



Australian Government
Chief Scientist

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Keynote address

A mind to win

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

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Appetite for success

It is a great pleasure to address this flagship innovation event in National Science Week.

On Monday I set out a challenge: by the end of the week, let's all know the names of at least five Australian scientists. Five *living* scientists. Not including me.

Put up your hand if you feel confident you can already pass the test.

Leave your hand in the air if you feel confident for an attendant with a microphone to come by and give you the opportunity to demonstrate your knowledge to the rest of us here today.

But not to worry – we all have until the end of the week to take the Five Scientist Pledge.

And I hope that we come here today with a mind to seek out success – and a willingness to embrace a share of risk.

I like to think I set the pattern early. In my maiden speech at the National Press Club in March, I told the story of the *Vasa*: a seventeenth century Swedish warship.

It was the pride of the nation. The most complicated war machine that the Swedes had ever built. An innovation project unlike any other.

And it might have changed the course of history.... if it hadn't sunk with a puff of wind, twenty minutes on from the gala launch.

It was about as seaworthy as a concrete duck.

I opened with that story – and embraced my destiny as the first Chief Scientist to launch himself with a shipwreck.

But I did it to make an important point about the attitude we take to innovation.

Doing something new means facing the risk that you might fail. But doing something *successfully* means accepting the risk and proceeding with science... not just self-belief.

It calls for big vision – and a pragmatic path. One without the other is a glorious concrete duck... or the same old canoe you've been building for years.

So even a shipwreck can be very instructive.

Still, I will be travelling to Europe very shortly. And it has been pointed out to me that the *Vasa* was my first and last reference to Scandinavian innovation. I wanted to take the opportunity to revisit the topic today.

And I am aware that another event is going on alongside National Science Week, and it has to be significant, because even the *Financial Review* has devoted a page or two to sport.

So, combining the nation's love of sport with my interest in Scandinavia – let me tell you the story of Iceland's soccer team.

The Icelandic puffin that roared

If you've visited Iceland, you will know the weirdness of the Icelandic moonscape.

I went there with my wife, son and daughter-in-law in January. The dead of winter. The sun doesn't rise above the horizon and the thermometer is offended by positive numbers.

Why, you might ask, did we go to Iceland in winter? To chase the Northern Lights, the Aurora Borealis, but that is another story.

We hired a Land Cruiser at the Reykjavik airport and drove through the late morning darkness for an hour to get to our hotel. The landscape was flat, and dotted with black basalt boulders capped with white snow hats. At the hotel, we piled out of the car to find that the door to reception was locked.

As we huddled in the cold, with the vapour from a geothermal power station billowing on the horizon, surrounded by endless white-capped basalt boulders, my wife looked at me mournfully, shivered and said "I want to go back to Earth!"

This, ladies and gentlemen, is Iceland: home to 10 million puffins, 300,000 people... and now, *the soccer team that knocked England out of the finals of Euro 2016.*

Of course, sport will always yield its share of random and inexplicable results. But Iceland's success in soccer has been both significant, and sustained. Over the past three years, Iceland has climbed 109 spots in the FIFA rankings.

Wouldn't we be glad to move even one or two notches up the Global Innovation Index, or the OECD's ranking for schools.

So let's dig a little further into this Icelandic volcano. If it wasn't stunning luck, how was this explosion of talent obtained?

Simple: it was the choice that Iceland's soccer fans made, way back in the 1990s, to be winners in 2016.

They understood that they couldn't win England's way. They didn't have A-grade soccer pitches: they had gravel. They didn't have the star international players: they had weekend punters. They didn't have sunlight in winter: they had darkness and gale force winds. And under those conditions, no-one wants to train.

So how does a country with all those excuses for failure build a genuinely competitive soccer team? Four things.

NUMBER ONE: they created the infrastructure.

And the Icelandic innovation was the indoor football house. At a stroke, athletes who spent half the year inside could still train all year round. Soon local councils were competing to build these indoor pitches, with private capital and public money.

[And, of course, they could afford to heat them as a result of Iceland's excellent and inexpensive geothermal power.]

