Leanne:

Look, next up, we are going to move to a session which will look at the role that hydrogen can play in one of our hard to abate sectors, the steel industry. So we'll now welcome back, Cathryn Carver, our Executive at Client Coverage who will be in conversation with Gretta Stephens, the Chief Executive of Climate Change and Sustainability at BlueScope. Welcome back, Cathryn.

Cathryn Carver:

Good afternoon, everyone. I'm Cathryn Carver, as Leanne said, and thank you for joining us for this really important conversation on enabling the global carbon economy. In my role as global leader of NAB's relationship banking team, working with clients across a range of industry sectors, just about every conversation we have includes some reference to sustainability and transition planning towards achieving net zero. In some industries, that critical stage of transition can be extremely complex and challenging. The steel industry is indeed one of those with multiple technological and logistical considerations and significant downstream impacts for a multitude of other industries. Getting it right in the steel industry is absolutely critical to Australia's future. Today, I'm absolutely delighted to be joined by Gretta Stephens, Chief Executive of Climate Change and Sustainability at BlueScope. Welcome Gretta.

Gretta Stephens:

Thanks very much, Cathryn. It's lovely to be with you all here today. Yeah, no pressure in that intro at all.

Cathryn Carver:

Well, I'll just say a couple of words on introducing yourself to the audience and then we'll get right into the questions. Please remember that if you'd like to ask a question today, you can do so using the Q and A function. You'll see on your screen adjacent to the live stream. Just to set the scene before we start talking about transition to net zero in the steel industry, I'd like to give our audience a little bit more background on you and your role at BlueScope. You're a qualified engineer with a bachelor of science in chemistry and material science and a bachelor of engineering in materials engineering honors, of course, from Monash University in Victoria. You joined BlueScope as the Chief Executive New Zealand and Pacific Islands in 2018, leading the mining, manufacturing and downstream businesses in New Zealand and the [inaudible] and ACM manufacturing and distribution businesses in the Pacific islands.

Cathryn Carver:

Then in early 2021, you were appointed Chief Executive Climate Change for BlueScope globally. In this role, you led the development and the implementation of BlueScope's climate strategy and decarbonization pathway towards the goal of net zero greenhouse gas emissions by 2050. From early 2022, if that wasn't enough, your role was expanded to Chief Executive Climate Change and Sustainability. I feel very privileged and humbled to be talking to you, Gretta. I'm going to sort of just go straight into the questions. The first one being, just let the audience kind of know a little bit about your role and the team and about the way BlueScope is approaching and addressing climate change.

Gretta Stephens:

Cool. And thanks for that introduction. As you said, the Chief Executive Climate Change role was created early last year. I think the session we've just listened to really underscores why you would do that. We hadn't had a role at the executive level dedicated to climate change before. And in fact, very few companies have. I think it'll be part of an emerging trend.

Gretta Stephens:

So I guess just to step back, our businesses have been doing a lot of work to decarbonize and tackle climate change for many, many years. In fact, even before it was cool to do so because climate change for us is around the use of energy and coal and minimizing them has always been good business. But the creation of our small corporate team on climate change and sustainability really brings a new layer of effort and coordination across all of our business in those efforts. And we work closely with the businesses to sort of incubate projects that they can then take away and execute. I guess that session we've just listened to. It's about building capacity and having a small core team of climate change experts.

Gretta Stephens:

So in terms of our pathway for BlueScope, as it's been stated on and still making our hard to abate industry, but taking that into account, inaction is still not an option. So we've been working hard to reduce emissions intensity, and it very much lines with our company purpose, which is to strengthen communities for the future. And it meets the expectations of all of our stakeholders, including those groups that were mentioned in the previous session, our employees, as well as our customers and our investors.

Gretta Stephens:

So last year, we added some targets. We already had still making intensity reduction target that was set back in 2018, but we added a net 2050 goal. To that goal, we specifically articulated what the five key enablers would have to be for that goal to become true, and I'll talk about those a little bit later, but they include breakthrough technology, the availability of affordable, renewable energy, hydrogen, raw materials, and the supportive policy environment.

Gretta Stephens:

We also added a midstream 2030 target. Steel making isn't all we do. We make coated and painted products such as color bond. So we brought that manufacturing process inside the envelope of targets as well. We've articulated the targets to 2030 and then to 2050, and that's to represent the different technology horizons, which we'll talk about a bit later. 2030 being what we can do in terms of optimizing our current businesses and 2050 to really cover that emergence of breakthrough technology.

