

Cabinet Economic Growth and Infrastructure Committee

Medium Term Economic Growth Agenda: Science and Innovation Initiatives

PROPOSAL

1. This paper sets out the contribution of research, science and technology (RS&T), in particular business research and development (R&D) in supporting the Medium Term Economic Growth Agenda (EGA). The paper also presents and seeks agreement for an integrated package of business R&D and technology transfer initiatives to complement and enhance our existing support to firms.

EXECUTIVE SUMMARY

2. Innovation is one of the Government's six pillars of economic growth. Now is the ideal opportunity for the Government to improve innovation's contribution to New Zealand's economic performance. The initiatives I am outlining in this paper are part of a wider suite of science and innovation initiatives. This includes complementary work to set clearer priorities for the government's investments in research, science and technology (RS&T); simplifying the science funding system; and the recommendations of the Crown Research Institute (CRI) Taskforce.
3. Business R&D support to firms is a major component of the proposed package. It is aimed at accelerating the growth of the high value manufacturing and services sectors in New Zealand as part of the EGA.
4. In this paper I focus on achieving two main objectives that will lead to improved economic performance:
 - a. Increasing New Zealand firms' own investment in R&D supporting increased productivity; and
 - b. Maximising the economic returns of the Government's investment in RS&T, especially in CRIs and universities.
5. I am also proposing a science and innovation budget package to support the EGA. My package consists of: a proposed new technology development grant for firms; a technology transfer voucher to improve linkages and technology transfer between firms and research organisations; a centre of excellence in technology transfer; and other technology transfer initiatives. I describe these in more detail below.

BACKGROUND

6. In the December 2009 Cabinet paper 'Medium Term Economic Growth Agenda: Cross Cutting and Sectoral Action Plan' it was agreed that I with the Minister of Finance and Minister for Economic Development would report back to Cabinet Economic Growth and Infrastructure Committee by 28 February 2010 on the full range of innovation and science system changes.
7. At the Economic Growth and Infrastructure Committee on 16th December 2009 a paper was also presented on restructuring Vote RS&T (EGI Min (09) 28/9). That paper noted that the recommendations arising from the CRI taskforce and Business R&D will be reported to Cabinet by 28 February.
8. I respond in full to the Business R&D component of EGI Min (09) 28/9, and in part to the report back requirements of Cab Min (09) 45/8 in so far as they relate to changes in the system of relevance to Business R&D and technology transfer. Note also that the CRI Taskforce Cabinet paper responds in more detail to the innovation and science system changes with respect to CRIs.

