

Rio Tinto releases fourth quarter production results

16 January 2025

Rio Tinto Chief Executive Jakob Stausholm said: “Our operating performance in 2024 was good, consistent with our ongoing commitment to strengthen the business as we execute our strategy to deliver profitable growth. The implementation of our Safe Production System has again contributed to greater consistency across key operations, including our iron ore assets in the Pilbara and our bauxite operations in Australia, where Amrun and Gove achieved record annual production.

“We are making strong progress in delivering organic growth from our major projects. The Oyu Tolgoi underground copper mine in Mongolia continues to successfully ramp up, while the Simandou high-grade iron ore project in Guinea and our Western Range mine in the Pilbara are on schedule for first production this year.

“Significant milestones were achieved at our Rincon project in Argentina during the quarter, with first lithium delivered and receipt of Board approval to expand the operation, demonstrating both our operational capabilities and ambition to grow in battery materials.

“We remain focused on executing our strategy to deliver attractive shareholder returns and build a stronger, more diversified, and growing business, driven by our confidence in the long-term demand for materials essential to the global energy transition.”

Production ¹		Q4 2024	vs Q4 2023	vs Q3 2024	2024	vs 2023
Pilbara iron ore shipments (100% basis)	Mt	85.7	-1%	+1%	328.6	-1%
Pilbara iron ore production (100% basis)	Mt	86.5	-1%	+3%	328.0	-1%
Bauxite	Mt	15.4	+2%	+2%	58.7	+7%
Aluminium ²	kt	837	-1%	+3%	3,296	+1%
Mined copper (consolidated basis)	kt	202	+26%	+21%	697	+13%
Titanium dioxide slag	kt	235	-14%	-11%	990	-11%
IOC ³ iron ore pellets and concentrate	Mt	2.5	-6%	+20%	9.4	-2%

¹ Rio Tinto share unless otherwise stated.

² Includes primary aluminium only.

³ Iron Ore Company of Canada.

Q4 2024 operational highlights and other key announcements

- In [October](#), Morlaye Camara, an employee of one of our contractors at the SimFer Port Project in Morebaya, part of the Simandou project, was injured, and subsequently passed away. During the quarter, we completed our internal investigation and the findings were shared across the business.
- Our all injury frequency rate (AIFR) for the fourth quarter was 0.38, a decrease from the third quarter of this year (0.41) and the fourth quarter of 2023 (0.39). The health, safety and wellbeing of our people and partners remains our priority.
- **In 2024, we delivered 1% production growth and a 3% increase in sales volumes**, both on a copper equivalent basis (based on long-term consensus pricing). At our [Investor Seminar](#) in December, our Executive Committee outlined our ambition for a decade of around 3% compound annual growth in copper equivalent production, driven by Oyu Tolgoi, Simandou and our new lithium portfolio.
- **Pilbara** operations produced 328.0 million tonnes in 2024, with shipments of 328.6 million tonnes, each 1% lower than 2023. Productivity improvements of 10 million tonnes did not fully offset depletion, predominantly at Yandicoogina and Paraburdoo, as we transition to Western Range. The Safe Production System target of 5 million tonnes for 2024 was achieved and Gudai-Darri reached 50 million tonne per annum rates during 2024.
- **Bauxite** production was 58.7 million tonnes in 2024, 7% higher than 2023, exceeding our guidance. The improvement was driven by the implementation of the Safe Production System, delivering record annual production at Amrun and Gove, with the former currently operating above nameplate capacity.

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- **Aluminium** production of 3.3 million tonnes was 1% higher than 2023, following the ramp-up of Kitimat and completion of cell recovery efforts at Boyne in the prior year, together with increased ownership of Boyne and New Zealand Aluminium Smelter (NZAS). These were partially offset by the continued closure program at Arvida and a request to reduce energy usage at NZAS, resulting in lower output. Production at NZAS is expected to be fully ramped up in the second quarter of 2025.
 - **Mined copper** production of 697 thousand tonnes (consolidated basis) in 2024 was 13% higher than 2023, reflecting the ramp up of Oyu Tolgoi underground and increased production from Escondida due to higher grades fed to the concentrator (0.99% versus 0.83%). This offset geotechnical challenges at Kennecott as instabilities in the pit wall impacted the mining sequence from the second quarter.
 - On 4 December, we [signed](#) a Term Sheet with Sumitomo Metal Mining (SMM) for a Joint Venture to deliver the **Winu copper-gold project** in Western Australia. We will continue to develop and operate Winu as managing partner and SMM will pay \$195 million upfront, and \$204 million in deferred consideration, contingent on milestones and adjustments to be agreed. We will now work to finalise definitive agreements in the first half of 2025, along with formalising the broader strategic partnership.
 - **Titanium dioxide slag** production of 990 thousand tonnes in 2024 was 11% lower than 2023 due to reduced market demand. A furnace reconstruction, starting in the first quarter of 2024, continues at our RTIT Quebec Operations. Through 2024, we operated six out of nine furnaces in Quebec and three out of four at Richards Bay Minerals (RBM).
 - **IOC** production of 9.4 million tonnes in 2024 was 2% lower than 2023 due to an 11-day site-wide shutdown driven by forest fires in mid-July, resulting in a revised mine plan and maintenance schedule. We also experienced operational challenges in the mine and concentrator throughout the year.
 - At the end of 2024, we had commenced deployment of the **Safe Production System** at 31 (~80%) of our sites, including three additional sites in the fourth quarter. We achieved our Safe Production System target of 5 million tonnes production uplift for Pilbara Iron Ore and two of our sites delivered their best production performance on record in the quarter.
 - On 9 October, we [announced](#) a definitive agreement to acquire **Arcadium Lithium plc** (Arcadium) in an all-cash transaction for US\$5.85 per share. This transaction will bring Arcadium's world-class, complementary lithium business into our portfolio, establishing a global leader in energy transition commodities. During the quarter, we made good progress on the outstanding conditions, with Arcadium announcing that it had obtained all requisite shareholder approvals for the proposed acquisition. We have received most of the required foreign investment approvals, including clearance by the Committee on Foreign Investment in the United States (CFIUS) in January 2025, and all of the required merger control clearances. Closing of the transaction remains subject to foreign investment approvals in Australia and Canada, approval of the Royal Court of Jersey and other closing conditions, and is expected to occur before mid-2025.
 - On 2 December, we [completed](#) the sale of **Dampier Salt Limited's** Lake MacLeod operation to Leichhardt Industrials Group. The consideration of A\$375 million was received in December.
 - On 6 December, we completed the sale of **Sweetwater**, a former uranium legacy site in Wyoming, United States. The consideration of \$175 million was received in December.
 - On 12 December, we [announced](#) the approval of \$2.5 billion¹ to expand the **Rincon project** in Argentina, our first commercial scale lithium operation, to an annual capacity of 60,000 tonnes of battery grade lithium carbonate. Mine life is expected to be 40 years², with construction of the expanded plant scheduled to begin in mid-2025, subject to permitting. First production is expected in 2028 with a three-year ramp-up to full capacity. The project uses direct lithium extraction (DLE) technology, a process that supports water conservation, reduces waste and produces lithium carbonate more consistently than other methods.
 - On 19 December, we [announced](#) the appointment of Georgie Bezette as our new Chief People Officer, succeeding James Martin, who retired at the end of 2024.

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.

¹ Included in the Group's capital expenditure guidance provided at our Investor Seminar on 4 December 2024.

² The production target of approximately 53 kt of battery grade lithium carbonate per year for a period of 40 years was previously reported in a release to the ASX dated 4 December 2024 titled "Rincon Project Mineral Resources and Ore Reserves: Table 1". Rio Tinto confirms that all material assumptions underpinning that production target continue to apply and have not materially changed. Plans are in place to build for a capacity of 60 kt of battery grade lithium carbonate per year with debottlenecking and improvement programs scheduled to unlock this additional throughput.

2025 guidance

	2024 Guidance	2024 Actuals	2025 Guidance
Rio Tinto production share, unless otherwise stated			
Pilbara iron ore (shipments, 100% basis) (Mt)	323 to 338	328.6	323 to 338
Bauxite (Mt)	53 to 56 ¹	58.7	57 to 59
Alumina (Mt)	7.0 to 7.3 ²	7.3	7.4 to 7.8
Aluminium (Mt)	3.2 to 3.4	3.3	3.25 to 3.45
Copper (consolidated basis) (kt) ³	—	792.6	780 to 850
Mined copper (consolidated basis) (kt)	660 to 720 ⁴	697.1	—
Refined copper (kt)	230 to 260	248.3	—
Titanium dioxide slag (Mt)	0.9 to 1.1	1.0	1.0 to 1.2
IOC iron ore pellets and concentrate (Mt)	9.1 to 9.6	9.4	9.7 to 11.4
Boric oxide equivalent (Mt)	~0.5	0.5	~0.5

¹ Expect to exceed the top end of guidance.

