

New Zealand Science Review

Vol 65 (2) 2008



Special Issue for the 2008 Election

Research, science and technology policies of the political parties

NZAS commentary on the political parties' RS&T policies



Official Journal of the New Zealand Association of Scientists

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Vol 65 (2) 2008

Official Journal of the New Zealand Association of Scientists
P O Box 1874, Wellington
www.nzas.rsnz.org

A forum for the exchange of views on science and science policy.

Editor: Allen Petrey
Production Editor: Geoff Gregory

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To produce this election issue of *New Zealand Science Review*, political parties registered for the general election were contacted and asked to provide their Research, Science and Technology policies. Council of the New Zealand Association of Scientists hopes that the policies presented here, their strengths, weaknesses, and omissions will be carefully considered by members and the wider science community. Members are encouraged to undertake dialogue with all parties to remedy any deficiencies both before and after the up-coming Election. An Association commentary on the parties' policies introduces this issue.

The Association's Council acknowledges the efforts of Mr Ross Moore in approaching the political parties for their RS&T policies. In some cases it was apparent that the policies were formalised only as a result of Ross' approach.

Instructions to Authors

New Zealand Science Review provides a forum for the discussion of science policy. It covers science and technology in their broadest sense and their impacts on society and the environment, both favourable and adverse. It also covers science education, science planning, and freedom of information. It is aimed at all scientists and decision makers, and the interested public. Readability and absence of jargon are essential.

Manuscripts on the above topics are welcome, two copies of which should be sent to:
The Editor
NZ Association of Scientists
P O Box 1874
Wellington

As well as full papers, short contributions, reports on new developments and conferences, and reviews of books, all in the general areas of interest of the journal, are invited. The journal also accepts reviews of a general nature and research reports.

Full manuscripts (with author's name removed) will be evaluated and authors will be sent copies of the reviewer's comments and a decision on publication. Manuscripts should not normally have appeared in print elsewhere but already published results discussed in the different, special context of the journal will be considered. They should preferably not exceed 2500 words.

To facilitate anonymous review, author's names on manuscripts and any acknowledgement of assistance should be on a detachable

cover page. Manuscripts should be accompanied by biographies of not more than 100 words on each author's personal history and current interests. Authors are also expected to supply a suitable passport-size photograph of themselves.

Manuscripts should be typed double-spaced with wide margins on one side of the page. Articles may be submitted in Word for PC, rich text format, or plain text, by e-mail, or on floppy disk or CD-R, but a hardcopy should also be sent so that fidelity may be confirmed. Diagrams and photographs should be on separate files (preferably eps, tif, jpg, all at 300 dpi), not embedded in the text.

All tables and illustrations should be numbered separately – Tables 1, 2, 3, 4, etc., and Figures 1, 2, 3, 4, etc. – and be referred to in the text. Footnotes should be eliminated as far as possible. Diagrams and photographs will be printed in black and white, so symbols should be readily distinguishable without colour, and hatching should be used rather than block shading.

References should preferably be cited by the author–date (Harvard) system as described in the Lincoln University Press *Write Edit Print: Style Manual for Aotearoa New Zealand* (1997), which is also used as the standard for other editorial conventions. This system entails citing each author's surname and the year of publication in the text and an alphabetical listing of all author's cited at the end. Alternative systems may be acceptable provided that they are used accurately and consistently.

New Zealand Association of Scientists: Commentary on the political parties' 2008 RS&T policies

Over many years, the New Zealand Association of Scientists (NZAS) has reported the disquiet of the research community over the way the Research, Science and Technology (RS&T) system is being run. We've noted the sources of this disquiet which include: a contract-driven high-compliance funding environment; increasingly fragmented funding sources and the increases in bureaucracy that went with this; the policy neglect of the health and environmental research sectors; the universities and Crown Research Institutes (CRIs) increasingly brought into conflict by the way the science system is being run; commercially oriented CRIs and the *ad hoc* funding of particular areas as problems arose. Of course, these are only symptoms of a deeper malaise. Analysis of the underlying causes and solutions to these problems are critical to the future health of the sector, but the answers may be difficult and even controversial.

As at 20 October 2008, we have received policies/statements from Labour, National, United Future, the Greens, the Māori Party, and New Zealand First. Readers are invited to refer to our website, www.VoteScience.org to check for any updates.

What are the basic qualities we will be looking for in the political parties' policies?

1. That each party has a policy that reflects its wish to govern or influence government across the whole RS&T portfolio

Clearly the **Labour Party** has such an all-encompassing policy, as it is running the RS&T system currently. The documents we have access to are a 'Science and Innovation Policy Statement'¹, released 17 October, and the Government's Agenda document 'From Strength to Strength'², which was released in July 2008. The first document mainly lists claimed achievements, while emphasising the government's commitment to the 'Fast Forward' fund³ and a 15 % tax credit for private sector R&D expenditure. The Labour-led Government has increased RS&T funding by 90% in dollar terms but unevenly across research sectors. Although improving, New Zealand's investment in RS&T is still well below the western world average: According to the Science and Innovation Policy Statement, public sector investment is about 75% and the private sector 33% of the western world average.

The Labour-led Government claims 75% increase in the total research and development workforce over the past decade. The 'Fast Forward' fund is projected to leverage matching private sector funding up to \$700m in the agricultural sector of the economy. A 15% tax credit⁴ introduced earlier this year for the private sector undertaking qualifying R&D includes loss making start-up companies not yet paying tax. The tax credit policy is projected to lead to 'foregone revenues' of \$330m per year in 2011/12.

The **National Party** appears to have a good overview of the RS&T system, although there is not much detailed mention of the university sector. They have noted things that seem to be going wrong with the RS&T system and have proposed some solutions. For example, they propose more secure funding for CRIs which they argue will make up about 14% of CRI's revenue in the next 3 years. This increase is to be funded by reversing the R&D tax credit policy of the Labour-led Government. They propose to achieve better flexibility and collaboration between CRIs and universities. The reasons offered for increasing stable funding for CRIs include the need to improve the employment environment to attract and retain quality staff, to promote collaboration between CRIs and universities, and to lessen the administrative burden of the current funding system. National argues that New Zealand has an 'extreme' level of contestability amongst developed countries. They propose to find ways to give greater support to independent research organisations that receive contract work through government funding. The present government's 'Fast Forward' fund will be wound up and the same quantum of money directed to three specific areas: reduction of greenhouse gas emissions from livestock; Vote RS&T primary sector and food research; and to research consortia for primary sector and food research. There is specific mention of boosting climate change research although this is limited almost exclusively to emissions-reducing technology in agriculture through the creation of a 'virtual centre', either university- or CRI-led. The establishment of a Prime Minister's prize that includes a multi-year grant to further research of the recipient is announced. Finally, the appointment of an adviser to the Prime Minister and Cabinet is proposed as a measure of the importance National attaches to what they call 'science at the heart of government'.

