

Rio Tinto releases fourth quarter production results

18 January 2019

Rio Tinto chief executive J-S Jacques said “We delivered a solid operational performance in the final quarter of 2018, in particular across our copper assets. During the year, we further strengthened our asset portfolio, continuing to invest in high quality growth. 2018 saw the early completion of Amrun, the deployment of AutoHaul™, the Koodaideri and Robe River investments and the signing of the power agreement at Oyu Tolgoi. Meanwhile, we completed disposals of \$8.6 billion, including the Grasberg mine in Indonesia and our remaining coal assets. With a firm ‘value over volume’ focus and disciplined allocation of capital, we will continue to progress our strategic objectives and to deliver superior returns to shareholders in the short, medium and long term.”

		Q4 2018	vs Q4 2017	vs Q3 2018	2018	vs 2017
Pilbara iron ore shipments (100% basis)	Mt	87.4	-3%	+7%	338.2	+2%
Pilbara iron ore production (100% basis)	Mt	86.6	-1%	+5%	337.8	+2%
Bauxite	kt	11,790	-14%	-7%	50,421	-1%
Aluminium	kt	874	-1%	-1%	3,458	-3%
Mined copper	kt	177.8	+20%	+11%	633.5	+33%
Titanium dioxide slag	kt	294	-14%	-1%	1,116	-15%
IOC iron ore pellets and concentrate	Mt	2.8	+4%	-2%	9.0	-20%

Operational update

- Pilbara iron ore shipments of 338 million tonnes (100 per cent basis) in 2018 were two per cent higher than 2017.
- During the quarter, Rio Tinto announced it had successfully deployed AutoHaul™ at its Pilbara operations, approved a \$2.6 billion investment in the Koodaideri iron ore replacement mine, and approved an investment of \$1.55 billion (Rio Tinto's 53 per cent share \$820 million) at two projects to sustain production capacity at the Robe River Joint Venture.
- Bauxite production of 50.4 million tonnes in 2018 was one per cent lower than 2017. Third party shipments increased by two per cent to 32.8 million tonnes. During the fourth quarter, commissioning works at CBG in Guinea and the transition of operations from East Weipa to Amrun in Queensland resulted in a short term drop in production.
- Aluminium production of 3.5 million tonnes was three per cent lower than 2017 due primarily to ongoing labour disruptions at the non-managed Becancour smelter in Canada.
- Mined copper production of 634 thousand tonnes was 33 per cent higher than 2017, and above the guidance range, primarily reflecting strong performance at Escondida and increased production from Rio Tinto Kennecott due largely to higher grades.
- Titanium dioxide slag production of 1.1 million tonnes was 15 per cent lower than 2017 due to production disruptions at Rio Tinto Fer et Titane in the second quarter, and intermittent stoppages related to labour disputes between contractors and their employees at Richards Bay Minerals in the first half.
- Fourth quarter production at Iron Ore Company of Canada was four per cent higher than the fourth quarter of 2017. However, 2018 production was 20 per cent lower than 2017, due to a strike at the mine that significantly impacted second quarter production.
- Other major milestones in the quarter included first bauxite shipment from Amrun, achieved six weeks ahead of schedule, and the signing of the Power Source Framework Agreement between Oyu Tolgoi and the Government of Mongolia.

Corporate update

- Disposal proceeds received in 2018 were approximately \$8.6 billion, pre-tax, including:
 - The completion of the sale of our entire interest in the Grasberg mine in Indonesia for \$3.5 billion, including a \$0.1 billion attributable share of copper and gold revenues, net of our capital contribution for the year.
 - The completion of the sale of our aluminium smelter at Dunkerque, France for \$0.4 billion, net of completion adjustments.
 - The completion of the sale of a wharf and land in Kitimat, British Columbia for \$0.6 billion.
 - The completion of the sale of our coking coal assets for \$4.1 billion.
- During the quarter, Rio Tinto announced that it had entered into a binding agreement with China National Uranium Corporation for the sale of its entire 68.62 per cent stake in Rössing Uranium. Subject to certain conditions precedent being met, the transaction is expected to complete in the first half of 2019.
- In 2018, Rio Tinto repurchased \$5.4 billion of shares. This included an off-market buy-back tender in Rio Tinto Limited shares for \$2.1 billion, and further on-market purchases of Rio Tinto plc shares of \$3.3 billion. See page 11 for details.
- In the first half of 2018, Rio Tinto noted the negative impact to EBITDA resulting from raw material input price inflation, particularly in the Aluminium business, and the escalation of alumina index prices which impacted its alumina legacy contracts. These trends have continued to be observed in the second half of 2018.

Average realised prices			
		2018	vs 2017
Iron ore	\$/dmt, FOB	62.5	-4%
Aluminium	\$/t (including VAP, mid-west premium)	2,470	+11%

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. To allow production numbers to be compared on a like-for-like basis, production from asset divestments completed in 2017 is excluded from Rio Tinto share of production data but assets sold in 2018 remain in comparisons.

IRON ORE

Rio Tinto share of production (million tonnes)

	Q4 2018	vs Q4 2017	vs Q3 2018	2018	vs 2017
Pilbara Blend Lump	21.7	+3%	+5%	84.8	+5%
Pilbara Blend Fines	31.7	+2%	+6%	122.6	+5%
Robe Valley Lump	1.4	-14%	-4%	5.9	-4%
Robe Valley Fines	2.6	-12%	-5%	11.0	+6%
Yandicoogina Fines (HIY)	14.9	-8%	+3%	57.5	-0%
Total Pilbara production	72.2	-1%	+4%	281.8	+4%
Total Pilbara production (100% basis)	86.6	-1%	+5%	337.8	+2%

Pilbara operations

Pilbara operations produced 337.8 million tonnes (Rio Tinto share 281.8 million tonnes) in 2018, two per cent higher than 2017, at the upper end of guidance. The production performance is attributable to the ramp-up of expanded mines and minimal weather events.

Fourth quarter production of 86.6 million tonnes (Rio Tinto share 72.2 million tonnes) was one per cent lower than the corresponding quarter of 2017.

2018 sales of 338.2 million tonnes (Rio Tinto share 280.8 million tonnes) were two per cent higher than 2017, whilst fourth quarter sales of 87.4 million tonnes (Rio Tinto share 72.7 million tonnes) were three per cent lower than the same period of last year.

Approximately 17 per cent of sales in 2018 were priced by reference to the prior quarter's average index lagged by one month. The remainder was sold either on current quarter average, current month average or on the spot market.

Approximately 32 per cent of sales in 2018 were made free on board (FOB), with the remainder sold including freight.

Achieved average pricing in 2018 was \$57.6 per wet metric tonne on an FOB basis (equivalent to \$62.5 per dry metric tonne). In 2017, the full year price achieved was \$59.6 per wet metric tonne (equivalent to \$64.8 per dry metric tonne).

Pilbara projects

On 28 December 2018, Rio Tinto announced it had successfully deployed AutoHaul™, establishing the world's first automated heavy-haul, long distance rail network. Since completing the first autonomous haulage run in July 2018, Rio Tinto has steadily increased the number of autonomous journeys in a controlled and safe manner, with over 1.6 million kilometres now travelled autonomously. The programme will now focus on optimising autonomous operations.