² Expect to achieve upper end of guidance.

³ From Q1 2025, we will report copper production and guidance as one metric, in order to simplify reporting and align with peer practices.

For further details see slide 90 of our [Investor Seminar 2024](#) presentation.

⁴ Around the bottom end.

- 2025 production guidance is unchanged since December 2024.
- Pilbara iron ore guidance remains subject to the timing of approvals for planned mining areas and heritage clearances. SP10 levels are expected to remain elevated until replacement projects are delivered.
- Iron ore shipments and bauxite production guidance remain subject to weather impacts.

Operating costs

- Guidance for 2025 Pilbara iron ore and copper C1 unit cash costs will be provided in the 2024 full year results release due on 19 February 2025.
- 2024 Pilbara iron ore unit cash costs are expected to be in the upper half of our \$21.75 to \$23.50 per tonne guidance (based on an average A\$:US\$ exchange rate of 0.66). This is due to inflation being at the higher end of our expectations and lower production.
- 2024 copper C1 unit costs are expected to be unchanged at 140 to 160 US cents/lb guidance.

Aluminium modelling

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

Alumina refining

Production cash cost (%)	FY 23	H1 24	H2 24	FY 24
Bauxite	31	32	33	33
Conversion	34	39	38	38
Caustic	22	17	17	17
Energy	13	12	12	12
Total	100	100	100	100

Input costs (nominal)	H1 23 Index price	H2 23 Index price	H1 24 Index price	H2 24 Index price	FY 24 Annual cost sensitivity impact on underlying EBITDA
Caustic soda ¹ (\$/t)	424	369	376	430	\$11m per \$10/t
Natural gas ² (\$/mmbtu)	2.54	2.79	2.21	2.61	\$4m per \$0.10/GJ
Brent oil (\$/bbl)	79.7	85.5	84.0	77.5	\$2m per \$10/bbl

¹North East Asia FOB | ²Henry Hub

Aluminium smelting

Production cash cost (%)	FY 23	H1 24	H2 24	FY 24
Alumina	38	41	45	43
Power	18	19	21	20
Conversion	21	22	19	20
Carbon	21	16	13	15
Materials	2	2	2	2
Total	100	100	100	100

Input costs (nominal)	H1 23 Index price	H2 23 Index price	H1 24 Index price	H2 24 Index price	Inventory flow	FY 24 Annual cost sensitivity impact on underlying EBITDA
Alumina ¹ (\$/t)	352	335	400	603	1 - 2 months	\$65m per \$10/t
Petroleum coke ² (\$/t)	631	491	394	391	2 - 3 months	\$11m per \$10/t
Coal tar pitch ³ (\$/t)	1,386	1,130	958	910	1 - 2 months	\$3m per \$10/t

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

Investments, growth and development projects

- Pre-tax and pre-divestment expenditure on exploration and evaluation charged to the profit and loss account in 2024 was \$935 million, compared with \$855 million in 2023 (excluding Simandou). Approximately 25% of the spend was by central exploration, 23% by Minerals (with the majority focusing on lithium), 36% by Copper, 14% by Iron Ore and 2% by Aluminium. In 2024, all qualifying expenditure relating to Simandou is being capitalised. Qualifying expenditure on the Rincon project has been capitalised since 1 July 2024.

Pilbara projects

- Construction of our Western Range mine is now over 90% complete with fabrication and overland conveyor belt installation finalised. We continue to focus on completion of the new crushing and screening facilities, with first ore from that new system on plan for the first half of 2025.
- We continue to advance our next tranche of Pilbara mine replacement projects at Hope Downs 1 (Hope Downs 2 and Bedded Hilltop), Brockman 4 (Brockman Syncline 1), Greater Nammuldi and West Angelas. Funding for the full execution of the Brockman 4 project was obtained during the quarter. Early works and design are underway for the Brockman 4 and the Hope Downs 1 projects. Environmental and heritage approvals are progressing and timelines remain subject to receiving these approvals. The Greater Nammuldi project continues to progress at a rate behind the original development schedule.
- The Rhodes Ridge pre-feasibility study, which is targeting an initial capacity of up to 40 million tonnes per year, subject to relevant approvals, remains on track to be completed in 2025. First ore is expected by the end of the decade.
- Early works activities at our Coastal Water desalination project progressed with earthworks materially complete and several key contract packages awarded during the quarter. The \$395 million plant will provide water to our port operations in Dampier. At full capacity, it will produce approximately 4GL/year to reduce draw from the Bungaroo aquifer to sustainable levels. We are assessing a further phase of the project.
- We are progressing engineering works for the replacement of all three bucketwheel reclaimers and associated infrastructure within the Parker Point Stockyard at our Dampier Port. Early enabling works are progressing well, with several contract packages awarded in the quarter and fabrication of the reclaimers commencing in December.

Oyu Tolgoi underground project

- First ore on the conveyor to surface belt was achieved in October 2024, with the conveyor system now able to transport ore to the surface from a depth of 1,300 metres. Load and production testing of the conveyor system is progressing.
- Construction works for the concentrator conversion remain on schedule. Commissioning activities commenced during the quarter and are forecast to be progressively completed through to the second quarter of 2025.
- Construction of primary crusher 2 is progressing to plan and remains on track to be completed by the end of 2025.

Simandou iron ore project

- The SimFer mine¹ is on track to deliver first production at the mine gate in 2025, ramping up over 30 months to an annualised capacity of 60 million tonnes per year² (27 million tonnes per year Rio Tinto share).
- For the SimFer mine, bulk earthworks are progressing to plan, despite productivity being impacted by wet weather during the quarter. All mine construction contracts are complete, and the two initial crushers are now commissioned, with first ore crushed on 1 January 2025.

- During the fourth quarter, all construction milestones for the period stipulated by the Government of Guinea were achieved for the SimFer infrastructure scope. In connection with SimFer's scope of the 620 kilometre long multi-use TransGuinean railway line, which will connect Simandou's mine operations to the port facilities, with the arrival of track laying locomotives, 8.5 kilometres of rail was installed and in October construction of the 275 metre Milo River bridge was completed. Tunnel excavation activity on the SimFer scope is now more than 75% complete, with construction at the port continuing to advance on the transshipment vessel (TSV) wharf and rail car dumper infrastructure. Expectations for delivery of the first trans shipping vessels remain on plan.
- The current total workforce across all the Simfer scope of mine, rail and port is 13,300 with 81% national Guinean participation.

Other key projects and exploration and evaluation

- The AP60 expansion project in Quebec remains on schedule. Construction activities during the quarter included commencement of installation of the silo for the gas treatment centre, busbar and the first floor slabs. Once completed, the project will add 96 new AP60 pots, increasing AP60 capacity by 160,000 tonnes of primary aluminium per year by the end of 2026. This new capacity, in addition to 30,000 tonnes of new recycling capacity at Arvida expected to open in the fourth quarter of 2025, will offset the 170,000 tonnes of capacity lost through the gradual closure of potrooms at the Arvida smelter from 2024.
- At Kennecott, activities continued on the North Rim Skarn (NRS) underground development and infrastructure. Production from NRS is forecast to commence in mid-2025, delivering around 250,000 tonnes through to 2033³.
- At the Resolution Copper project in Arizona, we continue to await a decision from the U.S. Supreme Court on the petition filed by the Apache Stronghold requesting to hear its case to stop the land exchange between Resolution Copper and the federal government. Separately the Supreme Court denied a petition from the San Carlos Apache Tribe, asking the Court to review a decision by the Arizona Supreme Court regarding a water discharge permit issued to Resolution Copper. We continue to progress the Final Environmental Impact Statement with the United States Forest Service, however they have yet to advise on the date of republication. We also advanced partnership discussions with several federally-recognised Native American Tribes. 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 concerns.
- At the Winu copper-gold project in Australia, we [signed](#) a Term Sheet with Sumitomo Metal Mining (SMM) in December for a Joint Venture to deliver the project. A pre-feasibility study with an initial development of processing capacity of up to 10 million tonnes per year is expected to be completed in 2025, along with the submission of an Environmental Review Document under the EPA Environmental Impact Assessment process. Project Agreement negotiations with Nyangumarta and the Martu Traditional Owner Groups remain our priority.
- Nuton, our copper heap leaching technology venture, continues to develop its path towards deployment with ten partnerships in five countries: United States, Mexico, Chile, Peru and Argentina. Construction is progressing at our first large scale deployment site at Gunnison's Johnson Camp Mine in Arizona, where we expect to achieve first copper in the second half of 2025. Work on the second industrial scale deployment for potential implementation in 2025 is well underway. Additionally, in the fourth quarter, Nuton signed an Option to the Joint Venture Agreement with Aldebaran Resources for the Altar project and also increased its ownership to 17.2% in McEwen's Los Azules project. Both projects are located in San Juan Province, Argentina.
- At the Rincon project in Argentina, first lithium was produced from the 3,000 tonne starter plant in November. Full commissioning and plant ramp-up continues, with project completion expected in the first quarter of 2025. The feasibility study for the full-scale operation was completed during the quarter, with our Board [approving](#) an investment of \$2.5 billion to expand Rincon's capacity to 60,000 tonnes⁴ of battery grade lithium carbonate per year. We [released](#) the Rincon Project Mineral Resources and Ore Reserves statement on 4 December.

