

Opening Address

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Parliamentary Buildings, Wellington

I have been asked to talk about the Government's vision for science and innovation over the next 20 years.

Our vision is a simple one. It is that science and innovation is at the heart of our economy. They will be the means by which we grow and develop the economic and social future of New Zealand.

As a small country, we are not big enough to dominate markets. Nor are we big enough to generate growth through our internal economy. We cannot build a competitive edge through low wages or degrading our environment. We have to be smart.

Symbolic of our priorities is the new Ministry of Science and Innovation. You may ask, 'What's in a name? Why is that important?'

It is important because it signals a new era and a new attitude. Science is not just for very clever people conducting advanced experiments at the frontiers of science. Of course this is important. All great discoveries ultimately come from frontier research. However, science also has to connect to the economy, not just for the future but also in the present.

Science is the wellspring of innovation. It is the effective application of that science which will generate the exports and jobs that we want. The conjunction of science and innovation is central to our strategy.

We are not the only country to have identified this. The Deloitte 2010 report on global manufacturing competitiveness ranks 'talent-driven innovation' as by far the most significant factor in global competitiveness.

Other countries have gone further. The transformation over the last three decades of the economies of countries like Finland, Denmark, and Singapore has been down to a long-term strategy of ongoing investment into science and innovation. These countries have built multiple streams to their economies.

Closer to home we have had the example of Queensland. Queensland is not just the Sunshine State. Over the last 12 years, they have undergone a major transformation of their regional economy. The results are compelling. In the 1990s,

the per capita income of Queensland was very similar to that of New Zealand – they were slightly ahead. Now, they are over 30% ahead.

Why is this? It is not just because they have minerals – Queensland has always had minerals. In fact, the difference can be summed up in two words – Smart State. This has been a comprehensive and broad strategy over time to diversify Queensland's economy from 'rocks and crops' (and tourists) to a far broader economy encompassing research activities and a whole range of local and international high-tech industries.

New Zealand's National-led Government has embarked on its own broad-reaching strategy to improve the economy. Complicating this effort is the biggest global financial crisis since the Great Depression, and the consequent strain on government and business finances around the world.

Science and innovation are not the only focus. They are part of a larger strategy that the Government has implemented to drive New Zealand forward.

We have made huge progress in terms of more efficient government. The last decade saw taxpayers' money squandered at a time when we should have been building for the future. Government spending increased by \$22 billion in just eight years. It is hard to see what we got for it.

Our highest priority as the incoming Government was to stem a deficit that threatened to blow out of control. It was not easy, but we have achieved this. We are prioritising government spending on what really matters.

Regulatory reform has also got under way, from streamlining the Resource Management Act through to holding regional and local bureaucracies to account. We have also rolled out an infrastructure programme across a whole host of areas from broadband to roads to public transport.

Tax reform was a focus for this year. Not only has it made a substantial difference to people's pockets, it also signals our clear intention that savings and investment should be rewarded over consumption.

All these initiatives are important. Taken together, they signal a marked shift in the direction that we are taking New Zealand.

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He holds a LLB (Hons) from Auckland University, a LLM from the University of Toronto, and a PhD in international law from the University of Cambridge.

Dr Mapp's career has involved both private legal practice and as Associate Professor of Commercial Law (international trade law, taxation & constitutional issues) at Auckland University, 1994–96.

Science and innovation initiatives

We have placed science front and centre. We have backed this by actions. In Budget 2009, we increased funding for fundamental science at a time when just about no other funding increases occurred. We initiated the CRI reforms, simplified the system, established overall science priorities, and introduced the Prime Minister's Science Prizes.

We appointed Sir Peter Gluckman, who you will hear from later, as the Prime Minister's Chief Science Advisor.

Sir Peter has been an inspiration. He has challenged us and stretched us. He has been a hugely effective conduit between science, government, and the public.

In 2010 we went even further. Science and innovation received another round of major new funding – one of the few areas that did.