On 29 November 2018, Rio Tinto announced the full approval of a \$2.6 billion investment in the Koodaideri iron ore replacement mine. Koodaideri will deliver a new production hub in the Pilbara, incorporating a processing plant and infrastructure including a 166-kilometre rail line connecting the mine to the existing network. Construction will start in 2019 with first production expected in late-2021. Once complete, the mine will have an annual capacity of 43 million tonnes, underpinning production of the Pilbara Blend. Construction of accommodation facilities has commenced at site. A \$44 million pre-feasibility study into Koodaideri Phase 2 was also approved in the fourth quarter.

On 1 October 2018, Rio Tinto announced an investment of \$1.55 billion (Rio Tinto's 53 per cent share \$820 million) at two projects to sustain production capacity at the Robe River Joint Venture. Approvals and commencement of works are proceeding to plan.

2019 guidance

Rio Tinto's Pilbara shipments in 2019 are expected to be between 338 and 350 million tonnes, (100 per cent basis), subject to weather and market conditions.

Following a plant fire at the port of Cape Lambert A on 10 January 2019, Rio Tinto expects limited disruption to Robe Valley lump and fines shipments, which is reflected in the above guidance.

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ALUMINIUM

Rio Tinto share of production ('000 tonnes)

	Q4 2018	vs Q4 2017	vs Q3 2018	2018	vs 2017
Rio Tinto Aluminium					
Bauxite	11,790	-14%	-7%	50,421	-1%
Alumina	2,020	-3%	+2%	7,980	-2%
Aluminium	874	-1%	-1%	3,458	-3%

Bauxite

Bauxite production in 2018 of 50.4 million tonnes was one per cent lower than 2017 and at the upper end of guidance. Strong production at Gove and the Andoom mining area in Weipa was offset by lower production at two non-managed operations. The CBG mine in Guinea was impacted by planned tie-in works as part of the commissioning of the expansion project, and MRN in Brazil was affected by the Alunorte refinery outage.

Fourth quarter production was 14 per cent lower than the corresponding period of 2017, reflecting the planned transition of operations from East Weipa to Amrun in Queensland, and the tie-in works at CBG.

32.8 million tonnes of bauxite were shipped to third parties in 2018, two per cent higher than 2017. Fourth quarter shipments were 19 per cent lower than the fourth quarter of 2017, reflecting the lower quarterly production.

Amrun

The Amrun project achieved first shipment six weeks ahead of schedule, with a total of nine ships loading 0.6 million tonnes before the end of 2018.

Alumina

Alumina production in 2018 was two per cent lower than 2017, primarily due to the timing of maintenance shutdowns.

Aluminium

Aluminium production of 3.5 million tonnes was three per cent lower than 2017 and in line with guidance, which was revised during the year due to an ongoing lock-out at the non-managed Becancour smelter, which began on 11 January 2018, and a power interruption at Dunkerque Aluminium in the first quarter. Excluding these smelters, aluminium production was one per cent higher than 2017, reflecting continued productivity creep.

On 14 December 2018, Rio Tinto completed the sale of its aluminium smelter at Dunkerque, France, to Liberty House for \$0.4 billion, net of completion adjustments. Production of 0.2 million tonnes is reflected up until this date.

Average realised aluminium prices in 2018 were \$2,470 per tonne (2017: \$2,231 per tonne). This includes premiums for value-added products (VAP), which represented 57 per cent of primary metal sold in 2018 (2017: 57 per cent) and generated attractive product premiums averaging \$224 per tonne of VAP sold (2017: \$221 per tonne) on top of the physical market premiums. The mid-west premium increased from \$199 per tonne in 2017 to \$419 per tonne in 2018.

Kemano

The starter tunnel at the Kemano project in Kitimat, British Columbia was completed in December 2018 and associated rail installation has commenced. The tunnel boring machine is forecast to be moved into the tunnel before the end of January 2019. The \$0.5 billion project is due to be completed by late-2020.

Market disruptions

In December, the United States Treasury Department announced its intention to lift the sanctions implemented on various Russian individuals and companies on 21 January 2019. Rio Tinto continues to monitor this situation closely.

2019 guidance

Rio Tinto's expected share of bauxite production in 2019 is between 56 and 59 million tonnes. Aluminium production guidance is between 3.2 and 3.4 million tonnes and alumina production guidance is 8.1 to 8.4 million tonnes.

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COPPER & DIAMONDS

Rio Tinto share of production ('000 tonnes)

	Q4 2018	vs Q4 2017	vs Q3 2018	2018	vs 2017
Mined copper					
Rio Tinto Kennecott	58.3	+67%	-1%	203.9	+37%
Escondida	79.7	-14%	-9%	350.4	+29%
Grasberg	25.9	+353%	N/A	25.9	+353%
Oyu Tolgoi	13.9	-8%	+5%	53.3	+1%
Refined copper					
Rio Tinto Kennecott	64.6	+193%	+19%	194.7	+55%
Escondida	21.6	-6%	+30%	80.0	+12%
Diamonds ('000 carats)					
Argyle	3,211	-48%	-16%	14,069	-18%
Diavik	1,078	+2%	+1%	4,358	-3%

Rio Tinto Kennecott

Mined copper production in 2018 was 37 per cent higher than 2017 as mining activity continued in a higher grade area of the pit, coupled with productivity improvements and increased plant throughput.

Refined copper was 55 per cent higher than 2017 as better mine grades improved concentrate quality and smelting throughput. Fourth quarter 2017 production was impacted by a fatality at the smelter.

Rio Tinto Kennecott continues to toll and purchase third party concentrate to optimise smelter utilisation, with 100 thousand tonnes of concentrate received for processing in 2018, compared with 161 thousand tonnes in 2017. Purchased and tolled copper concentrate are excluded from reported production figures.

In 2019, the production profile will see increased variability in grade as operations mine in lower levels of the pit, together with waste stripping related to the south wall pushback expansion. Anticipated south wall pushback grades begin to increase in late-2020 and are expected to offset this variability over the longer term.

Escondida

Mined copper production at Escondida in 2018 was 29 per cent higher than 2017, reflecting the ramp-up of production to nameplate capacity following commissioning of the Los Colorados concentrator, and the absence of a labour strike which significantly impacted 2017 production.

Oyu Tolgoi

Mined copper production from the open pit in 2018 was one per cent higher than 2017, with higher copper recovery partly offset by lower plant throughput due to the processing of harder ore.

Oyu Tolgoi Underground Project

Work continues on the critical Shaft Two equipping activities, central heating plant, mine infrastructure, underground materials handling systems and on priority underground development. Overall progress continues to track in-line with the re-forecast undertaken in the third quarter of 2018. The project workforce has now reached peak levels of around 9,400, whilst maintaining a high (88 per cent) participation rate of Mongolian nationals.

On 31 December 2018, Rio Tinto announced the signing of the Power Source Framework Agreement between Oyu Tolgoi and the Government of Mongolia. The agreement provides a binding framework and pathway for the construction of a power plant and also sets out an amended timetable for Oyu Tolgoi to meet its obligation to source power domestically. The 300 megawatt plant will be majority owned by Oyu Tolgoi LLC and will be situated close to the Tavan Tolgoi coalfields. Construction is scheduled to start in 2020, with the commissioning of the plant by mid-2023.

Grasberg

On 21 December 2018, Rio Tinto announced that it had completed the sale of its entire interest in the Grasberg mine in Indonesia as part of a series of transactions involving Inalum (PT Indonesia Asahan Aluminium (Persero)), Indonesia's state mining company, and Freeport McMoRan Inc. Total proceeds from the transaction were \$3.5 billion, including \$0.1 billion for the 2018 attributable metal share of 25.9 thousand tonnes of copper and 266.7 thousand ounces of gold, net of the capital contribution for the year.