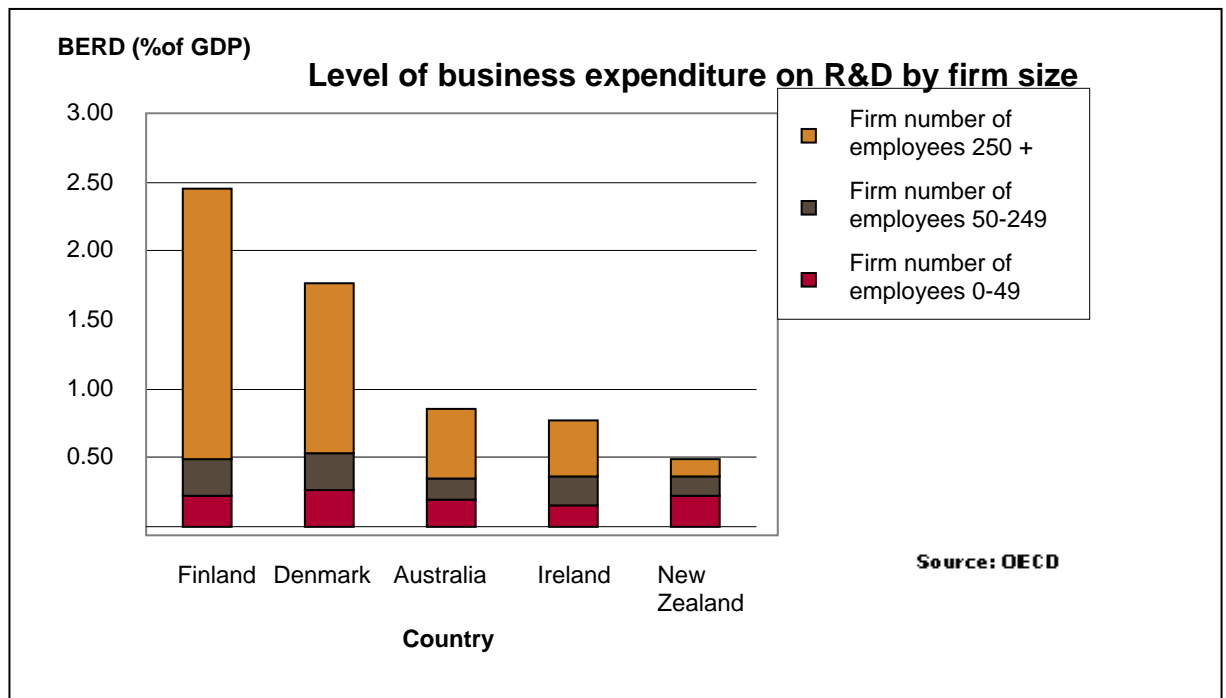
COMMENT

9. New Zealand is a small, open and trade-dependent economy. It is distant from markets, is natural resource based, and lacks large, internationalised firms. New Zealand faces rising competition from low cost producers in Latin America and elsewhere. New Zealand must compete more through knowledge and technology to escape our geographical and resource constraints, to underpin new entrepreneurship, and to lift the productivity and international competitiveness of our existing resource-based industries.
10. R&D is therefore critical to achieving the EGA goals as it underpins innovation and productivity growth, business diversification and enhanced international competitiveness.
11. Business R&D also leads to wider spill-over benefits, such as new ideas that are widely adopted and skilled people who move into other businesses or start their own. For example, Tait Electronics helped create a wider Christchurch electronics industry, while R&D undertaken largely in Fisher and Paykel Appliances led to Fisher and Paykel Healthcare. R&D such as plant breeding created the kiwifruit industry and has made our dairy industry a world leader. It also helped firms such as Adept and Gallaghers to compete in agribusiness markets and to diversify into new markets such as medical engineering, security and fuel systems.
12. There is a strong correlation between increasing business expenditure on R&D and economic growth¹. Business Expenditure on Research and Development

¹ A recent OECD study has shown that an increase of 0.1 percentage point in BERD intensity ultimately raises real output per capita by approximately 1.2%

(BERD) in New Zealand is low, although it is growing strongly in our small firms. Our large firms are under investing in R&D by international comparisons (see diagram 1 below). This is due in large part to the structure of our economy. If these levels are to rise there will need to be a greater number of firms that are R&D intensive, which will involve developing firms in areas such as high-value manufacturing and service sectors. Furthermore, we have few large firms that are R&D intensive.

Diagram 1



13. In order to meet the ambitious growth targets of the EGA we need to create a step change in the performance of our firms. Business as usual will not be sufficient. The government has set goals of increasing exports from the current level of 30% GDP to 40% GDP, and to achieve income parity with Australia by 2025.
14. New Zealand requires a rapid and sustained increase in productivity of New Zealand firms. This productivity growth will be underpinned by increasing the R&D intensity of our firms.
15. Firms, however, under invest in R&D. This is due to a number of reasons including the risky nature of this type of investment and the fact that they are unable to capture all the benefits of the research themselves. To meet the EGA targets New Zealand needs to grow more technology intensive firms. It is an important role for government to help minimise the risks and stimulate investment in business R&D.

16. R&D schemes generally fall within a range from highly non-discretionary (in which the Government does not exercise discretion over the project and the firm chooses what it does), such as a tax credit, to highly discretionary grants such as TechNZ (in which the funder agrees the project).
17. I am aware that officials prefer a combination of both discretionary and non-discretionary support. The mix ensures complementary objectives, allowing firms to fund both high stretch research and more in house development work. International evidence shows that a mix of both contributes best to economic growth. Both are also needed to place us on a level playing field globally. However, officials have recognised that given the current fiscal constraints a broad based non-discretionary scheme is not viable.

Supporting business R&D

18. I believe that new initiatives are required targeted towards:
 - a. Our R&D, technology intensive firms (those firms that invest a significant proportion of their revenue on R&D activities); and
 - b. Our medium to large firms (50+ employees) with limited R&D capability, who can grow their business through the adaption and adoption of new technology.
19. By targeting these firms we will have a positive impact on our levels of business expenditure on R&D, specifically addressing the areas where we are underperforming.
20. The Technology New Zealand programme (TechNZ) currently provides support for business R&D. TechNZ is a grant programme that supports both high risk research projects and capability development within firms. It is available to all firms and is managed by the Foundation for Research, Science and Technology (The Foundation), with an annual appropriation of around \$47M.
21. Over the past few months my officials have carried out some limited consultation with the private sector. This has included: workshops with groups of firms; discussions with Business New Zealand and individual firms; and through the Capitalising on Research Action Group. This consultation has been used in considering how best to support business R&D.

