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I would like to begin by acknowledging the traditional owners of the land on which we meet today and pay my respects to their elders and ancestors. I would also like to acknowledge the passing of Robin Vigar, who I know brought such commitment and passion to her role as Director of this club. My condolences to her family, friends and colleagues.

I'm pleased to finally be speaking at the Brisbane Mining Club. I think it was at least two years ago that I agreed to come and speak here so it's good to have the stars finally align.

Queensland is blessed with a rich endowment of natural resources. It is home to some of the world's best coal deposits and hosts more than half of Australia's demonstrated economic resources of lead, zinc, silver and bauxite¹. All of which makes The Brisbane Mining Club a perfect forum to reflect on the contribution of the Australian resources sector, and consider some of the challenges ahead.

The Australian resources sector contributes to Australian and global living standards

All Australians benefit from this great industry. Just as the gold rushes of the 19th century enriched and helped to build Australia in its early years, the recent China-led super-cycle resulted in enormous reinvestment in our country and lifted Australian living standards. The Minerals Council of Australia estimates that resource investment of around \$400 billion between 2003 and 2014 lifted the average Australian household's weekly income by \$100 per week². In Queensland today, as many as one in seven³ jobs is related to the resources sector. And of course right across Australia, the resources sector is responsible for around 200,000 well paid, highly skilled jobs and contributes billions of dollars to our economy, accounting for around 9 percent of Australia's GDP⁴.

The benefits to Australia have been well discussed, and while the vital role for resources in our broader global society is also often reflected on, I don't think we give it ample airplay.

Australia is an important source of resources for the rest of the world. We are global leaders in the production of minerals that are crucial for the development of emerging economies - iron ore, bauxite, lead, zinc, and of course, coal. I'd like to call out the contribution of coal today because it plays such a critical role – not just here in Queensland and Australia, but globally.

We all know the world faces a huge challenge in meeting both global energy demand and our climate objectives. This is a global problem and it requires global solutions. In Australia, it seems increasingly commonplace to assume that the only way to meet global climate objectives is to

¹ <https://www.business.qld.gov.au/industries/invest/mining/resources-potential/mineral-resources/metalliferous>

² Minerals Council of Australia, The Whole Story: Mining's Contribution to the Australian Economy

³ <https://www.qrc.org.au/media-releases/natural-resources-sector-supports-jobs-federal-seats/>

⁴ Minerals Council of Australia, The Whole Story: Mining's Contribution to the Australian Economy

eliminate coal as an energy source throughout the world. We have seen this reflected in the growth of anti-coal activism and increasingly sophisticated campaigns that target project owners, suppliers and financiers.

Before I continue, let me be clear in stating that I believe in climate change science and the need to eventually and thoughtfully move away from coal.

There are no easy solutions to a problem as complex as climate change. Every country will choose an energy mix that best meets its needs, and Australia and most other developed economies are increasing the proportion of renewable energy in their total energy mix.

But this comes at a cost, and we recognise that access to affordable, reliable energy and socio-economic development are intrinsically linked. As nations develop, they seek secure and affordable sources of energy to build their economies and lift living standards. Around 830 million people throughout the world gained electricity for the first time between 1990 and 2010, almost exclusively through coal-fired generation⁵. More than 1.2 billion people in the world still have no access to electricity, and around 2.7 billion people still cook and heat their homes by burning wood and dung⁶. These are extraordinary statistics that humanise the challenge we face.

Coal is currently the single largest source of electricity generation, with more than 40% of global electricity provided by coal-fired power plants⁷. In its annual World Energy Outlook for 2016, the International Energy Agency forecast that coal will remain the largest single source of electricity generation through to 2040, with most of the new demand for coal driven by India and Southeast Asia. So while coal's overall share as a global energy source relative to other fuels will decrease over time, absolute demand for coal will continue to be strong in the coming decade.

The challenges we face as a global community to reduce our carbon emissions, maintain our own standards of living, and relieve poverty in emerging nations cannot be solved independently of each other. This is a challenge of enormous significance for all humanity, and it will take great ingenuity and collaboration to resolve. I believe the solution, at least in part, will be found in technology.

Over the decade to 2015, investment in clean energy technologies is estimated to have been close to US\$2 trillion⁸. This investment has been supported by government policy and has seen us take great steps toward our emission reduction goals and away from our reliance on coal.

If the world is to reach global emissions reduction targets while meeting the ever-growing demand for energy, we need to continue to reinvest in technologies that will support reductions in emissions from coal-fired power generation.

⁵ Robert Bryce, *Not Beyond Coal: How the Global Thirst for Low-Cost Electricity Continues Driving Coal Demand*, Centre for Energy Policy and Environment at the Manhattan Institute, October 2014, p. 10.

