ASX Release

21 January 2021

The Companies Officer
Australian Securities Exchange Ltd
Level 40, Central Park
152-158 St Georges Terrace
Perth WA 6000

Dear Madam or Sir

DR ANDREW FORREST AO: BOYER LECTURE

Fortescue Metals Group Ltd (**Fortescue**) (ASX: FMG) advises that its Chairman and founder, Dr Andrew Forrest AO, has tonight recorded to a live audience the first Australian Broadcasting Corporation (ABC) Boyer Lecture for 2021, entitled "Oil vs Water: Confessions of a Carbon Emitter". A copy of the speech, which will be broadcast on ABC television on Saturday 23 January at 2.30pm AEDT, is attached.

The speech includes a reference to Fortescue's net profit after tax of over US$940 million for the month of December 2020, which is based on preliminary unaudited management accounts. Fortescue is scheduled to lodge its half year financial results for the financial year ending 30 June 2021 on 18 February 2021. Fortescue advises that the preliminary net profit after tax for the six months ended 31 December 2020 on an unaudited basis is in the range of US$4.0 to US$4.1 billion.

Yours sincerely
Fortescue Metals Group Ltd

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****Check against delivery****

Oil vs Water: Confessions of a Carbon Emitter
Dr Andrew Forrest AO
21 January 2021

The Boyer lectures are traditionally lectures – a speaker lecturing Australia about what it should do.

I've chosen a different path.

This lecture is about what I'm doing to fight climate change – under the premise that actions speak louder than words.

But first – I have a confession to make.

The iron ore company I founded 18 years ago, Fortescue, generates just over two million tonnes of greenhouse gas – every year.

Two million tonnes.

That's more than the entire emissions of Bhutan.

It's also just 0.004 per cent of the greenhouse gases that enter the atmosphere every year – around 50 billion tonnes.

The answer isn't to stop mining iron ore – which is critical to the production of steel and to humanity.

The answer is iron ore and steel – made using, zero-emissions energy.

Australia has 70 GW of energy capacity.

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To put it in perspective, if the world's renewable energy resources were a power station, we'd be able to produce not 70, but millions of GW.

There's enough pollution-free, renewable energy out there to power humanity for the entire Anthropocene.

The Anthropocene is the age of humans.

But unlike other geological eras, the markers of our age won't be *Tyrannosaurus* teeth or asteroid craters, they'll be giant landfills of single-swig, plastic water bottles – fossils the moment they were made.

We have no idea how long the Anthropocene will last. But if we don't stop warming our planet – it will be geological history's shortest era.

The solution is hydrogen.

Hydrogen is the most common element in existence.

In fact, the universe is 75 per cent hydrogen by mass – so we'll never run out of it.

It's also the simplest. To make it, you just run electricity through water.

That's green hydrogen, the purest source of energy in the world – and one that could replace up to three quarters of global emissions, if we improve the technology and had the scale.

But right now, we don't use it for energy.

It's just an ingredient used in industrial processes. And we make it from fossil fuels – quaintly calling it grey hydrogen, to hide the fact that it's a pollutant.

Green hydrogen – the good stuff – is virtually ignored by the economic world.

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We're missing a colossal opportunity.

The green hydrogen market could generate revenues – at the very least – of 12 trillion US dollars by 2050. Bigger than any industry we have.

And Australia, with characteristic luck, is sitting on everything it needs to be the world leader – but only if it acts fast.

The tricky part is transporting it – but we are cracking that.

The journey to replace fossil fuels with green energy has been moving at glacial speed for decades – but is now violently on the move.

Our technology-led northern neighbours, Japan, South Korea and China have together pledged to put almost 8 million hydrogen fuel cell cars on the road.

Boris Johnson, who once wrote that wind power "wouldn't pull the skin off a rice pudding," has invested 12 billion pounds in green energy – and, way more importantly, banned the sale of all fossil fuel engines by 2030.

Even Australia, which declined to commit to a zero emissions target, is investing 300 million dollars in hydrogen.

Europe has allocated a trillion – that's a thousand billion – Euros to reach zero emissions by 2050 – while the US has pledged 2 trillion of its dollars.

And almost every major business in the world has committed to net zero emissions by 2050, including Australian companies, marching ahead of government.

These are laudable and genuine ambitions.

But if we wait until 2050 to act, our planet will be toast.

