MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

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PRIME MINISTER'S SCIENCE, INNOVATION AND TECHNOLOGY ADVISORY COUNCIL

TITLE	Briefing pack: New Zealand's science, innovation and technology system – current state, funding, and reform overview
PURPOSE	To provide a foundational understanding of New Zealand's current science, innovation and technology system and the intended future structure of the system and its investment.

Section 1: Context for the SI&T reform programme

The current Science, Innovation and Technology (SI&T) system does not meet the needs of New Zealand…

1. Multiple reviews have concluded that New Zealand's Science, Innovation and Technology system is fragmented, without clear strategic priorities or accountability mechanisms. The system lacks focus, and delivers smaller results across many areas, rather than doing fewer things well. There is no strategy to say what is important, or direct scarce resources towards those priorities.
2. Our public research institutions focus on traditional areas of strength with limited agility to respond to emerging opportunities. Compared to peer countries (e.g. Singapore, Finland and Ireland) we spend a greater proportion of our science investments in areas of existing economic strength and a smaller proportion in advanced technologies.
3. A significant proportion of our science investments are contestable and with no prioritisation within the system, our resources are allocated according to science outcomes and impact, rather than alignment with Government priorities. Fragmentation within the system can lead to duplication, and competition for this pool of resources can lead to sub-optimal outcomes at a whole-of-system level.

…but the PMSITAC now creates a mechanism to determine priorities in the SI&T system

4. The PMSITAC will play a central role in the new SI&T system, setting strategy and priorities and fundamentally changing New Zealand's approach to science, innovation and technology, creating tangible benefits for the economy and society.
5. A clear set of national priorities (including areas to deprioritise) will guide investment decisions across the system. Over time, resources will flow to areas with the greatest importance and potential impact, and the system will be able to effectively respond when new opportunities emerge.
6. With a clearer set of priorities in place and a strategy to determine what is important will ensure that research will translate into commercial applications at an increased rate, generating greater economic returns.

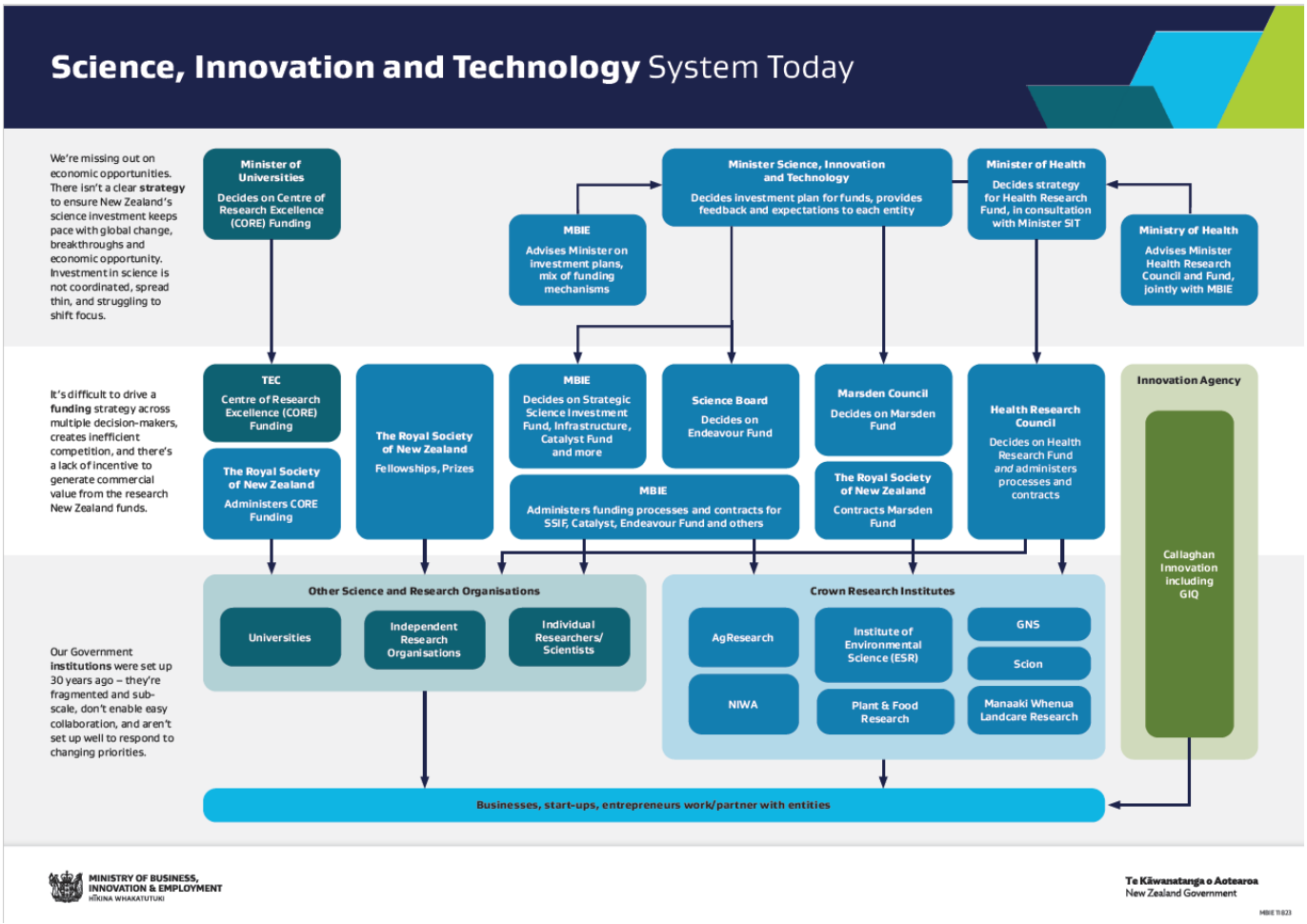
Section 2: Overview of the current SI&T System

