MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
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Briefing for the Incoming Minister of Research, Science and Innovation

October 2017

This document has been proactively released. Redactions made to the document have been made consistent with provisions of the Official Information Act 1982.

New Zealand Government

Contents

1. Portfolio Overview

Purpose

1. This briefing provides you with information about the Research, Science and Innovation portfolio. Further briefings will be provided focussing on your priority areas.

Research, science and innovation are key to growing a diverse and internationally connected economy

2. Research and science is the methodical generation and accumulation of knowledge. Innovation is the activity of finding new or improved ways of doing something.

3. Science expands our knowledge base and helps us understand the world. It helps us answer particular questions and solve specific social, cultural, environmental, and economic challenges. Science and research-led teaching are central to education and growing a highly skilled workforce, and science gives us the evidence to make better decisions as a society. As a key ingredient for innovation, science plays an important role in economic growth. It also helps us understand our place in the world, and explore, conserve and advance our unique heritage of mātauranga Māori.

4. Innovation is creating new or improved products, processes, and services. It is through innovation that firms become more competitive, efficient, and gain and maintain market share.

5. Domestically and internationally, innovation policy has tended to focus on R&D undertaken by firms. But innovation also includes marketing methods, organisational change and business model innovation, and not just in firms. The public and not-for-profit sectors can and should innovate successfully.

6. Innovation allows us to do more as a country while using the same or fewer resources. As we improve the way we do things and create more valuable products and services, our economy becomes more competitive, more productive, and grows as a result. Innovation also enables us to respond to social and environmental challenges, become more resilient to natural and economic shocks, and improve people's well-being.

Introduction to the research, science and innovation system

7. The research, science and innovation system includes the interactions that occur in the production, sharing, and use of new knowledge. It includes businesses, researchers, research institutions, entrepreneurs, and local and central government, the relationships between them, and the relationships with these actors in other countries.

Government

8. Government has many levers to influence the environment for science and innovation, which includes regulation, competition and inputs, such as skills and capital. These levers differ by industry, market and sector. Within the science and innovation system, the Government has the following roles:

- **A direction-setter**. Government's involvement in the research, science and innovation system creates significant influence over the direction of the system.
- **An owner** of parts of the system, most notably Crown Research Institutes (CRIs) and Callaghan Innovation.
- **A funder** of research, science and innovation activities and infrastructure.
- **A regulator.** Government does not directly regulate science and innovation activities, but its regulations have a strong impact on the system. For example, the granting of intellectual property rights creates incentives to innovate.
- **A provider of information**. Government has a role in collecting and sharing information to support good decision-making.
- **A coordinator and connector.** Government can play an active role in coordinating the activity or various entities across the research, science and innovation system, including connecting these with international research institutions and R&D intensive firms.

Other government and non-government actors

9. There is a range of other government and non-government actors that contribute to, and support the research, science and innovation system, and benefit from the positive impacts from science including social and environmental agencies, local government and the general public.

Businesses

10. Businesses are investors in, producers of, and users of R&D. They undertake 50 per cent of the R&D in New Zealand by expenditure[1]. Businesses create value from innovation by developing new products, processes and services, and by undertaking, adopting and commercialising knowledge and research. Government supports businesses to innovate by providing funding and information. More researchers in New Zealand work in business than in research institutions.

Research institutions

11. Research institutions undertake R&D and related activities. The main research institutions in New Zealand are the eight universities, seven CRIs, and a number of independent research organisations.

Māori

12. Māori have a special place in the research system as users and producers of science, as well as custodians, users and producers of our unique body of mātauranga Māori. The Vision Mātauranga policy, adopted in 2005, reflects this, and provides the framework to unlock the innovation potential of Māori knowledge, resources and people.

Infrastructure

13. An effective science and innovation system relies on strong infrastructure. Research facilities, collections and databases, digital connectivity infrastructure and technologies are needed for

[1] Business expenditure measures the R&D undertaken by business, regardless of the source of funding.

people to undertake R&D and innovate. Government invests, or co-invests with other countries, in some large-scale technological infrastructure.

Collaboration

14. Collaboration and networks across firms, institutions and people increases innovation intensity. Physical proximity and clustering of firms, people, researchers and ideas is important. Most of this occurs naturally, but innovation hubs and precincts are a mechanism to enhance clustering.

International partnerships

15. Partnerships between our research institutions and businesses and international research entities and R&D intensive firms bring new knowledge, ideas, people, technology and sources of funding into New Zealand, and increase access to offshore networks, capabilities, infrastructure and markets.

The current state of the research, science and innovation system

16. New Zealand's science and innovation system can be understood through a range of domestic and international surveys. MBIE published the first annual Science and Innovation System Report in December 2016, which sets out what we know about the performance of New Zealand's system. A copy is attached to this briefing.

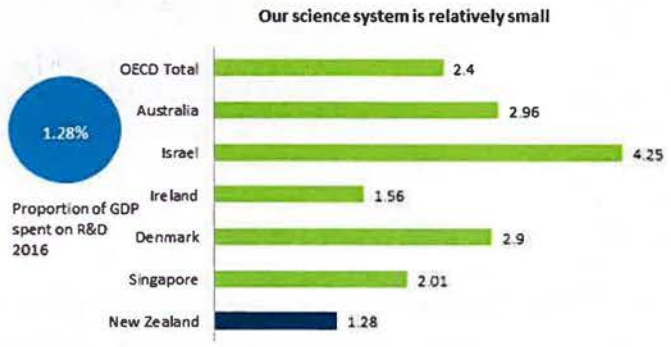
Research and science system

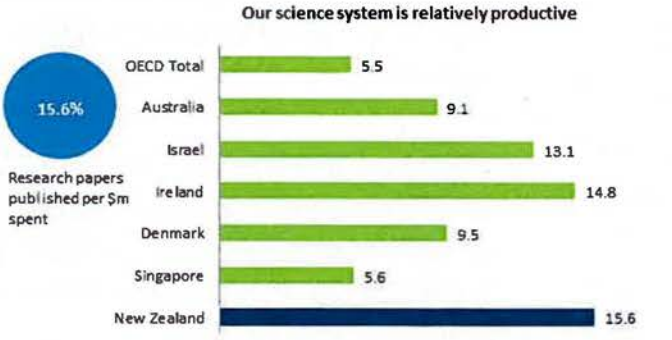
17. New Zealand's research sector is relatively small for the size of the economy, but very efficient in terms of the amount of science output per dollar. Our scientists work hard and well.

18. New Zealand produces more standout 'very good' research than the OECD average, but less than most other small advanced economies, suggesting there is still opportunity to improve.

19. New Zealand has strong international science links – international collaboration is seen in over 50 per cent of research papers, and this is growing. Top collaborating partner countries are the US, Australia and the UK.

20. We are successfully attracting science professionals[2] from overseas as permanent or long-term immigrants; we gain around 2,500 per year more than we lose. Highly internationally mobile researchers make a particularly high-quality contribution to New Zealand's research outputs.





[2] This includes people in a science, engineering or IT-related occupation.