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We're already way behind schedule.

The science says that to keep things halfway normal, we need to limit warming to 1.5 degrees.

The science also says that to do this, we need to slash our emissions every year between now and 2030 - and there's no way we're doing that.

As of today, we're heading for a 3 degree rise.

That's how science works. You can predict it.

There's only one solution, and we will all have to act with courage.

Zero-emissions energy needs to be available at an industrial, global scale – and at a price that competes with fossil fuels.

When renewable energy becomes less expensive than fossil fuel energy – that's when we'll reach the tipping point. That's when the world will begin the journey in earnest to become zero-carbon.

Not only because it's the right thing to do, but because it makes great sense.

And the shift will be lightning fast. Forget 2050 – zero emissions will begin to happen overnight.

That's how capitalism works – you can predict that too.

…

One of my favourite songs is Tom Petty's Runnin' down a Dream.

In the song, he's chasing a dream that won't happen unless he *pursues* it, wherever it leads.

It's a song that makes you feel like anything is possible.

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We played it every time our plane took off on our recent five-month journey around the world.

We were searching for the best places on Earth for renewable energy – a way to really change the source of all our energy.

The song is now tradition, part of the folklore of that trip.

So, let's talk business.

While net profit after tax continues to elude Tesla, it has a market value of over 800 billion US dollars.

Its major climate innovation is a battery that runs on whatever fuel is in the national grid – instead of a fuel tank.

I think the real climate change challenger, could be Fortescue.

It has a market capitalisation of less than 60 billion US dollars – but it made a net profit, after tax, of over 940 million US dollars – just last month.

Based on this position of strength, the Fortescue leadership recently decided to have a crack at becoming one of the world's largest green energy and product businesses.

To catalyse a global solution to climate change – by rapidly increasing the supply of green hydrogen.

In August 2020, a dedicated and determined team, in the midst of COVID, left Australia to visit almost 50 countries. Some of us have only just returned.

Timing was everything.

The world was in lockdown.

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Economies and energy markets were collapsing.

The diaries of political leaders were eerily empty, and foreigners were a rarity. Particularly foreigners with a vision to develop their wasting renewable assets, within a global strategy.

The trip came with considerable risk.

We had all left behind our loved ones and the security of Australia in the middle of a one of the worst global pandemics in history.

When I caught COVID, and spent three days on oxygen in Switzerland – I could be forgiven for fearing the worst.

Looking out of the isolation chamber, feeling like I'd been vacuum-packed in plastic, being medivacced between countries – I wondered why I had ever left home.

On reflection, it was the discussions I had with sovereign leaders, businesspeople, politicians and technology developers.

It was their genuine belief that the time for green hydrogen had come.

I sensed a change in the global mood – this shift in belief – that the impossible could be possible.

Like Banjo Patterson said in The Man From Snowy River, "there was movement at the station, for the word had passed around."

We could create sufficient volume of green hydrogen to challenge the oil sector. World leaders were lining up in support.

In Bhutan, the Prime Minister opened the border for the first time in months – just to allow my team to enter. Any staff who met us had to then quarantine for three weeks. If you've ever done quarantine, you'll know what a sacrifice that was.

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In Afghanistan, the Vice President showed huge conviction that his country could play a major role in the world's march to green energy.

After surviving a bomb and a seven-minute gun battle, with bandages on his hands and burns to his face, he negotiated the final clauses of our sovereign agreement – just so the President, also one of the most selfless leaders I have ever met, could sign before we flew out.

We once took an unusual flight path - Kyrgyzstan to Seoul - and I realised the smart money was already on the move. We saw thousands of wind towers and the foundations for what looked like tens of thousands more, on the Mongolian-Chinese border.

This is a massive move into green energy, and China is making it – without fanfare.

My time on the road made me realise that our ambitions – while risky – were far from radical.

The question wasn't whether green hydrogen would become the next global energy form – it was which company would have the resilience to take the risk and truly test green hydrogen at global, industrial scale?

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The board and I decided Fortescue would be that first mover.

We're now undertaking feasibility studies that could lead to some 300 GW of power – more than four times what Australia can produce.

We have targeted hydro-electricity – generated by rivers – and geothermal, which taps into the heat from the Earth's core - these renewables work around the clock – yet solar is currently the cheapest form of energy in the world.