⁶ International Energy Agency, *World Energy Outlook 2016*

⁷ International Energy Agency, *World Energy Outlook 2016*

⁸ Clean energy data from Bloomberg New Energy Finance, 2016 Clean energy Investment by the Numbers – End of Year 2015

China provides an interesting example. It has a commitment and plan to reduce emissions from coal-fired power and other industrial uses, and it has committed investment to achieving its goals. It is closing smaller, inefficient power stations, but also investing in large modern coal-fired plants that incorporate high efficiency low emissions technology as part of their total energy mix so they can meet electricity demand. In the ASEAN region, nearly 50% of all the planned coal-fired plants will use either supercritical or ultra-supercritical technology⁹.

These are positive steps, but the need for rapid adoption of new technologies is pressing.

Australia has developed a globally significant services sector

While the resources industry is sometimes perceived as stuck in old ways of working, the reality is that mining has been transformed by technology and this will continue well into the future.

Today's resources industry is a knowledge based sector, focused on productivity enhancing technologies that allow us to deliver more from less. Advances in ore body evaluation, blast and mine design, data management, automation and robotics are just some of the factors supporting the commercial development of resources with declining grade, at greater depth, in more remote locations.

Many of these innovations have relied on the contribution of our Mining Equipment, Technology and Services – or METS sector. The Australian METS sector has also made a significant contribution to our economy. The METS sector generates revenues of around \$90 billion annually, including an export component of around \$15 billion each year¹⁰.

A total of 6,539 Australian mining inventions were filed for patents between 1994 and 2011¹¹, and over half of all businesses operating in the Australian METS sector export products, services or technology to mines around the world¹².

Orica is one of Australia's longest standing and successful example of METS. Our origins date back to 1874 when the company that was later to become Orica established an explosives factory in Melbourne's gold fields. That company, Jones Scott & Co, subsequently became a division of UK-owned ICI, and Orica was created in 1998 after ICI divested its shareholding and created an independent ASX listed corporation.

Orica at that time was a relatively inward looking Australian and New Zealand based organisation – raised and cloistered in a manufacturing era of protectionist trade policy. With its new found freedom from its UK parent, and finding itself in an increasingly open and competitive economy, the company completed numerous acquisitions and divestments to carve a niche supporting the global mining industry. Today Orica is the global leader in mining and civil blasting. We employ more than 11,500 people and serve customers in around 100 countries.

⁹ World Coal Association: Energy in ASEAN Countries Fact Sheet

¹⁰ Minerals Council of Australia, The Whole Story: Mining's Contribution to the Australian Economy

¹¹ Minerals Council of Australia: Submission 23, Inquiry into innovation and technology: workforce for the new economy, 11 March 2015

¹² Department of Industry, Innovation and Science:

<https://industry.gov.au/industry/IndustrySectors/MiningEquipmentTechnologyServicesIndustry/Pages/default.aspx>

Public policy settings influence how successfully we leverage our comparative advantages

It's instructive to consider that the evolution of Orica began with the need to adjust to open economies. The chemical and plastics operations which lacked the scale and cost base to compete globally as tariffs were reduced were divested, and we focused on our areas of comparative advantage.

The same structural economic reform that shaped the need for Orica to adapt to its new circumstances also facilitated the success of the Australian resources industry throughout the recent boom.

The reform of the Hawke-Keating and subsequent Howard eras made Australia a more open and flexible economy. The floating of the Australian dollar, the removal of restrictions on foreign investment, the abolition of central wage-setting, and opening our borders to free trade supported large scale investment and the development of an open and globally competitive resources industry. This platform allowed Australia to fully benefit from the strength and duration of the most significant mining boom we are likely to ever see.

Our world has changed since those times. Mining is cyclical, and so resources and METS companies have to manage through the ups and downs as a normal part of life. Adaptation is part of the DNA of our industry, but there is not much that is as frustrating as the challenges that we as a nation inflict upon ourselves.

Just as the economic reforms of the 80s and 90s set the scene for us to benefit from the mining boom, we now see policy, and lack of policy, that hinders our ability to thrive and grow as a nation.

Of course I refer to our own "energy crisis".

We are a nation endowed with abundant coal and natural gas reserves. These reserves have played an important role in transforming the developing world, as I spoke about earlier. Here at home, they have also been fundamental in creating globally competitive manufacturing industries that add value to our natural resources and create jobs for Australians.

Despite having some of the best gas resources in the world, Australians are now facing some of the highest gas prices in the world, and in some cases a shortage of energy.

Availability of affordable gas and energy is now at a crisis point. Cost of living pressures on domestic households and unprecedented high energy costs that are making Australian manufacturing unaffordable have to be addressed for the long term, now.

Orica is in many ways a very good example of the energy and gas issues confronting manufacturing across Australia. We are an energy intensive business that also uses natural gas as a raw feedstock for manufacturing. Like all manufacturers in Australia, we have faced exponential increases in our energy costs and the associated erosion of a competitive advantage relative to imported products.