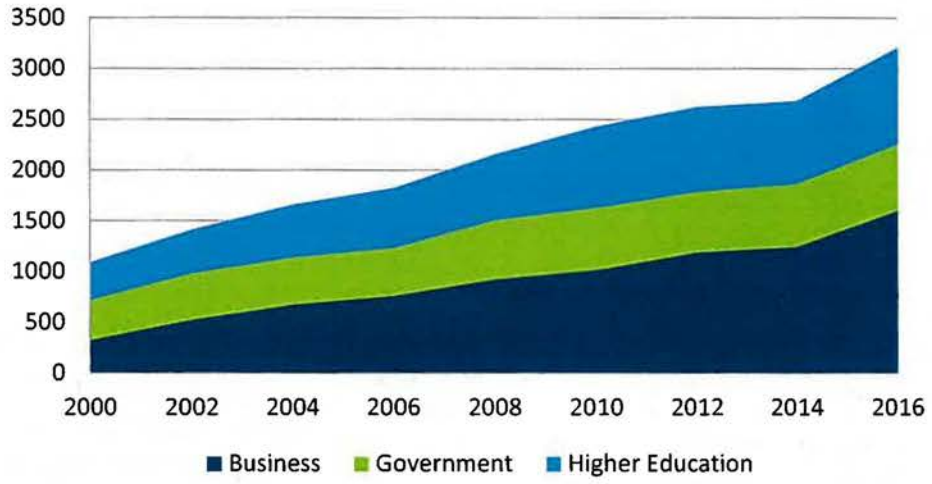
Innovation system

21. Business expenditure on R&D is the major proxy for levels of innovation in New Zealand. At 0.64 per cent of GDP it is lower than the OECD average of 1.64 per cent. From 2010 to 2016, business expenditure grew 65 per cent.

22. Total expenditure on R&D across the economy has grown significantly in real terms since 2000 (by over 120 per cent), driven by expenditure in the business sector. However New Zealand has low levels of R&D in comparison to other countries, spending just 1.28 per cent of GDP, compared to the OECD average of 2.4 per cent.

23. The biennial Business Operations Survey[3] identifies firms that have innovated over the last two years. In 2015, 18.1 per cent of businesses reported some form of sales from innovation, up from 17 per cent in 2013. Firms identified availability of management resources and access to the right skills as some of the greatest barriers to being able to innovate.

R&D growth by sector, nominal NZ$m



24. Less than 5 per cent of research in higher education is funded by business, which is around the middle of the pack for Small Advanced Economies[4]. But this is below the OECD average, and has fallen from a high of 7.5 per cent in 2005. The OECD Economic Survey of New Zealand identified weak collaboration between firms and research organisations as one of the issues affecting productivity in the New Zealand economy overall.

25. Global value networks are all the people and activities involved in the production of a good or service and its global supply and distribution. New Zealand has low firm engagement in global value networks compared to other OECD countries. However overseas funding for R&D in New Zealand increased 37 per cent in the two years to 2016, faster than the total rate of growth in expenditure of 20 per cent.

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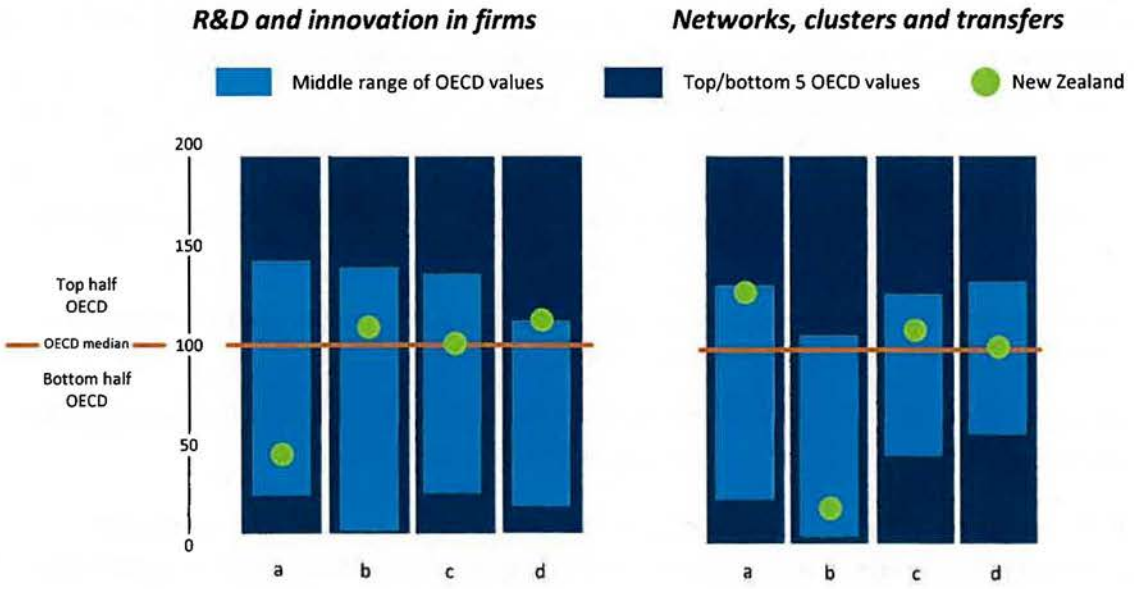
[3] The Business Operations Survey is a self-reported survey of firms which asks questions on a range of topics, including business operations, innovation, ICT usage, regulation, and skills.

[4] The Small Advanced Economies Initiative is a collaboration between Denmark, Finland, Ireland, Israel, New Zealand, Singapore, and Switzerland. All of the countries are advanced economies by International Monetary Fund standards, and are of similar scale in terms of population (5 to 10 million). Current work by the initiative includes research on science and innovation, economics, and international representation in small nations

26. New Zealand is considered as having many of the broader settings right for innovation.
    - We have high performing universities, good tertiary skill levels, particularly in science and technology problem solving.
    - New Zealand is one of the best in the world in terms of ease of doing business and entrepreneurship. It is highly digitally connected, and was announced as one of the top digital economies in the world in the 2017 Digital Evolution Index.
27. However in terms of the measures used to assess innovation outputs, New Zealand is middling to poor.
    - We sit around the middle of the OECD with regards to patents, trademarks, co-authorships and international co-invention.
    - New Zealand is at the bottom of the OECD when measured by patents filed by universities and public research institutions.



a Business R&D expenditure (per GDP)
b Top 500 corporate R&D investors (per GDP)
c Triadic patents families (per GDP)
d Trademarks (per GDP)

a Industry financed public R&D expenditure (per GDP)
b Patents filed by universities and public research (per GDP)
c International co-authorship (%)
d International co-invention (%)

We aim to maximise the benefits of the research, science and innovation system

Science and research helps us achieve inclusive and sustainable growth

28. Our investment in science and research helps us address the most important issues facing New Zealand. Our work is built on two key pillars:

    Excellence: we want our science to be some of the best in the world. Only excellent science will lead to the kinds of transformative changes to New Zealand's economy, environment and society that we need to see.

Impact: all of our science should have a strong line of sight to the eventual 'real world' effect it could have, even if that impact is not clear at the outset and many years in the future.

29. Fully realising these benefits requires broad support and enduring partnerships across the research community, including tertiary, non-government, business and industry. As part of its role in managing the Government's investment in science, the Ministry of Business, Science and Innovation has been building this support and developing these partnerships.

30. Government's investment in science is driven by the likely distribution of benefits from R&D. It is hard for an individual or a firm to 'capture' the benefits of R&D. If a firm pays for R&D, the knowledge produced will eventually become available to its competitors, removing that firm's advantage. So firms tend to underinvest in R&D, even though such investment improves society through better products or services. It is government's role to make up this gap.

31. This sometimes means government meets the full cost of research, where potential benefits are unclear or many years away, but the possible uses could have a large impact on the whole of New Zealand or the world. Where R&D is more quickly and easily used by a particular firm or sector (for example, research into dairy cattle will mostly benefit the dairy industry), government should meet a lower proportion of the cost.

32. The focus of work in recent years has been to progress science investment in three areas:

    - **Investment reform**: Most of the major funding schemes and science investments have now been aligned with the pillars of excellence and impact.
    - **Improving information**: Information is critical for scientists, businesses and government to understand the excellence and impact of the science system.
    - **Growing investment**: As understanding of the system grows, government is able to grow its most effective investments and target new and important opportunities.

33. There has been recent increased investment in the large competitive funds (e.g. Endeavour Fund, Marsden Fund), and new specific investments in areas such as fresh water, genomics and Antarctica. Additional funding mechanisms have also been introduced, including the National Science Challenges.

34. There is also a move to support international collaboration on New Zealand's research investments, and to use international-specific funding (the Catalyst fund) more strategically to support science needs.

