

Rio Tinto releases fourth quarter production results

18 January 2022

Rio Tinto Chief Executive Jakob Stausholm, said: "In 2021 we continued to experience strong demand for our products while operating conditions remained challenging, including due to prolonged COVID-19 disruptions. Despite this, we progressed a number of our projects, including the Pilbara replacement mines, underlining the resilience of the business and the commitment and flexibility of our people, communities and host governments. We are seeing some initial positive results from the implementation of the Rio Tinto Safe Production System, which we will significantly ramp up in 2022, as we continue to work hard to improve our operational performance to become the best operator.

"In the fourth quarter we set a new direction for the company and announced a number of partnerships focused on decarbonising the value chain for our products, including green steel. We also entered into a binding agreement to acquire the Rincon lithium project in Argentina, which is strongly aligned with our strategy. These actions will ensure we continue to deliver attractive returns to shareholders, invest in sustaining and growing our portfolio, and progress our ambition to net-zero carbon emissions."

Production*		Q4 2021	vs Q4 2020	vs Q3 2021	Full Year 2021	vs Full Year 2020
Pilbara iron ore shipments (100% basis)	Mt	84.1	-5%	+1%	321.6	-3%
Pilbara iron ore production (100% basis)	Mt	84.1	-2%	+1%	319.7	-4%
Bauxite	Mt	13.1	-2%	-6%	54.3	-3%
Aluminium	kt	757	-7%	-2%	3,151	-1%
Mined copper	kt	132	0%	+6%	494	-7%
Titanium dioxide slag	kt	228	-16%	+9%	1,014	-9%
IOC iron ore pellets and concentrate	Mt	2.5	-9%	+15%	9.7	-6%

*Rio Tinto share unless otherwise stated

2021 operational highlights and other key announcements

- The safety and well-being of our employees and contractors remains our priority. Fatigue, labour shortages and other pressures from COVID-19 have heightened the safety risk in day-to-day operations and remind us that there is no room for complacency. We experienced our third consecutive year with no fatalities at our managed operations. We are working hard with our partners to achieve the same results at our non-managed assets and marine operations.
- Pilbara iron ore production of 319.7 million tonnes (100% basis) was 4% lower than 2020. This is due to above average rainfall in the first half of the year, cultural heritage management and delays in growth and brownfield mine replacement tie-in projects. Pilbara shipments in 2021 were 321.6 million tonnes (100% basis), 3% lower than 2020, and included elevated levels of SP10 product as a result of delays in growth and brownfield mine replacement tie-in projects.
- Bauxite production of 54.3 million tonnes was 3% lower than 2020 due to severe wet weather in the first quarter impacting system stability throughout the year, equipment reliability issues and overruns on planned shutdowns at our Pacific operations.
- Aluminium production of 3.2 million tonnes was 1% lower than 2020 due to reduced capacity at our Kitimat smelter in British Columbia following the strike which commenced in July 2021. The labour union and employees have reached an agreement with controlled restart in 2022.
- Mined copper production of 494 thousand tonnes was 7% lower than 2020 due to lower recoveries and throughput at Escondida as a result of the prolonged impact of COVID-19, partly offset by higher recoveries and grades at Oyu Tolgoi in Mongolia and Kennecott in the US.

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- Titanium dioxide slag production of 1,014 thousand tonnes was 9% lower than 2020 as a result of community disruptions and subsequent curtailment of operations at Richards Bay Minerals (RBM) coupled with unplanned maintenance and equipment reliability issues at Rio Tinto Fer et Titane (RTFT) in Canada. On 24 August, RBM resumed operations following stabilisation of the security situation, supported by the national and provincial government, as well as substantive engagement with host communities and their traditional authorities.
 - Production of pellets and concentrate at Iron Ore Company of Canada (IOC) was 6% lower than 2020 due to prolonged labour and equipment availability issues impacting product feed and various other operational challenges throughout the year.
 - At the Jadar lithium-borate project in Serbia, as a result of delays in the approval of the Exploitation Field Licence (EFL), which is a prerequisite to publish the Environmental Impact Assessment (EIA) and commence the consultation process, we are revising development timelines. Based on current estimates and subject to receiving all relevant approvals, permits and licences, first saleable production is expected to be no earlier than 2027 (previously 2026).
 - In the fourth quarter, we entered into several partnerships to accelerate decarbonising our own business and the value chains we operate in. In November, we announced the ELYSIS joint venture successfully produced aluminium without any direct greenhouse gas emissions from commercial-size cells.
 - On 20 October, we [outlined](#) the actions being taken to strengthen the business and improve performance. We unveiled a longer-term strategy to ensure we thrive in a decarbonising world and continue to deliver attractive shareholder returns, in line with our policy.
 - This year, we initiated the Rio Tinto Safe Production System (RTSPS) at five pilot sites, focusing on sustainably unlocking capacity across the system. We are already seeing returns in the first year of rollout including a significant improvement at the Kennecott concentrator since the July deployment compared to the previous 12 months performance. A significantly larger programme is planned for 2022, subject to COVID-19 constraints, with the RTSPS rollout of up to 30 deployments at 15 sites as well as up to 80 rapid improvement projects which aim at improving targeted bottlenecks.
 - On 28 October, we [issued](#) \$1.25 billion 30-year fixed rate SEC-registered bonds priced at 2.75%. The proceeds of the new issuance were used to fund the early redemption and extinguishment of the company's \$1.20 billion 3.75% bonds due to mature in June 2025.
 - On 19 December, we [announced](#) the Board of Directors had selected Dominic Barton to succeed Simon Thompson as the new Chair. Dominic will join the Board with effect from 4 April 2022 and be appointed to the role of Chair at the conclusion of the Rio Tinto Limited annual general meeting on 5 May 2022.
 - On 21 December, we [announced](#) we had entered into a binding agreement to acquire the Rincon lithium project in Argentina from Rincon Mining for \$825 million. Rincon is one of the largest undeveloped lithium brine projects in the world, located in the heart of the lithium triangle in Salta Province.
 - Our guidance assumes development of the pandemic does not lead to government-imposed restrictions and widespread protracted cases related to new highly contagious variants with high severity, which could result in a significant number of our production 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. This risk is exacerbated globally by tight labour markets and supply chain delays.
 - 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 production guidance

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

¹Pilbara shipments guidance remains subject to risks around commissioning and 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 pandemic does not lead to government-imposed restrictions and widespread protracted cases related to new highly contagious variants with high severity, which could result in a significant number of our production 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. This risk is exacerbated globally by tight labour markets and supply chain delays.
- Pilbara shipments guidance remains subject to commissioning and ramp-up of new mines and management of cultural heritage, including any impacts from the recent changes to the Aboriginal Heritage Act 1972 (WA). We support the strengthening of Aboriginal heritage protection in Western Australia and continue to engage with Traditional Owners regarding current and proposed plans for mining activities, adjusting mine plans where required. Given the quality of our resource, we retain a range of development options in the Pilbara, subject to heritage and environmental approvals.

Investments, growth and development projects

- We continue to proactively manage COVID-19 and prioritise work across critical projects, as challenges associated with interstate and international border access continue, impacting the availability and movement of people and goods, most notably in Australia and Mongolia. Mitigation plans are in place however there are some delays with the delivery of equipment to sites and access to key personnel.
- Exploration and evaluation expense in 2021 was \$726 million, \$101 million (16%) higher than 2020, with ramp-up of activities in Australia, Europe and Western Africa.