The science policies of the minor parties tend to reflect

¹ See page 35

² <http://www.morst.govt.nz/publications/a-z/g/govt-agenda/>

³ <http://www.maf.govt.nz/mafnet/new-zealand-fast-forward/index.htm>

⁴ <http://www.ird.govt.nz/rd-tax-credit/>

their special interests and do not indicate how they would adapt the whole RS&T system to meet their principles.

ACT and the **Progressive Party** have no specific RS&T policy.

United Future's policy, although brief, offers a broad view of the RS&T system, including attention being given to economic and environmental sustainability. This policy appears to be a direct response to the report⁵ of the Royal Society of New Zealand's National Science Panel, although exactly how these policies would be carried out is not addressed.

The **Green Party** has a detailed policy. It includes the principle of 'public good' research being directed at 'public good' outcomes. They would emphasise projects in multi-disciplinary environmental and social issues which aim to improve the quality of our lives and to 'sustain and replenish the web of life'. Although fundamental and applied science research would be publicly funded, private funds would have to be used to develop the resultant technologies. Emphasis would be put on 'appropriate technology', defined as that which helps us 'do more with less for longer'. Research for industry would have to take into account sustainability as a key criterion before funds would be made available. A change to funding mechanisms is advocated and includes a mix of base funding and contestable pools (the latter for 'blue skies'; industry research and for fellowships). Funding of researchers' salaries would be out of base funding as a mechanism for increasing security for scientists. The funding that sector-based RS&T will get from the public purse, on a rolling five-year basis, will be determined in consultation with science providers, those who make direct use of RS&T, and the community. Institutional arrangements are evaluated, and it is concluded that the CRI model, with a profit motive, is not appropriate to get the best from the science community.

New Zealand First's policy on RS&T includes doubt about the value of the present government's expenditure, and focuses entirely on research relating to the economy. They believe there needs to be a balance between genuine blue sky research and research that leads directly to economic advancement. They also believe that New Zealand should focus its limited research funds where it has competitive advantage and expanding export potential. They note the low (1.2% of GDP) total (government and private sector) research and development expenditure relative to the OECD average of 2.2%. New Zealand First is in favour of tax incentives for business, focusing the public good research funding on

innovation and increased export earnings, tertiary education scholarships for courses where skills are in short supply and retaining the best students. There are a number of other business related provisions.

Māori Party policy development is guided by their commitment to a set of nine kaupapa or values that arise from a Māori world view. As regards RS&T, four of these values are specifically identified: the value of rangatiratanga or including Māori in policy-development and decision-making for public research; mana whenua giving expression to the authority that local Māori have over their wellbeing, ancestral lands and resources; kaitiakitanga such that that any research, development and application of science or technology upholds the integrity of the natural environment; protection of whakapapa that sustains the network of ancestral links that give a Māori worldview meaning. The Māori Party indicates that upholding this value does not translate into a Māori-led ban on all blue-sky research. No detailed policies, as such, are presented but the four values offer guidance in terms of purpose and taking due caution.

2. That each party has paid attention to the increasing disquiet about the RS&T system amongst scientists

It appears that most parties (apart from New Zealand First and the Māori Party are aware of some of the concerns of researchers, although Labour has not attempted to evaluate the effects of the way it has run the science system. Labour appears to consider their record is defensible and speaks for itself.

3. That each party provides evidence that they understand the RS&T system's strengths and limitations

It is not clear that all parties have a comprehensive understanding of how the science system currently works and that they are aware of the problems they might inherit. National seems to have a good level of general awareness and apparent engagement with the sector. The Greens have a well thought out programme but may be unaware of the extent to which CRIs have become dependent on consultancy and non-public good work. Some CRIs are much larger than any government would be willing to fund in terms of salaries of all researchers. Also, the Green Party implies a significant realignment of industry-related CRIs, but they provide little insight into how they would manage changes from where the system is now to how they would like it to be configured and run. New Zealand First appears to be unaware that there are environmental and health sectors in the RS&T portfolio. Labour's statement makes no evaluation of the weaknesses of the RS&T system.

⁵ 'A Science Manifesto or plan for the recovery of New Zealand science', see http://www.royalsociety.org.nz/Site/About/Our_structure/advisory/nsp/default.aspx

4. That each party/coalition is sufficiently motivated to address fundamental problems in the RS&T system

The extent to which we trust a particular party to recognise and fix what is wrong, depends on their track record. The Labour Party does not acknowledge that there is anything fundamentally wrong outside the deficiency in public and private sector funding relative to the 'western world average'. Consequently, we cannot be sure that they would attempt to correct what NZAS considers to be other fundamental problems. National has carefully promised no extra funds other than those they can redirect from elsewhere in present Labour spending promises (opening the books has shown that little new money will be available for some considerable time). The Green and Māori Parties could have some influence over science policy, but since they have not elaborated how they would transition the system from one state to another, this may be limited. On the basis of policies provided, it appears the best we can expect, in these uncertain economic times, is an improvement in science strategy development and greater institutional efficiencies.

NZAS likens the science system to a large tree with the roots being the mechanism for taking up funding, the trunk representing science capability and, longer term, underpinning science, and the leafy branches as research outcomes. At the moment there is a tendency for the government to concentrate on their favourite research outcomes (leafy

branches) while neglecting the workforce/underpinning research, the impediments to the roots taking up sustenance (funding) efficiently, and the necessary integration of all these components to ensure a reasonable level of efficiency and return on overall investment. The underpinning programmes have languished often because they are deemed not to be 'new work', reflecting a mechanistic behaviour of the system in the absence of a strong, integrated science strategy that recognises the role of all parts of the system. Using this analogy, we remain concerned that the leaves and branches will wither if there continues to be neglect of the roots and trunk. NZAS will look for an integrated strategy and will judge any new management of New Zealand's RS&T system by the way the 'roots', 'trunk' and system integration issues are dealt.

We invite you to make up your own minds by reading the following contributions or following the links to the indicated documents. We also invite readers who are not members to join the NZAS and help us further develop our analyses of the science system as a basis for re-invigorating the research 'tree' in all its diverse aspects.

**Michael Berridge, Janet Bradford-Grieve, and
Ken Richardson**
for NZAS Council

Green's Research, Science and Technology Policy

Spokesperson: Jeanette Fitzsimons MP

Our Vision

For the Greens, the role of science is to improve the quality of our lives and to sustain and replenish the web of life, of which we are a part and on which our quality of life depends. It should aim to protect both the common good and the environment, be ethically based and emphasise the precautionary principle. Research and science are tools that should be used for developing our nation in sustainable ways. The nature of our economic and social development is closely linked to investment in research. We support endeavours to uncover new knowledge about the world. However, our knowledge needs to be of the whole system and reflect an understanding of the integrated nature of all things, not motivated by a desire to control individual parts. With such knowledge, much better decisions can be made about which path to follow and the consequences for people and the environment. Knowledge in this sense is a route to humility rather than power. Technology needs to fit people rather than forcing people to fit the technology. In other words, technology is our servant not our master. Our commitment to appropriate decision-making means we want to see more links between researchers and both the private and community sectors in proposing, assessing and utilising research. 'Experts on tap, not on top' is a phrase that reflects our view of the role of science in the community. Our aim is dialogue that empowers researchers to play a personally satisfying role in helping create a more sustainable and just society. We need to do much more to ensure that information becomes knowledge and that knowledge becomes wisdom. The results of all publicly funded research will become public property. We believe curiosity about the world is a valid reason for research, provided it is tempered by ethics. The community has a key role to play in deciding on ethical issues relating to research. In principle, we support ethically based legislation that will end practices such as vivisection, and place controls on the use of technologies that could lead to human cloning and 'designer babies'. We believe that education and empathy as well as legislation are ultimately needed to guarantee ethical research.