- At the Jadar project in Serbia, the application process for obtaining the Exploitation Field Licence (EFL) continued during the fourth quarter. The EFL is essential for commencing fieldwork, including detailed geotechnical investigations, while cultural heritage and environmental surveys have resumed. The Environmental Impact Assessment process for the scoping and content for the mine progressed through the public consultation phase. This step includes legally mandated consultations, which the project supports, to encourage an open, fact-based dialogue.

¹ Simfer Jersey Limited is a joint venture between the Rio Tinto Group (53%) and Chalco Iron Ore Holdings Ltd (CIOH) (47%), a Chinalco-led joint venture of leading Chinese SOEs (Chinalco (75%), Baowu (20%), China Rail Construction Corporation (2.5%) and China Harbour Engineering Company (2.5%)). Simfer S.A. is the holder of the mining concession covering Simandou Blocks 3 & 4, and is owned by the Guinean State (15%) and Simfer Jersey Limited (85%). Simfer Infraco Guinée S.A.U. will deliver Simfer's scope of the co-developed rail and port infrastructure, and is co-owned by Simfer Jersey (85%) and the Guinean State (15%). Simfer Jersey will ultimately own 42.5% of Compagnie du Transguinéen, which will own and operate the co-developed infrastructure during operations.

² The estimated annualised capacity of approximately 60 million dry tonnes per annum iron ore for the Simandou life of mine schedule was previously reported in a release to the ASX dated 6 December 2023 titled "Investor Seminar 2023". Rio Tinto confirms that all material assumptions underpinning that production target and those production profiles continue to apply and have not materially changed.

³ The NRS production target of around 250 thousand tonnes of additional mined copper over ten years (2023 to 2033) at Kennecott was previously reported in a release to the Australian Securities Exchange (ASX) dated 20 June 2023 titled "Rio Tinto invests to strengthen copper supply in US". Rio Tinto confirms that all material assumptions underpinning the production targets continue to apply and have not materially changed.

⁴ The production target of approximately 53 kt of battery grade lithium carbonate per year for a period of 40 years was previously reported in a release to the ASX dated 4 December 2024 titled "Rincon Project Mineral Resources and Ore Reserves: Table 1". Rio Tinto confirms that all material assumptions underpinning that production target continue to apply and have not materially changed. Plans are in place to build for a capacity of 60 kt of battery grade lithium carbonate per year with debottlenecking and improvement programs scheduled to unlock this additional throughput.

Sustainability highlights

Workplace culture

During the fourth quarter, we completed one of the final recommendations of the Everyday Respect report; [publishing](#) an independent progress review conducted by Elizabeth Broderick & Co. Change is happening: one of the findings indicates people are more empowered to speak up and Everyday Respect is now widely considered a normal conversation within the company, which is a critical step for culture change. Achieving the sustained progress we want to see will require ongoing focus and effort. Guided by the Progress Review, we have shaped the next stage of our plan which will continue to drive progress towards becoming an organisation where everyone, everywhere feels safe, respected and empowered.

Communities & Social Performance (CSP)

In [November](#), as a result of Rio Tinto taking up its pro rata entitlements in the offer from Energy Resources of Australia (ERA), and the level of participation by other ERA shareholders, Rio Tinto holds over 98% of ERA's shares. Rio Tinto intends to proceed with the compulsory acquisition of all remaining ERA shares that it does not currently own. This underlines our commitment to the rehabilitation of the Ranger mine.

In December, we [welcomed](#) the release of the Panguna Mine Legacy Impact Assessment (PMLIA) [report](#) as a critical step forward in building understanding of the long-term legacy impacts of the former mine in Bougainville. The independent report assesses the environmental impacts and directly connected social and human rights impacts caused by the Panguna mine since Bougainville Copper Limited (BCL) ceased operations in 1989. Earlier in the quarter, we [signed](#) a Memorandum of Understanding with the Autonomous Bougainville Government (ABG) and BCL to form a roundtable to address the PMLIA findings and develop a remedy mechanism consistent with UN Guiding Principles on Business and Human Rights.

Other updates during the quarter are provided in the links below:

[20 October 2024 | Rio Tinto announces \\$27.5 million Channel 7 Telethon partnership](#)

[24 October 2024 | Rio Tinto and Pride WA announce 3-year partnership](#)

[8 November 2024 | Northwest Territories' diamond mines collaborate on one-of-a-kind pendant to be auctioned for charity](#)

[6 December 2024 | Rio Tinto renews support for prevention of gender-based violence across Canada](#)

Climate change, product stewardship and our value chain

On 5 December, we held a [Decarbonisation Update](#) during which we set out our substantial progress towards meeting our targets: reducing Scope 1 and 2 emissions by 50% by 2030, and achieving net zero by 2050. Our guidance on capital spending on decarbonisation projects to 2030 is maintained at \$5 to \$6 billion (lower end). During the quarter, we also [announced](#) a partnership with GravitHy to accelerate the decarbonisation of steelmaking in Europe and [named](#) Western Australia as the location to develop Australia's largest ironmaking electric smelting furnace pilot plant with our NeoSmelt partners. An update on our steel decarbonisation strategy can be found [here](#).

Further detail on these developments, and others during the quarter, is provided in the links below:

[29 October 2024 | Rio Tinto transitions to renewable diesel at Kennecott](#)

[6 November 2024 | Rio Tinto and China's State Power Investment Corporation partner to trial battery swap truck technology](#)

[13 November 2024 | Rio Tinto approves new solar plant to power Kennecott](#)

[15 November 2024 | Rio Tinto and GravitHy join forces to accelerate the decarbonisation of steelmaking in Europe](#)

[15 November 2024 | Rio Tinto invests \\$16m in Makira Natural Park REDD+ Project in Madagascar](#)

[2 December 2024 | Rio Tinto and Imperial launch \\$150 million partnership](#)

[13 December 2024 | Rio Tinto progresses the development of a gallium extraction process in Quebec](#)

[17 December 2024 | BlueScope, BHP and Rio Tinto select Western Australia for Australia's largest ironmaking electric smelting furnace pilot plant study](#)

Our markets

The global economy is showing resilience with inflation moderating and growth stabilising, although risks of geopolitical tensions and persistent labour shortages remain. China's economic growth drivers continue to shift from the property sector to advanced manufacturing and new technologies.

- The Chinese economy provided mixed signals during the quarter. It still faces headwinds from an ongoing property market oversupply, although the November data on home sales and prices showed signs of stabilisation following many months of policy loosening. Manufacturing and consumer durables further improved given increased subsidies to support consumption.
- The US economy has outperformed other developed economies and its outlook remains stable. In particular, the tech sector showed further strength in the fourth quarter, capping off a year of strong growth. However, the housing and building construction market showed mixed signals during the quarter, as residential starts and completions trended downwards in the latter part of 2024, while existing and new home sales saw an uptick in November.
- The eurozone outlook continues to be uncertain, with uneven growth across the region and consumption remaining subdued. Persistent manufacturing weakness and cross-country divergence make a strong recovery unlikely. However, the resilience of the labour market is expected to favour wage growth and slow disinflation.
- Iron ore prices decreased by 8% over the quarter, while the average monthly price in the fourth quarter of \$103/dmt (Platts CFR 62% Fe index) was 4% higher than the third quarter. China's crude steel production recovered to an annualised run-rate of more than one billion tonnes, as elevated steel exports partly offset domestic demand weakness. Seaborne supply declined by ~2% quarter on quarter in line with typical seasonality. China's iron ore inventories at 47 major ports drew down slightly during the quarter to 156Mt, although this level is still 31Mt higher than at the start of 2024.
- The LME aluminium price decreased by 4% over the quarter, while the average price increased by 8% from the third quarter to \$2,575/t. There was price support from high alumina costs and the cancellation of Chinese VAT rebates on semi-finished goods (semis) exports. Aluminium market spot premiums ended the fourth quarter at multi-year highs in the Japan and US, with the latter also supported by potential US tariffs on aluminium imports. China's aluminium production remained close to its capacity cap of 45 million tonnes, although fell back slightly after curtailments driven by high input costs. Ex-China aluminium semi-fabricated shipments slowed, driven by weak demand for extrusions and rolled products in the transport, building and construction sectors. Overall, the global market was in a slight deficit with inventories falling to lower levels compared to the historical norm. The Australian FOB alumina price corrected towards the end of the quarter to \$672/t, down from its peak level in early December. China's bauxite import prices surged in the fourth quarter, mainly driven by firm demand and disruptions to Guinean bauxite exports since early October.
- The LME copper price decreased by 11% over the quarter, while the average price was flat quarter on quarter at \$4.17/lb. Following the US elections, copper prices were weighed down by tariff risks and a strong dollar, dampening investor interest. China's refined copper consumption remained robust, but demand in the rest of the world was mixed, with manufacturing PMIs underperforming. After a counter-seasonal inventory build in the first half of the year, copper inventory drawdowns resumed in the fourth quarter, in line with historical trends. However, the refined copper market was still in surplus in 2024. In contrast, the copper concentrate market remains tight due to excess smelter capacity, with the 2025 benchmark treatment charges (TCs) settling at \$21/dmt, the lowest in two decades.
- Lithium demand continues to expand at double-digit growth on the back of strong global EV sales, up 25% year-on-year in the first eleven months of 2024, compared to 34% year-on-year for the same period of 2023. Supply cuts are gaining traction due to persistent price weakness, with Australia accounting for most of the output cuts and project delays. This pullback in production could tighten the market in 2025 and beyond.
- The TiO₂ market has shown mixed trends throughout 2024. Increased TiO₂ pigment production has supported feedstock consumption, but feedstock purchases have been impacted by surplus inventory. Western pigment producers have increased operating rates in response to improved demand, while Chinese pigment producers are facing increasing pressure from tariffs and a weak domestic market. Interest rate cuts and improving home sales in the US are positive for feedstock demand.

