

Sustainability — setting the scene

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*I love a sunburnt country, a land of
sweeping plains,
of ragged mountain ranges, of droughts
and flooding rains.
I love her far horizons, I love her jewel-sea,
Her beauty and her terror — The wide
brown land for me!¹*

We should think about this today. We live in a very beautiful country. I've just spent two years away and I often looked at this poem and thought of home for me, Australia, very different from England. I also looked at it and thought how lucky we are in this country, and we are indeed very lucky. I want to echo many of the things that the Governor has just mentioned. We are hugely impressive in terms of where the economy has gone in the last 24, 25 years. Certainly the entire time I have been in Australia, it has been on a growth path unlike any other economy in the world. I think it's more than just the growth — which is averaging 2.9% p.a. in the last couple of years when you compare it to Europe or, indeed, many other places in the globe — it's also incredibly resilient. It's not just mining or agriculture or any one field. Twelve of the main 19 major sectors expanded by more than 3% last year. This is really an amazing feat that's going on in Australia.

Having spent two years away living in the United Kingdom, spending a lot of time in the United States and in Europe doing vari-

ous things, I see that we don't know how lucky we are. I look at the social and political troubles in Europe and in the US, and really across the globe — not just the sort of issues around population and emigration — and I think the threats that are out there are growing threats. And we're very much hidden from that sort of thing.

The ways in which this country feeds for itself, works together, and does a lot of things that really make us a very, very resilient society. It's interesting coming back again and seeing how well the society supports itself relative to what's going on elsewhere in the world. So I think we've got to take one step back and say: we're doing well, but we also need to understand what the future holds, what the problems are, what we need to address, and we need to understand Australia's role in a global world in which we are increasingly playing a much, much larger part. That's something that's come home to me. When I was first in Australia, back in 1995, Australia's role was we were in Asia and we were the supporter of everyone, but now, actually, we're considered a major player in a lot of areas and I think there's a lot that we have to think about in terms of where this country is going, not just in a prosperity sense but in thought leadership around areas like sustainability.

I've got a whole list of things which — when I was trying to write what I should say — I thought I should try and get this community to think about today. I want

¹ Dorothea Mackellar (1885–1968), *My Country*, 1904.

to really try and set the scene a little bit. I think the first thing for me is the environment and it's one of these things that sort of creeps up on you, I guess. Twenty years ago and earlier, I'm not sure I thought about environment in a particular way. But now we begin to see what I think are genuine climate-change issues affecting the environment in which we live. About five years ago I bought a property out in the country and you get a much closer view of all of these different areas: how climate change is affecting the levels of dams, the types of livestock, and these sorts of things. I also look at the work in the government. I was at DPI, the Department of Primary Industries, a couple of weeks ago, and there they're working on how to design crops that will grow anywhere any time in any condition, the sorts of things that we really need to view in Australia.

There are associated issues. Tomorrow we have a workshop on the circular economy: what do we do with all this waste and recycling? Do we even have any plans as to how this is going to become sustainable in the future in any kind of way? I also worry particularly now, having property out in the country and lots of other things, about what's happening with our wildlife. Again, do we really have a plan for how that's going to work? I think what's interesting in my role in the New South Wales Government is that a very, very large part of what we do now is providing advice to Government on all of these issues. When I look at the projects — and we have about a dozen different projects we're currently doing for different departments across Government — they are all to do with pollution, what's happening with plastics, what's happening with wildlife, all of these sorts of things, with watering associated with mining and all these issues and

really trying to manage these sorts of things in a sustainable way. I have to say, one of the challenges that we face in general is often we take a step back from doing anything positive because generally we actually don't have the data, we don't understand what's going on, we don't have the models, we are not in a position to really make positive commitments to alternative *X* because we just don't have the information.

And so, typically, we kind of move backwards and backward and backwards, and that's not a bad thing if you're in an uncertain world, to not make those sorts of commitments: should I mine here, should I bottle water over here, should I do this? But what it says to me is that we need a bit more of a sustained program to understand the environment in which we live, by getting data, by building models and using those models to make evidence-based policy decisions in government. I think there needs to be a sustained effort in that area.

A second thing that does worry me, and I guess I see it also from the European perspective, is the issue of a booming population. You know, I'm not going to get into the debate of how much is enough in Australia. The reality is that almost all the world, excluding Africa, has already passed peak birth. We are already not on a replacement trajectory. So the idea that we should start aiming to restrict population growth is not there. The reason population is still growing is the fact that we're all living longer. That's a big issue.