35. Woven through these funding reforms and new investments is a focus on benefits for New Zealand, with Investment Plans describing what we seek from each investment. A Research, Science and Innovation Domain Plan provides a long-term picture of what is required to improve data on research, science and innovation, and steps for addressing this.

36. The previous Government set out its work in a science strategy. We are keen to engage with you on your plans for future science investments. This can help provide direction and clarity to researchers and introduce stability to the system.

Through innovation we lift productivity, and diversify and add value to the economy

37. Recent work in innovation policy has focussed on developing the structures to drive the innovation system. Callaghan Innovation was established in 2013 as a business-facing Crown Entity to accelerate the growth, scale and intensity of commercial innovation. It provides a one-stop shop for R&D incentives, innovation support services, and access to facilities and networking services. It also provides a range of programmes and support to help lift internal firm capability in order to realise the benefits of innovation.

38. Addressing New Zealand's low investment in R&D has been a particular focus in recent years. Business investment in R&D underpins a firm's ability to innovate and compete in new markets. However at 0.64 per cent of GDP, is still less than half the OCED average of 1.64 per cent.

39. International partnerships are essential to grow our capacity to innovate, lift business investment in R&D and connect with global value networks. Through our Innovative Partnerships programme we work with other government agencies and entities across the science and innovation system to attract high quality international R&D activities and actors to New Zealand to work in partnership with our research institutions and businesses. Our current focus is in areas of future strategic importance where we have unique opportunities to become world leaders, such as future foods, health technologies, ICT, space and intelligent transportation systems.

40. Innovation hubs and precincts support place-based approaches and are a valuable part of a national innovation system. Around half of New Zealand's innovation hubs or precincts receive some form of public funding. Opportunities for developing hubs have been created through a need to replace CRI and Callaghan Innovation infrastructure at Lincoln University, Gracefield in Wellington, and Massey University in Palmerston North. The renewal of central Christchurch has also provided the opportunity to develop a commercially-focussed innovation precinct. The launch of four Regional Research Institutes around New Zealand since 2016 aims to further promote collaboration among business, research and people.

41. New high growth firms are particularly important engines for innovation. A range of programmes have been developed to support entrepreneurs develop start-ups and connect them with mentors, investors and markets. Supports include incubator and accelerator programmes, a Seed Co-Investment Fund and access to repayable grants for new firms. Monitoring and evaluating the impacts of these investments will be important for future policy design to determine government's role in supporting start-ups in New Zealand.

2. Portfolio Responsibilities

Your responsibilities

42. As Minister of Research, Science and Innovation you have distinct yet complementary roles.

You have a number of statutory responsibilities as the Minister responsible for the Research, Science and Innovation portfolio

43. You are responsible for several pieces of legislation, the oversight of the administration of science and innovation appropriations within Vote Business, Science and Innovation, and setting the direction for MBIE's science and innovation investment. As a shareholding Minister, you are also responsible for managing the Crown's interests in, and relationships with, a number of Crown entities.

You also have a leadership role for the research, science and innovation system

44. Your unique position allows you to bridge gaps between individuals and groups in the science and innovation system and provide direction. You do this not only for those areas in which you are directly involved, but across all parts of the system where you have influence (but not necessarily direct control).

45. Working with other portfolios that invest in science and innovation, universities, research institutions, businesses, central and local government, and others is critical to fostering a dynamic science and innovation system that contributes to New Zealand's productivity and wellbeing.

Portfolio functions and responsibilities

Crown entities

46. You are responsible for the following Crown Entities (see Annex 1 for more detail):

- Seven Crown Research Institutes:
    - AgResearch Limited
    - The Institute of Environmental Science and Research Limited (ESR)
    - The Institute of Geological and Nuclear Sciences Limited (GNS Science)
    - Manaaki Whenua Landcare Research New Zealand Ltd (Landcare Research)
    - The National Institute of Water and Atmospheric Research (NIWA)
    - The New Zealand Institute for Plant and Food Research Limited (Plant and Food Research)
    - The New Zealand Forest Research Institute Limited (Scion)
- Callaghan Innovation
- Research and Education Advanced Network New Zealand Ltd (REANNZ)

Legislative responsibilities

47. As Minister of Research, Science and Innovation, you have certain functions, duties and powers under several Acts of Parliament. These do not typically require your daily attention and we will

brief you on them as needed. The Acts for which you are responsible are summarised below and your more significant functions, duties and powers are listed.

Research, Science and Technology Act 2010

48. This Act establishes the purposes for which the Government's research, science and technology funding may be allocated, as well as the processes for doing so.

49. Under this Act you are responsible for:

    - Establishing and appointing members of the Science Board. The Science Board is responsible for making independent funding decisions on research, science, and technology.
    - Setting criteria for the assessment of applications for funding. The Science Board must make funding decisions according to these criteria.

50. Some funding decisions are taken by the Science Board, and others are taken by you, MBIE, or other entities depending on the fund.

Crown Research Institutes Act 1992

51. This Act establishes your role as one of the shareholding Ministers responsible for the CRIs. Annex 1 contains more information on the CRIs and your responsibilities under this Act.

Callaghan Innovation Act 2012

52. This Act defines Callaghan Innovation's role, and your responsibilities for it. Annex 1 contains more information on Callaghan Innovation and your responsibilities under this Act.

Measurement Standards Act 1992

53. This Act provides for the use of uniform units of measurement throughout New Zealand. Annex 1 contains more information.

Building Research Levy Act 1969

54. This Act allows for a levy to be drawn from building and construction work payable to an industry organisation to fund building and construction research. You are the Minister responsible for the levy and may prescribe the rate of levy after consulting the Building Research Association of New Zealand Inc., which receives the levies prescribed under this Act.

Heavy Engineering Research Levy Act 1978

55. This Act allows for a levy to be drawn from producers and importers of steel goods payable to an industry organisation to fund heavy engineering research. You may prescribe the rate of levy after consulting the New Zealand Engineers' Federation. The Heavy Engineering Research Association receives these levies.

Wheat Industry Levies Act 1989

56. This Act allows for a levy to be drawn from wheat growers, flour millers, and purchasers of flour to be supplied to various industry organisations to fund research. United Wheatgrowers Ltd determines the levy and reports to you annually on how it is spent.

Royal Society of New Zealand Act 1997

57. This Act establishes The Royal Society of New Zealand with the objective of advancing and promoting science, technology, and the humanities in New Zealand.

Advisory bodies

58. You have close relationships with a number of advisory bodies; the main ones are the Science Board, the Royal Society of New Zealand, and the Marsden Fund Council.

The Science Board

59. The Science Board is responsible for making independent funding decisions for the purposes of research, science, or technology. The Science Board typically meets monthly to make decisions on proposals for funding. You appoint the Board members and set the direction of investment under the Research, Science, and Technology Act 2010. The Science Board is responsible for making funding decisions for the Endeavour Fund, National Science Challenges, and Partnerships.

The Royal Society of New Zealand

60. The Royal Society is an independent, non-government organisation that plays a critical role as New Zealand's academy of sciences. Its core purpose is the advancement and promotion of science, technology and the humanities in New Zealand. The Royal Society's broader functions include the provision of expert advice on important public issues to the Government and the community. The Royal Society also administers several funds, including the Marsden Fund, on your behalf.

The Marsden Fund Council

61. You are responsible for the Marsden Fund. The Marsden Fund is allocated by the Marsden Fund Council, which you appoint. The duties and responsibilities of the Marsden Fund Council are set in a Terms of Reference by the Minister of Research, Science and Innovation. The Royal Society of New Zealand provides administrative support to the Marsden Fund Council.

Vote Business, Science and Innovation

62. You are responsible for research, science and innovation expenditure within Vote Business, Science and Innovation totalling ($1,153 million in 2017/18). Annex 2 contains a full table of research, science and innovation expenditure[5].