Technology Development Grant

22. To enhance the support we provide to firms I am proposing the introduction of a technology development grant. The grant would provide support to R&D, technology intensive firms to support a broad range of R&D activities that the firm undertakes. The grant would complement support currently available through TechNZ. This would be available to firms that justify a more hands off approach to grant approval, where there is opportunity for more rapid returns

from R&D investment. A key consideration in developing this scheme has been the need to strike the right balance between managing fiscal uncertainty to the Crown and providing firms with greater transparency and control.

23. In our consultation with firms, they indicated their preference for a scheme that presents the lowest level of bureaucracy possible. In particular they are looking for: multi year approval for a package of research and development work; the need to minimise bureaucratic delays; and the ability to maintain a market driven approach (i.e. firms know more than a government agency about customer and market needs).
24. In weighing the views of firms with the needs of Government I am proposing the technology development grant will have the following features:
 - a. Entry to the scheme will be both rule and judgement based.
 - b. The full set of eligibility criteria is still to be developed. However, it will include R&D intensity to ensure we are targeting our high technology firms (such as software and games developers, medical device producers, etc.) These criteria will be publicly available.
 - c. In addition to the eligibility criteria, final decisions on eligibility will be made by the approving body (The Foundation). This judgement will include assessing the firms' research programme. Including an element of judgement into the selection process reduces fiscal risk for the Crown and minimises the opportunity for legal dispute around a set of rules.
 - d. However, levels of bureaucracy will be kept to a minimum, with quick turn around approving firm entry into the programme.
 - e. It is expected that the firms meeting the eligibility criteria will already have a well established track record in research and development.
25. Officials will be invited to report back to Ministers on the final design of the scheme by Budget 2010 so it can be implemented early in the new financial year.

Technology Transfer

26. In order to maximise the economic returns of Government's investment in RS&T, New Zealand needs to improve the transfer of knowledge and technology from our publicly funded research organisations into our firms. Whilst I recognise that there are already significant levels of technology transfer occurring between our firms and research organisations, New Zealand, along with most other countries, continues to strive to increase and capitalise on these exchanges.

Technology Transfer Voucher

27. I propose the introduction of a Voucher to support and enhance linkages between firms and research organisations to improve technology transfer. This initiative

will complement both TechNZ and the proposed new technology development grant.

28. The technology transfer voucher will also complement recommendations from the CRI Taskforce that CRI's should increase their focus on technology transfer to their relevant sectors and stakeholders. The voucher will provide them, along with other research organisations, a direct incentive and mechanism to increase their engagement with firms.
29. Technology transfer vouchers would be issued with face values from \$100,000 with the potential to rise up to \$1M, although it is anticipated most will be in the \$100,000 – \$200,000 range. The \$1M voucher would add significant promotional value in marketing the scheme. They will be allocated to firms who can grow their business through the adaption and adoption of new technology. With matched funding required they will clearly be targeted at our medium to larger firms. The voucher will place the purchasing power in the hands of the firm and will motivate research organisations to actively seek private sector partners. I propose establishing a two year pilot programme to test out this initiative. A comprehensive evaluation of the programme will be designed before the scheme is implemented. This will allow the collection of the data required to assess whether the programme has been effective and offers value for money.
30. The Foundation will accredit research organisations to be part of the scheme, and will manage both the promotion and administration. They will also manage payments against the voucher and undertake audits. However, for the vouchers to succeed a number of factors will be important:
 - (a) The firm must identify the problem and agree a research solution with a research organisation.
 - (b) Early and on going engagement between the firm and the research organisation is essential.
 - (c) The allocation process must be short (up to 10 weeks) and not be too resource intensive for the firm.
 - (d) The firm will own the intellectual property that arises from the work.

Centre (centres) of Excellence in Technology Transfer

31. Another initiative in this area that I am keen to progress is a centre (or centres) of excellence in technology transfer. Each university and Crown Research Institute has its own commercialisation office, achieving various levels of success. However, many are too small to have the internal capabilities and links to venture capital and firms to undertake the task successfully.
32. I am proposing that officials explore how public research organisation can develop a national network providing support and training to research

organisation commercialisation offices. There may also be a need to aggregate their technology transfer activities into fewer, more specialised and capable centres. Auckland University UniServices and Waikato University's WaikatoLink are already involved in approaches for doing this. This initiative closely aligns with the Prime Minister's Chief Science Advisor's proposed Hub and Spoke model.

33. The Government's role would be to facilitate the development of these centres. The cost of doing so is likely to be small. I have asked officials to provide further advice prior to budget 2010 announcements with a view to implementation during the year.

