

## **Rio Tinto Ventures and Rio Tinto's Jadar Project**

**Andrew Latham, Head of Rio Tinto Ventures**  
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**\*\*Check against delivery\*\***

Thank you for the invitation to speak at this Lithium and Battery Materials conference. Ladies and gentlemen it is always a pleasure to be here in Perth, the home of Rio Tinto Iron Ore and one of our most important hubs worldwide.

### **Cautionary Statement**

Please can I draw your attention to the cautionary statement and ask you to note its content.

### **Safety and health come first**

Today I would like to talk to you about two topics – Rio Tinto Ventures, a new division within our company with a remit to take us into new business areas and, our wholly owned subsidiary, Rio Sava Exploration and its lithium development project in the Jadar Valley of Serbia. These are exciting new prospects. However, for us, nothing is more important than the safety and health of our people and that is just as true for our new businesses as it is for our established operations.

Safety comes first at Rio Tinto and our ambition remains the same. That is, that all of our employees and contractors must return home safely at the end of each and every day.

Sadly, as you may know, we lost one of our colleagues, Alberto Lozano, in a tragic incident at our Kennecott operation in October last year. In the same month, there was a health related death of a colleague undertaking field reconnaissance work in the Pilbara, here in Western Australia. These losses were deeply felt by family, friends and all of Rio Tinto.

We are working very hard to try to ensure that these events never happen again.

We are focusing on fatality prevention through our Critical Risk Management programme, which is now well embedded across the company, with 1.5 million safety verifications in 2017.

We are also focusing on reducing injuries and improving process safety, as we strengthen our controls around major hazards.

Mental health and fatigue management are also priorities for us this year.

We all know that a safe operation is a well-run operation, and whilst we have a strong continuing history of improvement, we are always seeking to better our performance.

## **Superior returns from world class assets**

I expect Rio Tinto is well known to you as one of the world's major mining companies with many leading product groups, in particular Rio Tinto Iron Ore, Aluminium, Copper and Diamonds, and Energy and Minerals. Those businesses contain world class assets and performed strongly during the last twelve months. In Iron Ore, we delivered free cash flow of US\$7.3 billion and EBITDA margins of 68 per cent, as customers demanded our higher-quality product, driven by a need to improve their environmental performance.

In Aluminium, we delivered US\$1.4 billion in free cash flow, with an EBITDA margin of 35 per cent, our highest since 2007.

This was achieved despite increases in input costs.

In Copper & Diamonds, we delivered free cash flow of US\$319 million, including US\$1.2 billion in development capital expenditure as activity ramped up at the Oyu Tolgoi underground project.

And in Energy & Minerals, we delivered free cash flow of US\$1.5 billion taking advantage of our latent capacity and better market conditions.

So, we had a strong 2017 and we have real momentum going forward. Those businesses can offer Rio Tinto a bright future for years to come, but we are always looking for new opportunities.

Rio Tinto Ventures is a new team within the Energy and Minerals Product Group, formed during 2017. Its purpose is to seek opportunities beyond our current businesses, focussing on new products, and with a willingness to invest through a broader range of structures than we have in the past.

## **Macro indicators remain supportive**

As we look at the broader economy, global growth momentum is healthy. US growth is supported by record high consumer confidence and healthy manufacturing investment. The EU is also performing well on stronger manufacturing and improved consumer confidence. China may slow modestly over the next six months, but the outlook is positive in the medium to long term. Further, Chinese environmental policy measures are increasing demand for higher grade iron ore and reducing new aluminium capacity.

So, we see a very attractive future for Rio Tinto's businesses, providing materials that underpin manufacturing and economic growth in all of the world's major economies. At the same time we see the potential for a broader suite of metals to play an increasingly important role as new and disruptive technologies change the way we live. Among those, it is the potential for in particular electric vehicles and new power storage solutions, that may in the near future bring significant change to our lives and consequently to our mining industry.