NUMBER TWO: they invested in education.

And they spent their money wisely: on training the trainers.

They stopped relying on well-meaning parents, and started paying for the training and accreditation of their coaches.

For every 500 Icelanders, there is now one internationally-accredited coach. And every child with the talent for soccer can pursue it with world-class support – including the support to be mentors and teachers in their turn.

Which feeds into NUMBER THREE: they built the culture.

In the 1990s, it was said that you could hear a pin drop at an Iceland soccer game – if anyone were actually there to drop the pin.

This year, close to 10 per cent of the population travelled to France to watch the team at Euro 2016. It was almost mandatory to watch the games back home! Young people are signing up, sponsors are coming on board, and soccer is fusing into daily life.

And finally, NUMBER FOUR: they played to a strategy.

With no star players, Iceland had to work out how to be a star team. And it turns out that small countries with a strong work ethic can win on discipline and organisation.

Perhaps a gene pool that skews towards tall, strong and athletic also helps.

But they still needed a great game-plan – and they needed to pursue it through a great leader.

Iceland found that individual in the much-loved local dentist – who currently doubles up as the part-time Head Coach. Yes, as a dentist, his core experience is pulling teeth – but what is leadership, if not the art of pulling teeth in a reassuring way?

And *this* dentist sent the players out onto the pitch in good health... with a mind to *win*.

As one spokesman told the media: “When we go out on the field, we’re not thinking, we’ll try not to lose so bad. We’re thinking, we’re going to beat them”.

And surprise, surprise – come the big match, mighty England went down.

A vision for Australia

So what can we learn from the lessons of Iceland’s success? Let’s start with the attitude it takes to win.

Any startup, or startup nation, needs to start with a bold aspiration: and it can't be "just lose small".

We wouldn't accept that from our Olympic swimmers! And we wouldn't fund elite swimming as generously as we do if we thought the outcome would be, every now and again, a flash of bronze.

By the same token, a small goal for Australia will not attract all the fellow-travellers we need to achieve something that's ultimately worth having.

We have to stop telling ourselves – and everyone else - that innovation only works in those magic lands like Silicon Valley.

I can tell you, as someone who's tried it: even in California, success comes very hard.

Read *The Los Angeles Times* today, and you will discover any number of reasons for Californians to complain.

Our rents are too high! Our tech stock is over-valued! And then we've got that Presidential election in November – so we may as well move to Canada now!

If the pundits are pessimistic in Los Angeles – well, you can bet that they're apocalyptic on Wall Street.

We might scoff, and tell them to keep their problems in perspective.

As of last week, the five largest companies by market capitalisation on the S&P 500 were all tech firms: Apple, Google, Microsoft, Amazon and Facebook. And all of those companies except Facebook spend more on R&D than the Government of Australia spends across the entire science and innovation portfolio.

Let me repeat that: individual companies outspend our *national government*.

What possible reason have Californians got to complain?

But ladies and gentlemen – wouldn't they look at our universities, our banks, our stable regulatory systems, our cultural diversity, our proximity to Asia, and our world-beating quality of life... and wonder why we can't make a go of it here at home?

Which is exactly what Vice President Joe Biden did last month, when he challenged Australia to be "the innovation hub of the Southern Hemisphere".

So no excuses for low expectations!

We need to cease our self-criticism because it only destroys our ability to build constructively on what we have. And we do need to build on that foundation: constructively, creatively and continuously.

Game-plan for success

Now I am not pretending that we can achieve success by putting down all our big dreams in a policy document.

You cannot order your country to have ideas, or to pursue them – any more than you can order a soccer team to win.

You can exhort, you can encourage, you can get creative with the salary cap – but ultimately, you need to build the capability to play the game consistently well.

The same is true in innovation policy: it is a business of maximising the potential for people to perform, through a combination of smart regulation and strategic investment.

And here, we can read straight from Iceland's playbook.

Remember the key elements I outlined: infrastructure, education, culture and strategy.

They map very neatly against the National Innovation and Science Agenda, as I know that Minister Hunt will discuss tomorrow.