Other Technology Transfer Initiatives

34. In addition to a technology transfer voucher and the centre (centres) of excellence, I have asked officials to propose other technology transfer initiatives that can be developed and launched throughout the year. The aim of these initiatives is to develop the capabilities and infrastructure in the public RS&T system to better undertake knowledge and technology transfer. They will be developed alongside the CRI Task Force recommendations that are implemented and will include:

[Information deleted in order to maintain the current constitutional conventions protecting the confidentiality of advice tendered by ministers and officials]

35. Officials will report back to me on progress of these initiatives by September 2010.

FISCAL IMPLICATIONS

36. Additional money will required to fund the initiatives outlined in this paper. It has been indicated that the following will be required to fund the business R&D and technology transfer package.

	2010/11	2011/12	2012/13	2013/14
	\$m	\$m	\$m	\$m
Funding required for business R&D / technology transfer initiatives	31.5	58	73	73
Technology development grant	22.5	45	60	60
Technology transfer voucher	5	5	5	5
Centre of excellence in technology transfer	2	3	3	3
Technology transfer initiatives contingency	2	5	5	5
<i>Other RS&T initiatives infrastructure, top talent, Global Alliance and FINNZ</i>	18.5	17	22	27

37. It is anticipated that funding will come from the Prime Ministers rolling maul and reprioritisation from Vote RS&T and potentially other votes.

	2010/11	2011/12	2012/13	2013/14
	\$m	\$m	\$m	\$m
New from rolling maul	30	50	70	75
Reprioritised (Vote RS&T and potentially other votes)	20	25	25	25
TOTAL FUNDING	50	75	95	100

CONSULTATION

38. Departments and agencies consulted in the preparation of this paper are: the Treasury; the Ministry of Economic Development; the Department of Prime Minister and Cabinet and the Foundation for Research, Science and Technology.

LEGISLATIVE IMPLICATIONS

39. There are no legislative implications associated with this paper.

REGULATORY IMPACT AND BUSINESS COMPLIANCE COST STATEMENT

40. No regulatory impact statement has been prepared for this paper.

GENDER IMPLICATIONS

41. There are no gender implications from the proposed changes.

PUBLICITY

42. It is anticipated that these proposals will receive publicity through the Budget 2010 process and subsequently as new initiatives are launched.

HUMAN RIGHTS

43. There are no human rights issues arising out of the proposals in this paper

RECOMMENDATIONS

44. It is recommended that the Committee:

1. **Note** that the Minister of Finance, the Minister for Economic Development, and the Minister of Research, Science and Technology were requested to report back to EGI by 28th February 2010 on the full range of innovation and science system changes (CAB Min (09) 45/8 refers).
2. **Note** that the Minister of Research, Science and Technology was required to report on the CRI Taskforce and business R&D recommendations by 28 February 2010 (EGI Min (09) 28/9 refers).
3. **Note** that officials have developed proposals for a new business R&D initiative (a technology development grant), a new technology voucher, a centre (or centres) of excellence in technology transfer and other technology transfer initiatives.
4. **Note** in recent engagement, firms have indicated that their preference for a scheme that presents the lowest level of bureaucracy possible, that will include multi year approvals.
5. **Agree** in principle to a package that includes funding for:
 - (a) Retaining Technology New Zealand to support both high risk research and capability development within firms
 - (b) A new technology development grant that will support our high technology, R&D intensive firms to undertake broad programmes of research and development
 - (c) A two year pilot for a new technology transfer voucher that will enhance linkages and technology transfer between our firms and research organisations
 - (d) A Centre (centres) of excellence in technology transfer to aggregate the technology transfer activities of our public research organisations
 - (e) A range of other technology transfer initiatives.
6. **Agree** that the Minister of Research, Science and Technology in consultation with the Minister of Finance and the Minister of Economic Development be mandated to approve the operational details of the new initiatives prior to budget announcements.
7. **Note** the final details of the science and innovation package, including business R&D and technology transfer initiatives, will be agreed between Prime Minister, the Minister of Finance and the Minister of Research, Science and Technology and funded through the Budget 2010 process.

8. **Agree** that the majority of the science and innovation package will support business R&D and technology transfer initiatives.
9. **Note** the indicative business R&D and technology transfer allocations as shown in the table below.

	2010/11	2011/12	2012/13	2013/14
	\$m	\$m	\$m	\$m
Funding required for business R&D / technology transfer initiatives	31.5	58	73	73
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Centre of excellence in technology transfer	2	3	3	3
Technology transfer initiatives contingency	2	5	5	5

10. **Note** the Crown Research Institute taskforce report will be coming to you in a separate paper.
11. **Note** the report will indicate a change in emphasis for the Crown Research Institute roles to support increased technology transfer to firms.

Hon Dr Wayne Mapp

Minister of Research, Science and Technology

Date: