OFFICE OF THE PRIME MINISTER'S CHIEF SCIENCE ADVISOR

Professor Sir Peter Gluckman, KNZM FRSNZ FMedSci FRS
Chief Science Advisor

Office of the Prime Minister's Chief Science Advisor
Annual report 2013-2014

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Dear Prime Minister,

Please find herewith the 2013-2014 Annual Report of my activities as Chief Science Advisor.

Once again this year, I thank you for your support and thoughtful input. Your continued respect for the independence of my role has been noted across political lines and internationally. I take this to be a key indicator of the strength of the NZ science advice model, despite only being established relatively recently.

Preamble

The Office of the Prime Minister's Chief Science Advisor has both shaped and been shaped by the strengthening currents in New Zealand's science system and culture over the past year. 2013-2014 has been an important point in the evolution of the Office in highlighting and enabling the role of science in New Zealand's development.

A number of ongoing projects moved from developmental stages to fruitful actions this year, including further maturation of an international network of small advanced economies. These economies have been brought together with the support of the Prime Minister to give a broader set of inputs and analysis on science policy development. My Office acts as secretariat for the initiative and in particular for the science, technology and innovation work stream.

Another important initiative which flowed from the National Sciences Challenges panel, which I chaired in 2012/13, is the Science in Society strategic plan, which was published in July 2014. Work on this plan occupied my Office for much of 2013/14. I chaired the Reference Group of stakeholders contributing to this strategic vision, and was a member of the project Steering Committee.

The work we have done on the nexus between science and policy has achieved much international attention and the Office is heavily involved in organising international meetings on Science, policy and diplomacy to be held in Auckland in August 2014. I

Mail: PO Box 108-117, Symonds Street, Auckland 1150, New Zealand
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am in increasing demand internationally to speak or provide commentary on this relationship.

The sections that follow highlight the year's most prominent activities and the work that is underway. This work is undertaken through my 0.7 FTE PMCSA time allotment agreed with the University of Auckland, supported by a small staff complement. 2 FTE provide support for this work, while a new partnership with MFAT, MBIE and DPMC in 2013/14 has enabled the addition of staff (1.5 FTE) dedicated to the Small Advanced Economies Initiative. A contract researcher is employed on a casual basis through project-specific contributions.

Science in Society and Government

The contribution of science to providing robust evidence for individual, societal and government decision-making is increasingly recognised as critical. Similarly, there is increasing recognition of the influence of both society and government on the shape of the science system and on the social license required for the development and application of new science and technology. The PMCSA role continues to be a unique intermediary in brokering these relationships.

The 2013/14 signature initiative in this area has been the development and launch of New Zealand's first ever strategic plan for science in society. Entitled "*A Nation of Curious Minds*," this plan is the response to the National Science Challenges' 'leadership challenge' put to government by the NSC Peak Panel which I chaired. Over the past year, my Office has dedicated considerable effort and resource to assisting MBIE and the Ministry of Education to develop this plan, which focuses on enhancing STEM education from the earliest years; and on strengthening public engagement with science and the science sector's engagement with the public. As chair of the multi-stakeholder reference group and member of the steering committee to develop the plan, I believe that together we have created a vision and way forward for NZ that is unique in the world. The plan's deliberately iterative approach and its balance between the multiple perspectives of science, government, education and the public set it apart. The Participatory Science Platform at the heart of the plan is especially promising for its potential to meet the plan's multiple strategic objectives in a single initiative. In addition, early feedback on the plan from industry leaders has shown that it hits the right note for New Zealand's science-minded business community.

The theme of bridging the interests of the science sector, government and the public carried through to many of my public speeches and blog posts this year, in an effort to strengthen an environment of mutual understanding. These have all been made publicly available at my website www.pmcsa.org.nz. The time commitment expected and needed for this public engagement continues to grow.

My terms of reference also include a commitment to promoting the place of science within government policy and decision-making and to this end I delivered a major

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report in September 2013. The report discussed the variable use of scientific evidence in policy formation in NZ, and made a number of recommendations to improve the situation. The report's central recommendation to establish the position of Departmental Science Advisor in several ministries or clusters has since been taken up by State Services Commission. Within the context of the SSC's Better Public Services initiative, a network of DSA's is growing (2 appointments were made during this year with 3 others currently advertised). I will continue to chair and help shape this network as the DSA's take up their respective positions.

