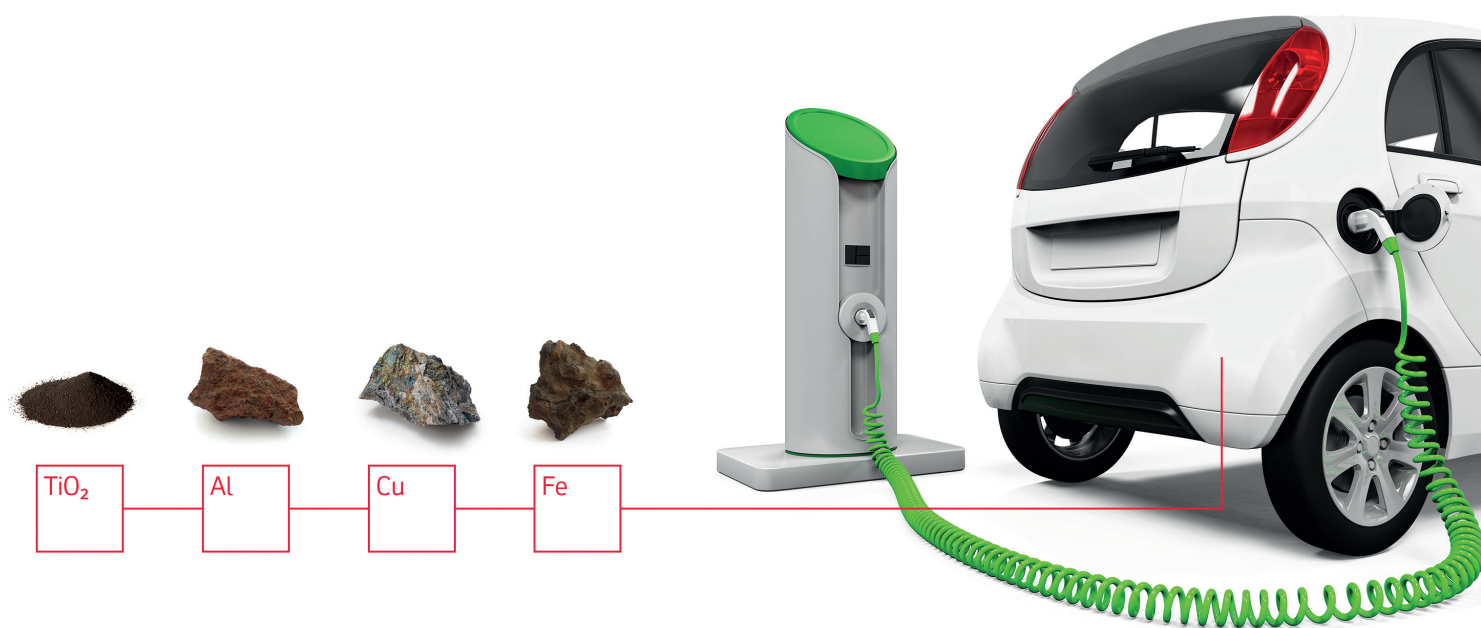


# 2016 Strategic report



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## Strategic report

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## Navigating through Rio Tinto's Annual and Strategic report

The UK's regulatory reporting framework requires companies to produce a strategic report. The intention is to provide investors with the option of receiving a document which is more concise than the full annual report, and which is strategic in its focus.

The first 42 pages of Rio Tinto's 2016 Annual report constitute its 2016 Strategic report. References to page numbers beyond 42 are references to pages in the full 2016 Annual report. This is available online at [riotinto.com/ar2016](http://riotinto.com/ar2016) or shareholders may obtain a hard copy free of charge by contacting Rio Tinto's registrars, whose details are set out at the back of this document.

Please visit Rio Tinto's website to learn more about the Group's performance in 2016.

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The Group's 2016 Strategic report complies with Australian and UK reporting requirements.

Copies of Rio Tinto's shareholder documents – the 2016 Annual report and 2016 Strategic report, along with the 2017 Notices of annual general meeting – are available to view on the Group's website at: [riotinto.com/ar2016](http://riotinto.com/ar2016) and [riotinto.com/agm2017](http://riotinto.com/agm2017)

## Directors' approval statement

This Strategic report is delivered in accordance with a resolution of the board, and has been signed on behalf of the board by:



**Jan du Plessis**

Chairman

1 March 2017

The auditors' report on the Group's 2016 annual accounts was unqualified. Within that report, the auditors' statements under section 496 Companies Act 2016, confirming that the Strategic report and Directors' report are consistent with the accounts, was also unqualified.

A copy of the auditors' report on the Group's 2016 Annual report is contained on pages 207 to 214 of that document, which is available to shareholders free of charge on request, or to view online on our website, [riotinto.com/ar2016](http://riotinto.com/ar2016)

## Key

➤ Page reference for more information within this report

KPI Denotes key performance indicators

## Cautionary statement about forward-looking statements

This document contains certain forward-looking statements with respect to the financial condition, results of operations and business of the Rio Tinto Group. These statements are forward-looking statements within the meaning of Section 27A of the US Securities Act of 1933, and Section 21E of the US Securities Exchange Act of 1934. The words "intend", "aim", "project", "anticipate", "estimate", "plan", "believes", "expects", "may", "should", "will", "target", "set to" or similar expressions, commonly identify such forward-looking statements.

Examples of forward-looking statements in this Annual report include those regarding estimated ore reserves, anticipated production or construction dates, costs, outputs and productive lives of assets or similar factors. Forward-looking statements involve known and unknown risks, uncertainties, assumptions and other factors set forth in this document that are beyond the Group's control. For example, future ore reserves will be based in part on market prices that may vary significantly from current levels. These may materially affect the timing and feasibility of particular developments. Other factors include the ability to produce and transport products profitably, demand for our products, changes to the assumptions regarding the recoverable value of our tangible and intangible assets, the effect of foreign currency exchange rates on market prices and operating costs, and activities by governmental authorities, such as changes in taxation or regulation, and political uncertainty.

In light of these risks, uncertainties and assumptions, actual results could be materially different from projected future results expressed or implied by these forward-looking statements which speak only as to the date of this Annual report. Except as required by applicable regulations or by law, the Group does not undertake any obligation to publicly update or revise any forward-looking statements, whether as a result of new information or future events. The Group cannot guarantee that its forward-looking statements will not differ materially from actual results.

# Performance highlights

## Cash generation of US\$8.5 billion and US\$3.6 billion of shareholder returns

Rio Tinto's 2016 results show that it has kept its commitment to deliver superior shareholder returns, and maximise cash and productivity. At the same time, the Group strengthened its portfolio and advanced its high-value growth projects.

Rio Tinto enters 2017 in good shape and will deliver US\$5 billion of extra free cash flow over the next five years from its mine-to-market productivity programme. The Group's value over volume approach, coupled with a robust balance sheet and world-class assets, places Rio Tinto in a strong position to deliver superior shareholder returns through the cycle.

### 2016 highlights

- Generating strong operating cash flow of US\$8.5 billion.
- Delivering underlying earnings of US\$5.1 billion.
- Achieving US\$1.6 billion of pre-tax sustainable operating cash cost improvements.<sup>(1)</sup>
- Investing in three major growth projects in bauxite, copper and iron ore.
- Optimising the portfolio with disposals of US\$1.3 billion announced or completed in 2016 and up to US\$2.45 billion announced to date in 2017.
- Strengthening the balance sheet further with net debt reduced to US\$9.6 billion.
- Returning cash to shareholders with US\$3.6 billion announced for 2016:
  - full year dividend of 170 US cents per share, equivalent to US\$3.1 billion.
  - share buy-back of US\$0.5 billion in Rio Tinto plc shares over the course of 2017.
  - in total, representing 70 per cent of 2016 underlying earnings.
- Generating free cash flow<sup>(2)</sup> of US\$5.8 billion which included US\$0.3 billion of sales of property, plant and equipment.
- Receiving US\$0.8 billion in net proceeds from disposals in 2016, with up to US\$2.6 billion expected in 2017, including the Coal & Allied transaction for up to US\$2.45 billion.

## Results at a glance

Year to 31 December		2016	2015	Change	
KPI	➤ 112	Net cash generated from operating activities (US\$ millions)	8,465	9,383	-10%
KPI	➤ 130	Underlying earnings <sup>(3)</sup> (US\$ millions)	5,100	4,540	+12%
		Net earnings/(loss) (US\$ millions)	4,617	(866)	n/a
KPI	➤ 128	Capital expenditure <sup>(4)</sup> (US\$ millions)	(3,012)	(4,685)	-36%
		Underlying earnings per share (US cents)	283.8	248.8	+14%
		Basic earnings/(loss) per share (US cents)	256.9	(47.5)	n/a
		Ordinary dividend per share (US cents)	170.0	215.0	-21%
At 31 December		2016	2015	Change	
KPI	➤ 145	Net debt <sup>(5, 7)</sup> (US\$ millions)	9,587	13,783	-30%
		Gearing ratio <sup>(6, 7)</sup>	17%	24%	

The financial results are prepared in accordance with IFRS.

(1) Operating cash cost improvements represent the difference between the current and prior year full cash cost of sales per unit based on the prior year volume sold.

(2) Free cash flow is defined as Net cash generated from operating activities less Purchases of property, plant and equipment (PP&E) plus Sales of PP&E. It is a key financial indicator which management uses internally to assess performance.

(3) Underlying earnings is a key financial performance indicator which management uses internally to assess performance. It is presented here to provide greater understanding of the underlying business performance of the Group's operations. Net and underlying earnings relate to profit attributable to the owners of Rio Tinto. Underlying earnings is defined and reconciled to net earnings on page 130. Additionally, underlying EBITDA is a key financial indicator which management uses internally to assess performance. It excludes the same items that are excluded in arriving at underlying earnings.

(4) Capital expenditure is presented gross, before taking into account any disposals of property, plant and equipment.

(5) Net debt is defined and reconciled to the balance sheet on page 145.

(6) Gearing ratio is defined as net debt divided by the sum of net debt and total equity at each period end.

(7) These financial performance indicators are those which management use internally to assess performance, and therefore are considered relevant to users of the accounts.

# Group overview

## Introduction to Rio Tinto

At Rio Tinto, as pioneers in mining and metals, we produce materials essential to human progress.

We have been in business for more than 140 years and remain focused on the long term. Our approach is driven by a clear strategy, with the goal of delivering superior value for our shareholders through the cycle (see page 8). Our strategy plays to our strengths: world-class assets, talented employees, a strong balance sheet and operating excellence.

Our approach is underpinned by our values of safety, teamwork, respect, integrity and excellence. Combined with the strength provided by our people and our assets, our values help form the foundations of our long-term success.

We have a 51,000-strong workforce in around 35 countries. We seek to foster a culture where our people keep their safety, and that of their workmates, contractors and communities, at the top of their minds; where every person understands how they can create and preserve value for the business; where diversity and innovation are embraced; and where our values guide everything we do.

We find, mine, process and market mineral resources, producing a diverse suite of minerals and metals that enable the world to grow and develop. These products give us exposure to markets around the world, and across the economic development spectrum, from basic infrastructure needs, through industrial growth, to consumer-led demand.

Under our Group-wide organisational structure, our four product groups – Aluminium, Copper & Diamonds, Energy & Minerals and Iron Ore – are complemented by our Growth & Innovation group. Supporting these are our central support functions, shared services, and headquarters-based activities.

Our contribution to sustainable development is integral to how we do business. It is a fundamental consideration in how we manage the business, seeking long-term mutually beneficial outcomes for our business and our stakeholders. Find out more on page 24.

## Iron Ore

Rio Tinto operates a world-class iron ore business, supplying the global seaborne iron ore trade. We are well positioned to benefit from continuing demand across China and the developing world. The Iron Ore product group's operations are located in the Pilbara region of Western Australia, where it has industry-leading margins, and in 2016 marked 50 years since their first contracted shipment.

### Products

#### Iron ore

Iron ore is the key ingredient in the production of steel, one of the most fundamental and durable products for modern-day living, with uses from railways to paperclips.

### Strategic advantages

- Strong presence in key markets.
- Proximity to key Asian markets.
- World-class assets, comprising an exclusive, integrated supply chain with extensive optionality.
- A premium product suite, which drives strong customer relationships, supported by technical and commercial marketing expertise.
- Low cost position with a Pilbara cash unit cost of US\$13.7 in 2016.
- Strong mineral resources provide multiple high-quality, low-cost options to sustain and grow our Pilbara operations.
- Employees driving sustainable productivity improvements: costs, quality and revenue.
- Industry leader in supply chain management, responsible mining and technology and innovation.

Key production locations	Key sales destinations
– Australia	– China
	– Japan
	– South Korea

Full operating review ► 32

## Aluminium

Building on more than a century of experience and expertise, Rio Tinto is a global leader in the aluminium industry. Our business includes high-quality bauxite mines, large-scale alumina refineries, and some of the world's lowest-cost, most technologically-advanced aluminium smelters.

### Products

#### Bauxite

Bauxite is the ore used to make aluminium. It is refined into alumina which is smelted into aluminium metal. Our wholly and partly owned bauxite mines are located in Australia, Brazil and Guinea.

#### Alumina

Alumina (aluminium oxide) is extracted from bauxite via a refining process. Approximately four tonnes of bauxite are required to produce two tonnes of alumina, which in turn makes one tonne of aluminium metal. Our wholly and partly owned alumina refineries are located in Australia, Brazil and Canada.

#### Aluminium

Aluminium is a versatile modern metal. Light, strong, flexible, corrosion-resistant and infinitely recyclable, aluminium is one of the most widely used metals in the world. Its largest markets are transportation, machinery and construction. Our smelters are mainly concentrated in Canada. We also have smelters in France, Australia, New Zealand, Iceland and Oman.

### Strategic advantages

- Access to the largest and best-quality bauxite ore reserves in the industry, strategically located to serve growing Chinese bauxite demand.
- One of the lowest-cost bauxite producers.
- Outstanding hydropower position, which delivers significant cost and other advantages in an energy intensive industry and today's carbon-constrained world.
- Rio Tinto has a low first-quartile average cost position for aluminium smelting, with industry-leading smelting technology.

Key production locations	Key sales destinations
– Canada	– Asia
– Australia	– Americas
– Europe	– Europe

Full operating review ► 34

## Copper & Diamonds <sup>(a)</sup>

Rio Tinto's Copper & Diamonds product group has managed operations in Australia, Canada, Mongolia and the US, and non-managed operations in Chile and Indonesia. By-products of the group's copper production include gold, silver, molybdenum and others such as sulphuric acid, rhenium, lead carbonate and selenium.

### Products

#### Copper

Copper makes a positive impact on many of society's challenges. It is the primary conductor in the world's electrical infrastructure, and carries voices, data and vital information to all corners of the world. It is a key component of green technologies, from wind energy and solar collection to high-efficiency buildings and electric vehicles.

#### Diamonds

Diamonds are an important component in both affordable and higher-end jewellery. We are able to service all established and emerging markets as we produce the full range of diamonds in terms of size, quality and colour distribution.

#### Gold

Gold is the ultimate store of value. It is used in jewellery, as a financial instrument, and supports the medical industry.

#### Silver

Also a precious metal, silver has the highest electrical and thermal conductivity of any metal and is used in many electronic devices. It is also used in aerospace and medical applications, to make jewellery and as an investment.

#### Molybdenum

Molybdenum enhances toughness, high-temperature strength and corrosion resistance when combined with other metals. It is frequently used to produce stainless steel and other metal alloys.

### Strategic advantages

- A portfolio of high-quality copper assets.
- Attractive copper growth opportunities.
- Fully integrated global copper and diamond exploration, mining, and sales and marketing business.
- A strong and trusted supplier of copper and diamonds in markets where we have an established presence and in those where we are developing new opportunities.
- Leading technology and processes for underground mining.

#### Key production locations    Key sales destinations

– Australia	– Australia
– Chile	– China
– Mongolia	– India
– North America	– Japan
– Indonesia	– North America
	– Europe

Full operating review ➤ 36

## Energy & Minerals <sup>(a)</sup>

Rio Tinto's Energy & Minerals product group comprises mining, refining and marketing operations in 14 countries, across six sectors: borates, coal, iron ore concentrate and pellets, salt, titanium dioxide and uranium. Energy & Minerals also includes the Jadar lithium-borate project in Serbia and the Simandou iron ore project in Guinea.

### Products

#### Borates

Refined borates are used in hundreds of products and processes. They are a vital ingredient of many building materials and are essential micro-nutrients for crops. They are also commonly used in glass and ceramic applications including fibreglass, television screens, floor and wall tiles, and heat-resistant glass.

#### Coal

Coal is a cost-effective and abundant energy source that plays an important role in the global energy mix. Thermal coal is used for electricity generation in power stations. The thermal coal from the Hunter Valley operations features the low ash and sulphur properties for modern lower-emissions power stations. We also produce high-value coking or metallurgical coal, which is mixed in furnaces with iron ore to produce steel.

#### Salt

Salt is one of the basic raw materials for the chemicals industry and is indispensable to a wide array of automotive, construction and electronic products, as well as for water treatment, food and healthcare.

#### Titanium dioxide

The minerals ilmenite and rutile, together with titanium dioxide slag, can be transformed into a white titanium dioxide pigment or titanium metal. The white pigment is a key component in paints, plastics, paper, inks, textiles, food, sunscreen and cosmetics. Titanium metal is light weight, chemically inert and strong, making it ideal for use in medical applications and in the aerospace industry.

#### Uranium

Uranium is one of the most powerful energy sources, and is used in the production of clean, stable, base-load electricity. After uranium is mined, it is processed into uranium oxide. This product is sold for processing into fuel rods for use in nuclear power stations.

Other products from the Energy & Minerals product group include high-purity ductile iron, steel billets, metal powders and zircon.

### Strategic advantages

- Industry-leading businesses operating in attractive markets.
- Demand-led, integrated operations that are responsive to the changing external environment.
- Minerals business poised to benefit from mid- to late-development-cycle demand growth as consumption increases in emerging markets.
- A lean, scalable operating model running cash-focused businesses.

#### Key production locations    Key sales destinations

– North America	– North America
– Australia	– China
– Africa	– Japan
	– South Korea
	– Europe

Full operating review ➤ 38

## Growth & Innovation <sup>(a)</sup>

The Growth & Innovation group operates through the entire life cycle of Rio Tinto's mines and assets, optimising value from the time of the initial exploration concept through to when we close a mine or processing facility.

Growth & Innovation works in close partnership with Rio Tinto's product groups, and is accountable for finding, evaluating, developing and delivering a portfolio of Tier 1 growth options. It also provides technical support to Rio Tinto operations to improve productivity, manage technical risk and drive innovation and automation initiatives.

Full operating review ➤ 40

(a) The Copper & Diamonds and Energy & Minerals product groups, and the Growth & Innovation group, were formed in July 2016 in a reorganisation of Rio Tinto's company structure.



# Chairman's letter

## Dear shareholders,

In 2016, your company delivered a strong performance despite challenging macroeconomic conditions and significant geopolitical uncertainty, which led to commodity price volatility throughout the year.

Change was a feature of 2016, both in the external environment and within the company. It is critical that, in uncertain times, a long-term perspective prevails.

It is pleasing to report we made progress against each of our strategic priorities during 2016, delivering robust earnings and cash generation, while maintaining balance sheet strength and progressing our high-value growth options.

## Strength through the cycle

In 2016, average prices for our products were slightly down on the previous year, yet we achieved underlying earnings of US\$5.1 billion, up 12 per cent on 2015. At US\$8.5 billion, operating cash flow was, however, ten per cent lower than in 2015, primarily due to interest paid on bond early redemptions and working capital movements.

During the year, your company continued to realise considerable savings from its cost reduction programme. The Group has now achieved US\$7.8 billion in pre-tax operating cash cost improvements and reductions in exploration and evaluation expenditure compared with 2012.

## Returns to shareholders

Last year, in response to a deterioration in the pricing environment and exceptional volatility, we determined that it was no longer appropriate to maintain our progressive dividend policy. We announced a new dividend policy with a more flexible approach which better reflects our underlying earnings profile and outlook.

It balances three factors: maintaining a strong balance sheet; reinvesting for future growth; and rewarding shareholders. We expect total cash returns to shareholders to be in the range of 40-60 per cent of underlying earnings in aggregate through the cycle.

In February 2017, we announced cash returns to shareholders of US\$3.6 billion with respect to 2016. This comprises total dividends of US\$3.1 billion and a share buy-back of US\$500 million in Rio Tinto plc shares, representing, in aggregate, 70 per cent of 2016 underlying earnings.

## Global growth

After five years of global GDP growth below the long-term average, and with the impact of interest rate policy stimulus nearing saturation, growth is now increasingly influenced by geopolitical matters. The tectonic political shifts in the UK and the US during 2016 are yet to translate into clear global economic impacts but there is no doubt that these events have contributed to a high level of uncertainty across the globe.

However, if we look to the long term, we believe there is plenty of opportunity. Over the next 15 years the world is expected to consume more copper than in the past

20 years, almost as much steel as in the past 30 years, and almost as much aluminium as in the past 40 years.

## Consistent strategy

Given the increasing complexity and uncertainty in the external environment, we are focusing more than ever on understanding the macro trends that may impact our company and our industry in the future.

During the year, the board and management reviewed these global trends and our strategy to address them. In September, the board endorsed the company's ten-year strategy. This remains consistent; our aim is to generate value by focusing on assets that are long life, low cost and expandable.

## Economic and social contribution

While delivering shareholder value is our primary objective, there is no doubt that we need to get better at explaining the economic and social contribution we make to our host countries, particularly during uncertain times.

In 2016, your company paid US\$4 billion in taxes and royalties worldwide, with payments over the past five years of more than US\$32 billion. Over the past five years, Rio Tinto's direct economic contribution has exceeded US\$235<sup>(a)</sup> billion of which almost half was through payments to suppliers for goods and services.

Our stakeholders have an increasing interest in how we are preparing for – and how we contribute to – a low-carbon future. In response to a shareholder resolution at our 2016 annual general meeting, this month we will publish our first climate change report, which provides information on our approach.

## Board and management

Over the last 12 months, we made a number of changes at both the board and management levels. In May 2016, Richard Goodmanson stepped down as a non-executive director and in February of this year, we announced that Robert Brown and Anne Lauvergeon will also step down from the board at the Rio Tinto Limited annual general meeting on 4 May 2017. Richard, Bob and Anne contributed significantly to the board over the years and we wish them well for the future.

In February 2017, we appointed three new independent non-executive directors to the board. Former Sasol Ltd chief executive David Constable and former Centrica plc chief executive Sam Laidlaw joined on 10 February 2017. Royal Dutch Shell plc chief financial officer Simon Henry will join the board with effect from 1 July 2017.

On 1 July 2016, Sam Walsh retired as chief executive of Rio Tinto, and I thank him for the significant service and transformative leadership he gave to the company during his three-and-a-half-year tenure as chief executive. Since taking over as chief executive in July, Jean-Sébastien Jacques has set about driving a new era of productivity, performance

and growth. During the first eight months in his role, J-S and our newly shaped executive team have continued the focus on generating cash, while maintaining a disciplined approach to capital allocation and balance sheet strength, and progressing our high-value growth options.

In 2016, your board visited Mongolia to see our management teams and employees in action. Site visits by the board allow us to meet with the company's dedicated employees and we continue to be greatly impressed by their expertise and commitment.

## Regulatory matters

I cannot reflect on 2016 without acknowledging the events of the final months of the year. On 9 November 2016, we announced, following an investigation supported by external counsel, that we had notified the relevant authorities in the US, UK and Australia about contractual payments totalling US\$10.5 million made to a consultant who had provided advisory services in 2011 on the Simandou project in Guinea.

On 1 December 2016, Rio Tinto confirmed that it was co-operating with relevant authorities in connection with an investigation into the impairment included in the company's accounts in 2012 in respect of Rio Tinto Coal Mozambique.

The outcome of the regulatory investigations, and any potential litigation, is uncertain. There is unfortunately little more I can say at this time, other than to assure you that the board is giving these matters its full and proper attention, and that we are continuing to co-operate fully with the relevant authorities. Under my chairmanship, we have established a dedicated board committee to monitor progress.

## National pride, international spirit

Despite the changes and uncertainties of the past year, the world remains deeply connected through bilateral agreements, shared cultural histories and friendship. These factors will be the foundations of future global growth.

National pride and international spirit have gone hand in hand since Rio Tinto's formation 144 years ago. That spirit continues today, as we partner with our stakeholders to build enduring businesses. On behalf of my fellow directors I would like to thank our hard-working employees and you, our shareholders, for your ongoing support.



Jan du Plessis  
Chairman

1 March 2017

(a) Summarised on page 26.

# Chief executive's statement

## Dear shareholders,

It is a privilege to serve as chief executive of a great company with world-class assets, talented employees and a commitment to delivering value to our shareholders over the short, medium and long term.

## Safety comes first

At Rio Tinto, safety comes first. Our ambition is clear: all of our employees and contractors must return home safely at the end of each and every day.

In 2016, most aspects of our safety performance improved, but this is still not good enough.

It is a real concern that fatalities continue to occur in the sector and at our operations. These deaths are devastating losses for family, friends and colleagues.

In June, we had a tragic fatality at one of our iron ore operations in Western Australia. One of our colleagues was crushed while working on a drill rig. We completed a full investigation into this event and have shared the learnings across Rio Tinto to seek to prevent an incident like this from happening again.

At the operations of our non-managed joint arrangements Alumar, Grasberg and Escondida, six people died during the year. We have shared our fatality prevention initiatives with our joint-venture partners and learn from their efforts as well.

During 2016, we deployed our critical risk management (CRM) system across more than 60 sites and completed more than 1.3 million safety verifications.

CRM is an important tool in our drive to eliminate fatalities across our organisation.

In 2016, our lost time injury numbers decreased and we have reduced our all injury frequency rate by 64 per cent over the last decade.

We must continue to learn and share information, for the benefit of our people, our contractors, and our partners.

For us, safety comes first and our drive to improve continues.

## Value over volume

In 2016, your company delivered on its commitments. Most importantly, we met our commitment to deliver superior shareholder returns. In February 2017, we announced total dividends for 2016 of 170 US cents per share, well in excess of the previously indicated 110 US cents per share minimum, and a share buy-back of US\$0.5 billion.

We maximised cash from our world-class assets and focused on value over volume. We delivered US\$1.6 billion in cost savings, and we progressed our three high-value growth projects, Oyu Tolgoi underground, Silvergrass and Amrun, while maintaining tight control of our capital expenditure, which in 2016 totalled US\$3.0 billion.

Our success in generating cash, controlling capex, and actively strengthening the portfolio, meant that we closed the year with net debt of US\$9.6 billion. This is a reduction of US\$4.2 billion compared with December 2015.

This strong performance was delivered against a backdrop of significant commodity price volatility and geopolitical uncertainty. We see this continuing into 2017 which is why we intend to maintain our strong balance sheet, the foundation of a resilient business.

Our team around the world is focused on our four Ps – portfolio, performance, people and partners. Relentless and consistent delivery against each of these will underpin our aim to deliver superior shareholder returns through the cycle.

## Profitable performance from our world-class assets

The external environment for our businesses remained challenging in 2016. The goal of our financial planning is to set objectives for your company that are resilient against various macroeconomic and commodity pricing scenarios.

Notwithstanding a significant lift in some commodity prices in the latter part of 2016, from a very low base, the average prices for the year were slightly lower than in 2015.

Our aim is to maximise cash and productivity across our entire portfolio of assets.

We made good progress during 2016 with underlying EBITDA of US\$13.5 billion, representing a margin of 38 per cent for the Group, compared with 34 per cent in 2015.

In 2016, our Iron Ore business delivered cash from operations of US\$5.6 billion and delivered industry-leading margins. This group delivered cost savings of US\$315 million for the year.

The Pilbara infrastructure investments of recent years are essentially complete. In June, we announced the US\$338 million Silvergrass investment which will provide new ore later in 2017, and complement our Pilbara blend.

Our Aluminium group has world-leading positions in bauxite, alumina and aluminium, and achieved a solid financial performance in 2016, driven by productivity and cash cost improvements.

With its low-carbon footprint, our aluminium business is among the best positioned in the world, but the price declines of the past year continue to pose industry-wide challenges.

In Aluminium, all of our assets were free cash flow positive, despite lower realised prices in the first half. This product group reduced operating costs by more than US\$480 million against a full year target of US\$300 million.

The Copper & Diamonds product group delivered cash from operations of US\$987 million and had underlying EBITDA margins from its operations of 31 per cent.

The Energy & Minerals product group matched production with market demand, generating significant free cash flow in 2016 of US\$1.3 billion, due to improved prices in some commodities, including coal.

The Australian coal portfolio, which has delivered a reduction in unit costs of more than 40 per cent over the last four years, benefited from higher coking coal prices.

## Driving productivity

Our aim is to deliver strong performance under any market conditions. Since 2012, we have reduced our annual cost run rate by more than US\$7 billion, and we are well on track to deliver on our promise of US\$2 billion in cost savings across 2016 and 2017.