We are already well placed to benefit from this growth with our copper and aluminium offerings and we are evaluating what others metals and minerals may also be preferentially impacted through Rio Tinto Ventures.

## **The ventures approach**

In Rio Tinto Ventures it is our objective to bring the skills and resources that Rio Tinto has to offer, through a broad range of investment structures, to investment opportunities in new metals and businesses. What do we mean by each of those statements?

Rio Tinto has much to offer to a project and all its stakeholders. The new Ventures team has already tended to be bracketed and compared with the private equity firms that invest in mining and metals. But we have much more to offer than capital alone, what differentiates us as an investor and partner are the broader skills and resources we can bring to bear. Rio Tinto is a world leader in Health, Safety and Environmental management. Our exploration activities and operations cover the world, with broad skills in ore body knowledge, surface and underground mining and mineral processing. Our Singapore commercial hub brings economies of scale to logistics and marketing, and our strong relationships with our host countries and governments are not by chance, but from the work, care and commitment of our teams.

It is this depth that we offer through Ventures, this depth that differentiates us from other investors and this depth that we believe increases the chances of project success.

As we saw earlier, Rio Tinto is associated with owning and operating many of the largest businesses in our industry. Whilst at Ventures we are very comfortable to continue that model into new businesses, we are also ready to think more widely. We will be happy to hold investments for the long term but if, after investing and adding value to a project, it has more value to others, then we will exit and recycle capital to new opportunities. If it makes sense for us to own a business outright then we will, but we will also be comfortable as a non-controlling investor, and we are not too proud to realise that others may have specific operating skills that we should acknowledge and embrace to bring project success.

We are most likely to be an equity investor, but we have already considered relationships built around debt instruments, offtake, and streams. We are keen to bring to bear the knowledge of our specialist financing and marketing teams, together with our more traditional expertise.

## **Metals most impacted by new technology**

At Rio our major product groups are always seeking new opportunities in their core businesses and we have excellent teams in place to achieve that goal. It is the role of Ventures to look to new areas.

However, the key to profitability, beyond fundamental ore body quality, is efficiency and the control of cost. The Energy and Minerals group within Rio is already an excellent mix of businesses, run under one umbrella, but able to generate strong margins and cash flows. It is our intent to continue that model by drawing together businesses that, although not in a single commodity, can be managed together within a single, lean and efficient product group. So where should we be investing? We must be pragmatic and we can only invest where opportunities arise, but there are clear trends that will guide our approach. The Massachusetts Institute of Technology has researched key new technologies that will influence future metal demand and the specific metals that those technologies will require. We have experience of almost all of them, and many we know well. The chart behind me summarises MIT's analysis and it provides a guide, and I emphasise just a guide, to some areas where we at Ventures will be looking for opportunities and willing to invest.

In terms of project characteristics, our friends at Rio Tinto Exploration cover the earlier stages of discovery and evaluation, Ventures interest begins when projects reach feasibility and beyond. We expect the majority of our investments to be upstream in mining and the first stages of processing and refining, but we will consider related businesses where we can see a clear value proposition and, most likely industrial logic and synergies with our existing businesses. The geographic spread of Rio Tinto's existing portfolio provides more than enough potential and can be taken as a broad guide to where we will invest. And, to be clear, Ventures is just one small part of Rio, our existing Product Groups will continue to be the first port of call, and as effective and active as ever, for opportunities in their respective fields.

To conclude on Rio Tinto Ventures, my purpose today has been to outline our intentions, but at the same time to tell you that we are actively looking for and evaluating investments, and that we expect that the entrepreneurial miners and mining industry of Western Australia may be one of our most fruitful locations.

## **The Jadar Project**

I will be happy to take questions on Ventures at the end, but we must now move on to Rio Sava Exploration and our unique Jadar Lithium project.