Provisional pricing

At 31 December 2018, the Group had an estimated 240 million pounds of copper sales that were provisionally priced at 277 cents per pound. The final price of these sales will be determined during the first half of 2019. This compares with 250 million pounds of open shipments at 31 December 2017, provisionally priced at 304 cents per pound.

Diamonds

At Argyle, carat production in 2018 was 18 per cent lower than 2017, when production was enhanced by the processing of higher grade alluvial tailings.

At Diavik, carats recovered in 2018 were three per cent lower than 2017 as lower recovered grade were partially offset by higher ore processing. The A21 project successfully mined first ore in March 2018 and reached commercial production during the fourth quarter.

2019 guidance

Rio Tinto's share of mined copper production for 2019 is expected to be between 550 and 600 thousand tonnes, subject to grade availability. Refined copper production is expected to be between 220 and 250 thousand tonnes.

Diamond production guidance for 2019 is between 15 and 17 million carats.

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ENERGY & MINERALS

Rio Tinto share of production

	Q4 2018	vs Q4 2017	vs Q3 2018	2018	vs 2017
Coal ('000 tonnes)					
Hard coking coal	-	-100%	-100%	3,988	-48%
Thermal coal (a)	-	-100%	-100%	2,527	-38%
Iron ore pellets and concentrate (million tonnes)					
IOC	2.8	+4%	-2%	9.0	-20%
Minerals ('000 tonnes)					
Borates – B ₂ O ₃ content	118	-2%	-14%	512	-1%
Salt	1,496	-3%	+1%	6,153	+21%
Titanium dioxide slag	294	-14%	-1%	1,116	-15%
Uranium ('000 lbs)					
Energy Resources of Australia	924	+1%	+13%	3,014	-13%
Rössing	979	+9%	-1%	3,750	+17%

(a) Production from Coal & Allied of 9.9 million tonnes (Rio Tinto share) prior to divestment on 1 September 2017 has been excluded from the comparisons above.

Coal

Following the completion of the sale of Rio Tinto's interests in Kestrel and Hail Creek on 1 August 2018, production of coal attributable to Rio Tinto ceased. The sale of these assets, along with the Valeria coal and Winchester South development projects resulted in gross disposal proceeds of \$4.15 billion.

Iron Ore Company of Canada (IOC)

Fourth quarter production at IOC was four per cent higher than the corresponding period of 2017.

IOC production and sales in 2018 were impacted by a two month strike at the mine in the second quarter, but was in line with revised guidance. Pellet production of 8.5 million tonnes (Rio Tinto share 5.0 million tonnes) was 18 per cent lower than 2017, whilst concentrate production for sale of 6.7 million tonnes (Rio Tinto share 3.9 million tonnes) was 22 per cent lower than 2017.

Total sales of pellets and concentrates achieved in 2018 were 15.0 million tonnes (Rio Tinto share 8.8 million tonnes), 21 per cent lower than 2017.

Borates

Borates production was one per cent lower than 2017, and in line with guidance, with production aligned to customer demand.

Iron and Titanium

Titanium dioxide feedstock production was 15 per cent lower in 2018 compared to 2017, primarily due to disruptions at Rio Tinto Fer et Titane (RTFT), the deflagration of a furnace at RTFT, and intermittent stoppages related to labour disputes between contractors and their employees at Richards Bay Minerals (RBM) in the first half. Production was in line with revised guidance.

Three of nine furnaces at RTFT are idle, two of which are being rebuilt. One of four furnaces at RBM remains idle. The focus remains on maximising the productivity of the furnaces currently in operation, and a decision to re-start idle furnaces will be based on maximising value over volume.

Salt

Salt production in 2018 was 21 per cent higher than 2017, with production aligned to customer demand.

Uranium

Energy Resources of Australia continues to process existing low grade stockpiles. 2018 production was 13 per cent lower than 2017 due to declining grades and completion of laterite processing.

Production at Rössing Uranium in 2018 was 17 per cent higher than 2017 due to higher mill grades.

On 26 November 2018, Rio Tinto announced it had entered into a binding agreement with China National Uranium Corporation for the sale of its entire 68.62 per cent stake in Rössing Uranium. The transaction is subject to certain conditions precedent including merger approval from the Namibian Competition Commission. Subject to these conditions precedent being met, the transaction is expected to complete in the first half of 2019.

2019 guidance

At IOC, guidance for Rio Tinto's expected share of iron ore pellets and concentrates production in 2019 is between 11.3 and 12.3 million tonnes. Titanium dioxide slag production guidance is between 1.2 and 1.4 million tonnes, and boric oxide equivalent production guidance is 0.5 million tonnes.

CORPORATE UPDATE

Share buy-back

During 2018, Rio Tinto purchased \$5.4 billion of shares through a combination of on-market purchases of Rio Tinto plc shares and an off-market tender of Rio Tinto Limited shares. As at 1 January 2019, a further \$1.7 billion of previously announced buy-backs in Rio Tinto plc shares remains outstanding.

Rio Tinto Limited

The Group returned \$2.1 billion through a Rio Tinto Limited off-market tender announced on 20 September 2018 and completed on 12 November 2018.

Rio Tinto plc

In 2018, on-market purchases were completed of \$3.3 billion in Rio Tinto plc shares. These comprised the return of \$1.9 billion announced in the second half of 2017, the \$1 billion programme announced on 7 February 2018 and \$0.4 billion of a \$1 billion programme announced on 1 August 2018. The remaining \$0.6 billion of this last programme will be completed no later than 27 February 2019.

A further \$1.1 billion of the programme announced in September 2018 will be returned through an on-market Rio Tinto plc share buy-back commencing on 28 February 2019 and will be completed no later than 28 February 2020.

Cash inflows of approximately \$8.6 billion, pre-tax, from divestments in 2018

	Pre-tax proceeds received in 2018 \$ billion
Aluminium Dunkerque, France sold to Liberty House*	0.4
Hail Creek coal mine and Valeria coal development project, both in Queensland, Australia, sold to Glencore	1.7
Kestrel underground coal mine, Queensland, Australia, sold to EMR Capital and PT Adaro Energy Tbk	2.3
Interest in Grasberg mine sold to Inalum (PT Indonesia Asahan Aluminium (Persero))**	3.4
Wharf and land in Kitimat, British Columbia sold to LNG Canada	0.6
Other, including Winchester South coal development project	0.2
Total	8.6

* Net of completion adjustments

** Before a \$0.1 billion attributable share of copper and gold revenues, net of Rio Tinto's capital contribution for the year.

Simandou

The non-binding heads of agreement, originally signed on 28 October 2016, for Chinalco to acquire Rio Tinto's entire interest in the Simandou iron ore project in Guinea has lapsed. Rio Tinto and Chinalco, who respectively own 45.05 per cent and 39.95 per cent of Simandou, will continue to work with the Government of Guinea to explore other options to realise value from the world-class Simandou iron ore deposit. The Government of Guinea owns a 15 per cent stake in the project.

EXPLORATION AND EVALUATION

Pre-tax and pre-divestment expenditure on exploration and evaluation charged to the profit and loss account in 2018 was \$488 million, compared with \$445 million in 2017, driven primarily by increased activity at Resolution. Approximately 48 per cent of this expenditure was incurred by central exploration, 37 per cent by Copper & Diamonds, eight per cent by Iron Ore and the remainder by Energy & Minerals and Aluminium.