Specific policy points

1. Funding

Recent history has seen the funding of science research become highly competitive. Although this has had some benefits, it has also had a detrimental effect upon science, and the future ability of science and technology to contribute to sustainable development in Aotearoa New Zealand. Steps need to be taken to increase collaboration and decrease competition among researchers and to create a greater degree of certainty and security for scientists. The Greens advocate a change in the funding mechanism for research, science and technology (RS&T) as well as supporting a progressive increase in the level of funding for RS&T. We would work to implement the following changes to the current model of funding:

1. Split funding for 'public good' research and development between base and contestable pools, with the appropriate

balance between these pools being the subject of regular review. Base funding would be available only to public sector researchers. Funding for 'blue skies' research, fellowships and industry research would still be on a competitive basis

2. Fund salaries for researchers out of base funding to provide greater security.
 3. Determine how much funding RS&T will get from the public purse on a rolling five year basis, in consultation with science providers and those who make direct use of RS&T, and the community.
 4. Expand the range of time frames over which research can be funded to include both the very short term and the long term.
 5. Include peer review, client assessment, and/or independent audit in the funding allocation system.
 6. Emphasise multi-disciplinary and collaborative projects on complex environmental and social issues (such as soil degradation, violent behaviour, and urban sustainability).
 7. Direct public funding to support fundamental and applied science research while leveraging private funds to develop technologies based on this research.
 8. Introduce clear ethical investment guidelines for the venture capital funds recently initiated by Government.
- We also believe that local industry and business must raise their commitment to research in parallel with changes in the public sector. To this end, we would examine the best means to encourage an increase in private sector funding, especially from small and medium sized enterprises (SMEs). We will:
9. Identify the factors that affect R&D spending among similar businesses and assess how to raise investment by those businesses that invest less than the median amount on a sector by sector basis.
 10. Facilitate pooling the R&D funds of SMEs through clustered partnerships with research institutions.

2. Structures

We do not believe that the current management model for Crown Research Institutes (CRIs), which are now required to turn a profit, is the best. We need to develop models to get the best from the science community. We believe the certainty and security created by the changes in funding outlined above will go a long way towards enabling scientists to carry out and communicate about increasing amounts of needed research. We support universities and other competent science research providers being funded to conduct needed research, especially when it is linked to science education. We also support the idea of partnerships to develop applied technology. We are concerned at the extent to which public science is becoming private knowledge and would seek to redress this. To improve the structure of science research, the Greens advocate a new model for the structure of

the science community, developed in partnership with those affected. This new model will:

1. Provide a career for scientists no less secure than that for other similarly qualified professionals in the public sector.
2. Ensure there are options beside administration for a career path in science.
3. Have a less bureaucratic administration system coupled with oversight by an independent audit agency
4. Have a broadly-based performance appraisal methodology that recognises contributions of scientists to different sectors rather than just the number of papers published in peer-reviewed journals.
5. Encourage collaboration and collegiality among all researchers
6. Establish more links between researchers and the rest of society, so that research can be better focused on the needs voiced by the community and that the results of research are made more readily available.
7. Facilitate community groups, including the 'alternative' sectors in agriculture, building, etc., to identify what research would be helpful to them, and to do the necessary preparatory work to try to get such research ideas undertaken.
8. Facilitate the linking of local knowledge and wisdom with more traditional forms of research.
9. Encourage researchers in CRIs to divide their effort among different stakeholder groups — private, community, and government, while also allowing them to pursue ideas of their own.
10. Maintain university academic staff as active researchers, and provide opportunities for teaching staff in other tertiary institutions and the secondary and primary sectors to be involved in active research, through exchanges and similar programmes.
11. Allow independent researchers to access contestable science funding.
12. Ensure that all research is conducted within strict ethical guidelines and make the assessment of the ethics of research more open to public scrutiny.
13. Maintain core support facilities such as libraries, specimen collections, and other information resources.
14. Encourage innovation and the development of small scale appropriate technologies.
15. Allow viable research projects to run to completion after peer review or independent audit.
16. Have all the results of publicly funded research published and held in the public domain, with proceeds from patents, licensing, etc. being reinvested in the funding pool.

3. What research?

The Green Party believes that as a society we need to commit resources to both fundamental and applied research and that all such research should aim to contribute to sustainable develop-

ment. Research priorities must lead to greater understanding of the interconnections within the ecosystems on which we depend and the causes of social problems. They must also support the shift to sustainable systems of production and patterns of consumption, rather than just generating profit in the present. Research must be conducted to support innovation and new industries. This is part of our commitment to localisation and community economic development. Research priorities need to be developed in partnership with the community, industry and government. Major science and technology research priorities emerging from Green policies include:

1. Multi-disciplinary applied social research, which can then be applied in areas such as mental health and crime.
2. Environmental, technological, and social impacts on health and wellness, such as antibiotic resistance and other health issues.
3. Housing issues such as needs, materials, and safety.
4. Education issues especially regarding special-needs learning.
5. Environmental rehabilitation, mitigation and damage prevention.
6. Real market advantage research and non-GE biotechnology for adding value to primary products.
7. Organic primary production, including a strategic portfolio outline and reference group that is focused on organic production.
8. Energy efficiency and renewable energy.
9. Sustainable transportation, including public transport, reducing car dependence, and the impacts of transport technologies on health, social well-being, the environment and the economy.
10. Clean production, waste minimisation, waste utilisation, and overcoming barriers to implementing zero waste initiatives.
11. Soil sciences including erosion minimisation and other geological research.
12. Native terrestrial ecosystem functioning.
13. Pest control and eradication.
14. Endangered species and other conservation-related ecological research, including the role native species can play in highly managed areas, both urban and rural.
15. Indigenous production forestry.
16. Marine ecosystem functioning and fishing impact research.
17. Small-scale technologies for small scale businesses.
18. Better ways to work.
19. Weather, climate, and hydrological sciences.
20. Technological change impacts.
21. Real cost accounting, new methods of national accounting, and statistical methodology

