





Our copper business

Rio Tinto is a leading international business involved in each stage of metal and mineral production. The Group combines Rio Tinto plc, which is listed on the London Stock Exchange, and Rio Tinto Limited, which is listed on the Australian Securities Exchange.

The Rio Tinto mine in Spain supplied copper to the Roman Empire and is recognised as one of the greatest copper deposits ever found. This deposit gave its name to our company, which today owns a world class copper business.

Our Copper group's portfolio comprises a diverse mix of operations and projects along the development pipeline. We own copper operations – which also produce gold, silver and molybdenum by-products – and development projects with copper, nickel and other potential by-products.

The Copper group's pipeline of projects positions Rio Tinto as one of the world's leading base metal producers. Nickel projects in Indonesia and the United States also offer a pathway for us to become a top tier nickel producer.

In 2009, the Copper group produced around 800,000 tonnes of copper, which places it among the top five producers in the world.

Left
Rio Tinto has interests in copper operations in South Africa (pictured), the US, Australia, Chile and Indonesia.

Copper

Copper is found in nearly every home and vehicle, and in parts and appliances used in numerous aspects of infrastructure and technology.

Producing copper

Copper can be produced either from open pit or underground mines. Rio Tinto's Bingham Canyon mine in the United States was one of the first large scale open pit mines to demonstrate economies of scale with its use of giant shovels and haul trucks moving hundreds of thousands of tonnes per day.

Now we are using block cave technology for a different kind of economy of scale in underground mining. Block caving involves undercutting the orebody to allow rock stresses and gravity to fragment the ore, so that it falls naturally through cone shaped funnels to be collected at drawpoints for hoisting to surface.

Crushed copper ore is finely ground, then concentrated, smelted and refined. At each stage, the copper content increases as impurities are removed. Some of these "impurities" may include gold, silver or molybdenum, which can be sold as by-products. Eventually, refined copper of 99.99 per cent purity is produced.

Other oxide or low grade sulphide copper ores may be processed to refined metal by solvent extraction and electrowinning, bypassing the smelter stage.

Watch "From Ore to More" – an animated film about the lifecycle of copper – at www.kennecott.com.

Using copper

The world uses more than 15 million tonnes of copper every year. Copper is found in nearly every home and vehicle, and in parts and appliances used in numerous aspects of infrastructure and technology. In many respects, modern life would not have been possible without copper.