### **Jadarite – a unique lithium-borosilicate**

I hope some of you will have already seen the picture behind me. A few years ago, as part of our European programme, Rio Tinto Exploration identified a new lithium-sodium-borosilicate in the Jadar Valley of North western Serbia, they named it Jadarite. As devotees of super heroes among you may already know, it has a chemical composition surprisingly similar to Kryptonite, the fictional mineral made famous by the films and stories of Superman. If that were not reward enough, Jadarite is about 47 per cent B<sub>2</sub>O<sub>3</sub> and about 7 per cent Li<sub>2</sub>O, providing a resource with the very attractive potential to provide both lithium carbonate and by-product boric acid.

### **History – A Rio Tinto Discovery**

The deposit was identified in the mid 2000's, by Rio Tinto, in an exploration search for industrial minerals, focussed on borates. The discovery of Jadarite led to initial studies to develop ore body knowledge and preliminary testing to understand the potential of this unique mineral. Pilot plant work, in particular at our Boron operations in California, enabled us to confirm the mineral chemistry and demonstrate a viable process route. Between 2013 and 2015, more extensive drilling and a 3D seismic survey clarified the resource characteristics, tonnage and grade. The project entered pre-feasibility shortly thereafter with a resource declared in 2017. Today, we have an extensive on the ground exploration team at Jadar, and project management offices in Belgrade and at the site.

### **Jadar Valley – North-western Serbia**

Whilst Serbia is not yet part of the European Union, it lies in South-East Europe within a few hundred kilometres of European Union borders. The picture shows the Jadar Valley. It is approximately 100km south west of the Serbian capital Belgrade. The deposit is close to the town of Loznica and the Drina River, lying on agricultural land that combines both flat terrain and rolling hills. The photo shows the locale and its favourable characteristics quite clearly. The project is close to both existing road and rail infrastructure, giving the option to send lithium and borates products to multiple sea ports, including Constanta in Romania and Rijeka in Croatia to name two, or by land directly into the industrial heartland of Europe.

## **Resource Profile and Mineralogy**

Within the deposit we find Jadarite together with other borates minerals. It does not outcrop and lies in three zones, the upper, middle and lower, each with thicknesses of about 4 to 50m at depths from 100 to 700m. Jadarite's key characteristic is the presence of both B<sub>2</sub>O<sub>3</sub> at grades similar to those found in traditional borates ores and Li<sub>2</sub>O at grades similar to those found in traditional lithium rich minerals. The Jadar deposit indicated and inferred resource amounts to some 136 million tonnes, containing some 2.5 million tonnes of Li<sub>2</sub>O and 21 million tonnes of B<sub>2</sub>O<sub>3</sub>, giving the potential for a multi decade mine life.

## **Operating Cost Implications**

The graph shows an indicative lithium carbonate cost curve for 2025 and it is intended to highlight the broad positions of higher operating cost hard rock versus lower cost brine producers. Clearly there are exceptions, but this is a distribution that we have come to expect. What is exciting about Jadar is that it is a hard rock underground resource, but its borates by-product brings it down the cost curve on a net cash cost basis. We will have to wait for further feasibility work to tell us where more accurately, but the prospects are attractive. Particularly when you overlay the range of potential demand trajectory estimates that we are seeing from established lithium industry players and the advantages to being on the left hand side of the cost curve.

## **Jadar project overview**

Rio Tinto's strategy is to invest in long life, low-cost, expandable operations. Jadar is a greenfield project that has that potential. It is expected to be an underground mine, with decline access, mined by selective methods including cut and fill stoping, suitable for this type of ore body. An onsite processing plant will produce battery grade lithium carbonate and boric acid. The markets for lithium carbonate are now well known including rechargeable batteries for electric vehicles and power storage, but also heat resistant glass and ceramics, and high strength aircraft alloys. Rio Tinto is already a major producer of borates which serves producers of insulation fibreglass, speciality glass for TV and telephone screens, ceramic glazes and agricultural micro nutrients.

