



**A CRITICAL IMPERATIVE – INNOVATION AND A SUSTAINABLE FUTURE
WORLD MINING CONGRESS, MONTREAL CANADA
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Distinguished guests, colleagues of the World Mining Congress, ladies and gentlemen. Good morning. Thank you for the introduction, Malcolm, and the opportunity to speak here today.

It feels good to be back in Canada, one of the great mining nations of the world. It is particularly exciting to be back in Montreal, the home of McGill University, one of the world's leading mining education institutions.

I must congratulate the organisers for putting such a good program together.

In being asked to be Honorary Chair with Jacynthe, I took the time to think about how I might articulate a worthwhile challenge to all that are participating in this great event. In this context I am referring to the elimination of poverty, economic inequality and other disconnects that ultimately drive both country-specific and regional conflicts across the globe.

So let me start with what some may see as a controversial proposition.

If we, as leaders in the mining industry, continue with our traditional conversations around incremental innovation and change, the mining houses of today will simply become subsidiaries of larger and more efficient industrial conglomerates. An even worse scenario may await us in more centrally managed economies, where frustration with rising commodity prices causes national governments to consider pushing more aggressively into resource nationalisation conversations. Now, while the integration into broader and more efficient private conglomerates would be one thing, the nationalisation of the industry would be a difficult development for the industry, with even more dire consequence for the people of the world.

So, let me unpack my proposition and why I believe we need to hit the reset button in terms of how we think about innovation and mining in the future.

Role of mining in society

“Mining is not everything. But without mining, everything is nothing.”

That’s a great quote – so let me start by setting context around the role of mining in society.

Mining represents around 10 per cent of the world’s economic activity as measured by the revenues from the commodity mining, quarrying and the petroleum sectors. It is estimated payments to service and support industries account for another 10 per cent of global economic activity. If we then count the contribution our products make to the productive capacity of other industries...including fertilisers for agriculture, fuel for energy and transportation, carbon and iron for steel and manufacturing and other products for construction we get to a global economic contribution estimate of more than 45 per cent for the mining industry.

Now, if we then consider we disturb less than 1 per cent of the earth’s surface in making this contribution, we produce less than 3 per cent of carbon gases and we are the key source of products that clean the water we drink and the air we breathe, it is not an unreasonable claim that we are the most important industrial activity on the face of the planet. At the same time we are also the world’s most vital industry to help ensure the future health of our planet.

Unfortunately, though, as an industry we’re not very good at telling our story in a way that regular people can see...or more importantly...feel. There are still far too many people who simply don’t see the linkage between the role of mining and the indispensability of minerals and metals in a modern, industrialised, and highly urbanised society. We make life, as we know it today, possible.

In any case I know I am preaching to the converted. If I can ask each of you today to stop and reflect for one minute... Are you helping to tell our story?

Our critical challenges

The mining industry is confronting three great and immediately pressing challenges.



First, while we have an abundance of resources across most commodities we are not able to develop these resources into reserves due to access and more specific social or legislative limitations. And for those limited new resources that are being developed, they are generally declining in scope and quality.

Second, because we have selectively developed our mines with short-term economic performance in mind, we have preferentially depleted lower-cost resources, leaving the world to bear the brunt of increasing commodity prices, driven by the compounding cost increases of extracting these lower-quality resources.

The third point that I would make seems so at odds with the first two points that it begs the question for us all – can we see the crisis we are lurching towards or do we simply not understand our role in society? So, my third point is that we, as an industry, are woefully under-spending on innovation and business-improvement programs given the state of extraction challenges. On a revenue to revenue basis, the mining industry spends 80 per cent less on technology and innovation compared to the petroleum sector. This is an astounding figure when one considers our operating costs are increasing at a rate that is three times consumer inflation rates. Now, in the context of being the world's most important industrial activity, it would seem to me that we all have a problem.

If you think I am being a little melodramatic let me share a statistic that reflects a worrying performance trend that is emerging in Australia as we speak.

The multifactor productivity metric for mining in Australia – the only area for which I have recent data – has decreased by 40 per cent over the past 10 years. That is, it now takes 40 per cent more inputs to generate a single unit of mineral product.