Pilbara mine projects

- Commissioning and ramp-up of Pilbara growth and brownfield mine replacement projects has been impacted by ongoing COVID-19 restrictions, including labour access and supply chain quality issues. The latter has been exacerbated by an inability to conduct pre-delivery quality assurance and control at international steel and equipment manufacturers due to limitations on travel.
- Mining and operational readiness activities are progressing at the Gudai-Darri mine and the railway is operational. The first train was loaded from the mobile crushing and screening facilities in December. First production from the main plant is now expected in the second quarter of 2022, subject to the continuing impacts of COVID-19.
- The Western Turner Syncline Phase 2 project achieved first ore in October, in line with previous guidance. At Robe Valley, the autonomous mining truck fleet has been commissioned. Since achieving first ore in August, ongoing wet plant construction and commissioning challenges are impacting production ramp-up.

Oyu Tolgoi underground project¹

Technical progress

- The project is technically and operationally ready for undercut commencement, despite continued COVID-19 constraints in Mongolia. Site accommodation and staffing levels improved in the quarter to between 60% and 70% of planned requirements. The impact on project costs of the additional restrictions related to COVID-19 to the end of December 2021 is estimated to be \$175 million. The project has achieved the conveyor to surface decline breakthrough and completed construction of Materials Handling System 1 with commissioning expected to be completed in the coming weeks.
- Shaft 4 sinking activities recommenced in October, with advancement now at 148 metres below ground level. Shaft 3 readiness works continue, with sinking commencement expected by the end of the first quarter of 2022, despite some disruptions following an unplanned failure on one of the sinking brake systems. The delay to the commissioning of shafts 3 and 4 is still expected to be approximately nine months per prior guidance based on known COVID-19 impacts to date. Panel 1 and 2 studies will be ongoing throughout 2022.

Other updates

- Negotiations with the Government of Mongolia are constructive and making positive progress. All key stakeholders have stated that they remain committed to moving the project forward and reaching a long-term solution to the items under discussion.
- In December, the updated Resources and Reserves were registered in Mongolia in accordance with Mongolian regulations and approval from Mongolian authorities of the 2022 Annual Mine Plan was received. The updated Feasibility Study (OTFS20) has been submitted to the relevant governmental agencies of Mongolia.
- As a result of COVID-19 impacts and outstanding non-technical undercut criteria, first sustainable production will be no earlier than January 2023, subject to the timing of commencement of the undercut. The full impact on the cost of the integrated project is subject to further analysis once we have clarity on the timeline around the completion of the undercut criteria and ongoing COVID-19 restrictions.
- Other milestones that need to be met in order to ensure that the project can commence caving operations (undercut) include: approval of the project investment uplift to \$6.75 billion, approval of the funding plan and extension of the current power supply arrangements until an agreed long term stable and reliable power solution can be fully implemented.

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, Canada, the tunnel boring machine is being dismantled and removed following breakthrough in October. Although COVID-19 continues to affect the workforce, project completion remains on schedule for the second half of 2022.
- At the Resolution Copper project in Arizona, we continue to work with the US Forest Service to secure approval of the Final Environmental Impact Statement (EIS). In parallel, mine studies and engagement with the Native American tribes and local communities continue to progress.
- At the Winu project in Western Australia, there has been progress towards securing consent from the Traditional Owners to the Project Agreement in advance of submitting the necessary environmental and regulatory approvals. Drilling, fieldwork and study activities continue to progress to schedule.
- At the Simandou iron ore project in Guinea, we continue to engage with key stakeholders in-country including the Government of Guinea. We remain committed to an inclusive partnership, seeking mutual and sustainable benefits by developing our project in line with international social and environmental standards. A new drilling programme has commenced, and expressions of interest are being sourced for construction and early development works expected to be carried out in 2022.
- At the Jadar lithium-borate project in Serbia, as a result of delays in the approval of the Exploitation Field Licence (EFL), which is a prerequisite to publish the Environmental Impact Assessment (EIA) and commence the consultation process, we are revising development timelines. Based on current estimates and subject to receiving all relevant approvals, permits and licences, first saleable production is expected to be no earlier than 2027 (previously 2026). The Feasibility Study and the EIA Studies are progressing. We fully understand the concerns amongst some Serbian stakeholders about environmental impacts and we will continue to engage to demonstrate the project has developed mitigation solutions in the project plan.
- Energy Resources of Australia (ERA) has previously indicated to the market that it has identified cost and schedule overruns in executing the mine closure plan that is expected to be significant relative to the findings of the Ranger Project Area closure feasibility study.

¹Project baseline reporting has been updated following endorsement of the definitive estimate by Rio Tinto Board and Turquoise Hill Resources (pending Oyu Tolgoi board approval).

The definitive estimate assumed COVID-19 restrictions in 2021 that were no more stringent than those experienced in September 2020 and noted that should COVID-19 constraints continue beyond 2021 or should the COVID-19 situation escalate further in 2021 leading to tougher restrictions, additional costs and schedule impacts would arise. Since the definitive estimate, at the end of 2020, Mongolia implemented additional restrictions in response to community transmission cases, and in March 2021 the first cases of COVID-19 were identified at Oyu Tolgoi resulting in temporary site shutdown, quarantine measures and further travel and movement restrictions. The impact of these additional restrictions, which have continued throughout this period and are beyond those experienced in September 2020, is ongoing. To date, the impact on projects costs of the additional restrictions experienced to the end of December 2021 is estimated to be \$175 million. Additional costs and schedule impacts continue to be incurred and the final impact is still to be determined.

Sustainability highlights

We continue to advance our sustainability agenda. We are now a member of [The Dow Jones Sustainability™ World Index](#), which comprises global sustainability leaders as identified by S&P Global, representing the top 10% of the largest 2,500 companies in the S&P Global Broad Market Index based on ESG dimensions.

On 9 November, we [announced](#) a partnership with RESOLVE, a Washington-based non profit organisation, to launch Regeneration, a start-up that will use the re-mining and processing of waste from legacy mine sites to support rehabilitation activities and restore natural environments. We will make an equity investment of \$2 million and analyse our portfolio to identify potential opportunities for the first Regeneration project.

On 23 October, we [announced](#) a partnership with BHP and Fortescue Metals Group to fund innovative, industry-first learning programmes as part of a continued commitment towards mining sector workplaces that are free from sexual harassment, bullying and racism. The partnership will fund and contribute to the design, development and implementation of new social awareness education packages for deployment through a range of education providers such as Technical and further education (TAFE), Registered Training Organisations, universities and high schools.

On 19 December, we [called for](#) Expressions of Interest from Western Australian manufacturers to build 100 rail cars for our Pilbara operations. We will initially purchase 50 rail cars from the successful supplier, followed by an ongoing commitment of 10 rail cars a year for the next five years. This will help grow the local rail car manufacturing industry and support local jobs.

Communities & Social Performance (CSP)

At the end of 2021 the relationship between Puutu Kunti Kurrama and Pinikura (PKKP) leadership and Rio Tinto Iron Ore is constructive and considered. The ongoing rehabilitation works at Juukan Gorge are on schedule and have the active involvement of the appointed Puutu Kunti Kurrama (PKK) committee members. An agreement on a co-management of country approach and an appropriate remedy for the destruction of Juukan Gorge is substantially progressed. Together we are charting new territory, and this takes time, but we are moving forward on a model which is respectful and looks to provide certainty of protection for cultural heritage and mining.

