State of the country: future challenges.

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Thank you for the opportunity to speak to you today.

I thought that instead of giving you a rundown on what I think about our nation's lack of real leadership, one defined by its vision and courage, I would talk more about what I know: education and science, the two principle preoccupations of my professional life.

In recent years I have been critical of our approach to both these areas. Indeed, I came to realise that we lived a delusion: we seemed to think that if we we were not demonstrably terrible then we must be good, or good enough.

We trot out statistics and revel in banalities such as 'we punch above our weight' (without ever seeming to wonder about the weight class); or that we have a 'world class' something or other (for the purposes of this discussion let's say, education system). We don't bother with what it means but it sounds good, and that's good enough.

But what does it mean that we are ninth in the world for research citations? Why is ninth good? Does it matter that countries like the UK, Sweden, Switzerland, Denmark are ahead of us? Should we find out why? Find out what they did? See if they did anything that would be useful to us? No need we assured ourselves; we punch above our weight and that's all we need to know.

We have a world class university system, we tell ourselves. It's true it's not bad and doesn't have the extreme range of some other systems. Its also probably more accessible than many. But Vice Chancellors have been known to make much of spurious ranking tables that compare apples with turnips, all the while arguing that this world class system desperately needs more money, from anybody with money.

It seems to matter little to us, or not matter enough anyway, that the performance of our school students declines in international testing, test after test after test. It matters little, it seems, that students around age 15 in one jurisdiction are the equivalent of two full years ahead of students in our lowest performing jurisdictions. The gap between regional and urban schools, and Indigenous and non-Indigenous students, is often wider again.

Why is the place or the circumstances of our birth such a strong determinant of our future - for so many of us? In this country. Still.

Now, there is no doubt at all that we do some things very well, and that some of our researchers and school students, for example, are up there with the very best in the world.

We should be proud of them, salute them, and learn from them. We could use their performance to illustrate what we can achieve. We could learn from their qualities and find out how they got to be where they are. We could apply the learning more broadly so that more of us could achieve more highly than we do. But no, we have an argument about money; or who pays.

And let's not be troubled to walk into the twenty-first century so bankrupt in this tricky business of actual ideas.

Why present a vision for the nation if you are a politician if it means you might tumble in the opinion polls, even as you tell us that there is only one poll that counts? Why put your job at risk, when it's your job that is important to you. Why make the effort to prepare us for what we all need to do, or

sacrifice, to achieve, say, the vision of Henry Parkes pre-federation. One people, one destiny, he said? A common wealth.

Nope. She'll be right (the national motto). No worries (its sibling).

Then I started as Chief Scientist.

I saw it as an opportunity to promote change. To present evidence to Ministers that we could do better, and show them that we would fall behind much of the world if we didn't.

I looked around. I found that other countries had already made their choice, in some cases decades ago. It was about science, technology, engineering and mathematics.

In 1998, the US House of Representatives Committee on Science released a document entitled "Unlocking Our Future: Toward a National Science Policy".

On top of which the Americans already had a means to prioritise a proportion of their research expenditure for closer to 40 years.

They pay attention to the trends and also bother to collect the data. So they know, and are concerned, that 60 per cent of the workforce in 2020 is expected to require skills held by only 20 per cent of the workforce in 2009.[1] They know whether their education system is lined up.

Could be better they say, not a bad start I say.

In the United Kingdom, in 2012, industry identified a need for 830,000 new science, engineering and technology professionals and 450,000 technicians to 2020.[2]

So they both did something about it. So did the EU, and China, and NZ, and Canada, indeed all the OECD countries. They got strategic. They made decisions. The worked to make sure the cogs mesh. They worked to build scale while we atomise (too many programs, too small, too little focus, too little urgency). Their leaders led. They worked at changing things, including attitudes.

All is not lost. We too have begun to change, just well after the rest and cautiously. State and Territory Ministers have agreed a science strategy for schools. Good if it is implemented. We have the rhetorical commitment to an ideas boom, backed up by a practical National Innovation and Science Agenda. It has good bits and is a good start - but it's not the comprehensive strategy we need. We still do not have, for example, a coherent and comprehensive national science policy - in which the key elements are built to connect.

We continue to let the study choices of students in year 10 influence the skills available to our workforce four to six or more years later. If they don't take an interest in a particular discipline – say, physics or mathematics or chemistry – then too bad, it's a market. We'll just have to get by without them - or pay to ship them in from somewhere else if we can.

If we analysed the need like other countries, no doubt we too could come up with a strategic, probably incentive-based, approach to ensure that the economy will have the skills it needs to evolve, and people to fill the jobs.

Instead we let economists preach to us about that market, with all its implied purity, and tell us about pull factors and what we can't do, rather than tell us how to do what we must do.

I am reminded that Norm Augustine, former President and CEO of Lockheed Martin went to Congress seeking more investment in education and research. He was asked whether he knew

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[1] American Society for Training & Development (2009) Bridging the Skills Gap, pg 10.

[2] Royal Academy of Engineering, econometrics of engineering skills project, (2012) Jobs and growth: the importance of engineering skills to the UK economy, pg 23.

there was a problem with the federal budget deficit. He responded that as aircraft designers they didn't take off an engine if their craft was too heavy to fly. And he went on...*Only by working together can government, industry and academia meet the great challenge we confront.*

In Australia, we are not good at the *working together* bit. The OECD looked at the level of business collaboration with higher education or public research agencies.[3] Australia was ranked 33rd of 33 countries; around 5% of our large firms collaborated and very slightly more of the SMEs. This compares with Sweden (19th) where it is about 50% and 10% respectively or the UK (also nearer the middle) where it is about 30% and 20%.

Even worse: 22.8% of Australian businesses collaborate with 'competitors and other business in the same industry' whereas only 4.8% collaborated with universities which employ some 60% of Australia's researchers. And all this notwithstanding that some 93% of Australian CEOs apparently believe in the need to collaborate.

We can muddle along, dabble at the margins and let what is represented as a market, determine our future. Or we can plan change. We can work out what sort of country we want to be, what sort we want to take responsibility to build. We can be strategic with our investment, be focussed, and be better at ensuring that national needs and comparative advantage are integral to our strategy.

But if we are to build that nation, ready for the future with all its uncertainties, we need education, we need science and above all we need leaders, real leaders. Leaders with vision way beyond an electoral cycle. Leaders who can also explain to the rest of us how their various policies across all the portfolios work together to make the country what we want it to be.

That means leaders with courage, not least the courage to try to change our culture. And that we must do because if we don't I fear that we won't be ready, she won't be right, and there will be cause to worry.

Thank you.

[3] OECD based on Eurostat (CIS-2010 and national data sources, June 2013