>> Welcome to the podcast series of Raising the Bar Sydney. Raising the Bar in 2019, saw 21 University of Sydney academics take their research out of the lecture theatre and into bars across Sydney all on one night. In this podcast you'll hear Penelope Crossley's talk, is it time to stop calling renewable energy green? Enjoy the talk.

[Applause]

>> So, there are very few things that we will directly experience in our lifetime, that we can be confident will make it into the history books. But one of the things that we can be confident will make it into the history books, is the transition from fossil fuels to renewable energy. We're currently in the most significant transformation of the energy sector that we've seen in over 200 years, but we know that change doesn't come easily and that there are always going to be winners and losers. So, it's in that context that I'll be talking to you tonight about Australia's approach towards renewable energy law and how that has made it an outlier internationally. How the lack of recent legal and policy certainty for the renewable energy sector, means that we fast risk becoming an international loser. In particular, I'll talk to you about how our position as an energy exporter has enabled us to be distracted by ideology rather than taking a much more strategic approach and viewing this transition as an opportunity. And I'll provide you with some case studies as we go through the evening of some countries who have adopted different approaches and who are arguably managing the transition far better than we are. By the end of the talk, what I want to achieve is, I want you to gain a greater understanding of why Australia's approach of being in renewable energy for purely environmental reasons is fundamentally flawed and needs to be radically overhauled if we once again want to be a winner. But before I begin, I thought I'd just begin by talking to you about, well, what is renewable energy? And I thought I was fairly confident that I knew what renewable energy was. I've been a renewable energy lawyer for over seven years, and what I discovered when I began my research is that, in fact, what I thought renewable energy was not what other countries thought were renewable energy. So, commonly, when we think about renewable energy, we think about it as being energy that is not derived from fossil fuels. So, energy that doesn't come from coal or gas or oil, and if we were to be even more precise, we'd be saying, well, actually renewable energy is energy that we can replace faster than we can use it up. But this isn't the approach that a lot of countries take. In fact, places like Ecuador include nuclear energy in their definition. Sweden includes Peat which takes 10,000 years to form and is a precursor to coal, and Kenya actually even includes charcoal simultaneously having to ban it from time to time because they actually don't have enough wood in their forests. Now, I could very, very happily talk about the definitions of renewable energy law all over the world for the rest of the night, but I'm not going to even worry. So, I'll just to– the definition that I'm going to adopt tonight is that used by about 70% of the world's countries and they've view the following sources of energy as renewable. So, it's wind energy, solar energy, which can be photovoltaic solar like you have any rooftop or concentrated solar thermal,

biomass, landfill gas, sewage treatment gas and biogas, small scale hydropower and geothermal energy. So with that in mind, what my research does is it analyses the national renewable energy laws of every country in the world that has one. So what that means practically, is I studied with the laws of about 113 different countries, and the reason why I do this is that prior to my research, most of the researchers in this field only tended to look at particular countries or particular regions of the world, and they tended to be the wealthier ones. So, they were then drawing generalisations and thought that that applied globally. And what my research has shown is that it simply doesn't. Otherwise, you kind of – if you take that approach, you end up drawing very gross generalisations that are often fundamentally flawed and fail to pick up the kind of clear national differences that we now know exist. Now, law actually becomes really important when we're talking about renewable energy because it actually provides a framework through which we can either choose to support the accelerator deployment of renewable energy, or actually, in fact, block it. Different countries around the world have taken different approaches. But I thought I'd first off, begin by talking about Australia's National Renewable Energy Law. So with that in mind, you first need to know a little bit of background. So, Australia is the world's largest exporter of coal, and we're soon to be the world's largest exporter of liquified natural gas. We also have the world's highest penetration of rooftop solar, and we've got a fantastic wind resource. So by any measure, Australia is actually an international energy superpower. But from one perspective, the fact that we have so much by way of fossil fuels means that we arguably don't need to shift to renewable energy in the same way that many other countries do to meet our rising energy needs. For example, we still have about 400 years of coal-based on current rates of domestic use. Now realistically, we were never going to use all of that coal. In fact, it's very, very likely that there's a coal seam directly under this bar, and I'm not going to propose tonight that we demolish a bar to access that coal, but on any basis, Australia, is energy self-sufficient in a way that many other countries aren't. Now approached renewable board energy actually reflects this. So, if you study our national law, which is the Commonwealth Renewable Energy Electricity Act, it becomes quite apparent that the reason why Australia supports the increased rate use of renewable energy is for environmental reasons and in fact, it's purely for environmental reasons. Our law says that its aims are to reduce the emissions of greenhouse gases in the electricity sector and to ensure that renewable energy sources are ecologically sustainable. Now on any measure, these are both highly admirable aims. The energy sector globally is responsible for 70% of anthropogenic greenhouse gas emissions that cause climate change, and that urgently needs to be addressed. Moreover, renewable energy, of course, should be ecologically sustainable. But by focussing very narrowly on these purely environmental aims and it's very close association with green politics, it's actually left our law vulnerable in a way not seen in other countries. Now, I can see some of you are sitting there thinking, well, we're an energy exporter. That's an entirely reasonable position. But this narrow thinking hasn't been adopted by other countries, including energy-exporting nations. Indeed, Australia is just one of