On 17 October, we [welcomed](#) the Joint Standing Committee on Northern Australia's final report into the destruction of the rock shelters at Juukan Gorge. We continue to work closely with Traditional Owners to build trusted relationships and better understand and protect their cultural heritage.

On 17 October, we [announced](#) a new three-year partnership with Telethon aimed at improving the health and well-being of children in Western Australia. The partnership, which follows \$4 million contribution in 2020, will provide \$4 million contribution each year to 2023, to support research into mental health and juvenile diabetes.

At Resolution Copper in Arizona, we partnered with Stantec and White Mountain Apache community members to provide 64 hydro panels on the Fort Apache Reservation, and we are planning installation programs in other Native American communities. The panels will provide a new source of clean drinking water through an innovative, renewable technology that uses solar energy.

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

Agreement modernisation

Discussions with Pilbara Traditional Owners to modernise existing agreements continued in the fourth quarter. Heads of Agreements (HoA), or similar, are being drafted with two Traditional Owner Groups. The HoA include principles and approaches to co-management of country over the life of mine cycle and partnership arrangements to broaden benefits arising from mining. Engagement protocols to guide the modernisation discussions have been executed or endorsed with five Traditional Owner Groups.

Cultural heritage management

Pilbara Iron Ore continues to apply the Integrated Heritage Management Process (IHMP). Known sites of cultural significance continue to be re-assessed and mine plans adjusted or measures taken to avoid disturbance. This includes increased buffer zones and blast management plans to reduce vibration risk. To date, we have reviewed 2,205 heritage sites across different planning horizons. Lessons learned and best practice are shared and replicated, as appropriate, across Rio Tinto.

Australian Advisory Group (AAG)

Work to develop the AAG is progressing with the terms of reference finalised. The AAG is on track to commence in the first quarter of 2022 and will be comprised of a minimum of 60% Aboriginal or Torres Strait Islander membership, with an Indigenous Australian Chairperson.

Aboriginal Heritage Act 1972 (WA)

We support the strengthening of Aboriginal heritage protection in Western Australia. We continue to collaborate with Traditional Owners, incorporating heritage and social surroundings information into mine designs, new developments and our IHMP systems.

Climate change and our value chain

We progressed initiatives in the fourth quarter in line with our pathway to decarbonise our business and actively develop technologies that will enable our customers and our customers' customers to decarbonise.

- On 26 October, we [announced](#) a partnership with Carbfix to implement a technology for capturing carbon and permanently storing it underground at our ISAL aluminium smelter in Iceland. Under a Memorandum of Understanding (MoU), Carbfix will use Rio Tinto's land surrounding the ISAL smelter for onshore CO₂ injection in the world's first carbon mineral storage hub, the Coda Terminal. Liquefied CO₂ will be imported by ship from industrial sites across North Europe for storage. The partnership follows an investment earlier in October in Carbon Capture Inc., a climate tech start-up that focuses on developing modular Direct Air Capture units powered by renewable energy and with the potential to remove significant amounts of CO₂ from the atmosphere for permanent underground storage.
- On 27 October, we [announced](#) a partnership with the U.S. Geological Survey (USGS), the science agency for the US Department of the Interior, to provide a clearer picture of the potential for critical mineral resources beneath the Continental Divide near Montana's Boulder Batholith. The USGS will fly airborne geophysical surveys in areas of interest with support from Rio Tinto during 2022 as part of its Earth Mapping Resources Initiative.
- On 28 October, we [announced](#) the signing of a MoU with BlueScope to research and design low-emissions processes for the steel value chain, including iron ore processing, iron and steelmaking and related technologies. The companies will work together to explore low-carbon steelmaking pathways using Pilbara iron ores, including the use of clean hydrogen to replace coking coal at BlueScope's Port Kembla Steelworks.
- On 4 November, we [announced](#) ELYSIS successfully produced aluminium without any direct greenhouse emissions at its Industrial Research and Development Center in Saguenay, Canada. Work is now focused on accelerating the scale-up of the ELYSIS technology towards the demonstration of even larger commercial-size cells in 2023.
- On 16 November, we [announced](#) an investment in Inobat Auto, a European-based battery technology and manufacturing company. This investment will support the completion of InoBat's research and development centre and pilot battery line in Voderady, Slovakia. The investment follows a MoU signed in May, outlining an intention to work together to progress the establishment of a "cradle-to-cradle" electric vehicle battery value chain in Serbia.
- On 10 December, we [announced](#) the launch of the construction of the the solar and wind power plant at QIT Madagascar Minerals (QMM) ilmenite mine operations in Fort Dauphin, in southern Madagascar. The renewable energy project plays a key role in implementing QMM's 'sustainable mine' concept and enabling Rio Tinto operations in Madagascar to reach carbon neutrality by 2023.
- On 11 January, we [announced](#) the purchase of four battery-electric trains for use in the Pilbara, Western Australia. Production is due to commence in 2023 ahead of initial trials in the Pilbara in early 2024. The locomotives will be recharged at purpose-built charging stations at the port or mine. They will also be capable of generating additional energy while in transit through a regenerative braking system which takes energy from the train and uses it to recharge the onboard batteries.

Our markets

Market dynamics were broadly positive throughout 2021 for most commodities, lifting a number of prices to cyclical highs. Fiscal and monetary support and successful vaccine campaigns were key contributors to strong demand growth that ultimately stretched global supply chains to their limits and created challenging conditions for many of the world's producers. We are encouraged by growth prospects in the coming year but remain vigilant in relation to potential disruption from new COVID-19 variants and geopolitical tensions.

- China is transitioning from tightening to easing policies following a slowdown in the last quarter of 2021, with mild pro-growth measures in place to support property, infrastructure and consumption. We expect China to continue to finetune its policies to balance multiple priorities.
- In the United States, activity momentum eased toward year end amid concerns over the latest COVID-19 variant and persistent supply chain constraints. Peak recovery has likely passed implying GDP growth will slow, but solid fundamentals remain in place. Household debt has fallen to the lowest since 2000, supply shortages are expected to ease and inventory restocking should support growth.
- Economic activity in the eurozone weakened significantly in late 2021, and the current level of restrictions suggest a slower than expected start to 2022, especially for the service-based economies.
- China's crude steel production and iron ore imports were stable year on year, with steel production exceeding 1 billion tonnes for a second time, despite numerous steel mill operating restrictions and a slowing property sector. Steel consumption and production rates in China decelerated significantly during the fourth quarter of 2021 however, iron ore seaborne supply improved, resulting in a ~30% decline in iron ore prices in the fourth quarter versus the prior quarter. Meanwhile, the steel and iron ore demand recovery in developed and other emerging economies maintained its momentum and global crude steel production grew by an estimated 6% year on year – by one of its largest absolute annual increments in history – to a record total of almost 2 billion tonnes in 2021.
- Aluminium prices experienced volatility during the quarter but recovered to just over \$2,800/t at the end of 2021, driven by extensive power-related smelting curtailments in Europe. Physical markets remained tight amid firm demand and lower inventory levels, resulting in regional market premia recovering by the end of the year in both the United States and Europe.
- Copper prices ended the year at 440c/lb, down 45c/lb from record levels reached in May 2021. Demand remained sound throughout 2021, whilst supply faced multiple headwinds including COVID-19, shipping disruptions and other factors. Exchange inventories declined over the course of 2021 and ended the year at less than 200kt.
- Global electric vehicle (EV) sales more than doubled in 2021 due to wider availability of EV models, government subsidies and falling production costs (battery prices). Lithium production was unable to maintain the same pace as demand and prices ended the year up 150%.