It is energising to be leading a business where continuous improvement and efficiency are part of the culture, and we are taking every opportunity to generate value, from mine to market.

Cutting costs can only deliver so much – we must also lift productivity. Increasing the mine-to-market productivity of our US\$50 billion asset base is the highest return available to us. As such, we have promised to deliver an additional US\$5 billion of productivity-driven free cash flow over the next five years.

We will boost productivity across the entire organisation, through harnessing technology and through improved operation and utilisation of our fixed assets, organisational resources and systems. We will continue focusing on value, not volume, and using our commercial excellence to achieve premium pricing for our quality products such as the Pilbara blend.

Our new centre of commercial excellence in Singapore is focused on generating more of these types of initiatives, with the aim of maximising value across our customer and supplier chains throughout the business.

## Investing in future growth

The competitive advantage of our strong balance sheet has meant that our cost and productivity drive is not at the expense of growth, and we seek to continue to invest wisely where we see opportunities for attractive returns.

In 2016, we progressed our three compelling growth projects, which play to the company's strengths. In line with our strategy, they are all multi-decade in outlook and offer highly attractive returns.

In May, work began on the underground development at Oyu Tolgoi in Mongolia.

First production is expected in 2020. When the underground is fully ramped up in 2027, the company expects it to produce more than 500,000 tonnes of copper a year. The mine also benefits from significant gold by-products, with an average gold grade of 0.35 grams per tonne.

# Chief executive's statement

continued

The new Silvergrass iron ore mine will take the total number of mines in the Pilbara to 16. Our integrated system also includes 1,700 kilometres of rail and four ports to serve more than 100 customers globally.

In Cape York, Australia, the Amrun bauxite project is progressing well, with 70 per cent of the US\$1.9 billion spend to occur in 2017 and 2018. It builds on our expertise as a reliable supplier of quality bauxite from Cape York, which Rio Tinto first discovered in the region over six decades ago.

As the next generation of deposits becomes more difficult to find and develop, we continue our focus on exploration. Rio Tinto has one of the largest exploration programmes in the industry, and in 2016 we were active in 14 countries across a range of commodities.

## Portfolio of world-class businesses

At Rio Tinto our strategy is centred on world-class assets – those that are long life, low cost and expandable.

During the year, we strengthened our portfolio. We announced or completed disposals of more than US\$1.3 billion in the year, including completing the sale of Lochaber in the UK in December. In January 2017, we announced the divestment of our thermal coal business in Australia for up to US\$2.45 billion, which, subject to approvals, should complete later this year.

In June 2016, we announced a reorganisation of our product group structure which saw the formation of the Copper & Diamonds group to help maximise our technical underground mining expertise. We also created the Energy & Minerals group which now holds a suite of premium coking coal and speciality mineral products and will act as an incubator for emerging opportunities.

The Iron Ore group is now focused on our operations in Western Australia, and the Aluminium group retains its focus on value creation from its high-quality bauxite, alumina and aluminium businesses.

The product groups are complemented by a newly shaped Growth & Innovation group, to drive our productivity agenda, project delivery expertise and the deployment of new technologies.

## People with purpose

My new role has provided me with an opportunity to visit many sites and meet our great teams around the world. Our people work hard for their families, their communities, and our company.

We know there is more to be achieved. I would like to thank our 51,000 people for their efforts during 2016 and their commitment to stepping up further in 2017.

Our employee engagement score, measured in our 2016 People Survey, was lower than we would have liked, but we will use the insights this provides to improve our leadership and direct our initiatives to build engagement.

We will focus on developing our employees in 2017, building commercial and technical expertise, as these are key enablers of our performance.

How we do things is as important as what we do. Integrity and *The way we work* – our global code of business conduct – guide our actions, and, at Rio Tinto, commitment to them is non-negotiable.

We renewed our focus on graduates in 2016 as part of our broader commitment to grow our diversity and critical capability for the future.

We are a global organisation with all the strengths this provides and we must do more to attract the next generation, and people from the places where we are operating, to become part of our company.

In 2016, we made some changes to the Executive Committee. The new team offers a strong and diverse perspective with deep industry expertise and global knowledge.

## Strengthening our partnerships

Last year, we celebrated a number of significant milestones which testify to the long-term nature of our investment, commitment and partnerships with local communities and governments.

During 2016, I met with many stakeholders, including visiting Australia, China, and Canada to meet customers and business partners.

Our Rössing uranium mine in Namibia and Richards Bay Minerals operation in South Africa both celebrated their 40<sup>th</sup> anniversaries.

And in Australia, we marked the 50<sup>th</sup> anniversary of the company's first contracted shipment of iron ore from the Pilbara to Japan.

These businesses were all pioneered on foundations of partnership between our company, government, business partners and communities.

In 2017, we will also mark 30 years of the Channar Mining Joint Venture with China's Sinosteel Corporation in the Pilbara, and the 145<sup>th</sup> anniversary of our borates operations in the US.

Our operations take years to plan and decades to deliver. The benefits of taxes, wages and procurement are shared across generations.

In an increasingly complex and uncertain world, which brings significant risks to our ongoing success, it is critical we partner expertly with customers, governments, communities and our suppliers. Our operations and our people make a material difference in the communities in which we have the privilege to work and live.

## Looking to the future

Rio Tinto is in a strong position. Our robust balance sheet, world-class assets, our focus on the drivers of performance and our talented employees will keep us resilient in times of volatility.

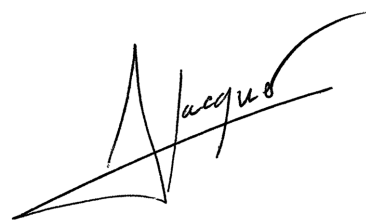
We can, however, be confident about the medium and long term megatrends of population growth and urbanisation.

Combined with the large infrastructure deficits that exist in both advanced and emerging economies, the long-term view is positive for our industry.

Regardless of the pace of economic growth or change in the years ahead, Rio Tinto's purpose will continue to be to produce materials essential to human progress, as we have done since the company was founded.

In 2017, we will do all we can to improve safety and our cash performance, drive our productivity agenda, and again deliver strong returns to our shareholders.

Thank you for your ongoing support and confidence in your company.



Jean-Sébastien Jacques  
Chief executive

1 March 2017



# Market environment

## Global economy

For the fifth year in a row, global GDP growth underperformed the long-term average, expanding at approximately three per cent in 2016, yet still exceeded initial expectations.

At the start of the year, concerns over a second wave of collapsing oil prices, negative interest rates in Japan and Europe, the possibility of a hard landing in China and revived expectations of a US recession pushed market expectations down sharply. In the first few months the S&P 500 fell by more than ten per cent from its 2015 close and commodity prices hit fresh lows.

Meanwhile, an expansion was taking shape in China as new fiscal support was released in tandem with relaxed housing purchase and mortgage restrictions. The resulting property market surge reversed the deflationary conditions of the previous two years. By mid-2016, job growth, rising real incomes and higher corporate earnings in the US were supporting a modest improvement in economic growth. Europe and Japan's economic performance also picked up, while the downturn in many emerging markets appeared to bottom out. This levelling-off set the stage for a sustained pick-up in commodity prices and equities. It also provided room for the Federal Reserve Bank to raise the benchmark rate later in the year and allowed a prolonged strengthening of the US dollar.

China's economic performance beat consensus expectations, with full year growth of 6.7 per cent. The end of deflation allowed Chinese industrial profits to improve substantially, though production growth remained relatively weak. Improved balance sheets provided some support to investment growth though it remains below trend. While consumer price inflation remained modest during 2016, surging commodity prices, particularly oil, drove a substantial reflation in producer prices. The short-term property cycle appeared to have peaked by October. Even so, completion of projects under construction prevented a sudden downward correction, and the market has moved into a more balanced position.

After signs of weakening momentum in the third quarter, the global economy finished 2016 with improved manufacturing and business sentiment. The new US administration's plans for fiscal stimulus, corporate tax reform and reduced regulation also helped to buoy market sentiment at year-end. Europe also enjoyed a modest improvement in demand, though banking sector issues continue to constrain recovery. Though negative rates persist in Japan, inflation and growth appear to have improved following fiscal stimulus measures.

Despite the apparent improvement, other events signalled increasing risk. The December increase in the US benchmark rate drove up Treasury bond yields, with negative

implications for borrowing and credit. Higher rates pushed the dollar up against other currencies, a negative signal for commodity prices. Finally, the re-emergence of inflation in the US, Europe and China supports expectations of further increases in US benchmark rates.

## Drivers of commodity prices

Long-term structural economic trends are important drivers of commodity prices through their effects on demand. The economic development and urbanisation of emerging countries goes through an initial investment-led growth phase, which benefits commodities such as steel and copper used in construction and infrastructure. As economies evolve, other commodities such as light metals, energy products and industrial minerals tend to take over as the main enablers of consumption-led growth.

The long-term nature of mining tends to result in cyclical investment patterns, translating into commodity price cyclicity. Over the past three years, the industry moved into the low phase of the cycle. Investments made during the previous period of high prices and margins have started to deliver new supply, into a context of decelerating Chinese demand. With markets for most metals and minerals moving into oversupply, the industry has shifted from capital investment toward strategies focused on strengthening balance sheets through productivity and cost reduction initiatives.

## Commodity markets

Most commodity prices increased for the first time in a number of years in 2016, despite numerous political and macro shocks to the global economy.

Iron ore prices started the year at around US\$40/dry metric tonne CFR (cost and freight) and ended the year around US\$80. Following a weak start, China's crude steel production increased in the second half of the year by nearly four per cent compared with 2015. This helped absorb new iron ore supply from Roy Hill and Minas Rio. The improved demand was underpinned by an increased appetite for Chinese steel demand as China's government expanded lending, eased monetary policy and supported the property sector. China also eliminated inefficient steelmaking capacity, supporting steel prices and profitability.

Hard coking coal prices almost quadrupled to US\$310/tonne from January to November. Healthy Chinese steel demand contributed to the spike, but the main driver was China's supply curtailment through the implementation of the "276 Directive", restricting coal mines to operating 276 days of the year. The thermal coal market was also affected, with prices more than doubling to US\$110/tonne FOB (free on board) Newcastle. The directive was relaxed in the second half and prices have since moderated.

Price increases for industrial metals were less dramatic. Copper prices dipped below US\$2/pound in early 2016 before rising 25 per cent by year-end. Over one million tonnes of new mine supply entered the market, and was accommodated through demand growth, lower scrap availability and mine curtailments.

Aluminium prices started 2016 below US\$1,500/tonne and ended the year about 15 per cent higher. Margins remained under pressure, however, as higher energy and alumina costs offset the price increase. The alumina price rallied from less than US\$200/tonne to US\$350/tonne as refinery curtailments caught up with the ten per cent cutback of global smelting capacity announced in 2015. Bauxite did not match these increases, with the average Chinese import price falling moderately to just under US\$50/tonne as new supply from Guinea, Australia and Brazil replaced volumes lost to Malaysia's export ban.

## Outlook

The global economy starts 2017 with improved manufacturing conditions but also evidence that cost pressures and tighter credit conditions in the US, the UK and China are affecting corporate profit growth. Europe's economy has gained momentum, though the pick-up in household consumption remains very weak and is vulnerable to inflation. Meanwhile, Japan should benefit from a planned fiscal policy expansion. China is facing the wind-down of its short-term property cycle and renewed policy calls to constrain credit growth and push through heavy industry restructuring and capacity reduction. At the same time, the Chinese government is working hard to keep growth relatively stable ahead of the 2017 mid-term leadership transition, with growth this year likely to be only slightly weaker. The stronger dollar, higher interest rates and inflation will constrain the pace of US recovery. However, should the new US Administration follow through with fiscal expansion, there is potential for higher US growth later in the year. Further strengthening of the dollar and higher interest rates and inflation could ensue for the global economy.

Overall, the reflationary conditions that dominated global commodity markets in 2016 may be reaching their limits, though positive sentiment and further steel and coal capacity cuts in China may provide further support. Consensus now points to moderate downside risk for commodity prices in the short to medium run. This context continues to favour producers at the lower end of the cost curve and those that can improve productivity. Longer-term demand prospects remain positive. The attractiveness of growth opportunities in some commodities is amplified by stronger mine depletion resulting from recent cutbacks in capital expenditure.

# Group strategy

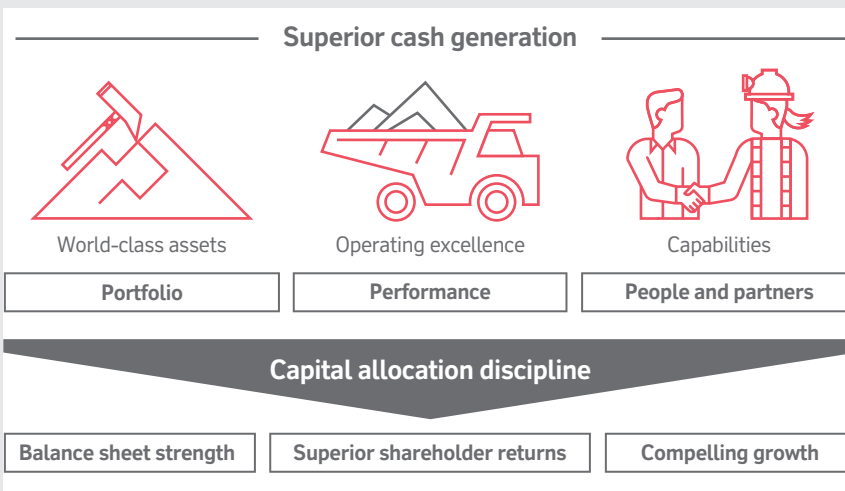
## Improved market conditions, but uncertainty remains

By comparison with recent periods, the mining sector enjoyed a relatively buoyant year in 2016, with equity valuations improving considerably across large parts of the sector. Prices for a number of commodities improved during 2016, aided by a combination of fiscal stimulus in China, policy-driven capacity reductions and new supply entering the market at a slower rate. This supportive environment allowed us to generate strong cash flow and further strengthen our financial position.

We continued to focus on productivity, cost reductions and capital discipline in 2016, in order to maximise our cash generation and the return on every dollar we invest. Similar strategic approaches played out across large parts of the mining sector – allowing many companies facing financial distress at the beginning of 2016 to pay down debt and regain some financial stability. However, our early and consistent action in these areas has positioned us favourably, and allowed us to continue investing in our most attractive organic growth opportunities where others have not been able to do so. We enter 2017 in good shape.

Despite some renewed optimism for the sector during 2016, we remain cautious. Recent commodity price rises have been helped by discrete fiscal policy decisions that could quickly be unwound. In addition, the geopolitical landscape remains uncertain, and major political transitions could impact our markets and operating environments during 2017. Elsewhere, we are seeing an increased threat of rent-seeking, resource nationalism and the adverse application of regulatory laws to previously settled practices. These include Indonesia's proposed revision to its mining legislation, a mooted production tax increase in Western Australia and the application of EU tax regulations on competitiveness. Accordingly, we will continue to adopt a conservative approach to our financial management and capital spending.

## A clear strategy to deliver value through the cycle



A clear and effective strategy is critical for us to perform strongly under a range of industry conditions. Our goal is to deliver superior value for our shareholders through the cycle, and we believe the best way to do this is to focus on the “four Ps”: **portfolio, performance, people and partners**. We couple this with our disciplined approach to capital allocation. This ensures that every dollar we generate is applied to the highest-returning opportunity – whether that be for maintaining our balance sheet strength, investing in compelling growth opportunities or delivering superior shareholder returns.

## Superior cash generation

### 1. Portfolio

At the heart of our approach is a portfolio of world-class assets – from our Pilbara iron ore business, to our Queensland bauxite ore reserves, our Canadian aluminium smelters and our global suite of copper mines. These are multi-decade assets that deliver attractive returns throughout the cycle, while providing material opportunities for growth over the long term. We use a clear strategic framework to assess our existing assets and new opportunities – taking into account the industry attractiveness and the competitive advantage of each asset, and its capacity to deliver strong and stable returns.

In 2016, we:

- Invested US\$1.3 billion in compelling growth opportunities.
- Announced an increase to our Pilbara iron ore reserves in Western Australia.
- Agreed the sale of our aluminium smelter and hydroelectric facilities at Lochaber in Scotland.
- Signed a non-binding agreement to sell our interest in the Simandou project in Guinea.
- Completed the sales of our Mount Pleasant thermal coal assets and of our interest in the Bengalla coal joint venture.

### 2. Performance

Safety is our number one priority and is core to everything we do. A well-run operation is a safe operation.

We seek to generate value at all stages of the value chain – from mine through to market. We prioritise value over volume in all of our operating and investment decisions. We have delivered substantial cost savings over recent years and this remains a key focus area.

Beyond this, we continue to increase the productivity of our existing assets, as a substantial and low-risk source of incremental returns.

We have established a leading position in the development and use of technology and innovation – allowing us to deliver more tonnes more cheaply and with less risk. As the industry faces increasingly complex geological, environmental and cost pressures, our technology advantage will be an increasingly important value driver.

Our commercial activities ensure we reap the maximum value from each of our businesses. Our marketing teams work hand-in-hand with our operations, so that our resource management is fully aligned to the market.

Over the years we have leveraged our understanding of customer needs to create new markets for our products, including high-temperature Weipa bauxite, and champagne and pink diamonds. We deploy industry-leading capabilities in supply chain optimisation and a variety of logistics solutions across the Group – and have in-house centres of excellence for value-in-use analysis, pricing and contracting strategies. Together, these activities allow us to manage risk and capture value in all market conditions.

In 2016, we:

- Completed more than 1.3 million safety critical control verifications in our critical risk management programme.
- Committed to generating US\$5.0 billion of additional free cash flow over the next five years from mine-to-market productivity improvements.
- Achieved a further US\$1.6 billion of operating cash cost reductions, as part of our target of US\$2.0 billion over 2016 and 2017.

- Strengthened our organisational structure, by adjusting our product groups to better align our assets with the business strategy, help drive further efficiencies and optimise performance.
- Appointed executives responsible for Health, Safety & Environment and Growth & Innovation to our Executive Committee.

### 3. People

As our industry evolves, new capabilities will be required and we must attract, develop and retain the right people to meet this challenge. We are strengthening our technical and commercial capabilities in particular, and establishing centres of excellence around these areas. Beyond this, we are committed to building a diverse and inclusive workforce at all levels of the organisation.

In 2016, we:

- Appointed a Human Resources Group executive to our Executive Committee.
- Announced we would be doubling our annual graduate intake.

### 4. Partners

As a global company, the environment in which we operate is becoming more complex. In order to secure access to new resources, while managing the unique risk profiles of our businesses across the globe, we must partner with a range of external stakeholders. These include our customers, suppliers, investors, governments and local communities (see “Delivering value for all of our stakeholders” on page 11).

Partnerships are relevant at all stages of the value chain and mining life cycle – from exploration, through to operations, marketing and mine closure. Successful partnerships enable us to secure and maintain our licence to operate and are a key long-term success factor for our industry.

In 2016, we:

- Extended our Channar Mining joint venture in Australia's Pilbara region and agreed to supply up to 70 million tonnes of iron ore to Sinosteel Corporation over the next five years.
- Marked 50 years since our first contracted iron ore shipment left the Pilbara, destined for a customer in Japan.
- Appointed a Corporate Relations Group executive to our Executive Committee, strengthening our focus on external & internal stakeholder engagement.

### Capital allocation discipline

We adopt a consistent and disciplined approach to capital allocation. Our first allocation is to sustaining capital. Secondly we fund dividends for our shareholders. Finally, we assess the best use of the remaining capital between compelling growth, debt reduction and further cash returns to shareholders. At each stage, we apply stringent governance and assessment criteria to ensure that every dollar is spent in the right way.

In 2016, we adhered to our disciplined capital allocation framework, resulting in: sustaining capital of US\$1.7 billion, dividends of US\$2.7 billion, reduced net debt by US\$4.2 billion and compelling growth capital of US\$1.3 billion.

### Balance sheet strength

In a cyclical and capital-intensive industry such as mining, a strong balance sheet is essential in order to preserve optionality and generate shareholder value at all points in the cycle. We have a guidance range for net gearing of between 20 and 30 per cent. At 31 December 2016, we were below the guidance range at 17 per cent and intend to retain a conservative stance given the uncertain macroeconomic outlook.

In 2016, we:

- Reduced our net debt from US\$13.8 billion to US\$9.6 billion.
- Reduced our gearing ratio from 24 per cent to 17 per cent.
- Reduced our gross debt by US\$5.4 billion.

### Quality growth

We have a high-quality pipeline of near-term and longer dated projects across the portfolio. By reinforcing capital discipline and reshaping our projects, we have retained significant, high-quality growth despite further reducing our capital expenditure. Our project pipeline has a compelling internal rate of return.

In 2016, we:

- Reduced capital expenditure from US\$4.7 billion in 2015 to US\$3.0 billion.
- Approved US\$338 million to complete the development of the Silvergrass iron ore mine in Western Australia.
- Approved US\$5.3 billion capital expenditure to develop the underground copper and gold mine at Oyu Tolgoi.

### Superior shareholder returns

We are committed to delivering superior returns to shareholders over the long term, and the cash returns we pay out to shareholders are a vital component of this. In a cyclical industry such as mining, we believe the most prudent way to deliver strong returns is to allow the overall level of returns to vary with the cycle. Accordingly, we aim to deliver shareholders total cash returns of 40 to 60 per cent of underlying earnings through the cycle. This policy is sustainable during cyclical lows, and allows shareholders to participate more fully in the upside during high points in the cycle.

In 2016, we:

- Adopted a new shareholder returns policy, designed to deliver superior cash returns to shareholders over the long term.
- Paid US\$2.7 billion in dividends to shareholders. In February 2017 we announced shareholder returns of US\$3.6 billion with respect to 2016.

### Our 2017 strategic priorities

Throughout 2017, we will continue to focus on the four Ps and our value over volume approach, to generate superior cash flow and maintain our balance sheet strength today and into the future.

We will maintain our focus on safety as our number one priority – as measured both by the elimination of fatalities and minimising our all injury frequency rate and lost time injuries. Our strong focus on costs and performance will continue in 2017, as we work towards delivering operating cash cost savings of US\$2.0 billion over 2016 and 2017. Beyond this, we will seek to extract productivity gains across our entire value chain, as part of our commitment to deliver US\$5.0 billion of incremental cash flow from mine-to-market productivity improvements by 2021.

We will continue to shape our world-class portfolio of assets, ensuring that we focus only on the highest returning assets in our preferred industry sectors and seeking to exit assets that do not fit these criteria. We will progress our high returning growth projects, including the Amrun bauxite project, the underground expansion at Oyu Tolgoi and our Silvergrass iron ore mine. We expect to invest around US\$5.0 billion in capital expenditure during 2017.

Investing in our people and our partnerships with external stakeholders will be a key focus during 2017. We are investing more in developing employees at all levels of the organisation – from our graduate intake to our top leaders. This is fundamental as we seek to build the technical and commercial capabilities that will enable us to unlock maximum value from our assets. In addition, we will continue building and maintaining strong partnerships across all stages of the value chain, founded on trusted relationships and our reputation for doing things the right way. Strong partnerships allow us to access and execute new opportunities, maximise value from our existing assets and manage licence-to-operate risks.

We enter 2017 with a sense of cautious optimism. The long-term outlook for our key commodities remains strong and our world-class assets, operating excellence and commercial capabilities place us in a strong position relative to peers. However, the near-term environment is marked by uncertainty – with geopolitical risk at both a macro level and a local level, and government policies impacting supply and demand in a number of key commodities. In this context, a conservative approach remains prudent and we will maintain our balance sheet strength and resilience to downside risks as core priorities.

# Business model

## How we create value

Rio Tinto owns a global and diversified portfolio of world-class assets: the result of investment decisions made in line with our longstanding strategy (see page 8).

We create value through the way we find, develop and operate these assets, how we market the minerals and metals they produce, and the legacy we leave at the end of their lives.

To optimise the value of our portfolio over time, we pursue opportunities for productivity improvements, cost reductions and focused growth. We are committed to running and growing our business in ways that are increasingly safer, smarter and more sustainable.

Our competitive advantages stem from our portfolio of world-class assets, our strong balance sheet, and the operating and

commercial excellence achieved by our excellent teams.

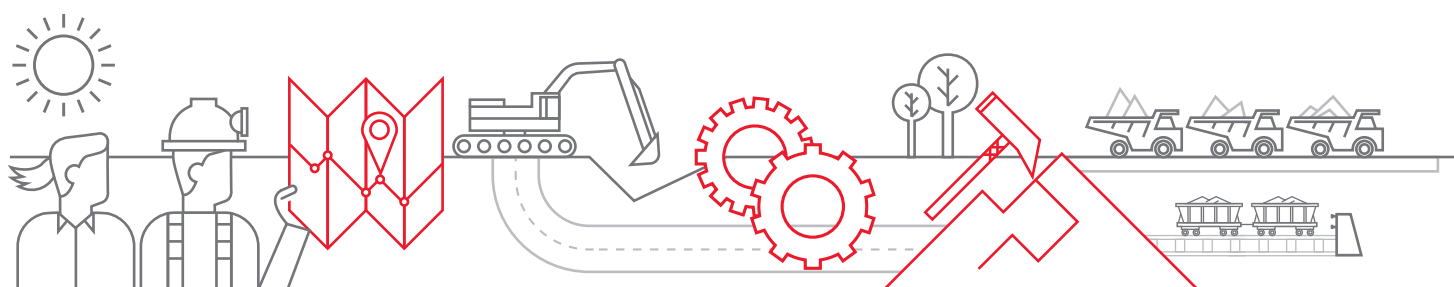
Coupled with our framework for managing risk effectively, these provide strength across the cycle, and through the challenges that the external environment presents.

Our approach is described in our business life cycle below, along with examples showing some of the ways we differentiate ourselves.

## Explore and evaluate

## Develop

## Mine and process



Our in-house exploration team has a multi-decade track record of discovery of orebodies in both greenfield and brownfield settings. To maintain our focus on targets that are important to Rio Tinto, we run most exploration programmes ourselves, but we will partner with others if it gives us access to skills or opportunities that we do not possess in-house.

Our exploration teams are often the first contact with communities we may work alongside for decades, so we explore respectfully and make sure we engage with them from an early stage.

Using our orebody knowledge, we develop our resources and position our products in the marketplace in ways that add value and support the Group's investment decision-making. Our geological expertise gives us the confidence to keep looking for the most elusive discoveries.

We have a strong tradition of developing innovative technologies to resolve specific exploration challenges. We apply these technologies, together with our tried and tested exploration techniques, to drive future discovery success.

### Differentiation in action

Our Resistate Indicator Minerals technology helps us prioritise porphyry copper exploration and related commercial opportunities. At our facility in Bundoora, Australia, we have the capacity to generate high quality trace element analyses of mineral grains, using high levels of automation. There is no equivalent commercial facility able to generate these types of data at this quality and at the rate or cost we can.

Our approach is to develop orebodies so that they deliver value over the long term. We apply rigorous assessment and review processes that aim to ensure we only approve investments that offer attractive returns well above our cost of capital. We assess the spectrum of risk and how we will manage it (see page 14).

Once we have confirmed the value of a resource and received internal and external approvals to develop it, the project moves into the implementation phase. The product groups work in partnership with Rio Tinto Projects – part of the Growth & Innovation group (see page 40).

As we develop an operation, we plan the most efficient configuration for mining the orebody and getting the products to market. We work closely with our customers to create demand that maximises the value of the deposit over its lifetime. We also work in partnership with host governments and communities, identifying ways in which we can deliver mutual benefits from the development of our operations.

### Differentiation in action

World-class capability in underground mining is critical for our successful, safe and productive growth. The combination of our copper and diamonds businesses in 2016 is giving us the opportunity to transfer best practices in underground mining and block caving. Growth & Innovation's new underground centre of excellence will support our future mine developments, including the Oyu Tolgoi underground project in Mongolia.

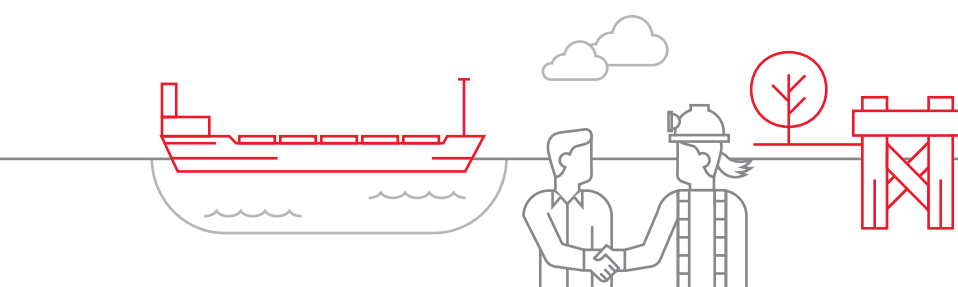
We create value by operating our assets safely and efficiently, and by building on our leadership position in low-cost operations. With a global operating model, we can apply standard processes and systems across the Group in areas such as health, safety, environment and communities, procurement, operations and maintenance. This extends the life of our equipment and optimises the extraction of ore, meaning higher production, lower costs and maximised value. Our operations bring benefit to local economies by providing employment opportunities, procurement, and the transparent payment of tax and royalties.