four countries globally who have the aim of reducing greenhouse gas emissions as their primary goal within their renewable energy legislation. The other three countries are Austria, Bangladesh, and the Czech Republic. That remains the case even after the adoption of the Paris Agreement on climate change where many countries around the world pledged to increase their deployment of renewable energy. Rather the position that we have and the position adopted by other countries in the world is far broader than Australia. So in addition, to the obvious environmental benefits, they view renewable energy as essential to ensuring energy security, critical to keeping energy affordable, a key source of innovation that strengthens the economy and provides a source of jobs, and in fact, in their laws, almost all of those benefits are prioritised over the environmental benefits. So, we're actually incredibly unusual internationally. So, to take energy security as an example. So, energy exporters actually do prioritise energy security in their laws and that might seem a little bit strange, but by energy security, I mean energy that is adequate, affordable, and reliable. I'm going to use a case study of Denmark. So, Denmark actually supports energy security through their renewable energy law because they actually need to export more crude oil. So, Denmark exports about 6.5% of its crude oil production, but two-thirds of their domestic electricity comes from renewable energy. What that means is that, if the high levels of renewable generation aren't maintained and the levels of oil production continue to decline in Denmark, Denmark will fast become a net energy importer. The other interesting thing about the Danish law is it actually coincided with a period of very high oil prices in 2008, and is actually quite apparent that they were trying to improve their terms of trade, and we actually see this amongst energy-exporting nations. So, countries like Russia and Kazakhstan are in renewable energy so they can actually export more fossil fuels to improve their terms of trade, because it is such an important source of revenue for their government. Now, I'm not suggesting that that's necessarily the approach we want to take in Australia, but it is an interesting counterpoint. The next thing I want us to consider is another aim that is really commonly cited by foreign countries, and that is how renewable energy can actually strengthen an economy. So, one of the things that we know is that there is a link between the accelerated deployment of renewable energy and a country's Gross Domestic Product and growth of that Gross Domestic Product. So, the international renewable energy agency has done a lot of work around this, and they've released a study that says that they think that policy interventions in the renewable energy sector have between a 0.2 and a 4% projected positive impact on GDP. So, when you actually calculate that cumulatively and on a global basis in the event of an energy transition, they actually estimate that increased deployment of renewable energy in our countries could be worth up to 52 trillion US dollars by the year 2050. So, we're not talking small amounts of money. Other areas that have been shown to correlate positively in the long term with increasing levels of renewable energy deployment include lower rates for electricity, greater levels of access to electricity, job creation, new infrastructure development and support for new industries and local manufacturing. The point that I'm trying to make here is that other countries get this. In other

countries renewable energy law and policy is treated like the one equivalent of the space race. So, there's clear evidence that countries around the world are using their renewable energy laws, as a means of facilitating a national industrial policy. So, to this end, they provide support to their renewable energy sectors, in order to become the leading producers of renewable energy technologies. The thinking behind it is, is that if you actually support renewable energy, you actually foster technological innovation and you get highly skilled jobs and that in turn supports the development of new industries and infrastructure and ultimately an export market. So, this point has been made quite clear. Barack Obama, while he was US President, said, "We're in a competition all around the world and other countries, Germany, China, South Korea, they know that clean energy technology is what is going to help spur job creation and economic growth for years to come, and that's why we've got to make sure that we win the competition. I don't want the new breakthrough technologies and the new manufacturing taking place in China and India. I want those new jobs right here in the United States of America, with American workers, American know-how, American ingenuity." So, we've got the US on the one hand, and then we've got other countries like China on the other. So, even as early as 2009, then Chinese premier Wen Jiabao, explicitly stated that we will accelerate the deployment of the low carbon and green economy, so as to gain an advantageous position in international industrial competition. This has only intensified since that point in time. So in the made in China 2025 report, which was released in 2018, China actually expressed a desire to produce 80% of the global supply of basic components and raw materials used in renewable energy technologies. Meanwhile, you've got Germany, Japan, South Korea, all very explicitly stating that they too would like a share of the pie. Now, this is not a small business in these countries. To put it in context, China actually invested more last year in its renewable energy sector than the whole of Europe combined. So, China is very definitely the leader in this sector. But as a result of that, and because of the use of industrial policy, we're actually starting to see a lot of international tensions and tit for tatting incurring within the sector and we're starting to see a lot of trade disputes. So, there've been a series of complaints to bodies like the World Trade Organisation, the European Union, and some of the Indian and American bodies, that countries, but particularly China, it's nearly always China had been using their renewable energy laws in breach of International Trade Law and that they've actually led a concerted programme over a number of years to provide financial incentives in the form of subsidies to enable Chinese manufacturers to squeeze their foreign competitors out of the market.