Science, Innovation and Technology in New Zealand

7. New Zealand's Science, Innovation and Technology (SI&T) system consists of businesses, people, institutions such as research organisations and universities, funding agencies and investors, accelerators and incubators. These different system actors engage with each other in a wide range of activities that contribute to the SI&T system. Government is only partially responsible for this activity.
8. The following sections focus on the configuration of the current system, as well as an overview of how the reforms will deliver an SI&T system which meets the needs of New Zealand now and in the future.

9. Figure 1 illustrates an overview of the current system architecture

Figure 1: Current Science, Innovation and Technology System



10. SI&T activities such as research, research services, commercialisation of research, business innovation, and Research and Development (R&D) drive the generation of new knowledge, development of new technologies, and apply them in New Zealand to drive economic, health, social, and environmental wellbeing.

11. The SI&T system overlaps and interacts with different systems in New Zealand, such as education, health, environmental, business and industrial, and trade and export. The SI&T system also delivers key services for Government, such as forensic testing, public health and environmental monitoring.

12. Importantly, the SI&T system plays a vital role in managing national risks, national security, and building national resilience. Understanding and managing national risks (that is, hazards and threats that can derail us as a country) improves the overall resilience of our economy.

New Zealand's investment in Science, Innovation and Technology

13. Expenditure on R&D is the best available measure of how much R&D is performed in a country, sector, or industry. New Zealand's total gross expenditure on R&D (GERD) has been growing, but from a low base compared to other small, advanced economies (SAEs) and the

OECD average. That expenditure is divided between the business (BERD), higher education (HERD) and government sectors (GovERD) as indicated in the figure below:

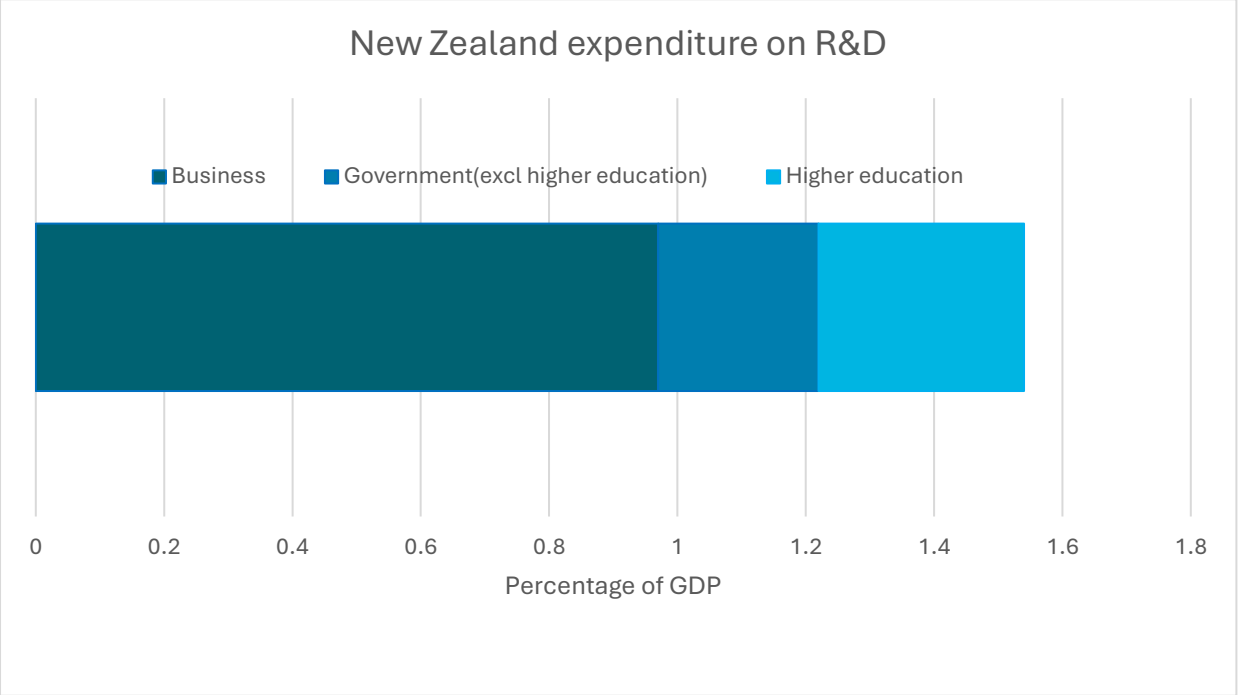


Figure 2: Expenditure on R&D in New Zealand by sector.

14. In 2024, New Zealand spent 1.54 per cent of GDP on R&D, compared to the OECD average of 2.72 per cent[1]. The majority of GDP contribution comes from BERD at 0.97 percent, whilst GERD and HERD are significantly lower. Most economies such as Israel and Ireland are above the OECD average, other economies such as the European Union have plans to get above three per cent of GDP.

[1] OECD Main Science and Technology indicators.

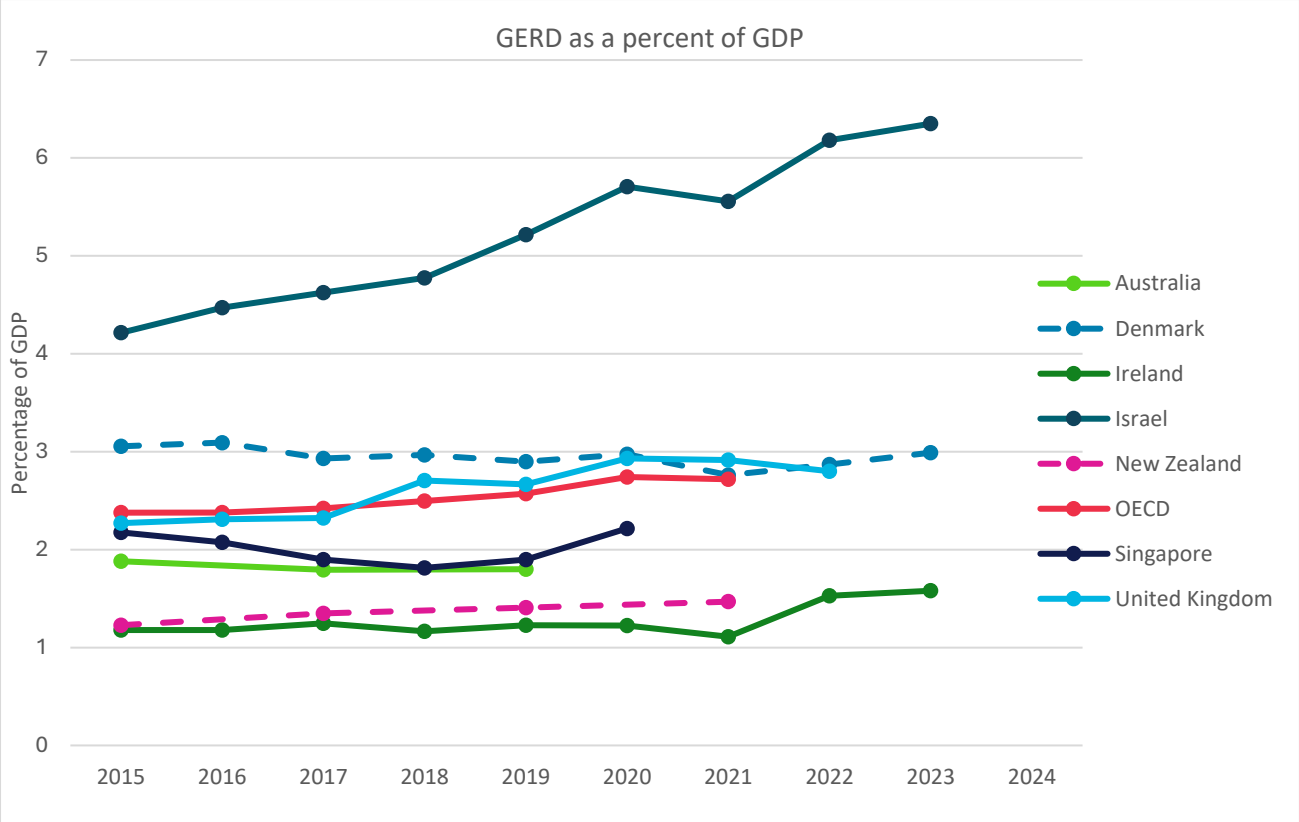


Figure 3: OECD Comparison of GERD as a percent of GDP (Source: OECD Main Science & Technology Indicators). The OECD offsets New Zealand data by one year to align to international comparison data.

15. New Zealand is an outlier when compared to peer jurisdictions in the Small Advanced Economies Initiative. Our investment in R&D is low and is focused on the traditional economic sectors like the primary industries. Only 30 per cent of science investment goes to advanced technology, compared to the Organisation for Economic Co-operation and Development (OECD) average of 60 per cent.

16. Given that overall investment in the SI&T system is not expected to grow significantly in the near term, the focus should be on ensuring existing funding is better aligned with national priorities, delivers greater impact and supports areas with the highest potential for economic return.

17. Other government agencies also fund and purchase SI&T through their portfolios for their specific policy needs and support the broader functioning of the broader SI&T ecosystem through administration of grants, incentives, and the attraction of investment and capital