Gretta Stephens:

We are getting on with it. We are finding existing process improvements, such as increasing the use of waste gases inside our plants, increasing our use of renewable energy and using things such as digital twin technology to really fine tune the efficiency of our processes. But as we'll talk about later, we're very active in beginning to explore the potential for green hydrogen through our value chain and I'm pretty excited about those projects.

Cathryn Carver:

Awesome. That gives our audience some great color. I particularly like some really short and sharp words of focus, coordination, incubating, and building capabilities. So thanks, Gretta. Just moving on to the next question I have. How does BlueScope think about steel in a low carbon future? You sort of touched on it a bit before, but wouldn't mind you just kind of deepening your comments there.

Gretta Stephens:

Sure. Well, there's no future that doesn't include steel. It's used in absolutely every aspect of our lives, but fortunately it's infinitely recyclable. Once we've made it once and that is carbon intensive at this stage, but that is a resource that we have forever in a circular economy. If we look at where the global demand for steel is heading, it's up. So at the moment we make 1.1, not we BlueScope globally, we make 1.8 billion tons of steel a year. And that global demand is projected to increase by more than a third through to 2015, even under decarbonizing scenarios. And steel is going to play a pivotal role in decarbonization because it underpins things such as the build out of renewable energy. So the wind towers, the solar farms in even hydro [inaudible].

Gretta Stephens:

So that's part of it also that steel will play a role in helping other sectors to decarbonize as well. We share many of the same issues as other hard to decarbonize sectors and particular I've touched on in the availability of competitively priced firmed renewables and supportive policy in the need for breakthrough technology.

Cathryn Carver:

Thanks, Gretta. And just maybe just a kind of part A or part B of my question, just in terms of timeframe, can steel decarbonize as quickly as the rest of the economy? What's your perspective around that?

Gretta Stephens:

Well, as I've mentioned, the big step downwards, we'll be able to improve to a certain level, a shallow abatement curve while we're optimizing the technologies that we've got. But the big step down for steel is going to depend on the arrival of a commercial scale breakthrough technology. And that's being piloted at various stages from lab through to small pilot plants around the world at the moment. And there's a few different ones in train, but it's really the point at which that becomes available commercially in its scale is going to be the tipping point for the steel industry. So it's not going to be linear or gradual. It's going to be a sort of shallow curve and then a big step down.

Cathryn Carver:

Okay. Look, thank you for that. Just moving on to the next question I have. You have been very busy as the audience will find, as I ask these different questions. I just wouldn't mind you giving the audience a bit of a brief overview on your recent MOUs with Rio and Shell on the low carbon steel making and green hydrogen and how they fit within your overall decarbonization strategy.

Gretta Stephens:

Yes. Well, we have been busy and what I will start with is we can't do this alone. Decarbonizing the steel industry is something that it's actually an issue for not just the steel industry, but for energy, for governments, for the world. We know we can't do it alone. So our collaboration with Rio Tinto for a start, they supply our iron ore and they supply beautiful Pilbara iron ore to the steel makers of the world. What we'll be doing with them is researching and designing low emissions processes and technologies across the steel value chain through iron ore processing and iron and steel making and other related technologies. And again, we'll work with them on two time horizons. The big one and the technology development is looking at low emissions iron feed for consumption at Port Kembla Steelworks being made from Rio Tinto's Pilbara iron ores. And the intent is to use green hydrogen-

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Gretta Stephens:

Ores. And the intent is that to use green hydrogen from renewable electricity to do that. I'm not going to try and get too technical. I understand my audience is financial, not science, but direct reduce iron ore is what we are talking about. It's where you use hydrogen instead of coal to extract the iron from the iron ore. That DRI technology operates using natural gas on a certain class of iron ores called magnetites. But what we have in the Pilbara is hematites and nobody's ever actually done this successfully. So it's really important for Australia's future that we break that technology. And that's the intent of that partnership with Rio.

Gretta Stephens:

The second part is that medium term, where there are different ways that iron ore can be processed and blended that could lead to lower greenhouse emissions in our activities. So we're making progress on that, and we're just about to launch, actually, a concept study. It will probably be one of the larger concept studies I've ever been involved in, but it's really about inventing new technology.