Average realised prices achieved for our major commodities

	Units	H1 2021	H2 2021	2021	2020
Pilbara iron ore	FOB, \$/wmt	154.9	111.5	132.3	91.0
Pilbara iron ore	FOB, \$/dmt	168.4	121.2	143.8	98.9
Aluminium*	Metal \$/t	2,626	3,254	2,899	1,946
Copper**	US c/lb	415	435	424	283
IOC pellets	\$/wmt	218.3	210.8	214.4	127.6

*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 positively impacted revenues in 2021 by \$246 million (2020 positive impact of \$182 million).

IRON ORE

Rio Tinto share of production (Million tonnes)	Q4 2021	vs Q4 2020	vs Q3 2021	Full Year 2021	vs Full Year 2020
Pilbara Blend and SP10 Lump ¹	20.4	-6%	+3%	76.4	-1%
Pilbara Blend and SP10 Fines ¹	32.1	+3%	+4%	119.9	-3%
Robe Valley Lump	1.2	-16%	-19%	5.1	-8%
Robe Valley Fines	2.0	-22%	-11%	8.4	-20%
Yandicoogina Fines (HIY)	14.4	+1%	-8%	56.9	-3%
Total Pilbara production	70.1	-1%	0%	266.8	-3%
Total Pilbara production (100% basis)	84.1	-2%	+1%	319.7	-4%

Rio Tinto share of shipments (Million tonnes)	Q4 2021	vs Q4 2020	vs Q3 2021	Full Year 2021	vs Full Year 2020
Pilbara Blend Lump	12.8	-21%	-1%	51.5	-18%
Pilbara Blend Fines	24.3	-31%	-16%	109.6	-13%
Robe Valley Lump	1.1	-15%	+10%	4.0	-14%
Robe Valley Fines	2.2	-27%	-13%	9.4	-18%
Yandicoogina Fines (HIY)	14.1	-6%	-5%	56.9	-1%
SP10 Lump ¹	4.8	+367%	0%	16.1	+315%
SP10 Fines ¹	10.7	+503%	+163%	20.5	+244%
Total Pilbara shipments ²	70.1	-5%	+1%	267.9	-2%
Total Pilbara shipments (100% basis) ²	84.1	-5%	+1%	321.6	-3%
Total Pilbara Shipments (consolidated basis) ^{2, 3}	72.0	-5%	+1%	275.2	-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

2021 shipments of 321.6 million tonnes (Rio Tinto share 267.9 million tonnes) were 3% lower than 2020. Shipments included 36.6 million tonnes of SP10 products. There was 8.8 million tonnes of Pilbara product retained as working capital at China portside (1.7 million tonnes in 2020). SP10 products comprised a higher share of shipments in the fourth quarter as a result of delays in growth and brownfield mine replacement tie-in projects. As those mines ramp-up through the first half of 2022, we will see SP10 gradually decrease and return to levels around 6% of shipments in the medium term.

Pilbara operations produced 319.7 million tonnes (Rio Tinto share 266.8 million tonnes) in 2021, 4% lower than 2020. This was due to above average rainfall in the first half of the year, cultural heritage management and delays in growth and brownfield mine replacement tie-in projects. Ongoing COVID-19 restrictions and a tight labour market have further impacted our ability to access experienced contractors and particular skill sets.

Production from the new greenfields mine at Gudai-Darri and brownfield mine replacement project at Robe Valley, was delayed due to COVID-19 impact on labour availability and an inability to conduct pre-delivery quality assurance and control at international steel manufacturers due to limitations on travel. First ore from Gudai-Darri was railed in December from the modular crushing and screening plant installed to supplement production and mitigate commissioning delays. Robe Valley production was significantly impacted by the Mesa A wet plant commissioning delays.

Approximately 11% of sales in 2021 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 or on the spot market. Approximately 28% of sales in the fourth quarter were made on a free on board (FOB) basis, with the remainder sold including freight.

Achieved realised pricing in 2021 was \$132.3 per wet metric tonne on an FOB basis (equivalent to \$143.8 per dry metric tonne, at 8% moisture assumption). This compares to the monthly average Platts index for 62% fines converted to an FOB basis of \$146.9 per dry metric tonne. In 2020, average realised pricing was \$91.0 per wet metric tonne (\$98.9 dry metric tonne).

China Portside Trading

We continue to increase our iron ore portside sales in China, with 5.1 million tonnes of sales in the fourth quarter of 2021 (1.8 million tonnes in the fourth quarter of 2020), leading to a total of 14.0 million tonnes in 2021 (5.5 million tonnes in 2020). We experienced increased inventory levels at the port due to higher volumes of SP10 and constrained availability of high grade blending stocks in the fourth quarter.

Our portside operation handles product from the Pilbara and Canada as well as third party product, and provides blending and screening capabilities. Approximately 81% of portside sales in 2021 were either blended or screened in Chinese ports.

ALUMINIUM

Rio Tinto share of production ('000 tonnes)	Q4 2021	vs Q4 2020	vs Q3 2021	Full Year 2021	vs Full Year 2020
Bauxite	13,095	-2%	-6%	54,326	-3%
Bauxite third party shipments	8,988	-1%	-11%	37,596	-4%
Alumina	1,911	-8%	-1%	7,894	-2%
Aluminium	757	-7%	-2%	3,151	-1%

Bauxite

Bauxite production of 54.3 million tonnes was 3% lower than 2020 due to severe wet weather in the first quarter impacting system stability throughout the year, equipment reliability issues and overruns on planned shutdowns at our Pacific operations.

We shipped 37.6 million tonnes of bauxite to third parties in 2021, 4% lower than the same period of 2020 due to the major weather events in the first quarter causing shipment delays.

Alumina

Alumina production of 7.9 million tonnes was 2% lower than 2020, as a result of outages during the year at the Yarwun refinery in Queensland, Australia and at Vaudreuil refinery in Quebec, Canada. Production at the Queensland refinery remained stable year on year.

Aluminium

Aluminium production of 3.2 million tonnes was 1% lower than 2020 due to reduced capacity at our Kitimat smelter in British Columbia following the strike which commenced in July 2021. Agreement with the labour union and employees was reached in October with a controlled restart in 2022. The reduced capacity was partly offset by a robust performance across the remaining smelting portfolio.

Average realised aluminium prices including both product and market premiums for value-added products (VAP) and remelt were up by 49% to \$2,899 per tonne in 2021 (2020: \$1,946 per tonne). The LME price increased by 46% to \$2,480 per tonne (2020: \$1,704 per tonne), whilst the mid-west premium duty paid increased by 119% to \$584 per tonne in 2021 (2020: \$267 per tonne). Our VAP sales comprised 50% of primary metal sold in 2021 (2020: 43%). Product premiums for VAP sales improved by 8% averaging, \$230 per tonne of VAP sold (2020: \$213 per tonne).

On 17 November, we [announced](#) an investment of \$87 million to increase low-carbon aluminium production in Canada with 16 new smelting cells at our AP60 smelter, in the Saguenay-Lac-Saint-Jean region of Quebec. The investment will increase production at the smelter by around 45%, or 26,500 tonnes of primary aluminium per year, to a capacity of 86,500 metric tonnes and provide a secure future for approximately 100 employees who work at the facility.