Models of science advice to governments (such as the DSA network) that embed science in the policy process are not yet common practice across the world's governments and New Zealand is in a unique position to critically assess the merits and challenges of multiple styles. In fact reflection on such models and practices has been elevated to a significant global discussion in recent months, with New Zealand the recognised thought-leader in the field through the efforts of my Office. In March of this year, I provided a practitioners' perspective in an invited commentary for the journal *Nature*. This commentary outlines many of the issues that I have raised for further discussion at a conference of global science advice practitioners organised by my office, together with the International Council for Science, to be held in Auckland in August 2014. Considerable work over the course of this year has gone into developing the programme and preparatory material for this conference, which has already raised New Zealand's science and policy profile globally.

Finally, science advice to governments need not (indeed should not) be limited to the natural sciences and engineering. Social Science, for its part, can contribute greatly to the development of robust evidence for social policy formation. At the request of the Prime Minister and Deputy Prime Minister, my Office has provided technical assistance and advice to the Families Commission's ground-breaking Social Science and Policy Forum. Held in Wellington in February 2014, this forum brought together cabinet ministers, policy executives and NZ's leading social science academics to discuss the pathways and obstacles in getting reputable social science embedded in the policy formation cycle. As a result of the forum, relevant ministries are currently considering social science research priorities and possible funding mechanisms to achieve these. I will continue to work with the Families Commission and its Social Policy Research and Evaluation Unit to help ensure the increasingly systematic use of social science research in policy formation and in establishing the mechanisms that link universities to end-users to help mobilise this important knowledge base.

Science system and policy

I act as a sounding board for the Ministry of Business Innovation and Employment and the Tertiary Education Commission on matters related to the national science system, and to technology and innovation policy. Over the past year, the focus has been on discussions of appropriate research impact measures and, more significantly, MBIE's development of the National Statement of Science Investment.

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Specifically, our analytics and insight, gained through the Small Advanced Economies Initiative (SAEI, see below), has been a valuable source of information and ideas as well as providing a challenge function for science policy in its developmental stages.

In February 2014, I took part in an invitational discussion in Melbourne organised by the journal *Nature* that considered the multiple policy-relevant questions around the issue of the 'impact' of publicly funded research. This discussion resulted in the special supplement to the publication (July 23) that provides an in-depth look at the New Zealand and Australian systems, and their models and methods for assessing impact and funding accordingly.

These are complex systems-level issues with which all advanced economies are currently grappling. New Zealand, like other small nations, has long privileged mission-led science that is end-user focused, in keeping with its small scale and limited research resources. However, lessons that we are drawing from international counterparts are helping to refine our perspective and better understand the need to remain focused on quality science and scientists as a first principle and as the bedrock for innovation in a healthy science system.

Science and diplomacy

The domain of science and diplomacy has become formalised over the past year to take a more central place among my responsibilities.

For instance, I co-lead the Small Advanced Economies Initiative (mentioned above) in its science and innovation work streams. In November 2013, the initiative held its second high level meeting of Principals, demonstrating the increasing commitment of partner economies to pursue the work. This was followed in May 2014 by a technical workshop on science system indicators and metrics. This project has brought New Zealand into a very close working relationship with similar economies. The policy insights that these relationships continue to produce provide good value to New Zealand.

In addition to co-leading the SAEI, which reflects mainly on science and innovation systems, I continued this year to chair the APEC CSA and Equivalents annual forum, which considers member economies' processes, practices and environments both in policy advice for science and science advice for public policy within the APEC region. My Office will host the 2nd annual meeting here in Auckland in August 2014, to be co-chaired with China.

I continue to assist NZ's diplomatic efforts through science and to act as NZ's Science Envoy. In particular, I have supported NZ's Security Council bid where it interfaces with science and science system issues.

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Technical scientific advice

At the request of the Prime Minister, I have provided technical scientific advice on specific issues over the course of the year.

Where these issues are complex and have required more than a technical review of the literature, I have assembled task teams of reputable content experts and peer reviewers to review and synthesise available evidence, on the basis of which I have elucidated what is known and not known about the issues, and provided critical insight on the way in which the scientific conclusions are made. In this, I have drawn attention to the inferential gaps between these conclusions and the range of policy options. This has been particularly important in policy-relevant topics of high public interest such as responses to climate change.

