

Rio Tinto releases first quarter production results

20 April 2023

Rio Tinto Chief Executive Jakob Stausholm said: “We continue to make steady progress with our highest ever first quarter shipments achieved in the Pilbara iron ore business. Through the ongoing deployment of our Safe Production System we expect to see a sustainable lift in operating performance across our global portfolio over time, in line with improvements already achieved.

“We remain focused on disciplined growth in materials the world needs for the energy transition, delivering first sustainable production from the underground mine at Oyu Tolgoi in Mongolia and progressing early works on the Rincon lithium project in Argentina. We advanced the Simandou high grade iron ore project in Guinea with our partners, and entered into an agreement for a joint venture to unlock La Granja in Peru, one of the largest undeveloped copper projects in the world.

“We continue to take action to strengthen our culture and invest in genuine partnerships, implementing the recommendations of the Everyday Respect report and reaching a new agreement with the Naskapi Nation of Kawawachikamach in Canada. As we progress against our four objectives and strategy, we have a clear long-term pathway to profitable growth and continued attractive shareholder returns.”

Production*		Q1 2023	vs Q1 2022	vs Q4 2022
Pilbara iron ore shipments (100% basis)	Mt	82.5	+16%	-6%
Pilbara iron ore production (100% basis)	Mt	79.3	+11%	-11%
Bauxite	Mt	12.1	-11%	-8%
Aluminium	kt	785	+7%	0%
Mined copper (consolidated basis)	kt	145	0%	-5%
Titanium dioxide slag	kt	285	+4%	-12%
IOC** iron ore pellets and concentrate	Mt	2.5	+5%	0%

*Rio Tinto share unless otherwise stated

**Iron Ore Company of Canada

Q1 2023 operational highlights and other key announcements

- Our all-injury frequency rate of 0.32 was a small improvement from the first quarter of 2022 (0.34), and an improvement against the prior quarter (0.45). We are undertaking an investigation at the Simandou iron ore project following a Permanently Disabling Injury (PDI). We continue to prioritise the safety, health and wellbeing of our workforce and communities where we operate.
- Pilbara operations produced 79.3 million tonnes (100% basis) in the first quarter, 11% higher than the first quarter of 2022. Shipments were 82.5 million tonnes (100% basis), 16% higher than the corresponding period of 2022, and a first quarter record, with stronger mine production and a drawdown of stocks.
- Bauxite production of 12.1 million tonnes was 11% lower than the first quarter of 2022 as our Weipa operations were affected by higher-than-average rainfall during the annual wet season. Production was further affected by equipment downtime at both Weipa and Gove. We have maintained our bauxite production guidance at 54 to 57 million tonnes as we implement plans to recover lost production at both sites through the remainder of the year.
- Aluminium production of 0.8 million tonnes was 7% higher than the first quarter of 2022 as we benefited from the continued ramp-up of the Kitimat smelter. Recovery at the Boyne and Kitimat smelters is progressing to plan with full ramp-up expected to be completed later in the year. All our other smelters continued to demonstrate stable performance during the quarter.
- Mined copper production of 145 thousand tonnes on a consolidated basis, was in line with the first quarter of 2022.
 - Kennecott mined copper production was 36% lower than the first quarter of 2022 with lower throughput due to the combined impact of record snowfall in the period and the failure of the conveyor belt that links the mine to the concentrator in March. The concentrator is expected to operate at reduced rates until the third quarter of 2023.

- Escondida mined copper production was 6% higher than the first quarter of 2022 due to 10% higher throughput, which returned to normal levels after the corresponding quarter in 2022 included impacts from the COVID-19 pandemic and extended plant maintenance. During the quarter mined copper production was impacted compared to plan by geotechnical challenges in the open pit. Mining has been resequenced, with continued optimisation of the pit in light of the geotechnical risk.
- Oyu Tolgoi mined copper production on a 100% basis increased 41% from the first quarter of 2022 due to concentrator maintenance in the prior period and higher copper head grades (0.49% vs. 0.40%). First sustainable underground production was achieved during the period with 0.7 million tonnes of ore milled from the underground mine at an average copper head grade of 1.36%, and 9.6 million tonnes from the open pit with an average grade of 0.43%.
- Mined copper guidance for 2023 has been lowered to 590 to 640 thousand tonnes (previously 650 to 710 thousand tonnes) primarily reflecting the impact of the conveyor outage at Kennecott, together with the geotechnical challenges in the open pit at Escondida.
- On 31 March, we [entered](#) into an agreement to form a joint venture that will work to unlock the development of the La Granja copper project in Peru, one of the largest undeveloped copper deposits in the world. Under the proposed transaction, First Quantum Minerals will acquire a 55% stake in the project for \$105 million, and commit to further invest up to \$546 million into the joint venture to sole fund capital and operational costs to take the project through a feasibility study and toward development.
- Titanium dioxide slag production of 285 thousand tonnes was 4% higher than the first quarter of 2022, due to continued improved performance at Rio Tinto Iron and Titanium Quebec Operations, Canada and Richards Bay Minerals, South Africa.
- IOC production was 5% higher than the first quarter of 2022, and in line with the prior quarter, with weather related issues impacting operations during the period. Shipments were 6% higher than the first quarter of 2022, and 4% lower than the prior quarter, following loading restrictions at the rail and port.
- At our Rincon lithium project in Argentina, our \$140 million estimate and schedule to develop the starter plant is under review in response to significant local inflation and cost escalation for equipment.
- In the first quarter, we commenced deployment of the Safe Production System (SPS) at a further two sites, taking the total sites where SPS is being deployed to 18. SPS focuses on continuously improving safety, strengthening employee engagement and sustainably lifting operational performance across our global portfolio. We remain on track for deployments across four to eight new sites in 2023.
- On 16 February, we re-financed the \$3.9 billion Oyu Tolgoi project finance facility with a syndicate of international financial institutions, export credit agencies and commercial lenders. The lenders have agreed to a deferral of the principal repayments by three years to June 2026 and an extension of the final maturity date by five years from 2030 to 2035.
- On 6 March, we [announced](#) the resolution of a previously self-disclosed investigation by the US Securities and Exchange Commission (SEC) into certain contractual payments made to a former consultant over a decade ago in 2011, relating to the Simandou project in Guinea.
- On 7 March, we [announced](#) the pricing of \$650 million of 10-year fixed rate, and \$1.1 billion of 30-year fixed rate, SEC-registered debt securities. The 10-year notes will pay a coupon of 5.000 per cent and will mature March 9, 2033 and the 30-year notes will pay a coupon of 5.125 per cent and will mature March 9, 2053.
- On 16 March, we [announced](#) that Dean Dalla Valle and Susan Lloyd-Hurwitz, both Australian citizens, will join the Board as non-executive directors on 1 June 2023. Mr Dalla Valle brings four decades of operational and project management experience in the resources and infrastructure sectors. Ms Lloyd-Hurwitz brings extensive leadership experience in Australia's built environment sector. She is known for her transformational leadership on cultural change, gender equity, diversity and inclusion, and sustainability.
- 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.