Our final aim is 1,000 gigawatts of zero-emissions energy.
It sounds daunting, and naysayers are everywhere.

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But as someone who's made a career out of doing what other people said was impossible, this doesn't feel any different.

You need a thick hide to withstand criticism, and, apparently, I have that. A colleague once said you could shoot me in the tail – and I wouldn't feel it.

To which I'd answer: it runs in the family.

John Forrest, my great-great-uncle, was born to indentured Scottish migrants who arrived in Perth in 1842.

John became WA's first qualified surveyor, and pulled off a series of death-defying but highly calculated expeditions, including the first transect through Australia's centre to join our east and west coasts as one country.

It was an eight-month, 2,000-km journey, largely on foot.

John become WA's first premier and a Founding Father of Australia's Federation.

But for me, one of his greatest achievements was the risk he took in building the vital water pipeline from Perth out to the Goldfields.

Together with engineer C Y. O' Connor, he built a 30-metre dam near Perth, and pumped the water 560 km inland, up a gradient of almost 400 metres – using many technologies for the first time. Each of the 60,000 sections of pipe – often laid by hand – weighed a tonne.

The logistics were formidable then – and they would be still today.

John borrowed several times the states' budget, and was told to stop wasting public funds on an impossible task – a pipe dream.

O' Connor ended up shooting himself on his horse at a beach near Fremantle due to the pressure.

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But the pipeline was built – and without it, the mining boom, which helped build cities as far away as Melbourne, would not have happened.

These pipes were made of steel, and steel is made from iron ore.

Most of the world's iron ore formed roughly 3 billion years ago, when organisms first evolved the ability to make oxygen.

The oxygen reacted with iron – sinking to the bottom of the ocean and creating the rich deposits in the Pilbara we have today.

Ironically, this ancient event is what's allowing us to modernise.

Steel is fundamental to everything you see around you, from your home, to your car, the roads you drive on, to your ability to watch this Boyer lecture.

But right now, Australia makes barely any of that steel.

We just dig up the iron ore, process and export it.

In some ways, that's a blessing: blast furnaces, where most steel is made, generate 8 per cent of global emissions – because coal is used in the process.

But our neighbours and customers want to phase out carbon pollution by 2050 – and the most carbon-intensive of the fossil fuels, coal – will be phased out too. That's just a fact.

Now imagine if we could find a way to make steel without coal – zero-carbon steel – in Australia.

This isn't a pipe dream, either.

There are two ways.

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In one, you replace coal in the furnace with our old friend, green hydrogen. You get steel – but instead of emitting vast clouds of CO_2, you produce nothing more than water vapour.

To strengthen the steel, you simply add the carbon separately. It bonds into the metal rather than dispersing into the atmosphere. Beautiful.

The other way to make green steel - the radical approach - is to scrap the blast furnace altogether and just zap the ore with renewable electricity.

Fortescue is trialling both methods.

We aim to start building Australia's first green steel pilot plant this year, with a commercial plant in the Pilbara, powered entirely by wind and solar, in the next few years.

Australia is in an absolutely unique position to scale green steel.

We could look at losing our coal industry as a national disaster – yet I've always believed out of every setback, is the seed of equal or greater opportunity.

We produce over 40 per cent of the world's iron ore. And our potential green energy and hydrogen resources are immeasurable.

If Australia were to capture just 10 per cent of the world's steel market, we could generate well over 40,000 jobs – more than what's required to replace every job in the coal industry.

Not any old jobs, but similar jobs - construction workers, mechanics, electricians, engineers – all of the sectors that'll be hit when coal is phased out.

The timing is right.

And we would also produce a product that is so much more valuable than either coal or iron ore – green steel.

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I volunteer and call on fellow leaders to help drive this industry, power our economy and protect the jobs of fellow Australians, as we make this critical transition.

The immediate and multiplier impact on the Australian economy, if we get this right, could be nothing short of nation-building. We stand to lose tens of thousands of jobs if we don't do this, but we stand to create hundreds of thousands of jobs if we do.

At the start of this lecture I said that actions speak louder than words. So, I want to tell you what we're doing to decarbonise Fortescue.

By the end of the decade, our trucks will run on renewable energy. Imagine that: a fleet of vehicles that produces nothing more than steam as exhaust.

We're also aiming to develop green iron ore trains – that are powered by either renewable electricity or green ammonia.