4. Technology

At the heart of sustainable technology is the idea of ‘appropriate technology’ — technology that helps us work together more effectively and tread lightly on the earth. We strongly support a commitment to technology that enables us to do more with less for longer. The planned obsolescence of most current technology, such as consumer electronics, has to be challenged and changed. The Greens believe that all technological items must be designed and constructed with repairable, reusable and or recyclable parts and casings. The challenge for designers is to think about the entire life of their products and ideas from the start. There are too many examples of technologies creating problems that no one predicted. We believe that being able to do something doesn’t mean we should do it. Jacob Monod reflects the Greens’ perception when he says: ‘We as scientists are in danger of allowing our knowledge to outstrip our wisdom’. Science and technology must be driven by society and not carried out for their own sakes. To encourage development of appropriate, ethically acceptable technology, the Greens will work to:

1. Require Research for Industry, Technology New Zealand and other grant schemes to use contribution to sustainability as a key criterion in making funds available to support technology development.
2. Create an agency to make information about sustainable technologies available. EECA will be expanded, or other agencies developed, to promote adoption of technologies which contribute to sustainability.
3. Provide financial encouragement to adopt new technologies.
4. Support initiatives to improve broadband internet access in urban and rural areas.
5. Develop decentralised community computing centres to ensure that people from all socio-economic groups have affordable access to computing facilities and the internet.
6. Encourage the use of open source software to help reduce costs in this area for all sectors.
7. Create additional demands for sustainable technologies by making them available to developing nations as part of Aotearoa New Zealand’s overseas development assistance.
8. Advance agriculture and horticulture through careful selective breeding with no patenting of life forms.
9. Enable the public to exercise its right to determine the ethical boundaries of technology development.

The Greens see many potential benefits from the technologies derived from the science of genetics. We support the development of genetic technologies when they are:

10. Properly contained in a laboratory.
11. Subject to case by case approval, including ethical screening and a proper application of the precautionary principle.
12. Not applied to food production.

5. The Treaty and science

The Green Party opposes the creation of patents over life and the forced mixing of genetic material across species barriers. We respect Maori concepts of the sacred nature of mauri (the life force) and of whakapapa (ancestry or biological heritage) and believe that they provide relevant ethical guidelines for the conduct of science and biotechnology in New Zealand. The Green Party supports the development and study of traditional Maori knowledge within the public science system. Such work can only occur in partnership with local Maori, may involve new science structures and must ensure that intellectual property rights remain with Maori.

6. Science education

The Green Party is committed to integrated and holistic education. We support science education within the school system as an essential part of understanding the world. However, the way we do and teach science needs to change from a focus on the parts (reductionism) to a focus on the parts in the context of the whole (holistic science). Both are amenable to scientific method but only the latter is likely to enable us to develop our society in a sustainable way. It is important that scientific research is seen in a greater context. Science teachers need to be adequately prepared and keep in touch with new developments in science. To achieve these goals we would:

1. Require environmental education and ethics to be parts of all programmes of study, including science education.
2. Encourage integration of various fields of study.
3. Expand links between research scientists, technology developers and educational institutions to give more opportunities to primary and secondary school teachers to undertake research with researchers in universities, CRIs or private research establishments.
4. Expand efforts by research scientists and technology developers to engage with young minds through regular visits to schools.

Labour Party Science & Innovation Policy Statement

Introduction

These responses reflect the policies and actions of Labour in government. The Labour Party's policy for the next parliamentary term and beyond will be released shortly.

Research and Development in New Zealand is on the verge of a significant step-change. Our aim is to make sure New Zealand science is not only world class in terms of the excellence of our researchers, but also world class in terms of funding and status of scientists.

Labour believes that good science lies at the heart of a modern society and a modern economy. Good science, and innovative technology, contributes to increased economic productivity, better health, and a greater understanding of our environment and society as well as the advancement of scholarship and human knowledge.

Over the past nine years the profile of research, science and technology in New Zealand society has risen significantly. It is debated more, it is valued more and it has delivered more.

Over the next three years the pace will quicken markedly. Recent policy changes and new policies to be implemented post-election will combine to produce a further step-change in this arena.

Research and Development

In the last decade Research, Science and Technology funding has increased by 90%. Labour funded strong growth in basic sciences through the Marsden Fund (90%), Health Research (130%) and New Economy Research Fund (1999 – \$5m, to 2008 – \$73m). In addition, Labour established the Pre Seed Accelerator Fund, the Equity Investment Fund, the Seed Capital Investment Fund and the Venture Investment Fund, all designed to accelerate the commercial development of the fruits of research. Business incubators were established for the same reason.

Although improving, New Zealand's investment in RS&T is still well below the western world average. Specifically, public sector investment is at about 75% of the western world average, and private sector investment is at about 33% of the western world average (up from 25%, 9 years ago).

In the private sector, already announced policy and funding is likely to raise reported private sector R&D investment to about 69% of the western world average by 2011/12.

In the public sector, already announced funding is likely to raise public investment to 82% or 83% of the western world average by 2011/12.

A growing R&D workforce

In the last decade the number of students undertaking doctoral study has increased significantly, especially in the last 3 years, and has almost doubled since 1999. The total research and development workforce has increased from 9,500 to 16,500 in the 10 years to 2006. Immigration flows of scientists and engineers in and out of New Zealand have resulted in a net positive inflow since about 2002.

Labour introduced a range of new fellowships and scholarships, and increased others, including doubling the number of Fulbright Scholarships. In addition Labour has established the Centres of Research Excellence and the Performance Based Research Fund (\$236m per annum) for University based research.

New Zealand: Fast Forward

Labour has created the New Zealand: Fast Forward fund of \$700m, to be matched by private funding from the food and pastoral sectors to create a substantial step change in R&D, ranging from basic environmental research to pre-commercial development over the next 10–15 years. This is easily the largest single investment in R&D in New Zealand's history.

New Zealand: Fast Forward is likely to deliver major change in the following areas over the 10–15 years during which the programme will run:

- Basic environmental research into the pastoral sector, to reduce the environmental effects of climate change gases (50% of which come from our pastoral sector), to improve water quality, to reduce chemical use further, etc.
- Advanced food research and development to create new food products, food ingredients, functional foods, nutraceuticals and the like
- Attention to various workforce and skills gaps that exist or are emerging in our economy throughout the value chain, perhaps with some early concentration on food technologists and food engineers.
- Growing more globally competitive firms in New Zealand who enjoy a degree of influence in many markets, thus joining existing companies of that ilk such as Fonterra, Zespri, PGG Wrightson, or Sealords.

The 15% R&D tax credit

Private sector investment in R&D is, by international standards, low.

Earlier this year the 15% tax credit was introduced. It has a relatively simple design, is applicable to all qualifying R&D expended by the private sector and is available even to loss making start-up companies which are not yet paying tax. Economic modelling confirms that that will result in a large increase in private sector investment in R&D.

The Inland Revenue Department (IRD) has calculated the 'forgone revenue' from the tax credit at \$330 million per annum in 2011/2012. This means that reported R&D activity in the private sector will double over the next three years (acknowledging that some of the reported increase will be due to earlier underreporting by some firms).

