

Rio Tinto Innovation
 Presentation to Austmine 2013
 Perth, Western Australia
 May 2013

Minister, Chair and Deputy Chair of Austmine, distinguished guests, ladies and gentlemen. I would like to thank you for providing me the opportunity to present to you today.



I intend to cover three areas in today's presentation; the first to discuss the mining cycle phase I believe we are in. I will argue that as the mining business transitions from a capital intensive build phase to more of a productivity focus, this offers unique opportunities for the Mining Engineering Services and Technologies (METS) sector companies. Secondly, I will cover what Rio Tinto has been doing in the Mine of the Future™ programme since we last presented to Austmine. In the last part of this presentation I intend to draw together the themes of Innovation, mining industry productivity and the opportunities available to the METS sector together. In doing so I will offer observations on what part I believe the host government has to play in shaping policy that fosters a vibrant, productive, innovating mining industry supported by a vibrant world-scale domestic METS sector.

This conference will cover in some depth the METS sector of the Australian economy, indeed this is the core theme of this conference. I am always excited to talk about the METS sector as it is a critical partner in the Rio Tinto drive to deliver productivity enhancing innovation into our business. The work of the METS sector companies is vital to the success of not only Rio Tinto but, as you will see in my presentation, we also believe it to be a significant opportunity for Australia.

For those in the audience that have been associated with the mining industry for some time you would not be surprised to observe the industry transitioning from one phase of the business cycle to the next. We have seen this many times before. The mining industry has added significant capital over the last decade, this capital has resized our business with significant additional capacity being added in the face of unprecedented developing nation demand; we are a much bigger business now after over a decade of capital expansion. The phase of the cycle we are transitioning from is the high capital investment phase; we are rapidly transitioning to a cost-focus and business productivity phase. This is business as usual; this is not unusual for the mining industry.



Demand for our products remains robust; indeed it is still growing in the face of developing nation needs. Our industry now has the task to ensure that the supply that we brought onto the market place is the most efficient and cost-effective supply in what is an increasingly competitive global business. Australia must address a number of structural challenges; this is illustrated by the government multifactor productivity analysis indicating a productivity fall of over 30% in the decade preceding 2010. These are well known challenges; however, they also provide excellent opportunities for the development and introduction of the next stage of advanced technologies required to win back productivity across the wider mining industry.

This unique opportunity can be used to create a “win-win-win” situation for the mining industry, the technology suppliers and government participants; I will explain this thinking in the next part of the presentation.

There are a number of logical places one needs to look to drive mining industry productivity improvements. Three important/ubiquitous areas (Orebody, Process and Energy) are shown on the screen, these will be self-evident to people who have been involved in the mining industry through previous business cycles.



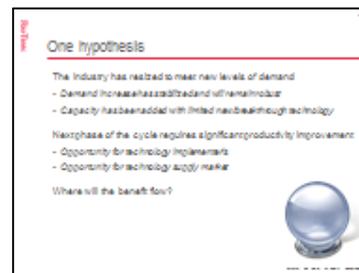
The pace of change in technology means that each one of the fundamental areas can be improved by the application of new technologies.

During the mid-2000's when the wider Mining industry was concentrating upon massive capital expansion, Rio Tinto also understood that productivity was an important business driver. Rio Tinto dedicated resources aimed at winning back productivity in the three critical areas; one manifestation of our efforts was the Mine of the Future™ programme which was conceived in 2007.

Rio Tinto understands that fundamental productivity is a critical business driver through the so-called boom times and other times.

The Rio Tinto Mine of the Future™ programme is directly aimed at winning back productivity improvements. However, we do recognize that the new tools, techniques and technologies that we require to capture fundamental shifts in productivity will not only come from within our business, we welcome and embrace all the wider stakeholders that can provide these important tools and techniques, the METS sector being a critical contributor to this effort.

This leads me to share with you the core hypothesis behind this presentation



The hypothesis is that in a production efficient and cost focused world new technologies and new services will be required, this is not a revolutionary hypothesis.

As the industry focusses on productivity and cost control many new opportunities will be created for the advancement of new technologies and services that will need to be introduced into our industry. I am not only talking about what one would call “hard” technologies, there could also be new ways of working combined with new innovative service offerings, the scope is both wide and deep.

