



## OFFICE OF THE PRIME MINISTER'S SCIENCE ADVISORY COMMITTEE

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Chief Science Advisor

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### REPORT TO THE PRIME MINISTER ON THE OFFICE OF CHIEF SCIENCE ADVISOR

**1 July 2009 to 30 June 2011**

#### **1. Preamble**

I was appointed to the role for an initial two year period from July 1 2009. To ensure independence, the role was filled by secondment from The University of Auckland. Formally, the position was created as a one-person Ministerial Advisory Committee accountable to the Prime Minister, carrying with it the title of Chief Science Advisor. While this has operated well within Government, the concept of a one-person advisory committee has caused a degree of confusion and misunderstanding in some quarters and considerable expectations from the public and scientific community on what might be expected of it, in the presumption that it is a substantive corpus of people and resources.

#### **2. Administrative and liaison matters**

Although the Office is independent of the State Service, the budget is provided via DPMC. The Office has operated within budget and the administrative arrangements have operated smoothly. I have kept the staff small – Dr Alan Beedle (0.8 FTE) acts as my chief of staff and Dr Stephen Goldson (0.3 FTE), who is a senior member of AgResearch's staff based in Lincoln and who is also Chairman of the Academy of the Royal Society of New Zealand, acts as my strategic advisor and has deputised for me in a number of public speaking engagements. A gap identified last year was the lack of a staffer to liaise with MSI and other government departments, and this is currently being remedied by a joint appointment with MSI. I have complied with the conflict of interest requirements of the role.

There is a high level of liaison with DPMC, with a specific staff member appointed for liaison (initially the late Ken Kirkpatrick, then Paul Alexander, then Charlotte Denny). I have regular meetings with that staffer about every 2-3 weeks, and less frequently with the Chief Executive. I acknowledge the support and advice of them and other members of DPMC. I am grateful for the regular meetings with you, which have been a mix of reporting to an agenda and more informal dialogue. Your staff have been fully accessible. I have operated under a 'no surprises' policy and I am pleased to report that on no occasion has there been any interference with the intended independence of this Office.

I have met regularly with Dr Wayne Mapp as Minister of Science and Innovation, generally at his request to advise on various aspects of science policy or strategy. I have met with many other Ministers as appropriate, either at their request or where my work programme interacts with their responsibilities.

I note multiple meetings in the past year with Ms Paula Bennett, Mr Bill English, Mr Steven Joyce, Mr David Carter and occasional meetings with Mr Tim Groser, Mr Murray McCully, Dr Nick Smith, Mr Gerry Brownlee, Dr Jonathan Coleman, Mr Tony Ryall, Mr Peter Dunne, Ms Anne Tolley and other Ministers.

I have met regularly with the Chief Executive of MoRST, Mr Murray Bain (now MSI), and with the CEs of many departments and agencies as appropriate. I have had the occasional meeting with the opposition spokesman on Science. I have met with the Education and Science Select Committee. The Health Select Committee has sought my advice and input on several occasions.

### 3. Terms of reference

The terms of reference were originally drafted under the following heads:

- independent advice,
- public statements,
- promotion of science,
- representation, and
- appointment to official committees.

In practice the roles have evolved to be:

- **Promote an understanding of science with public, officials and politicians.** This has required a high commitment to public engagements, placing speeches on the web, being accessible to the media, speaking on campuses and at CRIs, and engaging with the Royal Society of New Zealand, with the business community, and with opinion leaders, officials and Ministers as appropriate. While itself totally unscientific, the recent opinion poll by the *Reader's Digest* suggests that this role has been well received. My speeches have ranged from general considerations of what science can do for New Zealand, the value of science education, the interface between science and business, the role of science in policy formation, the changing nature of science and the role of science in diplomacy to specific issues such as adolescence and climate change.
- **Advise on policy for science.** Particularly in 2009 and the first part of 2010 I assisted considerably your office in considering how to move the science and innovation system forward. This including contributions to the CRI restructuring, to the various papers produced by Dr Mapp, and involvement in a variety of dialogues with MoRST, FRST and MSI. I made myself available to Dr Mapp and to the CE of MSI where appropriate to proffer inputs and advice.
- **Advise on science for policy.** I believe this has emerged as a major role. This is reflected in my work on improving the role of evidence in policy formation and in better using the evidence base in areas such as social domains. I see this developing as a major theme in coming years.