A relatively high proportion of privately funded R&D is carried out in our Crown Research Institutes and in our Universities. Their contract research activity will therefore rise significantly.

Māori Party's Research, Science and Technology Policy

Spokesperson: The Te Ururoa Flavell MP

In essence, Māori Party policy is guided by our commitment to a set of nine kaupapa or values that arise from a Māori worldview, for the benefit of the entire nation. Consistency with these values underpins the our policy position on a range of issues and portfolios. With regards to research, science and technology, four values are particularly instructive.

The first is the value of rangatiratanga: that tangata whenua be empowered as a full partner to Te Tiriti o Waitangi, including in relation to policies and decisions for public research. It is essential that Māori be critically involved in determining research priorities and directions in relation to the development and application of science and technology, and particularly so in relation to matauranga Māori.

Concerns that the research interests of Māori are given low priority and inadequate funding need to be addressed with some urgency. What is needed is a commitment from public research bodies to a Te Tiriti o Waitangi-based allocation model for determining both research priorities and funding. We also promote an increase in public research funds to accommodate the increase in Māori research that is anticipated from an invigorated Tiriti relationship. In academia, we are advocating for a redesign of the Performance Based Research Fund (PBRF) to better recognise the contribution of Māori academic researchers.

As a corollary of the commitment to rangatiratanga, research in particular geographical areas needs to happen in relationship

with local hapū and iwi. This is the value of mana whenua; giving expression to the authority that local Māori have over their wellbeing, ancestral lands and resources, including their traditional knowledge and customary practices.

The third value is that of kaitiakitanga, that any research, development and application of matauranga Māori, science or technology uphold the integrity of the natural environment, and that these be developed specifically for aiding environmental care, protection, rejuvenation, and sustainability. For instance, the Māori Party highlights the urgent need for research into the development of sustainable, renewable energy sources such as wind, solar and wave; and research into improving the quality of the water in our rivers, lakes and waterways. Another critical area for research is sustainable land use.

For the Māori Party, the fourth value of particular relevance to research, science and technology is the protection of whakapapa; the importance of sustaining the network of ancestral links that give a Māori worldview meaning and vitality. Upholding this value does not, as has been widely misrepresented, translate into a Māori-led ban on all blue-sky research. It does, however, offer guidance in terms of clarity of purpose and of heeding due caution. It also points to the necessity of dialogue with and consensus from tangata whenua and mana whenua.

National's Research, Science and Technology Policy

Spokesperson: Dr Paul Hutchinson MP

New Zealand's future economic performance depends to a great extent on having a skilled, technologically confident workforce, and a society which can generate and use new ideas and new processes.

In a world increasingly dominated by the products and processes of science and technology – in business, education, health, in the environment, and in many other areas – the ability to understand these processes, to adopt new technologies, and to push the boundaries of scientific knowledge is crucially important. These abilities are fundamental to increasing productivity and driving economic growth.

In the past, the growth in New Zealand's economic base, particularly in primary production, has been on the back of world-class science – most of it publicly funded – and an ability by New Zealand producers to use new technologies.

Publicly funded science

New Zealand stands out among other developed countries for the high proportion of total research and development (R&D) funded by the government, and also for our highly competitive funding system. Most public funding of R&D goes to universities and Crown Research Institutes (CRIs), through a variety of mechanisms and a number of different pots of funding.

Publicly funded R&D has several important effects on the economy. It:

- Adds to the stock of scientific and technological knowledge which companies draw on.
- Helps to train and retain the scientists, technologists, engineers, and researchers that companies use to absorb scientific and technological knowledge, and to handle complex technology.
- Underpins our ability to make the most of our natural resources, maintain effective biosecurity, and protect our environment.
- Maintains a stock of resident experts who contribute to national problem solving.
- Results in an improved ability to understand and adapt overseas research to New Zealand purposes.
- Creates new industries and generates intellectual property that can be commercialised.
- Better informs government policy making.

With this in mind, National believes that New Zealand must have a strong base of publicly funded science, and correspondingly strong universities and CRIs.

Labour's inconsistent record

In recent years, Labour's economic transformation terminology has promoted a short-term 'instant gratification' approach to scientific research. This has done the sector a disservice and does not recognise the myriad ways that science and technology

diffuse into the economy. There has been a series of seemingly unco-ordinated policy decisions and a haphazard strategic focus. In rapid succession, the sector has veered from the 'knowledge economy', to the 'growth and innovation framework', to 'economic transformation' and most recently to 'sustainable transformation'.

There is little consistency in policies. After previously rejecting an R&D tax credit, one was introduced in the 2007 Budget. The recently announced Fast Forward Fund is not consistent with any other funding mechanism in the sector and will create a parallel bureaucracy. Labour has also cemented-in a funding system where scientists seem to spend more time applying for funding and reporting on it than actually doing science. There are significant issues with capability and retention in the science sector.

National's long-term goals

National's long-term goals for the publicly funded R&D sector are to ensure that:

- Excellent science is performed in stable, high-quality institutions.
- Publicly funded research is responsive to the needs of the economy, in both the long term and the short term.
- Resources are directed towards areas of importance for New Zealand.
- Bureaucracy and compliance costs are minimised.
- There are clear performance and accountability measures within the system.

Summary of policies

In accordance with our long-term goals, National will:

- Discontinue the R&D tax credit and use \$315 million of the savings to boost funding for research and science in the next three years.
- Set up a new secure funding allocation for Crown Research Institutes.
 - Establish an international centre of research dedicated to the reduction of on-farm greenhouse gas emissions.
 - Boost funding within Vote RS&T for primary sector and food research.
 - Boost funding for research consortia in the primary sector.
- Introduce annual Prime Minister's Prizes for science.
- Create the role within government of the Prime Minister's Science Adviser.
- Reduce compliance costs and unnecessary bureaucracy within the science system.

- There is a good supply of research-trained scientists, engineers, and technologists into the workforce.
- Organisations the government owns are properly resourced and financially viable.
- There is an increase in the profile and prestige of science in New Zealand.

1. Discontinuing the R&D tax credit and funding more science

If the government wants more R&D performed in New Zealand, it has two broad options:

1. Give grants or tax credits to private sector firms to encourage them to undertake additional R&D.
2. Fund additional R&D directly, from public and/or private institutions.

In terms of option 1, the Labour Government gives grants to firms through Technology New Zealand and gives them a tax credit for the R&D they perform.

This tax credit was introduced on 1 April 2008, and is designed to provide an incentive for firms to undertake or commission additional R&D. It offers a credit of 15% of eligible expenditure on research and development, subject to certain requirements.

Treasury estimates that the cost of the R&D tax credit will rise from \$208 million this year to \$332 million in 2011/12. This is substantially more than the estimated cost when the policy was first announced.

This means that in the current year, more than 20% of the government's total spending on R&D is option 1 spending – that is, it is made up of the R&D tax credit and grants to private-sector firms.