Our hypothesis is that this change in focus increases the demand for value adding technologies and services and that this will be the phase that we face for some time to come in our industry, one could consider this phase of business cycle to be an accelerator for the METS sector.

If this hypothesis is correct one must ask who benefits? Where will the benefit flow? What do we need to do to maximize the benefit for all stakeholders?

Benefit for the mine owner

Technologically advanced operations are more productive, yield higher value, and are internationally competitive.



Benefit for the technology supplier

New value-adding technology generates new markets, new jobs, and new export opportunities.

Benefit for the host nation

Technologically advanced mining operations are more productive, yield higher value, are internationally competitive and yield higher relative tax revenues.

Technology and services developers generate new markets, new jobs, new export opportunities and yield higher relative tax revenues.

When people ask me what I do, I tell them that I am in the “Discover, Develop and Deliver” business. I do see this as a business and I see delivery of value-adding productivity-enhancing solutions as being the only reason why we are in business. Some of the more exciting opportunities can take up to 12 years to bring into production.



This business carries risk. Given my past history in Rio Tinto where I ran Rio Tinto procurement, I feel I am well qualified to make the comment that this business is called Innovation and not Procurement, they are inherently different.

You cannot approach the development of new technologies, new services and new ways of working in the same way you approach standard procurement, you must recognize and manage risk. Managing risk starts with the fundamental premise that you recognize the risk. The higher the risk the greater the reward if success is realized.

All members of our community can benefit from the value that development of new productivity delivering technologies can offer. However, I submit to this audience that Australia needs a progressive and enlightened approach to fostering research and development and appropriate risk taking and risk management against an international competitive market, if we fail in this regard we will miss a huge opportunity.

I now wish to transition this presentation into the next section. I will briefly touch upon what we have been doing in the Mine of the Future™ programme.



I will pay special attention to what we have been doing here in Western Australia.

Here, I will lift the veil on a number of Mine of the Future™ initiatives, one of which I hope you will conclude makes the link between productivity, the METS sector and government policy very clear.

The slide on the screen depicts the technologies that are being applied right here in Western Australia to improve productivity and enhance safety. We have announced to the market a range of technologies spanning our operations centre, autonomous haulage, drills and trains plus other associated supporting technologies. We have been busy and Rio Tinto Iron Ore has been at the forefront of turning the Mine of the Future™ programme from a concept into operational reality.



From a Western Australian perspective it is also worth mentioning our ongoing partnerships supporting various initiatives at the University of Western Australia. We are also well on the way to transitioning to what we call our operations centre – phase 2 platform. The new mine at Hope Downs 4 is well on its way to being brought into operation. In April we opened the Argyle Diamond Mine underground block cave. Western Australia is an important part of the Rio Tinto business. Reflecting on the fact that our Mount Tom Price mine began production in 1966 we have been a part of the Western Australian community for many decades and intend to be here for many decades to come.

A number of people ask me how is our trial with Autonomous haulage going? I find this surprising given that we finished the trial of Autonomous Haulage in 2010 and are in the process of deploying the world's largest Autonomous Haulage platform.

I need to stress to this expert audience that we are not trialling the technology, rather we are deploying the technology into operational mines. We have two mines operating today on the Autonomous Haulage platform and will commission a third before the end of 2013.



We have moved 100 million tonnes with our autonomous haul fleets since we started the trials in late 2008, in addition close to 300 operational people have been trained on the technology.

So what does 100 million tonnes look like? How can I best illustrate the scale of what we have moved using Autonomous Haulage? On the screen you can see what a pile of Iron Ore would look like in relation to the Perth CBD building scape. Our 100 million ton Iron Ore "pyramid" is a touch over 300 meters tall and Perth's tallest building (Central Park) is 249 meters tall.

By way of comparison the Great Pyramid of Giza is currently 139 meters tall – when built it was 147 meters tall, our Iron Ore pyramid is twice that height. At current rates we should move our next 100 million tonnes during Q4 2014, depending upon new mine commissioning schedule this could be much sooner. Ladies and gentlemen please be assured we are not trialling this technology, we are exploiting this technology.

