								
Copper in concentrates ('000 tonnes)		46.4	34.4	29.9	35.3	41.8	105.0	107.0
Gold in concentrates ('000 ounces)		149.1	102.2	57.4	67.9	56.0	332.5	181.3
Silver in concentrates ('000 ounces)		278	192	179	224	282	591	684

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

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
DIAMONDS								
Diavik Diamonds (a)	100 %							
<i>Northwest Territories, Canada</i>								
Ore processed ('000 tonnes)		643	596	496	537	590	1,944	1,623
Diamonds recovered ('000 carats)		1,390	1,356	991	1,149	1,192	4,487	3,333

(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 September 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
IRON ORE								
Rio Tinto Iron Ore								
<i>Western Australia</i>								
Pilbara Operations								
Saleable iron ore production ('000 tonnes)								
Hamersley mines	(a)	55,634	55,049	47,678	52,636	56,650	155,281	156,965
Hope Downs	50 %	13,000	13,133	11,660	12,771	12,529	36,151	36,959
Robe River - Pannawonica (Mesas J and A)	53 %	7,021	6,031	5,234	5,762	6,679	19,467	17,676
Robe River - West Angelas	53 %	7,652	9,909	7,130	7,474	8,484	24,704	23,088
Total production ('000 tonnes)		83,306	84,122	71,703	78,643	84,342	235,602	234,687
Breakdown of total production:								
Pilbara Blend and SP10 Lump (b)		23,617	24,998	20,827	23,228	25,452	67,464	69,507
Pilbara Blend and SP10 Fines (b)		37,046	38,681	31,094	36,220	38,709	106,145	106,023
Robe Valley Lump		2,686	2,173	1,982	2,226	2,621	7,453	6,829
Robe Valley Fines		4,335	3,857	3,252	3,536	4,058	12,014	10,846
Yandicoogina Fines (HIY)		15,623	14,412	14,548	13,433	13,501	42,526	41,482
Breakdown of total shipments:								
Pilbara Blend Lump		16,710	16,616	13,626	16,043	18,860	48,081	48,529
Pilbara Blend Fines		36,199	31,620	27,915	32,243	38,186	106,583	98,344
Robe Valley Lump		1,814	2,001	1,273	1,832	2,417	5,511	5,521
Robe Valley Fines		4,843	4,221	3,266	4,357	4,514	13,506	12,137
Yandicoogina Fines (HIY)		14,906	14,121	14,487	14,201	13,530	42,768	42,219
SP10 Lump (b)		4,826	4,841	3,827	4,456	1,647	11,237	9,930
SP10 Fines (b)		4,063	10,684	7,067	6,775	3,766	9,803	17,609
Total shipments ('000 tonnes) (c)		83,360	84,104	71,462	79,907	82,920	237,488	234,289
	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
Iron Ore Company of Canada								
	59 %							
<i>Newfoundland & Labrador and Quebec in Canada</i>								
Saleable iron ore production:								
Concentrates ('000 tonnes)		1,411	1,718	1,638	2,183	2,106	4,860	5,927
Pellets ('000 tonnes)		2,273	2,535	2,456	2,250	2,621	7,451	7,327
IOC Total production ('000 tonnes)		3,684	4,254	4,094	4,433	4,727	12,311	13,254
Shipments:								
Concentrates ('000 tonnes)		1,795	1,684	1,022	1,845	2,241	5,316	5,108
Pellets ('000 tonnes)		2,340	2,914	2,405	2,527	2,457	7,074	7,390
IOC Total Shipments ('000 tonnes) (c)		4,136	4,598	3,427	4,372	4,699	12,390	12,498
Global Iron Ore Totals								
Iron Ore Production ('000 tonnes)		86,990	88,375	75,797	83,076	89,069	247,913	247,941
Iron Ore Shipments ('000 tonnes)		87,496	88,702	74,889	84,279	87,619	249,878	246,787
Iron Ore Sales ('000 tonnes) (d)		86,542	85,256	79,194	86,103	89,689	247,930	254,986

(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 September 2022. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	9 MTHS 2021	9 MTHS 2022
SALT								
Dampier Salt	68 %							
<i>Western Australia</i>								
Salt production ('000 tonnes)		2,206	2,152	2,333	1,507	2,449	6,402	6,289
TITANIUM DIOXIDE SLAG								
Rio Tinto Iron & Titanium	100 %							
<i>Canada and South Africa</i>								
(Rio Tinto share) (a)								
Titanium dioxide slag ('000 tonnes)		209	228	273	293	310	787	876

(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 September 2022. The data represents production and sales on a 100% basis unless otherwise stated.