Gretta Stephens:

So the second one with Shell, our focus is more on the hydrogen side. And so our collaboration there is to explore and develop green hydrogen projects in the Illawara region around Port Kembla. And the main focus initially is the construction of a 10 megawatt hydrogen electrolyzer. So that's a small industrial scale electrolyzer, ideally powered by renewable electricity, and then that hydrogen to give us the opportunity to learn how to use hydrogen in our current steel making processes. And ultimately in the longer term, once we get that pilot plant with Rio up, the hydrogen will be used in there as well.

Cathryn Carver:

Awesome. I think it's super exciting that you're collaborating with both Shell and Rio, both in terms of what you can do, in terms of renewable hydrogen projects in the Illawara, but also what they themselves are doing individually as well. I'm going to come back to some of the things that you said just then, because I think we do have a few science oriented people in the audience, so bear with me. I'll come back on some of that DRI commentary that you made. Just moving on to the next question. How important is green hydrogen in decarbonizing the steel industry? Is it the only pathway, or can electrification also play a part? And I would share, I do have a bias on this question around green hydrogen, but I'm going to let the expert answer the question first.

Gretta Stephens:

Sure. Well, in terms of breakthrough technology for low emissions, and it is actually iron making rather than steel making we're talking about here. Hydrogen is the most prospective technology pathway at this stage. When we think about electrification in heavy industry, we are typically talking about the difference between coal as a source of energy to make things hot and substituting that with electricity. In our reaction, we are actually using the coal to provide carbon as a chemical reductant, and so you can't electrify that specifically and that's where hydrogen comes in. So it does seem the most likely path in terms of technology readiness. It's the furthest along. As I mentioned before, doing this DRI process of natural gas is very well established and it's really about how do you sub how do you change out the hydrogen for the gas.

Gretta Stephens:

But there are other breakthrough technologies and there is an electrical one being researched. Boston Metals is perhaps the most prominent company on this and it's a direct electrolysis of iron ore. So for anyone in the audience, that's familiar with the way that aluminum is made. It's that nature of process where you're actually tearing the irons and the oxygens apart using electricity rather than a reductant. So that's at a fairly early stage of technology readiness, but we keep in conversation with those guys pretty regularly to find out how they're going.

Cathryn Carver:

Fantastic.

Gretta Stephens:

And the other...

Cathryn Carver:

Sorry, Keep going. You keep going.

Gretta Stephens:

The other one that I probably haven't talked about is the concept of secondary steel making, and that's recycling. And so you can already make some fairly low emission steel if you've already made the iron and steel and you gather it back up and remelt it. And that's done in electric arc furnaces, which when that's powered by green electricity has a very low footprint. So it will be very important for the world to increase the recovery rates of steel and maximize the amount that we can make through that secondary steel making pathway. So that's something we are doing as well, is increasing the amount of recycling we do. Unfortunately we can't meet the entire world's requirement for steel that way at the moment. It's about 30% of the world steel is done by that pathway. But the IEA's forecast with growing steel demand, even with increased recovery rates, will probably only get to about 45% by 2050. So we still need that solution for the primary iron making, which looping back to your original question, I think is most likely to be hydrogen.

Cathryn Carver:

Yeah, no, thank you. And I think it's worth noting that green hydrogen has an important and critical role in decarbonizing many other hard to abate sectors, including heavy haulage, shipping, aviation. So really important for what appears to be the backbone of transportation. So look, let's move on to a little bit more of a technical question. So I certainly immunize my audience before I ask this question of you Greta. You talked a bit about some of these emerging technologies and in particular, the hydrogen direct reduction, iron DRI, which you referred to. So how quickly do you see that emerging technology actually being commercially viable to really meet, whether it's your de-carbonization pathway or others?

Gretta Stephens:

Look, it's a really, really good question, and it's a question that no one really has the answer to unfortunately. The gestation of new iron making technologies, historically has been decades long. But I don't necessarily believe the past has to predict the future in this regard, because in the past, they might have been being designed for perhaps an economic basis, and now the industry is facing an existential threat. So there's significantly more resource being directed to the solution of these problems. Nevertheless, I don't think we are talking about something that's going to be available in the next 10 years. You know, I think we are probably looking into the 2040s.