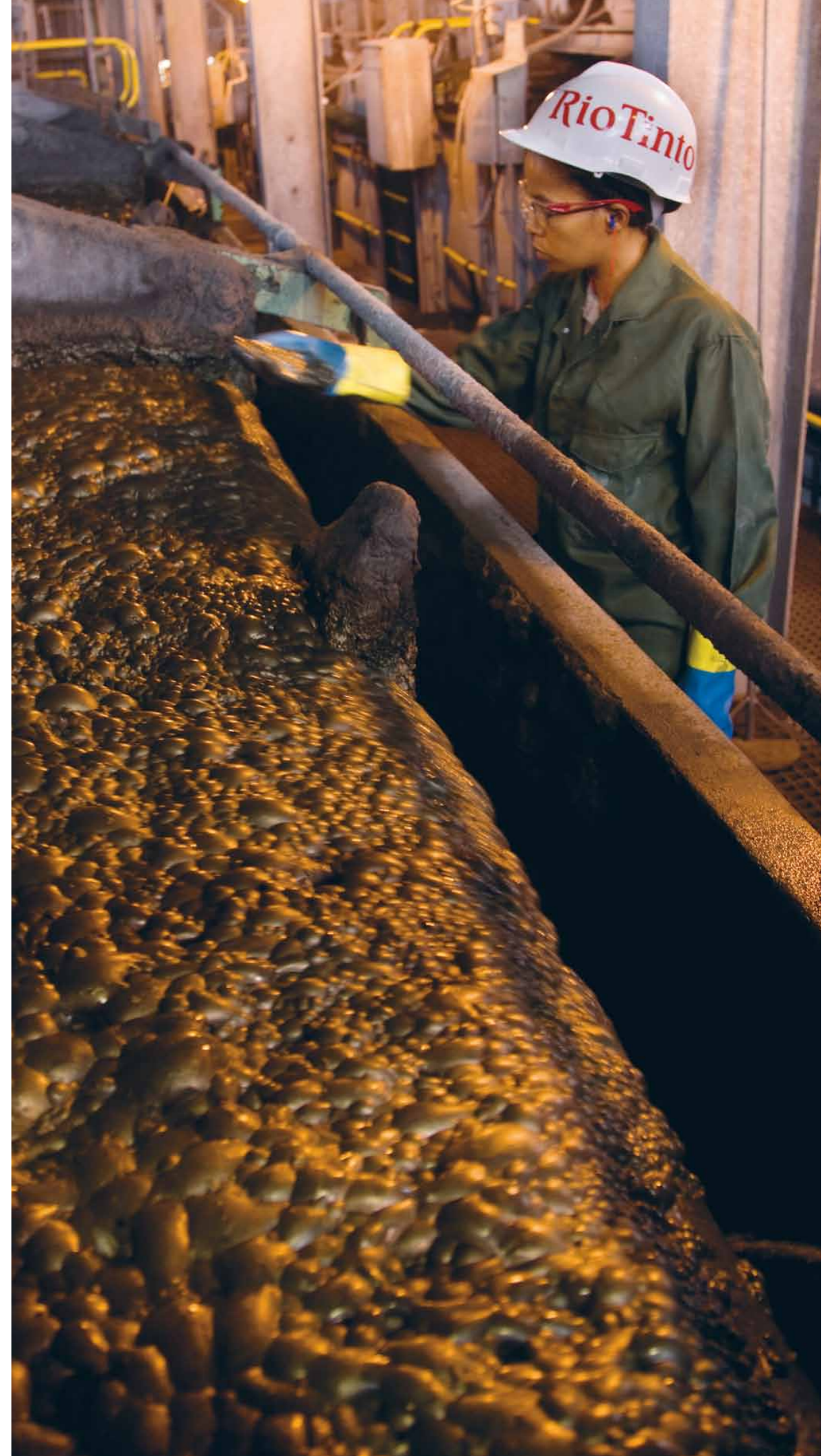
There is good reason why copper has played an important role in human civilisation for thousands of years. It can be easily shaped, moulded, rolled into sheets, or drawn into thin wire. It blends easily with other metals to form useful alloys such as brass and bronze. It does not rust, and is an excellent conductor of electricity and heat.

Copper's malleability, strength and resistance to corrosion make it useful in a broad range of building, construction and electrical applications. Wiring and plumbing are the largest markets for copper. In air conditioning and refrigeration, copper acts as a heat exchanger. It's also an important material architecturally and used in such applications as roofing sheet.

Over the past century, demand for copper has increased with the industrialisation of developing economies. As the number of people living in cities continues to grow, there will be increased demand for copper used in housing, infrastructure and consumer goods.

Right

At each stage of processing, copper concentration increases as impurities are removed.



Rio Tinto supplies around 25 per cent of US annual refined copper requirements from the Bingham Canyon mine in Utah.

Our copper operations

Kennecott Utah Copper
Kennecott Utah Copper (KUC) (Rio Tinto: 100 per cent) operates the Bingham Canyon mine, Copperton concentrator and a smelter and refinery complex, near Salt Lake City, US. The mine produces copper, gold, molybdenum and silver. As the second largest copper producer in the US (based on 2009 production), KUC supplies approximately 25 per cent of the nation's annual refined copper requirements.

KUC has been operating for more than 100 years. It is well positioned on the industry cost curve, benefiting from significant co-product revenues from gold and molybdenum.

KUC continues to be one of the most prospective brownfield environments of all Rio Tinto's mines and has significant options for further mine life extensions. Recent exploration led to the discovery of a world class molybdenum deposit underneath the Bingham open pit. Current ore reserves will support open pit operations until 2020 and this could be extended to 2032 through a combination of underground and open pit options.