There were no significant divestments of central exploration properties in the fourth quarter of 2018.

Exploration highlights

Rio Tinto has a strong portfolio of projects with activity in 16 countries across some eight commodities. The bulk of the exploration expenditure in this quarter was focused on copper targets in Australia, Canada, Chile, Kazakhstan, Mongolia, Namibia, Papua New Guinea, Peru, Serbia, United States, Zambia and diamond projects in Canada. Mine-lease exploration continued at a number of Rio Tinto managed businesses including Pilbara Iron in Australia, RTIT in Canada, Oyu Tolgoi In Mongolia, Weipa in Australia and Bingham in the US.

A summary of activity for the quarter is as follows:

Product Groups	Studies stage	Advanced exploration projects	Greenfield/ Brownfield programmes
Aluminium	Cape York, Australia	Amargosa, Brazil Sanxai, Laos	Cape York, Australia
Copper & Diamonds	Copper/molybdenum: Resolution, US	Copper: La Granja, Peru Nickel: Tamarack, US Diamonds: FalCon ¹ , Canada	Copper Greenfield: Australia, Chile, China, Kazakhstan, Mongolia, Namibia, Papua New Guinea, Peru, Serbia, US, Zambia Copper Brownfield: Bingham, US Nickel Greenfield: Canada, Uganda Diamonds: Canada
Energy & Minerals	Lithium borates: Jadar, Serbia Potash: KP405, Canada Heavy mineral sands: Mutamba, Mozambique and Zulti South, South Africa	Uranium: Roughrider, Canada	Heavy mineral sands: Tanzania, Canada
Iron Ore	Pilbara, Australia	Pilbara, Australia	Koodaideri, Australia

(1) Formerly Forte a la Corne

Forward-looking statements

This announcement may include "forward-looking statements" within the meaning of the US 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 production forecast or guidance, financial position, business strategy, plans and objectives of management for future operations (including development plans and objectives relating to Rio Tinto's products 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", "assumes" or similar expressions, commonly identify such forward looking statements.

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Nothing in this announcement should be interpreted to mean that future earnings per share of Rio Tinto plc or Rio Tinto Limited will necessarily match or exceed its historical published earnings per share.

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Contacts

media.enquiries@riotinto.com

www.riotinto.com

 Follow @riotinto on Twitter

Media Relations, United Kingdom

Illtud Harri
M +44 7920 503 600

David Outhwaite
T +44 20 7781 1623
M +44 7787 597 493

Media Relations, Canada

Matthew Klar
T +1 514 608 4429

Investor Relations, EMEA/Americas

John Smelt
T +44 20 7781 1654
M +44 7879 642 675

David Ovington
T +44 20 7781 2051
M +44 7920 010 978

Nick Parkinson
M +61 436 637 571

Media Relations, Australia

Jonathan Rose
T +61 3 9283 3088
M +61 447 028 913

Jesse Riseborough
T +61 8 6211 6013
M +61 436 653 412

Investor Relations, Australia/Asia

Natalie Worley
T +61 3 9283 3063
M +61 409 210 462

Rachel Storrs
T +61 3 9283 3628
M +61 417 401 018

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 7, 360 Collins Street
Melbourne 3000
Australia

T +61 3 9283 3333
Registered in Australia
ABN 96 004 458 404

Rio Tinto production summary

Rio Tinto share of production

		Quarter			Full Year		% Change		
		2017 Q4	2018 Q3	2018 Q4	2017	2018	Q4 18 vs Q4 17	Q4 18 vs Q3 18	2018 vs 2017
Principal Commodities									
Alumina	('000 t)	2,077	1,972	2,020	8,131	7,980	-3%	2%	-2%
Aluminium	('000 t)	887	880	874	3,551	3,458	-1%	-1%	-3%
Bauxite	('000 t)	13,762	12,700	11,790	50,796	50,421	-14%	-7%	-1%
Borates	('000 t)	120	137	118	517	512	-2%	-14%	-1%
Coal - hard coking	('000 t)	2,322	712	-	7,704	3,988	-100%	-100%	-48%
Coal - thermal	('000 t)	966	397	-	4,065	2,527	-100%	-100%	-38%
Copper - mined	('000 t)	148.6	159.7	177.8	478.1	633.5	20%	11%	33%
Copper - refined	('000 t)	44.9	70.8	86.1	197.2	274.8	92%	22%	39%
Diamonds	('000 cts)	7,207	4,896	4,290	21,627	18,427	-40%	-12%	-15%
Iron Ore	('000 t)	75,656	72,010	75,018	282,484	290,800	-1%	4%	3%
Titanium dioxide slag	('000 t)	341	297	294	1,315	1,116	-14%	-1%	-15%
Uranium	('000 lbs)	1,821	1,814	1,904	6,650	6,764	5%	5%	2%
Other Metals & Minerals									
Gold - mined	('000 oz)	62.6	101.4	385.1	260.1	638.8	515%	280%	146%
Gold - refined	('000 oz)	55.4	50.3	58.6	203.7	198.0	6%	17%	-3%
Molybdenum	('000 t)	1.9	1.4	2.2	5.0	5.8	15%	63%	16%
Salt	('000 t)	1,535	1,481	1,496	5,090	6,153	-3%	1%	21%
Silver - mined	('000 oz)	1,172	1,384	1,840	4,194	5,910	57%	33%	41%
Silver - refined	('000 oz)	516	730	807	2,378	2,865	56%	10%	21%

Throughout this report, figures in italics indicate adjustments made since the figure was previously quoted on the equivalent page. 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 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
ALUMINA								
Production ('000 tonnes)								
Jonquière (Vaudreuil)	100%	365	362	365	363	354	1,448	1,444
Jonquière (Vaudreuil) specialty Alumina plant	100%	29	31	32	31	29	122	124
Queensland Alumina	80%	773	717	752	748	742	2,988	2,958
São Luis (Alumar)	10%	93	87	87	85	92	370	351
Yarwun	100%	816	793	763	744	803	3,203	3,103
Rio Tinto total alumina production		2,077	1,990	1,999	1,972	2,020	8,131	7,980

ALUMINIUM								
Production ('000 tonnes)								
Australia - Bell Bay	100%	47	47	47	48	48	187	189
Australia - Boyne Island	59%	74	72	74	75	74	302	295
Australia - Tomago	52%	77	75	76	78	77	304	305
Canada - six wholly owned	100%	405	398	402	407	408	1,596	1,616
Canada - Alouette (Sept-Îles)	40%	60	58	58	59	58	239	234
Canada - Bécancour	25%	27	10	9	8	8	110	34
France - Dunkerque (a)	0%	72	51	52	66	57	284	227
Iceland - ISAL (Reykjavik)	100%	54	52	53	53	54	212	212
New Zealand - Tiwai Point	79%	67	66	67	68	70	267	270
Oman - Sohar	20%	5	17	19	20	20	51	76
Rio Tinto total aluminium production		887	846	858	880	874	3,551	3,458

(a) On 14 December 2018, Rio Tinto completed the sale of its 100% interest in the Dunkerque smelter. Production is reported up to the date of completion.