COPPER

Rio Tinto share of production ('000 tonnes)	Q4 2021	vs Q4 2020	vs Q3 2021	Full Year 2021	vs Full Year 2020
Mined copper					
Kennecott	49.7	+47%	+16%	159.4	+14%
Escondida	69.6	-18%	+2%	279.5	-17%
Oyu Tolgoi	13.0	-7%	-7%	54.6	+9%
Refined copper					
Kennecott	25.5	-38%	-29%	143.3	+69%
Escondida	14.5	-5%	-1%	58.6	-17%

Kennecott

Mined copper production was 14% higher than 2020, with higher grades and recovery but less than expected production due to the slope failure in May. The transition to the south wall is complete, with copper head grade exceeding 0.5% in the second half.

Refined copper production was 69% higher than 2020 as a result of improved performance through most of the year relative to 2020, despite the furnace failure in September 2021. The smelter was safely restarted in late October and has been stable since. In 2020, there was also significant downtime following an earthquake and major maintenance.

Escondida

Mined copper production was 17% lower than 2020, mainly due to 10% lower grade in ore feed to concentrators, 4% lower throughput and 31% lower recoverable copper in ore stacked for leaching, mostly caused by continuous COVID-19 restrictions in 2021 which impacted the mine development due to lower workforce availability.

Oyu Tolgoi

Mined copper production from the open pit was 9% higher than 2020 with improved performance, temporary increase in grades, and increased mill feed following geotechnical issues in the first half, partly offset by lower staffing levels due to COVID-19.

Safety is our first priority and strict measures are in place to protect our people. In the fourth quarter, stringent Chinese border restrictions continued due to increased cases of COVID-19 in Mongolia. We continue to work closely with the Mongolian and Chinese authorities and our customers to manage the risk of supply chain disruptions. Cross-border concentrate shipments into China have resumed with some measures in place to transport greater volumes in a safe and efficient manner, however uncertainty continues to exist with the rate of COVID-19 cases in Mongolia. The force majeure declared on shipments from 30 March remains in place.

Provisional pricing

At 31 December 2021, the Group had approximately 201 million pounds of copper sales that were provisionally priced at 436 cents per pound. The final price of these sales will be determined during the first half of 2022. This compares with 260 million pounds of open shipments at 31 December 2020, provisionally priced at 336 cents per pound. Provisional pricing adjustments positively impacted revenues in 2021 by \$246 million (2020 positive impact of \$182 million).

MINERALS

Rio Tinto share of production (million tonnes)	Q4 2021	vs Q4 2020	vs Q3 2021	Full Year 2021	vs Full Year 2020
Iron ore pellets and concentrate					
IOC	2.5	-9%	+15%	9.7	-6%

Rio Tinto share of production ('000 tonnes)	Q4 2021	vs Q4 2020	vs Q3 2021	Full Year 2021	vs Full Year 2020
Minerals					
Borates - B ₂ O ₃ content	117	+18%	-5%	488	+2%
Titanium dioxide slag	228	-16%	+9%	1,014	-9%

Rio Tinto share of production ('000 carats)	Q4 2021	vs Q4 2020	vs Q3 2021	Full Year 2021	vs Full Year 2020
Diavik	1,155	+27%	+38%	3,847	+3%

Iron Ore Company of Canada (IOC)

Iron ore production was 6% lower than 2020 due to prolonged labour and equipment availability issues impacting product feed and various other operational challenges throughout the year.

Borates

Borates production in 2021 was in line with 2020 and benefited from improved refinery operating rates following the successful implementation of productivity initiatives supporting system stability. We expect logistical challenges to continue with elevated congestion at the Port of Los Angeles and shipping rate escalation. Labour availability is also posing a threat to supply chain stability.

Iron and Titanium

Titanium dioxide production was 9% lower than 2020. The lower production was as a result of community disruptions and subsequent curtailment of operations at Richards Bay Minerals (RBM) in South Africa coupled with unplanned maintenance and equipment reliability issues at Rio Tinto Fer et Titane (RTFT), Canada. On 24 August, RBM resumed operations following stabilisation of the security situation, supported by the national and provincial government, as well as substantive engagement with host communities and their traditional authorities.

Diamonds

On 18 November, we [announced](#) we had become the sole owner of Diavik Diamond Mine in the Northwest Territories of Canada, continuing its leading role in the Canadian diamond industry. At Diavik, carats recovered in 2021 were 3% higher than 2020, due to an increased share of production from November, which offset plant performance issues and lower ore grade in the fourth quarter.

On 28 October, we [announced](#) that the 2021 Argyle Pink Diamonds™ Tender collection of 70 rare pink and red diamonds from our Argyle mine in Australia delivered record breaking results in its 38-year history. The 2021 collection is a historical collection comprising the pinnacle of the Argyle production, mined in its final year of operations, before closing in November 2020.

EXPLORATION AND EVALUATION

Pre-tax and pre-divestment expenditure on exploration and evaluation charged to the income statement in 2021 was \$726 million, compared with \$625 million in 2020. Approximately 40% of this expenditure was incurred by Copper, 35% by central exploration, 16% by Minerals and 9% by Iron Ore.

There were no significant divestments of central exploration properties in 2021.

Exploration highlights

Rio Tinto has a strong portfolio of projects with activity in 18 countries across seven commodities in early exploration and studies stages. All projects have followed government COVID-19 requirements and guidelines while focusing on protecting well-being and health of local communities. The bulk of the exploration expenditure in the fourth quarter focused on copper in Australia, Canada, Kazakhstan, United States and Zambia, nickel projects in Canada, and diamonds projects in Canada. A mineral investment contract was signed with the Republic of Angola and Endiama to explore for diamonds. Mine-lease exploration continued at Rio Tinto managed businesses including Pilbara Iron in Australia and Diavik in Canada. Activities on the ground at the Falcon diamonds project in Saskatchewan, Canada are limited to care and maintenance while Rio Tinto continues to carry out studies and review information acquired in previous programs.

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 borates: Jadar, Serbia Nickel: Tamarack, US (3rd party operated)		Nickel Greenfield: Canada, Finland
Copper	Copper/molybdenum: Resolution, US Copper/Gold: Winu, Australia	Copper: La Granja, Peru, Pribrezhniy, Kazakhstan Calibre-Magnum, Australia	Copper Greenfield: Australia, Chile, China, Kazakhstan, Nicaragua, Peru, Serbia, US, Zambia, Brazil, Canada, Colombia, Finland, Namibia
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: South Africa

*Limited activity during the quarter

**Became sole owner and operator in 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			Full Year		% change		
		2020 Q4	2021 Q3	2021 Q4	2020	2021	Q4 21 vs Q4 20	Q4 21 vs Q3 21	2021 vs 2020
Principal commodities									
Alumina	('000 t)	2,085	1,937	1,911	8,039	7,894	-8%	-1%	-2%
Aluminium	('000 t)	815	774	757	3,180	3,151	-7%	-2%	-1%
Bauxite	('000 t)	13,299	13,967	13,095	56,131	54,326	-2%	-6%	-3%
Borates	('000 t)	100	123	117	480	488	+18%	-5%	+2%
Copper - mined	('000 t)	132.5	125.2	132.3	527.9	493.5	0%	+6%	-7%
Copper - refined	('000 t)	56.1	50.5	40.0	155.0	201.9	-29%	-21%	+30%
Diamonds	('000 cts)	910	834	1,155	3,731	3,847	+27%	+38%	+3%
Iron Ore	('000 t)	73,749	72,074	72,561	285,932	276,557	-2%	+1%	-3%
Titanium dioxide slag	('000 t)	272	209	228	1,120	1,014	-16%	+9%	-9%
Other Metals & Minerals									
Gold - mined	('000 oz)	89.1	94.5	73.9	283.0	344.9	-17%	-22%	+22%
Gold - refined	('000 oz)	38.9	44.5	31.5	117.5	176.4	-19%	-29%	+50%
Molybdenum	('000 t)	6.4	0.4	1.1	20.4	7.6	-83%	+144%	-63%
Uranium	('000 lbs)	742	0	0	2,870	65	-100%	0%	-98%
Salt	('000 t)	1,113	1,508	1,471	4,861	5,848	+32%	-2%	+20%
Silver - mined	('000 oz)	1,120	1,110	1,108	4,357	4,148	-1%	0%	-5%
Silver - refined	('000 oz)	449	733	516	1,363	2,671	+15%	-30%	+96%