63. **Departmental output expenses** ($29 million) are MBIE's internal operating expenses. They enable MBIE to provide policy advice, monitoring and evaluation, and other services to the science and innovation sector.

64. **Non-departmental output expenses** ($803 million) are spent by MBIE on your behalf to purchase a range of outputs from the science and innovation sector. They represent most of MBIE's science and innovation investment, and include MBIE's direct investment, strategic

[5] Note that this total takes account of adjustments to the National Science Challenges across years.

science investment funding provided to the CRIs, funding allocated on behalf of MBIE by the Royal Society of New Zealand (e.g. the Marsden Fund), and the Health Research Council.

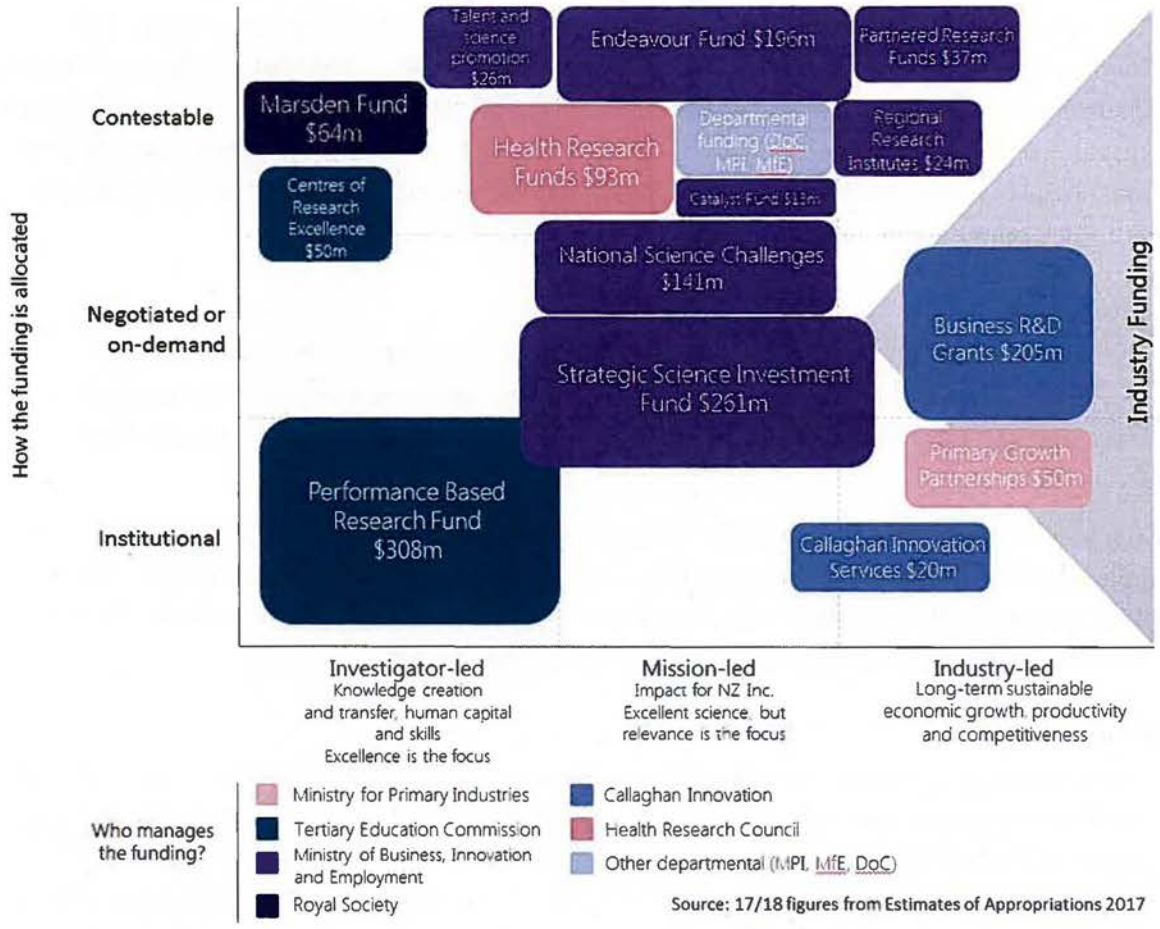
65. **Non-departmental capital expenditure** ($18 million) consisting of a one-off capital investment to support the establishment and development of Callaghan Innovation.

66. **Non-departmental 'other expenses'** ($37 million) cannot be classified within other appropriation types. This includes funding provided to the Royal Society to support its core functions, and grants to promote international science partnerships.

67. **Multi-year appropriations** ($265 million in 2017/18) are used when spending falls across two or more years (and no more than five years), but the timing of expenditure is uncertain. Vote Business, Science and Innovation currently has four multi-year appropriations for the National Science Challenges, R&D Growth Grants, Targeted Business R&D Funding, and Repayable Grants for Start-ups.

68. **The annual Budget round is particularly important in this portfolio** because expenditure is one of the main ways you influence the New Zealand science and innovation system. We would like to have an early conversation with you about your plans for Budget 2018.

Government funding for research, science and innovation investments



Source: 17/18 figures from Estimates of Appropriations 2017

A summary of major research and science funds

Strategic Science Investment Fund (SSIF)

69. The SSIF supports longer-term, underpinning infrastructure and programmes of mission-led science critical to New Zealand's future. It was established in 2016 from a combination of existing funds and some new investment at Budget 2016. A SSIF Investment Plan sets out what the Government is seeking from these investments. The Investment Plan was updated in August 2017 to take account of new funding made available for REANNZ, natural hazards research and monitoring, and an Antarctic Research Platform.

70. The Fund is divided into SSIF Programmes and SSIF Infrastructure:

- SSIF Programmes (around $200 million per year) funds long-term programmes of research. CRIs receive the bulk of this funding; CRIs have SSIF contracts that will end in 2024; Independent Research Organisations will transition to SSIF contracts in 2017/18.
- SSIF Infrastructure (around $60 million per year) funds national research infrastructure platforms, including a research vessel, high performance computing, and Nationally Significant Collections and Databases.

National Science Challenges

71. The National Science Challenges are a set of eleven mission-led research programmes, with funding of $141 million per annum, which aim to address issues of national significance to New Zealand over ten years. The Challenges provide an opportunity to align and focus New Zealand's research on large and complex issues by drawing scientists together from different institutions and disciplines. The Challenges are now mostly in their second or third year of operation, and are approaching a mid-point review in 2018.

Marsden Fund

72. The Marsden Fund invests in investigator-led research, to promote high-quality research capabilities in New Zealand. The Royal Society provides secretariat services for the Marsden Fund, and executive support to the Marsden Fund Council. You appoint the Marsden Fund Councillors.

73. The Marsden Fund was allocated $58 million in 2016/17, rising to $80 million in 2020/21 following new investment at Budget 2016. The strategy for expenditure is outlined in the recently published investment plan, including stronger international input in governance and peer review, and new funding for large inter-disciplinary projects.

Endeavour Fund

74. The Endeavour Fund is the Government's main competitive mission-led science investment. The Fund uses an annual competition to allocate funding to support research, science or technology with the potential to positively transform New Zealand's economic performance, the sustainability and integrity of our environment, help strengthen our society, and to give effect to the Vision Mātauranga policy. In 2017/18, a total of $196 million will be invested through Endeavour.

The Health Research Council (HRC) and health research strategy

75. The HRC is the Government's primary investor in health research in New Zealand, with funding of $93 million in 2017/18, rising to $120 million per year in 2020/21. You and the Minister of Health are jointly responsible for the efficient and effective functioning of the HRC. Responsibilities are set out in a Memorandum of Understanding between the two Ministers.

76. A review of the HRC in 2015 found it plays a valuable role in the science system. The review recommended a health research strategy be developed to set an agreed direction for health research. The health research strategy was released in June 2017. MBIE, Ministry of Health and the HRC are establishing a Steering Group to oversee the strategy, and developing an implementation plan. An external advisory group will advise MBIE and the Ministry of Health on implementation of the strategy.