Our commitment to technology and innovation also sets Rio Tinto apart. It enables us to take advantage of opportunities that may not be available to others, improves our productivity and helps us tailor our products to customer needs. We can use our network of partnerships with academia, technology suppliers and other experts to tap into knowledge and technical prowess that augment our own capabilities.

### Differentiation in action

It has been 50 years since our first export of iron ore from our Pilbara operations in Western Australia. Our integrated network of mines, rail, ports and related infrastructure is fully owned or managed by Rio Tinto for our exclusive use, providing unique optionality, and we are supported by strong joint venture partners. We are optimising our entire Pilbara system to deliver the best value, through focusing on revenue, operating cost and capital expenditure.



**Market and deliver****Close down and rehabilitate**

Our business is based on the supply of high-quality products that have been developed to meet our customers' needs. The minerals and metals we supply – mostly to industrial companies that process them further – are the building blocks of value-added goods. Our diverse portfolio allows us to respond to demand throughout countries' economic development cycles, including in infrastructure, transport, machinery, energy and consumer goods.

Rio Tinto's marketing teams work with our operations to align our resource management with market needs and to make sure we improve our products and services in a way that maximises value to customers. We are strengthening our commercial capabilities, including through creating a commercial centre of excellence in Singapore, supported by strong sales presence in each of the markets we serve.

What we learn from our markets and customers helps us to refine our investment decisions. In many cases we deliver products ourselves, with logistics capabilities that include our own networks of rail, ports and ships.

**Differentiation in action**

With the launch of our RenewAl™ brand, Rio Tinto became the first producer to market certified low carbon footprint aluminium. Our advanced AP Technology™ for aluminium smelting, and our largely carbon-free energy profile afforded by our hydropower portfolio, lie at the heart of RenewAl™. Production of RenewAl™ has a carbon dioxide footprint three times lower than the industry average.

Closure planning is part of every asset's life cycle. We start planning for closure from the earliest stages of development to help optimise outcomes and minimise risk.

We aim progressively to rehabilitate where we can, before closure. When a resource reaches the end of its life, we seek to minimise its financial, social and environmental impact by finding sustainable and beneficial future land uses.

We identify post-closure options that take into account stakeholders' concerns whilst fulfilling regulatory requirements.

**Differentiation in action**

Open-cut mining was completed at Energy Resources of Australia in 2012, but closure planning began soon after the Ranger mine started producing uranium in 1981. In 2016, Pit 1 – which has been backfilled with tailings – was capped with laterite, a type of clay material. A custom-built, 27-metre dredge also completed commissioning and is now transferring tailings to Pit 3.

**Delivering value for all of our stakeholders**

To be successful, we must continue to build strong partnerships at all stages of our business model. Through our global footprint and diverse portfolio, we are able to create value for our stakeholders in a variety of ways.

**Customers**

We supply our customers with the right products at the right time, so they can add value by turning them into the end products that society needs to sustain and enhance modern life.

**Shareholders**

Our primary objective is on delivering superior shareholder returns through the cycle. We do this by balancing disciplined investment with prudent management of our balance sheet and shareholder returns – as shown in our approach to capital allocation (see page 8).

**Communities**

Our operations create jobs for local communities and can open up new markets for local suppliers. Communities often benefit from the infrastructure we put in place and once our operations are closed, we restore the sites – for instance for community use, new industry, or back to native vegetation.

**Our people**

We invest in our people throughout their careers, offering diverse employment prospects, opportunities for development, and competitive rewards and benefits that have a clear link to performance.

**Governments**

We are often a major economic and social contributor to the local, state and national jurisdictions in which we operate. Our tax and sovereign equity contributions enable governments to develop and maintain public works, services and institutions. We help create growth that endures far beyond the active life of our operations.

**Suppliers**

By seeking the right balance of global, national and local supply capability, and supporting local supplier development wherever possible, we drive value for our shareholders and deliver economic benefits for the communities in which we operate.



# Key performance indicators

Our key performance indicators (KPIs) enable us to measure our financial and sustainable development performance. Their relevance to our strategy and our performance against these measures in 2016 are explained on these pages.

Some KPIs are used as a measure in the long-term incentive arrangements for the remuneration of executives. These are identified with this symbol:



See the Remuneration Report

➤ 67

## KPI trend data

The Group's performance against each KPI, and explanations of the actions taken by management to maintain and improve performance against them, are covered in more detail in later sections of this Annual report. Explanations of the actions taken by management to maintain and improve performance against each KPI support the data.

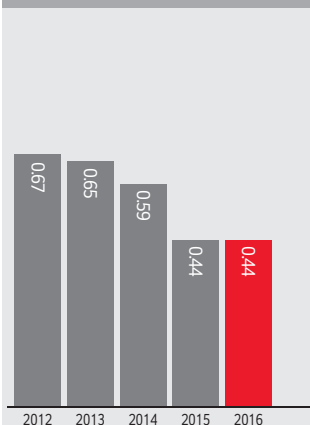
### All injury frequency rate (AIFR)

Per 200,000 hours worked

#### Relevance to strategy

Safety is our number one priority and is core to everything we do. Our goal is zero harm, including, above all, the elimination of workplace fatalities. We are committed to reinforcing our strong safety culture and a key part of this is improving safety leadership.

#### Performance



Our AIFR has improved by 34 per cent over the last five years. At 0.44, our AIFR remained the same in 2016 as in 2015. However, we did not meet our goal of zero fatalities and one of our colleagues died while working at Rio Tinto managed operations in 2016.

#### Definition

AIFR is calculated based on the number of injuries per 200,000 hours worked. This includes medical treatment cases, restricted work-day and lost-day injuries for employees and contractors.

#### More information

➤ 26 to 27

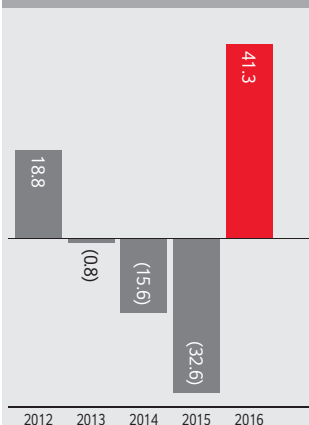
### Total shareholder return (TSR) <sup>(a)</sup>

%

#### Relevance to strategy

The aim of our strategy is to maximise shareholder returns through the cycle. This KPI measures performance in terms of shareholder value. We also measure relative TSR performance against the Euromoney Global Mining Index of peers and the MSCI World Index of large global companies.

#### Performance



Rio Tinto's TSR performance from 2012 to 2016 was impacted by weakness in commodity prices. Rio Tinto plc and Rio Tinto Limited share prices recovered during 2016, supported by an improvement in the global macro environment and rising commodity prices, particularly in the second half of the year. The Group recorded a TSR of 41.3 per cent in 2016 and outperformed the Euromoney Global Mining Index of peers over the four-year period by 17 percentage points but significantly underperformed the MSCI World Index over the same timeframe.

#### Definition

TSR combines share price appreciation and dividends paid to show the total return to the shareholder.

#### More information

➤ 95

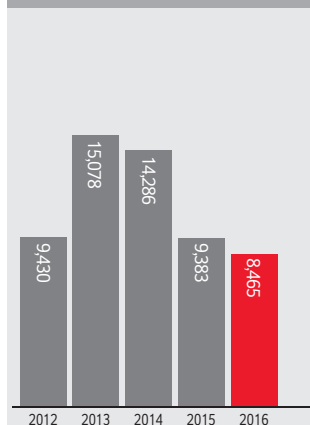
### Net cash generated from operating activities <sup>(b)</sup>

US\$ millions

#### Relevance to strategy

Net cash generated from operating activities is a measure demonstrating conversion of underlying earnings to cash. It provides additional insight to how we are managing costs and increasing efficiency and productivity across the business.

#### Performance



Net cash from operating activities of US\$8.5 billion was ten per cent lower year-on-year. 2015 benefited from a significant working capital reduction while 2016 saw a rebound in receivables driven by higher prices at the end of the year. In addition, there was an increase in interest paid of US\$0.5 billion to US\$1.3 billion in 2016, mainly related to early redemption costs associated with the bond purchase programmes.

#### Definition

Net cash generated from operating activities represents the cash generated by the Group's consolidated operations, after payment of interest, taxes, and dividends to non-controlling interests in subsidiaries.

#### More information

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#### Notes:

- The data presented in this table accounts for the dual corporate structure of Rio Tinto. In 2016, the approach used to weight the two Rio Tinto listings, and produce a Group TSR figure, was adjusted. This approach is consistent with the methodology used for the Performance Share Plan (PSP). The figures in this table are in some cases slightly different to equivalent tables presented in prior years' reports.
- The accounting information in these charts is extracted from the financial statements.
- Underlying earnings is a key financial performance indicator which management uses internally to assess performance. It is presented here as a measure of earnings to provide greater understanding of the underlying business performance of the Group's operations. Items excluded from net earnings to arrive at underlying earnings are explained in note 2 to the 2016 financial statements. Both net earnings and underlying earnings deal with amounts attributable to the owners of Rio Tinto. However, IFRS requires that the profit for the year reported in the income statement should also include earnings attributable to non-controlling interests in subsidiaries.

**Underlying earnings<sup>(b)(c)</sup>**

US\$ millions

**Relevance to strategy**

Underlying earnings gives insight to cost management, production growth and performance efficiency on a like-for-like basis. We are focused on reducing operating costs, increasing productivity and generating maximum revenue from each of our assets.

**Performance**

Underlying earnings of US\$5.1 billion were US\$0.6 billion higher than 2015, with the impact of lower prices (US\$0.5 billion post-tax) more than offset by cash cost improvements.

**Definition**

Items excluded from net earnings to arrive at underlying earnings are explained in note 2 "Operating segments" to the 2016 financial statements.

**More information**

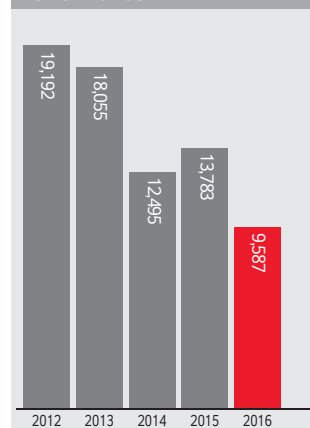
➤ 129

**Net debt**

US\$ millions

**Relevance to strategy**

Net debt is a measure of how we are managing our balance sheet and capital structure. A strong balance sheet is essential to remaining robust through the cycle and creating the ability to deliver appropriate shareholder returns.

**Performance**

Net debt decreased from US\$13.8 billion to US\$9.6 billion, principally as net cash generated from operating activities exceeded capital expenditure and cash returns to shareholders.

**Definition**

Net debt is calculated as: the net borrowings after adjusting for cash and cash equivalents, other liquid investment and derivatives related to net debt. This is further explained in note 24 "Consolidated net debt" to the 2016 financial statements.

**More information**

➤ 145

**Capital expenditure<sup>(b)</sup>**

US\$ millions

**Relevance to strategy**

We are committed to a disciplined and rigorous investment process – investing capital only in assets that, after prudent assessment, offer attractive returns that are well above our cost of capital.

**Performance**

Total capital expenditure of US\$3.0 billion in 2016 included US\$1.7 billion of sustaining capital expenditure. Development capital expenditure focused on three growth projects, the Silvergrass iron ore development, Oyu Tolgoi underground copper project and the Amrun bauxite project.

**Definition**

Capital expenditure comprises the cash outflow on purchases of property, plant and equipment, and intangible assets.

**More information**

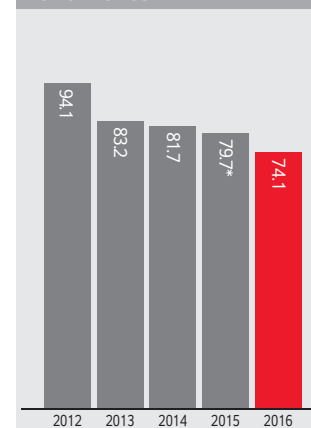
➤ 128

**Greenhouse gas (GHG) emissions intensity**

Indexed relative to 2008 (2008 being equivalent to 100)

**Relevance to strategy**

We are committed to reducing the energy intensity of our operations and the carbon intensity of our energy, including through the development and implementation of innovative technologies. Our GHG performance is an important indicator of this commitment and our ability to manage exposure to future climate policy and legislative costs.

**Performance**

There was a seven per cent reduction in GHG emissions intensity in 2016 versus 2015. This is largely a result of full production at our modernised Kitimat smelter, and efficiency gains at Rio Tinto Kennecott and the Oyu Tolgoi copper-gold mine. We are on track to meet our target of a 24 per cent reduction in total GHG emissions intensity between 2008 and 2020.

\* Number restated from 78.9 following the application from 1 January 2015 of updated global warming potentials from the IPCC's fourth assessment report

**Definition**

Our GHG emissions intensity measure is the change in total GHG emissions per unit of commodity production relative to a base year. Total GHG emissions are direct emissions, plus emissions from imports of electricity and steam, minus electricity and steam exports and net carbon credits purchased from, or sold to, recognised sources.

**More information**

➤ 28

# Risk management

Rio Tinto is exposed to a variety of risks that can have financial, operational and compliance impacts on our business performance, reputation and licence to operate. The board recognises that creating shareholder value is the reward for taking and accepting risk. The effective management of risk is therefore critical to supporting the delivery of the Group's strategic objectives.

## Risk management framework

Rio Tinto's risk management framework reflects our belief that managing risk effectively is an integral part of how the Group creates value, and fundamental to the Group's business success. The responsibility for identifying and managing risks lies with all of Rio Tinto's employees and business leaders. They operate within the Group-wide framework to manage risks within approved limits.

The framework includes clearly defined oversight responsibilities for the board and the Executive Committee, who are supported by the Risk Management Committee and central support functions including Group Risk and Group Internal Audit, to enable effective risk identification, evaluation and management across Rio Tinto.

This approach reflects a "three lines of defence" model for the management of risks and controls:

- First line of defence: ownership of risk by employees and business leaders.
- Second line of defence: control of risk framework by central support functions and the Risk Management Committee.
- Third line of defence: assurance of systems of internal control by Group Internal Audit.

The key risk management responsibilities throughout the Group are outlined below.

## Approach

The Group's approach to risk management, underpinned by the Risk policy and standards, is aimed at embedding a risk-aware culture in all decision-making, and a commitment to managing risk in a proactive and effective manner. This includes the early identification and evaluation of risks, the management and mitigation of risks before they materialise, and dealing with them effectively in the event they do materialise. Accountability for risk management is clear throughout the Group and is a key performance area of line managers.

To support risk understanding and management at all levels, the Group Risk function provides the necessary infrastructure to support the management and reporting of material risks within the Group, and escalates key issues through the management team and ultimately to the board where appropriate. Group Risk also supports the Risk Management Committee in its review of risk.

The process for identifying, evaluating and managing material business risks is designed to manage, rather than eliminate, risk and where appropriate accept risk to generate returns. Certain risks, for example natural disasters, cannot be managed using internal controls. Such major risks are transferred to third parties in the international insurance markets, to the extent considered appropriate or possible.

The Group has material investments in a number of jointly controlled entities. Where Rio Tinto does not have managerial control, it is not always able to ensure that management will comply with Rio Tinto policies and standards.

## Risk management framework

Oversight	Board	<ul style="list-style-type: none"> <li>– Determine the nature and extent of risk that is acceptable in pursuit of strategic objectives</li> <li>– Confirm that management's risk limits reflect the level of risk the board is willing to accept in pursuit of strategic objectives</li> <li>– Provide oversight across the risk management process</li> </ul>	Escalation as appropriate, transparency and formal reporting
	Board committees	<ul style="list-style-type: none"> <li>– The Audit Committee monitors and reviews at least annually the maturity and effectiveness of management processes and controls designed to identify, assess, monitor and manage risk</li> <li>– The Audit and Sustainability Committees review periodic reports from management: identifying the Group's material business risks within the committees' scope; and the risk management strategies and controls applied</li> </ul>	
Third line	Group Internal Audit	<ul style="list-style-type: none"> <li>– Provide reasonable assurance that the systems of internal controls are adequate and effective</li> </ul>	Risk appetite and tolerances; strategic objectives; accountability to manage; audit and assurance
Second line	Executive Committee	<ul style="list-style-type: none"> <li>– Set risk strategy and assess risks inherent in key investments and in strategic, business or annual plans</li> </ul>	
	Risk Management Committee	<ul style="list-style-type: none"> <li>– Oversee the risk management framework to facilitate the identification of significant risks to Group-level objectives and ensure effective risk management processes are in place</li> </ul>	
	Group Risk	<ul style="list-style-type: none"> <li>– Provide co-ordination and support of Group-level risk management activity and reporting</li> <li>– Embed risk management into core business processes, such as planning and capital allocation</li> <li>– Build risk management capability and a risk culture throughout the Group</li> </ul>	
	Other central support functions and management committees	<ul style="list-style-type: none"> <li>– Provide targeted expertise and support to risk owners</li> <li>– Develop and maintain specific controls, including policies, standards and procedures, to support the effective management of material Group-level risk within the agreed limits</li> <li>– Assure first line of defence compliance with controls</li> </ul>	
First line	Product groups and central functions, executive/audit forums	<ul style="list-style-type: none"> <li>– Monitor material risks and track activities to manage risk within their business activities, and escalate where appropriate</li> <li>– Consider risk and uncertainty in strategic and business planning and capital allocation proposals</li> </ul>	
	Product groups and business units	<ul style="list-style-type: none"> <li>– Identify, assess and manage risks in operations, functions and projects, utilising risk registers and our Group-wide risk data system: RioRisk</li> </ul>	
	Risk managers and Risk Forum	<ul style="list-style-type: none"> <li>– Provide technical expertise and risk management for line leaders and the product group executive management teams</li> <li>– The Risk Forum (risk managers across the Group) supports alignment, consistency and continuous improvement of risk management</li> </ul>	

## Principal risks and uncertainties

The principal risks and uncertainties outlined in this section reflect the inherent risks that could materially affect Rio Tinto or its ability to meet its strategic objectives, either directly or by triggering a succession of events that in aggregate become material to the Group.

Effects on the Group in the following respects may be positive or negative:

### Business model

The basis on which the Group generates or preserves value over the longer term, given its market positioning as a global diversified mining and processing business.

### Future performance

The Group's ability to deliver its financial plan in the short to medium term.

### Solvency

The Group's ability to maintain an appropriate capital structure to meet its financial liabilities in full.

### Liquidity

The Group's ability to meet its financial liabilities as they fall due.

### Health, safety, environment and communities (HSEC)

The Group's ability to send our employees and contractors home safe and healthy every day and to work with our communities and partners to achieve our sustainable development goals.

### Group reputation

The Group's ability to maintain investor confidence and licence to operate.

Rio Tinto's business units and functions assess the potential economic and non-economic consequences of their respective risks using the framework defined by the Group's Risk standard. Once identified, each principal risk or uncertainty is reviewed and monitored by the

relevant internal experts and by the Risk Management Committee, the relevant board committees and the board.

There may be additional risks unknown to Rio Tinto and other risks currently not believed to be material which could turn out to be material. A number of them, particularly those with longer-term potential impacts, are, referred to in the sustainable development section of this Annual report on pages 24 to 30.

## 2016 movements

As illustrated in the summary table below, the Group's exposure to a number of principal risks and uncertainties has changed through 2016. Market uncertainties were greater than planned, with greater upside movement in commodity prices and demand than forecast. With greater than planned cash flow, our balance sheet strengthened, decreasing our liquidity risk. Geopolitical uncertainty increased, as did the threat of greater rent-seeking and resource nationalism. Uncertainty regarding the performance and outlook of our joint venture operations also increased. Further detail on movements and monitoring of these exposures is provided in the relevant section of the Strategic report, including the Market environment, Group strategy, product group overviews, the Directors' report and the Notes to the 2016 financial statements.

## Assessment

The board confirms that, with the assistance of management, it has carried out a robust assessment of the principal risks of the Group as detailed below and has also tested the financial plans of the Group for each of these principal risks, and for a series of severe but plausible scenarios, made up of the concurrence or close sequence of a number of principal and material risks.

The Group will continue to monitor the potential impacts of the UK's departure from the European Union as a result of the referendum that took place in June 2016, but no material impacts are expected at this time.

## Longer-term viability statement

Current business planning processes within Rio Tinto require the preparation of detailed financial plans over a three-year time horizon. The Group's strategy is developed, and capital investment decisions are made, based on an assessment of cash flows over a multi-decade horizon, with financial investment capacity regularly tested to ensure capital commitments can be funded in line with the Group's capital allocation model. This multi-year planning approach reflects our business model of investing in, and operating, long-life mining assets, whose outputs we sell into commodity markets over which we have limited influence.

The planning process requires modelling under a series of macroeconomic scenarios and assumptions of both internal and external parameters. Key assumptions include: projections of economic growth, and thus commodity demand in major markets, primarily China; commodity prices and exchange rates, often correlated; cost and supply parameters for major inputs such as labour and fuel; and a series of assumptions around the schedule and cost of implementation of organic and inorganic growth programmes.

Reflecting the speed and degree of change possible in a number of these parameters, such as Chinese demand, commodity prices, and exchange rates, Rio Tinto has deemed a three-year period of assessment appropriate for the longer-term viability statement, consistent with the Group's detailed planning horizon.




Robust stress-testing has been undertaken, as part of the business planning process, to further test and confirm the longer-term viability of the Group, beyond commodity price and exchange rate movements. Production and social licence to operate related assumptions were also stressed, individually and collectively, to levels considered severe but plausible and well beyond those expected in the normal course of business.

The viability of the Group under these scenarios remained sound with the use of a suite of management actions available to redress the situation, including accessing lines of credit, changing capital allocation levers, and, if necessary, selling (down) assets.

Therefore, taking into account the Group's current position and principal risks, the directors have assessed the prospects of the Group, over the next three years, and have a reasonable expectation that the Group will be able to continue to operate and meet its liabilities as they fall due over that period.

It is impossible to foresee all risks, and the combinations in which they could manifest, and there may be risks that currently or individually do not appear material that could turn out to be material, particularly if occurring in close sequence.

### Principal risks and uncertainties exposure at a glance – 2016 trend




	External	Internal	Internal and external
Increasing risk or uncertainty 	Commodity prices China development pathway Strategic partnerships Sovereign risk		Regulation and regulatory intervention
No change in risk or uncertainty 		Attracting and retaining talent Execution of acquisitions and divestments Capital project development HSEC	Exploration and resources Operational excellence
Decreasing risk or uncertainty 			Liquidity

# Principal risks and uncertainties

The principal risks and uncertainties in this section have been categorised into Financial risks (Market, Financial and Strategic); Operational risks (HSEC, Resources, Operations, Projects and People); and Compliance risks (Stakeholder, Governance).

The principal risks and uncertainties should be considered in connection with any forward-looking statements in this Annual report and the cautionary statement on the inside front cover.

## Financial risks

Inherent risk and uncertainty	Risk exposure 2016 trend	Potential impact on viability, HSEC and reputation	Potential upside impact (opportunities)
<b>Market risks</b> Rio Tinto operates in global markets and accepts the impact of exchange rate movements and market-driven prices for our commodities, seeking premiums where possible.			
Commodity prices, driven by demand and supply for the Group's products, vary outside of expectations over time. Exchange rate variations and geopolitical issues may offset or exacerbate this risk.	 Price uncertainty has increased.	– Business model – Future performance – Solvency – Liquidity – Group reputation	A rise in commodity prices, or favourable exchange rate movement, allows the Group to pursue strategic capital expansions, pay down debt and/or increase returns to shareholders.
Anticipating and responding to market movements is inherently uncertain and outcomes may vary.	Prices stronger than forecast.		Capturing above-planned returns from commercial excellence activities would deliver additional cash flow to the Group.
China's development pathway could impact demand for the Group's products outside of expectations.	 Demand stronger than forecast.	– Business model – Future performance	Strong growth, positive policy decisions and reforms drive demand for commodities, resulting in rising prices which enable capital expansion and increased shareholder returns in the short to medium term.
<b>Financial risks</b> Rio Tinto maintains a strong balance sheet and liquidity position to preserve financial flexibility through the cycle.			
External events and internal discipline may impact Group liquidity.	 Balance sheet strengthened by stronger than forecast cash flows driven by higher commodity prices.	– Future performance – Solvency – Liquidity – Group reputation	Favourable market conditions and strong internal discipline could increase Group liquidity and/or balance sheet strength and allow it to pursue investment opportunities and enhance returns to shareholders.



## Potential downside impact (threats)

## Mitigating actions include:

Falling commodity prices, or adverse exchange rate movements, reduce cash flow, limiting profitability and dividend payments. These may trigger impairments and/or impact rating agency metrics. Extended subdued prices may reflect a longer-term fall in demand for the Group's products, and consequent reduced revenue streams may limit investment opportunities.

Failure to deliver planned returns from commercial excellence activities would negatively impact cash flows for the Group.

An economic slowdown in China, and/or a material change in policy, results in a slowdown in demand and reduced investment opportunities.

- Pursue low cost production, allowing profitable supply throughout the commodity price cycle.
- Maintain a diverse portfolio of commodities across a number of geographies.
- Maintain global portfolio of customers and contracts.
- Maintain a strong balance sheet.
- Monitor multiple leading indicators and undertake detailed industry analysis to develop more accurate assumptions in our commodity price and exchange rate forecasting used for capital allocation and planning process, and Commercial Excellence activities.
- Comply with the Group's Treasury policy and standard, which outlines the fundamental principles that govern the Group's financial risk management practices.
- Closely coordinate market-facing commercial excellence resources in the Group.
- Apply strong governance reflecting relevant regulatory frameworks and jurisdictions.



The Group's ability to raise sufficient funds for planned expenditure, such as capital growth and/or mergers and acquisitions, as well as the ability to weather a major economic downturn could be compromised by a weak balance sheet and/or inadequate access to liquidity.

- Comply with the Group's Treasury policy and standard, which outlines the fundamental principles that govern the Group's financial risk management practices.
- Maintain a net gearing ratio of 20 to 30 per cent and other financial metrics commensurate with a strong investment-grade credit rating.
- Manage the liquidity and financing structure of the Group using forecasts and sensitivity analysis tools to actively monitor, determine and enable access to the appropriate level, sources and types of financing required.
- Subject funds invested by the Group to credit limits and maturity profiles based on board-approved frameworks, to promote diversification and maintain appropriate liquidity.
- Embed Finance teams within the business support management and develop accurate financial reporting and tracking of our business performance.
- Report financial performance monthly to senior management and the board.
- Seek board approval of the financial strategy, long-term planning and cash flow forecasting.
- Apply a dividend policy which allows shareholder returns to adjust with the cycle.


# Principal risks and uncertainties

continued


## Financial risks continued

Inherent risk and uncertainty	Risk exposure 2016 trend	Potential impact on viability, HSEC and reputation	Potential upside impact (opportunities)
<b>Strategic risks</b>			
Rio Tinto enforces disciplined capital allocation to the best returning opportunities (organic and inorganic growth projects or returns to shareholders).			
Rio Tinto's ability to secure planned value by successfully executing divestments and acquisitions may vary.		<ul style="list-style-type: none"> <li>– Business model</li> <li>– Future performance</li> <li>– Solvency</li> <li>– Liquidity</li> <li>– Group reputation</li> </ul>	Proceeds realised from divested assets are greater than planned, allowing more capital to be redeployed into higher returning or more productive uses. The Group is successful in acquiring businesses that provide cash flow and/or future growth optionality, above that anticipated at the time of acquisition.
The Group's ability to develop new projects successfully may vary.		<ul style="list-style-type: none"> <li>– Future performance</li> <li>– HSEC</li> <li>– Group reputation</li> <li>– Solvency</li> </ul>	An ability to develop projects on time and within budget enhances licence to operate and investor confidence.