BAUXITE								
Production ('000 tonnes) (a)								
Gove	100%	3,224	3,124	3,274	2,893	3,250	11,201	12,540
Porto Trombetas	12%	426	353	393	342	489	1,764	1,576
Sangaredi	(b)	1,809	1,745	1,657	1,261	1,204	6,934	5,868
Weipa	100%	8,304	7,431	7,955	8,204	6,847	30,898	30,437
Rio Tinto total bauxite production		13,762	12,653	13,279	12,700	11,790	50,796	50,421

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

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

Rio Tinto share of production

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
BORATES								
Production ('000 tonnes B₂O₃ content)								
Rio Tinto Borates - borates	100%	120	124	132	137	118	517	512
COAL - hard coking								
Rio Tinto Coal Australia ('000 tonnes)								
Hail Creek Coal (a) (c)	0%	1,275	758	1,131	325	-	4,303	2,214
Kestrel Coal (b) (c)	0%	1,048	344	1,043	387	-	3,402	1,774
Rio Tinto total hard coking coal production		2,322	1,102	2,174	712	-	7,704	3,988

(a) On 1 August 2018, Rio Tinto completed the sale of its 82% interest in the Hail Creek mine. Production is reported up to the date of completion.

(b) On 1 August 2018, Rio Tinto completed the sale of its 80% interest in the Kestrel mine. Production is reported up to the date of completion.

(c) Kestrel and Hail Creek produce hard coking coal and thermal coal through their mining operations. Both mines may blend coal types at ports.

COAL - thermal								
Rio Tinto Coal Australia ('000 tonnes)								
Hail Creek Coal (a) (c)	0%	785	1,060	835	368	-	3,390	2,264
Kestrel Coal (b) (c)	0%	180	59	176	28	-	674	263
Rio Tinto total thermal coal production		966	1,119	1,011	397	-	4,065	2,527

(a) On 1 August 2018, Rio Tinto completed the sale of its 82% interest in the Hail Creek mine. Production is reported up to the date of completion.

(b) On 1 August 2018, Rio Tinto completed the sale of its 80% interest in the Kestrel mine. Production is reported up to the date of completion.

(c) Kestrel and Hail Creek produce hard coking coal and thermal coal through their mining operations. Both mines may blend coal types at ports.

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Rio Tinto share of production

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
COPPER								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100%	34.8	35.4	51.2	59.1	58.3	148.9	203.9
Escondida	30%	92.9	90.9	92.4	87.4	79.7	270.8	350.4
Grasberg - Joint Venture (b)	40%	5.7	0.0	0.0	0.0	25.9	5.7	25.9
Oyu Tolgoi (c)	34%	15.2	13.0	13.2	13.2	13.9	52.8	53.3
Rio Tinto total mine production		148.6	139.3	156.8	159.7	177.8	478.1	633.5
Refined production ('000 tonnes)								
Escondida	30%	22.8	20.8	21.0	16.6	21.6	71.4	80.0
Rio Tinto Kennecott	100%	22.1	35.3	40.7	54.2	64.6	125.8	194.7
Rio Tinto total refined production		44.9	56.1	61.7	70.8	86.1	197.2	274.8

(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) Through a joint venture agreement with Freeport-McMoRan (FCX), Rio Tinto is entitled to 40% of additional material mined as a consequence of expansions and developments of the Grasberg facilities since 1998. On 21 December 2018, Rio Tinto completed the sale of its entire interest in the Grasberg mine in Indonesia to PT Indonesia Asahan Aluminium (Persero) (Inalum). Production is reported up to 30 November 2018. Net cashflow of \$0.1 billion relating to this production is included in the total divestments proceeds of \$3.5 billion.

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

DIAMONDS								
Production ('000 carats)								
Argyle	100%	6,146	3,551	3,476	3,830	3,211	17,135	14,069
Diavik	60%	1,060	1,065	1,150	1,066	1,078	4,492	4,358
Rio Tinto total diamond production		7,207	4,616	4,626	4,896	4,290	21,627	18,427

GOLD								
Mine production ('000 ounces) (a)								
Bingham Canyon	100%	35.9	37.4	45.6	56.6	57.1	177.9	196.7
Escondida	30%	15.1	18.0	20.5	19.1	22.1	43.9	79.7
Grasberg - Joint Venture (b)	40%	0.0	0.0	0.0	0.0	266.7	0.0	266.7
Oyu Tolgoi (c)	34%	11.7	14.0	16.8	25.8	39.1	38.3	95.7
Rio Tinto total mine production		62.6	69.4	82.8	101.4	385.1	260.1	638.8
Refined production ('000 ounces)								
Rio Tinto Kennecott	100%	55.4	40.8	48.4	50.3	58.6	203.7	198.0

(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) Through a joint venture agreement with Freeport-McMoRan (FCX), Rio Tinto is entitled to 40% of additional material mined as a consequence of expansions and developments of the Grasberg facilities since 1998. On 21 December 2018, Rio Tinto completed the sale of its entire interest in the Grasberg mine in Indonesia to PT Indonesia Asahan Aluminium (Persero) (Inalum). Production is reported up to 30 November 2018. Net cashflow of \$0.1 billion relating to this production is included in the total divestments proceeds of \$3.5 billion.

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

Rio Tinto share of production

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
IRON ORE								
Production ('000 tonnes) (a)								
Hamersley mines	(b)	56,501	53,631	56,034	54,583	56,364	206,760	220,612
Hamersley - Channar	60%	1,345	1,136	1,227	604	1,337	6,479	4,304
Hope Downs	50%	5,987	5,342	5,783	5,713	5,845	23,470	22,684
Iron Ore Company of Canada	59%	2,733	2,364	871	2,880	2,836	11,166	8,952
Robe River - Pannawonica (Mesas J and A)	53%	4,580	4,672	4,048	4,208	4,004	16,526	16,932
Robe River - West Angelas	53%	4,509	4,290	4,373	4,021	4,631	18,082	17,316
Rio Tinto iron ore production ('000 tonnes)		75,656	71,436	72,336	72,010	75,018	282,484	290,800
Breakdown of Production:								
Pilbara Blend Lump		21,082	20,714	21,901	20,554	21,674	80,770	84,843
Pilbara Blend Fines		31,172	29,769	31,239	29,921	31,652	116,359	122,582
Robe Valley Lump		1,646	1,587	1,431	1,470	1,409	6,128	5,897
Robe Valley Fines		2,934	3,086	2,617	2,738	2,595	10,398	11,035
Yandicoogina Fines (HIY)		16,088	13,916	14,277	14,446	14,852	57,663	57,491
Pilbara iron ore production ('000 tonnes)		72,922	69,072	71,465	69,129	72,182	271,318	281,848
IOC Concentrate		1,163	799	572	1,131	1,433	5,020	3,934
IOC Pellets		1,571	1,566	299	1,750	1,403	6,146	5,018
IOC iron ore production ('000 tonnes)		2,733	2,364	871	2,880	2,836	11,166	8,952
Breakdown of Sales:								
Pilbara Blend Lump		18,861	18,062	19,424	17,967	18,439	71,156	73,892
Pilbara Blend Fines		35,575	30,746	35,158	31,432	35,205	127,272	132,541
Robe Valley Lump		1,388	1,223	1,264	1,174	1,219	5,217	4,881
Robe Valley Fines		3,287	2,996	3,255	2,839	2,996	11,204	12,085
Yandicoogina Fines (HIY)		15,731	13,578	14,388	14,583	14,831	57,185	57,380
Pilbara iron ore sales ('000 tonnes)		74,843	66,604	73,489	67,995	72,690	272,034	280,778
IOC Concentrate		1,559	746	62	1,521	1,558	5,053	3,887
IOC Pellets		1,615	1,574	202	1,659	1,516	6,108	4,950
IOC Iron ore sales ('000 tonnes)		3,173	2,320	263	3,180	3,073	11,161	8,837
Rio Tinto iron ore sales ('000 tonnes)		78,016	68,925	73,752	71,175	75,763	283,195	289,614

(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, Marandoo, Yandicoogina, Brockman, Nammuldi, Silvergrass and the Eastern Range mines. Whilst Rio Tinto owns 54% of the Eastern Range mine, under the terms of the joint venture agreement, Hamersley Iron manages the operation and is obliged to purchase all mine production from the joint venture and therefore all of the production is included in Rio Tinto's share of production.