2023 guidance

Rio Tinto production share, unless otherwise stated	2022 Actuals	Q1 2023 Actuals	2023 Previous	2023 Current
Pilbara iron ore (shipments, 100% basis) (Mt)	322	82.5	320 to 335	Unchanged
Bauxite (Mt)	55	12.1	54 to 57	Unchanged
Alumina (Mt)	7.5	1.9	7.7 to 8.0	Unchanged
Aluminium (Mt)	3.0	0.8	3.1 to 3.3	Unchanged
Mined copper (kt) ¹	521	145	650 to 710	590 to 640
Refined copper (kt)	209	59	180 to 210	Unchanged
Diamonds (M carats)	4.7	1.0	3.0 to 3.8	Unchanged
Titanium dioxide slag (Mt)	1.2	0.3	1.1 to 1.4	Unchanged
IOC ² iron ore pellets and concentrate (Mt)	10.3	2.5	10.5 to 11.5	Unchanged
Boric oxide equivalent (Mt)	0.5	0.1	~0.5	Unchanged

¹Mined copper for 2023 guidance and actuals includes Oyu Tolgoi on a 100% consolidated basis following Rio Tinto's acquisition of Turquoise Hill Resources Ltd, which completed on 16 December 2022. Mined copper for 2022 includes Oyu Tolgoi on a 33.52% Rio Tinto share basis.

²Iron Ore Company of Canada continues to be reported at Rio Tinto share.

- Mined copper production guidance has been lowered to 590 to 640 thousand tonnes (previously 650 to 710 thousand tonnes) primarily reflecting the conveyor outage at Kennecott, together with the geotechnical challenges in the open pit at Escondida.
- Iron ore shipments and bauxite production guidance remain subject to weather and market conditions. Pilbara shipments guidance remains subject to progressing the ramp-up of production from new mines and management of cultural heritage.

Operating costs

- Guidance for 2023 Pilbara iron ore unit cash costs is unchanged at \$21.0 to \$22.5 per tonne, based on A\$:US\$ exchange rate of 0.70.
- Guidance for 2023 copper C1 unit costs is unchanged at 160 to 180 US cents/lb.

Investments, growth and development projects

- Our share of capital investment for 2023 remains unchanged at around \$8.0 billion, including growth capital of around \$2.0 billion, depending on the ramp-up of spend at Simandou.
- Exploration and evaluation expense in the first quarter of 2023 was \$310 million, \$142 million (85%) higher than the first quarter of 2022, with continued ramp-up of activities in Guinea and Argentina.

Pilbara mine projects

- The ramp-up of Gudai-Darri continued to plan with the mine expected to reach its nameplate capacity on a sustained basis during 2023.
- During the quarter, we formed the Western Range Iron Ore Joint Venture between Rio Tinto (54 per cent) and China Baowu Steel Group Co. Ltd (46 per cent), following receipt of the remaining regulatory approvals. Construction for our first co-designed mine commenced following completion of early site works and contractor mobilisation.
- We continue to progress our next tranche of Pilbara mine projects including Hope Downs 1 Sustaining (Hope Downs 2 and Bedded Hilltop), Brockman 4 Sustaining (Brockman Syncline 1), West Angelas Sustaining and Greater Nammuldi Sustaining.

Oyu Tolgoi underground project

- We achieved first sustainable production from Panel 0 during the quarter. A total of 36 drawbells have been fired, including 17 drawbells during the quarter. We also [celebrated](#) the commencement of underground production with the Prime Minister of Mongolia, Luvsannamsrain Oyun-Erdene, in attendance to mark the occasion.
- Shaft sinking rates improved during the quarter and at the end of March, shafts 3 and 4 reached 503 metres and 623 metres below ground level, respectively. Final depths required for shafts 3 and 4 are 1,148 and 1,149 metres below ground level, respectively. Both shafts are expected to be commissioned in the first half of 2024, 15 months later than the 2020 Definitive Estimate.
- Construction of conveyor to surface works continued to plan and is now over 40% complete. We also awarded major contracts for upgrade works planned for the concentrator, with contractors mobilising to site.
- Study work for Panels 1 and 2 remains on track to be completed in the first half of 2023. It will incorporate any ventilation impacts due to the shaft 3 and 4 delays as a result of COVID-19 restrictions and reprioritisation of the mobilised workforce over the course of 2022, as previously reported.
- During the quarter, Rio Tinto, Oyu Tolgoi and the Government of Mongolia continued to work together towards the implementation of Mongolian Parliamentary Resolution 103 with the majority of matters now resolved. The international arbitration remains suspended while the parties attempt to reach an agreement on the tax matters.

Other key projects and exploration and evaluation

- At the Resolution Copper project in Arizona, the US Forest Service (USFS) continued work to progress the Final Environmental Impact Statement (FEIS) and complete actions necessary for the land exchange. We continued to advance partnership discussions with several federally-recognised Native American Tribes who are part of the formal consultation process. A hearing of the USFS versus Apache Stronghold case was held in the US Ninth Circuit Court of Appeals in front of a panel of judges on 21 March 2023, the outcome of which is not expected for several months. While there is significant local support for the project, we respect the views of groups who oppose it and will continue our efforts to address and mitigate these concerns.
- At the Winu copper-gold project in Western Australia, we continued to strengthen our relationships and advanced agreement making over the quarter with host Traditional Owners, the Martu and Nyangumarta groups. Drilling, fieldwork and study activities continued over the period strengthening the development pathway ahead of applications for regulatory and other required approvals.

- At the Simandou iron ore project in Guinea, negotiations towards the co-development of project infrastructure progressed with the March signing of a shareholder agreement, subject to certain conditions and the resolution of identified outstanding issues, between Rio Tinto joint venture Simfer, Winning Consortium Simandou (WCS) and the Government of Guinea¹. The agreement establishes the governance and operations model for la Compagnie du Transguinéen, which is designated as the future owner and operator of the trans-Guinean rail and port infrastructure to support the development of the Simandou iron ore deposit. The signing of the shareholder agreement is another step towards securing the cost estimates, schedule, fiscal regime and regulatory authority approvals necessary to progress the co-development of rail and port facilities. We also progressed upgrade works to camp facilities and other early works during the period.
- We continue to believe that the Jadar lithium-borate project in Serbia has the potential to be a world-class asset, that will support the development of other future industries in Serbia, acting as a catalyst for tens of thousands of jobs for current and future generations, and sustainably producing materials critical to the energy transition. We are focused on consultation with all stakeholders to explore options related to the project's future.
- At the Rincon lithium project in Argentina, development of the three thousand tonne per annum lithium carbonate starter plant is ongoing. To optimise the process and recoveries, we continue to produce battery-grade lithium carbonate from raw brine from the existing pilot plant operating at site. Construction activities also progressed on the camp, airstrip and process plant footprint for the project. Our \$140 million estimate and schedule to develop the starter plant is under review in response to significant local inflation and cost escalation for equipment. Detailed studies for the full scale operation are ongoing, and the exploration campaign progressed to further understand Rincon's basin and brine reservoir. 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.