Gretta Stephens:

I hope it's earlier than that. So it needs some fundamental research, and so we ourselves and other steel makers are putting money into some basic research projects in that regard. We've got some work going on, actually in New Zealand, looking at how to reduce the iron sands that we use in our process over there. We work with CSIRO and University of Wollongong, as well as those MOUs that I talked about. We are embarking on a reline of our number six blast furnace. We are in the feasibility study stage for that. And people do question that. They say, "Well, why aren't you changing to green steel right now?" And quite simply the answer is that there isn't a technology that we could install. But what we are doing on that reline is making sure we're building in the provision to retrofit improvement technologies as they come. But the timing, the other part of the timing question are those other two enablers I talked about and it's renewable energy and hydrogen.

Gretta Stephens:

I'll start with hydrogen. The economics of hydrogen are just not there yet. So there is actually not a single economic use case for hydrogen yet in Australia. So it's a bit of, you need to grow the market, you need to bring the cost down. So with hydrogen, the manufacturing cost, you've got the cost of the actual electrolyzers. And as we've seen with solar panels, there's every reason to expect the cost of electrolyzers will come down as the technology improves. But three quarters of the cost is energy, and that's where I get to the energy part.

Gretta Stephens:

What we need is a huge build out of renewable energy at a massive scale. It needs to be affordable. And by that, I mean internationally competitive, because iron and steel are international markets and it needs to be firmed. And I think Tony Wood touched upon this very well in his earlier session. So at the moment, even if someone could wave the magic wand and have that iron making technology ready tomorrow, we don't have the amount of renewable energy that we need in Australia, and we don't have a hydrogen industry. So this isn't just a technical development timeline.

Cathryn Carver:

Certainly if some of our other client executive chairmen were on this session, they'd probably say, "Game on." And you probably know who I mean. Just moving on to the next question I had, and you picked up on a few things, but I'll just try and bring it together. The expectations are that the electrolyzer costs will reduce with scale and follow the cost reduction seen in solar and wind. Is scaling up of the green hydrogen enough to bring costs down. Or do you think we need to see a much greater government support to accelerate the green steel industry? So a bit of a slant there from a what extra might we need?

Gretta Stephens:

Yeah, well, I do believe that the electrolyzer cost will come down. I think that's normal in the technology life cycle, but in terms of the support that's required, it really depends on what kind of speed we want, because when private industry are involved in investing in new tech, the business case is king, and we look for the business case. But if we want to accelerate things, and we do, we need to start investment when things are pre economic. And so, I think to a large degree we regard this stuff as some very long term R&D, but I think that's where government support can come in is to really catalyze investment and get things going more quickly. But in this case, it is that investment that's already been discussed in infrastructure and renewable energy itself, but also storage. And I think Tony, one of my favorite words is dunkelflaute. I'm really glad he got it in there. I would've otherwise, but you know, for large industrial processes, we need that electricity 24/7. So you can't turn up and down the.

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Gretta Stephens:

... Electricity 24/7, so you can't turn up and down the steel mill when the sun's shining or the wind's blowing. So this is part of the reason we're starting relatively small with our electrolyzer, is it lets us do the technical work and start seeding the growth of that hydrogen industry. Hopefully we'll enable some people in our vicinity to invest in some hydrogen trucks, for example, and then we have to build slowly but surely. And I think that's where some of the funding, you see the hydrogen strategies that governments are putting out there now, I think there's a role for dedicated co-investment with industry to accelerate the transition, and supportive policies against those other key enablers that we were talking about.

Gretta Stephens:

I think the other one is also about ensuring a level playing field, given that this is an internationally traded commodity. It's really important when you're going to invest a lot of capital in greening your industry that you're not then undercut by imported materials that haven't had that same investment. So there's a lot of discussion around the world about how to manage while we're still in this sort of two-speed transition, about different mechanisms for making sure that investment isn't undercut. And I think Tony touched on it well, is we do need really well-coordinated programs from government, particularly when it comes to things like network infrastructure. It just can't be done efficiently on a piecemeal basis.

Cathryn Carver:

Yeah, no, that makes a lot of sense. Look, the next two questions, Greta, are really around collaboration, and you obviously touched on that in terms of the MOU with Shell and Rio, but I just want to dig into it a little bit deeper. To what degree are you seeing within the steel industry collaboration in terms of working together on solutions to decarbonize? So that's the first question.

Gretta Stephens:

Yeah, well, there are many collaborative initiatives across the steel industry. One example, I'd table would be ResponsibleSteel, and it's the global steel industry's first sustainability standard and certification program, and we had our Port Kembla steelworks certified earlier this year, which we were very proud of. Only the fourth in the world, and the first in Asia Pacific.