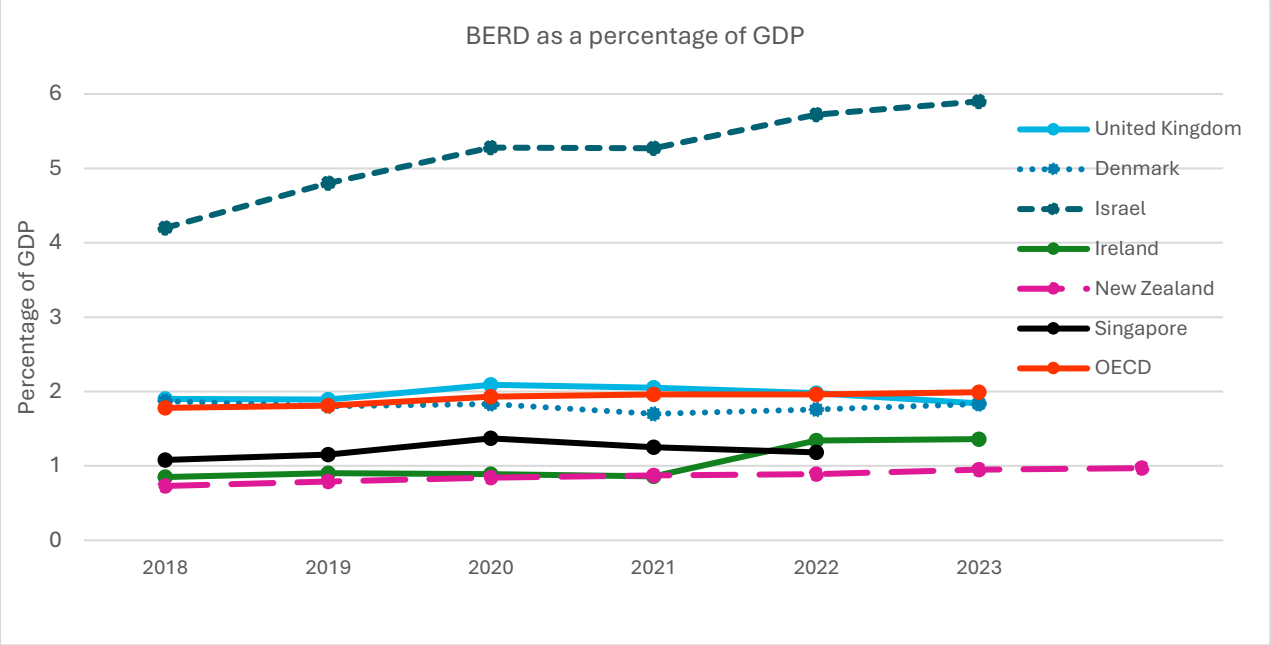


Figure 4: Business R&D expenditure as a proportion of GDP (Source: OECD Main Science & Technology Indicators). The OECD offsets New Zealand data by one year to align to international comparison data.

R&D expenditure by sector and purpose of research

18. Expenditure on R&D can be disaggregated by the purpose of research, shown in figure 5. At a high level, Government expenditure is heavily focused on the environment and primary industries, with business undertaking the bulk of manufacturing and ICT research.