Regional Research Institutes

77. Regional Research Institutes are new, private research organisations operating in the regions to stimulate leading edge, commercially focussed research. Four RRIs have been approved since 2016: the New Zealand Wine Growers Research Centre in Marlborough, the Centre for Space Science Technology in Alexandra, the New Zealand Institute for Minerals to Materials Research on the West Coast, and the New Zealand Institute for Technology and Innovation in Premium Plant-Based Value Chains in Tauranga.

Vision Mātauranga policy

78. Through the Vision Mātauranga policy, we encourage appropriate and distinctive research arising from the interface between Māori knowledge and science to deliver effective and innovation products, services and outcomes for Māori and all New Zealand. This includes integrating the policy across government investments in research, and building the capability, capacity and networks of Māori and the research community to collaborate and carry out this work. All research that MBIE funds must give effect to the Vision Mātauranga policy.

Research Partnerships

79. The Research Partnerships Scheme ($22 million per year) strengthens ties between research organisations and research users, particularly industry, by supporting sectors to establish a long-term research programmes. Following a review, the first Investment Plan was published in November 2016.

International Partnerships

80. International research and innovation connectivity helps drive the potential for impact of New Zealand research and innovation.

81. New Zealand has been pursuing opportunities to strengthen international connections across its science and innovation systems through **bi-lateral science and innovation partnerships**. In February 2017 New Zealand and Australia signed a science and innovation partnership agreement to lift collaboration across the systems. New Zealand is also in negotiation with Singapore to increase the integration of our science and innovation systems, and with Israel on a business-to-business technology cooperation agreement.

82. New Zealand is currently participating in the development of the **Square Kilometre Array (SKA)** radio telescope. The SKA is an international project to construct the world's largest and most

sensitive radio-telescope. Negotiations are in final stages to develop a treaty that would establish the SKA as an intergovernmental organisation. Once the negotiations conclude the Government will need to decide whether to ratify the treaty in order to participate in construction of the SKA.

83. MBIE invests directly in international science partnerships through the **Catalyst Fund**. The Catalyst Fund supports activities that initiate, develop and foster collaborations leveraging international science and innovation for New Zealand's benefit ($13 million in 2017/18).

Talent and Science Promotion

84. Talent and Science Promotion ($27 million) funds engagement between scientists and the public by contributing to the development of talented, skilled individuals and their organisations, and in undertaking research and innovation. Initiatives include Fellowships for Excellence, Science in Society (which includes A Nation of Curious Minds), and the Vision Mātauranga Capability Fund.

A summary of major innovation initiatives

Incentives for Business Innovation

85. R&D grants, introduced in 2013 and delivered through Callaghan Innovation, provide an incentive for business to invest in R&D. Callaghan Innovation administers the following grants:

- R&D Growth Grants ($154 million in 2017/18) support investment in firms with a track record in R&D. These are non-discretionary payments for business R&D, and our largest initiative to incentivise business investment. They have many of the features of a tax credit and may be a good starting place for your R&D tax credit.

- Targeted business R&D funding ($37.5 million in 2017/18) support businesses that are relatively inexperienced at performing R&D, and to fund internships in R&D active firms

- Repayable Grants for Start-ups ($14 million) support business incubator and accelerator activities.

86. Callaghan Innovation also receives $59.7 million to support businesses to develop new and improved products, processes and services through research and development, and technology-driven innovation.

Incubators and Accelerators

87. Callaghan Innovation funds incubators and accelerators to support the growth of start-ups.

- Technology incubators primarily invest in commercialising intellectual property (IP) generated by public research. They can access grants to validate IP, and repayable grants to invest in start-ups. Founder incubators work with entrepreneurs to develop start-up ideas, connect to investors and guide the business through its early stages and into global markets ($3.56m for both Tech and Founder incubators in 2017-18).

- Accelerators are short programmes used to train and accelerate entrepreneurs during the initial set-up stage of a new start-up, usually culminating in a pitch to investors where the start-up seeks funding ($0.75 million in 2017-18).

88. These initiatives were established as pilots in 2012. A 2015 review of accelerators in 2015 led to the programme being made permanent. Funding for incubators ends in June 2019. You may want to consider future and direction and support for these initiatives.

Commercialising Public Research

89. The Commercialisation Partner Network was established in 2010 to share commercialisation expertise among public research organisations. There are currently three commercial partners: Return on Science, KiwiNet and ChristchurchNZ Innovation. A 2015 review of the initiative found that it resulted in an increase in collaboration on commercialisation activities, and had significantly improved researcher attitudes to commercialisation. Contracts with the three partners are due to expire in June 2018 and a new investment round is underway that can continue this mechanism.

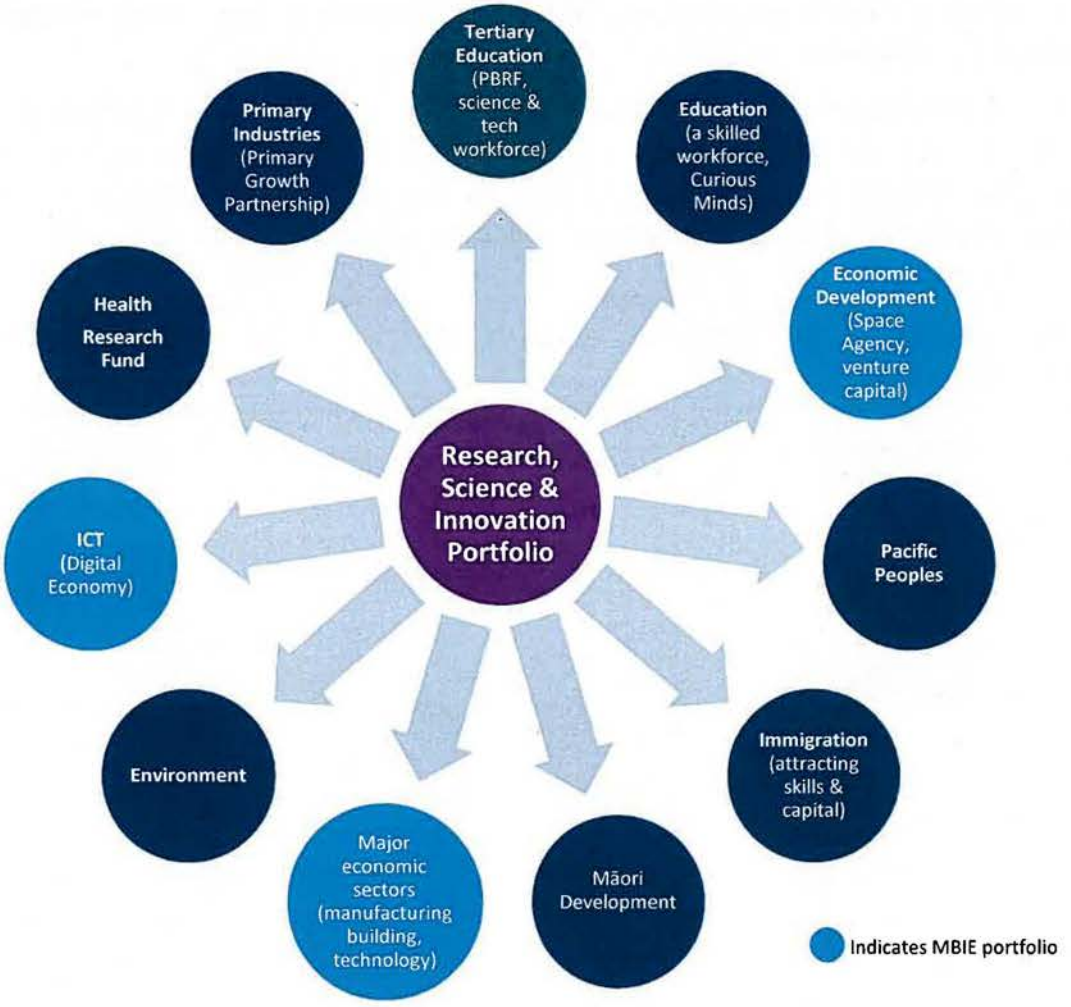
90. The Pre Seed Accelerator Fund, established in 2003, co-funds CRI and university early stage commercialisation activities from publicly funded research. The purpose of PreSeed is to help researchers to develop opportunities to the stage that they can attract private investment for further growth. The 50 per cent co-funding encourages researchers to seek funding from external investors.