Let me pause here for a moment to ask you to consider a question. What do you think would happen today if a large mining company sold iron ore to BlueScope for double the price they sell for in Japan? Surely it would not be long before the regulators would intervene? Well, that is exactly what is happening today in the Australian natural gas market.

It is well understood that as international commodity markets grow, with more suppliers and more customers, the length of contracts tend to shorten and the price of the commodity is set by the

market instead of bilateral negotiations. This is what we have already seen happen in the LNG market.

So what is the problem with natural gas prices in Australia? We know that local production is smaller than the sum of export commitments and domestic consumption, and so the local price does not clear to international prices and hence incredible local price spikes result. Today we can see contracts more than 100% higher than the spot Chinese price.

What can be done to solve this? Conceptually the answer is simple. We need policy settings and an environment that will encourage the LNG market to converge to a fully tradeable system. We've seen this work with other commodities such as iron ore.

As long as the profit to producers is at least equivalent for both export and domestic sales, they should be indifferent to which market they supply. Domestic prices would adjust to "parity" with export prices, eliminating the local price spikes we are currently seeing.

Bear with me as I discuss a numerical example.

Let's assume we have an Australian producer selling one tonne of LNG into China, at a North Asia spot price of US\$8.50, which is what it was in mid-January. After allowing for gas production costs of US\$6 and liquefaction and freight costs of US\$1.50, the producer would have made a profit of US\$1. In a fully tradeable market environment, the producer would be able to sell this tonne into the Sydney market instead, obtaining the same profits.

That is, they need to make the same profit of US\$1. Production costs of course will be the same, but the freight costs will be less. So, with the same production cost of US\$6, profit of US\$1 and freight costs of US\$1, the sale price into Sydney would be US\$8. In other words, the price in Sydney is the landed price in China, less the saving in freight costs.

Now, let's broaden the example a little to consider what is achievable in a fully tradeable system. Let's say an Australian producer has a long term contract to sell one tonne in Japan at \$11.00. This is a contract for dry gas, which means that theoretically they could supply this from Queensland or the United States. They can tap the US market and deliver that tonne of LNG at a cost to them of \$7.50, which would leave them with a cash profit of \$3.50. That still leaves them with the one tonne of gas they have produced in Queensland, which they can sell into the domestic market. As mentioned previously, they would have to sell in Sydney at the equivalent international price of US\$8, obtaining an additional profit of US\$1.

So what is happening today? As producers increase their exports and local demand for natural gas grows, a market of excess domestic demand for natural gas has been created. The domestic natural gas price is not determined by the internationally traded gas prices, but by the opportunity cost of not having that last cubic feet of gas for either manufacturing or power generation. That is why we have seen domestic gas prices significantly in excess of 100% of Japanese prices. It is the gas price of desperation, not the fair tradable prices that Australia should have.

What do some producers argue? Producers basically "invoke" the "contract sanctity" argument - a tonne of LNG can only be delivered from Queensland. Maybe in the short term this may have some merit, but with the right efforts this can be solved. A first step that can be taken today by the Commonwealth is that any new LNG export contract has to have a flexibility clause – every contract for copper or coal allows for multiple sources of origin, subject to the same quality. Furthermore, existing contracts have some sort of flexibility clause. That is, they usually contemplate for 10% to

15% of the volumes to be reduced or substituted. These clauses should be used to their maximum possibility, to liberate gas for the domestic market deficit.

And finally the Government, the producers and eventually the consumer countries should be persuaded to allow these substitutions. What is happening today is myopic and unsustainable, cornering domestic markets with prices so much higher than the international prices will eventually lead to a bad outcome, price ceilings or other non-market measures.

The faster Australian gas prices follow the path of all other commodities, the faster Australia develops a fully tradeable international LNG market, the better it will be for all the stakeholders involved.

Local prices should not be higher than export parity. In other words, it is wrong to have local prices higher than what the producers can get overseas. There is no other commodity in Australia where this happens; not in iron ore, nor oil, nor coal, nor copper, nor bauxite, nor any other. Their price is determined by international markets. Natural gas should not be the exception.

Of course, all of the above measures need to be complemented with incentives for natural gas exploration. The states should be persuaded to abolish reservation areas and exploration prohibitions, which in the end only end up hurting the whole of Australia. Hopefully this is done before we see manufacturing plants close because of excessive gas prices.

I'm sometimes told that Latin Americans have an optimistic outlook. I'm not sure if my outlook is optimistic, or if others are pessimistic. What I know is that comparative advantage in natural endowment is no guarantee of competitive strength. The right policy settings are critical to help us respond to new challenges and create the right environment for Australia to continue to prosper from the development of its resources.

Thank you.