National has concerns about this balance of spending because there is a real risk that the R&D tax credit will be ineffectual.

First, the tax credit subsidises a great deal of R&D that would have happened anyway, whether or not there was a tax credit.

NOTE

This policy was originally released on 25 September. At that time, we announced that the R&D tax credit would be reduced from a 15% credit to a 10% credit, for the reasons outlined above.

We said that the reason for not abolishing the R&D tax credit altogether was that most OECD countries have such tax credits, and they are accepted as part of the international business landscape.

However, given the persistent operating deficits revealed in the pre-election fiscal update (PREFU), these tax credits have become a 'nice-to-have' item that is simply not affordable any more. National will, therefore, discontinue the R&D tax credits altogether, from 1 April 2009.

This change, which was announced in National's Fiscal Policy two days after the PREFU, is the only amendment to the policy that was announced on 25 September.

Therefore, much of the money paid out as a tax credit will effect no change in the level of R&D whatsoever.

Secondly, it is not clear how much new R&D expenditure the tax credit will encourage that wouldn't otherwise have occurred. The credit will almost certainly result in a rise in reported expenditure on R&D, but in part this will be because there is now an incentive to get expenditure classified as R&D for the purposes of claiming the credit. Accounting firms have been active in advising firms on how to report their expenses so as to claim a credit. So the real increase in R&D as a result of the tax credit cannot be easily measured, and may be quite small.

Given these concerns, National believes the appropriate action is to discontinue the R&D tax credit and spend more on directly purchasing R&D (option 2).

National will:

Discontinue the R&D tax credit from 1 April 2009 and use a third of the savings to directly fund research.

- Redirect \$315 million of the savings into the direct funding of science and research. This will go into research at both universities and CRIs, by being split 50:50 between:
 - An increase to the Performance Based Research Fund (PBRF), Marsden Fund, and Health Research Council (HRC) funding .
 - The creation of a new secure funding allocation system for CRIs (see discussion below for more details).

Table 1 - Proposed Funding Changes from the R&D Tax Credit

	2009/10 (\$m)	2010/11 (\$m)	2011/12 (\$m)
Savings from R&D tax credit	90	105	120
Applied to:			
Increase in PBRF, HRC, and Marsden Fund	45	52.5	60
Secure funding for CRIs	45	52.5	60

How much funding will go to each of the PBRF, HRC, and Marsden Fund will be determined after discussion with the sector.

This increase of \$315 million over three years is a considerable boost in funding to directly purchase science.

2. Secure funding for CRIs

Currently, the only secure funding that CRIs receive is from the CRI Capability Fund. However, the Capability Fund is small and is more like transitional funding to give CRIs the capability to bid for more contestable funding at a later stage, not a mainstream source of funding. Almost all other sources of funding for CRIs are contestable.

New Zealand is extreme among developed countries in having a system weighted so heavily towards contestable funding.

In a recent review of New Zealand's innovation system, the OECD made these comments about CRIs:

A more strategic role for the CRIs will require shifting their funding from the current very high proportion of contestable funding towards more core funding. The system whereby CRIs compete for a large percentage of their funding has been very successful in encouraging them to undertake projects which meet the expressed needs of users but is probably less effective for encouraging them to undertake longer-term projects which try to anticipate those needs. It has also encouraged an entrepreneurial attitude towards creating new business opportunities based on their applied research. However there is a distinct risk that continuation of the current funding system will make them more and more like profit-seeking businesses, and that they may neglect the maintenance and development of the core stock of applied scientific and technological knowledge on which their role in helping businesses and society must ultimately rest. The system also creates uncertainty among the researchers themselves and makes co-operation between research institutes more difficult.

National wants to provide a greater degree of secure funding for our CRIs. There are three main reasons for our thinking.

First, secure funding can make up an important part of a portfolio of funding approaches, which includes:

- Research that is driven by the end-users, ie industry in most cases.
- Research which is driven by the government's strategic priorities.
- Research which is driven by researchers themselves.

Secure funding would ensure that this third category is present among the research undertaken by CRIs. It would mean that at least some decisions about what scientific research will be undertaken will happen within the CRIs, which are in a good position to take a longer-term, experienced view of research needs in their sector. It would mean that CRIs will be better able to drive their own agreed strategic direction.

Currently, the only significant publicly funded research which is driven by the researchers themselves happens in universities, which are funded in part by the PBRF.

The second reason to encourage secure funding is that it would help to provide a stable employment environment in order to attract and retain quality staff. In a highly contestable system, new projects may not be available to provide continuing employment, and CRIs risk losing their on-going capability to do research.

Finally, more secure funding would promote and enable collaboration between CRIs and universities, and help lessen the administrative burden that goes along with the current management-intensive funding system.

National will set up a new secure funding allocation for CRIs, made up initially from:

- Half the savings from discontinuing the R&D tax credit.
- The funding currently in the CRI Capability Fund.

Table 2 shows what this will mean in terms of secure funding over the next three years. Secure funding is likely to make up around 14% of total CRI revenue in these years.

Table 2. Secure Funding for CRIs.

	2009/10 (\$m)	2010/11 (\$m)	2011/12 (\$m)
Savings from R&D tax credit	45.0	52.5	60.0
CRI Capability Fund	50.6	50.6	50.6
Total Secure Funding for CRIs	95.6	103.1	110.6

National will treat the secure funding allocation as a core part of the CRIs' revenue stream. We will fund CRIs on a longer-term basis to develop and maintain a nationally significant research capacity in their core areas of science.

This does not mean that CRIs will be able to do what they like with their secure funding. CRIs will have to agree with the government on the broad uses of this funding, and research will still have to be undertaken with an eye to an ultimate end use or application.

Moreover, CRIs will have to be accountable for their use of this funding. They will be subject to international peer review to ensure that secure funding is adding to the quality of the science they undertake. To this end, National will investigate how quality can be measured similarly in universities and in CRIs to help create a more seamless system.

Well-performing CRIs will attract further increases in funding. As the secure funding allocation evolves, therefore, it will introduce a degree of contestability between CRIs at an institutional level, just as there is currently between universities in terms of funding from the PBRF. This will reward excellence in research.

Where appropriate, National will encourage collaboration across CRIs to ensure New Zealand's capability is used to maximum benefit.

We will also consider introducing the following measures to achieve greater flexibility and collaboration between CRIs and universities:

- An intellectual property policy for CRIs that rewards individual inventors as well as optimising outcomes for New Zealand.
- Encouraging mechanisms that favour co-supervision of postgraduate students between CRIs and universities.
- Support mechanisms that enable senior scientists to hold joint appointments and/or move between universities, CRIs, and industry for periods of time without losing status and career opportunities when they return.

In addition to CRIs, there are a number of independent research organisations such as the Cawthron Institute and the Malaghan Institute that are subject to similar uncertainties of funding because they rely on highly contestable government funding or private appeals.