## Operational risks

Inherent risk and uncertainty	Risk exposure 2016 trend	Potential impact on viability, HSEC and reputation	Potential upside impact (opportunities)
<b>HSEC risks</b>			
Rio Tinto's operations are inherently dangerous. We lead responsibly to preserve our social licence to operate and ensure our employees and contractors go home safe and healthy.			
Our operations and projects are inherently hazardous with the potential to cause illness or injury, damage to the environment, disruption to a community or a threat to personal security.		<ul style="list-style-type: none"> <li>– Future performance</li> <li>– HSEC</li> <li>– Group reputation</li> </ul>	<p>Delivering leading health, safety, environment and communities performance is essential to our business success. Meeting or exceeding our commitments in these areas contributes to sustainable development and underpins our continued access to resources, capital and a diverse workforce to sustain the organisation.</p> <p>Good performance in legacy management (of closed sites) and closure can enhance our reputation and enable us to maintain access to land, resources, people and capital, so we can continue to establish new projects with the support of local communities.</p>

## Resources risks

Rio Tinto invests materially to accurately identify new deposits and develop orebody knowledge, underpinning our operations and projects.			
The success of the Group's exploration activity may vary. In addition, estimates of ore reserves are based on uncertain assumptions that, if changed, could result in the need to restate ore reserves and mine plans.		<ul style="list-style-type: none"> <li>– Business model</li> <li>– Future performance</li> <li>– Group reputation</li> </ul>	<p>The discovery of a new viable orebody can significantly improve future growth options.</p> <p>The volume of ore is based on the available geological, commercial and technical information which is by its nature, incomplete. As new information comes to light the economic viability of some ore reserves and mine plans can be restated upwards. As a result, projects may be more successful and of longer duration than initially anticipated.</p>

### Potential downside impact (threats)

### Mitigating actions include:

Divestment and acquisition activity incurs transaction costs that cannot be recouped, or may result in value destruction by realising less than planned value for divestments or paying more than fair value for acquisitions. This could result in unforeseen pressure on the Group's cash position or reduce the Group's ability to expand operations. The Group may also be liable for the past acts, omissions or liabilities of assets it has acquired that were unforeseen or greater than anticipated at the time of acquisition. The Group may also face liabilities for divested entities if the buyer fails to honour commitments or the Group agrees to retain certain liabilities.

A delay or overrun in the project schedule could negatively impact the Group's profitability, cash flows, ability to repay project-specific indebtedness, asset carrying values, growth aspirations and relationships with key stakeholders.

- Complete detailed, independent due diligence on all material potential divestments and acquisitions, including technical review, commercial review and functional sign-offs, before consideration by the Investment Committee and board where appropriate.
- Resource Business Development team appropriately, supported by external specialists as required.
- Involve business unit leaders early in process to recognise integration planning and synergies, or separation threats and opportunities.
- Undertake post-investment reviews on divestments and acquisitions, to identify key learnings to embed into future initiatives.
- Consistently approach development of large-scale capital projects, through a specialised projects division.
- Follow rigorous project approval and stage-gating process, including monitoring and status evaluation, as articulated in Project evaluation standard and guidance.
- Ensure effective stakeholder management in project development.

### Potential downside impact (threats)

### Mitigating actions include:

Failure to manage our health, safety, environment or community risks, could result in a catastrophic event or other long-term damage which could in turn harm the Group's financial performance and licence to operate.

Recognised hazards and threats include, among others, underground operations, aviation, pit slope instability, tailings facilities, vector-borne and pandemic disease, chemicals, gases, vehicles and machinery, extreme natural environments, endangered flora or fauna, areas of cultural heritage significance, water supply stress and climate change.

- Continue focus on HSEC as a core priority at all operations, and projects, overseen by the Sustainability Committee.
- Clearly define and ensure compliance with Group HSEC strategy, policy and performance standards.
- Regularly review and audit HSEC processes, training and controls to promote and improve effectiveness, at managed and non-managed operations.
- Monitor HSEC performance measurement metrics at the Group level monthly.
- Report, investigate and share learnings from HSEC incidents.
- Build safety targets into personal performance metrics to incentivise safe behaviour and effective risk management (see Remuneration Implementation Report).
- Develop mutually beneficial partnerships with local communities and establish appropriate social performance targets.
- Report annually on performance on greenhouse gas emissions, water, land use and rehabilitation, among others.
- Focus on fatality elimination through implementation of a programme to verify safety risk controls.

A failure to discover new viable orebodies could undermine future growth prospects.



The risk that new information comes to light or operating conditions change means that the economic viability of some ore reserves and mine plans can be restated downwards. As a result, projects may be less successful and of shorter duration than initially anticipated, and/or the asset value may be impaired.

- Comply with the Group's resources and reserves standard.
- Recruit and retain skilled and experienced exploration and evaluation personnel.
- Provide stable funding for exploration activities.
- Prioritise the exploration portfolio continuously.
- Utilise new technologies where appropriate.
- Develop and leverage and manage third-party partnerships.
- Coordinate orebody knowledge through active Group-wide leadership forum.



# Principal risks and uncertainties

continued

## Operational risks continued

Inherent risk and uncertainty	Risk exposure 2016 trend	Potential impact on viability, HSEC and reputation	Potential upside impact (opportunities)
<b>Operations, projects and people risks</b> Rio Tinto seeks to achieve operational and commercial excellence, and to attract and retain the best people in the industry.			
Operational excellence is derived from high operational and human productivity. Productivity which is driven by optimisation of the balance of people, process and systems may vary.		<ul style="list-style-type: none"> <li>– Future performance</li> <li>– Liquidity</li> <li>– HSEC</li> <li>– Group reputation</li> </ul>	Improved productivity and innovation from new systems can decrease costs and increase output, delivering additional cash flow.  Development and retention of talent enhances productivity, financial and HSEC outcomes.
Attracting and retaining talent as the company and industry evolves presents a constant challenge.		<ul style="list-style-type: none"> <li>– Business model</li> <li>– Future performance</li> <li>– Group reputation</li> </ul>	Leveraging the evolving company and market to attract a diverse and engaged workforce will deliver a competitive advantage to the Group.

## Compliance risks

Inherent risk and uncertainty	Risk exposure 2016 trend	Potential impact on viability, HSEC and reputation	Potential upside impact (opportunities)
<b>Stakeholder risks</b> Rio Tinto recognises positive engagement with a range of stakeholders, and seeks to develop collaborative and mutually beneficial partnerships that underpin our social licence to operate.			
Strategic partnerships and third parties influence the Group's supply, operations and reputation. The Group's ability to control the actions of these parties varies.		<ul style="list-style-type: none"> <li>– Business model</li> <li>– Future performance</li> <li>– HSEC</li> <li>– Group reputation</li> </ul>	Joint venture and third parties offer opportunities to increase shareholder returns, reduce political risk and reduce operational risks.
The Group's operations are located across a number of jurisdictions, which exposes the Group to a wide range of economic, political, societal and regulatory environments.		<ul style="list-style-type: none"> <li>– Business model</li> <li>– Future performance</li> <li>– Group reputation</li> </ul>	Proactive engagement with governments, communities and other stakeholders can increase access to new resources, support stable and predictable investment frameworks and operational environments, and shape mutually beneficial policies and legal/regulatory frameworks.

## Governance risks

Rio Tinto employees operate in compliance with <i>The way we work</i> – our global code of business conduct, the Group delegation of authorities and all Group policies, standards and procedures.			
The Group's reputation and regulatory licences are dependent upon appropriate business conduct and are threatened by a public allegation or regulatory investigation.		<ul style="list-style-type: none"> <li>– Business model</li> <li>– Future performance</li> <li>– Group reputation</li> </ul>	Good corporate citizens are acknowledged to operate to a high ethical standard, thus attracting talent.  Securing access to resources and investment opportunities.

Potential downside impact (threats)	Mitigating actions include:
<p>Business interruption may arise from a number of circumstances, including:</p> <ul style="list-style-type: none"> <li>Operational difficulties such as extended industrial dispute, delayed development, bottlenecks or interruptions to infrastructure for power, water and transportation, throughout the value chain.</li> <li>Operational failure such as a process safety incident, major pit slope, dump or tailings/water impoundment failure, underground incident.</li> <li>Cyber breach/incident of commercial and operational systems.</li> <li>Natural disasters such as earthquakes, subsidence, drought, flood, fire, storm and climate change can impact mines, smelters, refineries and infrastructure installations.</li> </ul> <p>Any of these events could result in a significant HSEC incident, an interruption to operations, or the inability to deliver products and a commercial loss.</p>	<ul style="list-style-type: none"> <li>Preserve geographically diverse portfolio limiting physical events/ disruptions to a specific business, single infrastructure or logistical event.</li> <li>Comply with slope geotechnical, tailings management, underground mining and process safety technical and safety standards, supported by subject matter experts and audit protocols, reducing the risk (likelihood and consequence) of operational failure.</li> <li>Comply with the Acceptable use of information and electronic resources standard, supported by periodic reviews of IT infrastructure and security controls by dedicated (in-house) cyber-security team.</li> <li>Operate under strong human resources and employee relations framework.</li> <li>Undertake business resilience planning and preparedness exercises for execution of plans, across all operations.</li> </ul> <p>For certain risks involving higher-value losses the Group purchases insurance. Risks not transferred to the external insurance market are retained within the business.</p>
<p>The inability to attract or retain key talent will constrain the Group's ability to reach its goals within planned timeframes.</p>	<ul style="list-style-type: none"> <li>Improve HR processes in recruitment, development and leadership training.</li> <li>Introduce employee engagement programme and metrics, to enhance engagement.</li> <li>Enhance focus on inclusion and diversity, at all levels of the Group.</li> <li>Refresh Group purpose and values statements.</li> </ul>
Potential downside impact (threats)	Mitigating actions include:
<p>Joint venture partners may hinder growth by not agreeing to support investment decisions. For non-managed operations, controlling partners may take action contrary to the Group's interests or standards and policies, resulting in adverse impact to health and safety, performance, cyber integrity, reputation or legal liability.</p>	<ul style="list-style-type: none"> <li>Approach investments and partnerships with a long term relationship rather than transactional.</li> <li>Shape governance structures to ensure appropriate influence and engagement.</li> <li>Maintain strong focus on contractor management.</li> <li>Actively participate within the governance structures of joint ventures to promote, where possible, compliance with the Group's policies and alignment with strategic priorities.</li> <li>Participate in strategic partnerships or financing structures to moderate political risk.</li> <li>Maintain geographically diverse portfolio to reduce exposure to changes in these environments.</li> <li>Monitor jurisdictional, including sovereign, risks and take appropriate action.</li> <li>Develop long-term relationships with a range of international and national stakeholders.</li> <li>Comply with Group policies and standards which provide guidance concerning risk management, human rights, cyber threat, data privacy, business integrity and external communications.</li> <li>Undertake rigorous third-party due diligence.</li> </ul>
<p>Adverse actions by governments and others can result in operational/ project delays or loss of licence to operate. Other potential actions can include expropriation, changes in taxation, and export or foreign investment restrictions, which may threaten the investment proposition, title, or carrying value of assets. Legal frameworks with respect to policies such as energy, climate change and mineral law may also change in a way that increases costs.</p>	
<p>Fines may be imposed against Group companies for breaching antitrust rules, anti-corruption legislation, sanctions or human rights violations or for other inappropriate business conduct.</p> <p>A serious allegation or formal investigation by increasingly connected regulatory authorities (regardless of ultimate finding) could result in a loss in share price value, and/or loss of business. Other consequences could include the criminal prosecution of individuals, imprisonment and/ or personal fines, and reputational damage to the Group. There may also be considerable cost and disruption in responding to allegations or investigations and taking remedial action.</p>	<ul style="list-style-type: none"> <li>Identify and meet our regulatory obligations and respond to emerging requirements.</li> <li>Comply with Group policies, standards and procedures which provide guidance to our businesses and drive compliance with regulatory obligations.</li> <li>Dedicate legal and compliance teams to assist Group businesses in complying with regulatory obligations and internal standards and procedures.</li> <li>Maintain appropriate oversight and reporting, supported by training and awareness, to drive compliance with regulatory obligations.</li> <li>Continue to develop and deploy training across relevant sectors of the workforce.</li> </ul>



# Portfolio management

Rio Tinto has a programme of high-quality projects delivering industry-leading returns across a broad range of commodities. In 2016, Rio Tinto approved two additional capital projects: the Oyu Tolgoi underground mine development in Mongolia and the Silvergrass iron ore development in the Pilbara region of Western Australia. In 2016, Rio Tinto funded its capital expenditure with net cash generated from operating activities and aims to continue funding its capital programme from internal sources, except for the Oyu Tolgoi underground development for which there is a separate project financing arrangement.

## Major capital projects

(Rio Tinto 100% owned unless otherwise stated)	Total approved capital cost (100%)	Approved capital remaining to be spent from 1 January 2017	Status/milestones
<b>In production</b>			
Investment in Nammuldi Incremental Tonnes (NIT) projects in the Pilbara, to maintain the Pilbara blend.	US\$0.2bn	–	NIT1, with five million tonnes annual capacity, commenced production in the fourth quarter of 2015. NIT2, which took annual mine capacity from five to ten million tonnes, was delivered in October 2016.
<b>Ongoing and approved</b>			
<b>Copper &amp; Diamonds</b>			
Construction of a desalination facility to ensure continued water supply and sustain operations at Escondida (Rio Tinto 30%), Chile.	US\$1.0bn (Rio Tinto share)	US\$0.1bn (Rio Tinto share)	Approved in July 2013, the project is designed to provide a long-term sustainable supply of water for the operations. It remains on schedule and on budget and is 99 per cent complete, with commissioning scheduled in 2017.
Grasberg project funding to 2017.	US\$0.2bn (Rio Tinto share)	US\$0.1bn (Rio Tinto share)	Investment to continue the pre-production construction of the Grasberg Block Cave, the Deep Mill Level Zone underground mines and the associated common infrastructure. Rio Tinto's final share of capital expenditure will be influenced in part by its share of production over the period of investment.
Remediation of the east wall at Rio Tinto Kennecott, US.	US\$0.3bn	–	Following the pit wall slide in 2013, mine operations have focused on remediation from the slide and the east wall of Bingham Canyon, including significant dewatering and dewatering activities. There is a small amount of dewatering activity scheduled to be completed in 2017.
Investment to extend mine life at Rio Tinto Kennecott, US beyond 2019.	US\$0.7bn	US\$0.6bn	Funding for the continuation of open pit mining via the push back of the south wall has been approved and will largely consist of simple mine stripping activities.
Development of A21 pipe at the Diavik Diamond Mine in Canada (Rio Tinto 60%).	US\$0.2bn (Rio Tinto share)	US\$0.1bn (Rio Tinto share)	Approved in November 2014, the development of the A21 pipe is expected to ensure the continuation of existing production levels. First carats are planned for mid-2018.
Development of the Oyu Tolgoi underground mine in Mongolia (Rio Tinto 34%) where average copper grades of 1.66 per cent are more than three times higher than the open pit.	US\$5.3bn	US\$5.1bn	Approved in May 2016, first production from the underground is expected in 2020. Contractor mobilisation commenced in the third quarter of 2016. Work on the underground mine development, accommodation camp, conveyor to surface decline, sinking of shaft #2 and shaft #5 and critical facilities are continuing to progress. The focus is on completing the underground crusher and dewatering system to enable increased lateral development rates.

## Major capital projects continued

(Rio Tinto 100% owned unless otherwise stated)	Total approved capital cost (100%)	Approved capital remaining to be spent from 1 January 2017	Status/milestones
<b>Ongoing and approved continued</b>			
<b>Aluminium</b>			
Investment in the Amrun bauxite mine on the Cape York Peninsula in north Queensland with a planned initial output of 22.8 million tonnes a year.	US\$1.9bn	US\$1.7bn	Approved in December 2015, output includes an expected 10 million tonne increase in annual exports with production commencing in the first half of 2019.
Investment in the Compagnie des Bauxites de Guinée (CBG) bauxite mine to expand from 14.5 to 18.5 million tonnes a year. Rio Tinto's share of capex is \$0.3bn.	US\$0.7bn (100%)	US\$0.6bn (100%)	Approved in 2016. Financing completed in November 2016. First incremental shipment expected in June 2018.
<b>Iron Ore</b>			
Development of the Silvergrass iron ore mine in the Pilbara, to maintain the Pilbara blend.	US\$0.3bn	US\$0.3bn	The US\$338m approval in August 2016 is expected to add 10 million tonnes of annual capacity with commissioning anticipated for the second half of 2017.

## Material acquisitions and divestments

Asset	Consideration US\$m	Status
<b>Divested in 2016</b>		
Bengalla Joint Venture	599	Sold to New Hope Corporation Limited
Lochaber	410 <sup>(a)</sup>	Sold to SIMEC
<b>Divested in 2014</b>		
Clermont Joint Venture	1,015 <sup>(a)</sup>	Sold to GS Coal Pty Ltd
Rio Tinto Coal Mozambique	50 <sup>(a)</sup>	Sold to International Coal Ventures Private Limited (ICVL)
SØRAL	Undisclosed	Sold to Norsk Hydro
Alucam	Undisclosed	Sold to the Government of Cameroon

(a) Before working capital and completion adjustments.

There were no material acquisitions in 2016 or 2015. There were no material divestments completed during 2015.

Further information on acquisitions and divestments is included in note 37 to the financial statements on page 165.

# Sustainable development

Producing minerals and metals is vital for sustaining and growing social wellbeing. It is essential for human progress. Our activities can affect people, communities and the environment. We work in partnership with those affected to share the wealth and benefits our business creates and to minimise negative impacts.

Rio Tinto's contribution to sustainable development underpins our ongoing commercial results. It benefits our shareholders, partners, neighbouring communities, suppliers, customers, employees and society.

We recognise that we can always improve, and work in partnership to find smarter ways of operating. To achieve our goals we look beyond our business and industry, seeking innovative solutions that we can adopt to manage our impacts. We participate in industry organisations such as the International Council on Mining & Metals (ICMM), and global initiatives such as the Extractive Industries Transparency Initiative and B20 taskforces and summits which support the work of the G20, to help drive change and set sustainability standards that reflect societal expectations and challenges. We also work in partnership with non-government organisations to help us better understand and meet the needs of stakeholders.

Our global code of business conduct, *The way we work*, sets out the behaviour we expect of our people, consistent with Rio Tinto's values: safety, teamwork, respect, integrity and excellence. Together our code of conduct and our values are the foundation of our business.

Our Sustainability Committee ensures our approach is consistent with Rio Tinto's vision and values, that material risks (both local and global) are managed effectively, and that our activities contribute to sustainable development. Further information on this committee can be found on page 61 of the Directors' report.

A summary of our 2016 performance follows. Greater detail, including disclosure of performance metrics and the materiality assessment, is contained in our 2016 Sustainable development report, available at [riotinto.com/sd2016](http://riotinto.com/sd2016)

## Materiality

Every year we rank the sustainability issues that matter most to our business and stakeholders. This helps focus our response and aligns our report with the Global Reporting Initiative (GRI) G4 Guidelines.

In 2016, to compile this ranking, we combined feedback from our internal subject matter experts and discipline leaders, stakeholder expectations and analysis of the external environment. The Sustainability Committee reviewed and approved the assessment.

Our materiality ranking scheme comprises three tiers:

- Highly material aspects that are core to our sustainability performance, to our business and stakeholders. These aspects are described in this Annual report.
- Material aspects that could have localised or moderate impacts on our overall sustainability performance and to stakeholders. These aspects are described in our Sustainable development report.
- Other issues considered important across Rio Tinto and to specific stakeholders.

## Performance overview

Tragically, one colleague lost his life while working at the Paraburdoo iron ore operation in 2016. This incident reinforces the importance of strong safety standards, procedures and leadership. Our ongoing reduction in the number of work-related injuries gives us confidence that our safety processes and culture are strong. Furthermore, by continuing to implement critical risk management (CRM), eliminating fatalities is achievable.

Our performance is assessed globally by external agencies. In 2016, Rio Tinto has again been recognised by the Dow Jones Sustainability Index Metals & Mining Sustainability Leaders group and the FTSE4Good indices.

## Materiality ranking

Importance to our stakeholders	Highly material			Material aspects reported in the Annual report
	Material		Material aspects reported in the Sustainable development report	
	Important	Aspects addressed through other communications		
		Important	Material	Highly material
		Importance to our business		

### Highly material

Economic contributions  
Safety  
Communities  
Employee relations  
Operational environment performance  
Water  
Health  
Climate change  
Human rights  
Non-managed operations  
Tailings and structures  
Business integrity  
Assurance  
Closure

### Material

Value chain  
Business resilience  
Biodiversity

### Important

Waste  
Air

We aim to improve our performance each year. Some highlights and examples of our progress in 2016 included:

- Rolling out the CRM programme across more than 60 operational sites, resulting in 1.3 million risk verifications.
- At 0.44 our all injury frequency rate (AIFR) per 200,000 hours worked was the same as in 2015, the lowest rate in our company history, and we recorded 14 fewer lost time injuries than in 2015.
- 25.9 per cent reduction in our greenhouse gas emissions intensity from 2008 – a seven per cent improvement from 2015.
- Meeting our 2016 target of graduate gender diversity and intake of nationals from regions where we are developing new businesses.
- Introducing a new global Communities and Social Performance (CSP) target to our procurement practices for 2016–2020, with 100 per cent of businesses on track.

- Achieving an Elevate Reconciliation Action Plan (RAP), the highest possible phase in Reconciliation Australia's RAP programme.
- Publishing the *Why agreements matter* best practice guide and our Know your supplier procedure.
- Developing our first modern slavery statement in compliance with the UK Modern Slavery Act 2015 and our new climate change report.
- Reviewing our water management practices, opportunities and obligations to ensure responsible oversight of this resource.
- A seven per cent improvement in managed operations on track to meet their local water performance targets by 2018.
- Implementing a number of updated technical standards and procedures, including those covering the Management of tailings and water storage facilities, geotechnical risk and rail safety.
- Receiving endorsement from the ICMM tailings review group on Rio Tinto's safe tailings governance practices.

At 19.2 per cent, we fell just short of our target for 20 per cent of women in senior management positions and we did not meet our targets for year-on-year reductions in reporting of new cases of occupational illness (the rate increased by 36 per cent from 2015). Actions to address these shortfalls are covered later in the report.

Our employee engagement score was lower than we would have liked but provides hard data for us to improve our leadership and provides direction for our 2017 initiatives in that area.

We reported one significant environmental incident. There was an alleged breach of Warkworth Mining Limited's Environmental Protection Licence conditions in relation to the partial failure of a sediment dam at the Mount Thorley Warkworth mine. The incident did not result in any environmental harm. We paid US\$57,618 in fines related to environmental compliance. Further information on the Group's environmental regulation, including incidents and fines, is in the Directors' report on page 48.

## Goals and targets

We set targets to communicate across the company the areas where we need to improve in sustainability performance and to stretch our thinking as to what is possible and acceptable. Our performance against these targets is summarised below. Actions to maintain or improve performance in these areas is described in the following pages. Further information on the risk framework we apply to identify these metrics can be found on pages 14 to 23.

Targets	Outcomes in 2016
Our goal is zero harm, including, above all, the elimination of workplace fatalities.	One fatality at managed operations in 2016.
Performance against this goal is measured by the number of fatalities and a year-on-year improvement in our all injury frequency rate (AIFR) per 200,000 hours worked.	AIFR remains the same as 2015.
A year-on-year improvement in the rate of new cases of occupational illness per 10,000 employees annually.	36 per cent increase in the rate of new cases of occupational illness compared with 2015.
By the end of 2018, all managed operations will be effectively controlling exposure to all identified material health risks by verifying that critical controls are reducing harmful exposure.	57 per cent of businesses identified and consolidated critical control management plans for their material health risks with the remainder on track to achieve our end of 2018 goal.
Our diversity goal is to employ people based on job requirements that represent the diversity of our surrounding communities. We are targeting: <ul style="list-style-type: none"> <li>– Women to represent 20 per cent of our senior management by 2016.</li> <li>– Women to represent 40 per cent of our 2016 graduate intake.</li> <li>– 15 per cent of our 2016 graduate intake to be nationals from regions where we are developing new businesses.</li> </ul>	<ul style="list-style-type: none"> <li>– Women represented 19.2 per cent of our senior management in 2016.</li> <li>– Women represented ten per cent of our Executive committee in 2016. From 1 January 2017, women represented 27.3 per cent of our Executive Committee.</li> <li>– Women represented 46.4 per cent of our 2016 graduate intake.</li> <li>– 36.2 per cent of our 2016 graduate intake were nationals from regions where we are developing new businesses.</li> </ul>
From 2016 all operations will locally report on an annual basis, and will demonstrably achieve by 2020: <ul style="list-style-type: none"> <li>– Progress against a locally defined target that demonstrates the local economic benefits of employment and procurement of goods and services.</li> <li>– Effective capture and management of community complaints with year-on-year reduction in repeat and significant complaints.</li> </ul>	100 per cent of sites established their Communities and Social Performance targets in 2016.
24 per cent reduction in total greenhouse gas emissions intensity between 2008 and 2020.	We are on track to meet our 2020 target. Seven per cent reduction in greenhouse gas emissions intensity in 2016 versus 2015.
All managed operations with material water risk will have achieved their approved local water performance targets by 2018.	67 per cent of managed operations are on track to meet their approved local water performance targets.

# Sustainable development

continued

## Performance data

A summary of our performance data is provided in the table below. The data are reported for calendar years and unless stated otherwise represent 100 per cent of the parameters at each managed operation even though Rio Tinto may have only partial ownership.

Data reported in previous years may be modified if verification processes detect material errors, or if changes are required to ensure comparability over time.

We have incorporated the requirements of the ten principles of the ICMM and the mandatory requirements set out in the ICMM position

statements into our own policies, strategies and standards. We report in accordance with the GRI G4 guidelines.

Further information on our data definitions, our GRI G4 report and our alignment with the ICMM are available online at [riotinto.com/sd2016](http://riotinto.com/sd2016).

## Performance data 2012-2016<sup>(a)</sup>

	2016	2015	2014	2013	2012
<b>Social</b>					
Fatalities at managed operations from safety incidents	1	4	2	3	2
Fatalities at managed operations from health incidents	–	–	–	–	1
All injury frequency rate (per 200,000 hours worked)	0.44	0.44	0.59	0.65	0.67
Number of lost time injuries	206	220	381	500	535
Lost time injury frequency rate (per 200,000 hours worked)	0.26	0.25	0.37	0.42	0.37
New cases of occupational illness (per 10,000 employees)	44	31*	17	16	15
Employees (number) <sup>(b)</sup>	51,000	55,000	60,000	66,000	71,000
<b>Environment</b>					
Greenhouse gas emissions intensity (indexed relative to 2008)	74.1	79.7*#	81.7	83.2	94.1
Total energy use (petajoules)	454	433	450	484	502
Freshwater used (billion litres)	467	460*	465	436	446
Land footprint – disturbed (square kilometres)	3,696	3,629	3,592	3,556	3,530
Land footprint – rehabilitated (square kilometres)	541	533	502	472	446
<b>Direct economic contribution</b>					
Value add (US\$ million) <sup>(c)(d)</sup>	19,515	18,888	29,178	31,818	26,195
Payments to suppliers (US\$ million) <sup>(c)</sup>	15,637	17,896	21,370	26,054	30,271
Community contributions (US\$ million)	166	184	264	332	291

\* Numbers restated from those originally published to ensure comparability over time.

# Number restated from 78.9 following the application from 1 January 2015 of updated global warming potentials from the IPCC's fourth assessment report.

(a) Data reported in previous years may be modified if verification processes detect material errors, or if changes are required to ensure comparability over time. Wherever possible, data for operations acquired prior to 1 October of the reporting period are included. Divested operations are included in data collection processes up until the transfer of management control.

(b) These figures include the Group's share of joint ventures and associates (rounded to the nearest thousand).

(c) These figures include the Group's share of joint ventures and associates.

(d) Value add is the sum of labour, payments to governments and returns on capital invested in operations.

There will always be opportunities to improve and to contribute further to sustainable development.

## 2017 priorities

Our priorities for 2017 are to:

- Maintain momentum of the CRM programme and achieve our first fatality-free year.
- Collaborate with our joint venture partners to improve safety performance across our managed and non-managed sites, such as with PT Freeport Indonesia on the implementation of a fatality prevention programme at the Grasberg joint operation in Indonesia.
- Reduce new cases of occupational illnesses, with a particular focus on stress, noise-induced hearing loss and fitness for work.
- Continue the focus on our technical risk standards such as those covering process safety, water and tailings management, and geotechnical events.
- Implement measures to improve employee engagement.
- Increase our graduate intake for 2017.
- Strengthen our understanding and improve

the management and disclosure of resilience to climate change risks.

- Meet the expectations of the new ICMM position statement on water stewardship for transparent water governance and water management at operations.
- Participate in the tailings committee of the Australian National Committee on Large Dams to further improve industry guidelines on tailings dams.
- Strengthen processes to manage human rights risk across our value chain through our third-party due diligence project.
- Strengthen integration of human rights considerations in incident reporting, impact assessments, and complaints handling.
- Progress the closure planning for facilities nearing the end of their economically viable life.

## Our people

### Safety

The safety of our people is Rio Tinto's highest priority and we believe all safety incidents are preventable. We work to create a safe environment through strong safety systems, processes and tools, and verifications of critical controls – together with visible and caring

leadership. We take a balanced approach to safety, which is focused on the three core areas of fatality elimination, injury reduction and catastrophic risk prevention including process safety.

CRM is crucial to achieving our fatality prevention goal. It is a dedicated fatality prevention programme which involves every person at our operational sites checking that critical controls are in place for jobs that include a fatality risk, and that they are working effectively. In 2016 every Rio Tinto managed operation rolled out CRM and over 1.3 million critical control verifications were completed.