¹This followed notification to Rio Tinto and the Government of Guinea, of Baowu's earlier entry into a term sheet agreement with WCS in respect of an investment into WCS InfraCo and WCS MineCo (blocks 1 and 2) – an agreement welcomed by Rio Tinto. Baowu Resources Co. is a member of China Baowu Steel Group Corporation Limited.

Sustainability highlights

We are implementing the 26 recommendations of the Everyday Respect report in line with the management team's commitment to a safe, respectful and inclusive Rio Tinto. We are creating an open and transparent environment which will make positive and lasting change and strengthen our workplace culture for the long term. We have now expanded the scope of our Board's People and Remuneration Committee to include an ongoing focus on people and culture.

We have trained over 90% of our 7,000 leaders in the foundations of building psychological safety and moving from bystander to upstander, and in 2023 we are rolling out this training to all our employees. We continue to review and ensure that our facilities are safe and inclusive. All sites have completed a self-assessment of their facilities and unsafe areas have been upgraded with locks, lighting and access to amenities.

On 17 March, we [announced](#) that we had increased our spend with Australian suppliers to more than A\$15.3 billion in 2022, as part of the company's ongoing commitment to support communities where it operates. This was an increase of almost 9 per cent on the previous year and was spent with more than 6,200 businesses, including Australian owned and operated businesses and locally owned and managed branches of global companies. The spend helped support tens of thousands of Australian jobs and delivered a significant economic contribution to communities across the country.

On 22 March, we marked World Water Day 2023 by becoming the first major mining company to [publish site-by-site water usage data](#). Through an interactive map on our website riotinto.com/water detailed information about annual surface water usage across our global network of managed sites in 35 countries has been made available, delivering on our commitment to drive good water stewardship and improve disclosure to stakeholders.

Communities & Social Performance (CSP)

On 9 January, we [announced](#) a donation of A\$2 million to the Lord Mayor's Distress Relief Fund to support Kimberley communities left devastated by the catastrophic flooding event generated by ex-Tropical Cyclone Ellie.

On 18 January, IOC and the Town of Labrador City [signed](#) an agreement whereby IOC will donate 34 hectares of land valued at approximately C\$4.2 million to the Town of Labrador City. The donated land is made of 17 separate parcels located in different parts of the town that together represent an area equivalent to 48 football fields. A parcel will be developed by the Town as a green space dedicated to senior citizens, including benches and signage. Over the next few months, the Town of Labrador City will be assessing how the remaining land will be used for the benefit of the community.

On 1 February, the Naskapi Nation of Kawawachikamach and IOC [signed](#) an agreement to establish a mutually beneficial relationship based on dialogue, collaboration and trust between the company and the community over the coming decades. This socio-economic agreement aims to create opportunities for greater participation by Naskapi people in IOC's activities through training and development, employment, collaboration on environmental projects, and procurement. It will also protect and encourage the practice of traditional activities and provide long-term financial benefits to the Naskapi Nation.

On 20 March, we [published](#) an independent report based on a global audit of our Cultural Heritage Management compliance and performance – one of a number of steps we are taking to continue to find better ways to manage and protect heritage. The audit identified areas where we are achieving leading cultural heritage practices but also identified other practices where we need to improve our performance. The report was produced by ERM, a global sustainability consultancy, following an audit of 37 Rio Tinto assets. The audit was completed throughout 2021 and 2022 across 20 assets in Australia and 17 assets in other countries where we operate including Canada, South Africa, the United States (US) and Mongolia.

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

Climate change, product stewardship and our value chain

In the first quarter, we progressed initiatives to decarbonise our business and actively develop technologies to decarbonise our value chains.

- On 13 January, we [announced](#) the progression of plans to swap conventional diesel for renewable fuel in haul trucks at our US operations to reduce the carbon footprint of our fleet. We have successfully completed a renewable diesel trial at the US Borax mine and we anticipate their haul truck fleet will be fully converted by the end of 2024. We are now conducting a second trial at the Kennecott copper operations to determine the suitability of renewable diesel for open pit haulage.
- On 16 February, we [completed](#) the first sale under a new strategic Collaboration Agreement with Marubeni Corporation to secure a sustainable and reliable supply of Rio Tinto's Responsible Aluminium products to Japanese downstream manufacturers. The first sale was a batch of Rio Tinto's RenewAl™ high purity aluminium, from the renewable powered New Zealand Aluminium Smelters (NZAS), to a major Japanese motorcycle manufacturer committed to reducing carbon emissions throughout its supply chains and manufacturing process.
- On 21 February, we [announced](#) a partnership to provide responsibly sourced aluminium to the BMW Group's vehicle production plant in Spartanburg, South Carolina, for use in body components from 2024. Low-carbon primary aluminium from Rio Tinto's hydro-powered operations in Canada, combined with recycled content, could generate a reduction of up to 70 percent in CO₂ emissions compared to the BMW Group's benchmark for aluminium. The two companies have signed a Memorandum of Understanding which will see technical experts working together on how to embed these low-carbon solutions into the BMW Group's supply chain while ensuring the highest standards of vehicle quality are maintained. The partnership provides for the use of aluminium produced using ELYSIS™ on BMW production vehicles.

Our markets

Commodity prices found further support during the first quarter, whilst the global economy remained resilient. This has been supported by an improving Chinese economic outlook, strong labour market and spending data in the US, and falling gas prices in Europe. However, inflation remains persistently high in the western world, and the risk of further rate hikes on the global economy remains. The potential banking crisis has led to further tightening of conditions both in terms of credit availability and costs, which will weigh on economic activity across the board.