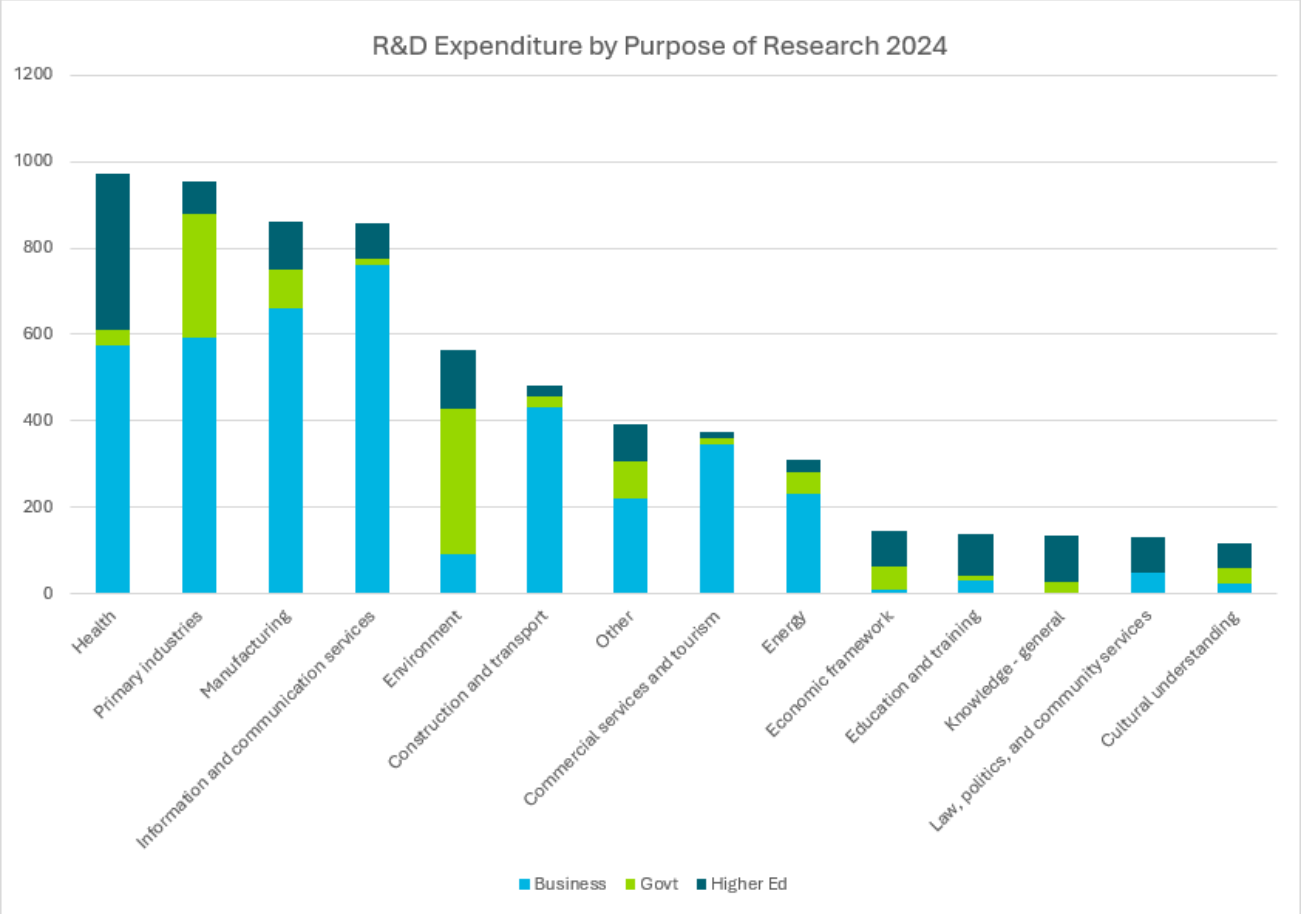


***Figure 5**: R&D expenditure by purpose of research for 2024. Data source Stats NZ research and development survey*

Examples of Government supported research activities

19. Government supports a wide range of research, innovation, and commercialisation activities across sectors and institutions through various funding mechanisms and MBIE plays a pivotal role in shaping New Zealand's science and innovation landscape through strategic funding and policy leadership.

20. In the 2023/24 financial year, MBIE allocated over $1.9 billion in departmental and non-departmental expenditure to support a dynamic business environment, with a significant portion directed toward science, innovation, and technology initiatives.

21. Key funding mechanisms and initiatives in the current system include:

    - **Marsden Fund** ($79M): Investigator led, curiosity driven research. 50% is now directed toward projects with economic benefit. Social sciences and humanities have been excluded from scope.
    - **Endeavour Fund** ($248M): Mission-led research aligned with national priorities, including economic information and Vision Mātauranga.
    - **Strategic Science Investment Fund** (SSIF) ($348M): Long-term support for key science capabilities, infrastructure (e.g. NIWA's research vessel Tangaroa), and CRI missions.

- **Health Research Council** ($128M): Investigator and mission-led health research via contestable funding.
- **Centres of Research Excellence** ($50M): Inter-institutional networks delivering long-term researcher-led programmes.
- **Catalyst Fund** ($20 - $30M): Supports international collaboration and partnerships.
- **PreSeed Accelerator Fund** ($15M): Early-stage commercialisation of publicly funded research.
- **Commercialisation Partner Network** ($6M): Builds capability across institutions to bring public research to market.
- **R&D Tax Incentive** ($590M): Broad tax credit to stimulate business investment in R&D.
- **Callaghan Innovation Grants**: Includes New to R&D Grant ($30.7M), Student grant ($16.5M), and Arohia Innovation Trailblazer Grant ($29M).
- **Other Government Agencies**: e.g. Ministry for Primary Industries ($44M), Department of Conservation ($22M) and the Ministry for the Environment ($1.5M) also fund targeted, mission-led research.

22. While some investments take time to yield economic returns, they often build long-term capability. Here are a few examples of projects that support research, innovation, and commercialisation activities in the system:

- **Robinson Research Institute:** MBIE's investment in superconductivity research in year 2000 enabled the Robinson Research Institute to launch a focused program on electrifying transport in 2020. The project, funded through the Endeavour Fund and Strategic Science Investment Fund (SSIF), has grown into a multi-disciplinary platform with global partners like NASA and HyFlux. It evolved from basic materials science into applied engineering for hybrid-electric aircraft and heavy vehicles. The Robinson Research Institute began with fundamental research into high-temperature superconductors. Initial studies focused on understanding the properties and potential applications of these materials. With MBIE's support, the institute expanded its research to include cryogenics and power electronics, forming a comprehensive approach to electric propulsion. Collaborations with international partners like NASA and Boeing helped scale the technology from lab prototypes to real-world applications. Outcomes from this include the development of a 3MW superconducting motor for electric aircrafts. These motors are being tested for use in hybrid-electric aircraft and marine propulsion systems with these systems estimated value being between USD $2–5 million
- **Lumi™ Drug Scan:** Lumi™ began as a co-design initiative between ESR and NZ Police, piloted in 2020 and evaluated through early 2021. MBIE's SSIF enabled the development of AI-powered drug detection tools, which were refined through field testing. By 2022, Lumi™ was rolled out nationwide, with 150 devices deployed. The project grew from a prototype to a national policing tool. The Lumi™ project started with a focus on developing a reliable and portable drug detection device. Initial prototypes were created using near-infrared spectroscopy and machine learning algorithms. Field testing with NZ Police provided valuable feedback, leading to iterative improvements in the device's accuracy and usability. MBIE's continued support allowed ESR to integrate cloud-based

analytics, making Lumi™ scalable for national deployment. The global AI-powered drug detection and forensic tech market is projected to exceed **USD $2.5 billion by 2027** and Lumi™ represents a **niche but growing segment** of this market, particularly in mobile field applications.

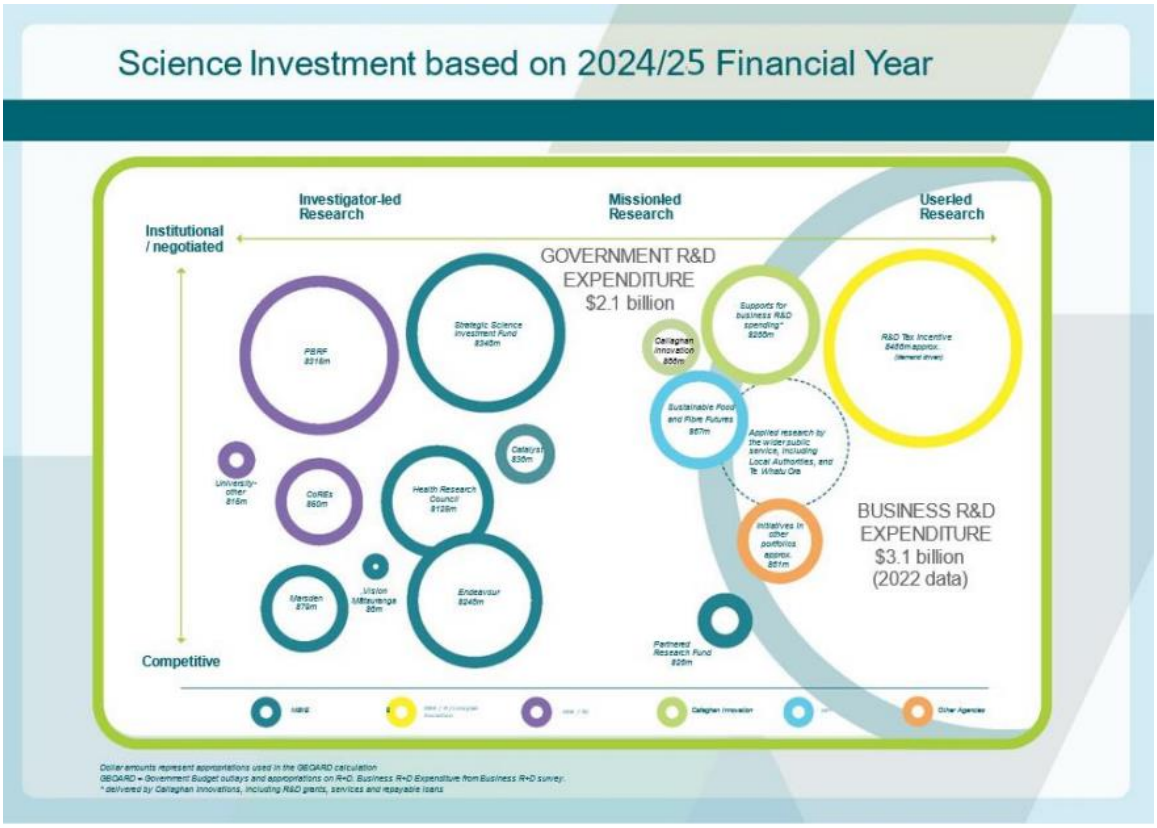
- **Ocean Observation Project:** The Moana Project, funded with $11.5 million from MBIE's Endeavour Fund was a project with a 5-year duration that transformed New Zealand's ocean monitoring capabilities. It integrated mātauranga Māori, crowd-sourced data, and advanced modelling. Over five years, it evolved into a national platform supporting fisheries, climate resilience, and marine science. The project's success has led to new initiatives in ocean forecasting and blue economy development. The Moana Project began with a focus on enhancing New Zealand's ocean monitoring capabilities. Initial research involved integrating traditional Māori knowledge with modern scientific methods. Crowd-sourced data from local communities provided valuable insights into marine ecosystems. MBIE's support enabled the development of advanced modelling tools for climate resilience and fisheries management. These sensors are now used on over 250 commercial fishing vessels in New Zealand.
- **3D Printing for Amputees – Custom Prosthetics at Scale:** This project began at Victoria University's School of Design with MBIE and NZ Product Accelerator support in 2010. It has grown from student-led prototypes to clinical partnerships with the NZ Artificial Limb Service. By 2023, 40% of lower-limb prosthetics were 3D printed. The project continues to expand into upper-limb devices and mobile delivery. The 3D Printing for Amputees project began with the development of custom prosthetic designs using 3D printing technology. Initial prototypes were created by students at Victoria University's School of Design. MBIE's support enabled collaborations with clinicians and patients, leading to iterative improvements in prosthetic design and functionality. The project's success in reducing production costs and wait times attracted private sector interest and expanded its reach to regional hospitals. The growth from student-led prototypes to scalable, patient-centred solutions highlights the transformative potential of design-led innovation. This project has produced custom 3D-printed prosthetics, including swim limbs and lifestyle sockets. These are now used by the NZ Artificial Limb Service and private providers like BDL.