I welcome the commitments that the Government has already made, and – just as importantly – the impetus that is building behind this agenda.

But let me highlight a few elements of the national mission that will be central to my work, under those four headings.

First, the **INFRASTRUCTURE**.

It's no secret: great science needs great science equipment.

And if science turns money into knowledge – then innovation turns that knowledge back into money, and generally a lot *more* money than the taxpayers put in.

We have in Australia a very strong national research infrastructure base, which consistently delivers outstanding returns. The Government and the research sector are enthusiastic to build the next-generation equipment on that foundation.

Of course, ask 20 scientists, and you will get 56 opinions on what the taxpayer dollar should fund.

My job in the months ahead is to collect those opinions, and condense them into a crystal: a 10 year National Research Infrastructure Roadmap.

And I'll take some inspiration from Iceland in the drafting: build to the conditions, contain the operating costs, and maximise the use of the facilities all year round.

The next item on the list: **EDUCATION**. Here we need to grasp that true Scandinavian insight: *train the trainers*. It worked in Iceland's football houses, and it worked in Finland's schools.

I have said it many times, but in National Science Week it is important to say it again.

At all levels of education, from early childhood to PhD, we need to build in the incentives and support for quality teaching – as a national priority.

We do have great teachers, but we should have what Finland has created: a great teaching *system*.

And if Iceland can have one UEFA coach for every 500 people – we can certainly have at least one qualified mathematics and science teacher accessible to every child.

So, to the third item: **CULTURE**.

How do you change the way that people think? It's a question that plays on my mind every time I read another one of those articles about people with science PhDs who can't find jobs.

It irks me that people consider science PhDs to be excellent researchers – and nothing more.

Surely, it shouldn't be so hard to think of other things that people with science PhDs are uniquely equipped to do!

They are phenomenally hard-working. They are extremely bright. And they have to be both disciplined in their methods, and creative in the way they apply them.

If you want a worker who can solve a complex problem in a short period of time with resources strung out to the nth degree – hire someone with a science doctorate.

It just amazes me that more companies can't perceive it.

I suspect it comes down to a lack of awareness – and a lack of experience in harnessing a PhD's strengths.

The only way to create that awareness is to give people the taste for success: so we have role models for people in PhD programs today, and advocates in the business community eager to bring those graduates on board in the future.

So I will continue to investigate and advocate for two things:

- Programs that bring down the threshold costs for business to engage PhDs both during and after their training.
- And incentives for universities to introduce those programs.

Finally, to the **STRATEGY**: the way we play to our strengths.

And here I have the advantage of two team coaching roles: as Executive Officer of the Commonwealth Science Council and Deputy Chair of Innovation and Science Australia.

In both roles, the basic task is the same: identify those areas where Australia has a national need or a strategic opportunity to pursue through science.

Bill Ferris has already spoken very ably for Innovation and Science Australia.

On the Commonwealth Science Council, let me just say that I am looking forward to our next meeting with great relish.

The Council is our opportunity to bring together the captains of industry and academia with the leaders of Government.

The Prime Minister is the Chair, the Minister for Industry Innovation and Science is his Deputy, and the Minister for Health and the Minister for Education both bring their important perspectives as members.

The shared ambition is to inform the national game-plan with foresight to the new challenges ahead; and insight to the strengths and weaknesses of the national team today.

Conclusion

And we will come with the inspiration of Iceland: you can come from a land of puffins and still have the spirit to roar.

Let's make that the ethos of our gathering today.

I look around me at a room full of leaders, and people with the capacity to be leaders or to influence what leaders do.

And I challenge each of you to use this forum to identify two things – two specific things – that you are going to take back to your organisation.

Not twenty things that could conceivably be done if someone had a mind to pursue them! Two things that you are going to do because they will put your organisation on the path to opportunity.

You might start by looking up a few scientists' names – and taking contact details for their universities while you're about it.

But finding potential in this country is easy. Explaining it – and acting on it – is the key. We have the chance to learn from experience today.

So here's to the heroes of Iceland – and here's to a podium finish for the heroes at home.

THANK YOU