Gretta Stephens:

The ResponsibleSteel program was designed by not just the steel industry, but also civil society, suppliers, and NGOs, and it's been done so people can feel confident that steel that they're getting is being produced and sourced responsibly, and it includes requirements for steel companies to take action on climate change and ensure transparency around emissions reporting and disclosure, but across a whole breadth of other sustainability indicators as well.

Gretta Stephens:

The MOUs that we talked about in relation to BlueScope, there are many MOUs throughout the steel industry. Rio Tinto, for example, has MOUs with other steel makers, so there's a lot of collaboration happening across the supply chain. Similarly, academic institutions, things such as the Energy Transitions Initiative, the HILT organization are bringing people together in collaborative research and development projects. And there are technical forums as well through organizations such as World Steel, where steel makers are sharing their decarbonization developments. I think something to remember is a lot of this is actually driven by the OEMs, who are the technology suppliers who are seeking to market the new technology as well, and that does tend to ensure rapid diffusion of new technology.

Cathryn Carver:

Yeah, no, awesome. And it's certainly, I can relate to some of those examples from the finance industry ourselves. The second collaborative kind of question is really around how you're seeing collaboration. You talked about the universities outside the industry, but I was probably coming from more of a stakeholder perspective, and just how you're seeing, you know, how do your stakeholders assist your organization in terms of achieving your decarbonization ambitions?

Gretta Stephens:

Yeah, well, we've had fantastic engagement, I'd say, with our investment community, for example, I think really seeking genuine engagement with us and seeking to understand what our issues are. Certainly, there's a lot that investors can do to support us, and a lot of discussion about the presence or absence of capital for an investment in companies such as ours who have a decarbonization pathway. I think external stakeholders can be really supportive in terms of their joining the advocacy for some of the policies that I've been talking about, particularly around what the country needs for renewable energy, storage, transmission. The growth of the hydrogen industry is one in particular. That's not just the steel industry that's going to drive that. There's energy, transport, there's a lot of broader stakeholders there.

Gretta Stephens:

I think I've talked already about our suppliers in terms of, say, our iron ore suppliers. Another really important group for us obviously is our customers, and we're involved in things such as the Green Building Council of Australia, Infrastructure Sustainability Council, and MECLA, which is the Materials Embodied Leaders Carbon Alliance. Working with our customers to understand how we can reduce the embodied carbon in buildings, for example, even ahead of being able to actually decarbonize the commodity itself through innovative use of products and product developments, longer-lasting products, more resilient products. So those would be a few examples that I'd give.

Cathryn Carver:

No, they're outstanding examples. I feel to some extent I can answer this question, but I'm not, the next one I'm going to give you. I'll leave you to do this. What gives you confidence, and you could say all of the above, that BlueScope can achieve net zero by 2050?

Gretta Stephens:

Yeah, well, I think this is more about my confidence in the steel industry as a whole, and BlueScope included. You know, the world needs steel, and the world that we have is built on steel. We continue to need steel, and the world needs to decarbonize. So those two things have to come together. There is an enormous amount of investment of money and resources being applied to make this happen. I've worked in the metals industry for my entire career, and I started it in R&D, and I'm just really confident that the dedication and the expertise of our people, and the ambition, and particularly in our company, the commitment of our board and management and all of the collaboration with partners and stakeholders, I feel really optimistic about our ability to make it happen, and the ingenuity of our industry.

Cathryn Carver:

No, awesome, and you did a much better job than I could have done answering that question, as you should. Hey, Greta, I've got a couple of questions from the audience, so love to kind of go to those at now. The first question up is, Greta, what have you learnt in your current work involving hydrogen in the steel industry that could be adapted or applied in other industries?

Gretta Stephens:

Mm. Well, I have to say that I, look, I'm fairly new to both the steel industry and the involvement in hydrogen. So adapting to other industries, I think having to think really deeply through the value chain of where is the best place to make the hydrogen, where to use the hydrogen, and somewhere along the value chain, they're going to need storage. So you're going to need scads, as I said, of cheap, renewable energy, and then you need your hydrogen electrolyzers. Energy is not that cheap to store. Hydrogen's actually notoriously difficult to store as well, and expensive.

Gretta Stephens:

And so it's around thinking about that value chain, where are you going make it, how are you going to store it and/or transmit it, because we have gas pipelines across Australia. We don't have hydrogen ones, and not all gas pipelines will be amenable. So I think it's really thinking through what does the sort of ecosystem look like for future hydrogen-based industries, and physically, where will they be?