- China continues its recovery. The government is looking to spur domestic consumption, stabilise the property sector and further support infrastructure investments to realise its 2023 GDP target. Consumption is expected to normalise and recover further with household incomes supported by job creation amid government efforts to boost business.
- The US economy remained resilient during the quarter, despite interest rate hikes and uncertainty in the banking sector. The services sector has been holding up well, although manufacturing PMI continues to remain contractionary. Given the lag effect of tighter monetary policy, the risk of a recession later this year remains as consumer spending will likely be constrained by rising interest rates and depleted savings.
- The eurozone economy continues to be challenged by weak manufacturing activities and high core inflation, as manufacturing output and new orders fell, while services showed an expansion. Correspondingly, core inflation has been pushed up by services, whilst manufactured goods inflation has tapered down.
- Iron ore prices increased 8% over the quarter, while the average monthly price of \$125/dmt (Platts CFR 62% Fe index) was higher than the fourth quarter of 2022 by 27%. The major iron ore producers' combined shipments also rose 4% over the same period, while Chinese steelmakers ramped up their blast furnace capacity utilisation rates to more than 90%, a seasonal record. China's iron ore imports hit a record 309 million tonnes in the first quarter of 2023, effectively unchanged from the volume imported during the prior quarter and 9% more than the first quarter of 2022. Port inventories briefly exceeded 140 million tonnes, but subsequently drew back down towards their 130 million tonnes level as at the beginning of the year.
- The LME cash aluminium price declined by 1% over the quarter, although the average price of \$2,395/t was 3% higher than the fourth quarter of 2022. Global ex-China aluminium demand ended 2022 on a weak note, while China's aluminium demand has improved over the quarter. Chinese reported inventories have declined steadily since their peak in early March, and hydropower constraints due to low reservoir levels in Southern China have prevented any smelter restarts.
- The copper LME price rose 7% over the quarter to \$4.05/lb, driven by a shift in sentiment associated with improved expectations on copper demand from China after the end of its zero-Covid policy. This was reflected in a significant increase in net long investor positions in January. Despite a weaker dollar, concerns over interest rate hikes and fears of a bank crisis led to increased price volatility in March. Conversely mine supply disruptions in Chile, Peru, Panama and Indonesia provided support to prices.
- The electric vehicle (EV) sector remains robust, albeit with falling growth rates from a higher base. Lithium carbonate spot prices fell sharply over the quarter, driven by the termination of the EV cash subsidy and a price war in China's auto market. Short term uncertainty remains as the global economy slows and rising interest rates dampen consumers' discretionary spending. Nevertheless, the long-term outlook remains favourable as governments continue their push for EV adoption.

Iron Ore

Rio Tinto share of production (Million tonnes)	Q1 2023	vs Q1 2022	vs Q4 2022
Pilbara Blend and SP10 Lump ¹	19.6	+15%	-9%
Pilbara Blend and SP10 Fines ¹	30.9	+20%	-12%
Robe Valley Lump	1.1	+8%	-31%
Robe Valley Fines	2.0	+15%	-22%
Yandicoogina Fines (HIY)	13.7	-6%	-10%
Total Pilbara production	67.3	+12%	-11%
Total Pilbara production (100% basis)	79.3	+11%	-11%

Rio Tinto share of shipments (Million tonnes)	Q1 2023	vs Q1 2022	vs Q4 2022
Pilbara Blend Lump	15.7	+45%	+4%
Pilbara Blend Fines	28.5	+31%	-13%
Robe Valley Lump	1.1	+56%	-16%
Robe Valley Fines	2.3	+31%	-22%
Yandicoogina Fines (HIY)	13.7	-6%	-7%
SP10 Lump ¹	1.7	-56%	-40%
SP10 Fines ¹	6.8	-3%	+35%
Total Pilbara shipments ²	69.7	+16%	-6%
Total Pilbara shipments (100% basis) ²	82.5	+16%	-6%
Total Pilbara Shipments (consolidated basis) ^{2, 3}	71.5	+16%	-6%

¹SP10 includes other lower grade products.

²Shipments 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.

³While 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 79.3 million tonnes (Rio Tinto share 67.3 million tonnes) in the first quarter, 11% higher than the corresponding period of 2022, with steady improvements across the system. The ramp-up of Gudai-Darri continues to progress well.

Shipments of 82.5 million tonnes (Rio Tinto share 69.7 million tonnes) were a record for the first quarter and 16% higher than the first quarter of 2022 with stronger mine production and a drawdown of stocks. The Robe Valley Circuit and Yandicoogina mine were impacted by plant reliability and materials handling issues during the quarter.

Approximately 10% of sales in the first quarter were priced by reference to the prior quarter's average index lagged by one month. The remainder was sold either on current quarter average, current month average, average of two months, forward month or on the spot market. Approximately 26% of sales in the first quarter were made on a free on board (FOB) basis, with the remainder sold including freight.

China Portside Trading

Our iron ore portside sales in China were 6.2 million tonnes in the first quarter of 2023 (7.0 million tonnes in the first quarter of 2022). At the end of the March, inventory levels were 6.5 million tonnes, including 4.4 million tonnes of Pilbara product. In the first quarter of 2023 approximately 90% of our portside sales were either screened or blended in Chinese ports.

Aluminium

Rio Tinto share of production ('000 tonnes)	Q1 2023	vs Q1 2022	vs Q4 2022
Bauxite	12,089	-11%	-8%
Bauxite third party shipments	7,880	-22%	-15%
Alumina	1,860	-2%	-4%
Aluminium	785	+7%	0%

Bauxite

Bauxite production of 12.1 million tonnes was 11% lower than the first quarter of 2022 as our Weipa operations were affected by higher-than-average rainfall during the annual wet season. This resulted in reduced pit access, speed limits for mobile equipment and stockpile bottlenecks due to port closures. Production was further affected by equipment downtime at both Weipa and Gove. We have maintained our bauxite production guidance at 54 to 57 million tonnes as we implement plans to recover lost production at both sites through the remainder of the year.

The weather-related port closures at Weipa had a disproportionate impact on our third-party shipments. We shipped 7.9 million tonnes of bauxite to third parties in the first quarter, 22% lower than the same period of 2022.

Alumina

Alumina production of 1.9 million tonnes was 2% lower than the first quarter of 2022 following unplanned outages at Queensland Alumina Limited (QAL) and plant reliability issues at Yarwun in Australia. Production at the Vaudreuil refinery in Quebec, Canada, was higher than the prior year quarter due to improved operational stability.

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 7% higher than the first quarter of 2022 as we benefited from the continued ramp-up of the Kitimat smelter. Recovery at the Boyne and Kitimat smelters is progressing to plan with full ramp-up expected to be completed later in the year. All our other smelters continued to demonstrate stable performance during the quarter.

Copper

Rio Tinto share of production ('000 tonnes)	Q1 2023	vs Q1 2022	vs Q4 2022
Mined copper			
Kennecott	30.3	-36%	-36%
Escondida	72.3	+6%	-1%
Oyu Tolgoi (66% basis) ¹	28.1	+177%	+159%
Total mined copper production	130.7	+4%	0%
Total mined copper production (consolidated basis ²)	145.2	0%	-5%
Refined copper			
Kennecott	43.6	+8%	+21%
Escondida	15.2	+6%	2%

¹Oyu Tolgoi production for 2022 reported on a 33.52% equity share basis. Following the acquisition of Turquoise Hill Resources Ltd on 16 December 2022, Oyu Tolgoi production for 2023 reported on a 66% equity share basis.

²Includes Oyu Tolgoi on a 100% consolidated basis, Kennecott and Escondida on an equity share basis.

Kennecott

Mined copper production was 36% lower than the first quarter of 2022 due to a combination of record snowfall (twice the historical Utah average) and a failure in early March of motors that drive a conveyor belt that feeds crushed ore to the concentrator. The concentrator is expected to operate below full capacity until the third quarter of 2023 as contingencies are implemented while replacement conveyor motors are sourced (reduced conveyor rates supplemented with trucking of material). Kennecott is also managing heightened geotechnical and flooding risk associated with spring melting of the snowpack.