Rio Tinto share of production

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
MOLYBDENUM								
Mine production ('000 tonnes) (a)								
Bingham Canyon	100%	1.9	1.5	0.7	1.4	2.2	5.0	5.8

(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.

SALT								
Production ('000 tonnes)								
Dampier Salt	68%	1,535	1,514	1,662	1,481	1,496	5,090	6,153

SILVER								
Mine production ('000 ounces) (a)								
Bingham Canyon	100%	418	461	615	708	736	2,156	2,520
Escondida	30%	658	702	758	599	771	1,712	2,830
Grasberg - Joint Venture (b)	40%	0	0	0	0	253	0	253
Oyu Tolgoi (c)	34%	96	74	75	77	80	326	306
Rio Tinto total mine production		1,172	1,237	1,448	1,384	1,840	4,194	5,910
Refined production ('000 ounces)								
Rio Tinto Kennecott	100%	516	867	461	730	807	2,378	2,865

(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) Through a joint venture agreement with Freeport-McMoRan (FCX), Rio Tinto is entitled to 40% of additional material mined as a consequence of expansions and developments of the Grasberg facilities since 1998. On 21 December 2018, Rio Tinto completed the sale of its entire interest in the Grasberg mine in Indonesia to PT Indonesia Asahan Aluminium (Persero) (Inalum). Production is reported up to 30 November 2018. Net cashflow of \$0.1 billion relating to this production is included in the total divestments proceeds of \$3.5 billion.

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

TITANIUM DIOXIDE SLAG								
Production ('000 tonnes)								
Rio Tinto Iron & Titanium (a)	100%	341	294	232	297	294	1,315	1,116

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

URANIUM								
Production ('000 lbs U₃O₈) (a)								
Energy Resources of Australia	68%	919	667	603	820	924	3,458	3,014
Rössing (b)	69%	902	848	928	994	979	3,192	3,750
Rio Tinto total uranium production		1,821	1,515	1,531	1,814	1,904	6,650	6,764

(a) ERA and Rössing production reported are drummed U₃O₈.

(b) On 26 November 2018, Rio Tinto signed a binding agreement to sell its 68.62% interest in the Rössing mine in Namibia to China National Uranium Corporation Limited.

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.

The Rio Tinto percentage shown above is at 31 December 2018.

Rio Tinto's interest in the Coal and Allied mines were sold in 2017. No data for these operations are included in the Share of production table.

Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
ALUMINA								
Smelter Grade Alumina - Aluminium Group								
Alumina production ('000 tonnes)								
<i>Australia</i>								
Queensland Alumina Refinery - Queensland	80.0%	966	896	940	935	927	3,735	3,697
Yarwun refinery - Queensland	100.0%	816	793	763	744	803	3,203	3,103
<i>Brazil</i>								
São Luis (Alumar) refinery	10.0%	934	871	869	851	918	3,697	3,509
<i>Canada</i>								
Jonquière (Vaudreuil) refinery - Quebec (a)	100.0%	365	362	365	363	354	1,448	1,444
<i>(a) Jonquière's (Vaudreuil's) production shows smelter grade alumina only and excludes hydrate produced and used for specialty alumina.</i>								
Specialty Alumina - Aluminium Group								
Specialty alumina production ('000 tonnes)								
<i>Canada</i>								
Jonquière (Vaudreuil) plant – Quebec	100.0%	29	31	32	31	29	122	124

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

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Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
ALUMINIUM								
Primary Aluminium								
Primary aluminium production ('000 tonnes)								
<i>Australia</i>								
Bell Bay smelter - Tasmania	100.0%	47	47	47	48	48	187	189
Boyne Island smelter - Queensland	59.4%	124	122	124	126	125	508	497
Tomago smelter - New South Wales	51.6%	149	145	148	151	149	590	592
<i>Canada</i>								
Alma smelter - Quebec	100.0%	116	115	116	117	118	457	465
Alouette (Sept-Îles) smelter - Quebec	40.0%	150	144	146	148	146	598	584
Arvida smelter - Quebec	100.0%	44	43	43	43	44	171	173
Arvida AP60 smelter - Quebec	100.0%	14	13	13	13	13	57	52
Bécancour smelter - Quebec	25.1%	108	39	35	32	30	438	136
Grande-Baie smelter - Quebec	100.0%	58	57	58	59	59	229	233
Kitimat smelter - British Columbia	100.0%	110	108	109	110	109	433	436
Laterrière smelter - Quebec	100.0%	64	63	64	65	65	249	257
<i>France</i>								
Dunkerque smelter (a)	0%	72	51	52	66	57	284	227
<i>Iceland</i>								
ISAL (Reykjavik) smelter	100.0%	54	52	53	53	54	212	212
<i>New Zealand</i>								
Tiwai Point smelter	79.4%	85	83	84	85	88	337	341
<i>Oman</i>								
Sohar smelter	20.0%	27	87	97	98	99	253	380

(a) On 14 December 2018, Rio Tinto completed the sale of its 100% interest in the Dunkerque smelter. Production is reported up to the date of completion.

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
BAUXITE								
Bauxite production ('000 tonnes)								
<i>Australia</i>								
Gove mine - Northern Territory	100.0%	3,224	3,124	3,274	2,893	3,250	11,201	12,540
Weipa mine - Queensland	100.0%	8,304	7,431	7,955	8,204	6,847	30,898	30,437
<i>Brazil</i>								
Porto Trombetas (MRN) mine	12.0%	3,550	2,939	3,273	2,848	4,073	14,698	13,134
<i>Guinea</i>								
Sangaredi mine (a)	23.0%	4,020	3,878	3,683	2,803	2,675	15,409	13,039
Rio Tinto share of bauxite shipments								
Share of total bauxite shipments ('000 tonnes)		13,557	12,551	12,936	12,427	11,622	50,240	49,536
Share of third party bauxite shipments ('000 tonnes)		9,164	8,248	8,738	8,441	7,387	32,303	32,813

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

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

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Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
BORATES								
Rio Tinto Borates - borates	100.0%							
<i>US</i>								
Borates ('000 tonnes) (a)		120	124	132	137	118	517	512
<i>(a) Production is expressed as B₂O₃ content.</i>								
COAL								
Rio Tinto Coal Australia								
Hail Creek Coal mine (a)	0.0%							
<i>Queensland</i>								
Hard coking coal ('000 tonnes)		1,555	924	1,380	396	-	5,247	2,700
Thermal coal ('000 tonnes)		958	1,293	1,018	449	-	4,134	2,760
Hunter Valley Operations (b)	0.0%							
<i>New South Wales</i>								
Semi-soft coking coal ('000 tonnes)		-	-	-	-	-	1,529	-
Thermal coal ('000 tonnes)		-	-	-	-	-	8,502	-
Kestrel Coal mine (c)	0.0%							
<i>Queensland</i>								
Hard coking coal ('000 tonnes)		1,309	430	1,303	484	-	4,252	2,217
Thermal coal ('000 tonnes)		226	74	220	35	-	843	329
Mount Thorley Operations (b)	0.0%							
<i>New South Wales</i>								
Semi-soft coking coal ('000 tonnes)		-	-	-	-	-	876	-
Thermal coal ('000 tonnes)		-	-	-	-	-	2,011	-