- Demand for borates continues to be stable, although uneven amongst end-use sectors. Agriculture demand growth has been positive. Industrial-related demand (i.e fibre glass) in China is projected to grow marginally for the full year, supported by an increase in exports, while housing sector demand in China and Europe remains depressed.

Average realised prices achieved for our major commodities

	Units	H1 2024	H2 2024	2024	2023
Pilbara iron ore	FOB, \$/wmt	97.3	82.5	89.6	99.7
Pilbara iron ore ¹	FOB, \$/dmt	105.8	89.7	97.4	108.4
Aluminium ²	Metal \$/t	2,746	2,928	2,834	2,738
Copper ³	US c/lb	419	423	422	390
IOC pellets	FOB \$/wmt	153.9	132.3	144.0	155.0

¹ Assuming 8% moisture.

² LME plus all-in premiums (product and market).

³ Average realised price for all units sold. Realised price does not include the impact of the provisional pricing adjustments, which negatively impacted revenues by \$92 million in 2024 (2023 positive impact of \$2 million).

Iron Ore

Rio Tinto share of production (Million tonnes)	Q4 2024	vs Q4 2023	vs Q3 2024	2024	vs 2023
Pilbara Blend and SP10 Lump ¹	23.5	+6%	+4%	86.6	+3%
Pilbara Blend and SP10 Fines ¹	35.2	+5%	+6%	129.6	+1%
Robe Valley Lump	1.8	+15%	+23%	6.4	+9%
Robe Valley Fines	2.7	-1%	+16%	10.4	+9%
Yandicoogina Fines (HIY)	10.4	-24%	-9%	45.2	-15%
Total Pilbara production	73.6	0%	+4%	278.2	-1%
Total Pilbara production (100% basis)	86.5	-1%	+3%	328.0	-1%

Rio Tinto share of shipments (Million tonnes)	Q4 2024	vs Q4 2023	vs Q3 2024	2024	vs 2023
Pilbara Blend Lump	13.1	-10%	-8%	52.6	-12%
Pilbara Blend Fines	23.4	-1%	-12%	97.8	-7%
Robe Valley Lump	1.5	0%	+29%	5.2	+5%
Robe Valley Fines	3.1	0%	+19%	11.7	+11%
Yandicoogina Fines (HIY)	10.6	-22%	-10%	46.0	-14%
SP10 Lump ¹	7.3	+59%	+28%	22.6	+86%
SP10 Fines ¹	13.4	+10%	+29%	41.2	+17%
Total Pilbara shipments ²	72.3	-1%	0%	277.2	-1%
Total Pilbara shipments (100% basis) ²	85.7	-1%	+1%	328.6	-1%
Total Pilbara Shipments (consolidated basis) ^{2,3}	74.2	-1%	—%	284.6	-1%

Production figures are sometimes more precise than the rounded numbers shown, hence small rounding differences may appear.

¹ SP10 includes other lower grade products.

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

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

Pilbara operations

We produced 86.5 million tonnes (Rio Tinto share 73.6 million tonnes) in the fourth quarter, 1% lower than the corresponding period of 2023. Mine productivity mostly offset depletion and higher than average rainfall, which was more than five times historical levels. As a result, mine stocks were drawn down, with operations in the first quarter of 2025 to focus on recovering pit health.

Shipments of 85.7 million tonnes (Rio Tinto share 72.3 million tonnes) were 1% lower than the fourth quarter of 2023. SP10 volumes accounted for 25%¹ of shipments in the fourth quarter, higher than the first three quarters of 2024 (18%). SP10 levels are expected to remain elevated until replacement projects are delivered. We are reviewing our future product strategy, having regard to customer requirements and available ore grades.

Full year mine production of 328.0 million tonnes was 1% lower than 2023, with shipments also 1% lower. Production was affected by depletion, predominantly at Paraburdoo as we transition to Western Range and Yandicoogina, as well as higher than average rainfall. The Safe Production System target of 5 million tonnes for 2024 was achieved. Gudai-Darri demonstrated 50 million tonne per annum rates during the fourth quarter. Sustaining production at these rates is subject to the timing of approvals for planned mining areas and heritage clearances, and continuation of the debottlenecking program at the main plant.

Approximately 10% of sales in 2024 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 25% of sales in 2024 were made on a free on board (FOB) basis, with the remainder sold including freight.

Achieved average pricing in 2024 was \$89.6 per wet metric tonne (\$99.7 in 2023) on an FOB basis (equivalent to \$97.4 per dry metric tonne, with an 8% moisture assumption). This compares to the average price for the monthly average Platts index for 62% iron fines converted to a FOB basis of \$98.4 per dry metric tonne.

China Portside Trading

Our iron ore portside sales in China were 9.5 million tonnes in the fourth quarter of 2024 (5.8 million tonnes in the fourth quarter of 2023), leading to a total of 29.9 million tonnes in 2024 (23.3 million tonnes in 2023). At the end of the December, inventory levels were 7.1 million tonnes, including 4.9 million tonnes of Pilbara product. In 2024 approximately 89% of our portside sales were either screened or blended in Chinese ports (86% in 2023).

¹ Based on total Pilbara shipments on a 100% basis.

Aluminium

Rio Tinto share of production ('000 tonnes)	Q4 2024	vs Q4 2023	vs Q3 2024	2024	vs 2023
Bauxite	15,412	+2%	+2%	58,653	+7%
Bauxite third party shipments	10,627	-1%	-4%	40,935	+10%
Alumina	1,992	+4%	+13%	7,303	-3%
Aluminium	837	-1%	+3%	3,296	+1%
Recycled aluminium	58	n/a	-7%	264	n/a

Bauxite

Bauxite production of 15.4 million tonnes was 2% higher than the fourth quarter of 2023. Implementation of the Safe Production System continued to drive higher plant availability and utilisation rates, especially at our Amrun mine at Weipa. We remain focused on continued operational improvement as we enter a quarter typically impacted by wet weather.

Full year 2024 production was 58.7 million tonnes, 7% higher than 2023, exceeding our guidance. We delivered record annual production at Gove and Amrun, with the latter currently operating above nameplate capacity.

We shipped 10.6 million tonnes of bauxite to third parties in the fourth quarter, 1% lower than the same period of 2023.

Alumina

Alumina production of 2.0 million tonnes was 4% higher than the fourth quarter of 2023. Gas supplies to our Gladstone operations from the third-party operated Queensland Gas Pipeline are now meeting 100% of our requirements, following a breakage of this pipeline in March.

As the result of sanction measures by the Australian Government, Rio Tinto has taken on 100% of capacity of Queensland Alumina Limited (QAL) for as long as the sanctions continue. 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 1% lower than the fourth quarter of 2023. At our New Zealand Aluminium Smelter (NZAS) production continued to ramp-up following a previous call from Meridian Energy to reduce its electricity usage in August, for which we are compensated. As previously reported, we expect the ramp-up to run through to the second quarter of 2025. At Kitimat, our energy supply and production was impacted by lower reservoir levels.

We [completed](#) the previously announced [acquisition](#) of Sumitomo Chemical Company's (SCC's) 20.64% interest in NZAS on 1 November 2024 and now fully own the Tiwai Point aluminium smelter.

We also [completed](#) the previously announced acquisition of SCC's 2.46% stake in Boyne Smelters Limited (BSL). The completion of this transaction, along with the recently [completed](#) acquisition of Mitsubishi's 11.65% stake in BSL, brings Rio Tinto's total interest in BSL to 73.5%.