Refined copper production was 8% higher than the first quarter of 2022 as plant availability at the smelter improved and vacancy rates associated with the COVID-19 pandemic abated. The largest rebuild of the smelter and refinery in Kennecott's history is planned to commence in May 2023 with a duration of approximately three months.

Escondida

Mined copper production was 6% higher than the first quarter of 2022 due to 10% higher concentrator throughput rates, which returned to normal levels after the corresponding quarter in 2022 included impacts from the COVID-19 pandemic and extended plant maintenance. During the quarter, mined copper production was impacted compared to plan by geotechnical challenges in the open pit. Mining has been resequenced, with continued optimisation of the pit in light of the geotechnical risk.

Oyu Tolgoi

Mined copper production on a 100% basis increased 41% from the first quarter of 2022 due to concentrator maintenance in the prior period and higher copper head grades (0.49% vs. 0.40%). First sustainable underground production was achieved during the period with 0.7 million tonnes of ore milled from the underground mine at an average copper head grade of 1.36%, and 9.6 million tonnes from the open pit with an average grade of 0.43%.

Following our acquisition of Turquoise Hill Resources Ltd on 16 December 2022, our equity share of production increased from 33.52% to 66%, effective in reporting from 1 January 2023.

Minerals

Rio Tinto share of production (million tonnes)	Q1 2023	vs Q1 2022	vs Q4 2022
Iron ore pellets and concentrate			
IOC	2.5	+5%	0%
Rio Tinto share of production ('000 tonnes)			
Minerals			
Borates - B ₂ O ₃ content	124	+1%	-12%
Titanium dioxide slag	285	+4%	-12%
Rio Tinto share of production ('000 carats)			
Diavik	954	-4%	-28%

Iron Ore Company of Canada (IOC)

Iron ore production was 5% higher than the first quarter of 2022, and in line with the prior quarter, with weather related issues impacting operations during the period. Shipments were 6% higher than the first quarter of 2022, and 4% lower than the prior quarter, following loading restrictions at the rail and port. Safe Production System (SPS) deployment at the pellet plant commenced during the quarter.

Borates

Borates production in the first quarter was 1% higher than the corresponding period of 2022 as we continue to optimise the mine. We continued to see an easing of supply chain constraints at the Port of Los Angeles in the period. SPS deployment across the operation also commenced during the quarter.

Iron and Titanium

Titanium dioxide slag production was 4% higher than the first quarter of 2022, due to continued improved performance at Rio Tinto Iron and Titanium Quebec Operations, Canada and Richards Bay Minerals (RBM), South Africa. Production constraints related to nationwide electrical power loadshedding at RBM continued in the first quarter.

Diamonds

At Diavik, our share of carats was 4% lower than the first quarter of 2022 due to temporary restrictions accessing open pit material.

We [announced](#) a \$40 million investment in the first phase of underground mining below the existing A21 open pit. Diavik is now expected to end commercial production in the first quarter of 2026, with Phase 1 of underground mining of the A21 pipe expected to deliver an additional 1.4 million carats of rough diamonds.

Exploration and evaluation

Pre-tax and pre-divestment expenditure on exploration and evaluation charged to the profit and loss account in the first quarter of 2023 was \$310 million, compared with \$168 million in the first quarter of 2022. Approximately 29% of this expenditure was incurred by Simandou, 25% by central exploration, 22% by Minerals, 19% by Copper and 5% by Iron Ore.

Our annual budget for central greenfield exploration remains around \$250 million, mainly focused on copper, with a growing battery minerals programme.

Exploration highlights

Rio Tinto has a strong portfolio of projects with activity in 18 countries across eight commodities in early exploration and studies stages. The bulk of the exploration expenditure in the first quarter focused on copper in Colombia, Chile, Zambia, US and Kazakhstan, lithium in the US and diamonds in Angola. Exploration is ongoing for nickel in Canada and Finland, and in lithium across all regions, with opportunities emerging in the US and Africa. Mine-lease exploration continued at Rio Tinto managed businesses including Bingham Canyon in the US, Pilbara Iron Ore in Australia, Diavik in Canada and Cape York in Australia. Projects in Australia experienced delays in the quarter due to unprecedented weather.

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: Australia, Brazil, Canada, Finland, US Lithium borates Brownfield: US
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, Papua New Guinea, Serbia, US, Zambia Copper Brownfield: US
Diamonds	Falcon, Canada*		Diamonds Greenfield: 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		Potash Greenfield: Canada Heavy mineral sands Greenfield: Australia, South Africa

*Limited activity during the quarter. The Falcon Project in Saskatchewan, Canada, is currently in care and maintenance whilst Rio Tinto considers alternative commercial options, including potential exit.

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.

Contacts

Please direct all enquiries to
media.enquiries@riotinto.com

Media Relations, UK

Matthew Klar

M +44 7796 630 637

David Outhwaite

M +44 7787 597 493

Media Relations, Americas

Simon Letendre

M +1 514 796 4973

Malika Cherry

M +1 418 592 7293

Media Relations, Australia

Matt Chambers

M +61 433 525 739

Jesse Riseborough

M +61 436 653 412

Investor Relations, UK

Menno Sanderse

M +44 7825 195 178

David Ovington

M +44 7920 010 978

Clare Peever

M: +44 7788 967 877

Investor Relations, Australia

Tom Gallop

M +61 439 353 948

Amar Jambaa

M +61 472 865 948

Rio Tinto plc

6 St James's Square
London SW1Y 4AD
United Kingdom

T +44 20 7781 2000

Registered in England

No. 719885

Rio Tinto Limited

Level 43, 120 Collins Street
Melbourne 3000
Australia

T +61 3 9283 3333

Registered in Australia

ABN 96 004 458 404

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

riotinto.com

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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 2022	% change	
		2022 Q1	2022 Q4	2023 Q1		Q1 23 vs Q1 22	Q1 23 vs Q4 22
Principal commodities							
Alumina	('000 t)	1,901	1,941	1,860	7,544	-2%	-4%
Aluminium	('000 t)	736	783	785	3,009	+7%	0%
Bauxite	('000 t)	13,625	13,181	12,089	54,618	-11%	-8%
Borates	('000 t)	123	141	124	532	+1%	-12%
Copper - mined	('000 t)	125.5	131.3	130.7	521.1	+4%	0%
Copper - refined	('000 t)	54.7	51.0	58.9	209.2	+8%	+15%
Diamonds	('000 cts)	991	1,319	954	4,651	-4%	-28%
Iron Ore	('000 t)	62,465	78,415	69,784	283,247	+12%	-11%
Titanium dioxide slag	('000 t)	273	323	285	1,200	+4%	-12%
Other Metals & Minerals							
Gold - mined	('000 oz)	68.5	55.7	64.4	235.0	-6%	+16%
Gold - refined	('000 oz)	32.2	30.3	22.0	113.9	-32%	-27%
Molybdenum	('000 t)	1.1	1.1	0.1	3.3	-88%	-88%
Salt	('000 t)	1,595	1,458	1,450	5,757	-9%	-1%
Silver - mined	('000 oz)	1,012	1,042	935	3,940	-8%	-10%
Silver - refined	('000 oz)	577	512	432	1,950	-25%	-16%