91. We would like to take the opportunity to discuss strengthening commercialisation opportunities with you more broadly.

3. Major Links with Other Portfolios

92. Government's total investment in science and innovation is currently over $1.6 billion per year. Vote Business, Science and Innovation is the single largest source of government funding ($1.2 billion in 2017/18). Vote Tertiary Education and Vote Primary Industries also make significant direct investments in research, science and innovation. A number of other portfolios are involved in the science and innovation system.

93. The diagram below highlights links between the Research, Science and Innovation and other portfolios.



4. How MBIE Assists You

Key MBIE officials

94. Responsibility for providing advice on Research, Science and Innovation issues sits within the Ministry's Science, Skills and Innovation Group. Key contacts are set out in the table below:

Contact		Priority Area	Contact details
Carolyn Tremain Chief Executive, MBIE		All	E carolyn.tremain@mbie.govt.nz P 04 901 1357 M Information withheld consistent with Section 9(2)(a) of the Official Information Act.
Paul Stocks Deputy Chief Executive, Labour, Science and Enterprise		All	E paul.stocks@mbie.govt.nz M Information withheld consistent with Section 9(2)(a) of the Official Information Act.
Dr Peter Crabtree General Manager, Science Innovation and International		International, science and innovation policy	E peter.crabtree@mbie.govt.nz P 04 901 3907 M Information withheld consistent with Section 9(2)(a) of the Official Information Act.
Dr Prue Williams General Manager, Science System Investment and Performance		Science investments	E prue.williams@mbie.govt.nz P 04 901 3939 M Information withheld consistent with Section 9(2)(a) of the Official Information Act.
Michael Bird General Manager, Entity Performance and Investment		CRI and Callaghan Innovation monitoring, Crown entity responsibilities	E michael.bird@mbie.govt.nz P 04 901 3929 M Information withheld consistent with Section 9(2)(a) of the Official Information Act.

The advice and support we provide to you

95. MBIE provides a range of support and advice to you in your role as the Minister of Research, Science and Innovation. This includes:

- **Research, science and innovation policy** as well as advice on the leadership and development of the science and innovation system.
- **Management of science and innovation appropriations** within Vote Business, Science and Innovation, including the planning and prioritisation of funding.
- **Crown entity ownership and monitoring** including commenting on draft statutory planning documents, developing and communicating the Government's ownership priorities and objectives for CRIs, and monitoring CRI performance.
- **International science and innovation partnerships** including advice on investments, the development of international partnerships, and the provision of support for your missions and international meetings.

5. Research, Science and Innovation Work Programme

Focus for the first 100 days

96. The table below lists the major decisions and actions you are required to take in your first 100 days as the Minister of Research, Science and Innovation. These cover the day-to-day operational requirements of your role – Board appointments, funding decisions, significant policy decisions, and other matters which require your immediate attention.

Policy Issues			
Topic	*Description*	*Driver*	*Timing*
Manifesto Commitments	As part of the Manifesto, you have announced a number of commitments within the Science and Innovation portfolio. We would like to have an early conversation with you on implementation of these commitments.	Manifesto	At your earliest convenience
Budget 2018	We will provide you with advice on options for investment at Budget 2018. We would like to have an early conversation with you about your plans for Budget 2018.	Budget 2018	At your earliest convenience
International engagements	There are several significant international engagements for you to consider attending over the last quarter of 2017 and the first quarter of 2018. We will provide you with advice on the potential visits and proposals for international travel in 2018.	International engagements	At your earliest convenience
Partnership with Singapore	The Enhanced Partnership with Singapore, announced in April 2017, is to include cooperation on research, technology and innovation. [redacted] Information withheld consistent with Section 9(2)(f) (iv) of the Official Information Act.	Cabinet decision required to finalise Enhanced Singapore Partnership Agreement	At your earliest convenience
[redacted]	[redacted] Information withheld consistent with Section 9(2)(f)(iv) of the Official Information Act.	Cabinet decision required to finalise Enhanced Singapore Partnership Agreement	At your earliest convenience
Endeavour Fund	The Endeavour Fund is MBIE's main contestable science fund. We will provide advice on the design of the 2019 funding round.	Agency briefing on proposed options	February 2018
Square Kilometre Array	Decide whether to sign the Square Kilometre Array treaty once negotiations are concluded. Negotiations are currently underway and are close to completion.	Decide whether to sign the treaty	January 2017

Information withheld consistent with Section 9(2)(f) (iv) of the Official Information Act.

Topic	De	Driver	Timing
Israel Technology Cooperation Agreement	[redacted] We will provide you advice on this draft Agreement.	Decide whether to sign and ratify the treaty	At your earliest convenience
October Baseline Update	The October Baseline Update is an in-year revision of the Budget, where variances against the previous set of forecasts are changed against the operating allowance. You will be asked to confirm changes to Vote Business, Science and Innovation baseline spending to reflect decisions made over the previous six months.	Public Finance Act	At your earliest convenience
System Governance			
Topic	*Description*	*Driver*	*Timing*
Marsden Fund Council	The terms of the Chair and six Council Members on the Marsden Fund Council expire on 28 February 2018. We have begun a process to select a new Chair and Council members and will provide you with advice on this in November 2017.	Board appointments (non statutory)	November 2017
Science Board appointment	The Science Board has a vacancy that needs to be filled by December 2017. We will provide you with advice on this shortly, with the aim of seeking Cabinet decisions at an APH Committee meeting before end of 2017.	Board appointments (non statutory)	November 2017
Crown entity responsibilities			
Topic	*Description*	*Driver*	*Timing*
Annual meetings with Crown Entities	CRIs hold their Annual Meetings October to December. There is a legal requirement relating to annual reporting and audit, but the main focus is on discussing a CRI's strategic direction. It is customary for the Minister, or a proxy, to attend Annual Meetings.	Relationship with Crown Research Institutes	October – December 2017
Crown Entities Board appointments	• Sue Suckling's term as Chair of the Callaghan Innovation Board ends on 31 January 2018. • One REANNZ director terms of appointment fall due for consideration in December 2017. We will provide you advice on filling these positions. • There are also five Chairs and 26 Directors whose terms fall due in the middle of 2018. Given these appointment processes typically take six months, we would like to start engaging with you on these roles at your earliest convenience.	Board appointment (statutory)	January 2018
Crown Entities Letters of Expectations	It is customary for you as the primary shareholding Minister to send an annual Letter of Expectations setting out key expectations These expectations are addressed in Statements of Intent and other public accountability documents. We will advise you on possible content of these letters.	Outline performance expectations	Early 2018

Topic	*Description*	*Driver*	*Timing*
Callaghan Innovation	MBIE and Callaghan Innovation will review Callaghan Innovation's operational funding Multi Category Appropriation (MCA) to ensure Callaghan Innovation's long term funding requirements still align with policy intent. This will be completed by February 2018 in time for inclusion in the March Baseline Update. MBIE and Callaghan Innovation undertook a joint strategic review of Measurement Standards Laboratory long-term funding needs. The results of this review will need to be considered as part of Budget 2018.	Agency briefing	February 2018

97. We will work with you to agree a work programme that extends beyond the first 100 days. There are some reviews and other decisions currently planned for 2018, which we will advise you on in light of your priorities.