Production is reported including these changes in ownership from 1 November 2024.

Average realised aluminium prices including premiums for value-added products (VAP) increased 4% to \$2,834 per tonne in 2024 (2023: \$2,738 per tonne). The LME price increased by 8% to \$2,419 per tonne (2023: \$2,250 per tonne), whilst the mid-west premium duty paid declined 17% to \$427 per tonne in 2024 (2023: \$512 per tonne), which is 59% of our total volumes (57% in 2023). Our VAP sales remained at 46% of primary metal sold in 2024 (2023: 46%). Product premiums for VAP sales decreased, averaging \$295 per tonne of VAP sold (2023: \$354 per tonne).

On 4 December, we [announced](#) a partnership agreement with the Swedish investment company Vargas, Mitsubishi Corporation and other international and local industry partners to study a low-carbon aluminium greenfield opportunity in Finland. We will provide the Arctial partnership with access to our proven industry-leading AP60 technology and assist in what would be the first AP60 deployment in an aluminium smelter outside Quebec. As a first step, Arctial will conduct a feasibility study and environmental impact assessment.

Recycled aluminium

Rio Tinto's share of production from Matalco was 58 thousand tonnes in the fourth quarter (116 thousand tonnes on a 100% basis), as production continued to be impacted by market conditions in North America. Full year 2024 production from Matalco was 264 thousand tonnes (528 thousand tonnes on a 100% basis).

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Copper

Rio Tinto share of production ('000 tonnes)	Q4 2024	vs Q4 2023	vs Q3 2024	2024	vs 2023
Mined copper					
Kennecott	31.2	-35%	+14%	123.4	-19%
Escondida	104.8	+46%	+16%	358.7	+20%
Oyu Tolgoi (66% basis)	43.8	+63%	+33%	141.9	+28%
Total mined copper production	179.8	+23%	+19%	624.0	+11%
Total mined copper production (consolidated basis ¹)	202.4	+26%	+21%	697.1	+13%
Refined copper					
Kennecott ²	55.4	+73%	+30%	193.2	+78%
Escondida	13.3	-5%	+13%	55.1	-17%

¹ Includes Oyu Tolgoi and Kennecott on a 100% consolidated basis, and Escondida on an equity share basis.
² We continue to process third party concentrate to optimise smelter utilisation, including 8.7 thousand tonnes of cathode produced from purchased concentrate in 2024. 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.

Kennecott

Mined copper production was 35% lower than the fourth quarter of 2023. This was primarily due to reduced head grade caused by geotechnical instabilities in the pit wall that impacted the mining sequence and increased the usage of lower grade stockpiled ore, as first identified in our Second Quarter Operations Review. As detailed at our Investor Seminar in December, we have revised our mine plan with smaller benches, lower bench stack height and step outs, and increased waste movement to unload the area around the faults.

We are focusing on our overheads and contractor management costs while identifying efficiencies in our truck and excavator fleet. We are also supplementing our smelter with third party concentrate (5.7 thousand tonnes in the fourth quarter) to maintain throughput.

Production will be impacted in 2025 and 2026 in line with the annualised mine production rate from the last three quarters of 2024, with slight improvement expected in 2026. Meanwhile, we continue to review future options for the open pit and underground.

Refined copper production was 73% higher than the fourth quarter of 2023, following the rebuild of the smelter and refinery in 2023. Refined production was 30% higher than the third quarter, due to good smelter performance following the annual planned shutdown of the concentrator and smelter in July.

Escondida

Mined copper production was 46% higher than the fourth quarter of 2023 due to higher ore grades being fed to the concentrators (1.06% versus 0.77%) driven by access to a higher grade zone.

Refined copper production was 5% lower than the same quarter of last year, given reduced oxide leach volumes, with lower grades being stacked during 2024 and integration of the Full SaL project. However, production in the fourth quarter was 13% higher than the prior quarter due to higher grade of the stacked ore. Full SaL continues to progress, with first salt addition achieved this quarter and ramp up expected during 2025.

We continue to work with our joint venture partners on Escondida growth options.

Oyu Tolgoi

Mined copper production increased 63% from the fourth quarter of 2023 given the ramp-up in production, and higher grade, from the underground mine. Production was 33% higher than the previous quarter due to the ongoing commissioning of the conveyor to surface, with first ore on the belt delivered in October. Open pit operations also benefited from an increase in ore grade.

We have opened a total of 124 drawbells from Panel 0 of the underground mine, including four during the fourth quarter. During the quarter, we delivered 2.1 million tonnes of milled ore from the underground mine at an average copper head grade of 1.96% and 8.9 million tonnes from the open pit with an average grade of 0.43%. The ramp-up remains on track to reach 500 thousand tonnes of copper per year (100% basis and stated as recoverable metal) for the underground and open pit mines for the years 2028 to 2036¹.

Production is scheduled to come from Panel 0 and Panel 2 in 2025. We are also planning to undertake development work in Panel 1. Panel 1 sits partially on a mining licence subject to a joint venture between Entrée Resources and Oyu Tolgoi. We are working closely with all stakeholders towards a longer-term solution for mining in this joint venture area.

In November, we successfully concluded our Collective Agreement negotiations, marking a historic milestone as the first agreement involving two trade unions at the operation. The agreement will remain in effect for the next three years.

¹ The 500 thousand tonnes per annum copper production target (stated as recoverable metal) for the Oyu Tolgoi underground and open pit mines for the years 2028 to 2036 was previously reported in a release to the ASX dated 11 July 2023 "[Investor site visit to Oyu Tolgoi copper mine, Mongolia](#)". All material assumptions underpinning that production target and those production profiles continue to apply and have not materially changed.

Minerals

Rio Tinto share of production (million tonnes)	Q4 2024	vs Q4 2023	vs Q3 2024	2024	vs 2023
Iron ore pellets and concentrate					
IOC	2.5	-6%	+20%	9.4	-2%
Rio Tinto share of production ('000 tonnes)					
Minerals					
Borates - B ₂ O ₃ content	132	+18%	+5%	504	+2%
Titanium dioxide slag	235	-14%	-11%	990	-11%
Rio Tinto share of production ('000 carats)					
Diavik	775	+18%	+43%	2,759	-17%

Iron Ore Company of Canada (IOC)

Iron ore production was 6% lower than the fourth quarter of 2023 due to lower quality iron ore feed into the concentrator given challenges with ore availability at the mine. Although these challenges will persist into 2025, we expect they will be offset by improved productivity in the mine.

Shipments were 3% lower than the fourth quarter of 2023 driven by reduced concentrate production.

Annual rail haulage was 36.4 million tonnes, 7% higher than in 2023, driven by continued operational improvements to meet increasing third-party and IOC demand.

Our focus going forward is to stabilise the operation and achieve safe, cost-effective and consistent production.

Borates

Borates production in the fourth quarter was 18% higher than the corresponding period of 2023 due to a scheduled shut in the prior period.

Iron and Titanium

Titanium dioxide slag production was 14% lower than the fourth quarter of 2023 reflecting a planned shutdown at our RTIT Quebec Operations. A furnace reconstruction continues in Quebec, where we continue to operate six out of nine furnaces. Three out of four furnaces are operating at Richards Bay Minerals (RBM).

Diamonds

At Diavik, carat production was 18% higher than the fourth quarter of 2023. Production continues to ramp up from a subsidence event in July that limited underground ore deliveries.

On 3 October, we [announced](#) that the Diavik mine has safely completed the development and construction of Phase 1 of the A21 underground mine, now moving the underground mine into commercial production.

Exploration and evaluation

Pre-tax and pre-divestment expenditure on exploration and evaluation charged to the profit and loss account in 2024 was \$935 million, compared with \$855 million in 2023 (excluding Simandou). Approximately 25% of the spend was by central exploration, 23% by Minerals (with the majority focusing on lithium), 36% by Copper, 14% by Iron Ore and 2% by Aluminium. In 2024, all qualifying expenditure relating to Simandou is being capitalised. Qualifying expenditure on the Rincon project has been capitalised since 1 July 2024.

Exploration highlights

Rio Tinto has a strong portfolio of projects with activity in 17 countries across eight commodities in early exploration and studies stages. The bulk of the exploration expenditure in the fourth quarter focused on copper in Angola, Chile, Colombia, Papua New Guinea, Peru, the US and Zambia, nickel in Finland, lithium in Canada, Rwanda, and Australia, potash in Canada, diamonds in Angola, heavy mineral sands (HMS) in South Africa and rutile-graphite in Malawi. The Rio Tinto operated Nuevo Cobre joint venture copper project in Chile continues to make good progress with permitting advancing alongside ongoing geological field programs. Mine-lease exploration continued at Rio Tinto managed businesses including Pilbara Iron Ore in Australia.