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	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
ALUMINA								
Production ('000 tonnes)								
Jonquière (Vaudreuil)	100 %	364	352	349	325	338	1,424	1,364
Jonquière (Vaudreuil) specialty Alumina plant	100 %	24	22	28	29	28	94	107
Queensland Alumina	80 %	774	743	756	738	727	2,961	2,964
São Luis (Alumar)	10 %	99	95	97	75	99	385	366
Yarwun	100 %	823	822	782	770	719	3,175	3,093
Rio Tinto total alumina production		2,085	2,034	2,012	1,937	1,911	8,039	7,894
ALUMINIUM								
Production ('000 tonnes)								
Australia - Bell Bay	100 %	48	46	47	48	48	192	189
Australia - Boyne Island	59 %	77	74	75	75	75	303	298
Australia - Tomago	52 %	77	75	75	77	78	305	305
Canada - six wholly owned	100 %	387	385	391	343	325	1,506	1,444
Canada - Alouette (Sept-Îles)	40 %	63	62	63	64	63	249	251
Canada - Bécancour	25 %	29	28	29	29	30	98	116
Iceland - ISAL (Reykjavik)	100 %	48	49	51	52	52	183	203
New Zealand - Tiwai Point	79 %	67	65	65	67	67	265	264
Oman - Sohar	20 %	20	20	20	20	20	79	79
Rio Tinto total aluminium production		815	803	816	774	757	3,180	3,151
BAUXITE								
Production ('000 tonnes) (a)								
Gove	100 %	3,090	2,879	3,030	3,067	2,787	12,299	11,763
Porto Trombetas	12 %	392	254	364	332	416	1,395	1,366
Sangaredi	(b)	1,887	1,887	1,755	1,763	1,704	7,428	7,109
Weipa	100 %	7,929	8,545	8,550	8,805	8,188	35,009	34,088
Rio Tinto total bauxite production		13,299	13,566	13,699	13,967	13,095	56,131	54,326

(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	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
BORATES								
Production ('000 tonnes B₂O₃ content)								
Rio Tinto Borates - borates	100 %	100	122	126	123	117	480	488
COPPER								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100 %	33.8	33.2	33.7	42.8	49.7	140.0	159.4
Escondida	30 %	84.8	72.1	69.5	68.4	69.6	337.8	279.5
Oyu Tolgoi (b)	34 %	14.0	15.2	12.3	14.1	13.0	50.2	54.6
Rio Tinto total mine production		132.5	120.5	115.5	125.2	132.3	527.9	493.5
Refined production ('000 tonnes)								
Escondida	30 %	15.2	14.0	15.3	14.7	14.5	70.2	58.6
Rio Tinto Kennecott (c)	100 %	40.9	45.2	36.9	35.7	25.5	84.8	143.3
Rio Tinto total refined production		56.1	59.2	52.3	50.5	40.0	155.0	201.9

(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 38.1 thousand tonnes of cathode produced from purchased concentrate in year-to-date 2021. 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 %	910	1,007	851	834	1,155	3,731	3,847
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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 %	45.3	36.2	30.5	38.1	34.7	171.2	139.5
Escondida	30 %	14.3	11.4	11.7	12.6	12.9	50.9	48.5
Oyu Tolgoi (b)	34 %	29.4	48.8	37.9	43.8	26.3	61.0	156.9
Rio Tinto total mine production		89.1	96.4	80.1	94.5	73.9	283.0	344.9

Refined production ('000 ounces)

Rio Tinto Kennecott	100 %	38.9	56.8	43.6	44.5	31.5	117.5	176.4
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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	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
IRON ORE								
Production ('000 tonnes) (a)								
Hamersley mines	(b)	53,316	47,063	47,621	53,041	51,974	210,682	199,699
Hamersley - Channar (c)	100 %	1,935	2,250	2,712	2,593	3,075	6,139	10,630
Hope Downs	50 %	6,571	5,616	5,960	6,500	6,567	24,522	24,642
Iron Ore Company of Canada	59 %	2,740	2,345	2,721	2,163	2,498	10,402	9,727
Robe River - Pannawonica (Mesas J and A)	53 %	3,988	3,506	3,090	3,721	3,196	16,056	13,514
Robe River - West Angelas	53 %	5,199	4,900	4,137	4,056	5,252	18,131	18,345
Rio Tinto iron ore production ('000 tonnes)		73,749	65,681	66,241	72,074	72,561	285,932	276,557
Breakdown of Production:								
Pilbara Blend and SP10 Lump (d)		21,666	18,050	18,265	19,742	20,374	77,393	76,431
Pilbara Blend and SP10 Fines (d)		31,122	28,245	28,796	30,825	32,081	123,292	119,947
Robe Valley Lump		1,364	1,307	1,219	1,423	1,152	5,561	5,102
Robe Valley Fines		2,624	2,199	1,871	2,297	2,044	10,496	8,412
Yandicoogina Fines (HIY)		14,233	13,534	13,369	15,623	14,412	58,789	56,938
Pilbara iron ore production ('000 tonnes)		71,009	63,336	63,520	69,910	70,063	275,530	266,830
IOC Concentrate		1,297	871	1,154	829	1,009	4,781	3,863
IOC Pellets		1,443	1,474	1,567	1,335	1,489	5,622	5,864
IOC iron ore production ('000 tonnes)		2,740	2,345	2,721	2,163	2,498	10,402	9,727
Breakdown of Shipments:								
Pilbara Blend Lump		16,280	12,842	12,830	13,018	12,832	62,878	51,522
Pilbara Blend Fines		35,140	28,565	27,795	28,901	24,308	126,578	109,569
Robe Valley Lump		1,246	1,025	934	962	1,061	4,608	3,981
Robe Valley Fines		3,062	2,402	2,190	2,567	2,237	11,473	9,395
Yandicoogina Fines (HIY)		15,055	14,222	13,640	14,906	14,121	57,749	56,889
SP10 Lump (d)		1,037	2,664	3,748	4,826	4,841	3,879	16,078
SP10 Fines (d)		1,771	2,923	2,817	4,063	10,684	5,951	20,487
Pilbara iron ore shipments ('000 tonnes) (e)		73,590	64,642	63,953	69,242	70,084	273,115	267,921
Pilbara iron ore shipments - consolidated basis ('000 tonnes) (e) (g)								
IOC Concentrate		1,157	1,019	1,048	1,054	989	4,928	4,110
IOC Pellets		1,539	1,477	1,303	1,374	1,711	6,006	5,865
IOC Iron ore shipments ('000 tonnes) (e)		2,696	2,496	2,352	2,428	2,700	10,934	9,976
Rio Tinto iron ore shipments ('000 tonnes) (e)		76,286	67,137	66,305	71,671	72,784	284,050	277,897
Rio Tinto iron ore sales ('000 tonnes) (f)		76,125	65,551	67,145	70,967	69,489	283,778	273,153

(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 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.

