



Australian Government

**AUSTRALIA'S CHIEF SCIENTIST**

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**ATSE REPORT LAUNCH, GREEN GROWTH- ENERGY:  
INDUSTRY OPPORTUNITIES FOR AUSTRALIA**

**15-MINUTE SPEECH**

**MONASH UNIVERSITY CONFERENCE CENTRE,  
MELBOURNE**

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**\*\*\*\*\* CHECK AGAINST DELIVERY \*\*\*\*\***

Good morning.

It is clear that to manage or mitigate the challenges facing us, we must do things differently.

Creating a Green Growth mindset takes commitment to a purpose.

Moving from a high CO<sub>2</sub> emissions energy system to one which is cleaner and more sustainable is a difficult transition to make.

And making that transition, while also contributing to economic growth, adds yet more layers of difficulty.

Then there are the unique Australian factors - small population and large distances which work against us. It is easier to keep doing what we've always done.

But we must make this change. This report by ATSE (in part) seeks to identify how Australia might become a supplier, not just a consumer, of products, systems and services for clean energy supply and use.

Green growth is as much a part of the productivity and business agenda, as it is about promoting better environmental outcomes.<sup>1</sup>

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<sup>1</sup> Pg 10 - <http://www.innovation.gov.au/Innovation/Policy/AustralianInnovationSystemReport/AISR2011/wp-content/uploads/2011/07/Australian-Innovation-System-Report-2011.pdf>

It is interesting that this report identifies three specific areas from the renewable energy research sector where it sees a global comparative advantage for Australia.

The speakers that follow will talk you through those areas (a major Green Growth opportunity in the production and supply of sustainable liquid aviation fuels and diverse opportunities in low-emissions electricity generation technologies and the management of intensely distributed electricity systems (smart grids, energy storage systems)).

I do think it is important that we continue to look for opportunities, while working to address our major societal challenges.

It is equally important that we have alignment, focus and scale of our scientific enterprise in order to capitalise on those opportunities and I'd like to come back to how we might achieve that.

But it is important to note that an energy focus is in line with societal challenges facing Australia

Australia faces a number of critical sustainability challenges. As the driest inhabited continent with a climate characterised by weather extremes, Australia is exposed to 'greater risks of climate change than any other developed country'<sup>2</sup> We are also

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<sup>2</sup> Pg 122 – <http://www.innovation.gov.au/Innovation/Policy/AustralianInnovationSystemReport/AISR2011/wp-content/uploads/2011/07/Australian-Innovation-System-Report-2011.pdf>

one of the most emissions and water intensive economies in the world.<sup>3</sup>

Green Growth has the potential to secure Australia's future prosperity.

This relies on promoting and taking advantage of a number of current trends which, in combination, constitute a significant economic opportunity.<sup>4</sup>

Green Growth can go some way to achieving Australia's 2050 greenhouse gas emissions reductions target (reducing Australia's net greenhouse gas emissions to 80% below 2000 levels by 2050)<sup>5</sup>

Green Growth can be achieved via a suite of energy system solutions and by utilising technologies that enhance Australia's global economic competitiveness and social development.

Scientific endeavour and innovation are critical to achieving all of these goals.

We must be strategic about the sort of science our nation needs. There are sure to be areas that are critical to our nation's interest.

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<sup>3</sup> Pg 122 – <http://www.innovation.gov.au/Innovation/Policy/AustralianInnovationSystemReport/AISR2011/wp-content/uploads/2011/07/Australian-Innovation-System-Report-2011.pdf>

<sup>4</sup> Australian Innovation System Report 2011

<sup>5</sup> Clean Energy Act 2011 (Cth), available at <http://www.comlaw.gov.au/Details/C2011A00131>.

Energy is one of those and we can't just assume that we will have enough, or the right kind, where and when we need it.

This ATSE report emphasises the importance of integrating **innovation** with energy market, regulatory and industry development when refocussing energy policies and industry policies.

As the report says, "Strategic positioning and investment in all parts of the innovation chain are needed for Green Growth – Energy opportunities to be effectively exploited".

The OECD Innovation Strategy notes that countries that harness innovation and entrepreneurship as engines for new sources of growth will be more likely to pull out of and stay out of recession.<sup>6</sup>

Innovation is at the heart of taking advantage of Green Growth opportunities.