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

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Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
COAL (continued)								
Warkworth mine (b)	0.0%							
<i>New South Wales</i>								
Semi-soft coking coal ('000 tonnes)							514	-
Thermal coal ('000 tonnes)		-	-	-	-	-	4,521	-
Total hard coking coal production ('000 tonnes)		2,864	1,354	2,683	880	-	9,499	4,917
Total semi-soft coking coal production ('000 tonnes)		-	-	-	-	-	2,919	-
Total thermal coal production ('000 tonnes)		1,183	1,367	1,238	485	-	20,010	3,089
Total coal production ('000 tonnes)		4,047	2,721	3,921	1,365	-	32,429	8,007
Total coal sales ('000 tonnes)		4,092	3,050	3,717	1,725	-	32,053	8,492
Rio Tinto Coal Australia share (d)								
Share of hard coking coal sales ('000 tonnes)		2,429	1,368	2,228	650	-	8,181	4,246
Share of semi-soft coal sales ('000 tonnes) (e)		-	-	-	-	-	2,010	-
Share of thermal coal sales ('000 tonnes) (e)		896	1,119	791	754	-	13,186	2,664

(a) On 1 August 2018, Rio Tinto completed the sale of its 82% interest in the Hail Creek mine. Production is reported up to the date of completion.

(b) On 1 September 2017, Rio Tinto completed the sale of Coal & Allied, a wholly owned subsidiary of Rio Tinto Coal Australia (RTCA) and production from these assets is included to this date. This included Coal & Allied's 67.6% interest in the Hunter Valley Operations mine, 80% interest in the Mount Thorley mine and 55.6% interest in the Warkworth mine. In an earlier restructuring of the Coal & Allied group completed on 3 February 2016, Rio Tinto had obtained 100% of Coal & Allied and retained a 67.6% interest in the newly created Hunter Valley Operations joint venture. Prior to restructuring, Rio Tinto's interest in the Hunter Valley Operations, Mount Thorley and Warkworth mines was 80%, 64% and 44.46% respectively.

(c) On 1 August 2018, Rio Tinto completed the sale of its 80% interest in the Kestrel mine. Production is reported up to the date of completion.

(d) Kestrel and Hail Creek produce hard coking coal and thermal coal through their mining operations. Both mines may blend coal types at ports.

(e) Sales relate only to coal mined by the operations and exclude traded coal.

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
COPPER & GOLD								
Escondida	30.0%							
<i>Chile</i>								
Sulphide ore to concentrator ('000 tonnes)		30,260	32,203	31,732	30,513	30,507	81,171	124,956
Average copper grade (%)		0.98	0.96	0.96	0.94	0.87	1.03	0.93
Mill production (metals in concentrates):								
Contained copper ('000 tonnes)		245.7	252.6	253.6	241.9	219.9	684.5	968.0
Contained gold ('000 ounces)		50	60	68	64	74	146	266
Contained silver ('000 ounces)		2,193	2,339	2,527	1,997	2,570	5,707	9,433
Recoverable copper in ore stacked for leaching ('000 tonnes) (a)		63.9	50.4	54.4	49.4	45.7	218.2	199.9
Refined production from leach plants:								
Copper cathode production ('000 tonnes)		76.1	69.4	70.1	55.4	71.9	238.0	266.8

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

Freeport-McMoRan								
Grasberg mine (a)	0.0% (b)							
<i>Papua, Indonesia</i>								
Ore treated ('000 tonnes)		16,381	15,625	17,101	17,535	14,049	51,262	64,310
Average mill head grades:								
Copper (%)		1.03	1.12	1.06	1.00	0.73	1.01	0.99
Gold (g/t)		1.28	1.63	1.77	1.77	1.08	1.15	1.59
Silver (g/t)		4.36	4.68	5.09	4.49	2.09	4.32	4.17
Production of metals in concentrates:								
Copper in concentrates ('000 tonnes)		153.2	159.9	165.7	158.7	85.4	468.2	569.7
Gold in concentrates ('000 ounces)		579	693	842	842	402	1,602	2,779
Silver in concentrates ('000 ounces)		1,293	1,513	1,548	1,439	545	3,877	5,045
Sales of payable metals in concentrates: (c)								
Copper in concentrates ('000 tonnes)		154.3	157.4	145.3	170.6	82.7	450.3	556.0
Gold in concentrates ('000 ounces)		584	676	740	903	399	1,540	2,719
Silver in concentrates ('000 ounces)		1,044	1,184	1,098	1,221	426	2,964	3,928

(a) Through a joint venture agreement with Freeport-McMoRan (FCX), Rio Tinto is entitled to 40% of additional material mined as a consequence of expansions and developments of the Grasberg facilities since 1998. The Q4 2018 results show the forecast from FCX's most recent five-year plan, because FCX is not releasing its actual 100% operating data for Q4 2018 until the release of its 2018 fourth-quarter results on 24 January 2019. On 21 December 2018, Rio Tinto completed the sale of its entire interest in the Grasberg mine in Indonesia to PT Indonesia Asahan Aluminium (Persero) (Inalum).

(b) Rio Tinto share of Grasberg production is 40% of the expansion.

(c) Net of smelter deductions.

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
COPPER & GOLD (continued)								
Rio Tinto Kennecott								
Bingham Canyon mine	100.0%							
<i>Utah, US</i>								
Ore treated ('000 tonnes)		9,074	9,260	8,974	11,173	10,853	39,382	40,260
Average ore grade:								
Copper (%)		0.43	0.43	0.63	0.58	0.59	0.43	0.56
Gold (g/t)		0.21	0.23	0.26	0.26	0.26	0.25	0.25
Silver (g/t)		1.89	2.25	2.73	2.62	2.76	2.33	2.60
Molybdenum (%)		0.036	0.025	0.025	0.030	0.032	0.029	0.028
Copper concentrates produced ('000 tonnes)		162	171	194	233	222	704	820
Average concentrate grade (% Cu)		21.5	20.7	26.4	25.3	26.0	21.1	24.8
Production of metals in copper concentrates:								
Copper ('000 tonnes) (a)		34.8	35.4	51.2	59.1	58.3	148.9	203.9
Gold ('000 ounces)		36	37	46	57	57	178	197
Silver ('000 ounces)		418	461	615	708	736	2,156	2,520
Molybdenum concentrates produced ('000 tonnes):		3.8	2.8	1.5	2.8	4.5	9.8	11.6
Molybdenum in concentrates ('000 tonnes)		1.9	1.5	0.7	1.4	2.2	5.0	5.8
Kennecott smelter & refinery								
	100.0%							
Copper concentrates smelted ('000 tonnes)		90	200	224	246	262	644	932
Copper anodes produced ('000 tonnes) (b)		12.1	42.4	44.4	58.1	62.4	129.0	207.3
Production of refined metal:								
Copper ('000 tonnes)		22.1	35.3	40.7	54.2	64.6	125.8	194.7
Gold ('000 ounces) (c)		55.4	40.8	48.4	50.3	58.6	203.7	198.0
Silver ('000 ounces) (c)		516	867	461	730	807	2,378	2,865

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

(b) New metal excluding recycled material.