The final scope of the project will have to await the completion of a definitive feasibility study. Rio Tinto follows a disciplined approach to project development and when we make capital allocation decisions, we focus only on the best projects. At this point in the pre-feasibility work, we anticipate the mine and plant to be potentially in production in the early 2020's and have the potential to produce about 50,000 tonnes per annum of lithium carbonate equivalent, subject to study outcomes. Taking into account the scale of the orebody and favourable location, our planning will seek to allow for future expansion.

## **Attractive Serbian investment climate**

Serbia offers us a strong combination of attractive investment characteristics. An established democratic process has delivered government and an economic environment that is supportive of foreign investment. Annual real GDP growth above 3 per cent is likely in the medium term and public debt is falling.

Unemployment is also falling and real incomes are rising. As mining is increasingly heading to more challenging jurisdictions, Serbia is a very favourable place to be.

The country offers a skilled and productive labour force and costs remain competitive. Road and rail infrastructure is wide spread, it will need upgrading to meet the needs of a project of the scale of Jadar, but we anticipate government support.

Serbia has a history of mining, the mining code was updated in 2015 and government has encouraged the Jadar project from the start.

We signed a Memorandum of Understanding with the Government of Serbia in July 2017 which will enable the formation of joint working groups between the administration and Rio Tinto, each focussed on different aspects of the development, to progress the Jadar project through the study and permitting phases.

We are already interacting with the local and regional communities around Loznica and have encountered broad support for the project and the investment and opportunities that it will bring.

EU membership is expected within the next decade. It offers over 500 million consumers and is already the destination for 66 per cent of Serbian exports. It is also expected to be the second largest market worldwide for electric vehicles and we are seeing increasing interest from European auto makers to gain a secure feed of battery materials.

Rio Tinto is of course already one of the top two producers worldwide of boric acid and related added value products. We have our mine in California, processing facilities in the United States and Europe and distribution infrastructure in the United States, Europe and China. That presence, together with the resources of our Singapore based commercial hub, offers we believe an excellent foundation for the marketing and distribution of both Jadar products, and from which the project could become a significant participant in its chosen markets.

### **Jadar value proposition**

So, let me wrap-up.

We believe Jadar can have a bright future. It combines a unique resource with the potential to sustain mining for many years, and its two products potentially offer a very attractive net cash operating cost. The scale of the resource and its favourable location offer future expansion potential.

It is close to multiple transport options. Serbia is adjacent to established European markets and has good access to emerging markets in Asia and the Middle East. And remember the project can build on the Rio Tinto Borates logistics and marketing network that is already in place.

Prefeasibility work is underway and the project will draw on Rio Tinto's borates mining and processing experience and project development expertise.

Finally, in Serbia, we have a supportive mining friendly environment, backed by excellent local and government relationships.

I will end there, but I would be happy to take one or two questions. Thank you.

## Contacts

media.enquiries@riotinto.com

riotinto.com



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### Media Relations, United Kingdom

Ilftud Harri

T +44 20 7781 1152

M +44 7920 503 600

David Outhwaite

T +44 20 7781 1623

M +44 7787 597 493

### Investor Relations, United Kingdom

John Smelt

T +44 20 7781 1654

M +44 7879 642 675

David Ovington

T +44 20 7781 2051

M +44 7920 010 978

Nick Parkinson

T +44 20 7781 1552

M +44 7810 657 556

### Media Relations, Australia

Jonathan Rose

T +61 3 9283 3088

M +61 447 028 913

### Investor Relations, Australia

Natalie Worley

T +61 3 9283 3063

M +61 409 210 462

Rachel Storrs

T +61 3 9283 3628

M +61 417 401 018

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### Rio Tinto plc

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

T +44 20 7781 2000

Registered in England

No. 719885

### Rio Tinto Limited

Level 7, 360 Collins Street  
Melbourne 3000  
Australia

T +61 3 9283 3333

Registered in Australia

ABN 96 004 458 404