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2025 Taskforce  
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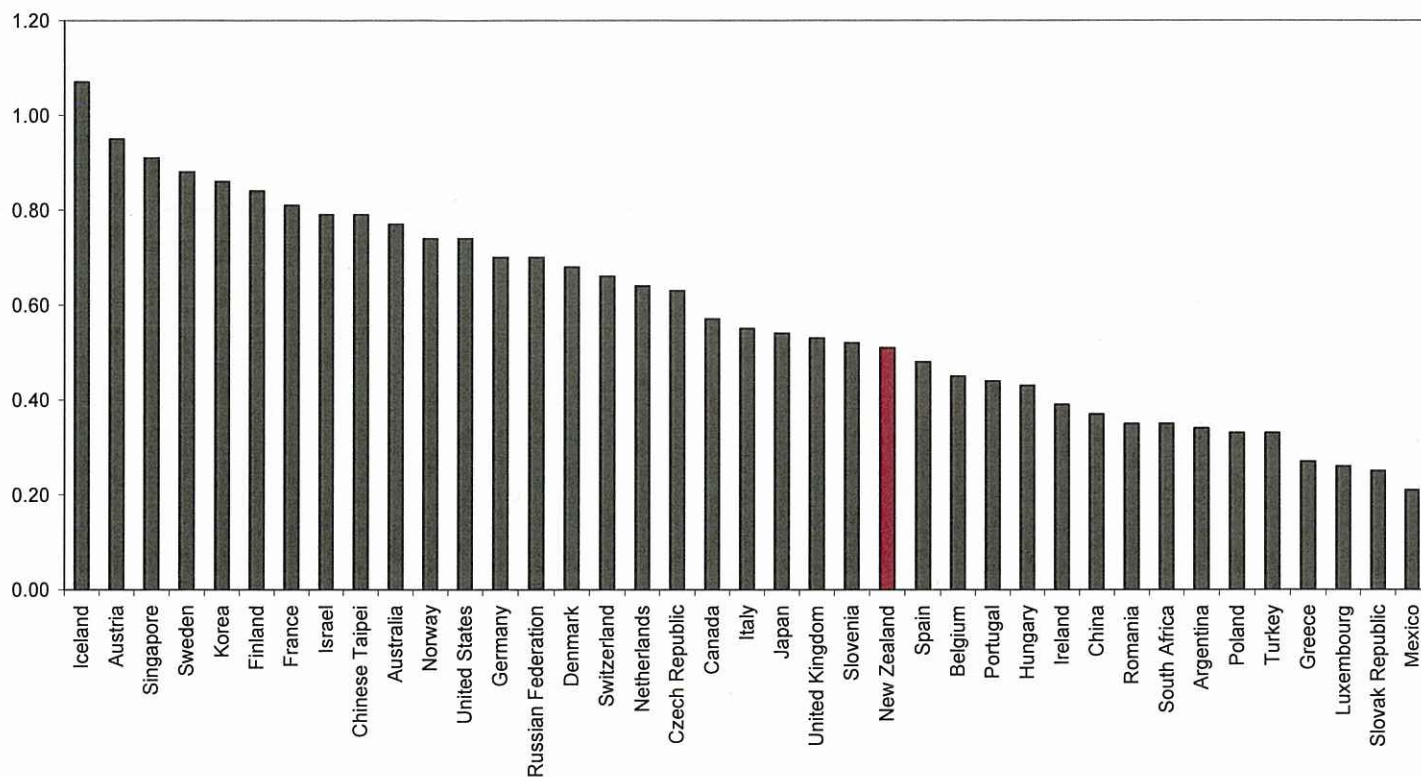
Dear Dr Brash

### 2025 Taskforce report

Thank you for inviting MoRST to contribute to your second report. Your question was *“Was our first report correct to downplay the significance of further government-funded research and development in helping to close the income gap?”* Your report stated that the Taskforce was “unconvinced that there is a compelling case for more government spending on research and development”.

There is international and domestic evidence available to support the link between government investment in R&D and economic growth. In the context of increased Australian public investment in R&D, it is important to recognise trends of increasing investments in R&D by other countries. New Zealand needs to continue increasing R&D investments in order to raise New Zealand’s relative international competitiveness and thereby to help close the income. The chart below illustrates the higher level of government investment in research and development in Australia than New Zealand.

Government Financed GERD as a Percentage of GDP for OECD and selected countries, latest figures



**International evidence:**

Private and social returns to investment in R&D are high and yet private sector firms tend to under-invest in R&D. It is well accepted that the reason for this underinvestment in R&D is because each firm cannot appropriate all the benefits from its investment. This explains a role for government in investing in R&D to provide benefits for society.

The Australian Productivity Commission<sup>1</sup> cite a number of international studies showing empirical evidence of the links between investment in R&D and economic growth. Estimates typically show that a 10% increase in a nation’s gross investment in R&D is associated with an increase in multifactor productivity of about 1.0%<sup>2</sup>.

Business investment in R&D is supported with public investment in R&D in many countries, including New Zealand, and so some of the impacts of business investment in R&D are attributable to public investment in R&D also.

The Australian Productivity Commission notes the often cited studies of Guellec and van Pottelsberghe de la Potterie (2001, 2004) that find that, in the long-run, a nation’s multifactor productivity increases by 1.7% for a 10% increase in public investment in R&D.

<sup>1</sup> Australian Productivity Commission (2007) “Public Support for Science and Innovation” Table 4.5, p. 129, 135, Research Report, Productivity Commission, Canberra, Australia.

<sup>2</sup> Refer for example Bassinni and Scarpetta (2001) cited.