- **Advise on specific science matters.** This has ranged from proactive consideration at your request of specific matters such as methamphetamine precursors, barriers to business uptake of research, and the problems of adolescence to the reactive consideration of earthquake prediction and the psychosocial responses to earthquakes.
- **Assist in whole-of-government matters involving science.** Perhaps the most important roles there have been in relationship to science and diplomacy (see below) but I have also contributed to planning of the Global Research Alliance on Agricultural Greenhouse Gas Emissions and to our inter-agency committee on the Square Kilometre Array.
- **Public communication.** I have seen a major role of my office as being to communicate to the public on matters of complex post-normal science and on the limits and potential of science. I have tried to explain what science and innovation can do to enhance New Zealand's economic and social development. I took a significant role in explaining how the scientific position on anthropogenic climate change was reached. More recently I have addressed issue of public concern over earthquake predictions and psychosocial responses to earthquakes.
- **Domestic ambassadorship.** I have made myself available to universities, CRIs, interest groups such as the Institute of Directors, businesses, iwi and opinion leaders and community groups both to explain science and to assist as appropriate on specific matters which fall within my scope.
- **Science and diplomacy.** This has emerged as a major role. Many countries have an equivalent position and have wanted discussion with me either in a bilateral or multilateral basis. Our ambassadors have used me when I am overseas in the course of my academic role. Ambassadors based in New Zealand seek me out. I take part as requested in various diplomatic hostings. This set of roles is growing as New Zealand increasingly uses science in its diplomatic engagement and as we seek the links between innovation and trade grow. I have been active in assisting New Zealand's positioning in the UN system.

#### 4. Activity report

Some matters merit more detail in describing my activities.

##### 4.1 Special reports

In 2009/10 I issued reports on methamphetamine precursors and on the interaction between science and business. In 2011 I have released reports on science education, evidence in policy, and adolescence.

**4.1.1 Science education.** Assisted by MSI and the Royal Society, I undertook a major piece of work on the future of the primary and secondary school education system. This led to a report entitled *Looking Ahead: Science Education for the Twenty-First Century* which was released on 5 April.

It is intentionally focused on looking a decade ahead and makes a number of recommendations. I am aware that the Ministry of Education has a working group considering aspects of this report, which I believe was well received.

**4.1.2 Evidence in policy.** On 11 April I released a report entitled *Towards Better Use of Evidence in Policy Formation*. This was the result of 18 months reflection, research and analysis combined with extensive consultation within the state services and in other jurisdictions on how New Zealand could and should use evidence more properly in policy formation. Other jurisdictions have moved considerably in this direction and my report identifies flaws, weaknesses and many opportunities to improve the quality of policy formation.

The report received good responses from commentators and many departments have started dialogue with me to explore how to operationalise it. I thank you for sponsoring this work, which I believe may turn out in time to be the most important contribution this Office can make and I see further work and assistance in this general area as arguably one of the most important roles of this Office. How this happens may define key functions of this Office in future years.

The report has engendered considerable international interest and I am in demand to provide advice and speak on the authority of science, science communication and the nexus between science and policy internationally. I spoke on these matters at the Global Science Leaders Forum in Taiwan in April 2011.

**4.1.3 Adolescence.** At your request in October 2009 I commenced a major piece of work on analysing the evidence base relating to New Zealand's unacceptably high rate of adolescent morbidity. This work had the secondary purpose of demonstrating the value of social science and how the evidence base could be used to assist policy formation in complex areas. This work turned into a major undertaking and may well be in international terms the most definitive analysis of the issues.