Currently, the global shipping industry is one of the single biggest polluters in the world – so, this year, we'll begin to settle designs that also allow our ships to also run on zero-pollution, green ammonia.

And we're willing to share that knowledge, to help our competitors go green too – including Vale, one of the largest mining companies in the world.
But where will we get all our green energy from?

In the Pilbara, Fortescue is designing vast wind and solar farms that can generate over 40 GW of power – more than half of what Australia can make now.

In the Northern Territory, I've personally invested in Sun Cable, which will be the largest solar farm and energy storage facility in the world – providing 20 per cent of Singapore's needs via a 4,500-km long cable.

With all these technologies, the day that Australia can mine iron ore without generating emissions is rapidly approaching.

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And if a major player like Fortescue does it, substantially reducing operating costs, then be assured business will follow promptly.

You may have noticed that I've been talking about climate change for almost half an hour now – and haven't pointed any fingers at anyone (apart from myself!) or asked anyone to make any sacrifices.

I'm a realist.

I know we can't expect our CEOs to act like Mother Teresa – they'll get moved on by shareholders, and the next, less principled CEO, wheeled in.

Don't get me wrong – I do believe that business must be steered by ethics.

The environment, business, family, health, society and our communities – they're all connected.

For example, I've never invested in coal – even though I knew years ago it would have doubled the cash flow of our company.

I've made an allowance for natural gas – as a critical stepping-stone – but only because the infrastructure can easily be adapted to green hydrogen.

And all of Fortescue's Sovereign Agreements come with strict conditions.

One is that we will build multiple, small dams along each river, rather than one huge dam. This is called run-of-river and is environmentally respectful.

Another is that countries must commit, in the contract, to humanitarian targets – eliminating child marriage, eliminating forced marriage and modern slavery, in all its forms.

Equality of education outcomes between girls and boys – leading to equality of employment between women and men.

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No commitment, no deal.

We dust off our shoes and go to another country.

Change takes courage. And that must be encouraged by our society.

We must be prepared to fail in pursuit of improvement – or we as individuals, or as societies, or as a nation – will stagnate.

Often with change comes fear – and I'm used to fear.

I feel it as much as anyone else.

My job is to persevere through it.

Eighteen years ago, I was just a young upstart trying to set up Fortescue.

Everyone told me I was crazy to take on BHP and Rio Tinto. They had a stranglehold on the Pilbara. Almost everyone I met in the industry said it was impossible.

But we did it.

And in the process, we reduced costs from around US $48 to $13 per tonne.

How? It wasn't down to luck or unexpected breakthroughs.

There was no one hero, there was no single great technology.

Rather, it was thousands of people and thousands of improvements that made our operations safer and more efficient day by day, year by year.

At Fortescue, we call this the flywheel.

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We nudge the wheel, make sure our systems work, reduce costs, free up capital and create demand.

Then we encourage that momentum and reduce costs further, creating an even larger, more reliable supply, that again creates more demand.

The flywheel begins to spin, on its own, faster and faster.

Now, we're building – at global scale – the flywheel of green energy.

But let's not underestimate the challenge.

The fossil fuel sector will react to falling green hydrogen prices by slashing the cost of oil and gas until it's almost zero.

At the end, it will be grim – think of a knife fight in a telephone box.

And Big Oil's last stand will be to use fossil fuels to create blue hydrogen – storing the emissions in the ground and peddling it as clean energy.

But it's not clean energy and governments are already falling for it.

So-called blue hydrogen just displaces the pollution from one part of the world to another. It's the same dog, just a different leg action.

And it's not just the oil companies we need to be wary of. Self-interest will be everywhere.

Elon Musk recently called hydrogen fuel cell cars - despite the 8 million that will soon be on the roads - "mind-bogglingly stupid".

He has every reason to fear them.

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His description is perhaps better suited to someone who peddles a battery technology as green – when it runs on fossil fuel.

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There are two possible futures ahead of us.

Stop flying, driving, slash your standard of living – but you're still killing the planet.

Or… the alternative, beyond symbolic gestures and sacrifice, that demands far more courage – change.

One where quality of life increases, and we reduce carbon emissions.

One where we de-couple our economy – for the first time – from damage to our planet, damage that threatens our, and the Anthropocene's, very existence.

I choose change.

I choose hydrogen.

What do you choose?

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