The Australian Productivity Commission<sup>3</sup> cite more recent studies by Khan and Luintel (2005, 2006) that show an increase of 2.1% in a nation's multifactor productivity is associated with a 10% increase in public investment in R&D.

The OECD Innovation Strategy 2010<sup>4</sup> explains the connection between innovation and long-term economic growth. It discusses evidence that confirms these links. It concludes that all governments must understand the importance of innovation and develop policies to strengthen efforts for innovation and outcomes from it.

The OECD<sup>5</sup> notes that innovation that drives economic growth requires public and private investment in the infrastructure and networks that support innovation, as well as in R&D and other intangibles, and governments play an important role in fostering private as well as public investment in innovation.

The OECD further notes<sup>6</sup> that the public research system plays many roles in innovation systems including education, skill development, problem solving, creation and diffusion of knowledge, development of new instrumentation and storage and transmission of knowledge.

The OECD notes that the public research system:

- performs much "blue sky" science or basic research and undertakes activities that support innovation.
- has been the source of significant scientific and technological breakthroughs that have become major innovations.
- shapes a region's capacity to innovate, as its institutions act as a magnet for high-technology firms or the research and development facilities of multinational enterprises.

#### **Australian Government Productivity Commission evidence:**

The Australian Productivity Commission reports<sup>7</sup> a number of case studies suggesting *"publicly funded research has produced positive benefits through a large range of mechanisms including the introduction of new crop varieties and farming techniques; improvements to the productivity of cattle through selective breeding; cost-saving for large Australian industrial operations; and through decreased maintenance costs for public infrastructure. Benefits were also expected from research into preventative health;*

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<sup>3</sup> Australian Productivity Commission (2007) "Public Support for Science and Innovation" Research Report, Productivity Commission, Canberra, Australia at p135.

<sup>4</sup> OECD (2010) "The OECD Innovation Strategy" p. 19-21, Box 1.3, OECD Paris, France

<sup>5</sup> Ibid at p. 125

<sup>6</sup> Ibid.

<sup>7</sup> Australian Productivity Commission (2007) "Public Support for Science and Innovation" Tables 1.2-1.11, Research Report, Productivity Commission, Canberra, Australia

*improved water management; improved fisheries management, aluminium, magnesium and titanium production; and cost-savings from the automation of large mining operations”.*

The 75 individual benefit cost analysis case studies showed an average benefit cost ratio of 12.4. *“But such studies are subject to biases because of the mix of ex ante and ex post studies, selection biases and deficient assumptions. The bias is likely to be upward because of the exclusion of unsuccessful projects”.*

In addition to this, the Australian Productivity Commission concluded:

- *There are a number of examples of public research projects that were able to accelerate the introduction of new technologies with possible net social benefits.*

### **New Zealand Evidence**

The OECD assessment of New Zealand innovation policy<sup>8</sup> found that in New Zealand the public research institutions have a special influence on the production of R&D for economic growth. The Review said that compared to most OECD countries, the New Zealand innovation system is characterised by both a larger share of publicly funded organisations in total R&D and the dominance of public laboratories in publicly funded research. This suggests that public investment in R&D is additionally important for helping to provide the essential attributes for economic growth (such as enabling technology diffusion) of large research-intensive firms as well as providing for essential R&D.

**Recent New Zealand Case studies** support conclusions that public investments in R&D result in net benefits to the economy:

1. Analysis was conducted on a selection of research programmes representative of research funded through Research for Industry between 2000 and 2008. Such research programmes are understood to support long-term technology platforms that support industrial development in the long-term. Five programmes (which received an average annual investment of approximately \$25 million) were analysed. This found<sup>9</sup> :
  - Increases in Real Gross National Disposable Income of between 2.0 and 2.5 for every dollar of public money invested in R&D for most programmes, with one programme recording returns of 7.1 per dollar invested.
  - Investments in pastoral research produced some of the largest gains in gross domestic product.

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<sup>8</sup> OECD (2007) OECD Reviews of Innovation New Zealand p.117, OECD Paris, France

<sup>9</sup> Economic Impact of Industry Research (MoRST & Infometrics, 2010 [not yet published])

2. A study of 28 firms found that, over a period of five years, \$1 invested under Technology New Zealand schemes generated \$12.9 of increased sales.
3. Investment in Golden Kiwifruit research resulted in<sup>10</sup>
  - o Exports of ZESPRI™ GOLD Kiwifruit (2003) of \$160 million (compared with \$20.5 million invested in R&D).
  - o Exports (1996–2003) of \$344 million.
4. Investment in Seismic Isolation Technology research resulted in<sup>11</sup>
  - o Export income (over the past decade) of around \$100 million per annum that is estimated to increase New Zealand's GDP by \$228 million.
5. Investment in Wool Drying Technology research<sup>12</sup> resulted in:
  - o A contribution of \$855 million to the competitiveness of annual sawn timber exports.
  - o Other impacts, including significant productivity improvements in wood processing.
6. Investment in domestic agricultural R&D – much of which is publicly funded – according to one estimate has an annual rate of return of about 17%<sup>13</sup>.

I believe that the above examples demonstrate large benefit to cost ratios from public investments in R&D and that there is a case for more government investments in R&D.

MoRST would appreciate the opportunity to have a discussion with the 2025 Taskforce and answer questions that may arise from reading our submission.

Once again, thank you for the opportunity to provide comments on this important area of government investments.

Yours sincerely



Lesley Middleton  
Acting Chief Executive

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10 Growing futures # 1 Zespri Gold, 2002

11 Economic Impact of Seismic Isolation Technology, BERL, 2004

12 Economic Impact of Wool Drying technology, BERL, 2004

13 The Role of R&D in Productivity Growth: The Case of Agriculture in New Zealand: 1927 to 2001 NZ Treasury working paper 06/01