(c) 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. Production is reported at 100% from this date onward. Historic data is unchanged.

(d) SP10 includes other lower grade products.

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

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

(g) 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	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
MOLYBDENUM								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100 %	6.4	5.0	1.1	0.4	1.1	20.4	7.6

(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.

SALT								
Production ('000 tonnes)								
Dampier Salt	68 %	1,113	1,411	1,458	1,508	1,471	4,861	5,848

SILVER								
Mine production ('000 ounces) (a)								
Bingham Canyon	100 %	555	524	476	639	589	2,205	2,228
Escondida	30 %	488	395	370	387	439	1,859	1,591
Oyu Tolgoi (b)	34 %	77	85	79	84	80	293	328
Rio Tinto total mine production		1,120	1,005	925	1,110	1,108	4,357	4,148
Refined production ('000 ounces)								
Rio Tinto Kennecott	100 %	449	812	609	733	516	1,363	2,671

(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 %	272	279	298	209	228	1,120	1,014

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

URANIUM								
Production ('000 lbs U₃O₈) (a)								
Energy Resources of Australia	86 %	742	65	—	—	—	2,870	65

(a) ERA production data are drummed U₃O₈. ERA ceased processing operations on 8 January 2021, as required by the Ranger Authority.

Rio Tinto's Argyle operations were closed in 2020. 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 31 December 2021.

Rio Tinto operational data

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
ALUMINA								
Smelter Grade Alumina - Aluminium Group								
Alumina production ('000 tonnes)								
<i>Australia</i>								
Queensland Alumina Refinery - Queensland	80 %	968	929	945	922	909	3,701	3,705
Yarwun refinery - Queensland	100 %	823	822	782	770	719	3,175	3,093
<i>Brazil</i>								
São Luis (Alumar) refinery	10 %	990	953	968	748	993	3,848	3,662
<i>Canada</i>								
Jonquière (Vaudreuil) refinery - Quebec (a)	100 %	364	352	349	325	338	1,424	1,364
<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 %	24	22	28	29	28	94	107

Rio Tinto percentage interest shown above is at 31 December 2021. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
ALUMINIUM								
Primary Aluminium								
Primary aluminium production ('000 tonnes)								
<i>Australia</i>								
Bell Bay smelter - Tasmania	100 %	48	46	47	48	48	192	189
Boyne Island smelter - Queensland	59 %	129	124	127	125	126	510	502
Tomago smelter - New South Wales	52 %	149	145	146	150	150	592	592
<i>Canada</i>								
Alma smelter - Quebec	100 %	119	117	117	119	119	473	471
Alouette (Sept-Îles) smelter - Quebec	40 %	158	155	157	159	157	623	629
Arvida smelter - Quebec	100 %	41	40	42	42	43	169	168
Arvida AP60 smelter - Quebec	100 %	15	15	15	15	15	60	60
Bécancour smelter - Quebec	25 %	115	112	117	115	119	393	463
Grande-Baie smelter - Quebec	100 %	57	56	57	58	58	225	230
Kitimat smelter - British Columbia	100 %	91	95	97	46	25	329	263
Laterrière smelter - Quebec	100 %	63	62	63	63	64	250	252
<i>Iceland</i>								
ISAL (Reykjavik) smelter	100 %	48	49	51	52	52	183	203
<i>New Zealand</i>								
Tiwai Point smelter	79 %	84	82	82	84	85	333	333
<i>Oman</i>								
Sohar smelter	20 %	100	98	99	100	100	397	395

Rio Tinto percentage interest shown above is at 31 December 2021. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
BAUXITE								
Bauxite production ('000 tonnes)								
<i>Australia</i>								
Gove mine - Northern Territory	100 %	3,090	2,879	3,030	3,067	2,787	12,299	11,763
Weipa mine - Queensland	100 %	7,929	8,545	8,550	8,805	8,188	35,009	34,088
<i>Brazil</i>								
Porto Trombetas (MRN) mine	12 %	3,268	2,117	3,033	2,764	3,469	11,629	11,383
<i>Guinea</i>								
Sangaredi mine (a)	23 %	4,193	4,194	3,899	3,919	3,786	16,506	15,797

Rio Tinto share of bauxite shipments

Share of total bauxite shipments ('000 tonnes)		12,993	13,444	13,602	14,201	13,031	55,345	54,278
Share of third party bauxite shipments ('000 tonnes)		9,104	9,024	9,493	10,091	8,988	39,357	37,596

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

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
BORATES								
Rio Tinto Borates - borates	100 %							
<i>US</i>								
Borates ('000 tonnes) (a)		100	122	126	123	117	480	488

(a) Production is expressed as B₂O₃ content.

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
COPPER & GOLD								
Escondida	30 %							
<i>Chile</i>								
Sulphide ore to concentrator ('000 tonnes)		36,303	32,654	31,903	33,528	35,787	139,230	133,872
Average copper grade (%)		0.83	0.78	0.78	0.73	0.71	0.83	0.75
Mill production (metals in concentrates):								
Contained copper ('000 tonnes)		246.1	207.8	202.8	201.2	203.6	956.8	815.5
Contained gold ('000 ounces)		47.8	38.0	38.9	42.0	42.9	169.5	161.7
Contained silver ('000 ounces)		1,627	1,318	1,234	1,291	1,462	6,196	5,305
Recoverable copper in ore stacked for leaching ('000 tonnes) (a)		36.5	32.5	28.7	26.7	28.4	169.1	116.3
Refined production from leach plants:								
Copper cathode production ('000 tonnes)		50.8	46.6	51.1	49.0	48.4	233.9	195.3

(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 31 December 2021. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
COPPER & GOLD (continued)								
Rio Tinto Kennecott								
Bingham Canyon mine	100 %							
<i>Utah, US</i>								
Ore treated ('000 tonnes)		11,418	10,054	7,918	9,995	9,809	44,676	37,776
Average ore grade:								
Copper (%)		0.34	0.38	0.48	0.47	0.55	0.36	0.47
Gold (g/t)		0.22	0.21	0.21	0.22	0.21	0.22	0.21
Silver (g/t)		2.07	2.30	2.64	2.80	2.55	2.08	2.57
Molybdenum (%)		0.068	0.058	0.021	0.017	0.020	0.059	0.029
Copper concentrates produced ('000 tonnes)		138	140	141	180	187	561	648
Average concentrate grade (% Cu)		24.2	23.7	23.9	23.7	26.3	24.8	24.5
Production of metals in copper concentrates:								
Copper ('000 tonnes) (a)		33.8	33.2	33.7	42.8	49.7	140.0	159.4
Gold ('000 ounces)		45.3	36.2	30.5	38.1	34.7	171.2	139.5
Silver ('000 ounces)		555	524	476	639	589	2,205	2,228
Molybdenum concentrates produced ('000 tonnes):								
Molybdenum in concentrates ('000 tonnes)		12.2	9.4	2.2	1.0	2.2	40.7	14.8
		6.4	5.0	1.1	0.4	1.1	20.4	7.6
Kennecott smelter & refinery								
	100 %							
Copper concentrates smelted ('000 tonnes)		234	240	103	165	157	448	665
Copper anodes produced ('000 tonnes) (b)		44.8	50.5	23.5	35.7	32.9	86.9	142.5
Production of refined metal:								
Copper ('000 tonnes) (c)		40.9	45.2	36.9	35.7	25.5	84.8	143.3
Gold ('000 ounces) (d)		38.9	56.8	43.6	44.5	31.5	117.5	176.4
Silver ('000 ounces) (d)		449	812	609	733	516	1,363	2,671