The emphasis in 2010 was support for business innovation. This included the new Technology Development Grant, aimed at research-intensive firms. The first of these grants will be announced soon.

Yesterday, I announced the initial group of research and development institutions that businesses will be able to engage with the new Technology Transfer Vouchers. This is aimed at smaller businesses that do not have their own research and development capacity. They will be able to work with our scientists and engineers to get the solutions they need to grow their businesses.

When you consider the overall economic and fiscal situation, it shows just how much importance we have placed on science and innovation.

Already, we are seeing results. Scientists and professionals have been enthused by the changes. The CRIs are being let off the leash to concentrate on their science and how it benefits the country, rather than the short-term focus on funding rounds and annual statements.

In business, we have signalled that we want innovation-fuelled progress. We are not just supporting ideas, we are supporting solutions. This support is carefully targeted towards market-driven growth.

The media have responded to the new mood. Every day, there are articles about new inventions and successful innovations. The young scientist who earlier this year won the inaugural Prime Minister's Prize for Young Scientists is now fronting a TV show.

Overall, there is a sense of excitement and enthusiasm.

Yet we know we cannot rest on our laurels. In a highly competitive world, others are catching up fast.

One of our standout economic performers has been the dairy industry. This has harnessed science in all areas of animal and plant breeding, productivity enhancements, processing innovation and product development. There is also a major science effort around environmental management.

However, we are already at a point of declining efficiency gains. Over the last decade, our milk production efficiency has scarcely moved. Our major competitors have closed the gap.

This does not mean that the dairy industry is facing decline. Far from it. The emphasis is already moving from production efficiencies to higher-value products. It does illustrate that we

need to not only capitalise on existing sectors, but build new ones.

So where should our next focus be?

I believe there are three main areas we should concentrate on. These are: improving our business innovation, strengthening the relationship between science and economic opportunity, and growing our science capability.

Business innovation

Research and experience shows that there is a 'tipping point' for businesses, where they start to see major benefits from the R&D investment. For many of our high-tech businesses, this is already occurring.

The proof of this is in the Technology Investment Network annual report, the TIN 100, which looks at our top high-tech companies. This notes that those companies that had established a good global position continued to grow strongly. An example is Fisher & Paykel Healthcare, which increased revenue by over 20% last year. Overall, the TIN 100 companies invest over 5% of gross revenue into R&D.

Even more significant is the next group of companies, ranked from 100 to 200 in the TIN 100 list. Their average R&D investment is around 20%. These are not just start-ups. The majority of these are established companies that have crossed the 'valley of death' and are positioned for serious growth.

Our current business-facing schemes are deliberately targeted at encouraging co-investment. We will see companies like those in the TIN 100 grow even more strongly as the global economy recovers. Their R&D investment will keep them at the forefront.

We will keep supporting commercial innovation, and expand our business-facing schemes. We expect that demand will outstrip supply for vouchers, for project grants, and for the Technology Development Grants.

The next step in the commercialisation drive will be around clusters and centres of excellence. Too often, we end up with a maze of small and unco-ordinated efforts. Current initiatives such as the Food Innovation Network and the titanium industry cluster are a template for increased efforts and support.

Strengthening the relationship between science and business opportunity

New Zealand produces a lot more ideas than we currently have businesses for. Ideas on their own are worth nothing. As we build our innovation ecosystem, the pressure to commercialise intellectual property will grow more acute.

This process is already under way. We will shortly be releasing the request for proposal for the new commercialisation centres. These will build on commercialisation activity already being undertaken by universities and Crown research institutes (CRIs). The intention is to allow New Zealand companies far greater access to the range of scientific knowledge and capability.

We also need to look beyond New Zealand.

Take a company like Lanzatech, in Auckland. Their innovation is in custom microbes that clean the waste gas streams of large industrial processes, such as steel mills. The market for this innovation in New Zealand is just about non-existent. They need

to work with global steel producers. In fact, they have recently signed a deal with a major Chinese steel company that will let them take their process to the next level.