A summary of activity for the quarter is as follows:

Commodities	Studies Stage	Advanced projects	Greenfield/ Brownfield programs
Bauxite			East Arnhemland, Australia
Battery Materials	Lithium borates: Jadar, Serbia Nickel: Tamarack, US (3rd party operated)		Nickel Greenfield: Finland Lithium Greenfield: Australia, Canada, Chile, China, Finland, Kazakhstan, Rwanda, US
Copper	Copper/molybdenum: Resolution, US Copper/gold: Winu, Australia	Copper: La Granja, Peru (3rd party operated)	Copper Greenfield: Angola, Australia, Chile, China, Colombia, Kazakhstan, Laos, Peru, Papua New Guinea, Serbia, US, Zambia Copper Brownfield: US (Bingham), Australia (Winu)
Diamonds		Chiri, Angola	
Iron Ore	Pilbara, Australia	Pilbara, Australia	Greenfield and Brownfield: Pilbara, Australia
Minerals	HMS: Mutamba, Mozambique	Potash: Texas, Canada. HMS: Kamiesberg, South Africa (3rd party operated). Rutile-graphite: Kasiya, Malawi (3rd party operated)	

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 report, including, without limitation, those regarding Rio Tinto’s financial position, business strategy, plans and objectives of management for future operations (including development plans and objectives relating to Rio Tinto’s products, production forecasts and reserve and resource positions), are forward-looking statements. The words “intend”, “aim”, “project”, “anticipate”, “estimate”, “plan”, “believes”, “expects”, “may”, “should”, “will”, “target”, “set to” or similar expressions, commonly identify such forward-looking statement.

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

Nothing in this 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. Past performance cannot be relied on as a guide to future performance.

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

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LEI: 213800YOE050Q72G2R82

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		
		2023 Q4	2024 Q3	2024 Q4	2023	2024	Q4 24 vs Q4 23	Q4 24 vs Q3 24	2024 vs 2023
Principal commodities									
Alumina	('000 t)	1,919	1,770	1,992	7,537	7,303	+4%	+13%	-3%
Aluminium (Primary)	('000 t)	846	809	837	3,272	3,296	-1%	+3%	+1%
Bauxite	('000 t)	15,098	15,100	15,412	54,619	58,653	+2%	+2%	+7%
Borates	('000 t)	111	126	132	495	504	+18%	+5%	+2%
Copper - mined (consolidated)	('000 t)	160.0	167.8	202.4	619.6	697.1	+26%	+21%	+13%
Copper - refined	('000 t)	46.1	54.3	68.7	175.2	248.3	+49%	+26%	+42%
Iron Ore	('000 t)	76,514	73,160	76,102	290,171	287,676	-1%	+4%	-1%
Titanium dioxide slag	('000 t)	275	263	235	1,111	990	-14%	-11%	-11%
Other Metals & Minerals									
Diamonds	('000 cts)	659	542	775	3,340	2,759	+18%	+43%	-17%
Gold - mined	('000 oz)	75.6	69.4	79.0	281.5	282.0	+4%	+14%	—%
Gold - refined	('000 oz)	20.6	25.7	43.1	74.2	143.8	+109%	+68%	+94%
Molybdenum	('000 t)	0.8	0.5	0.8	1.8	2.6	+11%	+77%	+46%
Salt	('000 t)	1,438	1,511	1,347	5,973	5,823	-6%	-11%	-3%
Silver - mined	('000 oz)	1,100	1,046	1,144	3,811	4,236	+4%	+9%	+11%
Silver - refined	('000 oz)	406	392	766	1,407	2,314	+89%	+96%	+65%

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 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
ALUMINA								
Production ('000 tonnes)								
Jonqui�re (Vaudreuil)	100 %	349	352	328	323	350	1,392	1,353
Jonqui�re (Vaudreuil) specialty Alumina plant	100 %	29	27	30	28	26	109	111
Queensland Alumina	80 %	664	675	602	693	737	2,693	2,707
S�o Luis (Alumar)	10 %	90	87	93	93	97	338	369
Yarwun	100 %	786	722	624	634	782	3,006	2,762
Rio Tinto total alumina production		1,919	1,864	1,676	1,770	1,992	7,537	7,303

ALUMINIUM								
Primary production ('000 tonnes)								
Australia - Bell Bay	100 %	47	47	47	47	47	186	187
Australia - Boyne Island (a)	74 %	76	75	75	76	93	295	318
Australia - Tomago	52 %	77	73	75	77	77	304	302
Canada - six wholly owned	100 %	410	405	399	395	398	1,565	1,597
Canada - Alouette (Sept-�les)	40 %	64	63	63	63	64	253	253
Canada - B�cancour	25 %	30	29	30	30	30	117	119
Iceland - ISAL (Reykjavik)	100 %	54	49	50	52	51	209	202
New Zealand - Tiwai Point (b)	100 %	67	66	65	49	59	265	239
Oman - Sohar	20 %	20	20	20	20	20	80	80
Rio Tinto total primary aluminium production		846	826	824	809	837	3,272	3,296
Recycled production ('000 tonnes)								
Matalco	50 %	—	74	70	62	58	—	264
Rio Tinto total recycled aluminium production		—	74	70	62	58	—	264

(a) On 1 November 2024, Rio Tinto's ownership interest in Boyne Smelters Limited (BSL) increased from 71.04% to 73.5%. Production is reported including this change from 1 November 2024.

(b) On 1 November 2024, Rio Tinto's ownership interest in Tiwai Point Smelter (NZAS) increased from 79.36% to 100%. Production is reported including this change from 1 November 2024.

BAUXITE								
Production ('000 tonnes) (a)								
Gove	100 %	3,234	3,104	3,172	3,073	3,372	11,566	12,721
Porto Trombetas (b)	22 %	509	508	667	737	623	1,502	2,535
Sangaredi	(c)	1,544	1,583	1,622	1,544	1,571	6,425	6,319
Weipa	100 %	9,811	8,224	9,262	9,747	9,846	35,126	37,078
Rio Tinto total bauxite production		15,098	13,418	14,723	15,100	15,412	54,619	58,653

(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) On 30 November 2023, Rio Tinto's ownership interest in Porto Trombetas increased from 12% to 22%. Production is reported including this change from 1 December 2023.

(c) 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 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
BORATES								
Production ('000 tonnes B₂O₃ content)								
Rio Tinto Borates - borates	100 %	111	121	125	126	132	495	504
COPPER								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100 %	47.8	32.5	32.3	27.4	31.2	151.6	123.4
Escondida	30 %	71.6	77.2	86.4	90.4	104.8	299.9	358.7
Oyu Tolgoi	66 %	26.8	30.4	34.7	33.0	43.8	110.9	141.9
Rio Tinto total mine production		146.2	140.1	153.3	150.8	179.8	562.4	624.0
Rio Tinto total mine production - consolidated basis		160.0	155.8	171.2	167.8	202.4	619.6	697.1
Refined production ('000 tonnes)								
Escondida	30 %	14.1	14.7	15.2	11.8	13.3	66.7	55.1
Kennecott (b)	100 %	32.0	47.8	47.5	42.5	55.4	108.6	193.2
Rio Tinto total refined production		46.1	62.5	62.7	54.3	68.7	175.2	248.3

(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.

(b) We continue to process third party concentrate to optimise smelter utilisation, including 8.7 thousand tonnes of cathode produced from purchased concentrate in 2024. 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 %	659	740	702	542	775	3,340	2,759

GOLD

Mine production ('000 ounces) (a)								
Bingham Canyon	100 %	33.5	26.7	22.5	22.1	24.0	104.8	95.2
Escondida	30 %	14.6	11.7	13.6	14.1	11.2	59.7	50.6
Oyu Tolgoi	66 %	27.5	28.2	30.9	33.3	43.8	117.0	136.2
Rio Tinto total mine production		75.6	66.6	67.1	69.4	79.0	281.5	282.0
Refined production ('000 ounces)								
Kennecott (b)	100 %	20.6	35.3	39.7	25.7	43.1	74.2	143.8

(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) We continue to process third party concentrate to optimise smelter utilisation, including 8.7 thousand tonnes of cathode produced from purchased concentrate in 2024. 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.