Quoting a major supplier of mining equipment last year, they expect that, in less than 10 years' time, open-cut mines will need to strip 70 per cent more waste to access the same products they are mining today... As a point of reference, traditionally, the base-metals and gold industries, over an eight-year period, increased waste stripping by around 15 per cent.

The world cannot afford for us to continue on our current trajectory. We need to constructively interrupt these disturbing trends through a number of decisive interventions:

- We must engage our political and community leaders to help them understand our role in society...and the long-term destruction their policies and approaches to mining are reaping on their own constituencies.
- We must dedicate ourselves to working with local partners to solve the problems our close proximity to their communities creates for them in terms of social development. While we need governments at all levels to help us engage in these local conversations, it will remain our responsibility to connect with our local stakeholders if we are to effectively navigate the complexities of these relationships. If we cannot engage constructively with our immediate neighbours, how can we expect to lead the world in a new set of conversations around our role in society?
- We must step more boldly into a world of aggressive and consultative social, technical and commercial innovation.

As I challenged you in my opening remarks, if we cannot solve these most pressing challenges, other industry leaders, with greater insight and vision for the future, will.

Innovation and our Brave New World

As a new chief executive of a major mining company, I am not allowed the luxury of thinking about things that won't work or cannot be practically applied to improve our business across the short, medium and long term.

In looking at how we try to get the balance right we are now thinking about our underlying business improvements across three major dimensions.

First, we are focused on driving our management and operating practices up to industry best practice. That is, not the mining industry but the more progressive industrial or process-orientated businesses where the ability to compete and establish an advantage is measured in millimetres through the underlying efficiencies of your process. As more of the deposits we find and develop look more like the one



next door, and cost curves are flattening, the ability to be quicker, smarter and more efficient will define competitive positioning and the scope of the financial margins we have to work with. We will need to be better and on the ground, more aggressive and effective in our commercial practices and more user-friendly in our customer and stakeholder engagements.

My second point... we must see and understand technologies and their potential application in our business quicker and more clearly than our competitors. Our “Mission to Mars” will come in quantum steps, supported by incremental developments that transform our underlying mining processes from potential to application in the shortest possible timeframe. The open-forum collaborative model that defined new mining methods and potential for the deep underground gold mines of South Africa has established a new benchmark in how integrated thinking and broad collaborative partnerships can drive rapid progress from idea to application in a fraction of the time it would have taken back in the ‘70s. In less than two years we went from a desktop concept to operating prototypes – with a potential practical operating model within less than a four-year timeframe very likely.

The third leg of the “innovation tripod” must be focused on customers and finding better or more cost effective uses for our products in their industries. In having worked for Inco as COO I still reflect on what we missed when the world started sourcing nickel pig-iron in certain lateritic feeds back some 10 years ago. I guess the question I keep reflecting on, as the largest nickel producer in the world, is how did we miss such an obvious “value- add feedstock” for our industry? If we had taken the time to understand our customers’ value chain, would we have seen a better raw-material feedstock option? While I can’t be sure the answer would have been yes – if it had been, we could have improved our competitive position quite substantially, instead of becoming a partial victim of someone else’s feedstock solution.

The Anglo American Story

At Anglo American we are rethinking our Value Proposition as a major diversified mining house. In our first few months in this process, we have focused on shareholders and how we create sustainable value from their perspective. We know

that many of our shareholders think beyond the immediate term and understand we have to position the organisation for continuing and long term competitive success.

In that same context, I hope that you will indulge me when I say a little bit about an exciting initiative we call “*FutureSmart*”, which sets out our own vision for the mining industry. “*FutureSmart*”, which we’re introducing here at this Congress, embraces our approach to collaborative innovation that we believe is necessary for the industry to become truly sustainable. And my aim in doing so is not so much to ‘plug’ Anglo American as to look at some possible ways in which aspects of “*FutureSmart*” might benefit the industry in general.

As many of you know, Anglo American has a long-deserved reputation in technology innovation in such areas as:

- Deep-level hard-rock mining;
- Platinum and diamond processing;
- Marine mining for diamonds; and,
- Exploration success, particularly in base metals.