The major technical report undertaken by my office in 2013-2014 was *New Zealand's Changing Climate and Oceans*, for which I engaged university- and CRI-based experts to review the current state of the climate and its foreseeable effects on New Zealand's regions and land-based businesses. I consider this report to be realistic and unflinching in its depiction of the imminent challenges that we face, and the need to develop robust risk management strategies.

In addition to the climate change project, I have also been asked this year by the Ministry of Health, together with a number of district councils, to conduct a definitive scientific review of the benefits and risks of municipal water fluoridation. With the Prime Minister's approval, this work is being undertaken jointly with the Royal Society of New Zealand, with whom we have assembled an expert panel. Our report is due to be published later this year. This approach is new and will help to enhance the role of the Royal Society of New Zealand as a source of scientific evidence for policy matters where a more deliberative method is warranted.

Looking ahead

The three international conferences that I am hosting in August (Science Advice to Governments; Science and Diplomacy; and APEC economies' Science Advisors and Equivalents) will generate considerable follow-on activity. For instance, I am currently negotiating the terms of a partnership with the OECD Global Science Forum, which has expressed interest in supporting our work to foster the emergent international network of science advisors.

Secondly, with the recent launch of Science in Society strategic plan by Ministers Joyce and Parata, I look forward to my continued role on the Steering Committee, which has now been repurposed to provide ongoing oversight, monitoring and evaluation of the implementation of the plan. I expect also that there will be a great deal of work to do in the development and launch of the Participatory Science Platform which sits at the heart of the plan, and which will require science leadership and management expertise to design and deliver.

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Thirdly, I will continue to bring to bear, on the NZ science policy context, lessons and analytics from within the Small Advanced Economies Initiative. Indeed, the SAEI constitutes a further priority area of focus for the coming year. I believe this initiative is well worth the resource investment made by MFAT and MBIE this year. Going forward, we will be considering the optimal institutional arrangement for the international secretariat (currently undertaken by my Office), as this is not necessarily linked to the CSA role.

Finally, I intend to make Risk and Resilience a central theme of my activities in the coming year. My office has become increasingly engaged in risk-related issues, both as a member of a Risk Policy community of practice among government agencies, and with my appointment to the Strategic Risk and Resilience panel. Yet, to date, we have not had the opportunity – nor indeed the time – to produce the type of statement on risk and resilience that I feel is required to promote more reflective and analytical societal and government approaches to risk.

A major issue to which this Office continues to draw attention is the very considerable rate of change in science systems globally. This change has many drivers including: the changed nature of the relationship between science and society; the increased utilitarian approach to science; the focus on 'impact' in peer review; the problems of scientific integrity and peer review; the unintended consequences of open access publishing and so forth. These issues are concerning my peers globally and in small science systems such as ours these tensions are amplified and become problematic at an early stage. I am engaged with OECD on discussions about these issues at a global level and they are reflected in part in the consultation regarding the draft NSSI. The science community itself has yet to fully appreciate some of these issues and their consequences in the New Zealand context.

I am grateful for the support of Cabinet, the CEs of Ministries, agencies and DPMC and for the advice of Mr Andrew Sweet of DPMC, Ms. Kristiann Allen, my Chief of staff (replacing Alan Beedle in 2013), Professor Stephen Goldson, my strategic advisor (part-time), Ms. Kate Harland, Project-Lead for the SAEI, Mr. Julian Tollestrup, Research and Policy Coordinator in my Office. I also thank the staff at MFAT and MBIE, and Ms. Marian McCay for their continued support.

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Appendix: related activities

In addition to the activities and roles outlined above, the PMCSA role has attracted a number of additional responsibilities, some of which are directly linked to the original terms of reference, while others reflect on the Office in a more lateral fashion. Taken together, all of these activities highlight the broad expectations on the role from multiple stakeholders.

Families Commission: I serve as a commissioner to the FC. While this is a separate appointment which is handled independently of the Office of the CSA, in my role as CSA role I have assisted in the development of its research unit SUPERU

Museum of New Zealand Te Papa, Board Member: This role is not formally linked to the Office of the CSA as the appointment is personal. That said, there is obvious synergy and important overlap in the promotion of science and technology education and the public's critical science literacy.

Defense Technology Advisory Board Member: This appointment is linked to the role of CSA.

OECD Innovation Advisory Board Member: While this appointment is made individually, it nonetheless reflects the international standing of the Office.

Global Research Alliance on Agricultural Greenhouse Gases: As CSA, I serve as the Chair of the scientific panel for this, NZ's international research fund.

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