Rio Tinto share of production

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
IRON ORE								
Production ('000 tonnes) (a)								
Hamersley mines	(b)	59,138	53,373	54,691	57,096	59,656	225,898	224,816
Hope Downs	50 %	6,074	5,081	5,044	5,753	5,100	23,241	20,978
Iron Ore Company of Canada	59 %	2,703	2,613	2,185	2,116	2,532	9,676	9,446
Robe River - Pannawonica (Mesas J and A)	53 %	4,330	4,245	4,186	3,844	4,549	15,456	16,823
Robe River - West Angelas	53 %	4,269	3,388	3,607	4,352	4,265	15,899	15,612
Rio Tinto iron ore production ('000 tonnes)		76,514	68,701	69,712	73,160	76,102	290,171	287,676
Breakdown of Production:								
Pilbara Blend and SP10 Lump (c)		22,228	19,885	20,828	22,460	23,460	84,301	86,634
Pilbara Blend and SP10 Fines (c)		33,485	29,836	31,277	33,320	35,158	127,786	129,592
Robe Valley Lump		1,592	1,534	1,546	1,488	1,825	5,882	6,393
Robe Valley Fines		2,739	2,711	2,640	2,356	2,723	9,574	10,431
Yandicoogina Fines (HIY)		13,768	12,122	11,235	11,421	10,402	52,952	45,181
Pilbara iron ore production ('000 tonnes)		73,811	66,088	67,527	71,045	73,570	280,495	278,230
IOC Concentrate		1,298	1,130	930	842	1,062	4,796	3,964
IOC Pellets		1,405	1,483	1,255	1,274	1,470	4,880	5,482
IOC iron ore production ('000 tonnes)		2,703	2,613	2,185	2,116	2,532	9,676	9,446
Breakdown of Shipments:								
Pilbara Blend Lump		14,533	12,844	12,463	14,240	13,079	59,725	52,626
Pilbara Blend Fines		23,706	23,168	24,702	26,626	23,351	105,083	97,847
Robe Valley Lump		1,506	1,223	1,337	1,166	1,508	5,005	5,234
Robe Valley Fines		3,054	2,943	3,095	2,565	3,055	10,511	11,658
Yandicoogina Fines (HIY)		13,628	12,228	11,364	11,794	10,585	53,544	45,971
SP10 Lump (c)		4,620	4,474	5,071	5,715	7,341	12,137	22,601
SP10 Fines (c)		12,208	9,221	8,218	10,366	13,421	35,353	41,225
Pilbara iron ore shipments ('000 tonnes) (d)		73,255	66,100	66,250	72,471	72,341	281,358	277,162
Pilbara iron ore shipments - consolidated basis ('000 tonnes) (d) (f)		75,058	67,910	68,281	74,211	74,213	288,438	284,615
IOC Concentrate		1,196	1,162	986	1,228	1,140	4,659	4,515
IOC Pellets		1,369	1,493	1,438	1,157	1,357	4,929	5,444
IOC Iron ore shipments ('000 tonnes) (d)		2,565	2,654	2,423	2,385	2,497	9,588	9,959
Rio Tinto iron ore shipments ('000 tonnes) (d)		75,820	68,755	68,673	74,856	74,838	290,947	287,121
Rio Tinto iron ore sales ('000 tonnes) (e)		76,269	69,356	71,920	74,078	77,648	296,707	293,002

(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, Eastern Range and Western Range mines. Whilst Rio Tinto owns 54% of the Eastern Range and the Western Range mines, 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	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
MOLYBDENUM								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100 %	0.8	0.7	0.6	0.5	0.8	1.8	2.6

(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 %	1,438	1,425	1,540	1,511	1,347	5,973	5,823

SILVER								
Mine production ('000 ounces) (a)								
Bingham Canyon	100 %	504	370	368	368	377	1,618	1,484
Escondida	30 %	420	398	465	464	486	1,476	1,813
Oyu Tolgoi	66 %	176	205	239	214	281	717	940
Rio Tinto total mine production		1,100	973	1,072	1,046	1,144	3,811	4,236
Refined production ('000 ounces)								
Kennecott (b)	100 %	406	550	606	392	766	1,407	2,314

(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) We continue to process third party concentrate to optimise smelter utilisation, including 8.7 thousand tonnes of cathode produced from purchased concentrate in 2024. 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.

TITANIUM DIOXIDE SLAG								
Production ('000 tonnes)								
Rio Tinto Iron & Titanium (a)	100 %	275	254	238	263	235	1,111	990

(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 December 2024.

Rio Tinto operational data

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
ALUMINA								
Smelter Grade Alumina - Aluminium Group								
Alumina production ('000 tonnes)								
<i>Australia</i>								
Queensland Alumina Refinery - Queensland	80 %	830	844	752	866	921	3,366	3,384
Yarwun refinery - Queensland	100 %	786	722	624	634	782	3,006	2,762
<i>Brazil</i>								
São Luis (Alumar) refinery	10 %	899	867	926	927	967	3,375	3,687
<i>Canada</i>								
Jonquière (Vaudreuil) refinery - Quebec (a)	100 %	349	352	328	323	350	1,392	1,353
<i>(a) Jonquière's (Vaudreuil's) production shows smelter grade alumina only and excludes hydrate produced and used for specialty alumina.</i>								
Speciality Alumina - Aluminium Group								
Speciality alumina production ('000 tonnes)								
<i>Canada</i>								
Jonquière (Vaudreuil) plant – Quebec	100 %	29	27	30	28	26	109	111

Rio Tinto percentage interest shown above is at 31 December 2024. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
ALUMINIUM								
Primary Aluminium								
Primary aluminium production ('000 tonnes)								
<i>Australia</i>								
Bell Bay smelter - Tasmania	100 %	47	47	47	47	47	186	187
Boyne Island smelter - Queensland (a)	74 %	128	126	126	127	128	496	507
Tomago smelter - New South Wales	52 %	149	142	146	150	149	589	587
<i>Canada</i>								
Alma smelter - Quebec	100 %	123	121	119	120	122	484	483
Alouette (Sept-Îles) smelter - Quebec	40 %	160	157	158	158	159	634	632
Arvida smelter - Quebec	100 %	43	43	37	36	37	172	153
Arvida AP60 smelter - Quebec	100 %	15	15	15	15	15	59	61
Bécancour smelter - Quebec	25 %	119	116	119	119	120	465	473
Grande-Baie smelter - Quebec	100 %	58	57	57	57	58	229	229
Kitimat smelter - British Columbia	100 %	109	107	107	103	102	377	419
Laterrière smelter - Quebec	100 %	62	61	63	64	64	244	252
<i>Iceland</i>								
ISAL (Reykjavik) smelter	100 %	54	49	50	52	51	209	202
<i>New Zealand</i>								
Tiwai Point smelter (b)	100 %	85	83	82	62	63	334	290
<i>Oman</i>								
Sohar smelter	20 %	100	99	99	100	101	398	399
Recycled Aluminium								
Recycled aluminium production ('000 tonnes)								
Matalco	50 %	—	148	139	125	116	—	528

(a) On 1 November 2024, Rio Tinto's ownership interest in Boyne Smelters Limited (BSL) increased from 71.04% to 73.5%. Production is reported including this change from 1 November 2024.

(b) On 1 November 2024, Rio Tinto's ownership interest in Tiwai Point Smelter (NZAS) increased from 79.36% to 100%. Production is reported including this change from 1 November 2024.

Rio Tinto percentage interest shown above is at 31 December 2024. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
BAUXITE								
Bauxite production ('000 tonnes)								
<i>Australia</i>								
Gove mine - Northern Territory	100 %	3,234	3,104	3,172	3,073	3,372	11,566	12,721
Weipa mine - Queensland	100 %	9,811	8,224	9,262	9,747	9,846	35,126	37,078
<i>Brazil</i>								
Porto Trombetas (MRN) mine	22 %	3,202	2,310	3,034	3,348	2,831	11,472	11,523
<i>Guinea</i>								
Sangaredi mine (a)	23 %	3,430	3,517	3,604	3,432	3,491	14,278	14,043
Rio Tinto share of bauxite shipments								
Share of total bauxite shipments ('000 tonnes)		15,513	12,715	15,177	15,511	15,513	55,335	58,916
Share of third party bauxite shipments ('000 tonnes)		10,749	8,496	10,691	11,120	10,627	37,337	40,935

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

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
BORATES								
Rio Tinto Borates - borates	100 %							
<i>US</i>								
Borates ('000 tonnes) (a)		111	121	125	126	132	495	504

(a) Production is expressed as B₂O₃ content.