Cathryn Carver:

Excellent. Thank you. Well, for someone who hasn't been in there, that was a great answer. Another question from the audience is we saw a large Australian presence at the World Hydrogen Summit. How viable is it for Australia to become a global hydrogen export superpower?

Gretta Stephens:

It's a lovely vision, isn't it?

Cathryn Carver:

Yes, it is a lovely vision.

Gretta Stephens:

This has been more of an energy talk than a steel talk. It comes down to the ability to make renewable energy at scale, and Australia is absolutely blessed with fantastic solar radiation, lots and lots of consistent wind. We've got heaps of room to build this. So there's no doubt that we have all the capacity that we need, if we get on with it, to install it. So I think that's a huge, natural advantage that Australia has, so with the right investment, I do think we can become a hydrogen superpower.

Gretta Stephens:

One of the challenges is that hydrogen can, at this early stage, it seems that hydrogen may be almost as expensive to transport as it is to make, so we need to think very carefully about that. I think Tony Wood touched earlier on the fact that it may in the longer term be more... A more sensible thing to do is to actually conduct the next stage of processing with the hydrogen and export the results of that, so green iron or green aluminium may be examples of those things, but there's no doubt we've got natural advantages. We don't have natural advantages in terms of storage of renewables, because we really don't have the landscape for large-scale hydro, other than the Tassie and the Snowy that we've already got. So as I've mentioned, you'd be wanting to use that renewable energy straight away into hydrogen.

Cathryn Carver:

No, excellent. Thank you very much. Another sort of comment/question this person has asked, they noticed in your BlueScope sustainability policy BlueScope relies on breakthroughs on innovation, technology, and regulation in order to achieve net zero target. Can you please provide further insight into what technology and regulatory innovations BlueScope is looking for? You've probably touched on some of the technology, unless there's some other ones you wanted to talk to, Greta, but maybe on the regulatory side, you might want to delve into a bit more?

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Cathryn Carver:

Maybe on the regulatory side, you might want to delve into a bit more.

Gretta Stephens:

Yeah, so the technology, as you said, is what I'm talking about. It's that big breakthrough technology that makes green iron able to be produced at scale is really what we need. And we're not sitting on our hands, we're working to become part of the solution in our Rio Tinto collaboration.

Gretta Stephens:

In terms of the policy environment, I feel as if it's perhaps already been said by some previous presenters. It's around some really durable, long-term policy around energy, renewables, and infrastructure that gives people the confidence to make those long-term investments. It's about policies that ensures that we do have a level playing field, so that when we start decarbonizing the steel industry, or in fact, any industry in Australia, that investment is an undercut through the import of materials that are from non-decarbonized jurisdictions.

Gretta Stephens:

There are different ways of doing that, and I'm a bit sort of mechanism agnostic, to be honest, but to make sure that we don't have that carbon leakage to other jurisdictions. They're probably the main things, but I think it's durability of policy to give industry to de-risk the investment.

Cathryn Carver:

No, thanks for that. We've certainly got a very big bias to green hydrogen in our questions, so I'll just give you forewarning the next few. But one of the questions is, "Is converting hydrogen into ammonia a viable engineering solution to transporting hydrogen in safe liquid form?"

Gretta Stephens:

Look, I don't actually think I'm the right person to ask that question. I'm sorry. No, I think there would be other people that would be better qualified.

Cathryn Carver:

I have a funny feeling that might have been from our chief economist. Let me just quickly shift on. "How much of a role do you think green hydrogen will play in the years ahead, especially in emissions intensive industries?" And I know we've touched on it but might be worthwhile just delving a bit deeper there.

Gretta Stephens:

Yeah. I think that there's a huge opportunity here, particularly for industries such as ours where we need it, not as an energy source, but as a chemical reductant. I think it does, if I jump back for a second to hydrogen as an energy source, at least it does provide an opportunity to store energy, so it does have that positive property. Although you do need an enormous overbuild of renewables because creating green hydrogen and then reconverting it to energy is a very, very lossy process, so you kind of only get about 30% out of what you put in, in the first place. But if you do have a big overbuild of renewables or a major surplus of solar in the middle of the day, for example, it does give you that opportunity to store energy and energy storage is going to be, it's absolutely fundamental to addressing this issue of the intermittency of renewables.