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>> So to give you an example, imagine it's 2005, the share of foreign wind turbine manufacturers in China is 75%. Now the Chinese weren't very happy about that. So, they decided to counter that growth and so they put a requirement, and this was the National Development and Reform Commission, that said that the Chinese wind farms had to source at least 70% of turbine parts from domestic producers. Now, this regulatory policy was so effective that over a three-year

period, they managed to increase the share of Chinese wind farm manufacturers to 80%. They also went from only having six domestic wind turbine manufacturers, to being the number one producer of wind turbine manufacturers– sorry, wind turbines in the world by 2009. So it was a very intentional, use of their law to squash foreign competition. So, there was in there quite significant foreign pressure and so the domestic content cap was revoked, but then it got replaced with conditional subsidies, that gave preferential treatment to domestic wind turbine manufacturers in China. So, the thing that's really interesting about the Chinese, the Chinese are better at this than everybody else. They're actually using the International Trade Law and the World Trade Organisation knowing that it takes – once there's been a complaint made three to five years to hear the complaint, to reach a settlement, to reach a resolution, and so their strategy seems to be, and we saw this in 2011, when the US steelmakers filed an official complaint over a subsequent subsidy. Their strategy appears to be, that they will maintain the subsidy for as long as possible, try and squash their international competition for as long as possible, and then just as it's about to settle, they say, "Oh, sorry, we understand we were wrong. We'll withdraw the subsidy." The strategy then appears to be, that they moved the subsidy onto another sector. So, what they did in the case of the Chinese –I'm sorry, US steelmakers case. So, they had set up this subsidy regime, which required you to either be a state-owned company or a Chinese control company. So automatically, it was forcing foreign companies into a joint venture arrangement with the majority share being held by the Chinese entity. The equipment had to have a Chinese intellectual property right. So, they were forcing any international partners to actually do a technology transfer over to the Chinese entity. They also required that Chinese turbine systems had to be manufactured, installed and tested in China and had to be operated without fault for 240 hours. So, it was estimated that over the period of 2008 to 2011, they actually gave out hundreds of millions of dollars to their own domestic industry as a way of building it up. So, following negotiations between the WTO and China and the United States, they formally revoked that subsidy in February of 2011. Only then to introduce a very similar one in the solar sector. So, it's a really clever approach. I'm not saying it's the right approach, I'm just saying it's a very –it's taking advantage of an illegal loophole, something that lawyers love. So, the problem here though is that, you've got foreign companies trying to access the Chinese wind market, and we see this all over the world. This is a sector where industrial espionage is real, where there are significant amounts of reverse engineering where it's actually very, very hard to secure your technology. But the problem with all of this is that these kinds of industrial policy approaches and actually legislating these types of industrial policy approaches is actually highly effective. So, for countries who don't adopt them, you rapidly get left behind. Now, the other thing that comes with dominance of the international renewable energy sector is jobs. So, at the moment, they think there are about 10 million jobs in the sector worldwide. China currently has 43% of those jobs, that gets worse if we look at the solar sector, which China has 2.2 million of the jobs, or 66% of all jobs internationally in solar are actually within China. That