National will investigate how independent research institutes that do significant contract work through government funding might receive a similar type of funding to the secure funding

for CRI's, provided they fulfil accountability and performance criteria.

3. Primary sector research

Labour has recently established the 'Fast Forward Fund'. This is a capital allocation from the government of \$700 million which will be invested in financial securities. The returns and capital of the fund will be spent on R&D in the pastoral and food sectors. Research projects will be those relating to the chain from 'farm to fork', that is, agricultural, horticultural, and seafood industries that produce foods and food products.

The fund will be used up over a 10- to 15-year period, and Labour's aim is for spending to be matched dollar for dollar by industry groups. Several of the major corporate players in the sector have said they are prepared to participate.

Initial estimates from the Minister of Agriculture were that the following sums were indicative of what the fund would pay out in its first few (calendar) years:

2008	\$20 million
2009	\$30 million
2010	\$40 million
2011	\$65 million

To our knowledge, no firm commitments have been entered into, however, and it is unlikely that any significant money will be spent in 2008. Progress has been limited to establishing the governance structure for the fund. It will have an independent board, with its own secretariat. There will be a number of strategic investment programmes, each with its own steering group, comprising government and industry parties. Each programme will be developed through the negotiation of a number of inter-related and mutually supporting projects between investors (government and industry) and providers.

National welcomes the size of the increase in spending for primary sector R&D. The primary sector remains at the heart of the New Zealand economy, and its strong and sustained productivity growth has always rested on a world-class scientific base.

However, we have a number of concerns with the Fast Forward approach, which has not been well thought-out.

First, the use of an investment fund, rather than an annual operating appropriation, makes little sense. There are no similar funds in other areas of public spending, let alone in the R&D sector. A fund requires fund managers, which adds a layer of extra costs, and the amount available each year depends on international financial trends. The capital allocated to the fund is essentially borrowed from the Crown at an interest rate of around 6% a year, because that \$700 million could have been used to pay down government debt. The use of a capital fund is in fact a gimmick, the purpose of which is to highlight the total amount of money being spent from a stream of research funding.

Second, the scope of Fast Forward is limited to R&D, which is ultimately food-related. Therefore, a research field such as pasture improvement would be eligible for funding from Fast

Forward, because it is in the chain from farm to fork. On the other hand, anything to do with wool or hides or wood, for example, would not be, even though these are important primary industries.

Third, Fast Forward risks simply replacing funding that the private sector would otherwise have undertaken on its own account. One of the principles of the fund is that investments will be additional to, and not displace, current private spending on R&D, but this is impossible to ensure. And what is 'current private spending' 10 or 15 years down the track?

Finally, the fund will not use any of the existing processes used in the sector for setting priorities, funding, and monitoring – it will operate quite separately from the rest of the Government's R&D infrastructure. This risks creating separate layers of bureaucracy and a lack of co-ordination between different parts of the R&D system. A significant proportion of all public R&D is already related to primary production, including R&D done in conjunction with the private sector, so it is not as if the Government needed to start from scratch.

The initial Cabinet paper for Fast Forward recognised this risk. It specified that one of the fund's principles was 'to minimise transaction costs by using existing investment management and institutional structures as far as possible (such as research consortia)' and recognises that 'using existing mechanisms as much as possible should help to maintain efficiency, cost-effectiveness and coordination of the system'.

However, this principle is not being followed. As described above, Fast Forward is creating an entirely parallel process, and the only link to existing mechanisms is the presence of people from government agencies on the programme steering groups.

National's policy is to continue with the same quantum of new funding but to spend it in a way that ensures better research outcomes.

We will also talk to the establishment group about what they have learned from Fast Forward that can usefully be carried over. Where R&D initiatives have already been established through Fast Forward, consideration will be given to continuing them.

Table 3 shows what this new allocation of funding will mean over the next three years and compares it with the Minister of Agriculture's estimate of funding under the Fast Forward Fund.

National will wind up the Fast Forward Fund and:

- Establish an international centre for research dedicated to the reduction of on-farm greenhouse gas emissions, and fund it at \$20 million a year (see the discussion below).
- Boost funding within Vote RS&T for primary sector and food research by \$25 million a year.
- Boost funding for research consortia in the primary and food sectors by \$25 million a year.

Table 3. National's New Funding for Primary Sector Research.

	2009/10 (\$m)	2010/11 (\$m)	2011/12 (\$m)
National's policy			
Establish and maintain an International Centre for Research	20	20	20
Boost funding for Primary sector and food research	25	25	25
Boost funding for research consortia in the primary and food sectors	25	25	25
Total increase in funding for primary sector	70	70	70
<i>This compares with:</i>			
Minister's estimate of funding for the Fast Forward Fund	30	40	65

4. Boosting climate change research

National is committed to honouring New Zealand's obligations under the Kyoto Protocol and reducing this country's greenhouse gas emissions by 50% by 2050.

New Zealand is unique among developed countries and Kyoto signatories in that nearly half of our greenhouse gas emissions come from agriculture. For example, in the European Union, emissions from agriculture comprise well under 10% of total emissions.

Our agricultural emissions represent a large liability under Kyoto. However, we believe that the cost of lowering agricultural emissions should not be borne by the primary sector alone and should not rely simply on reducing stock numbers.

National is committed to boosting research and development into emissions-reducing technology, especially in agriculture. Around the world, countries will focus their research dollars on the main causes of their own emissions, and so should we. We have an opportunity to reduce our own emissions, and therefore our potential liabilities, and to export our home-grown technology to other parts of the world. This has the potential to be our unique contribution to the global effort to reduce greenhouse gas emissions.

The most important, and most difficult, area of research will be into methane from deer, sheep, and cattle. New Zealand already has significant experience in ruminant microbiology. Even so, there are only a small number of scientists and technicians, around 25, working in this area.

National will establish an international centre of research dedicated to the reduction of on-farm greenhouse gas emissions. This centre will include a focus on conducting scientific research into methods for reducing methane emissions from ruminants, and better understanding of ruminant animal biophysiology, growth, and reproduction.

This centre would be a 'virtual centre' – a multiinstitutional research network with scientists and researchers from Crown and private sector agencies working together on a commonly agreed work programme.

We are flexible as to the precise structure of this centre, but would likely appoint one CRI or university as the lead agency, with other universities, CRIs, and industry groups closely involved. We would also aim to establish links with research institutions in other countries which have established strengths in pastoral farming science.

The centre would build on existing government private sector research initiatives in this area, specifically the Pastoral Greenhouse Gas Consortium.

The exact cost of such a centre will depend on decisions about its structure. However, National envisages providing capital establishment funding and ongoing operational funding of up to \$20 million a year.

5. Prime Minister's prize for research

New Zealand scientists are doing high-quality research in many disciplines, but too often their achievements receive little public acclaim. National is committed to raising the profile and prestige of science in New Zealand.