Whilst we have maintained our injury performance, we are yet to achieve a fatality free year. In June we experienced a fatality within our managed operations when an employee was killed while undertaking maintenance on a drill at the Paraburdoo iron ore operation in the Pilbara, Western Australia. This tragedy continues to impact family, friends, workmates and the local community. The business provided immediate support and counselling services and continues to do so. A full investigation has been completed and the learnings have been shared across Rio Tinto to prevent an incident like this being repeated.



The all injury frequency rate (AIFR), which includes data for employees and contractors, was 0.44 per 200,000 hours worked for the 2016 year. Over the last five years, we have reduced our AIFR by 34 per cent. Although we had 14 fewer lost time injuries in 2016 when compared with 2015, due to a reduction in our workforce hours, our lost time injury frequency rate (LTIFR) was 0.26 per 200,000 hours worked in 2016 – a four per cent increase compared with 2015.

Catastrophic risks are managed and assured through a suite of standards, deep dives and external reviews. Process safety is one such risk and its management involves designing, operating and maintaining our processes for preventing a catastrophic release of hazardous materials or energy. There were no process safety incidents with a major or catastrophic consequence in 2016. We progressed the implementation of our Process safety standard, updated in 2015, to reduce process safety risks.

## Health

We aim to eliminate occupational illness and to create workplaces that protect health and promote wellbeing. Guided by our health standards, we identify emerging health issues and key occupational health risks, and apply controls to mitigate these. Our focus areas in 2016 were occupational illness reduction, health risk management, wellness and mental health, and the control of vector-borne and infectious diseases.

In 2016, the rate of new cases of occupational illness increased by 36 per cent from 2015. This further increase is due to increased reporting of noise-induced hearing loss (NIHL) and a number of previously unreported historic NIHLs being identified and reported in 2016. An increasing awareness of medical surveillance and tighter reporting requirements of health incidents also contributed to the increase. The main types of occupational illnesses in 2016 were noise-induced hearing loss (60 per cent), musculoskeletal disorders (11 per cent) and stress (23 per cent).

Our health risk management programme helps operational sites manage their material health risks effectively by verifying that critical controls are reducing harmful exposure for employees and contractors. During 2016, businesses identified and consolidated critical control management plans for their material health risks.

We are implementing a range of wellness and mental health programmes and working to improve how we measure their effectiveness. Fatigue remains a critical risk and, during 2016, in conjunction with the Central Queensland University in Australia and the University of Witwatersrand in South Africa, we began a study of management attitudes to fatigue across a number of sites in Africa and Australia.

We are working with local governments and health organisations to ensure effective education in, control of and, where necessary, treatment of our employees, contractors and

communities surrounding our operations for vector-borne and infectious diseases such as tuberculosis, Ebola, malaria and HIV/AIDS and, more recently, Zika. During 2016, we contributed to the international response to the Zika virus by preparing our business resilience teams. We also continued to collect data for the epidemiological study of the workforce at the Rössing uranium mine in Namibia, which has gained approval by the Ethics Committee of the University of Manchester and the University of Witwatersrand.

## Employee relations

In 2016, we employed 51,000 people, including the Group's share of joint ventures and associates, in around 35 countries. Of these, approximately 28,000 were located in Australasia, 13,000 in North America, 6,000 in Africa, 2,000 in Europe, and 2,000 in Central and South America. See page 201 for a breakdown of employees by business units.

We understand the relationship between employee engagement and the productivity of our business, and are focused on increasing engagement levels with all employees and their representatives. We want to be a preferred employer. In our 2016 survey of employee engagement, the results indicated that our leaders have more to do in addressing the impacts of past organisational change and headcount reductions. We were, however, very pleased with the level of engagement at our newest large project, Oyu Tolgoi, and with strong recognition across the Group on our approach to safety.

We value the strength that a diverse workforce and an inclusive culture bring to our business. We employ people on the basis of job requirements and do not discriminate on grounds of age, ethnic or social origin, gender, sexual orientation, politics, religion, disability or any other status. We do not employ forced, bonded or child labour. We recognise the right of all employees to choose to belong to a union and to seek to bargain collectively. We employ people with disabilities and make considerable efforts to offer suitable alternative employment and retraining to employees who become disabled and can no longer perform their regular duties.

We remain one of the largest private sector employers of Indigenous Australians, with over 1,467 full-time Indigenous employees who represented approximately 8.3 per cent of our Australian employees in 2016. Our local employment commitments are often managed through directly negotiated agreements with Traditional Owners.

In 2016, women represented 46.4 per cent (female: 32; male: 37) of our graduate intake, 27.3 per cent (female: 3; male: 8) of the board, 19.2 per cent (female: 100; male: 420) of our senior management, and 18.2 per cent (female: 7,933; male: 35,701)<sup>(a)</sup> of our total workforce. Further information on inclusion and diversity can be found in the Corporate governance section on page 63.

## Communities and regional development

Our Communities and Social Performance (CSP) standard is the basis on which we build relationships and local knowledge, engage with communities and develop programmes that reflect mutually agreed priorities. Our framework is founded on trust and mutual respect and we use it to identify and manage social risks, and to build relationships that secure community support for our work.

Agreements are the basis of many of our relationships. Across the business we have negotiated more than 40 participation agreements and more than 120 global exploration access agreements. In 2016 we launched a new guide, *Why agreements matter*, which describes practices related to community agreements. This guide supports our commitment to build strong community relationships and publicly shares the lessons we have learned over the past two decades of agreement making.

Our partnership with Australia's Northern Territory Government, Developing East Arnhem Limited (DEAL), won a National Economic Development Excellence Award for best rural and remote initiative. We created DEAL to help generate new economic activity in the East Arnhem region following curtailment of the Gove alumina refinery. DEAL's housing programme allows businesses to rent properties to accommodate employees and their families and has helped generate more than 200 jobs in the region. The revenue DEAL derives from the housing assets is reinvested in local economic development initiatives.

Sharing the wealth and benefits that our operations create is also fundamental to our approach. In addition to the taxes and royalties paid to both regional and federal governments in 2016 (see our *Taxes paid in 2016 report*, which will be published later this year on the Group's website), we also contributed to 1,294 programmes covering a wide range of sectors such as health, education, environmental protection, housing, agricultural and business development. Our business spent US\$166 million on community contribution programmes. This was a decrease in overall community contributions of ten per cent compared with 2015 due to lower agreement-related payments flowing from lower commodity prices.

We introduced a new CSP target for 2016-2020 aimed at capacity-building in our local communities. It requires all operations to develop locally tailored employment, procurement and complaint management targets, and report annually on progress. At the end of 2016, all sites had established their targets.

During 2016, Rio Tinto launched its second Reconciliation Action Plan (RAP), which outlines how we will build deeper engagement between Indigenous communities and

(a) Gender distribution for our total workforce is based on managed operations (excludes non-managed operations and joint ventures) as of 31 December 2016. Less than one per cent of the workforce gender is undeclared.

# Sustainable development

continued

our operations around Australia. The 2016-2019 RAP sets stretch targets for Indigenous employment, education and training, and business development. At the end of 2016, the total national percentage of Aboriginal and Torres Strait Islander people employed by Rio Tinto in Australia was 8.3 per cent compared with our eight per cent target by December 2019. The Group is the first resources company to obtain an Elevate RAP, the highest possible phase achievable in Reconciliation Australia's RAP programme.

## Protecting the environment

### Climate change and energy

We acknowledge the changing global climate, and support the intent and aspirations of the Paris Agreement to limit global warming to less than two degrees Celsius above pre-industrial levels. We are aiming for a substantial decarbonisation of our business by 2050 and are taking steps to reduce emissions, manage risk and build resilience to climate change. This work is supported by our climate change position statement.

Our climate change programme focuses on reducing the energy intensity of our operations and the carbon intensity of our energy. Our total greenhouse gas (GHG) emissions were 32 million tonnes of carbon dioxide equivalent (CO<sub>2</sub>-e) in 2016, 0.3 million tonnes higher than in 2015. The majority of our GHG emissions are generated as a result of energy use (electricity, fuel) and chemical processes (anodes and reductants) at our operations. The majority (68 per cent) of the electricity we use is from hydro, wind and solar power, which is similar to previous years.

Transportation, processing and use of our products also contribute to GHG emissions. In 2016, the three most significant sources of indirect emissions associated with our products were:

- Approximately 6 million tonnes of CO<sub>2</sub>-e associated with third-party transport of our products and raw materials, representing a ten per cent increase versus 2015.
- An estimated 102 million tonnes of CO<sub>2</sub>-e associated with customers using our coal in electricity generation and steel production, representing a 13 per cent decrease versus 2015.
- Approximately 524 million tonnes of CO<sub>2</sub>-e associated with customers using our iron ore to produce steel (these emissions are not all in addition to the coal-use emissions above, as some customers use both our iron ore and our coal to produce steel), representing a three per cent increase versus 2015.

In 2016, our shareholders passed a resolution to report on our progress in addressing climate resilience. Our new climate change report will provide information on what we are doing to prepare our business for a low-carbon future under five areas: operational emissions management; asset portfolio resilience to post-

2035 scenarios; low-carbon energy R&D and investment strategies; key performance indicators; and public policy activities. In 2016 we commenced work on identifying appropriate scenarios against which to test our business resilience. The focus in 2017 will be on applying these scenarios to our assets and products.

### Operational environment performance

We manage ongoing environmental aspects at our operations to avoid or minimise related health or environmental impacts, including air emissions, noise, water discharge and waste. We have our own internal environmental and occupational health standards and are subject to various environmental regulations. Our air quality protection standard is designed to prevent breaches under normal and worst-case weather conditions, with the focus on controlling and monitoring our air emissions at their source and understanding impacts on local airsheds.

We have mechanisms to record and enable us to respond to complaints, disputes and grievances about issues such as noise and dust. While the overall number of recorded grievances is low, we work with communities neighbouring our operations to understand the impact and improve our practices. Our air quality monitoring information is made publicly available through site-specific websites and community monitoring programmes.

We look for opportunities to reuse or recycle our waste. Where that is not possible, we manage it in facilities suited to its specific physical nature and risks whilst also minimising disposal costs and avoiding future liabilities. In 2016, we disposed of or stored 1,781 million tonnes of mineral waste (predominantly waste rock and tailings) and 529,123 tonnes of non-mineral waste. About one fifth of our mineral waste has the potential to react with air and water or break down to create potentially harmful contaminants, such as acidic and metalliferous drainage (AMD). Our controls are designed to prevent AMD impacts.

Our water resource management programme focuses on site-specific risks, such as security of water supply, managing the quality of water returned to the environment during operations and at closure, and balancing operational needs with those of local communities, Traditional Owners and regulatory requirements.

We carry out an annual assessment of performance against site-specific water targets, which have been established for those sites where water is a material risk for the business, and focus efforts on operations that may need to improve. At the end of 2016, 67 per cent of managed operations were on track to meet their local water performance targets by 2018.

To ensure we are maintaining the right emphasis on long-term water management, we completed a detailed analysis of our water-related risks during 2016. The outcomes

of this will see us adopt further improvements in water governance and planning processes. During the year we supported the development of the new ICMM position statement on Water Stewardship.

### Management of tailings and structures

We operate tailings and large water storage facilities at 33 sites and currently have closed impoundments that we continue to monitor at five sites. We continue to review and audit operations (including with independent external reviews) to ensure that practices at all managed tailings and major water storage facilities are in full compliance with all relevant industry standards as well as our Management of tailings and water storage facilities standard. Assurance over these storage facilities by internal and independent third-party reviews remains a focus.

During 2016, we participated in the ICMM review of tailings dam management amongst its member companies by sharing practices, protocols and assurance processes. The resultant ICMM position statement on tailings management is consistent with our own approach. It outlines principles for preventing catastrophic failures of tailings dams through risk control for planning and design, implementation and operation, monitoring and inspection, and disaster management. Since the principles identified in ICMM's position statement are already incorporated in our standard, it was not necessary for the Rio Tinto standard to be updated.

## Economic contributions

Equitably sharing the wealth that our operations create provides substantial benefits and long-term opportunities for the communities, regions and countries in which we operate. Our contributions include the transparent payment of tax to local and national governments, dividends to shareholders, the direct and indirect employment we generate, and investment in community programmes. The payments we make to our suppliers also represent a significant part of our global economic contribution. The figures in this section include the Group's share of joint ventures and associates.

Globally, the Group's direct economic contribution was US\$35.1 billion in 2016. This includes:

- US\$19.5 billion in value add, made up of payments to employees, payments to governments and returns on capital.
- US\$15.6 billion as payments to suppliers.

During 2016, our capital investment was US\$3.0 billion.

We are a major employer and tax contributor to local, state and national jurisdictions. We promote governance over the benefits of mining that flow through to host communities and governments by being transparent in the payments we make and by striving to provide local employment and procurement

opportunities. Details of the payments we made to governments will be published in our *Taxes paid in 2016 report*, and made available online.

## Governance

### Business integrity

We are firmly committed to operating with integrity and being accountable for our actions. The key principles that guide our behaviour in the *The way we work* are supported by standards that cover antitrust, business integrity, conflicts of interest, data privacy, fraud and third party due diligence. All of these are supported by workforce training. During 2016 we began a review of our company's purpose and vision in consultation with our employees and included safety and excellence into our values.

We maintain a strict stance against bribery and corruption. We remain dedicated to open and transparent dealings with our stakeholders. Our integrity and compliance programme is aligned with the risk-based approach included in our business integrity standard. We update our training materials and delivery to ensure they remain engaging and relevant to the risks employees encounter.

*Speak-OUT*, the Group's confidential and independently-operated whistleblowing programme, enables employees, suppliers contractors and community members to report anonymously, subject to local law, any significant concerns about the business, or behaviour of individuals. This could include suspicion around safety violations, environmental procedures, human rights, financial reporting or business integrity issues in general. We are committed to a culture of transparency and encourage employees to speak up about their issues and concerns, whether through their management, human resources or through *Speak-OUT*.

In 2016, 674 incidents were reported through *Speak-OUT*, compliance managers and/or management, representing an increase of approximately 12 per cent on last year. The increase is mainly due to a higher volume of incidents raised outside of the hotline. Twenty six per cent of cases raised this year were substantiated, resulting in corrective and preventative actions.

Information on the Group's operational, financial and sustainable development performance is issued on time through a number of channels, such as media releases and regulatory filings. We communicate views to governments and others on matters affecting our business interests.

### Human rights

We respect and support human rights consistent with the Universal Declaration of Human Rights, wherever we operate. We have our own human rights policy and procedures and have made voluntary commitments to the OECD Guidelines for Multinational Enterprises, the UN Global Compact and the Voluntary

Principles on Security and Human Rights (VPSHR). Our human rights approach is consistent with the United Nations Guiding Principles on Business and Human Rights (UNGPs). Where our standards and procedures are stricter than local laws, we seek to apply our own standards.

Our most salient human rights issues are those relating to security, land access and resettlement, Indigenous people's rights including cultural heritage, environment including access to water, labour rights and in-migration-related impacts on local communities such as access to health services. In 2016 we engaged with investors, civil society and community members on issues related to our own operations and to our business partners such as land access, cultural heritage, environment and labour rights.

Human rights considerations are included in our business processes and we conduct standalone studies and programmes at high-risk sites when required. In 2016 we updated our human rights training. The introductory module will be required to be undertaken by all employees as part of our business integrity training from 2017. Function-specific modules around communities, procurement, security and inclusion and diversity will also be made available.

To support our Communities and Social Performance target for 2016-2020, sites began collecting data relating to the effective capture and management of community complaints. All sites are required to have a complaints, disputes and grievance mechanism in place in line with the effectiveness criteria for operational-level grievance mechanisms in the UNGPs. We strive to achieve the free, prior and informed consent of Indigenous communities as defined in the 2012 International Finance Corporation Performance Standard 7 and the ICMM position statement on Indigenous Peoples and Mining.

In 2016, our new *Supplier code of conduct* was launched, which clearly outlines expectations of our suppliers, their subsidiaries and sub-contractors including around human and labour rights. The code is available on our website and we distributed 32,000 copies to our current suppliers. We continue to work to ensure we have a comprehensive approach on responsible supply chains and human rights. Work also progressed on third-party due diligence including in relation to suppliers. We launched our *Know your supplier* procedure which establishes a process to understand legal, ethical and reputational risks arising from use of a supplier.

We developed our first annual modern slavery statement in compliance with the UK Modern Slavery Act 2015. The statement outlines the steps taken in 2016 to ensure that slavery and human trafficking are not taking place in any of our operations or supply chains. This will be published online at [riotinto.com](http://riotinto.com) in March 2017.

We provide training for security personnel and conduct security and human rights analysis in support of our security arrangements. Our online VPSHR training is mandatory for all security personnel at high risk sites and is strongly recommended for all our other businesses. During the year we conducted VPSHR and Use of Force training for security providers at three of our locations in South Africa and Guinea.

### Non-managed operations and arrangements

We hold interests in companies and joint arrangements that we do not manage, the two largest being the Escondida copper mine in Chile and the Grasberg copper-gold mine in Indonesia. We actively engage with our partners through formal governance structures and technical exchanges and endeavour to ensure that the principles in *The way we work* are applied. We also encourage our partners to embed a strong safety, security and human rights culture in their workforces.

#### Escondida

Rio Tinto has a 30 per cent interest in Escondida, which is managed by BHP Billiton. Our seats on the Owners' Council enable us regular input on strategic and policy matters. Sadly, there was one fatality in 2016, whereby a maintainer was fatally injured when working on the mill.

Construction of the Escondida Water Supply desalination project progressed well in 2016. Initial start-up milestones have been met and the plant is on track to be fully operational in 2017. By utilising seawater, the plant will significantly reduce demand on fresh groundwater resources around the mine.

#### Grasberg

PT Freeport Indonesia (PTFI), a subsidiary of Freeport-McMoRan Copper & Gold, Inc., owns and operates the Grasberg mine in Papua, Indonesia. We have a joint operation interest attributable to the 1995 mine expansion, which entitles Rio Tinto to a 40 per cent share of production above specified levels until the end of 2021 and 40 per cent of all production after 2021 (this date is subject to extension under certain conditions). We engage with PTFI through four forums: the Operating, Technical and Sustainable Development committees and the Tailings Management board.

The largest of these, the multidisciplinary Technical Committee, enables discussion of joint operation activities such as environmental management, orebody knowledge, project execution, worker health and safety, communities, mine planning, processing and tailings management. Rio Tinto is represented by a senior environmental manager on the PTFI tailings management board, which meets twice a year at Grasberg and includes third-party experts. A Rio Tinto senior manager also works closely with PTFI on key safety improvement activities such as fatality prevention programmes.

# Sustainable development

continued

Tragically, there were four fatalities at PTFI operations in 2016: one electrician was fatally injured whilst performing routine maintenance on a transmission line; one worker was struck by a moving forklift; one worker fell approximately six metres when checking a power supply fault; and one mine operator who was not properly secured in a bulldozer was thrown from the machine when it slid down a bench slope. We worked with the PTFI team to share fatality prevention initiatives including CRM and “learning critical lessons” to ensure the circumstances leading to these incidents are not repeated.

## Closure

Our planning for closure starts early to ensure that post-closure outcomes are achievable and that impacts and risks are minimised. The work is overseen by our Closure Steering Committee to ensure good closure processes and governance.

We work with local communities and regulators to evaluate potential post-closure land uses and agree on closure objectives. During 2016, we continued detailed closure planning for a number of large mines that will reach the end of their commercially viable life over the next ten years.

We manage a range of non-operational sites, including those inherited through acquisitions and mergers, some of which are remotely located or are former industrial or brownfield sites. During 2016, 11 of the sites progressed to the point where we can relinquish them. In many jurisdictions we maintain long-term responsibility for monitoring and managing the sites. We are also learning from the

commitments and expectations associated with operations we have relinquished.

We aim to progressively rehabilitate land as we operate at a mine site. In 2016, 26 per cent of our disturbed land (excluding land disturbed for hydroelectricity dams) had been rehabilitated.

Our industry is entering a new stage in mine closure, with many of our peers also planning to close large operations over the next decade. In many jurisdictions where we operate, regulatory frameworks for large mine closure remain undeveloped or untested. In collaboration with our peers, we are improving our understanding of opportunities, seeking solutions to challenges and engaging governments to establish good closure policies and regulations.

## Assurance

We engaged an independent external assurance organisation, PricewaterhouseCoopers, to provide the directors of Rio Tinto with assurance on selected sustainable development subject matters, as explained on the next page.

PricewaterhouseCoopers’ assurance statement satisfies the requirements of subject matters 1 to 4 of the ICMM assurance procedure.

Further information on external auditors and internal assurance is included in the Directors’ report under the Corporate governance section on pages 60 and 66.



# Independent limited assurance report



## What we found

Based on the work described below, nothing has come to our attention that causes us to believe that the selected subject matter for the year ended 31 December 2016 has not been prepared, in all material respects, in accordance with the Reporting criteria.

To the directors of Rio Tinto plc and Rio Tinto Limited (together Rio Tinto)

## What we did

Rio Tinto engaged us to perform a limited assurance engagement on the selected subject matter within the Sustainable development sections of the Rio Tinto 2016 Annual report and the Rio Tinto 2016 Strategic report for the year ended 31 December 2016.

### Selected subject matter

- Rio Tinto's assertion that it has incorporated the requirements of the 10 sustainable development principles of the International Council on Mining & Metals (ICMM) and the mandatory requirements set out in ICMM Position Statements into its own policies
- Rio Tinto's assertions regarding the approach that it has adopted to identify and prioritise its material sustainable development risks and opportunities
- Rio Tinto's assertions regarding the existence and status of implementation of systems and approaches used to manage the following selected sustainable development risk areas:
  - Safety
  - Greenhouse gas emissions
  - Energy use
  - Water management
- The following Rio Tinto performance data related to the selected sustainable development risk areas:
  - Number of fatalities
  - All injury frequency rate
  - Lost time injury frequency rate
  - Number of lost time injuries
  - Total greenhouse gas emissions
  - Greenhouse gas emissions intensity
  - Total energy use
  - Percentage of managed operations with material water risk that are on track to achieving their approved local water performance targets

## Reporting criteria

The subject matter above has been assessed against the ICMM Sustainable Development

Framework and the definitions and approaches within the Glossary which will be presented at [www.riotinto.com/sd2016/glossary](http://www.riotinto.com/sd2016/glossary) as at 2 March 2017.

## Independence and Quality Control

We have complied with relevant independence requirements and other ethical requirements of the *Code for Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

PricewaterhouseCoopers applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

## Responsibilities

### PricewaterhouseCoopers

Our responsibility is to express a conclusion based on the work we performed.

### Rio Tinto

Rio Tinto management is responsible for the preparation and presentation of the selected subject matter in accordance with the Reporting criteria.

## What our work involved

We conducted our work in accordance with the International Standard on Assurance Engagements 3000 (Revised) *Assurance Engagements Other than Audits or Reviews of Historical Financial Information* and (for selected subject matter relating to greenhouse gas emissions) the International Standard on Assurance Engagements 3410 *Assurance Engagements on Greenhouse Gas Statements*. These Standards require that we comply with independence and ethical requirements and plan the engagement so that it will be performed effectively.

## Main procedures performed

- Making enquiries of relevant management of Rio Tinto regarding the processes and controls for capturing, collating and reporting the performance data within the selected subject matter, and evaluating the design and effectiveness of these processes and controls
- Validating the operation of controls over the accuracy of injury classification and assessing the final injury classification applied for a sample of injuries reported during the year ended 31 December 2016
- Testing the arithmetic accuracy of a sample of calculations of performance data within the selected subject matter
- Assessing the appropriateness of the greenhouse gas emission factors applied in calculating the Total greenhouse gas emissions and Greenhouse gas emissions intensity
- Testing performance data, on a selective basis, substantively at both an operational and corporate level, which included testing at a selection of operations from across Aluminium, Copper & Diamonds, Energy & Minerals, and Iron Ore
- Undertaking analytical procedures over the performance data within the selected subject matter
- Making enquiries of relevant management and reviewing a sample of relevant management information and documentation supporting assertions made in the selected subject matter

We believe that the information we have obtained is sufficient and appropriate to provide a basis for our conclusion.

Liza Maimone

Partner

1 March 2017

PricewaterhouseCoopers

Canberra

Liability limited by a scheme approved under Professional Standards Legislation

## Inherent limitations

Inherent limitations exist in all assurance engagements due to the selective testing of the information being examined. Therefore fraud, error or non-compliance may occur and not be detected. Additionally, non-financial data may be subject to more inherent limitations than financial data, given both its nature and the methods used for determining, calculating and sampling or estimating such data.

## Restriction on use

This report has been prepared in accordance with our engagement terms to assist Rio Tinto in reporting its sustainable development performance. We do not accept or assume responsibility for the consequences of any reliance on this report for any other purpose or to any other person or organisation. Any reliance on this report by any third party is entirely at its own risk.

We consent to the inclusion of this report in the Rio Tinto 2016 Annual report and the Rio Tinto 2016 Strategic report to assist Rio Tinto's members in assessing whether the directors have discharged their responsibilities by commissioning an independent assurance report in connection with the selected subject matter.

## Limited assurance

This engagement is aimed at obtaining limited assurance for our conclusions. As a limited assurance engagement is restricted primarily to enquiries and analytical procedures and the work is substantially less detailed than that undertaken for a reasonable assurance engagement, the level of assurance is lower than would be obtained in a reasonable assurance engagement.



# Iron Ore

## Financial performance

	2016 US\$ million	2015 US\$ million
Gross revenue <sup>(a)</sup>	14,605	13,952
Net cash generated from operating activities	5,644	5,844
Underlying earnings	4,611	3,940
Capital expenditure <sup>(a)</sup>	868	1,608
Net operating assets	16,339	16,850
Underlying EBITDA	8,526	7,675

Iron Ore Company of Canada and Simandou are reported within Energy & Minerals (see page 38), reflecting management responsibility.

(a) Gross revenue and capital expenditure are defined on page 202 under Notes to financial information by business unit.

## Strategy and priorities

The Iron Ore product group's vision and strategy is focused on delivering optimal value from its integrated system of assets.

These strategic principles guide the business:

- Safety is the number one priority.
- Focus on value over volume to ensure the optimum outcome based on the combination of revenue, operating costs and capital expenditure.
- Engaged employees are the key to success.
- Mine-to-market productivity is an important driver of cash generation.
- Making a lasting and positive contribution will build strong partnerships.

The group's strategic priorities are to:

- Run safe and fatality-free operations.
- Employ a workforce of fully engaged people.
- Sustain the competitive advantage of premium Pilbara Blend products.
- Realise the full potential of the system to maximise cash flow and productivity from the existing asset base.
- Harness innovation and technology to help drive superior performance.
- Follow a disciplined, value-accretive approach to growth.
- Engage with its highly valued partners and support sustainable local and regional investment.

## Safety

The tragic death of a colleague at the Paraburdoo operations in June was a sobering reminder of the critical risks in the business. A maintainer died following the unexpected movement of a hydraulic arm while carrying out maintenance work on a drill rig. The business is implementing the learnings from this incident, so that the same or a similar accident can never happen again. This terrible event strengthened the resolve of the business to fully implement the critical risk management fatality elimination programme which was rolled out in 2016. This programme aims to ensure key risks are identified and the right

protections are in place before any job starts. Critical control checklists were fully implemented across all operations and operational leaders and team members are actively verifying tasks to ensure that critical controls are in place.

The all injury frequency rate stayed consistent in 2016 at 0.45 compared with 0.45 in 2015. A focus by frontline leaders on visible leadership in the field has been maintained and will help drive the rate down.

In 2016, Iron Ore continued to work to sustain the employee wellbeing strategy through training and educating leaders in how to manage fitness for work, understand mental wellness and build resilience.

The Yandicoogina team was named the winner of the 2016 Safety and Health Innovation award by the Chamber of Minerals and Energy of Western Australia for its breakthrough project to reduce manual handling injuries.

## Greenhouse gas emissions

Throughout 2016, Iron Ore continued to reduce its greenhouse gas emissions intensity across mine, rail and port operations compared with the baseline target set in 2008. Since 2008, the product group's greenhouse gas emissions intensity has improved by 2.2 per cent.

## Review of operations

In the Pilbara, Rio Tinto operates the world's largest integrated portfolio of iron ore assets. This system comprises 15 mines, four independent port terminals, over 1,700km of the largest privately owned heavy freight railway in Australia, and supporting infrastructure, all linked by the Operations Centre in Perth.

In 2016, Rio Tinto celebrated 50 years since the first shipment of iron ore from the Pilbara operations. Events were held in regional Western Australia, Perth and internationally to recognise and acknowledge the significant contribution of past and present employees, customers, suppliers, communities and other partners who helped shape the world-class business.

Rio Tinto Marine delivers shipping services to the wider Rio Tinto Group, including Iron Ore.

In 2016, Iron Ore's underlying earnings increased by US\$671 million, up 17 per cent on 2015. This was achieved through record sales volumes, continued cash cost savings and higher iron ore prices.

Iron Ore shipments for 2016 met the guidance at 327.6 million tonnes (Rio Tinto share: 268.9 million tonnes), an increase of three per cent on 2015, attributable to the newly expanded infrastructure and minimal weather events.