(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 38.1 thousand tonnes of cathode produced from purchased concentrate in year-to-date 2021. 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 31 December 2021. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
COPPER & GOLD (continued)								
Turquoise Hill Resources								
Oyu Tolgoi mine (a)	34 %							
<i>Mongolia</i>								
Ore Treated ('000 tonnes)		9,594	9,813	9,401	9,336	10,573	40,200	39,124
Average mill head grades:								
Copper (%)		0.50	0.56	0.47	0.53	0.46	0.46	0.50
Gold (g/t)		0.41	0.68	0.50	0.63	0.38	0.24	0.54
Silver (g/t)		1.16	1.29	1.19	1.29	1.27	1.18	1.26
Copper concentrates produced ('000 tonnes)		190.2	201.9	173.2	191.9	182.7	693.1	749.6
Average concentrate grade (% Cu)		21.9	22.5	21.2	21.9	21.3	21.6	21.7
Production of metals in concentrates:								
Copper in concentrates ('000 tonnes)		41.6	45.4	36.7	41.9	38.9	149.6	163.0
Gold in concentrates ('000 ounces)		87.8	145.7	113.1	130.8	78.6	181.9	468.1
Silver in concentrates ('000 ounces)		231	255	235	249	239	876	977
Sales of metals in concentrates:								
Copper in concentrates ('000 tonnes)		37.9	39.0	19.6	46.4	34.4	137.8	139.4
Gold in concentrates ('000 ounces)		65.8	110.9	72.6	149.1	102.2	150.0	434.7
Silver in concentrates ('000 ounces)		194	207	106	278	192	760	783

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

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
DIAMONDS								
Argyle Diamonds (a)	100 %							
<i>Western Australia</i>								
AK1 ore processed ('000 tonnes)		1,078	—	—	—	—	5,773	—
AK1 diamonds produced ('000 carats)		1,893	—	—	—	—	10,945	—
Diavik Diamonds (b)	100 %							
<i>Northwest Territories, Canada</i>								
Ore processed ('000 tonnes)		643	632	669	643	596	2,518	2,540
Diamonds recovered ('000 carats)		1,517	1,678	1,418	1,390	1,356	6,218	5,843

(a) Rio Tinto's Argyle operations were closed in 2020.

(b) 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 31 December 2021. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
IRON ORE								
Rio Tinto Iron Ore								
<i>Western Australia</i>								
Pilbara Operations								
Saleable iron ore production ('000 tonnes)								
Hamersley mines	(a)	53,316	47,063	47,621	53,041	51,974	210,682	199,699
Hamersley - Channar (b)	100 %	2,169	2,250	2,712	2,593	3,075	9,175	10,630
Hope Downs	50 %	13,142	11,232	11,920	13,000	13,133	49,045	49,284
Robe River - Pannawonica (Mesas J and A)	53 %	7,525	6,616	5,830	7,021	6,031	30,295	25,497
Robe River - West Angelas	53 %	9,809	9,246	7,806	7,652	9,909	34,209	34,613
Total production ('000 tonnes)		85,961	76,406	75,889	83,306	84,122	333,405	319,724
Breakdown of total production:								
Pilbara Blend and SP10 Lump (c)		25,888	21,901	21,946	23,617	24,998	94,375	92,463
Pilbara Blend and SP10 Fines (c)		38,316	34,356	34,743	37,046	38,681	149,947	144,826
Robe Valley Lump		2,574	2,467	2,300	2,686	2,173	10,492	9,626
Robe Valley Fines		4,951	4,149	3,530	4,335	3,857	19,803	15,871
Yandicoogina Fines (HIY)		14,233	13,534	13,369	15,623	14,412	58,789	56,938
Breakdown of total shipments:								
Pilbara Blend Lump		20,155	15,740	15,631	16,710	16,616	77,117	64,697
Pilbara Blend Fines		42,727	35,777	34,607	36,199	31,620	155,533	138,203
Robe Valley Lump		2,351	1,934	1,762	1,814	2,001	8,694	7,512
Robe Valley Fines		5,778	4,532	4,131	4,843	4,221	21,648	17,727
Yandicoogina Fines (HIY)		15,055	14,222	13,640	14,906	14,121	57,749	56,889
SP10 Lump (c)		1,037	2,664	3,748	4,826	4,841	3,879	16,078
SP10 Fines (c)		1,771	2,923	2,817	4,063	10,684	5,951	20,487
Total shipments ('000 tonnes) (d)		88,873	77,791	76,336	83,360	84,104	330,570	321,592
<hr/>								
	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
Iron Ore Company of Canada								
59 %								
<i>Newfoundland & Labrador and Quebec in Canada</i>								
Saleable iron ore production:								
Concentrates ('000 tonnes)		2,208	1,484	1,965	1,411	1,718	8,141	6,578
Pellets ('000 tonnes)		2,457	2,510	2,669	2,273	2,535	9,574	9,986
IOC Total production ('000 tonnes)		4,666	3,993	4,634	3,684	4,254	17,715	16,564
Shipments:								
Concentrates ('000 tonnes)		1,970	1,735	1,785	1,795	1,684	8,392	7,000
Pellets ('000 tonnes)		2,620	2,515	2,220	2,340	2,914	10,229	9,988
IOC Total Shipments ('000 tonnes) (d)		4,591	4,250	4,005	4,136	4,598	18,621	16,989
Global Iron Ore Totals								
Iron Ore Production ('000 tonnes)		90,627	80,400	80,523	86,990	88,375	351,121	336,288
Iron Ore Shipments ('000 tonnes)		93,464	82,041	80,341	87,496	88,702	349,190	338,581
Iron Ore Sales ('000 tonnes) (e)		93,016	80,291	81,097	86,542	85,256	348,098	333,185

(a) Includes 100% of production from Paraburdoo, Mt Tom Price, Western Turner Syncline, Marandoo, Yandicoogina, Brockman, Nammuldi, Silvergrass 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.

(b) 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. Historic data is unchanged.

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

Rio Tinto percentage interest shown above is at 31 December 2021. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Full Year 2020	Full Year 2021
SALT								
Dampier Salt	68 %							
<i>Western Australia</i>								
Salt production ('000 tonnes)		1,628	2,064	2,132	2,206	2,152	7,111	8,555
TITANIUM DIOXIDE SLAG								
Rio Tinto Iron & Titanium	100 %							
<i>Canada and South Africa</i>								
(Rio Tinto share) (a)								
Titanium dioxide slag ('000 tonnes)		272	279	298	209	228	1,120	1,014

(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.

URANIUM

Energy Resources of Australia Ltd

Ranger mine (a)

Northern Territory, Australia

U ₃ O ₈ Production ('000 lbs)	860	75	—	—	—	—	3,471	75
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(a) ERA production data are drummed U₃O₈.

ERA ceased processing operations on 8 January 2021, as required by the Ranger Authority.

Rio Tinto percentage interest shown above is at 31 December 2021. The data represents production and sales on a 100% basis unless otherwise stated.