National will introduce a range of annual Prime Minister's Prizes for Science, and make a total of \$1 million available each year to fund them. Prizes will include:

- A supreme science prize.
- A prize for the young scientist of the year.
- Other prizes could include a prize for a mid career or emerging scientist, a teacher of science, and a science media communicator.

This approach is in line with recent initiatives in Australia, Canada, and Norway, which have helped raise the profile of science in these countries.

The supreme science prize will include a generous multi-year grant for the recipient to further their research. Other prizes will also come with financial rewards.

The scientific community already awards a number of prizes and they are highly sought after. They have prestige within the scientific community and carry the names of some of our greatest scientists.

However, these prizes come with little or no financial rewards, and winning them has not yet translated into wider public recognition of scientists. For example, the Rutherford Medal is the most prestigious scientific award in the country, instituted by the New Zealand Royal Society at the request of the Government. It is named after, and has been won by, New Zealand's most eminent scientists but it attracts limited public attention.

Wherever possible, the Prime Minister's Prizes would dovetail with existing prizes to:

- Retain the heritage of the existing prizes.
- Ensure structures and processes are not duplicated.
- Protect the independent selection of recipients.

6. Science at the heart of government

We believe there is an important role for science at the heart of government.

National will create a new role of Prime Minister's Science Adviser. This role will be filled by a scientist seconded for a time from the sector. He or she would be an adviser, not just to the Prime Minister, but to all members of the Cabinet.

The Prime Minister's Science Adviser will:

- Provide input to ministers on science and research policy.
- Guide ministers on the range of policy options available to them in the light of the scientific understanding of any policy issue, not just science policy.
- Maintain extensive networks with scientists so as to be alert to up-to-date issues and discoveries and know where to go for the best advice.
- Be a channel of contact between the government and science community, and one which is independent of any consideration of government funding.

This position would not usurp the role of the Minister of Research, Science and Technology in taking across-government leadership of RS&T policy.

7. Reducing compliance costs and ensuring relevance

In the first six months of office, National will investigate options for reducing compliance costs and unnecessary bureaucracy within the science system. In particular, we will work towards:

- Reducing product clutter and the proliferation of funding pots.
- Developing accountability mechanisms with the lowest compliance necessary for the size and risk of the project.
- Developing best practice mechanisms for funding proposals and contracts, including common templates for equivalent information, common contract formats, and common signoff requirements across the different public funding agencies.
- Developing a nationally co-ordinated calendar of the RS&T funding cycle that spreads the activities of all participants predictably through the year.
- Avoiding one-off or ad hoc funding processes for small sums of funding out of the normal cycle.
- Using common terminology and definitions across the sector.
- Reducing duplication in administrative functions across funders.
- Facilitating common electronic transfers of information rather than paper-based transfers.

National will also expect public funders and providers to demonstrate that projects are relevant to the interests of New Zealand.

National will reduce compliance costs and unnecessary bureaucracy within the science system.

New Zealand First's Research, Science and Technology Policy

Spokesperson: Dail Jones MP

With such a large proportion of the funding of research in New Zealand coming from the government (with over \$300m going directly to Crown Research Institutes (CRIs)), clearly the state must play a key role in leading Research and Development (R&D). However, we are unsure how much benefit is derived from this investment.

The key to a successful research and development policy is the maintenance of balance between genuine blue sky research and research activity which will directly lead to economic advancement. New Zealand must focus its limited research funds where it has a competitive advantage, primarily in expanding export potential.

Total R&D expenditure in New Zealand has hovered under 1.2% of GDP (compared with an over 2.2% average for the OECD) and further incentives and investment are required.

New Zealand First will:

- provide tax incentives for businesses to engage in research and development leading to innovation and export growth;
- focus Public Good Research funding more tightly on innovation and on increased export earnings;

- increase the proportion of tertiary tuition subsidies for specific courses to increase the number of appropriately qualified graduates (e.g. science and technology);
- introduce further scholarships (especially at post-graduate level) to ensure that we keep our best students and provide for research and development expertise;
- expand publicly-funded topo-culture research through rural New Zealand;
- assist New Zealand companies in developing new technology and facilitate technology transfer;
- provide improved lower cost intellectual property protection for New Zealand-based innovators;
- provide and encourage venture capital sources for New Zealand innovations; and,
- provide assistance in the marketing of new or innovative products.

United Future's Research, Science and Technology Policy

Spokesperson: Peter Dunne MP

It is important that New Zealand maintains a strong (RST) sector, now more than ever. With significant issues such as climate change facing our energy, primary and export sectors, it is imperative that scientific research is given the required long-term certainty of funding to successfully meet those challenges. UnitedFuture believes that one of the key elements to New Zealand's ongoing economic and environmental sustainability will be our ability to maintain a skilled and experienced RST workforce.

It is United Future policy to:

- Establish an independent Office of the Chief Scientist or Science Council to directly advise the Prime Minister and Cabinet, and be responsible for ensuring that science is drawn on appropriately in all phases of government decision-making.
- Integrate the operations of MRST and FRST into the Office of the Chief Scientist as part of the drive to simplify funding mechanisms, with a particular emphasis on improving the effectiveness and coherence of the system.
- Develop a National Science Strategy that identifies New Zealand's science needs and directions, resource and capability needs and international trends in the medium and long terms.
- Increase government funding of Research, Science & Technology (RST) to at least the OECD average.
- Investigate ways to increase the amount of privately-funded RST. Government policy is to reduce public funding of research that benefits industry, assuming that producers will contribute directly, but it can be difficult to attract industry funding for projects with a longer-term horizon from industry, as they often seek more immediate benefits in productivity.
- United Future initiated business tax cuts in the 2008/09 year that will encourage greater long-term investment by companies in research and development.
- Simplify the different funding mechanisms for research. These have been allowed to develop in an ad hoc manner over a period of time to fill perceived gaps, but the result is a system that has become inefficient and difficult to navigate. Ensure there is no duplication of research.
- Review the scope and operation of the current range of CRIs, with particular regard to the balance between public good activity and commercial applications, and their relationship with other institutions such as universities.
- Increase the attractiveness of research as a career option and science PhD's by reducing the costs of study, through Universal student allowances, reducing course fees for those fields facing skills shortages, introducing bonding schemes that reduce student loan debt for those who are qualified in such fields in return for a continuous period of work in New Zealand, and establishing a system of research scholarships between tertiary providers and the private sector.
- Encourage national research specialisation, bearing in mind New Zealand's size, as well as specialisation by institution. Focus to be on the following areas for the medium to long term:
 - Agriculture and horticultural efficiency
 - Biotechnology
 - Nanotechnology
 - Energy efficiency and substitution
 - Aquaculture
 - Bio-security and environmental degradation
- Support the Performance Based Research Fund, but seek greater efficiency in the collection, collation and review of performance indicators.
- Provide opportunities for researchers to gain knowledge of business practices and commercial applications.
- Reinstate research excellence as an important funding criterion by external peer review.
- Establish a national awards event for science and technology excellence to celebrate achievement and raise the profile of science and technology in New Zealand.