Production of 329.5 million tonnes (Rio Tinto share: 270.7 million tonnes) in 2016 was six per cent higher than in 2015. The strong production performance in 2016 follows the ramp up of expanded mines, operational

productivity improvement projects across most sites and minimal weather events.

Contestable iron ore demand in 2016 increased by around 80 million tonnes to 1.8 billion tonnes. Rest-of-world contestable demand recovered from a weak start to the year to be slightly higher than 2015 levels. Additional demand was met predominantly by expansions from the top six producers which netted around 55 million tonnes in 2016. Notably, the ramp-ups of Roy Hill and Minas Rio added almost 30 million tonnes.

In 2016, the iron ore price averaged around US\$58.40 per dry metric tonne (Platts 62 per cent Fe CFR), up from an average of around US\$55.50 per dry metric tonne in 2015. This masks a significant range in iron ore prices during 2016. Prices ranged from a low of US\$39.25 per dry metric tonne in mid-January to a peak of US\$83.95 per dry metric tonne in mid-December.

Rio Tinto Marine shipped 281 million tonnes of dry bulk cargo on behalf of the entire Rio Tinto Group, an increase of six per cent on 2015. By volume, Rio Tinto is the largest dry bulk shipping business in the world, operating 17 vessels of its own and contracting a fleet of around 200 vessels at any given time. Average freight rates in 2016 tracked below 2015 and forward voyage rate curves are flat, reflecting ongoing vessel oversupply and low bunker fuel prices.

A strong pipeline of initiatives in 2016 resulted in pre-tax cash cost reductions of US\$318 million. Iron Ore has now delivered US\$1.4 billion of cumulative savings compared with the 2012 base, making a significant contribution to the wider Rio Tinto Group pre-tax savings.

Further efficiency improvements reduced the Pilbara cash unit costs to US\$13.7 per tonne in 2016, compared with US\$14.9 per tonne in 2015. Cost savings initiatives included optimising system maintenance shut intervals and alignment, and improving contracting arrangements such as the ten-year integrated facilities management agreement signed in 2016 that is expected to deliver more than US\$75 million in cash benefits during 2016 and 2017. Productivity improvements included increasing effective utilisation across the Pilbara fleet, increasing payloads and reducing ore car dumper cycle times.

Iron Ore continues to be a leader in safe autonomous mining technologies. The Operations Centre controls and operates major assets including autonomous haul trucks and drills, processing plants, train loading and unloading, and stockyard stacking and reclaiming machines.

The automated truck fleet continues to provide advantages relating to safety, productivity and operating costs. On average, each of the 72 autonomous haul trucks, which is 20 per cent of the fleet, operated an additional 1,000 hours and at 15 per cent lower cost in 2016 than comparable conventional haul trucks.

The performance of autonomous trucks and increased utilisation of all trucks, together with improvements in payload, has reduced fleet requirements, resulting in lower capital expenditure and operating costs.

Iron Ore continues to consider the optimal size of its automated truck fleet, including new purchases and evaluating manned-to-autonomous conversion for the existing fleet.

Autonomous drills at West Angelas also operated for an average 1,000 more hours per drill compared with conventional drills. Autonomous drills are now being deployed at Yandicoogina.

Further progress was made with the AutoHaul® project in 2016, bringing it closer to implementation. This will deliver a step change in the safety controls and productivity of rail operations. One hundred per cent of planned territory track is now AutoHaul® enabled. Since testing began in 2014, more than 600,000 kilometres of track has been covered in AutoHaul® mode with a driver in attendance. The implementation of AutoHaul® will transition to the rail operations team in 2017 and its use is expected to progressively expand during the year. Full implementation is scheduled for the end of 2018.

Iron Ore maintained its focus on supporting local communities, Aboriginal Traditional Owners, businesses and people within its operational footprint. The product group continued actively implementing participation agreements with Traditional Owners in the Pilbara, which secure land access for the life of mining operations. In 2016, along with Pilbara Traditional Owners, Iron Ore completed five-year reviews of the Participation Agreements and Regional Framework Deed. It also finalised the Participation Agreement with the Banjima people, its tenth agreement in the Pilbara. Relationships with Pilbara Traditional Owners are integral to Iron Ore's privilege to operate and it has now signed agreements with all Native Title Claim groups who hold interests in areas of the Pilbara in which it operates. These agreements incorporate mutual obligations to deliver outcomes in employment, financial compensation, education and training, heritage surveys and practices, environmental care and land use.

Iron Ore remains one of the largest private-sector employers of Indigenous people in Australia, with approximately 900 Indigenous employees, including 380 Pilbara Aboriginal people. In 2016, Rio Tinto launched its elevate Reconciliation Action Plan – the first industry group to launch a RAP at this level – where it publicly committed to meeting eight per cent Indigenous employment across Australia by the end of 2018. Indigenous employment was 7.8 per cent across Iron Ore as at December 2016.

Iron Ore continues to support programmes and initiatives across the Pilbara, and its fly-in, fly-out (FIFO) source communities in regional Western Australia and Perth. Its award-winning Community Infrastructure and Services Partnership with Pilbara local governments continued its success during 2016 with the delivery of key community infrastructure projects. The Partnerships with the City of Karratha and the Shire of Ashburton work to deliver real benefits to the community to ensure the Pilbara is a great place to live through a shared vision of improving town amenities and revitalising communities.

### Development projects

Iron Ore's mineral resources position continues to support sustaining production and growth options in the Pilbara. Managing this base efficiently forms the basis of creating a development sequence which maximises the value of its assets and maintains the required delivery of customer product. Ore reserves are being maintained in line with mine production. Given their significance to the business and customers, the focus continues on the premium Pilbara Blend products.

Iron Ore has invested over US\$14 billion in Pilbara mines and infrastructure growth, increasing production by more than 50 per cent and expanding port operations to 360 million tonne capacity. With the completion of the ports development the focus has shifted to productivity-driven growth supported by low-capital-cost brownfield developments.

Since 2012, Iron Ore has followed a disciplined, value-accretive, low-cost brownfield approach to the expansion of Pilbara operations. Most recently, efforts have been concentrated on the Nammuldi Incremental Tonnes (NIT) project which was fully commissioned in 2016 and provides 10 million tonnes of high-grade, low-phosphorus ore annually.

The balance of the full Silvergrass mine comprises the installation of a satellite crusher and overland conveyor, increased autonomous mining capacity and the expansion of Nammuldi non-process infrastructure. It will add an extra 10 million tonne capacity to the NIT expansion with first ore expected in the second half of 2017. Following approval of the final capital allocation for the full Silvergrass project in August 2016, the overall capital intensity is around US\$29 per tonne. Replacing the road trains being used at Nammuldi with a conveyor will also significantly reduce operating costs.

A number of sustaining mine developments also progressed in 2016. The West Angelas Deposit F project will use existing processing and plant infrastructure to support total production of 35 million tonnes per year from the West Angelas mine.

Yandicoogina Oxbow is being built as a supporting mine for the Yandicoogina operations, assisting in sustaining current production rates of 56 million tonnes per year. Yandicoogina Oxbow will use existing facilities and will expand the Yandicoogina autonomous truck fleet.

The Iron Ore group continues to invest in community infrastructure in regional towns. The A\$18 million Dampier Community Hub was officially opened in July while the A\$4.6 million Paraburdoo Childcare Centre opened in October. The Red Earth Arts Precinct commenced construction in the fourth quarter which will provide state of the art theatre and library services. These projects were made possible through financial contributions from Rio Tinto and the State Government's Royalties for Regions programme and local government.

Rio Tinto will contribute A\$8 million towards the construction and operation of the A\$14.5 million Paraburdoo Community Hub. The Shire of Ashburton secured remaining funds for the project in the fourth quarter of 2016. Construction is expected to commence in 2017, with completion of the Paraburdoo Community Hub in 2018. Various other civic projects were also unveiled during the year.

### Outlook

Iron ore and steel, along with a number of other commodity prices, experienced strong price appreciation towards the end of 2016. Several factors have buoyed China's steel demand such as downstream restocking, higher inflation expectations and a supportive credit and monetary environment. Rest-of-world steel output has been supported by a considerable improvement in macroeconomic conditions across advanced economies in the fourth quarter of 2016.

China's current high rates of steel production are anticipated to unwind somewhat in 2017 in part due to an expected gradual withdrawal in stimulus. Over the longer term, there is still room for Chinese steel production to grow – driven by manufactured goods such as automobiles and machinery, and increasing replacement requirements. Steel production in the world ex-China will continue to grow with capacity expansions in India, the Middle East and ASEAN coming to fruition and stronger macroeconomic conditions in other key steel markets.

Over the next few years, Rio Tinto expects further supply from low-cost producers and new entrants. In addition, the Group expects to see further exits as the significant input cost deflation experienced in 2015, particularly in oil and exchange rates, begin to reverse.

# Aluminium

## Financial performance

	2016 US\$ million	2015 US\$ million
Gross revenue	9,458	10,117
Net cash generated from operating activities	2,074	2,413
Underlying earnings	947	1,118
Capital expenditure	916	1,682
Net operating assets	15,782	15,949
Underlying EBITDA	2,472	2,742

## Strategy and priorities

Rio Tinto's Aluminium product group continues to focus on delivering industry-leading performance and value creation throughout the cycle. The product group benefits from a sector-leading bauxite position, large-scale alumina refineries and a low first-quartile average cost smelter portfolio. Aluminium's strategy focuses on:

- Safety as the number one priority.
- Prioritising value over volume.

Each of the three areas of the business – bauxite, alumina and primary metal – has its own targets and strategies, summarised below:

- In bauxite, the emphasis is on capturing value from expanding seaborne demand. This involves continuing to enhance performance and output at current operations while developing Tier 1 growth opportunities such as the Amrun project.
- In alumina, providing security of supply to the group's smelter portfolio is essential. The focus is on aggressively driving down costs to improve the refineries' positioning on the industry cost curve.
- In primary metal, the Aluminium group focuses on leveraging its low-cost, low-carbon power position – a significant and sustainable competitive advantage.

The three product areas are supported by a single global commercial organisation that focuses on maximising value from mine to market, while providing customers with higher-margin, value-added products and services.

## Safety

In 2016, Aluminium achieved a second consecutive fatality-free year. The product group's all injury frequency rate continued its downward trend, ending the year at 0.46 compared with the 0.48 rate recorded at the end of 2015. The group is striving to improve its overall safety performance further, with the ultimate goal of achieving a zero harm workplace. To that end, it has deployed a comprehensive systems-based approach, including the roll-out of the critical risk management fatality elimination programme during 2016.

## Greenhouse gas emissions

Rio Tinto's Aluminium group has one of the lowest carbon footprints in the aluminium industry. Since 2008, the group has reduced greenhouse gas (GHG) emissions by 45 per cent in absolute terms and 36 per cent in intensity. GHG emissions intensity of the group's primary aluminium production reduced by 39 per cent in 2016 compared with 2008, due to portfolio management and the ramp-up of the modernised Kitimat smelter in 2016. Compared with the global aluminium industry, Rio Tinto offers a metal with one of the lowest GHG footprints based on a life cycle analysis approach<sup>(a)</sup>. This GHG footprint is 50 per cent lower than the global industry average, thanks to low-carbon sources of electricity and world-leading technology. Almost 80 per cent of the Aluminium group's total power needs are supplied by low-carbon sources, with 55 per cent coming from self-generated hydropower, compared with 35 per cent for the industry. This unique combination enables the Aluminium group to respond to increasing market demand for responsible metal produced with a low carbon dioxide footprint through Rio Tinto's globally available RenewAl™ brand.

## Review of operations

The quality of its assets combined with a robust, highly disciplined performance management system enabled the Aluminium group to reinforce its position as a sector-leading business in 2016 and to deliver superior results, despite the ongoing market challenges.

The product group achieved underlying earnings of US\$947 million (2015: US\$1,118 million). This performance was driven by the ongoing strength of the group's operational performance and the continued delivery of strong cash cost savings. This helped largely to offset the ten per cent reduction in Rio Tinto's average realised price for primary metal products – including regional and product premia (US\$1,849 per tonne in 2016 compared with US\$2,058 per tonne in 2015). Cash cost improvements of US\$481 million (pre-tax), a 48 per cent increase compared with 2015 savings, are evidence of the efficiency momentum within the Aluminium group. Savings realised over the past four years now total more than US\$1.6 billion, further entrenching the group's superior integrated EBITDA margins. The resilience of the group's underlying EBITDA, combined with further reductions in working capital levels, resulted in net cash generated from operating activities of US\$2,074 million.

(a) Life cycle analysis approach takes into account the entire production process, electricity generation, and the product's use and end-of-life.

At the end of 2016, the Aluminium product group was carrying out some 1,200 value improvement initiatives across its operations. These are designed to strengthen margins further through production and procurement efficiencies and reduced support costs.

All three of the Aluminium group's product segments demonstrated strong operational performance and delivered strong year-on-year production increases. In 2016, the Aluminium product group delivered more than 29 million tonnes of bauxite to third parties. This represented a ten per cent increase on 2015 levels and reinforced Rio Tinto's position as the largest single seaborne bauxite supplier in the world. Record production achieved at the Weipa and Gove mines in Australia contributed to a nine per cent increase in Rio Tinto's global bauxite production. Alumina production increased by five per cent in 2016 due primarily to operational improvements driving record production at Yarwun (up 11 per cent). Production records were also realised at the Jonqui re and S o Luis refineries.

Rio Tinto's aluminium production for 2016 was ten per cent higher than in 2015, reflecting the successful ramp-up of the modernised and expanded Kitimat smelter. This delivered its full nameplate capacity of 420,000 tonnes from the second quarter, while ongoing production creep through productivity improvements helped to deliver annual production records at ten smelters.

In 2016, Rio Tinto completed the sale of its Carbone Savoie cathode blocks business in France, and its Lochaber smelter and hydropower facilities in the UK. The divestments reflect the Aluminium group's determination to continue refining its portfolio to ensure the most effective use of capital.

## Development projects

The Aluminium group's development pipeline focuses on its competitive advantages in energy and bauxite.

In 2016, construction commenced on the Amrun bauxite project, south of the Embley River in Cape York, Queensland, Australia. With mining costs projected to be in the first quartile of the cost curve, Amrun is an exceptional project: long life, low cost and expandable; and strategically placed to satisfy increasing demand for seaborne bauxite. With an approved capital cost of US\$1.9 billion, the project includes a mine plus port facilities and infrastructure that could be leveraged for future expansions. At the end of 2016, the project was 25 per cent complete and proceeding on time and on budget, having met all major project milestones for the year. Planned initial output for Amrun is 22.8 million tonnes per annum beginning in 2019. The project will partly replace the depleting East Weipa mine with lower-cost production, while also delivering additional volumes of around 10 Mt/a.

A US\$0.7 billion expansion currently under way by the joint-venture Compagnie des Bauxites de Guinée will further enhance Rio Tinto's strong bauxite position.

The Kitimat Modernisation Project was successfully completed at the end of Q1 2016, and the modernised and expanded smelter reached full nameplate capacity in April 2016. Output at the smelter, which uses the Aluminium group's wholly owned Kemano hydropower resource and high-efficiency AP smelting technology, has been increased by 48 per cent while overall environmental emissions have been reduced by nearly 50 per cent. Energy efficiency has also increased by 33 per cent. Kitimat is already positioned in the lowest decile of the industry cost curve.

## Outlook

The long-term outlook for aluminium remains strong. The consensus view foresees a steady increase in demand, averaging two to three per cent per year over the next 15 years. This translates into additional consumption of 25.8 Mt (around 1.7 Mt/a) compared with a 2015 base of 56.6 Mt.

This outlook is driven mainly by rising utilisation intensity and more diverse end-use applications. In the automotive sector, for example, manufacturers are planning to use significantly more aluminium in the future to make lighter vehicles that consume less fuel and produce fewer emissions.

Developing economies, where current consumption is low, also provide solid growth potential for aluminium. In India, for example, consumption is less than two kilograms of aluminium per capita compared with 20 kilograms in more developed economies.

Despite this positive long-term view, 2016 was another difficult year for the aluminium industry, with London Metal Exchange (LME) prices remaining at levels last seen during the global financial crisis.

Looking forward, while China continues to add smelting capacity, the global market is moving back towards balance after eight years of working through excess inventory and capacity overhang. At year-end 2016, stocks were down to 11 weeks of supply, compared with a high of 16 weeks in 2009, and the downward trend appears set to continue.

Prospects for bauxite – a sector where Rio Tinto maintains a very strong competitive position – are positive. The projected growth rate, driven mostly by seaborne bauxite traded into the China market, is outpacing that of aluminium. This is due to both a desire by China to be self-sufficient in alumina, and the continuing depletion and reduction in quality of China's bauxite resource position.



# Copper & Diamonds

## Financial performance

	2016 US\$ million	2015 US\$ million
Gross revenue	4,524	5,592
Net cash generated from operating activities <sup>(1)</sup>	987	1,575
Underlying (loss)/earnings	(18)	370
Capital expenditure	924	806
Net operating assets	11,531	11,552
Underlying EBITDA	1,387	1,833

(1) Net cash generated from operating activities excludes the operating cash flows from equity accounted units (mainly Escondida) but includes dividends from equity accounted units.

## Strategy and priorities

The Copper & Diamonds product group's strategy is to deliver sustainable value by:

- driving continuous improvements in safety, the number one priority;
- focusing on value over volume at our existing operations;
- driving improvements in productivity and commercial excellence;
- developing copper brownfield growth options and new, world-class greenfield projects in low-risk jurisdictions;
- focusing on cost control and cash generation; and
- developing strong leaders and an aligned, capable, engaged, diverse and collaborative workforce.

## Safety

In 2016, there were zero fatalities in the Copper & Diamonds group's managed operations, and the all injury frequency rate was 0.38 compared with 0.45 in 2015.

Sadly, the Grasberg and Escondida mines, in which we are a joint venture partner, suffered fatal incidents during 2016. At Grasberg there were four fatalities. Further details are included on page 30.

Rio Tinto continues to support PT Freeport Indonesia, Grasberg's managing partner, in developing and implementing safety programmes and initiatives.

Copper & Diamonds continued to embed the company's critical risk management fatality elimination programme, which is aimed at identifying and mitigating the common dangers that can lead to fatalities, into all its operations.

## Greenhouse gas emissions

The Copper & Diamonds group's 2016 greenhouse gas (GHG) emissions were 3.3 million tonnes of carbon dioxide equivalent (tCO<sub>2</sub>-e), which is 0.1 million tonnes CO<sub>2</sub>-e less than 2015. The emissions intensity improved at Rio Tinto Kennecott and the Oyu Tolgoi copper-gold mine while marginally deteriorating for Diamonds. This was due to increased intensity at the Diavik Diamond Mine.

## Review of operations

Rio Tinto combined its copper and diamonds businesses in July. At the end of 2016, the integrated Copper & Diamonds group had four copper assets and two diamonds assets in production.

In 2016, both total mined copper and total diamonds production increased by four per cent. The product group produced 523 thousand tonnes of mined copper (Rio Tinto share), and 18 million carats of rough diamonds (Rio Tinto share) in 2016. Copper & Diamonds also produced 294 thousand ounces of mined gold, 4,210 thousand ounces of mined silver and 2.8 thousand tonnes of molybdenum as byproducts. Rio Tinto is now the world's seventh largest copper supplier and remains one of the largest diamond producers.

The Copper & Diamonds group's underlying loss of US\$18 million (compared with underlying earnings of US\$370 million in 2015) was driven by lower prices. This includes US\$114 million of one-off non-cash asset write-downs which concludes the asset portfolio review at Rio Tinto Kennecott. The group generated pre-tax cash cost improvements of US\$278 million in 2016, delivering US\$78 million in free cash flow. All Copper & Diamonds managed operations were cash flow positive in challenging market conditions.

The Bunder diamond project in India was closed down at the end of 2016 and project assets have been approved to be gifted to the State Government of Madhya Pradesh in 2017.

In June 2016, Rio Tinto transferred its 53.8 per cent shareholding Bougainville Copper Limited (BCL) to an independent trustee.

## Operating assets

### Copper

#### Rio Tinto Kennecott

(Rio Tinto: 100 per cent)

Kennecott supplies approximately eight per cent of US refined copper requirements. In 2016, Kennecott produced 156 thousand tonnes of refined copper, 135 thousand ounces of refined gold, and 2.8 thousand tonnes of molybdenum.

Mined copper production in 2016 was significantly higher than 2015 as mining progressed through an area of higher grades.

In addition, the operation maximised smelter utilisation by receipt of 315 thousand tonnes of third-party concentrate for tolling in 2016.

#### Oyu Tolgoi

(Rio Tinto: 50.8 per cent interest in Turquoise Hill Resources)

Located in Mongolia's South Gobi Desert, Oyu Tolgoi is one of the world's largest copper-gold mines. In 2016, Oyu Tolgoi's open-pit mine produced 201 thousand tonnes of copper, 300 thousand ounces of mined gold and 1,420 thousand ounces of silver (100 per cent basis). Mined copper production for 2016 was in line with 2015, as the impact of lower grades was offset by higher throughput, a new record for the mill.

#### Escondida

(Rio Tinto: 30 per cent interest)

Located in Chile's Atacama Desert, Escondida is the world's largest copper-producing mine. In 2016, Escondida produced 1,011 thousand tonnes of mined copper (100 per cent basis). Mined copper production at Escondida in 2016 was 12 per cent below 2015 due to lower grades and slightly reduced mill throughput.

#### Grasberg

(A joint operation that gives Rio Tinto a 40 per cent share of production above specified levels until the end of 2021 and 40 per cent of all production thereafter under the Participation Agreement. This date is subject to extension under certain conditions including force majeure.)

Grasberg is owned and operated by PT Freeport Indonesia (PTFI), a subsidiary of US-based Freeport-McMoRan, Inc. Located in the province of Papua, Indonesia, it is one of the world's largest copper mines. Rio Tinto's share of mined copper production at Grasberg was nil in 2016 due to the minimum production threshold not being met.

On 12 January 2017, the Government of Indonesia issued new mining regulations to address exports of unrefined metals, including copper concentrates, and other matters related to the mining sector. These regulations impact PTFI's operating rights, including its right to continue to export concentrate without restriction, and may have a significant impact on Rio Tinto's share of production in 2017.



PTFI continues to engage with Indonesian government officials and has advised that if it is prohibited from exporting copper concentrate it would be required to reduce production to match domestic smelting capacity, resulting in near-term actions to reduce its workforce, significantly reduce costs and suspend future investments on its underground development projects and new smelter. PTFI has indicated that it will consider legal action to enforce its contractual rights should it fail to reach a mutually satisfactory agreement with the Indonesian government.

## Diamonds

### Argyle Diamond Mine

(Rio Tinto: 100 per cent)

Located in the remote east Kimberley region of Western Australia, Argyle is one of the world's largest producers of diamonds by volume. Ramp-up of production from the underground mine delivered a four per cent increase in carat production compared with 2015. However, the combination of lower-than-expected volumes and prices has led to a pre-tax impairment charge of US\$241 million to property, plant and equipment and intangible assets being recorded.

### Diavik Diamond Mine

(Rio Tinto: 60 per cent)

Diavik is located in Canada's remote Northwest Territories, 220km south of the Arctic Circle. At Diavik, carats recovered in 2016 were four per cent higher than 2015 due to higher ore throughput offsetting lower grades.

## Development projects

### Rio Tinto Kennecott

Through improved utilisation and payload, Kennecott will drive an approximately five per cent improvement in truck productivity, which equates to around 12 million tonnes of additional material moved in 2017.

Kennecott is in the process of executing the South Pushback project, which is key to unlocking the existing ore reserve and potential growth options.

### Grasberg

Work continues to develop the large-scale, high-grade underground orebodies located beneath and proximal to the Grasberg open pit. The underground orebodies are expected to ramp up over several years following the anticipated transition from the Grasberg open pit.

### Oyu Tolgoi

Development of Oyu Tolgoi's underground mine was approved in May 2016, with first production expected in 2020. When the underground is fully ramped up in 2027, the company expects it to produce more than 500,000 tonnes of copper a year.

### Diavik

The development of the A21 kimberlite pipe at Diavik is advancing as planned, with first production expected in 2018. A21 will provide an important source of incremental production to maintain current volumes through to the end of mine life.

### Resolution Copper

(Rio Tinto: 55 per cent)

The Resolution Copper project, located in Arizona, US, is one of the world's largest undeveloped copper deposits. Drilling, proposed development and engineering studies continue and in March 2016, the National Environmental Policy Act (NEPA) process formally began for the proposed development.

## Operational & Technical Support

In 2016, the Copper & Diamonds group formed an Operational & Technical Support team to improve the safety, cash flow and long-term value of its assets by delivering productivity improvements. The team works across Copper & Diamonds' managed and non-managed operations in four disciplines: resource strategy, surface mining, underground mining and ore processing.

## Outlook

### Copper

After reaching multi-year lows in early 2016, the copper market saw an improvement in the fourth quarter of 2016 and this momentum has continued in the first months of 2017. Rio Tinto continues to expect near-term volatility in the copper market before a structural deficit emerges going into the next decade. The Group expects China to continue to be a key driver of commodity markets in the next decade, after which, demand from emerging markets, including India, South East Asia, the Middle East, Latin America and Africa, will begin to ramp up. In the developed world, green technologies should drive increased demand over time. Meanwhile, supply growth will continue to be constrained by lower grades and the depletion of mature mines and often higher cost and more challenging development options.

### Diamonds

The diamond market outlook for 2017 is positive, although macro events, currency movements, policy choices and short-term supply availability will continue to impact market confidence and trading conditions.

However, medium to long-term fundamentals for the diamond industry remain positive. Support for future price growth can be attributable to a declining global mineral resource base, exacerbated by limited exploration investment and success, resulting in reductions in supply over the medium to longer term. Demand in India and China is expected to pick up as market conditions improve. Demand in mature markets is expected to continue to grow in line with GDP growth.

# Energy & Minerals

## Financial performance

	2016 US\$ million	2015 US\$ million
Gross revenue	6,734	7,140
Net cash generated from operating activities	1,431	1,482
Underlying earnings	610	175
Capital expenditure	141	552
Net operating assets	7,283	7,621
Underlying EBITDA	1,803	1,235

Iron Ore Company of Canada and Simandou are reported within Energy & Minerals, reflecting management responsibility.

## Strategy and priorities

The Energy & Minerals product group has an attractive portfolio of high-quality mining, refining and marketing operations and projects that connect customers and consumers around the world with products that enhance their quality of life. Demand growth for industrial minerals typically comes mid-to-late in the economic development cycle, following peak requirements for commodities such as iron ore and copper.

The product group's strategy is focused on operating low-cost, demand-led businesses. Through its integrated marketing strategies and insight, the product group creates and grows global markets for its products to deliver value for Rio Tinto and its shareholders. Energy & Minerals' strategy focuses on:

- Safety as the number one priority.
- Prioritising value over volume.
- Operating demand-led, integrated operations that can respond quickly to the changing external environment.
- Creating and growing global markets through technical research and development and market insight.
- Improving operating performance by driving productivity, reducing costs and streamlining the organisation.
- Strengthening its position in traditional segments and entering attractive new markets.

## Safety

In its pursuit of zero harm, Energy & Minerals continues to focus on fostering a culture of accountability and awareness among employees and improving contractor safety. The product group's health and safety target continues to be on fatality elimination. This has resulted in an emphasis on critical controls and robust process safety, including rolling out and implementing the critical risk management fatality elimination programme across the business. In 2016, there were no fatalities in the product group and a significant reduction in potential fatal incidents. However, the all injury frequency rate rose to 0.47 in 2016 from 0.46 in 2015.

With a workforce spanning multiple geographies, languages and cultures, Energy &

Minerals faces health and safety challenges. Managers use innovative strategies and visible safety leadership to address these and to train the workforce.

## Greenhouse gas emissions

Overall greenhouse gas (GHG) emissions intensity across the product group was marginally higher in 2016 compared with 2015 but still an improvement over 2008 (base year). Rio Tinto Coal Australia's (RTCA) emissions intensity increased to 0.066 tonnes of carbon dioxide equivalent per tonne of coal produced, compared with 0.062 tonnes in 2015.

## Review of operations

The Energy & Minerals product group's underlying earnings of US\$610 million were US\$435 million higher than 2015. This reflected further cash cost improvements and weaker exchange rates while volumes were slightly higher overall. Prices for coal and iron ore were volatile but increased significantly in the second half of the year. This impact was offset by lower prices for uranium, titanium dioxide feedstocks, zircon and borates. Pre-tax cash cost improvements in the product group were US\$342 million and the group has now delivered US\$1.4 billion of cumulative savings compared with the 2012 base.

Net cash generated from operating activities of US\$1,431 million was three per cent lower than in 2015, as the benefit of cash cost savings and weaker exchange rates was offset by the expensing of all Simandou study costs from the start of 2016, and the absence of one-off reductions in working capital achieved in 2015. The decline in capital expenditure reflected continued capital discipline across the product group and the net proceeds from the sale of Mount Pleasant thermal coal assets of US\$192 million. Free cash flow during the year was US\$1,294 million, 40 per cent higher than in 2015.