Annex 1: Crown Entities

A number of Crown Entities fall within the Science and innovation portfolio. You have responsibility for overseeing and managing the Crown's interest in, and relationship with, these entities, and to carry out any statutory responsibilities including:

- Making sure an effective board is in place to govern each entity through the appointment, reappointment and removal of board members
- Participating in setting the strategic direction and annual expectations of the entities
- Reviewing performance and results
- Managing risks on behalf of the Crown
- Agreeing to the levels of funding for reportable outputs for Crown Agents (not CRIs)
- Answering to Parliament for entity performance.

Crown Research Institutes

CRIs are Crown-owned companies that undertake scientific research for the benefit of New Zealand. Each of the seven CRIs is aligned with a productive sector of the economy or a grouping of natural resources. CRIs are also partner investors in science and innovation alongside MBIE, and are some of New Zealand's most significant producers of science and technology. CRIs receive revenue of $712 million, of which 64% is from government sources.

Crown Research Institutes Act 1992

Under this Act the Minister of Finance and the Minister of Research, Science and Innovation are shareholding Ministers responsible for the CRIs. The Minister of Research, Science and Innovation generally takes the lead shareholder role, particularly as the formal point of contact with the CRI Boards. Your responsibilities as a shareholding Minister include:

- Appointing and dismissing directors
- Overseeing the Government's ownership priorities and objectives
- Approving any major transactions
- Monitoring Board performance.

Annual cycle

- Send the Letter of Expectation (January/February)
- Table the half-year report (March)
- Accept and table the Statement of Corporate Intent (June)
- Table annual report (October)
- Attend the CRI Annual Meetings (October – December) or send a proxy.

Other

- Meet with CRIs (usually Chair and Chief Executive), new Directors and visit CRI campuses
- Accept and endorse CRI business cases (with the other shareholding Minister).

CRIs and their boards

Assets: $282.6 million
Revenue: $146 million

AgResearch Limited – AgResearch's purpose is to enhance the value, productivity, and profitability of New Zealand's pastoral, agri-food, and agri-technology sectors.

Chief Executive: Tom Richardson

Board Members	Term of Appointment
Jeffrey Grant, Chair	9/6/2014 – 30/6/2020
Dr Paul Reynolds	1/7/2015 – 30/6/2018
Tania Simpson	1/7/2011 – 30/6/2018
Andy Macfarlane	1/7/2011 – 30/6/2019
Dr Peter Stone	1/8/2013 – 30/6/2019
Colin Armer	1/7/2017 – 30/6/2020
Jackie Lloyd	1/7/2017 – 30/6/2020
Kim Wallace	1/7/2017 – 30/6/2020

Assets: $70.7 million
Revenue: $75.5 million

The Institute of Environmental Science and Research Limited (ESR) – ESR's purpose is to deliver scientific and research services to the public health, food safety, security and justice systems, and the environment sector.

Chief Executive: Keith McLea

Board Members	Term of Appointment
Denise Church QSO, Chair	1/7/2015 – 30/6/2018
Marion Cowden, Deputy Chair	1/7/2012 – 30/6/2018
Richard Gill	1/01/2016 – 30/6/2018
Professor Cristin Print	14/8/2017 – 13/8/2018
Dr Andy Shenk	14/8/2017 – 13/8/2018
Dr Helen Darling	1/7/2013 – 30/6/2019
Quentin Hix	1/9/2016 – 30/6/2019

Assets: $63 million
Revenue: $86.2 million

The Institute of Geological and Nuclear Sciences Limited (GNS Science) – GNS Science's purpose is to deliver research that drives growth in New Zealand's geologically based energy and minerals industries, and to improve understanding of geological processes and hazards.

Chief Executive: Ian Simpson

Board Members	Term of Appointment
Dr Nicki Crauford, Chair	1/7/2015 – 30/6/2018
Sarah Haydon, Deputy Chair	1/7/2014 – 30/6/2020
Chris Bush	1/1/2016 – 30/6/2018
Paul White	14/8/2017 – 13/8/2018
Dr John Sharpe	1/9/2016 – 30/6/2019
Emeritus Professor Steve Weaver	1/7/2010 – 30/6/2019

Assets: $62.7 million
Revenue: $64.6 million

Manaaki Whenua Landcare Research New Zealand Ltd (Landcare Research) – Landcare Research's purpose is to drive innovation New Zealand's management of terrestrial biodiversity and land resources, in order to both protect and enhance the terrestrial environment.

Chief Executive: Richard Gordon

Board Members	Term of Appointment
Jane Taylor, Chair	1/7/2014 – 30/6/2020
Dr Paul Reynolds	1/7/2015 – 30/6/2018
Dr Chris Downs	1/7/2012 – 30/6/2018
Professor Caroline Saunders, ONZM	1/7/2015 – 30/6/2018
Ngarium Blair	1/7/2017 – 30/6/2020
Associate Professor Emily Parker	1/7/2011 – 30/6/2020
John Rodwell	1/7/2017 – 30/6/2020
Hon Kate Wilkinson	1/7/2017 – 30/6/2020

Assets: $155.8 million
Revenue: $142.6 million

The National Institute of Water and Atmospheric Research (NIWA) – NIWA's purpose is to enhance the value and management of New Zealand's aquatic resources and environments, and to improve understanding and prediction of climate and weather hazards.

Chief Executive: John Morgan

Board Members	Term of Appointment
Sir Christopher Mace, CNZM, Chair	1/7/2009 – 30/6/2018
Nick Main, Deputy Chair	1/7/2014 – 30/6/2020
Professor Keith Hunter	1/7/2012 – 30/6/2018
Mike Pohio	1/7/2015 – 30/6/2018
Jason Shoebridge	1/7/2009 – 30/6/2018
Dr Helen Anderson QSO, CFinstD	1/7/2011 – 30/6/2020
Dr Gillian Lewis	1/7/2014 – 30/6/2020

Assets: $136.1 million
Revenue: $145.8 million

The New Zealand Institute for Plant and Food Research Limited (Plant and Food Research) – Plant and Food Research's purpose is to enhance the value, productivity and sustainability of New Zealand's horticultural, arable, seafood, and food and beverage industries.

Chief Executive: Peter Landon-Lane

Board Members	Term of Appointment
Michael Ahie, Chair	1/7/2010 – 30/6/2018
Gregory Gent, Deputy Chair	1/7/2013 – 30/6/2019
Colin Dawson	1/7/2015 – 30/6/2018
Mark Stuart	1/7/2010 – 30/6/2018
Professor Juliet Gerrard	1/7/2013 – 30/6/2019
Andrew von Dadelszen MBA	1/7/2014 – 30/6/2020

SCION FORESTS+PRODUCTS+INNOVATION *Assets: $54.2 million* *Revenue: $51.5 million* **The New Zealand Forest Research Institute Limited** (Scion) – Scion's purpose is to drive growth from New Zealand's forestry, wood products, wood-derived materials, and other biomaterials. **Chief Executive:** Julian Elder	**Board Members**	**Term of Appointment**
	Tony Nowell, Chair	1/7/2010 – 30/6/2018
	Dr Barry O'Neil	10/12/2012 – 30/6/2018
	Dr Jon Ryder	1/1/2016 – 30/6/2018
	Greg Mann	14/8/2017 – 13/8/2018
	Stana Pezic	14/8/2017 - 13/8/2018
	Steve Wilson	1/7/2016 – 30/6/2019
	Colleen Neville	1/7/2014 – 30/6/2020

Crown Agents

CallaghanInnovation Callaghan Innovation is a Crown agent, established on 1 February 2013. As a business-facing organisation, its purpose is to accelerate the commercialisation of innovation by New Zealand businesses. **Chief Executive:** Vic Crone *Funding: $59.7 million to support business* *$ 205.4 million to incentivise business R&D* *$ 5.8 million for Measurement Standards Laboratory*	**Board Members**	**Term of Appointment**
	Sue Suckling, OBE, Chair	10/2/2013 – 30/1/2018
	Simon Botherway	28/2/2016 – 27/2/2019
	George Gong	28/8/2017 – 27/8/2018
	Robin Hapi	1/2/2013 – 30/6/2018
	Stefan Korn	28/8/2017 – 27/8/2018
	Associate Professor Kate McGrath	28/2/2016 – 27/2/2019
	Al Monro	1/8/2015 – 30/6/2018
	Frances Valintine	28/2/2016 – 27/2/2019

Callaghan Innovation works across the science and innovation system to help translate scientific knowledge into economic value. It provides a number of services to businesses:

- Providing research and technical services to support near-to-market innovation by firms, and acting as an intermediary to help link firms to the commercialisation of services and funding.
- Administering and awarding R&D grants to firms.
- Managing the business incubator and business accelerator programmes.
- Helping firms acquire the skills and expertise needed to take ideas to market successfully.