sounds like a lot now, but those numbers are predicted to treble in the next 30 years. So, they're really seeing this as, this is going to be an industry of the future. This is going to be an industry that is worth a lot of money. So, they've used their laws very effectively to actually secure that competitive advantage. But renewable energy doesn't just help with a national economy or particularly China's economy, but it also helps consumers with their household energy bills. So, we see this in the Russian and law and in the Indonesian law, just to pick a few of the bigger ones. The costs that have been associated with renewable energy use have declined sharply over the past 10 years. So, the cost of photovoltaic solar cells on your rooftops have gone down by about 80%, and the cost of wind generation has dropped by about 40%, and the advantages about actually thinking about renewable energy as a means of reducing electricity rates for consumers, is that unlike coal or gas-fired generation, they require an input, or they require a feedstock. Renewable energy doesn't. So the vast majority of renewable energy projects, once you've actually constructed it, you then don't have to bear any costs in terms of providing feedstocks, which actually makes the cost of supplying renewable generation much more predictable and much less susceptible to price volatility. It gets even better if you're in landfill gas. The reason why people love landfill gas, is people pay you to take their rubbish. So, you're actually then being paid to take a feedstock, which makes it even better economically. So, the reason why that's a really clear advantage for us is it leads to what we call within the sector the price oppression effect. So we have a competitive wholesale market that operates behind you and I buying our energy from an energy retailer. But what happens in a wholesale electricity market is that the market operator calls for bids from companies, from generators to supply energy, within the applicable window of time. The market operator then selects the lowest price bids until they reach a sufficient supply to meet the likely electricity demand for that particular window of time. Now, due to the lack of feedstocks in renewable generation, renewable generators are often able to bid in at a lower cost than the fossil fuel generators, and that then lowers what we call the overall bidstack. So it makes the price for everybody lower because you're bearing lower costs, and it also reduces the reliance on high cost and often old, in fact, always old fossil fuel generators. So in Australia, our electricity prices have dropped. We're now only the eighth highest in the world. For a while there we were the highest. I know it doesn't feel like they've dropped, but you know apparently, they have comparatively. So that just means that other country's electricity prices are getting worse. I'd suggest rather than ours actually getting better, but greater integration of renewables, and even if you do it well, if you can manage the frequency, if you can manage the voltage issues, could actually provide significant benefits to consumers. So, I'm not for one-minute suggesting that Australia should engage in an international trade war, or that we should breach our international legal obligations or seek low-cost manufacturing. But what I'm trying to suggest to you is that we're fundamentally missing a trick here. Every other country around the world, sees the transition from renewable energy, possibly with the exception of Donald Trump, shoot that [inaudible] add that in. Pretty much everybody else sees this transition. It's inevitable. It

is going to happen. It's going to take some time, but it's already occurring and it's already occurring in an environment where fossil fuels still get subsidised at almost twice the rate of renewable energy, and that's the great irony of all of this. We actually need renewable energy laws, not because renewables aren't cost-competitive, because often they are, we need renewable energy laws to compete with subsidised fossil fuels. It's an absolute subsidies be getting subsidies. It's craziness absolute insanity. But there is some good news. Last year in the OACD, so the major economies of the world, almost 10% of new renewable energy generation was added and globally, you're looking at about 70% of new global power capacity coming from renewable generation. But in the context of Australia, just to take you back there, we profess to support renewable energy, through our law for environmental reasons. Yet, we're one of the few developed countries in the world where we still lack an integrated, energy and climate policy. But more than that, we have a prime minister who carries the lumps of coal into the Australian parliament. I got asked last year by the BBC world service how I could explain to an international audience why we have a prime minister who carries lumps of coal into the Commonwealth parliament when we're doing so on the renewable sector. Quite hard to answer that one on international television. I opted for the line, Australia's energy policy is based on ideology rather than scientific fact or reason. But I'm not sure that necessarily –it kind of threw me, let's just say it threw me. When you're doing your first-ever television interview, and that's the opening line. It's the kind of stuff that nightmares are made of, but all good. But the main problem that we've got in Australia is that we lack any form of legal or policy certainty as to what our strategy is going to be for the renewable energy sector past 2030. So, we've got a sector that doesn't know what's going on. Now, ironically, I think that much of this lack of vision has been made possible by the close association in Australia between renewable energy and green politics. Because we don't value that full range of benefits and there actually 28 different aims and goals in other countries laws – because we don't value that full range of benefits that renewable energy could be providing us with, opponents of the energy transition, only have to target one line of argument, and they commonly do that by questioning climate change, and I think that that makes our laws weak. I think it's not an accurate reflection of the sector, and I think it's something that we probably need to change, but the good news is that all is not lost. Even though the Australian renewable energy sector has been profoundly affected by a lack of policy certainty and regulatory certainty, we still have an opportunity now to get it right. We've got an exceptionally talented renewable energy sector, and we have consumers proactively taking matters into their own hands and installing integrated solar and storage systems into their homes and businesses. We had businesses seeking to implement demand response, and that just means you'll get paid to turn off your electricity when there's a really high peak demand situation rather than us trying to have to supply more. But above all, we need to value the full range of benefits and to articulate those in our laws and create an integrated plan for energy transition. So, last year, Togo, I'm now going to talk to a – so, this is the advantage about studying literally every country's renewable energy laws in

the world. You didn't think you were going to learn about Togo's laws, but you are really important. So, Togo, last year enacted their first renewable energy act, Togo is one of the world's poorest countries. It's one of the world's least developed nations, and yet their government managed to enact a clear vision for how they were going to manage the energy transition and give their entire population access to energy by 2030. Their law talks about the benefits of diversifying their energy supply, about supporting innovation, about developing new industries, creating jobs, and reducing greenhouse gas emissions. So, I suppose what I wanted you to get tonight –to tonight is that Australia needs to be more like Togo. So, yeah. Time to recognise that broader range of benefits. Thank you.

[Applause]

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