KUC is considering building a new Molybdenum Autoclave Process (MAP) facility to increase the value it receives from extraction of molybdenum and rhenium, which are used as alloy metals. The MAP design includes a number of energy conservation features and an environmentally responsible technique for producing molybdenum products. A steam recovery system will be included to capture excess steam from the autoclave for use in downstream processes.

Grasberg
Grasberg, located in the province of Papua in Indonesia, is one of the world's largest copper and gold mines in terms of ore reserves and production. It is owned and operated by Freeport Indonesia (PTFI), the principal and 91 per cent owned subsidiary of US based Freeport-McMoRan Copper & Gold Inc. (FCX). The Government of Indonesia owns the remaining nine per cent of PTFI. Rio Tinto has a joint venture with FCX giving us a 40 per cent share of production above specific levels until 2021, and 40 per cent of all production after 2021.

Top
Bingham Canyon, near Salt Lake City, produces copper, gold, molybdenum and silver.
Right
The mine has been operating for more than 100 years.





Escondida

The Minera Escondida copper mine in Chile's Atacama Desert, of which we own 30 per cent, is the largest copper mine in the world in terms of annual production, and has a mine life expected to be approximately 20 years. Escondida accounts for approximately eight per cent of world primary copper production. BHP Billiton owns 57.5 per cent of Escondida and is the operator and product sales agent.

The Escondida district hosts two of the largest porphyry copper deposit systems in the world, Escondida and Escondida Norte, located five kilometres from Escondida.

Palabora

Rio Tinto owns a 57.7 per cent stake in South Africa's Palabora Mining Company. The copper operation comprises an underground mine, a concentrator, a copper smelter with anode casting facilities and an associated acid plant, an electrolytic refinery tank house, a rod casting plant and by-product recovery plants.

The deposit was initially mined by open pit methods, but mining of the open pit ceased in 2002. Palabora has developed a US\$465 million block cave underground mine with a planned production rate of at least 32,000 tonnes of ore per day.

Palabora supplies most of South Africa's copper needs and exports the balance. The refinery produces continuous cast rod for the domestic market and cathodes for export. Useful by-product metals and minerals include zirconium chemicals, magnetite and nickel sulphate as well as small quantities of gold, silver and platinum.

Palabora also owns a nearby vermiculite deposit which is mined and processed for sale worldwide. Vermiculite is a versatile industrial mineral with hundreds of uses. The vermiculite operation comprises an open pit mining operation and recovery plant. Overseas subsidiaries in the US, UK and Singapore are responsible for the sale and marketing of vermiculite.

Northparkes

Northparkes is a copper and gold mine located 27 kilometres north west of Parkes in the Central West of New South Wales, Australia. Northparkes is a joint venture between Rio Tinto (80 per cent) and the Sumitomo Group (20 per cent).

Northparkes operates both underground block cave mines and open cut mines on its mining leases and was the first in the country to use a variation of the cost effective block cave mining technique in its underground operations.

Ore is processed on site to produce a high grade copper concentrate which is then transported by road train to the Goonumbla rail siding approximately 13 kilometres from the mine. The containers are then placed on to a train and transported to Port Kembla, south of Wollongong, where the concentrate is shipped to customers primarily in Japan, China and India.

Northparkes Mines owns 6,000 hectares of land around the mine, of which the mining lease covers 1,630 hectares. The remaining land is actively farmed using best practice farming methods developed and adopted to maximise productivity and quality while conserving water and soils.



Top

Escondida is the world's largest copper mine in terms of annual production.

Left

Northparkes uses a variety of cost effective block cave mining techniques in its underground operations.

Our copper projects

The Copper group has developed a strong portfolio of copper and nickel projects and has acquired interests in four of the world's largest known undeveloped copper and nickel deposits – Oyu Tolgoi in Mongolia, Resolution in the US, La Granja in Peru and Sulawesi in Indonesia.

Resolution Copper

The Resolution Copper project is situated in Superior, Arizona, US, in the area of the depleted Magma Copper mine. Rio Tinto has a 55 per cent share in the project, in partnership with BHP Billiton. The pre-feasibility study is currently underway.