### Borates

Rio Tinto Borates (Rio Tinto: 100 per cent) supplies over 30 per cent of the world's refined borates from its world-class deposit in Boron, California. It also has borates refineries and/or shipping facilities in China, France, Malaysia, the Netherlands, Spain and the US together with the Jadar lithium-borate project (Rio Tinto: 100 per cent) in Serbia. Rio Tinto Borates production of 503,000 tonnes boric oxide equivalent was six per cent higher than in 2015, driven primarily by higher market demand. Gross revenue of US\$620 million was essentially flat with 2015, and earnings of US\$117 million were 14 per cent higher due to lower costs.

### Coal

In Queensland, Rio Tinto Coal Australia (RTCA) manages the Hail Creek (Rio Tinto: 82 per cent) and Kestrel (Rio Tinto: 80 per cent) coal mines. In New South Wales, RTCA manages Coal & Allied's coal mines, Hunter Valley Operations (Rio Tinto: 67.6 per cent) and the combined

Mount Thorley (Rio Tinto: 80 per cent) and Warkworth (Rio Tinto: 55.57 per cent) operations. On 30 September 2015, Rio Tinto announced a restructure of Coal & Allied which included changes in Rio Tinto's interests in Hunter Valley Operations and, indirectly, in Warkworth. The restructure completed on 3 February 2016 and resulted in Rio Tinto taking a 100 per cent stake in Coal & Allied. The ownership shown above reflects these changes.

Hard coking coal production of 8.1 million tonnes was four per cent higher than in 2015 due to longwall and plant outperformance at Kestrel. Semi-soft coking coal production of 4.1 million tonnes was 12 per cent higher due to mine production sequencing at Hunter Valley Operations and Mount Thorley Warkworth. Thermal coal production of 17.3 million tonnes was seven per cent lower than in 2015 as increased production from Hail Creek, Kestrel and Mount Thorley Warkworth partially offset lower volumes which resulted from the restructure of Coal & Allied and the divestment of Bengalla in early 2016. Revenue fell four per cent to US\$2,634 million as the impact of higher prices and sales volumes was offset by the impact of the Coal & Allied restructure. However, earnings increased from US\$48 million to US\$382 million, driven by higher prices, cash cost savings and favourable exchange rates.

On 30 September 2015, Rio Tinto reached a binding agreement for the sale of its interest in the Bengalla Joint Venture to New Hope Corporation Limited. The sale completed on 1 March 2016 for US\$616.7 million. In January 2016, Rio Tinto signed an agreement for the sale of its Mount Pleasant thermal coal assets to MACH Energy Australia Pty Ltd for US\$220.7 million plus royalties. The sale completed on 5 August 2016. In February 2016, Rio Tinto signed an agreement to sell its 74 per cent interest in Zululand Anthracite Colliery (ZAC), an anthracite coal mine in South Africa, to Menar Holding. The sale completed on 2 September 2016. On 24 January 2017, RTCA declared a significant increase (561 million tonnes) in its managed mineral resources at Mount Thorley Warkworth. This raises total mineral resources, exclusive of run of mine (ROM) reserves, to a total of 6,608 million tonnes. After depletion due to mining, total ROM reserves remain relatively stable at 1,566 million tonnes.

On 24 January 2017, Rio Tinto announced that it had reached a binding agreement for the sale of its wholly owned subsidiary Coal & Allied Industries Limited to Yancoal Australia Limited for up to US\$2.45 billion. The transaction is subject to certain conditions precedent being satisfied, including approvals from the Australian Government, Chinese regulatory agencies, the New South Wales Government and shareholder approval. Subject to all approvals and other conditions precedent being satisfied, it is expected that the transaction will complete in the second half of 2017.

### Iron Ore Company of Canada (IOC)

IOC operates a mine, concentrator and pelletising plant in the Canadian province of Newfoundland and Labrador, together with rail and port facilities in Sept-Îles, Quebec. IOC continued as a supplier of high-quality, premium pellets and high-quality, low contaminant concentrate. The company remains focused on increasing production to nameplate capacity following completion of the Concentrate Expansion Project in 2014 and further increasing productivity. IOC achieved full year production of 10.7 million tonnes of saleable production (concentrate and pellets) (Rio Tinto share), an increase of three per cent over 2015. Revenues were two per cent lower than 2015, however, earnings increased from US\$12 million to US\$64 million, reflecting cash cost savings and favourable exchange rates.

### Iron & Titanium

Rio Tinto Iron & Titanium (RTIT) is the world's largest producer of high-grade titanium dioxide feedstocks. It mines ilmenite at its wholly owned Rio Tinto Fer et Titane (RTFT) operation in Canada, its managed Richards Bay Minerals (RBM) operation in South Africa (Rio Tinto: 74 per cent), and its QIT Madagascar Minerals operation (Rio Tinto: 80 per cent). RTIT produces high-grade titanium dioxide feedstocks at its world-class metallurgical complexes at RTFT and RBM as well as valuable co-products that include high-purity ductile iron, steel billets, metal powders and zircon. At 1 million tonnes, titanium dioxide slag production was four per cent lower in 2016 than in 2015, as RTIT continues to optimise production to match demand. Two of nine furnaces at RTFT and one of four furnaces at RBM are currently idled. RTIT's revenues reduced by ten per cent due to lower sales volumes and prices for titanium dioxide feedstocks, metallic products and zircon. Earnings fell by 26 per cent to US\$86 million.

### Salt

Dampier Salt (Rio Tinto: 68 per cent), the world's largest solar salt exporter, produces industrial salt by solar evaporation of seawater at Dampier and Port Hedland, and from underground brine at Lake MacLeod, all in Western Australia. Salt is sold principally to base chemical industry markets in Asia. Salt production of 5.2 million tonnes (Rio Tinto share) was six per cent lower than in 2015 as a result of lower market demand. Earnings were in line with 2015 at US\$25 million.

### Uranium

The Uranium business comprises Energy Resources of Australia Ltd (ERA, Rio Tinto: 68.4 per cent), which operates the Ranger Mine in the Northern Territory of Australia and Rössing Uranium Limited (Rio Tinto: 68.6 per cent) in Namibia, together with the Roughrider project (Rio Tinto: 100 per cent) in Canada's Athabasca Basin.

Uranium production of 6.3 million pounds (Rio Tinto share) was 29 per cent higher than in 2015 due to increased mill throughput, grade and recovery. Revenues fell four per cent due to lower prices, however, earnings of US\$10 million were US\$52 million more favourable than 2015, including the effect of cash cost savings and lower depreciation at ERA following the impairment recognised in 2015.

### Development projects

The Jadara project in Serbia is a lithium-borate deposit that was discovered by Rio Tinto in 2004. If developed, it could supply a significant proportion of global demand for lithium and borates. Findings so far are encouraging and prefeasibility assessments are ongoing to confirm the economic business case and advance the environmental and socio-economic impact assessments for the project.

Work continued on the feasibility study for the Zulti South mine expansion at RBM, which will maintain low-cost RBM smelting capacity. The group entered into a joint venture with Savannah Resources Plc to conduct further evaluation work on its ilmenite tenements in Mozambique.

Rio Tinto remains in discussion with North Atlantic Potash Inc. (NAPI), a subsidiary of JSC Acron, a world leader in fertiliser production, regarding the optimum development pathway for their exploration joint venture in Saskatchewan, Canada.

Simfer (owned 42.8 per cent indirectly by Rio Tinto) completed the integrated Bankable Feasibility Studies for the mine, rail, port and infrastructure elements of the Simandou iron ore project in May 2016 in accordance with its obligations under the Investment Framework. On 28 October 2016, Rio Tinto and Chinalco signed a non-binding agreement to sell Rio Tinto's entire stake in the Simandou project in Guinea to Chinalco. The Heads of Agreement sets out the proposed principal terms of the sale with the aim of signing a binding agreement within six months. If the sale occurs, Rio Tinto expects to receive payments of US\$1.1-1.3 billion depending on the timing of the development of the project.

### Outlook

Whilst markets remain volatile, the medium to long term outlook continues to be positive across all products as urbanisation and rising standards of living, particularly in China, drive higher levels of demand.

Last year saw dramatic changes in the supply and demand balance driving spot prices for both thermal and metallurgical coal from very low levels early in 2016, to short-term record highs in November. The changing market dynamics were primarily driven by Chinese policies which are likely to continue to affect coal markets in the short to medium term. Even though market prices are at higher levels for both thermal and metallurgical coal, producers remain wary as potential exists for pricing to revert to levels seen in late 2015 and early 2016.

Uranium prices fell through the latter half of 2016, due to lacklustre demand growth and oversupply. Demand outlook was muted as Japan made slow progress restarting its offline reactors, additional reactor closures were announced in the US, and no new Chinese reactors were approved in 2016. Strong uranium production and surplus secondary material have exacerbated the price weakness and it will likely take some time for the market to rebalance and prices to recover.

Even though titanium dioxide market conditions remained challenging in 2016, there are signs of improving demand fundamentals with excess titanium dioxide pigment and feedstock inventories across the supply chain starting to normalise and pigment prices rising, albeit with ongoing latent capacity in the feedstock market. In response to the challenging market, RTIT has taken action at a number of its operations, including flexing production capacity to align with demand, optimising working capital, and structural cost reductions. In the medium to long term, demand for titanium dioxide feedstock is expected to grow, in line with improving global economic conditions, urbanisation and demand growth in emerging markets, supported by rising per capita incomes.

Long-term borate sector fundamentals remain attractive. Near-term demand is stable, with North American housing-related sectors and global glass and agricultural demand performing well. Rio Tinto Borates is focused upon increasing refined borate capacity to meet above-GDP global demand growth while improving safety performance and its cost position.

# Growth & Innovation

Growth & Innovation was formed in July 2016, bringing together Exploration and Technology & Innovation. It supports Rio Tinto's assets in achieving superior performance throughout their life cycle, to ensure the Group is managing risk effectively and generating maximum cash. Growth & Innovation partners with the Rio Tinto product groups to optimise value from the time of the initial exploration concept through to closure of a mine or processing facility.

## Strategy and priorities

Growth & Innovation is accountable for finding, evaluating, developing and optimising assets so they are safe, productive and profitable. Centralised technical knowledge and experience enable Growth & Innovation to deliver portfolio growth effectively, drive innovative solutions to operational and business challenges and provide support for quality decision-making.

Safety is the number one priority. Growth & Innovation works with and through the product groups to deliver results in line with the Rio Tinto strategy in the following areas:

- Finding: exploring, discovering or acquiring new Tier 1 resources.
- Evaluating: ensuring the right projects proceed with the optimal business case.
- Developing: delivering major capital projects safely and efficiently, on time, on budget and ready for a seamless handover to operations.
- Optimising: leading a step change in Group productivity as well as providing technical services to operations, replicating best practice, building technical capability, managing strategic technical risk and overseeing the Group's innovation and automation platforms.

## Safety

In 2016, Growth & Innovation achieved a fatality free year. The all injury frequency rate was 0.57 against 0.44 in 2015. Exploration achieved excellent results with four months injury free from September. However, Rio Tinto Projects reported a disappointing all injury frequency rate of 0.66 compared with 0.46 in 2015.

During 2016, the focus on fatality prevention continued in Growth & Innovation with further implementation and embedding of the critical risk management programme. Exploration completed five successful pilots of critical risk management and the programme will be rolled out across all of Exploration in 2017. The Projects team continued embedding the critical risk management fatality elimination programme, reporting high levels of leader engagement and consistently identifying opportunities to strengthen critical controls for fatality risks.

Growth & Innovation continued to build capability and improve the management of

major hazard risks across the Group.

## Performance

### Exploration

Exploration creates value for Rio Tinto by discovering or acquiring well-located, high-grade Tier 1 resources. Its work includes both greenfield exploration to identify completely new business opportunities and brownfield exploration to sustain or grow existing Rio Tinto businesses. Exploration also provides orebody knowledge and resource evaluation support to a range of projects within the company as well as potential acquisitions.

Increasingly complex community, sustainability and investment requirements mean it typically takes more than a decade to progress from initial exploration through to discovery, evaluation and then to a final development decision. Exploration's comprehensive approach to stakeholder and community engagement contributes to the Group's social licence to operate. Rio Tinto has continued to invest in exploration despite the difficult market conditions of the last few years. Maintaining this core exploration capability and applying a rigorous prioritisation process have consistently delivered Tier 1 discoveries, which in the last ten years include:

Year	Discovery	Commodity	Location
2008	Sulawesi	Nickel	Indonesia
2008	Mutamba	Titanium	Mozambique
2009	Jadar	Lithium/ borates	Serbia
2011	Amargosa	Bauxite	Brazil
2013	KP405	Potash	Canada
2014	Yandi Braid	Iron ore	Australia
2015	Mount Thorley Warkworth/ Hunter Valley	Coking coal	Australia

At the end of 2016, the Exploration group was active in 14 countries and continued to assess opportunities across a range of commodities including copper, nickel, iron ore, bauxite, coking coal, uranium, diamonds and mineral sands. During the year, Exploration increased its commercial activity, establishing joint ventures in the US, Chile, Serbia, Kazakhstan, Canada, Mexico, Papua New Guinea and Australia. Divestment activities continued for projects that do not meet Rio Tinto's investment criteria, reinforcing the approach of treating Exploration like a business. In the past decade the Group has spent around US\$1.7 billion on greenfield exploration and in turn generated US\$2.2 billion from divestments of exploration projects that the company decided did not meet these criteria.

In 2016, the Group reduced its exploration and evaluation expenditure to US\$497 million<sup>(a)</sup>. This represented a 14 per cent decrease compared with 2015 expenditure of US\$576 million. Of the 2016 spend,

US\$206 million relates to centrally controlled exploration and evaluation activity. In total, Rio Tinto's 2016 exploration and evaluation activity covered eight commodities across a range of greenfield and brownfield environments. In recent years, Rio Tinto has shifted the emphasis of Exploration expenditure to projects in the OECD and Peru in line with the increasing focus on copper exploration.

At the Roughrider uranium project in Saskatchewan, orebody knowledge continued to progress, with resource modelling, drilling activities and identification of new exploration targets. At the Sanxai bauxite project in Laos, ongoing exploration improved understanding of resource quality, while infrastructure studies continued to assess options for moving future ore to a suitable port for export. At the La Granja copper project in Peru ongoing orebody knowledge and brownfield exploration progressed with drill testing of new geophysical and geochemical targets within the orbit. At the Tamarack nickel project in the US, drilling and exploration activities continued, providing greater confidence in resource quality. Brownfield projects again generated good drilling results at iron ore projects in the Pilbara and for bauxite in the Weipa region in Australia. In 2016, the five year exploration partnership with Chinalco in China concluded. Exploration retains a presence in the country to monitor exploration opportunities and options for future partnerships.

### Evaluation

Discoveries that align to company strategy progress to evaluation to ensure "the right project" is undertaken. Business objectives of investment returns are balanced with technical and resource certainty and stakeholder requirements to manage overall project risk. The goal is to minimise uncertainty associated with the resource and to develop the optimal technical solutions using proven methods or new innovation to bring the project to market.

In collaboration with business units, Growth & Innovation applies a range of strategic planning processes and expertise to identify, analyse and select the optimal configuration and timing of greenfield and brownfield projects. During the year, this support was provided to projects in the Aluminium and Copper & Diamonds product groups.

In 2016, extensive work was also done on a pilot process for the Jadar project to enable production of both borates and lithium from the newly discovered mineral jadarite. At Oyu Tolgoi, the Group's experience in block caving enabled more efficient mine design, to enhance productivity and safety.

(a) An additional US\$21 million gain on disposal of undeveloped evaluation projects was recorded separately in profit/(loss) relating to interest in undeveloped projects in the income statement.



To maximise value, Growth & Innovation looks beyond the technical solution, reviewing capital intensity and project timing to ensure all aspects of each project are optimised. The Amrun bauxite and Silvergrass iron ore projects in Australia benefited from these reviews in 2016.

Engagement with a broad range of stakeholders during evaluation protects and enhances our licence to operate. The enduring relationships built during exploration and evaluation are essential to future operational success.

The Group's major evaluation projects in 2016 were:

Project	Commodity	Country
La Granja	Copper	Peru
Resolution	Copper	US
Pilbara	Iron ore	Australia
Bowen Basin	Coking coal	Australia
Zulti South	Mineral sands	South Africa
Jadar	Lithium/borates	Serbia
Simandou	Iron ore	Guinea
Weipa	Bauxite	Australia

## Projects

Rio Tinto has a central major capital projects team that uses standardised project management systems and processes to deliver projects safely and efficiently, on time and on budget and ready for a seamless handover to operations upon completion.

In 2016, the US\$1.9 billion Amrun bauxite project in the Weipa region in Australia advanced to schedule in both engineering and construction. All major contracts have been committed as planned, and site establishment continued with the construction of the accommodation village progressing to plan. The 40 kilometre main access road was completed in December and the river terminals are expected to be operational in Q1 2017.

In 2016, the Oyu Tolgoi underground project ramped up significantly. More than 2,800 personnel were mobilised, with 87 per cent of these Mongolian nationals. Works on underground mine development, the accommodation camp, conveyor to surface decline, sinking of shaft #2 and shaft #5, and critical facilities continue to progress.

During the year, a range of projects were completed in the Pilbara for the Iron Ore business including Cape Lambert Port B, the Pilbara Fuel Infrastructure project, Yandi Billiard South and phase two of the Nammuldi Incremental Tonnes project, which was delivered in October. The Silvergrass project commenced and is on schedule to be completed in 2017, increasing the Nammuldi operation by ten million tonnes per annum by adding a primary crushing facility and nine kilometres of overland conveying system to integrate with the existing processing plant.

The Yandicoogina Oxbow project progressed in 2016. Upon completion it will sustain Yandicoogina fines production by opening access to a new orebody. Construction is more than 50 per cent complete and three months ahead of the construction plan. Construction of the Cape Lambert 80 megawatt gas-fired power station is ahead of plan – 70 per cent complete at the end of 2016 with planned completion in Q1 2018.

Following delays to the project schedule due to software issues in early 2016, the AutoHaul® project regained stability in the second half of 2016 with improved reliability, and all relevant parts of the rail network are now enabled for autonomous trains. In 2017, the AutoHaul® trains will operate extensively in automated mode, with a driver on board until all safety and reliability systems are thoroughly demonstrated.

In 2016, the Holden Environmental Remediation project was completed and received the 2015 Environmental Excellence Award from the American Exploration & Mining Association for cleaning up the historic site in Washington State in the US. The East Waste Rock Extension project at Kennecott was also completed in 2016.

## Productivity and innovation

In 2016, Rio Tinto committed to a target of US\$5 billion of free cash flow from mine-to-market productivity improvements over the next five years. Growth & Innovation will lead this step change in productivity and technical excellence across the Group, building upon the cost reduction and transformation achievements of the businesses to deliver further sustainable gains.

The productivity remit in Rio Tinto has multiple streams including mining, processing, infrastructure and asset management. In 2016, the focus was on replication of leading practice, progressing integrated operations and commencing redesign of the value chain.

All work in this space is underpinned by a technical excellence programme to ensure improvements are sustainable.

Rio Tinto continues to progress its Mine of the Future™ automation and innovation programme, leveraging a partnership with the University of Sydney to deliver innovative tools to support Rio Tinto operations in the delivery of improved productivity. The Mine Automation System (MAS) and RTVis™ orebody visualisation software is now implemented at 85 per cent of surface mining sites, helping operators in the field make better real-time decisions as well as supporting longer-term work like mine planning.

## Outlook

In Exploration, challenges are expected to continue in relation to timely access to ground and the decreasing grade and quality of potential orebodies. For 2017, exploration projects at a more advanced stage are listed in the table at the base of the page.

In project evaluation and development, work will continue to deliver priority Group projects on schedule and on budget including Amrun, Silvergrass, the Oyu Tolgoi underground and AutoHaul® projects as well as the progression of studies for the Jadar project in Serbia.

The productivity programme will gain momentum in 2017 in pursuit of savings targets, driving improvements in key metrics like effective utilisation of plant and equipment, payload, maintenance intervals and processing rates. The Group's approach to integrated operations will be advanced, to leverage a wealth of real-time data to enable quicker and better decision making across the whole value chain. Work will also continue to centralise technical expertise to better support operational performance and problem solving.

In 2017, a centre of excellence for underground mining will be progressed to support Oyu Tolgoi as well as future Rio Tinto underground mine developments, such as Resolution in the US.

## 2017 exploration projects

Project	Commodity	Country	Type	Stage
Tamarack	Nickel	US	Greenfield	Project of Merit
Roughrider	Uranium	Canada	Greenfield	Order of Magnitude
Sanxai	Bauxite	Laos	Greenfield	Project of Merit
Stargrove	Diamonds	Canada	Greenfield	Project of Merit
La Granja orbit	Copper	Peru	Greenfield	Project of Merit
Pilbara	Iron ore	Australia	Brownfield	Project of Merit
Weipa	Bauxite	Australia	Brownfield	Project of Merit



# Five year review

## Selected financial data

The selected consolidated financial information below has been derived from the historical audited consolidated financial statements of the Rio Tinto Group. The selected consolidated financial data should be read in conjunction with, and qualified in their entirety by reference to, the 2016 financial statements and notes thereto. The financial statements as included on pages 110 to 194 have been prepared in accordance with IFRS as defined in note 1.

### Rio Tinto Group

#### Income statement data

For the years ended 31 December Amounts in accordance with IFRS	2016 US\$m	2015 US\$m	2014 US\$m	2013 US\$m	2012 US\$m
Consolidated sales revenue	33,781	34,829	47,664	51,171	50,942
Group operating profit/(loss) <sup>(a)</sup>	6,795	3,615	11,346	7,430	(1,925)
Profit/(loss) for the year from continuing operations	4,776	(1,719)	6,499	1,079	(3,020)
Loss after tax from discontinued operations	–	–	–	–	(7)
Profit/(loss) for the year	4,776	(1,719)	6,499	1,079	(3,027)
Basic earnings/(losses) per share <sup>(b)</sup>					
– From continuing operations (US cents)	256.9	(47.5)	353.1	198.4	(163.4)
– From discontinued operations (US cents)	–	–	–	–	(0.4)
Basic earnings/(losses) for the year per share (US cents)	256.9	(47.5)	353.1	198.4	(163.8)
Diluted earnings/(losses) per share <sup>(b)</sup>					
– Profit/(loss) from continuing operations (US cents)	255.3	(47.5)	351.2	197.3	(163.4)
– Loss after tax from discontinued operations (US cents)	–	–	–	–	(0.4)
Diluted earnings/(losses) for the year per share (US cents)	255.3	(47.5)	351.2	197.3	(163.8)
<b>Dividends per share</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>2012</b>
Dividends declared in respect of the year					
US cents					
– interim	45.0	107.5	96.0	83.5	72.5
– final	125.0	107.5	119.0	108.5	94.5
UK pence					
– interim	33.80	68.92	56.9	54.3	46.4
– final	100.56	74.21	78.0	65.8	60.3
Australian cents					
– interim	59.13	144.91	103.1	93.0	68.5
– final	163.62	151.89	153.0	120.14	91.7
Dividends paid during the year (US cents)					
– ordinary	152.5	226.5	204.5	178.0	163.5
Weighted average number of shares – basic (millions)	1,797.3	1,824.7	1,848.4	1,847.3	1,849.1
Weighted average number of shares – diluted (millions) <sup>(b)</sup>	1,808.6	1,824.7	1,858.7	1,857.7	1,849.1

#### Balance sheet data

at 31 December Amounts in accordance with IFRS	2016 US\$m	2015 US\$m	2014 US\$m	2013 US\$m	2012 US\$m
Total assets	89,263	91,564	107,827	111,025	118,437
Share capital/premium	8,443	8,474	9,053	9,410	10,189
Total equity/net assets	45,730	44,128	54,594	53,502	57,740
Equity attributable to owners of Rio Tinto	39,290	37,349	46,285	45,886	46,553

(a) Group operating profit or loss includes the effects of charges and reversals resulting from impairments (other than impairments of equity accounted units) and profit and loss on disposals of interests in businesses. Group operating loss or profit amounts shown above excludes equity accounted operations, finance items, tax and discontinued operations.

(b) The effects of dilutive securities has not been taken into account when calculating diluted loss per share for the years ended 31 December 2015 and 2012, in accordance with IAS 33 "Earnings Per Share".

# Summary Remuneration Report: Annual statement by Remuneration Committee chairman

## Dear shareholders

On behalf of the board, I am pleased to introduce our 2016 directors' remuneration report (the Remuneration Report), for which we seek your support at our annual general meetings (AGMs), in London in April, and in Sydney in May.

The Remuneration Report is designed to demonstrate the link between the Group's strategy, its performance, and the remuneration outcomes for our executives, particularly the executive directors.

Rio Tinto takes a long-term approach to its activities. This means that we concentrate on developing long-life, low-cost, expandable operations, that are capable of providing attractive returns to our shareholders throughout the cycle. Our executives' performance objectives are set accordingly.

The Remuneration Report has been prepared in accordance with applicable legislation and corporate governance guidance in the UK and Australia. Australian legislation requires disclosures in respect of "key management personnel", being those persons having authority and responsibility for planning, directing and controlling the activities of the Group. The key management personnel are, in addition to the directors, the non-director members of the Executive Committee. The Executive Committee comprises the executive directors, product group chief executives and Group executives. Throughout this Remuneration Report, the members of the Executive Committee are collectively referred to as "executives". They are listed on pages 53 and 54, with details of the positions held during the year and dates of appointment to those roles.

Shareholders will be aware that we have to comply with UK and Australian legislation in the remuneration arena and that the rules differ. We have structured the voting arrangements such that all shareholders vote on both the resolutions that we are putting to our AGMs.

This Remuneration Report is divided into two parts: the statement of remuneration policy, which summarises our policies and practices (the Remuneration Policy); and the annual report on remuneration, which shows how the Remuneration Policy has been applied (the Implementation Report).

The Remuneration Policy was subject to a binding vote for UK law purposes in 2015 and became effective in respect of payments to directors from 7 May 2015. Minor changes were made to the Remuneration Policy included in the 2015 Annual report; these did not require shareholder approval. A version of the Remuneration Policy which highlights these changes can be found on our website. There will be no vote this year for UK law purposes on the Remuneration Policy. It is our intention that the Remuneration Policy will

next be put before shareholders for a vote, for UK law purposes, at our AGMs in 2018.

The Implementation Report (including this statement) is subject to an advisory vote for UK law purposes. The Remuneration Report as a whole is subject to an advisory vote for Australian law purposes. Both resolutions are to be voted on at the AGMs as Joint Decision Matters by Rio Tinto plc and Rio Tinto Limited shareholders.

Although, as a matter of UK law, the Remuneration Policy only applies to the remuneration of our directors, it is the intention of the Remuneration Committee ("the Committee") that its broad policy principles will continue to inform the way in which our non-director key management personnel on the Executive Committee are remunerated.

The Remuneration Policy describes, among other things: our executive remuneration structure; the details of the discretions available to the Committee; our approach to remuneration on recruitment; the details of executives' service contracts; and how we treat leavers.

Remuneration for executives comprises fixed compensation in the form of base salary; participation in a pension plan, superannuation fund and/or a cash allowance to contribute to a pension fund; the receipt of certain benefits; and performance-related remuneration. Each element is described in the Remuneration Policy. The majority of the remuneration of executives will normally be performance related, which is provided in the form of variable short and long-term incentives, weighted towards the long-term and delivered in Rio Tinto shares.

In relation to the short-term incentive plan (STIP), the Committee each year sets performance criteria relative to three benchmarks: "threshold", "target" and "outstanding". "Target" performance is intended to be stretching, and is typically equivalent to the business plan for the year.

Our approach to the disclosure of measures, weightings and targets remains unchanged. In relation to the long-term incentive plan (LTIP), these will all be disclosed in advance, at the beginning of each five-year performance period. In relation to the STIP, we will, when it comes to disclosure, distinguish between safety goals and financial and individual goals. In the area of safety goals, we will continue to disclose the measures, weightings and targets at the beginning of each year. In the area of financial and individual goals, we will continue to disclose, at the beginning of each year, the measures and weightings only, because we regard the targets as commercially sensitive. However, as we said in the Remuneration Report last year, we intended to disclose, and have in the Implementation Report disclosed, the targets and outcomes for 2016 retrospectively. In the rare instances where this may not be prudent on grounds of commercial

sensitivity, I will seek to explain why, and give an indication of when they would be disclosed.

The chart on page 92 demonstrates the usual timeframe for the delivery of the components of remuneration, using 2016 as an example. This emphasises the long-term nature of our remuneration arrangements.

You will see several mechanisms in the Remuneration Report that are intended to create alignment of interest between shareholders and executives. We have, for our executives, a mandatory conversion of 50 per cent of any annual short-term bonus payment into shares, with vesting deferred for three years. The performance measures under our long-term remuneration plans are structured to support and incentivise the creation of long-term shareholder value. In addition, should circumstances warrant, we have reserved to the Committee such discretions as enable it to safeguard against the return experience of shareholders being materially misaligned with the reward experience of executives. Because we want their remuneration outcomes properly to reflect the Group's overall performance. We also have meaningful share ownership requirements for our executives which are described in the Implementation Report.