Many of you will know about our purpose built operations centre located adjacent to Perth Airport. From this centre we operate some 14 mines, all rail and port infrastructure plus power and water distribution systems.

This facility is an industry first; we started conceptually mapping it out in late 2006 and during 2007 started the first trials. Rio Tinto Iron Ore now possess unsurpassed experience on how to operate this type of facility.



We have not rested on our laurels with the operations centre, we have turned our minds to increasing the efficiency and productivity that we can gain from these facilities, importantly, we have built into our operations centre many of the philosophies of human systems engineering. We wish to specifically thank MIT and the US defence, aerospace and space sectors for assistance in this regard.

We believe the next generation of operations centre efficiencies will come from the seamless integration of the people who oversee and command these facilities with innovative systems design that makes the human interaction seamless. Our operations centre experience is going from strength to strength providing a capability that grows to support our expanding business needs.

I would now like to introduce you to a facility that we are calling an excellence centre. Rio Tinto as a group learned many things when Rio Tinto Iron Ore took the bold step of building the industry first, fully integrated, operations centre. We have learned much from the operations centre and now we are leveraging this thinking into other parts of our business.



Early 2012 we announced to the market that we were building the generic extension of the operations centre, plans at that time were well advanced and the systems engineering and human factors work was nearing conclusion. As we did with the initial operations centre we built a lifelike graphic of what the excellence centre would look like. What is running on the screen behind me is a demonstration of this graphic. At the end of the presentation a photograph of the built facility appears.

The excellence centre facility went live this year and we are now able to interconnect in near real time operational data on from large complex facilities; using this we model, analyse and optimise the performance of chosen processes irrespective of where they are situated anywhere on the globe.

The excellence centre brings together hundreds if not thousands of man years of discrete process expertise by way of embedded computer models; it houses experts into one place and links these assets with the operations in real time. It is also a critical training engine for our technical people.

In the early part of this presentation I put forward a hypothesis that the challenges we face in pursuing productivity enhancements demand the development and introduction of new innovative technologies and this could lead to a “win-win-win” situation between the mining industry, the technology suppliers and government participants.

To illustrate this practically I would like to talk about what I call a “win-win” alliance that we created some time ago with an Australian company headquartered in Victoria.



When one looks at today's mining industry through critical eyes of improving productivity, cost and safety there are literally hundreds of opportunities to introduce new technologies, new processes and new work into our business.

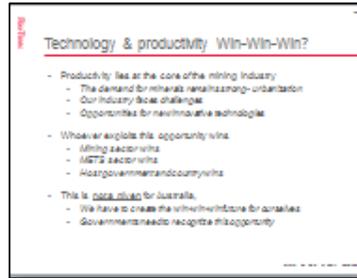
Those familiar with the mining business will recognize that haul truck tyre changing is a hazardous labour-intensive operation.

Partnering with innovative Australian vendors, leveraging deep expertise in our operations and taking a balanced view with respect to risk and reward delivers results. I'd like to introduce you to one such result, the world's first autonomous haulage truck wheel changer. This machine is not yet finalized but given the next AustMine presentation is two years away we thought we would show it today.

The haul truck wheel changer is a real-life example of what a “win win” can possibly look like.

Should the machine deliver against our expectations, at this juncture we see no reason why it will not. It provides a fantastic opportunity to embed a new technology that will provide a safer and more productive workplace. It also provides the opportunity for Australian-based suppliers working in partnership with the mining industry to possibly create a new manufacturing sector that can service not only domestic, but one would imagine, export markets.

In the decades to come as we drive to reverse the multifactor productivity decline we should be able to create many exciting new opportunities like the haul truck wheel changer, however, this will only happen if we can obtain alignment between the mining sector, the METS sector and Government. Government has a vital part to play in recognizing that with innovation comes risk and risk can be best managed within an appropriate and stable policy framework.



We should not rest on our laurels. Other countries have the capability to generate these types of industries and seize this opportunity, this is not a given for Australia rather it is a huge opportunity for Australia.



On behalf of Rio Tinto I would like to thank you for taking the time to listen to this presentation, I wish you well with the rest of this conference.