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
COPPER & GOLD								
Escondida	30 %							
<i>Chile</i>								
Sulphide ore to concentrator ('000 tonnes)		34,752	31,653	34,377	32,488	35,293	132,143	133,811
Average copper grade (%)		0.77	0.92	0.99	1.00	1.06	0.83	0.99
Mill production (metals in concentrates):								
Contained copper ('000 tonnes)		217.6	238.6	279.5	269.9	309.8	882.1	1,097.8
Contained gold ('000 ounces)		48.6	39.0	45.4	47.0	37.3	199.2	168.6
Contained silver ('000 ounces)		1,401	1,328	1,549	1,546	1,619	4,921	6,042
Recoverable copper in ore stacked for leaching ('000 tonnes) (a)		21.0	18.6	8.4	31.4	39.5	117.5	97.9
Refined production from leach plants:								
Copper cathode production ('000 tonnes)		46.9	49.0	50.7	39.4	44.4	222.2	183.6

(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 2024. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
COPPER & GOLD (continued)								
Kennecott								
Bingham Canyon mine	100 %							
<i>Utah, US</i>								
Ore treated ('000 tonnes)		10,579	8,271	10,257	9,149	10,487	33,126	38,164
Average ore grade:								
Copper (%)		0.50	0.43	0.36	0.36	0.35	0.51	0.37
Gold (g/t)		0.14	0.14	0.11	0.12	0.12	0.15	0.12
Silver (g/t)		2.10	1.97	1.79	2.02	1.78	2.16	1.88
Molybdenum (%)		0.019	0.021	0.020	0.019	0.020	0.017	0.020
Copper concentrates produced ('000 tonnes)		191	127	135	121	144	579	527
Average concentrate grade (% Cu)		25.0	25.6	23.9	22.0	21.6	26.1	23.3
Production of metals in copper concentrates:								
Copper ('000 tonnes) (a)		47.8	32.5	32.3	27.4	31.2	151.6	123.4
Gold ('000 ounces)		33.5	26.7	22.5	22.1	24.0	104.8	95.2
Silver ('000 ounces)		504	370	368	368	377	1,618	1,484
Molybdenum concentrates produced ('000 tonnes):								
Molybdenum in concentrates ('000 tonnes)		1.6	1.6	1.6	1.1	2.2	3.7	6.5
		0.8	0.7	0.6	0.5	0.8	1.8	2.6
Kennecott smelter & refinery								
	100 %							
Copper concentrates smelted ('000 tonnes)		187	171	227	156	187	486	741
Copper anodes produced ('000 tonnes) (b)		44.1	56.7	54.4	42.8	43.2	118.9	197.2
Production of refined metal:								
Copper ('000 tonnes) (c)		32.0	47.8	47.5	42.5	55.4	108.6	193.2
Gold ('000 ounces) (d)		20.6	35.3	39.7	25.7	43.1	74.2	143.8
Silver ('000 ounces) (d)		406	550	606	392	766	1,407	2,314

(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 8.7 thousand tonnes of cathode produced from purchased concentrate in 2024. 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 2024. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
COPPER & GOLD (continued)								
Oyu Tolgoi mine	66 %							
<i>Mongolia</i>								
Ore Treated ('000 tonnes) - Open Pit		8,714	9,011	9,284	7,352	8,881	35,924	34,528
Ore Treated ('000 tonnes) - Underground		888	1,313	1,533	1,521	2,144	3,363	6,510
Ore Treated ('000 tonnes) - Total		9,602	10,323	10,817	8,873	11,025	39,288	41,037
Average mill head grades:								
Open Pit								
Copper (%)		0.42	0.39	0.37	0.39	0.43	0.41	0.39
Gold (g/t)		0.22	0.19	0.17	0.22	0.24	0.22	0.21
Silver (g/t)		1.24	1.25	1.12	0.97	1.08	1.17	1.11
Underground								
Copper (%)		1.59	1.67	2.02	2.05	1.96	1.57	1.94
Gold (g/t)		0.37	0.42	0.62	0.61	0.55	0.37	0.56
Silver (g/t)		3.42	3.28	4.75	4.76	4.59	3.59	4.40
Total								
Copper (%)		0.53	0.55	0.61	0.67	0.73	0.51	0.64
Gold (g/t)		0.23	0.22	0.24	0.28	0.30	0.23	0.26
Silver (g/t)		1.44	1.50	1.64	1.62	1.77	1.38	1.63
Copper concentrates produced ('000 tonnes)		196.0	208.5	246.2	232.0	307.3	795.7	994.0
Average concentrate grade (% Cu)		20.8	22.1	21.3	21.6	21.6	21.1	21.6
Production of metals in concentrates:								
Copper in concentrates ('000 tonnes)		40.7	46.1	52.5	50.0	66.3	168.1	215.0
Gold in concentrates ('000 ounces)		41.7	42.8	46.9	50.4	66.3	177.3	206.4
Silver in concentrates ('000 ounces)		266	311	363	325	426	1,086	1,424
Sales of metals in concentrates (a):								
Copper in concentrates ('000 tonnes)		38.4	43.7	48.3	43.6	62.6	165.7	198.2
Gold in concentrates ('000 ounces)		41.5	41.5	43.3	42.1	63.6	174.6	190.5
Silver in concentrates ('000 ounces)		240	272	317	273	382	1,008	1,244

(a) Sales of metals in concentrates refer to the payable metals in concentrates collected by customers from the Mongolia/China border.

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
DIAMONDS								
Diavik Diamonds	100 %							
<i>Northwest Territories, Canada</i>								
Ore processed ('000 tonnes)		388	343	361	232	330	1,688	1,267
Diamonds recovered ('000 carats)		659	740	702	542	775	3,340	2,759

Rio Tinto percentage interest shown above is at 31 December 2024. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
IRON ORE								
Rio Tinto Iron Ore								
<i>Western Australia</i>								
Pilbara Operations								
Saleable iron ore production ('000 tonnes)								
Hamersley mines	(a)	59,138	53,373	54,691	57,096	59,656	225,898	224,816
Hope Downs	50 %	12,148	10,163	10,087	11,507	10,200	46,482	41,956
Robe River - Pannawonica (Mesas J and A)	53 %	8,171	8,009	7,898	7,252	8,583	29,162	31,742
Robe River - West Angelas	53 %	8,054	6,393	6,805	8,211	8,048	29,999	29,457
Total production ('000 tonnes)		87,511	77,938	79,481	84,066	86,486	331,542	327,972
Breakdown of total production:								
Pilbara Blend and SP10 Lump (b)		26,308	23,386	24,416	26,604	27,273	99,682	101,679
Pilbara Blend and SP10 Fines (b)		39,264	34,422	35,932	38,788	40,228	149,745	149,370
Robe Valley Lump		3,004	2,894	2,916	2,807	3,444	11,097	12,062
Robe Valley Fines		5,167	5,115	4,982	4,445	5,139	18,065	19,680
Yandicoogina Fines (HIY)		13,768	12,122	11,235	11,421	10,402	52,952	45,181
Breakdown of total shipments:								
Pilbara Blend Lump		17,355	15,635	15,832	17,498	16,223	71,629	65,188
Pilbara Blend Fines		29,840	28,475	31,336	31,870	29,042	129,866	120,723
Robe Valley Lump		2,842	2,308	2,522	2,200	2,846	9,444	9,876
Robe Valley Fines		5,762	5,553	5,839	4,839	5,764	19,832	21,995
Yandicoogina Fines (HIY)		13,628	12,228	11,364	11,794	10,585	53,544	45,971
SP10 Lump (b)		4,620	4,612	5,141	5,790	7,567	12,137	23,110
SP10 Fines (b)		12,208	9,221	8,275	10,559	13,650	35,353	41,705
Total shipments ('000 tonnes) (c)		86,255	78,033	80,309	84,550	85,678	331,805	328,570
Iron Ore Company of Canada								
	59 %							
<i>Newfoundland & Labrador and Quebec in Canada</i>								
Saleable iron ore production:								
Concentrates ('000 tonnes)		2,210	1,924	1,584	1,434	1,809	8,167	6,750
Pellets ('000 tonnes)		2,393	2,526	2,137	2,169	2,503	8,311	9,336
IOC Total production ('000 tonnes)		4,603	4,450	3,721	3,603	4,312	16,478	16,086
Shipments:								
Concentrates ('000 tonnes)		2,037	1,978	1,678	2,090	1,942	7,934	7,689
Pellets ('000 tonnes)		2,331	2,542	2,449	1,971	2,310	8,394	9,272
IOC Total Shipments ('000 tonnes) (c)		4,368	4,520	4,127	4,061	4,252	16,329	16,961
Global Iron Ore Totals								
Iron Ore Production ('000 tonnes)		92,114	82,388	83,203	87,669	90,798	348,020	344,058
Iron Ore Shipments ('000 tonnes)		90,623	82,553	84,436	88,611	89,931	348,134	345,531
Iron Ore Sales ('000 tonnes) (d)		91,072	82,790	87,479	87,349	92,063	353,193	349,682

(a) Includes 100% of production from Paraburdoo, Mt Tom Price, Western Turner Syncline, Marandoo, Yandicoogina, Brockman, Nammuldi, Silvergrass, Channar, Gudai-Darri, Eastern Range and Western Range mines. Whilst Rio Tinto owns 54% of the Eastern Range and the Western Range mines, 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 December 2024. The data represents production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2023	2024
SALT								
Dampier Salt	68 %							
<i>Western Australia</i>								
Salt production ('000 tonnes)		2,103	2,085	2,253	2,211	1,970	8,737	8,518
TITANIUM DIOXIDE SLAG								
Rio Tinto Iron & Titanium	100 %							
<i>Canada and South Africa</i>								
(Rio Tinto share) (a)								
Titanium dioxide slag ('000 tonnes)		275	254	238	263	235	1,111	990

(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 December 2024. The data represents production and sales on a 100% basis unless otherwise stated.