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	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
ALUMINA							
Production ('000 tonnes)							
Jonqui�re (Vaudreuil)	100 %	334	325	336	368	371	1,364
Jonqui�re (Vaudreuil) specialty Alumina plant	100 %	25	30	30	29	25	114
Queensland Alumina	80 %	704	697	662	678	632	2,740
S�o Luis (Alumar)	10 %	94	91	95	97	94	377
Yarwun	100 %	745	721	715	769	739	2,949
Rio Tinto total alumina production		1,901	1,864	1,838	1,941	1,860	7,544
ALUMINIUM							
Production ('000 tonnes)							
Australia - Bell Bay	100 %	46	44	46	48	45	185
Australia - Boyne Island	59 %	73	61	65	68	70	267
Australia - Tomago	52 %	75	75	76	76	75	302
Canada - six wholly owned	100 %	318	323	341	360	367	1,341
Canada - Alouette (Sept-�les)	40 %	62	63	64	63	62	251
Canada - B�cancour	25 %	28	29	29	29	29	115
Iceland - ISAL (Reykjavik)	100 %	50	50	51	52	51	202
New Zealand - Tiwai Point	79 %	66	66	67	68	66	267
Oman - Sohar	20 %	19	20	20	20	20	79
Rio Tinto total aluminium production		736	731	759	783	785	3,009
BAUXITE							
Production ('000 tonnes) (a)							
Gove	100 %	3,093	2,637	2,905	2,874	2,579	11,510
Porto Trombetas	12 %	240	308	393	391	275	1,332
Sangaredi	(b)	1,765	1,946	1,953	1,588	1,744	7,252
Weipa	100 %	8,527	9,240	8,429	8,328	7,492	34,525
Rio Tinto total bauxite production		13,625	14,131	13,680	13,181	12,089	54,618

(a) Mine production figures for metals refer to the total quantity of metal produced in concentrates, leach liquor or dor  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	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
BORATES							
Production ('000 tonnes B₂O₃ content)							
Rio Tinto Borates - borates	100 %	123	137	130	141	124	532
COPPER							
Mine production ('000 tonnes) (a)							
Bingham Canyon	100 %	47.1	33.9	50.7	47.5	30.3	179.2
Escondida	30 %	68.2	82.3	75.1	73.0	72.3	298.6
Oyu Tolgoi (b)	66 %	10.2	10.2	12.2	10.8	28.1	43.4
Rio Tinto total mine production		125.5	126.4	138.0	131.3	130.7	521.1
Rio Tinto total mine production - consolidated basis		145.6	146.7	162.1	152.8	145.2	607.2
Refined production ('000 tonnes)							
Escondida	30 %	14.4	16.7	14.9	14.9	15.2	60.9
Kennecott (c)	100 %	40.2	32.7	39.2	36.1	43.6	148.3
Rio Tinto total refined production		54.7	49.4	54.1	51.0	58.9	209.2

(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) On 16 December 2022, Rio Tinto completed the acquisition of 100% of Turquoise Hill Resources Ltd, increasing our ownership in Oyu Tolgoi from 33.52% to 66%. From 1 January 2023, our share of production has been updated to reflect this change.

(c) We continue to process third party concentrate to optimise smelter utilisation. There was no cathode produced from purchased concentrate in 2023 year-to-date. 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	100 %	991	1,149	1,192	1,319	954	4,651
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GOLD

Mine production ('000 ounces) (a)

Bingham Canyon	100 %	37.8	22.8	32.5	29.7	20.6	122.7
Escondida	30 %	10.9	13.7	11.5	14.5	14.7	50.6
Oyu Tolgoi (b)	66 %	19.8	16.0	14.3	11.5	29.1	61.6
Rio Tinto total mine production		68.5	52.5	58.2	55.7	64.4	235.0

Refined production ('000 ounces)

Kennecott	100 %	32.2	20.9	30.5	30.3	22.0	113.9
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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) On 16 December 2022, Rio Tinto completed the acquisition of 100% of Turquoise Hill Resources Ltd, increasing our ownership in Oyu Tolgoi from 33.52% to 66%. From 1 January 2023, our share of production has been updated to reflect this change.

Rio Tinto share of production

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
IRON ORE							
Production ('000 tonnes) (a)							
Hamersley mines	(b)	47,678	52,636	56,650	61,339	54,433	218,304
Hope Downs	50 %	5,830	6,385	6,264	5,945	5,885	24,425
Iron Ore Company of Canada	59 %	2,404	2,603	2,776	2,530	2,526	10,312
Robe River - Pannawonica (Mesas J and A)	53 %	2,774	3,054	3,540	4,178	3,123	13,546
Robe River - West Angelas	53 %	3,779	3,961	4,496	4,424	3,816	16,660
Rio Tinto iron ore production ('000 tonnes)		62,465	68,640	73,726	78,415	69,784	283,247
Breakdown of Production:							
Pilbara Blend and SP10 Lump (c)		17,081	19,309	21,317	21,443	19,612	79,152
Pilbara Blend and SP10 Fines (c)		25,658	30,240	32,592	35,097	30,851	123,587
Robe Valley Lump		1,051	1,180	1,389	1,645	1,136	5,264
Robe Valley Fines		1,724	1,874	2,151	2,533	1,987	8,281
Yandicoogina Fines (HIY)		14,548	13,433	13,501	15,168	13,672	56,650
Pilbara iron ore production ('000 tonnes)		60,061	66,037	70,951	75,886	67,258	272,934
IOC Concentrate		962	1,282	1,237	1,186	1,241	4,667
IOC Pellets		1,442	1,321	1,539	1,343	1,285	5,646
IOC iron ore production ('000 tonnes)		2,404	2,603	2,776	2,530	2,526	10,312
Breakdown of Shipments:							
Pilbara Blend Lump		10,809	12,684	15,301	15,089	15,689	53,883
Pilbara Blend Fines		21,698	25,156	31,597	32,659	28,528	111,110
Robe Valley Lump		675	971	1,281	1,244	1,051	4,171
Robe Valley Fines		1,731	2,309	2,392	2,896	2,262	9,329
Yandicoogina Fines (HIY)		14,487	14,201	13,530	14,661	13,689	56,880
SP10 Lump (c)		3,827	4,456	1,647	2,824	1,686	12,753
SP10 Fines (c)		7,067	6,775	3,766	5,062	6,832	22,672
Pilbara iron ore shipments ('000 tonnes) (d)		60,295	66,552	69,515	74,435	69,738	270,798
Pilbara iron ore shipments - consolidated basis ('000 tonnes) (d) (f)		61,818	68,114	71,379	76,303	71,505	277,613
IOC Concentrate		600	1,083	1,316	1,174	984	4,174
IOC Pellets		1,412	1,484	1,443	1,036	1,143	5,375
IOC Iron ore shipments ('000 tonnes) (d)		2,012	2,567	2,759	2,210	2,127	9,548
Rio Tinto iron ore shipments ('000 tonnes) (d)		62,307	69,119	72,274	76,645	71,864	280,346
Rio Tinto iron ore sales ('000 tonnes) (e)		66,683	71,263	74,587	75,337	74,273	287,871