It required the establishment of a Taskforce, an interim report and a very detailed definitive report entitled *Improving the Transition: Reducing Social and Psychological Morbidity During Adolescence* released on June 1 2011. It has received very high public attention. Given subsequent events, I and other members of the Taskforce have proffered advice as appropriate where adolescent crises have emerged. This work has led to my appointment as chair of the science reference group for the Child Action Plan green paper currently being prepared.

In retrospect, the intensity of this project was such that it may be unrealistic to take on another exercise of this size within the current resources available to my Office. A specific budget would be desirable to undertake work of this magnitude in the future.

**4.2 International role.** Science and diplomacy interact in a number of ways. I recommended to you the establishment of the International Science and Innovation Coordination Committee and I am pleased to report that this committee has led to a clearer strategy and that as a result there is a considerable enhancement of our international strategy around science. In 2009-2011 I have visited and met with my counterparts in the UK (twice), USA (twice), Australia (twice), each time with specific agendas and with science officials in these countries as well as The People's Republic of China, Taiwan, Israel and Singapore.

I have also participated in multilateral meetings considering how science and innovation may be better integrated into the APEC agenda. I have been involved in the discussions leading up to the United Nations high level meeting on non-communicable disease, working in liaison with MFAT and MoH.

At Dr Mapp's request I accompanied him on a fact finding visit to Israel. I have visited OECD, and assisted our ambassadors in China, Chile, Indonesia and Singapore – always in the course of travel in my academic role.

## **5. The science system ahead**

In my view a good start has been made in making science and innovation more central to your economic and social development strategy. However the externalities associated with the earthquake and global fiscal downturn have slowed the momentum, which now I hope can be restored. Many things remain to be done before we will maximally exploit our innovative capacity through research and development, and this will be needed if effective transformation is to occur in the New Zealand economy.

Scientific transformation will permit our country's well-educated population and increasing technological capacity to partake far more in the increasingly weightless global economy. At the same time we must have the capability and capacity to build and exploit areas such as advanced foods, high-technology products and the service sector. Furthermore, the nature of innovation is such that a truly vibrant innovation-based culture will inevitably create unexpected value in other domains as well – this is amply demonstrated by international experience.

It is noteworthy that all other small advanced countries, which I see as logical comparators, have succeeded in transforming their economy via increased government-led investment in basic and strategic research and development. New Zealand has lagged because it has, for some decades, failed to invest sufficiently in basic and strategic research in a manner sufficient to create a fully-functional innovation ecosystem.

Rather, in relation to comparator economies, it has maintained one of the lowest investments in R&D. It has sought repeatedly to achieve improved performance by focusing on single components of it. International evidence demonstrates that this minimal incremental approach is unlikely to succeed. However, the intent demonstrated in *Igniting Potential* demonstrates your commitment to a more holistic approach.

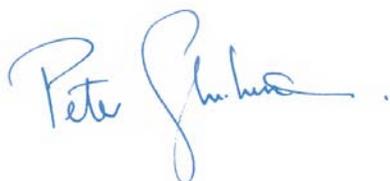
A key understanding of those countries which have thrived is that their systems only work if there is sufficient idea flow for entrepreneurs and businesses to develop and that in turn comes only through investment in basic science, generally through Universities and Institutes. This in turn, requires attention to create suitable performance incentives and drivers in the universities and research institutes (the latter has been partially addressed by the CRI reforms, and early indications of these reforms are generally positive).

This is a unique time in New Zealand's economic history, when transformation is not only needed but is possible as a new wave of growth appears on the horizon. It is also at a time when there is a high public consensus that this is desirable.

To get this change will require investment by the public sector – it is not a question of market failure, rather it reflects the reality that basic research is the source of new ideas and this virtually always starts as a public good. The OECD sees this as a central part of an economic growth strategy.

Beyond arguments based on comparator economies, events over the last year have shown to the New Zealand public the importance of rebuilding and maintaining a strong public science system. They have seen the importance of science in dealing with earthquakes, in the *PSA* incursion into kiwifruit, in the shifting understanding of climate change, in the emergence of a nascent green-technology industry, and in the application of social science to important social questions.

I thank you for the opportunity to work with you and acknowledge the confidence you have shown in me. I look forward to contributing further.



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