Callaghan Innovation Act 2012

This Act established Callaghan Innovation as a Crown entity with the aim of supporting science and technology-based innovation and its commercialisation by New Zealand businesses, in order to improve their growth and competitiveness.

Measurement Standards Act 1992

Through this Act, you provide for the use throughout New Zealand of uniform units of measurement of physical quantities, and for the establishment and maintenance of standards of measurement of physical quantities. The Measurement Standards Laboratory of New Zealand operates as a business unit of Callaghan Innovation, and is funded by a separate appropriation.

Other Crown Entities

hrc Health Research Council of New Zealand

The HRC receives funding through Vote Business, Science and Innovation's Health and Society appropriation. In 2017/18 this totals $95.5 million. Funding will increase to $120 million in 2019/20.

Chief Executive: Professor Kathryn McPherson

Board Members	Term of Appointment
Lester Levy, Chair	1/1/2016 – 31/12/2018
Andrew Mercer, Deputy Chair	31/10/2012 – 23/3/2019
Suzanne Snively	14/12/2010 – 26/4/2018
Suzanne Pitama	22//6/2015 – 21/5/2018
Jeroen, Douwes	28/8/2015 – 27/8/2018
Parry Guilford	13/10/2016 – 12/10/2019
Lesley McCowan	24/1/2014 – 26/4/2020
Tony Norman	8/6/2017 – 7/6/2020
Will Barker	8/6/2017 – 7/6/2020
Monique Faleafa	8/6/2017 – 7/6/2020

The HRC is the Government's primary funder for research funds specifically targeted at health research. The HRC supports research that has the potential to improve health outcomes and the delivery of healthcare, and to produce economic gain for New Zealand. The HRC currently invests in the following research areas:

- Maintaining health and wellbeing throughout the life course of New Zealanders.
- Building an evidence base that contributes to Māori health gains.
- Improving outcomes for acute and chronic conditions in New Zealand.
- Supporting innovation and improvement in health service delivery and planning.

Your responsibilities

You and the Minister of Health are jointly responsible for the efficient and effective functioning of the HRC. A Memorandum of Understanding sets out the responsibilities for both Ministers. The Minister of Research, Science and Innovation has a responsibility to ensure the HRC is part of a

cohesive science and innovation system, that HRC funding aligns with other investments in the science system, and that the economic and scientific benefits of health research are captured. You negotiate an output agreement for Vote Business, Science and Innovation funding with the Chair of the HRC and monitor the performance of the HRC with respect to the agreement.

REANNZ *Revenue: $3 million* Research and Education Advanced Network New Zealand Ltd (REANNZ) provides a high-performance computing network to promote research, education and innovation for the benefit of New Zealand. It was formed in September 2005 under the Companies Act 1993 and is listed under schedule 4 of the Public Finance Act 1989. **Chief Executive:** Nicole Fergusson	**Board Members**	**Term of Appointment**
	Jim Donovan (Chair)	1/7/2012 – 30/6/2018
	Ross Peat	1/7/2015 – 30/6/2018
	Susie Johnstone	1/7/2011 – 31/12/2017
	Professor Simon Hall	1/7/2015 – 30/6/2018
	Emeritus Professor Steve Weaver	1/7/2014 – 30/6/2020

Your responsibilities

As the lead shareholding Minister for REANNZ your responsibilities include:

- Appointing its Board and monitoring Board performance.
- Approving the annual Statement of Intent and Letter of Expectations, which sets the Government's priorities and objectives for REANNZ.
- Approving any major transactions.

Annex 2: Research, science and innovation components of Vote Business, Science and Innovation as at Budget 2017

	2017/18	2018/19	2019/20	2020/21
	($000)	($000)	($000)	($000)
Non-Departmental Output Expenses				
National Science Challenges	140,557	73,466	79,153	79,153
Research and Development Growth Grants (MYA Expense)	153,902	161,353	169,186	172,786
Contestable Research Fund	196,265	216,363	223,236	242,712
Health Research Fund	92,986	100,641	117,489	120,175
Marsden Fund	63,755	71,755	79,755	79,755
National Measurement Standards	5,764	5,764	5,764	5,764
Partnered Research Fund	37,161	37,771	38,453	38,090
Repayable Grants for Start-Ups	13,996	13,996	13,996	13,996
Targeted Business Research and Development Funding (MYA Expense)	37,500	37,500	37,500	37,500
Total Non-Departmental Output Expenses	**741,886**	**718,609**	**764,532**	**789,931**
Non-Departmental Other Expenses				
Catalyst Fund	13,351	15,851	14,351	14,351
Regional Research Institutes	23,584	20,000	20,000	0
Total Non-Departmental Other Expenses	**36,935**	**35,851**	**34,351**	**14,351**
Non-Departmental Capital Expenditure				
Callaghan Innovation	18,000	20,000	21,410	0
Total Non-Departmental Capital Expenditure	**18,000**	**20,000**	**21,410**	**0**
Multi-Category Expenses and Capital Expenditure				
Policy Advice and Related Outputs MCA				
Departmental Output Expenses				
- Policy Advice - Science and Innovation	5,148	5,148	5,148	5,148
- Related Services to Ministers - Science and Innovation	2,608	2,608	2,608	2,608
Science and Innovation: Talent and Science Promotion MCA				
Non-Departmental Output Expenses				
- Fellowships for Excellence	11,570	11,570	11,570	11,570
- Science in Society	8,849	8,849	8,849	8,849
- Vision Mātauranga Capability Fund	5,967	5,967	5,967	5,967
Non-Departmental Other Expenses				
- Royal Society of New Zealand	500	500	500	500
Science and Innovation: Strategic Investment Fund MCA				
Non-Departmental Output Expenses				
- Strategic Investment Fund - Infrastructure	62,261	58,759	56,289	56,359
- Strategic Investment Fund - Programmes	198,724	205,724	205,724	205,724

Science and Innovation: Callaghan Innovation - Operations MCA				
Non-Departmental Output Expenses				
- Building Business Innovation	32,378	32,378	32,378	32,378
- Business Research and Development Contract Management	7,750	7,750	7,750	7,750
- Research and Development Services and Facilities for Business and Industry	19,523	19,523	19,523	19,523
Science and Innovation: Contract Management MCA				
Departmental Output Expenses				
- Mulit-National Corporation Research and Development Attraction	2,000	2,000	2,000	0
- Contract Management	19,187	19,094	18,414	18,414
Non-Departmental Output Expenses				
- Research Contract Management	8,966	8,761	8,913	6,227
Total Multi-Category Expenses and Capital Expenditure	**385,431**	**388,631**	**385,633**	**381,017**
Total Annual and MYA Expenses	**1,182,252**	**1,163,091**	**1,205,926**	**1,185,299**
Adjusting for National Science Challenges[6]	-29,477	17,583	24,803	24,803
TOTAL	**1,152,775**	**1,180,674**	**1,230,729**	**1,210,102**

[6] The adjustment to re-phase the National Science Challenges appropriation across years will occur at the end of the 2017/18 financial year.