(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, Gudai-Darri 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) 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	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
MOLYBDENUM							
Mine production ('000 tonnes) (a)							
Bingham Canyon	100 %	1.1	0.4	0.8	1.1	0.1	3.3

(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 %	1,595	1,030	1,674	1,458	1,450	5,757

SILVER							
Mine production ('000 ounces) (a)							
Bingham Canyon	100 %	561	385	591	521	356	2,057
Escondida	30 %	381	393	363	453	404	1,590
Oyu Tolgoi (b)	66 %	71	67	86	68	176	292
Rio Tinto total mine production		1,012	846	1,040	1,042	935	3,940
Refined production ('000 ounces)							
Kennecott	100 %	577	290	571	512	432	1,950

(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) On 16 December 2022, Rio Tinto completed the acquisition of 100% of Turquoise Hill Resources Ltd, increasing our ownership in Oyu Tolgoi from 33.52% to 66%. From 1 January 2023, our share of production has been updated to reflect this change.

TITANIUM DIOXIDE SLAG							
Production ('000 tonnes)							
Rio Tinto Iron & Titanium (a)	100 %	273	293	310	323	285	1,200

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

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 March 2023.

Rio Tinto operational data

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
ALUMINA							
Smelter Grade Alumina - Aluminium Group							
Alumina production ('000 tonnes)							
<i>Australia</i>							
Queensland Alumina Refinery - Queensland	80 %	880	871	827	847	790	3,425
Yarwun refinery - Queensland	100 %	745	721	715	769	739	2,949
<i>Brazil</i>							
São Luis (Alumar) refinery	10 %	940	910	946	975	936	3,771
<i>Canada</i>							
Jonquière (Vaudreuil) refinery - Quebec (a)	100 %	334	325	336	368	371	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 %	25	30	30	29	25	114

Rio Tinto percentage interest shown above is at 31 March 2023. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
ALUMINIUM							
Primary Aluminium							
Primary aluminium production ('000 tonnes)							
<i>Australia</i>							
Bell Bay smelter - Tasmania	100 %	46	44	46	48	45	185
Boyne Island smelter - Queensland	59 %	123	103	110	114	117	450
Tomago smelter - New South Wales	52 %	145	145	148	147	145	586
<i>Canada</i>							
Alma smelter - Quebec	100 %	117	121	122	122	120	482
Alouette (Sept-Îles) smelter - Quebec	40 %	154	157	159	158	156	628
Arvida smelter - Quebec	100 %	42	42	43	44	43	171
Arvida AP60 smelter - Quebec	100 %	14	14	15	15	14	58
Bécancour smelter - Quebec	25 %	111	117	116	116	115	459
Grande-Baie smelter - Quebec	100 %	57	58	59	58	57	232
Kitimat smelter - British Columbia	100 %	25	26	38	57	72	145
Laterrière smelter - Quebec	100 %	63	63	64	64	61	253
<i>Iceland</i>							
ISAL (Reykjavik) smelter	100 %	50	50	51	52	51	202
<i>New Zealand</i>							
Tiwai Point smelter	79 %	83	83	85	85	83	336
<i>Oman</i>							
Sohar smelter	20 %	97	98	100	100	98	395

Rio Tinto percentage interest shown above is at 31 March 2023. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
BAUXITE							
Bauxite production ('000 tonnes)							
<i>Australia</i>							
Gove mine - Northern Territory	100 %	3,093	2,637	2,905	2,874	2,579	11,510
Weipa mine - Queensland	100 %	8,527	9,240	8,429	8,328	7,492	34,525
<i>Brazil</i>							
Porto Trombetas (MRN) mine	12 %	2,000	2,569	3,275	3,256	2,288	11,100
<i>Guinea</i>							
Sangaredi mine (a)	23 %	3,922	4,323	4,339	3,530	3,876	16,115
Rio Tinto share of bauxite shipments							
Share of total bauxite shipments ('000 tonnes)		13,876	14,054	13,294	13,561	12,264	54,784
Share of third party bauxite shipments ('000 tonnes)		10,135	9,599	9,049	9,233	7,880	38,016

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

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
BORATES							
Rio Tinto Borates - borates	100 %						
<i>US</i>							
Borates ('000 tonnes) (a)		123	137	130	141	124	532

(a) Production is expressed as B₂O₃ content.

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
COPPER & GOLD							
Escondida	30 %						
<i>Chile</i>							
Sulphide ore to concentrator ('000 tonnes)		30,235	34,318	32,894	33,911	33,309	131,358
Average copper grade (%)		0.81	0.87	0.83	0.76	0.78	0.82
Mill production (metals in concentrates):							
Contained copper ('000 tonnes)		191.5	239.5	214.6	212.8	210.0	858.4
Contained gold ('000 ounces)		36.3	45.8	38.2	48.4	49.0	168.7
Contained silver ('000 ounces)		1,270	1,311	1,210	1,510	1,346	5,301
Recoverable copper in ore stacked for leaching ('000 tonnes) (a)		35.9	34.8	35.8	30.4	31.0	136.9
Refined production from leach plants:							
Copper cathode production ('000 tonnes)		48.1	55.7	49.6	49.7	50.8	203.1

(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 March 2023. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
COPPER & GOLD (continued)							
Kennecott							
Bingham Canyon mine	100 %						
<i>Utah, US</i>							
Ore treated ('000 tonnes)		10,130	6,862	10,125	10,449	7,405	37,565
Average ore grade:							
Copper (%)		0.51	0.55	0.56	0.52	0.47	0.53
Gold (g/t)		0.19	0.17	0.16	0.14	0.12	0.16
Silver (g/t)		2.36	2.39	2.50	2.20	2.16	2.36
Molybdenum (%)		0.021	0.017	0.021	0.020	0.012	0.020
Copper concentrates produced ('000 tonnes)		176	136	192	184	116	688
Average concentrate grade (% Cu)		26.8	24.9	26.2	25.6	26.1	26.0
Production of metals in copper concentrates:							
Copper ('000 tonnes) (a)		47.1	33.9	50.7	47.5	30.3	179.2
Gold ('000 ounces)		37.8	22.8	32.5	29.7	20.6	122.7
Silver ('000 ounces)		561	385	591	521	356	2,057
Molybdenum concentrates produced ('000 tonnes):							
Molybdenum in concentrates ('000 tonnes)		2.1	0.9	1.8	2.0	0.1	6.8
		1.1	0.4	0.8	1.1	0.1	3.3
Kennecott smelter & refinery							
	100 %						
Copper concentrates smelted ('000 tonnes)		213	152	166	194	200	725
Copper anodes produced ('000 tonnes) (b)		45.8	27.9	46.2	24.5	55.1	144.5
Production of refined metal:							
Copper ('000 tonnes) (c)		40.2	32.7	39.2	36.1	43.6	148.3
Gold ('000 ounces) (d)		32.2	20.9	30.5	30.3	22.0	113.9
Silver ('000 ounces) (d)		577	290	571	512	432	1,950