Today, we are actively involved and providing a lead in the development of:

- Low-temperature super conducting quantum interference device (SQUID) exploration technology;
- Underground hard-rock cutting machines that take the human element out of potentially hazardous working areas (with two remote-controlled machines cutting rock in our platinum mines as we speak);
- Automated vehicles (we have 2 ADTs that have been automated with a kit system – the only ones currently running in the industry); and,
- Underground mapping and positioning.

What we hope to do with *FutureSmart* is to use it as an enabler for a more sustainable future not only for Anglo American, but for the industry. We want to be in the vanguard in driving a more sustainable approach to mining, using innovation and

technology to find safer, more efficient and more environmentally friendly ways to unlock mineral value.

Collaboration – creating the future

In three important areas – collision avoidance, automation and underground cutting – we are working in an open and collaborative approach by connecting with our peers in order to help each other in safety and productivity.

Why more collaboration?

Well, it comes from a realisation that, although there are many areas of excellence in our individual companies, we could do so much more if we were able to make a step-change by co-operating in mining technology.

And if that sounds a bit fanciful, take the example of the process-control industry, where we benefited from collaboration with the chemical and petrochemical industries. In the early days of process control you had to buy a single-source solution from instruments all the way through to controllers. Now you select the best instruments from the best suppliers and connect them to the best control solution appropriate to your specific need, through common interfaces.

Even more importantly perhaps, we need to co-operate within our sector because in a number of important areas we have effectively ceded control of the mining technology space to our OEM suppliers.

An ideal outcome is a progressive, competitive ecosystem where players compete on adding value to the mining process – and not by developing closed, insular, proprietary components.

Catching up...and the future

To be frank, our industry lags – in places by decades – the manufacturing, automotive and aviation sectors and other more progressive and innovative heavy industry players in terms of operating practices and processes.

When it comes to automation, for example, motor manufacturers supply driver-assist systems that are paving the way for autonomous-assist driving, while Google's driverless concept cars already operate on set routes in normal traffic. We can even learn from the humble tractor, some of which are now equipped with semi-automated functions to increase productivity and minimise operator fatigue. John Deere and others have developed a guidance system which accurately keeps tractors on a pre-determined route to maximise productivity by avoiding overlapping and subsequent soil compaction.

To deliver on our sector's potential, we will have to put in place new processes that reach outside the mining industry for their inspiration and application – and there is no reason why our industry should not use the best from all of these “restless innovators”.

When we integrate this type of approach with an experienced technical knowledge of how to extract value from our resources, I have no doubt that the industry will take a significant step forward in the business of creating value.

A final word

There is no doubt the challenges we face as individuals and as an industry are huge. But none of those challenges are insurmountable or too big for us to solve. I believe we need to think and build on our collaboration models for research, as the pace of change we are seeing in society is simply outpacing our ability as individuals to deliver solutions that are keeping up with the dynamic social change in our new world order. We have to rethink our own models and start considering ways that we can help each other start running at the same pace, to then start closing the progress gap. Our current models for innovation and change are out-dated and they are simply not delivering what society needs from us. We need to help each other deliver on our solemn commitment to society – that is, to help make the world a better place.

We must focus on these three critical challenges:



- first, we must work with each other to create a new set of mining models that deliver step-changes in cost and other key performance metrics;
- second, let us consign restrictive intellectual-property rights to the wastebasket. They are simply holding back our ability to innovate and change at the pace the world demands; and,
- third, let's rebuild our relationship with our most important stakeholders – the people. It is only with their support that we will deliver on our obligations to society.

While I am not suggesting what I have put forward today is the only answer. What I am challenging everyone in this room to do is to put aside our petty competitive issues and concerns and start thinking about a much bigger picture that we are all part of. What we need to do is help each find the future in our quest to serve society. We are all part of that conversation and so I remain ever the optimist...that we can all be part of creating a new future, one that looks better than the grim realities many of our brothers and sisters are facing today.

The future of our industry and the world we know is in our hands. Let's make sure we deliver on this solemn responsibility.