There are many examples in the Remuneration Policy and practice of how our dialogue with shareholders has influenced the Committee's decisions. In 2013, we added a new performance measure to our Performance Share Plan (PSP), namely the relative EBIT margin improvement measure. We did this because many of our owners had expressed a wish that our PSP should incorporate some diversification beyond total shareholder return (TSR). We extended the performance period of the PSP from four to five years and we materially reduced the pay-out for "threshold" performance. We ceased new awards under our Share Option Plan. We have adjusted the safety measures in our STIP targets to reflect lost time injuries and all injury frequency rates. In addition, from and including 2016, we included performance metrics relating to a key programme to support our goal of fatality elimination, called critical risk management (CRM), which is described in more detail on page 26.

Our meetings with shareholders in 2016 were well attended and provided an opportunity for me to discuss remuneration related topics with our owners. I look forward to continuing that dialogue during 2017 as we prepare to present our refreshed Remuneration Policy to shareholders at the 2018 AGM.

## 2017 decisions

In his letter, the chairman of the board has provided context to the issues arising from the Simandou project. The board has determined that it would be inappropriate, while investigations are ongoing, to make any determination about Sam Walsh, our former

# Summary Remuneration Report: Annual statement by the Remuneration Committee chairman continued

chief executive, or about his outstanding remuneration. The company has therefore reached an agreement with Sam to defer the payment of his 2016 STIP award and all remaining unvested LTIP awards (including BDP and PSP awards) for a minimum of two years. Further details of these arrangements are described in the Implementation Report.

There will be no annual salary increases for the chief executive or for the newly appointed members of the Executive Committee. Consistent with the prior practice, annual salary increases for other executives are in line with the base salary budgets applying to the broader employee population.

For 2017, the STIP measures and opportunities for executives remain weighted 50 per cent for financial, 30 per cent for individual and 20 per cent for safety measures. The Group financial targets relate to earnings and free cash flow. The individual targets cover objectives directly relating to the five strategic priorities, described on page 9. These include safety, cash, license to operate, people and growth, together with an assessment of broader leadership capability and contribution. The 2017 safety measures, weightings and targets are fully disclosed on page 91. The financial measures and weightings are also described on page 89. We expect to describe the 2017 financial and individual targets retrospectively in the 2017 Implementation Report.

The level of LTIP awards to be granted to executives in March 2017, as a percentage of base salary, will be broadly equivalent to those made in 2016. Consistent with our practice since 1998, the awards made under the LTIP are calculated using the average share price over the previous calendar year. As such, the awards granted in 2017 will be calculated using the 2016 average share prices of £23.352 and A\$48.533 respectively. These prices are below the current share price as at the end of February 2017. When we made the awards last year, the reverse was true. The level of the average price compared to the current price has an impact on the number of shares contained within an LTIP award. Our decision to use average prices over the year, rather than spot prices, is intended to subdue the reward consequences of share price volatility.

The performance conditions for the 2017 PSP awards are outlined in the Implementation Report. The 2017 comparator group for the EBIT margin measure remains unchanged from 2016 although Alcoa's membership will be subject to future review following its recent demerger.

## 2016 performance and remuneration

On pages 80 and 82 of this Report, we retrospectively disclose the financial and individual targets for our Short Term Incentive Plan (STIP), set by the board for 2016. I won't repeat here the details of performance against targets, save to say that, in the main, targets were exceeded, especially when looking at the financial targets on an "unflexed" basis. I talk

later in this statement about 2016 remuneration outcomes, and I describe our "flexing" policy in relation to the STIP. This is designed to subdue the reward consequences of significant foreign exchange and commodity price volatility.

I know that shareholders expect to see strong alignment between the value of their own shareholdings and the wealth of executives. The remuneration outcomes shown in the single total figure of remuneration testify clearly to this alignment. Fifty per cent of the annual STIP awards are deferred into shares (through the Bonus Deferral Plan (BDP)) for three years, specifically to ensure that a material proportion of short-term pay is exposed over the medium term to fluctuations in our share price.

The single total figure of remuneration is of understandable interest to shareholders, so let me comment on it. The picture is somewhat complicated in this year's report because of the retirement of our previous chief executive, Sam Walsh, at the beginning of July, and his succession by Jean-Sébastien Jacques. Jean-Sébastien's base pay and variable pay arrangements are at a similar level to his predecessor's, using three-year average exchange rates. However, our new chief executive does not receive the expatriate benefits provided to his predecessor. If we compare the chief executive's total single figure of remuneration for 2016 with the equivalent figure for last year, it is lower, because Jean-Sébastien was paid as a deputy chief executive and product group chief executive for the first half of 2016. If we compare Jean-Sébastien's single figure for 2016 compared to 2015, it is higher because his base pay and variable pay increased upon his appointment as chief executive.

The single total figure of remuneration for the chief financial officer, Chris Lynch, is higher in 2016 due mainly to the LTIP awards vesting in 2016, this being the first vesting of such awards following his appointment to the Executive Committee in April 2013.

## Short Term Incentive Plan (STIP)

The 2016 STIP awards for both executive directors are higher than last year (although in the case of Jean-Sébastien, this comparison is distorted by what I described above), reflecting performance against stretching safety, financial and individual targets. I will talk in a moment about the aggregate STIP financial result, but before that I will talk about the 2016 safety performance.

## STIP – Safety

Our safety performance continues to improve year on year, but the challenge to do better remains. In June 2016, a colleague died at Paraburdoo, our iron ore operation in Western Australia. Our Critical Risk Management (CRM) programme is designed to prevent fatalities in the future – this is our most important safety goal. Encouragingly, we saw some solid

learnings and improvements in 2016, starting the rollout of CRM at every site, with leaders recording more than 1.3 million verifications, and we introduced new procedures to make our rail networks safer.

Looking at achievement against our 2016 safety STIP targets, the Group's all injury frequency rate remained unchanged at 0.44 for 2016 which was the Group's "threshold" target (set at the 2015 AIFR outcome). There were 206 lost time injuries in 2016 compared with 220 in 2015. This was above the level set for "threshold" performance for the Group, and just below the level set for "target", of 202 lost time injuries. Performance against the CRM measures was between "target" and "outstanding". This has led to a total safety outcome for the Group of 106 per cent (out of 200 per cent).

However, reductions were applied to the safety performance component of the STIP where a fatality occurred. For example, the safety result for the chief executive was reduced from 106 per cent to 85 per cent due to the impact of the Paraburdoo fatality. This was driven by a 25 percent reduction for the period from the chief executive's appointment as deputy chief executive effective 17 March 2016, leading to an overall reduction of 20 percent for the year. Such adjustments reflect the level of oversight which the chief executive and other executives had for safety leadership during the year. There were also safety related downward adjustments to the remuneration of the chief financial officer and of certain other executives.

## STIP – Financial

To remind you, in considering financial performance against the annual plan, we measure half against the original plan; the other half is "flexed" to exclude the impact of fluctuations in exchange rates, and quoted metal and other prices during the year, which are outside management's control. We have used this approach consistently since 2005 for measuring our earnings performance, and have flexed the cash flow outcomes since the introduction of this measure in the STIP in 2009. When commodity prices rise, or there are favourable exchange rate variations, we protect shareholders by ensuring that 50 per cent of the STIP opportunity (as it relates to financial performance) is denied the benefit of that rise. When the reverse happens, and commodity prices fall or there are negative exchange rate variations, that STIP opportunity is safeguarded (as to 50 per cent) against the fall. Our view is that this approach maintains appropriate incentive for executives, even in times of significant earnings volatility.

In terms of achievement against our 2016 financial STIP targets, the Committee determined that the "outstanding" level for underlying "unflexed" earnings and free cash flow set by the board was exceeded. The "flexed" earnings free cash flow targets were also exceeded. It is worth noting that the targets were set in early 2016 when there was a subdued outlook for commodity prices. For

example, iron ore prices started 2016 at US\$43 per tonne and ended the year around US\$80 per tonne. Shareholders too benefited from the unexpected increase in commodity prices, particularly in the second half of the year, because this created higher profits for the year than were signaled by consensus estimates in January 2016, with the commensurate strengthening in share price and the level of dividend payments. A significant contribution to the achievement of the “flexed” targets was driven by meeting and exceeding challenging cost savings and productivity targets.

Taking all these points into consideration, the Committee determined that the STIP financial result for 2016 should be 166 per cent out of a maximum of 200 per cent. This was after certain minor adjustments to the targets in 2016 to take account of events outside management’s control and to ensure a like-for-like comparison. The financial result before adjustments made by the Committee was 167 per cent.

#### Long Term Incentive Plan

Turning to the LTIP, the PSP awards granted in 2013 have three performance metrics – TSR relative to the Euromoney Global Mining Index, TSR relative to the MSCI World Index and improvement in EBIT margin relative to global mining comparators (weighted one third each). Once again, I believe that the award outcome clearly demonstrates that our decision some years ago to have the two TSR indices operate alongside each other has protected shareholders against windfall gains for

executives. For while our TSR against the Mining Index demonstrated outperformance, we underperformed against the MSCI. The outcome against the TSR measures, which is explained in the Implementation Report, was an award of 24.67 per cent out of a potential 66.67 per cent. The Committee gave consideration to the Group’s overall performance during the four-year performance period and concluded that the vesting of awards, based upon the achievement of the TSR measures, was justified and, by consequence, this portion of the award vested on 20 February 2017.

The estimated performance against the EBIT margin measure is that Rio Tinto ranked no.2 against the comparator group of eleven, which would result in a vesting of 100 percent for this measure (33.33 per cent of the total award). We can only provide an estimate at this time as we do not have the reported data for all the comparator companies. The overall estimated vesting for the award when the TSR and EBIT margin portions are combined is therefore 58.0 per cent. The Committee will make a definitive assessment against the improvement in EBIT margin measure when the details of the margin performance of the comparator group companies become available in May 2017 and if applicable, this portion of the award would vest on 31 May 2017.

There were a number of changes to the Group’s Executive Committee during 2016, all of which have previously been announced. The details of the retirement of the former chief

executive are included on page 87. The appointment and departure terms for other executives are included in the relevant sections of the Implementation Report. These include the severance terms for Alan Davies and Debra Valentine. The terms in all cases are compliant with our Remuneration Policy and with precedent.

The Company continues to monitor gender pay and is satisfied that awards made between male and female employees demonstrate equality.

#### Governance and owners’ views

It continues to be our intention to be alert to evolving best practice as well as to the views and guidance given to us in the conversations we have with our owners. The Committee reaffirms its commitment to keep under review the level of vesting for “threshold” performance under the PSP. We are committed to a continuing dialogue, including listening to views about this report, which are most welcome.

Yours sincerely,



**John Varley**  
Remuneration Committee chairman

References to page numbers in this letter and the pages following are references to relevant page numbers in the 2016 Annual Report. This is available online at [riotinto.com/ar2016](http://riotinto.com/ar2016).



# Remuneration Summary – Single total figure of remuneration

The table below provides the single total figure of remuneration for each individual who acted as an executive director during 2016, with appropriate prior year comparison figures, in accordance with the UK legislation. The amounts in this table are stated in currency of actual payment. This is in addition to the Australian statutory disclosure requirements set out in US dollars in Table 1a on pages 98 and 99 of the 2016 Annual report which include theoretical accounting values relating to various parts of the remuneration packages, most notably LTIP arrangements.

	Jean-Sébastien Jacques (£)			Chris Lynch (£)		
	2016	2015	2014	2016	2015	2014
Base salary paid <sup>(a)</sup>	887	546	500	836	834	817
STIP payment – cash	732	465	394	717	690	746
STIP payment – deferred shares <sup>(b)</sup>	732	465	395	718	690	746
Total short-term pay	2,351	1,476	1,289	2,271	2,214	2,309
Value of LTIP awards vesting <sup>(c)</sup>	501	58	350	1,016	0	0
Pension <sup>(d)</sup>	225	130	117	209	208	204
Other benefits <sup>(e)</sup>	43	31	31	144	151	107
Single total figure of remuneration	3,120	1,695	1,787	3,640	2,573	2,620
Percentage change in total remuneration (2016 versus 2015; 2015 versus 2014)	84.1%	(5.1%)		41.5%	(1.8%)	
Percentage of total remuneration provided as performance-related pay (STIP and LTIP)	63.0%	58.3%	63.7%	67.3%	53.6%	56.9%
Percentage of total remuneration provided as non-performance-related pay (base salary, pension and other benefits)	37.0%	41.7%	36.3%	32.7%	46.4%	43.1%
Percentage of maximum STIP awarded <sup>(f)</sup>	82.4%	84.0%	77.0%	85.8%	82.5%	91.0%
Percentage of maximum STIP forfeited	17.6%	16.0%	23.0%	14.2%	17.5%	9.0%
Percentage of target STIP awarded	139.9%	168.1%	154.0%	143.0%	137.5%	151.7%
Percentage of PSP award vesting <sup>(g)</sup>	58.0%	65.4%	–	58.0%	–	–
Percentage SOP award vesting <sup>(g)</sup>	–	–	–	–	–	–

	Sam Walsh (A\$)		
	2016	2015	2014
Base salary paid <sup>(a)</sup>	1,004	1,985	1,940
STIP payment – cash	–	1,631	1,721
STIP payment – deferred shares <sup>(b)</sup>	–	1,632	1,721
Total short-term pay	1,004	5,248	5,382
Value of LTIP awards vesting <sup>(c)</sup>	–	2,076	3,161
Superannuation <sup>(d)</sup>	232	600	903
Other benefits <sup>(e)</sup>	421	1,217	1,030
Single total figure of remuneration	1,657	9,141	10,476
Percentage change in total remuneration (2016 versus 2015; 2015 versus 2014)	(81.9%)	(12.7%)	
Percentage of total remuneration provided as performance-related pay (STIP and LTIP)	0%	58.4%	63.0%
Percentage of total remuneration provided as non-performance-related pay (base salary, pension and other benefits)	100%	41.6%	37.0%
Percentage of maximum STIP awarded <sup>(f)</sup>	–	81.9%	88.4%
Percentage of maximum STIP forfeited	–	18.1%	11.6%
Percentage of target STIP awarded	–	136.5%	147.3%
Percentage of PSP award vesting	–	65.4%	73.5%
Percentage SOP award vesting	–	–	–

(a) Salaries are generally reviewed with effect from 1 March. For Jean-Sébastien Jacques the amount indicates the salary paid in the financial year to 31 December. Jean-Sébastien did not receive a salary increase effective 1 March 2016. However, in 2016 Jean-Sébastien's base salary was increased from £553,300 to £800,000 on appointment as deputy chief executive with effect from 17 March 2016 and increased to £1,080,000 on appointment as chief executive with effect from 2 July 2016. The salary and single figure of remuneration for 2015 and 2014 relate to his positions as chief executive, Copper & Coal for the period 1 March 2015 to 31 December 2015 and as chief executive, Copper for the period 1 January 2014 to 28 February 2015. For Chris Lynch and Sam Walsh the amounts indicate the salaries paid in the financial year to 31 December. Neither Chris nor Sam received a salary increase effective 1 March 2016.

(b) Value of STIP deferred under the BDP, the vesting of which is subject to the Plan rules. For Sam Walsh the 2016 STIP award is subject to the deferral agreement explained in the Implementation Report.

(c) For Jean-Sébastien Jacques and Chris Lynch this is based on the estimated value of the LTIP awards, including dividend shares where applicable, which vested on 20 February 2017 (TSR portion) and which are anticipated to vest at 31 May 2017 (EBIT margin portion) for the performance period that ended 31 December 2016 and the LTIP awards which vested for the performance periods that ended 31 December 2015 and 31 December 2014. The Rio Tinto plc share price used to calculate the estimated value of the award vesting with respect to 2016 is the average share price over the last quarter of 2016 of £29.30. The performance conditions for awards vesting for the period ending 31 December 2016 are detailed in the notes to table 3 on page 107.

For Sam Walsh the LTIP awards vesting with respect to the performance period ending 31 December 2016 is subject to the deferral agreement explained in the Implementation Report. The value of the LTIP awards vesting with respect to the performance periods ending 31 December 2015 and 31 December 2014 includes the cash payment for dividends on the awards that vested. The performance conditions for awards vesting for the period ending 31 December 2016 are detailed in the notes to table 3 on page 107 in the Implementation Report.

(d) For Jean-Sébastien Jacques and Chris Lynch the amount reflects the value of the pension contribution and payment in lieu of pension paid during the year. For Sam Walsh the amount reflects the value of the superannuation accrued during the year assuming that it was to come into payment immediately. This differs from the value reported in table 1a in the Implementation Report which is calculated using an IAS19 methodology and assumptions on rates of investment return, inflation and salary increases.



- (e) Includes healthcare, allowance for professional tax services and car allowance. For Sam Walsh the value includes international assignment benefits of A\$293,000 for 2016 (2015: A\$1,001,000), medical cover, allowance for professional tax compliance services, car allowance, Company provided transport and other contractual payments or benefits. Sam's 'other benefits' value was lower in 2016 due primarily to the proportion of the year worked.
- (f) The maximum potential STIP award is 200 per cent of base salary.
- (g) Jean-Sébastien had no PSP awards vest in respect of the performance period that ended 31 December 2014 as his first PSP award was granted in 2012 and vested in respect of the performance period that ended 31 December 2015. He has received no awards under the SOP. Chris Lynch had no LTIP awards vest in respect of the performance periods that ended prior to 31 December 2016 as he received no LTIP awards prior to the award made in 2013.

### Single total figure of remuneration for non-executive directors

The table below provides details of the fees and other benefits paid to the chairman and non-executive directors in 2016 and 2015 and is reported in US dollars.

Stated in US\$'000 <sup>(a)</sup>		Fees and allowances <sup>(b)</sup>	Non-monetary benefits <sup>(c)(d)</sup>	Single total figure of remuneration <sup>(e)</sup>	Currency of actual payment
<b>Chairman</b>					
Jan du Plessis	2016	990	88	1,078	£
	2015	1,116	134	1,250	£
<b>Non-executive directors</b>					
Robert Brown	2016	186	46	232	£
	2015	310	59	369	£
Megan Clark	2016	286	28	314	A\$
	2015	268	0	268	A\$
Michael L'Estrange	2016	237	25	262	A\$
	2015	275	0	275	A\$
Ann Godbehere	2016	221	9	230	£
	2015	249	20	269	£
Richard Goodmanson <sup>(f)</sup>	2016	122	10	132	£
	2015	340	25	365	£
Anne Lauvergeon	2016	173	13	186	£
	2015	218	23	241	£
Paul Tellier	2016	207	52	259	£
	2015	325	72	397	£
Simon Thompson	2016	196	8	204	£
	2015	218	9	227	£
John Varley	2016	295	5	300	£
	2015	333	13	346	£

#### Notes to Table 1b – Non-executive directors' remuneration

- (a) The remuneration is reported in US dollars. The amounts have been converted using the relevant 2016 average exchange rates of £1 = 1.35616 US\$ and A\$1 = 0.74406 US\$ (1 January to 31 December 2016 average).
- (b) 'Fees and allowances' comprise the total fees for the chairman and all non-executive directors and travel allowances for the non-executive directors (other than the chairman). The payment of statutory minimum superannuation contributions for Australian non-executive directors is required by Australian superannuation law. These contributions are included in the Fees and Allowances amount disclosed for Australian non-executive directors. While the fees and allowances contractual values defined in British Pounds have not changed, the US Dollar values reflected in Table 1b are a primarily a consequence of the weakening of the British Pound relative to the US Dollar in 2016 (note that the rate for 2015 was £1 = 1.52868 US\$). Travel allowances were overpaid in 2015 due to an administrative error to Robert Brown and Paul Tellier and were refunded. The amounts stated in 'Fees and allowances' do not reflect the refunds.
- (c) 'Non-monetary benefits' include, as in previous year, amounts which are deemed by the UK tax authorities to be benefits in kind relating largely to the costs of non-executive directors' expenses in attending Board meetings held at the Company's UK registered office (including associated hotel and subsistence expenses). Given these expenses are incurred by directors in the fulfilment of their duties, the Company pays the tax on them.
- (d) In 2016, the following additional amounts are included as noted for the relevant director. For Jan du Plessis the value of company provided transport and medical insurance premiums. Mr du Plessis is provided with a car and driver in his capacity as chairman of Rio Tinto. For the year ended 31 December 2016, the amount was £30,353.
- (e) Represents disclosure of the single total figure of remuneration under Schedule 8 of the Large and Medium-sized Companies and Groups (Accounts and Reports) Regulations 2008 (as amended) and total remuneration under the Australian Corporations Act 2001 and applicable accounting standards.
- (f) The amounts reported for Richard Goodmanson reflect the period when he was an active member of the Board from 1 Jan to 5 May 2016.

# Summary shareholder information

## Dividends

Both Companies have paid dividends on their ordinary shares every year since incorporation in 1962.

### Dividend policy

The dividend policy adopted by the Board in February 2016 provides that at the end of each financial period, the board will determine an appropriate total level of ordinary dividend per share, taking into account the results for the financial year, the outlook for our major commodities, the board's view of the long-term growth prospects of the business and the Company's objective of maintaining a strong balance sheet. The intention is that the balance between the interim and final dividend is weighted to the final dividend.

The board expects total cash returns to shareholders over the longer term to be in a range of 40 to 60 per cent of underlying earnings in aggregate through the cycle.

The board is committed to maintaining an appropriate balance between cash returns to shareholders and investment in the business, with the intention of maximising shareholder value.

Acknowledging the cyclical nature of the industry, in periods of strong earnings and cash generation, it is the board's intention to

supplement the ordinary dividends with additional returns to shareholders.

### Dividend determination

The majority of our sales are transacted in US dollars, making this the most appropriate measure for our global business performance. It is our main reporting currency and, consequently, the natural currency for dividend determination. Dividends determined in US dollars are translated at exchange rates prevailing two days prior to the declaration and payable in sterling by Rio Tinto plc and in Australian dollars by Rio Tinto Limited.

On request, shareholders of Rio Tinto plc can elect to receive dividends in Australian dollars and Rio Tinto Limited shareholders can elect to receive dividends in pounds sterling. If such an election is made, the dividend amounts received will be calculated by converting the declared dividend using the exchange rates applicable to sterling and Australian dollars – five days prior to the dividend payment date.

Shareholders who wish to receive their dividends in any other currencies should contact the Companies' share registrars, who offer payment services in other currencies, subject to a fee.

### 2016 dividends

The 2016 interim and final dividends were determined at 45 US cents and at 125 US cents

per share respectively and the applicable conversion rates for the interim and final dividend were US\$1.33135 and US\$1.2365 to the pound sterling and US\$0.76105 and US\$0.7611 to the Australian dollar respectively. For those Rio Tinto plc shareholders who elected to receive their interim dividend in Australian dollars the applicable conversion rate was A\$1.75850 to the pound sterling and for Rio Tinto Limited shareholders who elected to receive their dividend in sterling the applicable conversion rate was £0.56867 to the Australian dollar.

Final dividends of 100.56 pence or 163.62 Australian cents per share will be paid on 6 April 2017. For those Rio Tinto plc shareholders requesting the 2016 final dividend be paid in Australian dollars, those holders of Rio Tinto plc ADRs (each representing one share) and those Rio Tinto Limited shareholders requesting the 2016 final dividend be paid in pounds sterling, the applicable conversion rates will be determined on 30 March 2017.

### Dividend reinvestment plan (DRP)

Rio Tinto offers a DRP to registered shareholders, which provides the opportunity to use cash dividends to purchase Rio Tinto shares in the market.

# Contact details

## Registered offices

### Rio Tinto plc

6 St James's Square  
London  
SW1Y 4AD  
Registered in England No. 719885  
Telephone: +44 (0) 20 7781 2000  
Website: riotinto.com

### Rio Tinto Limited

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120 Collins Street  
Melbourne  
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ABN 96 004 458 404  
Telephone: +61 (0) 3 9283 3333  
Fax: +61 (0) 3 9283 3707  
Website: riotinto.com

Rio Tinto's agent in the US is Cheree Finan, who may be contacted at  
Rio Tinto Services Inc.  
80 State Street Albany,  
NY 12207-2543

## Shareholders

Please refer to the Investor Centre of the respective registrar if you have any queries about your shareholding.

### Rio Tinto plc

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BS99 6ZZ

Telephone: +44 (0) 370 703 6364  
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UK residents only,  
Freephone: 0800 435021  
Website: computershare.com

### Holders of Rio Tinto American Depositary Receipts (ADRs)

Please contact the ADR administrator if you have any queries about your ADRs.

### ADR administrator

JPMorgan Chase & Co  
PO Box 64504  
St. Paul, MN 55164-0854  
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(800) 990 1135  
US residents only, toll free Global invest direct:  
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New Zealand residents only, toll free:  
0800 450 740  
Website: computershare.com

### Former Alcan Inc. shareholders

Computershare Investor Services Inc.  
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100 University Avenue  
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Ontario

Telephone: +1 416 263 9200  
North American residents only,  
toll free: +1 (866) 624-1341  
Website: computershare.com

### Investor Centre

Investor Centre is Computershare's free, secure, self service website, where shareholders can manage their holdings online. The website enables shareholders to:

- View share balances
- Change address details
- View payment and tax information
- Update payment instructions

In addition, shareholders who register their email address on Investor Centre can be notified electronically of events such as annual general meetings, and can receive shareholder communications such as the Annual report or Notice of meeting electronically online.

### Rio Tinto plc shareholders

Website: investorcentre.co.uk/riotinto

### Rio Tinto Limited shareholders

Website: investorcentre.com/rio

# Financial calendar

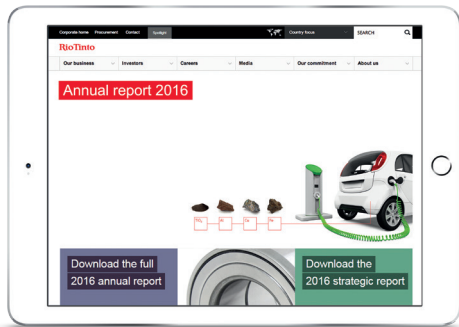
2017		
16	January	Fourth quarter 2016 operations review (Sydney 17 January)
8	February	Announcement of unaudited results for 2016
22	February	Rio Tinto Limited shares and Rio Tinto plc ADRs quoted "ex-dividend" for 2016 final dividend
23	February	Rio Tinto plc shares quoted "ex-dividend" for 2016 final dividend
24	February	Record date for 2016 final dividend for Rio Tinto plc and Rio Tinto Limited shares and Rio Tinto plc ADRs
2	March	Publication of 2016 Annual report, 20-F and Notices of annual general meetings
16	March	Plan notice date for election under the dividend reinvestment plans and date for electing dividends paid in alternate currency for the 2016 final dividend
30	March	Dividend currency conversion date (Rio Tinto plc holders electing to receive Australian dollars and Rio Tinto Limited holders electing to receive pounds sterling)
6	April	Payment date for 2016 final dividend to holders of ordinary shares and ADRs
12	April	Annual general meeting for Rio Tinto plc, London
19	April	First quarter 2017 operations review (Sydney 20 April)
4	May	Annual general meeting for Rio Tinto Limited, Sydney
17	July	Second quarter 2017 operations review (Sydney 18 July)
2	August	Announcement of half year results for 2017
9	August	Rio Tinto plc ADRs quoted "ex-dividend" for 2017 interim dividend
10	August	Rio Tinto plc shares and Rio Tinto Limited shares quoted "ex-dividend" for 2017 interim dividend
11	August	Record date for 2017 interim dividend for Rio Tinto plc and Rio Tinto Limited shares and Rio Tinto plc ADRs
31	August	Plan notice date for election under the dividend reinvestment plans and date for electing dividends paid in alternate currency for the 2017 interim dividend for Rio Tinto plc and Rio Tinto Limited
14	September	Dividend currency conversion date (Rio Tinto plc holders electing to receive Australian dollars and Rio Tinto Limited holders electing to receive pounds sterling)
21	September	Payment date for 2017 interim dividend to holders of ordinary shares and ADRs
16	October	Third quarter 2017 operations review (Sydney 17 October)
2018		
January		Fourth quarter 2017 operations review
February		Announcement of unaudited results for 2017
April		Annual general meeting for Rio Tinto plc, London
April		First quarter 2018 operations review
May		Annual general meeting for Rio Tinto Limited, Melbourne
July		Second quarter 2018 operations review
August		Announcement of half year results for 2018
October		Third quarter 2018 operations review

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**[riotinto.com/sd2016](http://riotinto.com/sd2016)**



To be more environmentally friendly, Rio Tinto is reducing the print run of all publications. We encourage you to visit the website to learn more about the Group's performance in 2016 and to view all available PDFs of this Strategic report and the Annual report.

**[riotinto.com/ar2016](http://riotinto.com/ar2016)**



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