(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. There was no cathode produced from purchased concentrate in 2023 year-to-date. 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 March 2023. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
COPPER & GOLD (continued)							
Oyu Tolgoi mine (a)	66 %						
<i>Mongolia</i>							
Ore Treated ('000 tonnes) - Open Pit		9,320	9,225	10,141	8,900	9,613	37,586
Ore Treated ('000 tonnes) - Underground		261	460	544	510	675	1,776
Ore Treated ('000 tonnes) - Total		9,581	9,685	10,685	9,411	10,288	39,361
Average mill head grades:							
Open Pit							
Copper (%)		0.40	0.39	0.40	0.41	0.43	0.40
Gold (g/t)		0.33	0.26	0.22	0.20	0.21	0.25
Silver (g/t)		1.26	1.12	1.28	1.14	1.16	1.20
Underground							
Copper (%)		0.40	0.57	0.82	1.03	1.36	0.75
Gold (g/t)		0.20	0.24	0.22	0.29	0.35	0.24
Silver (g/t)		1.06	1.73	2.16	2.54	3.26	2.00
Total							
Copper (%)		0.40	0.40	0.42	0.45	0.49	0.42
Gold (g/t)		0.32	0.26	0.22	0.21	0.22	0.25
Silver (g/t)		1.25	1.15	1.32	1.21	1.30	1.24
Copper concentrates produced ('000 tonnes)		144.3	146.0	173.6	151.9	201.8	615.8
Average concentrate grade (% Cu)		21.0	20.9	20.9	21.3	21.1	21.0
Production of metals in concentrates:							
Copper in concentrates ('000 tonnes)		30.3	30.6	36.3	32.3	42.6	129.5
Gold in concentrates ('000 ounces)		59.2	47.6	42.7	34.2	44.1	183.8
Silver in concentrates ('000 ounces)		211	201	256	204	266	871
Sales of metals in concentrates:							
Copper in concentrates ('000 tonnes)		29.9	35.3	41.8	25.3	41.4	132.3
Gold in concentrates ('000 ounces)		57.4	67.9	56.0	26.2	44.0	207.5
Silver in concentrates ('000 ounces)		179	224	282	152	242	836

(a) On 16 December 2022, Rio Tinto completed the acquisition of 100% of Turquoise Hill Resources Ltd, increasing our ownership in Oyu Tolgoi from 33.52% to 66%. From 1 January 2023, our share of production has been updated to reflect this change.

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
DIAMONDS							
Diavik Diamonds	100 %						
<i>Northwest Territories, Canada</i>							
Ore processed ('000 tonnes)		496	537	590	535	427	2,158
Diamonds recovered ('000 carats)		991	1,149	1,192	1,319	954	4,651

Rio Tinto percentage interest shown above is at 31 March 2023. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
IRON ORE							
Rio Tinto Iron Ore							
<i>Western Australia</i>							
Pilbara Operations							
Saleable iron ore production ('000 tonnes)							
Hamersley mines	(a)	47,678	52,636	56,650	61,339	54,433	218,304
Hope Downs	50 %	11,660	12,771	12,529	11,891	11,771	48,850
Robe River - Pannawonica (Mesas J and A)	53 %	5,234	5,762	6,679	7,882	5,892	25,558
Robe River - West Angelas	53 %	7,130	7,474	8,484	8,347	7,200	31,435
Total production ('000 tonnes)		71,703	78,643	84,342	89,458	79,296	324,146
Breakdown of total production:							
Pilbara Blend and SP10 Lump (b)		20,827	23,228	25,452	25,251	23,196	94,758
Pilbara Blend and SP10 Fines (b)		31,094	36,220	38,709	41,158	36,537	147,180
Robe Valley Lump		1,982	2,226	2,621	3,103	2,143	9,932
Robe Valley Fines		3,252	3,536	4,058	4,779	3,748	15,625
Yandicoogina Fines (HIY)		14,548	13,433	13,501	15,168	13,672	56,650
Breakdown of total shipments:							
Pilbara Blend Lump		13,626	16,043	18,860	18,153	18,733	66,682
Pilbara Blend Fines		27,915	32,243	38,186	38,835	35,349	137,179
Robe Valley Lump		1,273	1,832	2,417	2,348	1,983	7,870
Robe Valley Fines		3,266	4,357	4,514	5,464	4,268	17,602
Yandicoogina Fines (HIY)		14,487	14,201	13,530	14,661	13,689	56,880
SP10 Lump (b)		3,827	4,456	1,647	2,824	1,686	12,753
SP10 Fines (b)		7,067	6,775	3,766	5,062	6,832	22,672
Total shipments ('000 tonnes) (c)		71,462	79,907	82,920	87,347	82,540	321,636
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	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
Iron Ore Company of Canada							
	59 %						
<i>Newfoundland & Labrador and Quebec in Canada</i>							
Saleable iron ore production:							
Concentrates ('000 tonnes)		1,638	2,183	2,106	2,020	2,113	7,947
Pellets ('000 tonnes)		2,456	2,250	2,621	2,288	2,189	9,615
IOC Total production ('000 tonnes)		4,094	4,433	4,727	4,308	4,302	17,562
Shipments:							
Concentrates ('000 tonnes)		1,022	1,845	2,241	1,999	1,676	7,108
Pellets ('000 tonnes)		2,405	2,527	2,457	1,764	1,947	9,153
IOC Total Shipments ('000 tonnes) (c)		3,427	4,372	4,699	3,763	3,622	16,261
Global Iron Ore Totals							
Iron Ore Production ('000 tonnes)		75,797	83,076	89,069	93,766	83,599	341,708
Iron Ore Shipments ('000 tonnes)		74,889	84,279	87,619	91,110	86,162	337,897
Iron Ore Sales ('000 tonnes) (d)		79,194	86,108	89,689	89,650	88,490	344,641

(a) Includes 100% of production from Paraburdoo, Mt Tom Price, Western Turner Syncline, Marandoo, Yandicoogina, Brockman, Nammuldi, Silvergrass, Channar, Gudai-Darri 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) 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 31 March 2023. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Full Year 2022
SALT							
Dampier Salt	68 %						
<i>Western Australia</i>							
Salt production ('000 tonnes)		2,333	1,507	2,449	2,133	2,121	8,422
TITANIUM DIOXIDE SLAG							
Rio Tinto Iron & Titanium	100 %						
<i>Canada and South Africa</i>							
(Rio Tinto share) (a)							
Titanium dioxide slag ('000 tonnes)		273	293	310	323	285	1,200

(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 31 March 2023. The data represents production and sales on a 100% basis unless otherwise stated.