This is an example of harnessing our science in the global marketplace. We want the world to look on New Zealand as both 100% Pure and 100% Innovative.

Growing our science capability

It goes without saying that if we are prioritising innovation through science, then we need plenty of scientists to feed the innovation pipeline.

Without a constant flow of energised and excited people we will not build the diverse economy we need. Attracting, empowering, and retaining talent must be the foundation on which our innovation future is built.

This means investing more in our young scientists. As I go around the country, I note that more and more young scientists are seeing the future not only in terms of their specific research focus, but also in ways that they can apply their talents outside the laboratory.

The future will see a far higher number of scientists sharing their career development across the public and private sectors. They may start in a university, then migrate out into business before coming back into an institution to either return to focus again on more pure research, or teach and inspire others.

Much of our science expertise is in the CRIs. We have therefore empowered CRIs to take a far greater role in determining their major science priorities and managing their resources in consultation with their stakeholders.

In return, they need to demonstrate to their shareholders and stakeholders just what they are doing for New Zealand, why it is important, and how they are getting results that matter.

The universities obviously play a vital role. The Centres of Research Excellence have been very successful. The Performance Based Research Fund, the Marsden Fund, and the Health Research Council are integral to supporting science-led discovery.

We also need to develop and expand the role of institutes of technology and polytechnics and other leading vocational institutions on the development side of the R&D equation.

The Rutherford Scholarships were introduced to help address the early/mid-career gap that many scientists face. They are part of the more targeted support approach that will ensure that we keep our talented people encouraged and engaged at critical times in their careers.

Transforming our economy

The three objectives mentioned above have a purpose.

Over the next 20 years we want to see our economy transformed. I know you have heard this rhetoric before from various politicians, business leaders and committees over the last 25 years. And there is no doubt our country has made major changes.

We opened up the economy, we became more competitive and market-focused. We have built new skills. We did have further to come than our competitor nations. They did not require Reserve Bank approval to subscribe to an overseas magazine; they did not have strict import licensing resulting in televisions being assembled at three times the world price; and they did not have compulsory unionism.

These things are now all in the past. However, our competitors did make changes in the last 15 years which we failed to do. They built their advanced high-tech sectors.

For example, in 1990 Denmark exported about the same value of agricultural products as it did high- and medium-technology manufactured products. By 2009, their agricultural exports had increased in value by 100%. In contrast, their exports of high- and medium-value manufacturing had increased by nearly 400%. Their economy had fundamentally changed.

Countries like Denmark, Finland, Singapore, and Queensland have built world-class science and innovation systems in the last 15 years. We have not done so.

New Zealand will always have a strong agricultural sector and we will always be attractive to tourists. We need to add to it, just as Queensland has added to 'rocks and crops'.

The investment in science and innovation will enable New Zealand to build a 'third pillar'. It will take the TIN 100 group of companies with their focus on high-tech manufacturing and service from their current \$5 billion in exports, to double that.

Currently, our wider high-tech manufacturing sector contributes about 10% of New Zealand's export revenue. We need to lift that to 25% over the next 20 years.

That would really be an economic transformation. It offers our best chance to move on the OECD ladder.

That is our also best chance of ensuring that more of our brightest and most talented stay in our country. They will not just see it as a way station, a place to be educated, to leave, and to visit from time to time to see relatives and enjoy the beach.

Conclusion

The brief you gave me was around the Government's vision for science and innovation.

Today I have given you some of my ideas as to how I see that vision developing.

The Government has many competing demands on its limited resources.

Yet in spite of this, the Government has delivered on its science and innovation programme. The response to that has been very positive. It augurs well for the future.

Right now is an incredibly exciting time for science and innovation in New Zealand. The next few years will more than fulfil the anticipation and expectation that we all share.