(c) Includes gold and silver in intermediate products.

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
COPPER & GOLD (continued)								
Turquoise Hill Resources								
Oyu Tolgoi mine (a)	33.5%							
<i>Mongolia</i>								
Ore Treated ('000 tonnes)		10,838	9,561	10,164	9,652	9,361	41,177	38,738
Average mill head grades:								
Copper (%)		0.53	0.51	0.48	0.51	0.55	0.51	0.51
Gold (g/t)		0.20	0.25	0.26	0.38	0.56	0.17	0.36
Silver (g/t)		1.54	1.32	1.17	1.19	1.22	1.39	1.22
Copper concentrates produced ('000 tonnes)		205.5	177.3	178.8	179.8	189.0	722.5	724.9
Average concentrate grade (% Cu)		22.0	21.9	22.0	21.9	21.9	21.8	21.9
Production of metals in concentrates:								
Copper in concentrates ('000 tonnes)		45.3	38.8	39.4	39.4	41.5	157.4	159.1
Gold in concentrates ('000 ounces)		34.8	41.8	50.0	77.0	116.7	114.3	285.4
Silver in concentrates ('000 ounces)		285	221	225	230	238	974	914
Sales of metals in concentrates:								
Copper in concentrates ('000 tonnes)		35.7	34.3	46.1	36.0	40.2	149.3	156.7
Gold in concentrates ('000 ounces)		27	31	51	55	111	111	248
Silver in concentrates ('000 ounces)		205	206	250	201	216	860	873

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

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
DIAMONDS								
Argyle Diamonds	100.0%							
<i>Western Australia</i>								
AK1 ore processed ('000 tonnes)		1,446	1,260	1,428	1,465	1,292	4,957	5,444
AK1 diamonds produced ('000 carats)		6,146	3,551	3,476	3,830	3,211	17,135	14,069
Diavik Diamonds	60.0%							
<i>Northwest Territories, Canada</i>								
Ore processed ('000 tonnes)		525	556	652	670	651	2,190	2,530
Diamonds recovered ('000 carats)		1,767	1,774	1,916	1,776	1,797	7,486	7,264

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

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Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
IRON ORE								
Rio Tinto Iron Ore								
<i>Western Australia</i>								
Pilbara Operations								
Saleable iron ore production ('000 tonnes)								
Hamersley mines	(a)	56,501	53,631	56,034	54,583	56,364	206,760	220,612
Hamersley - Channar	60.0%	2,241	1,893	2,045	1,007	2,228	10,798	7,173
Hope Downs	50.0%	11,975	10,685	11,567	11,426	11,691	46,941	45,368
Robe River - Pannawonica (Mesas J and A)	53.0%	8,642	8,816	7,637	7,940	7,555	31,182	31,947
Robe River - West Angelas	53.0%	8,507	8,094	8,252	7,587	8,738	34,116	32,672
Total production ('000 tonnes)		87,866	83,120	85,534	82,542	86,576	329,797	337,772
Breakdown of total production:								
Pilbara Blend Lump		25,496	24,831	26,253	24,461	26,084	99,127	101,629
Pilbara Blend Fines		37,641	35,556	37,368	35,696	38,085	141,826	146,705
Robe Valley Lump		3,106	2,993	2,699	2,774	2,659	11,563	11,126
Robe Valley Fines		5,535	5,823	4,937	5,166	4,896	19,619	20,821
Yandicoogina Fines (HIY)		16,088	13,916	14,277	14,446	14,852	57,663	57,491
Breakdown of total sales:								
Pilbara Blend Lump		22,377	21,457	22,954	21,644	22,161	86,059	88,215
Pilbara Blend Fines		43,039	37,320	42,638	38,100	42,497	155,895	160,555
Robe Valley Lump		2,619	2,307	2,386	2,215	2,301	9,843	9,209
Robe Valley Fines		6,202	5,652	6,141	5,356	5,652	21,140	22,801
Yandicoogina Fines (HIY)		15,731	13,578	14,388	14,583	14,831	57,185	57,380
Total sales ('000 tonnes) (b)		89,968	80,314	88,506	81,898	87,442	330,122	338,160
<i>(a) Includes 100% of production from Paraburdoo, Mt Tom Price, Marandoo, Yandicoogina, Brockman, Nammuldi, Silvergrass and the Eastern Range mines. Whilst Rio Tinto owns 54% of the Eastern Range mine, under the terms of the joint venture agreement, Hamersley Iron manages the operation and is obliged to purchase all mine production from the joint venture and therefore all of the production is included in Rio Tinto's share of production.</i>								
<i>(b) Sales represent iron ore exported from Western Australian ports.</i>								
Iron Ore Company of Canada 58.7%								
<i>Newfoundland & Labrador and Quebec in Canada</i>								
Saleable iron ore production:								
Concentrates ('000 tonnes)		1,980	1,360	974	1,926	2,441	8,549	6,700
Pellets ('000 tonnes)		2,675	2,667	510	2,979	2,389	10,467	8,545
IOC Total production ('000 tonnes)		4,655	4,027	1,484	4,905	4,830	19,016	15,245
Sales:								
Concentrates ('000 tonnes)		2,655	1,271	105	2,590	2,653	8,605	6,619
Pellets ('000 tonnes)		2,750	2,681	343	2,825	2,581	10,402	8,430
IOC Total Sales ('000 tonnes)		5,404	3,951	449	5,415	5,234	19,006	15,049
Global Iron Ore Totals								
Iron Ore Production ('000 tonnes)		92,521	87,146	87,018	87,448	91,406	348,814	353,017
Iron Ore Sales ('000 tonnes)		95,373	84,265	88,954	87,314	92,676	349,128	353,209

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

Rio Tinto operational data

	Rio Tinto interest	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2017	Full Year 2018
SALT								
Dampier Salt	68.4%							
<i>Western Australia</i>								
Salt production ('000 tonnes)		2,246	2,215	2,431	2,167	2,188	7,446	9,001
TITANIUM DIOXIDE SLAG								
Rio Tinto Iron & Titanium	100.0%							
<i>Canada and South Africa (Rio Tinto share) (a)</i>								
Titanium dioxide slag ('000 tonnes)		341	294	232	297	294	1,315	1,116

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

URANIUM								
Energy Resources of Australia Ltd								
Ranger mine (a)	68.4%							
<i>Northern Territory, Australia</i>								
U ₃ O ₈ Production ('000 lbs)		1,343	975	881	1,199	1,351	5,056	4,407
<i>(a) ERA production data are drummed U₃O₈.</i>								
Rössing Uranium Ltd (a) (b)	68.6%							
<i>Namibia</i>								
U ₃ O ₈ Production ('000 lbs)		1,314	1,236	1,352	1,449	1,427	4,652	5,465

(a) Rössing production data are drummed U₃O₈.

(b) On 26 November 2018, Rio Tinto signed a binding agreement to sell its 68.62% interest in the Rössing mine in Namibia to China National Uranium Corporation Limited.

Rio Tinto percentage interest shown above is at 31 December 2018. The data represent full production and sales on a 100% basis unless otherwise stated.

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