As a report on the Australian Innovation System noted:

*"Innovation delivers new ideas, new ways of doing business, new markets and new jobs. These are the tools of transformational change. As resource use continues to grow there will be a point at which outcomes that are simultaneously economically, environmentally and socially beneficial will be*

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<sup>6</sup> OECD Innovation Strategy 2010

*limited by the continued depletion of natural capital. Innovation, both through the development of radical new solutions and the spread of incremental improvements throughout the economy, will be the key to doing more with less, enabling continued growth beyond present limits.*<sup>7</sup>

Developing new sources of growth will depend on investing in innovation and skills. Research and development to invent new technologies and solutions that can support a Green Growth transformation is one important aspect of this innovation process. Such innovation requires the continuous strengthening of Australia's public sector research capabilities.

We must be a nation where the skills and inventiveness of our citizens, and the quality of our science, will enable business and government to deliver better products and services, and where our innovative people can compete in an increasingly difficult world economy to address our societal challenges.

How do we fare on the innovation front? One survey has Australia ranked 13th of 25 countries on the strength of our innovation environment<sup>8</sup>, behind many of our Asian neighbours including Japan, South Korea, Singapore and India; and the

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<sup>7</sup> Australian Innovation System Report 2011

<sup>8</sup> Pg 26 - [http://www.ge.com/sites/default/files/Innovation\\_Overview.pdf](http://www.ge.com/sites/default/files/Innovation_Overview.pdf)

OECD rankings put us at 23rd out of 30 countries for international business innovation.<sup>9</sup>

When we look more closely, we see that overall some 40% of Australian companies can be described as actively innovating. When you look even more closely, approximately 4% of the Australian companies innovate and take goods and services to the world market, approximately twice that number have goods and services new to Australia, about the same number new to the industry and around 60% new to the business only.

Between 2006-7 and 2008-9, the percentage in each of the first three categories fell and the last one (new to the business only) rose.

I might add that these figures (the first three) are way behind New Zealand. Now there is a challenge – first the rugby, probably the cricket, and even innovation for export.

In this context (about innovation not NZ), I read with interest I read with interest the comments the other day from the Australian-born head of the U.S. Business Council, Andrew Liveris, that Australia's business climate is in "rigor mortis" and must stop being complacent. He went on to say that Australia has lost the ability to innovate.

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<sup>9</sup> Chart 5.3:

<http://www.innovation.gov.au/Innovation/Policy/AustralianInnovationSystemReport/AISR2012/chapter-5-links-and-collaboration/collaboration-performance/index.html>

He was interviewed alongside the Head of the Business Council of Australia, Tony Shepherd, who agreed that Australia had become too complacent and was suffering a "national malaise".

I think, like nearly everybody else who spends anytime thinking about this, that this *malaise* is a looming and probably large problem. And it is complex. It must be, we have been talking about it for at least thirty years in my direct experience. Maybe that is the problem, too much talk.

Our culture is one important element. And we pigeon-hole early.

- We spend something less than 3% of primary school teaching time on science on average.
- We spend something like 18% on 'mathematics' yet surveys suggest that only about one half the community can cope with the mathematics needed for everyday life.
- Time spent is one thing; teaching is another.
- We ask students to choose early in secondary school what subjects they will study, and we offer few incentives to get students interested in subjects that are important to our future when they are in decline or stagnant.
- We take away incentives like pre-requisites on the presumption that an over-christmas-cram will get them



ready. [And 40% of students starting engineering do not complete an engineering degree].

- Once they have chosen their subjects they are set up for similar studies post-school.

And we pigeon hole later:

- Employers say that graduates are not work-ready.
- As a general rule, not enough look behind a discipline studied to see whether a person has talents and skills that go beyond a discipline.
- They say they won't employ PhD graduates - and they don't. We have something like 9 doctorates per thousand in the workforce and Switzerland has 28. Around 75% of Australian researchers are in universities or research agencies – in the Finland and Germany it is closer to 30%.

While there may be too much talking, I would suggest also that there is too much timidity.

When tend to small programs and think of incrementalism rather than what we can do that is different and likely to lead to real change. When the *status quo* is challenged, it is the challenge to show why it should not be changed that is more often taken up than the challenge to change.

There is a lot to be done. Changing a culture, any culture, is not easy. But it has to be done. We may have been 'lucky' in the past, but the future will be less likely one in which **luck** will play a large part.

Indeed, as the Prime Minister said in March this year: "***In a world where our future is not assured there is nothing automatic about a strong and prosperous future for our nation.***"

We can have no sense of entitlement. No sense of waiting for the luck to turn. We have to get out there and earn it.

Innovation will help. And so will Reports like this one. They are important in themselves. But so is the fact that ATSE is urging movement, and as long as that is relentless, it will have an effect. Positive.

Thank you.