Cathryn Carver:

No, great. Thank you. I'm going to completely pivot here, so giving you a little bit of warning, one of our, our audiences actually asked about some of your own personal motivations in your work to help transition to net zero. I think it's a lovely question because obviously there's a really big purpose that drives lots of people, but just interested in your own personal motivations, Gretta?

Gretta Stephens:

Yeah, well, I think it's already been put in print, so I'm probably not revealing anymore, but I have been described as being a tree hugger by my nearest and dearest. So, I've always been very, very deeply invested in the impact that we make on the world, and that could seem a little at odds of my career of over 30 years working in heavy industrial manufacturing.

Gretta Stephens:

I worked in aluminum and now steel, but throughout my entire working career has been around improving the way businesses run and improving the safety, the working conditions and the efficiency of those processes. And improving the efficiency of industrial processes does reduce their greenhouse footprint, so it kind of all comes together, but there is a new overlay of meaning attached to that work in the current point at which we find ourselves in history where this now becomes mission critical. So maybe, once upon a time I was trying to save millivolts on an aluminum smelting line to make more money, and now I'm trying to save a couple of kilos of coal to save the planet. It's a much higher purpose.

Cathryn Carver:

Well, thank you very much for sharing those personal motivations. Again, we're going to pivot to another kind of energy source. Someone's asked, "If zero emissions is the goal, should nuclear energy not form part of the transition?" Whether it's your transition, steel or other similar supply chain type companies to your organization?

Gretta Stephens:

Yeah, nuclear is such a contested question, and I really appreciated Tony's comments earlier about the sort of the deep psychological aversion that people have to nuclear, and we can understand that given some significant notable safety incidents.

Gretta Stephens:

I think most engineers that you talk to will have a much more sort of, what you say, pragmatic view of nuclear. That if there are emerging technologies such as small modular reactors, which can be operated safely, and in some cases I understand will use previous nuclear waste as their fuel, so become part of the solution. I think it's important to rule that out. We're going to need to pull out all of the stops to get to where we need to go.

Gretta Stephens:

I think the latest IPCC reports really show the degree of acceleration that we need, so I think that we shouldn't rule them out, and it's really interesting just depending on the country in which you ask this question. In a number of countries, this wouldn't even be a question because they're quite comfortable with nuclear power and its long-term safety and efficacy, and Tony was correct in what he said earlier.

Gretta Stephens:

I think the statistics show that there have been significantly more sort of human fatalities attributed to coal-fired power in human history than nuclear power, but it does still have a very deep psychological concern for people. And so, it's not purely a scientific question. I don't think we're going to get there in Australia until we actually make that sort of cultural change as well.

Cathryn Carver:

Thank you for sharing that. One of the other questions from our audience, or comments to start with, then a question. "Steel is a significant share of our scope three emissions, but we have limited ability to influence the embedded emissions. Are setting contractual targets for our steel suppliers a reasonable response?"

Gretta Stephens:

Here, we talk about this with our customers. I think the challenge with setting contractual targets is that it implies that the reason that you can't get lower carbon embodied steel right now, is that it's to do with sort of the will or level of ambition of the steel maker, which it isn't. It's that it doesn't exist. You can't buy green steel or green iron at the moment.

Gretta Stephens:

We can do whatever we can do to increase the amount of recycling, and we've just bought a recycling business in the States. And in fact, our US steel making facility actually, to your previous question, is nuclear powered and almost exclusively scrap, so it's exceedingly low emissions.

Gretta Stephens:

But you need to work with what's available in your region, and we don't have that scrap availability in Australia. It's very limited, so it is a really difficult one. I think right now what we can do is reduce the embodied carbon, particularly in building through clever design, use of high-strength steels and innovative products.

Cathryn Carver:

Well, Gretta, that's about all we have time for in this session. It's been absolutely wonderful to have you with us today, and a massive thank you from all of us, and I'm sure from our audience, for joining us at our conference.

Cathryn Carver:

You've shared some amazing and important insights on the direction of the net zero journey for BlueScope, and I'm sure everyone has enjoyed really hearing your views and certainly have learned a bit more about green hydrogen, so thank you so much.

Cathryn Carver:

Now we'll return to our conference host, Leanne, and thanks everyone for joining us today. Thanks, Gretta.

Gretta Stephens:

Thanks, Catherine.

PART 4 OF 4 ENDS [00:42:24]