There is still an immigration thing and it's not just Australia. Europe is grappling with this and you look at it and it is truly scary actually, some of the things that are going round, and it's causing political change, it's causing real challenges and, of course,

I should mention America in this context as well. Emigration is a major issue and it's not a sustainability issue, it's a political issue around these sorts of things. So, again, this is a challenge in small part which Australia really is going to have to deal with and it's a *now* issue, rather than a 20-or-30-years-from-now issue.

Moving to more prosperity-related things, I think the other thing that's quite noticeable, coming back from Europe and seeing the U.S. is, to be honest, how uncompetitive Australia is. We are an expensive place for doing business. There are high housing costs. We make things difficult. We are not very good at getting involved in the international supply chain and I'm particularly grappling with defence at the moment. We are about to expend a lot of money on defence. Truthfully, we don't really have the industries to actually take advantage of that. We don't have a way of sustainably building business in these areas. We've got to think carefully about what we want to do in the future in terms of business sustainability, in terms of being competitive on the world economy and there's a whole range of issues there. It's about teaching and training, it's about the skill sets we have, it's about the way that we do business, it's about the way we need to develop technology, it's the understanding what our role is in the bigger ecosystem of what's going on in the planet and I think we have so many issues to deal with in that.

I'm going to bring out just one which I'm sure is going to be controversial. We — the Chief Scientists from different states and the Federal one — have lots of conversations about things like STEM.² And I rather controversially brought out the article that was in the *AFR* about two or three weeks ago

² Science, Technology, Engineering and Mathematics.

that said only 32% of science graduates in full-time jobs say that their skills are actually being used in their employment.³ So there we are. We're graduating all these scientists and we go round and we say, "More, more STEM, guys. We want more and more," and yet, actually, we're not providing jobs for the scientists that we graduate. Engineering is better, but even that's not great.

The problem in my view is that we're not building the industries that can actually make good use of science and mathematics skills in a way that genuinely will attract people, that will start growing things, that will really start building something new. I will tell you, it's a bit of a controversial thing to say because all my fellow Chief Scientists are busily out there selling STEM to schools, and my view is, at the moment, the problem is not that, it's the fact that we don't have industries which are really able to drive that sort of thing.

So, again, as Chief Scientist, one of the big things I've started — and I'll recognise at this point my predecessor has left me something that, frankly, doesn't need to be changed at all because she did such a wonderful job of getting engagement with government and everything else — is what I'm talking about as the prosperity agenda and this is something that, again, I saw overseas. It's where Chief Scientists and the science community and academia and everyone are concerned not just about the science of the problem but also how that science gets translated into outcomes, whether that's through a business outcome, whether that's through

³ See also "Bringing relevance to STEM education," *ATSE Focus*, 147, December 2007, at <https://www.applied.org.au/wp-content/uploads/2019/02/Focus-issue-147.pdf> and Michael Anft, *The STEM-Crisis Myth*, *The Chronicle of Higher Education*, Nov. 15, 2013.

a societal outcome, whether that's through any other form of engagement. I have to say, we are not good at that in Australia. We think our job is done when we've written the paper and we've graduated the student, but our job has only just started. We really need to be creating prosperity outcome, creating the future for this country in terms of the types of jobs, the types of roles, the types of thinking that we should do.

I gave a talk recently for the Engineers Australia Awards⁴ and I said, "We need to think of ourselves as we used to think of ourselves in the 19th century in some senses. We need to be makers and thinkers and doers." And I think a little less talking and more doing is perhaps somewhere where I'd like to go on the agenda. So certainly I'm putting a lot more support and a lot more funding into those kind of areas. How do we translate things into outcomes?

Where are we going in this state? I would say I look outside here, it is beautiful. We have a wonderful country. I will reflect on the poem that I told you earlier. We should all be very proud to be here. What I think we do need to be concerned about is thinking in the 10, 20, 30 year time frame, sustainability. Energy is another area that I hesitate to get

into. Energy for our Federal government is like Brexit for the UK government, it's the kind of thing that just destroys parties. We are beginning to realise it is a complex issue, but it's a solvable problem and I think that we need to get on with that.

I urge people in this room to think about those sorts of problems. I think that we have the wherewithal to solve them. We have the community to solve them. I think also, from my position, one thing that's been very positive and something that Mary has left as a great legacy is the fact that this government — and not just this government but the secretaries, the ministers, this process — now trust science in a way that I don't think they did probably a decade ago because of the sorts of things that Mary — and, indeed, my office before I arrived — managed to deliver and managed to achieve.

I think within this state we have an opportunity to influence the outcomes of what New South Wales might actually do. So I'll be listening today to try to get some of those ideas and try to draw them in and try to influence government, at least at a state level, to really make those changes. I'll be very interested to hear what everyone has to say and thank you for inviting me to speak today.

⁴ See <https://www.engineersaustralia.org.au/News/celebrating-success-harricks-oration-and-bradfield-awards>