Exploration from 2001 to 2003 suggests that a large, world class copper resource exists more than 2,000 metres below surface. Pre feasibility studies are expected to be completed by 2013 with production at the new mine expected to start by 2020, eventually ramping up to 500,000 tonnes per annum of copper¹.

Oyu Tolgoi

Located in Mongolia's South Gobi desert, Oyu Tolgoi is one of the world's most promising undeveloped copper resources. When it comes on line in 2013, it will be a top ten copper producer and one of the world's biggest gold producers, with costs in the first quartile.

Rio Tinto has 49 percent ownership position in Ivanhoe Mines, which holds a 66 per cent interest in Oyu Tolgoi LLC. The government of Mongolia owns the remaining 34 per cent. To date, Rio Tinto has invested more than \$3.6 billion in Ivanhoe to help fund the development of Oyu Tolgoi.

As the operating manager of the project, Rio Tinto is applying its international best practices, from demanding health and safety standards to a commitment to operational excellence and sustainable development to the development of Oyu Tolgoi.

The aim is to deliver an operation that is safe, that produces meaningful, long-term economic benefits for Mongolia, that provides strong employment, with a target of 90 per cent of the jobs at Oyu Tolgoi filled by Mongolian people, and that balances the benefits of development with the needs of the community and the national environment.

¹ There are currently no defined Ore Reserves to supply any of the forecast production for this project. Such production is therefore subject to defining sufficient Ore Reserves for the project from the current and any further identified mineralisation.

Entrée Gold

In 2005, Rio Tinto acquired a 9.9 per cent stake in Entrée Gold Inc., a Canadian junior mining company. In 2007, Rio Tinto exercised warrants that took its direct equity in Entrée Gold to 16 per cent. Entrée Gold's main asset includes three claims that surround the Ivanhoe Mines Oyu Tolgoi project in Mongolia.

La Granja

La Granja in the Cajamarca region of northern Peru is a copper project currently in the pre-feasibility phase. Rio Tinto acquired the project in 2005 for US\$22 million plus a minimum investment of US\$60 million, through a public bidding process carried out by the Peruvian Government.

La Granja could represent the largest undeveloped greenfield copper project in Latin America. It has the potential to be a very large, long life operation. Instead of looking at La Granja as a conventional milling operation producing concentrates for export, the pre feasibility study is aimed at demonstrating the possibility of recovering copper metal using leaching of copper from whole ore, with solvent extraction and electrowinning.

Pebble

Rio Tinto has a 19.6 per cent equity holding in Northern Dynasty Minerals which owns a 50 per cent share in the Pebble Joint Venture (Rio Tinto share in Pebble: 9.8 per cent). Northern Dynasty Minerals is advancing the Pebble copper-gold-molybdenum deposit in south western Alaska, which includes an orebody amenable to block caving.

Sulawesi Nickel

The Sulawesi Nickel project, on the island of Sulawesi in Indonesia, was discovered by Rio Tinto Exploration in 2000. This deposit currently ranks as one of the largest known undeveloped greenfield lateritic nickel deposits in the world.

Eagle

Late in 2007, Rio Tinto approved the development of the Eagle nickel high grade underground mine in Michigan, US. There are similarities between Eagle and other world class magmatic nickel-sulphide deposits. Rio Tinto has an extensive land position in the Eagle district which is extremely prospective, including a 30 kilometre identified trend containing multiple target intrusions.

¹ Top With Ivanhoe Mines of Canada, we are developing the Oyu Tolgoi copper-gold resource in Mongolia.



Copper operations and projects¹

Copper operations*

- 1 Escondida (30%)
- 2 Grasberg joint venture (40%)
- 3 Kennecott Utah Copper
- 4 Northparkes (80%)
- 5 Palabora (58%)

Copper projects

- 6 La Granja
- 7 Oyu Tolgoi (19.7% of Ivanhoe Mines)
- 8 Pebble (10%)
- 9 Resolution (55%)

Nickel projects

- 10 Eagle
- 11 Sulawesi

Gold operations

- 12 Rawhide

*By-products may include gold, silver and molybdenum.

¹Locations on the map are indicative. Operations and projects are wholly owned unless otherwise shown.



Fact sheets

Corporate profile

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