How funding decisions are made in the current system

23. Funding decisions are made by different decision-makers including the Science Board, the Minister, MBIE, or other entities, depending on the fund. Examples of current funding mechanisms include the Marsden Fund, Endeavour Fund, Health Research Council (HRC), Centres of Research Excellence (CoRE) Fund and the Strategic Science Investment Fund (SSIF). Callaghan Innovation also had an operating appropriation of $86 million in 2024/25.

24. Figure 6 highlights New Zealand's science investment based on the 2024/25 financial year.

Figure 6: New Zealand's science investment based on the 2024/25 financial year



Key structural issues in the current SI&T system

25. Various reviews, reports and engagement with stakeholders over the last decade have consistently highlighted the following issues across the SI&T system:

- **Continued focus of resources spent on research and innovation in New Zealand's traditional areas of strength**, limiting investments into new and emerging technology areas with high potential to transform the economy, such as artificial intelligence (AI), synthetic biology, aerospace, medical technology, and quantum technology.
- **Insufficient ability of public organisations to deliver core science and innovation functions**, such as the CRIs' mismatched funding to expectations and limited ability to adapt to government priorities, and Callaghan Innovation's wide mandate to include activities not well suited for an innovation agency.
- **Continued fragmentation** and siloes between research organisations due to the current organisational arrangements and funding model, causing counterproductive competition, complexity and unnecessary administrative effort.
- **Continued inability for Government to coordinate SI&T activities** including mechanisms for setting priorities and directing CRIs, and institutions adapting to those settings.
- **Continued difficulty for system actors to navigate the system** making it difficult for researchers, businesses, and collaborators to effectively partner and cooperate to maximise impact.

- **Suboptimal levels of research, innovative and commercialising activities**, limiting the generation of positive spillover benefits to the New Zealand economy.

26. The Science System Advisory Group (SSAG) was established on 25 March 2024 to investigate issues across the SI&T system. Its first report observes that New Zealand's relative wealth and international position have declined, and that we have become reliant on past SI&T investments in the primary sector. Meanwhile, other small, advanced economies, most major countries, and the European Union have long recognised and demonstrated the central role of SI&T in driving productivity and economic growth.

Section 3: Overview of the Future SI&T System

The SI&T Reforms

27. The Government has announced the most significant reset of the SI&T system in over 30 years. These reforms aim to address long-standing, fundamental challenges that have constrained New Zealand's economic productivity and competitiveness, as outlined above.

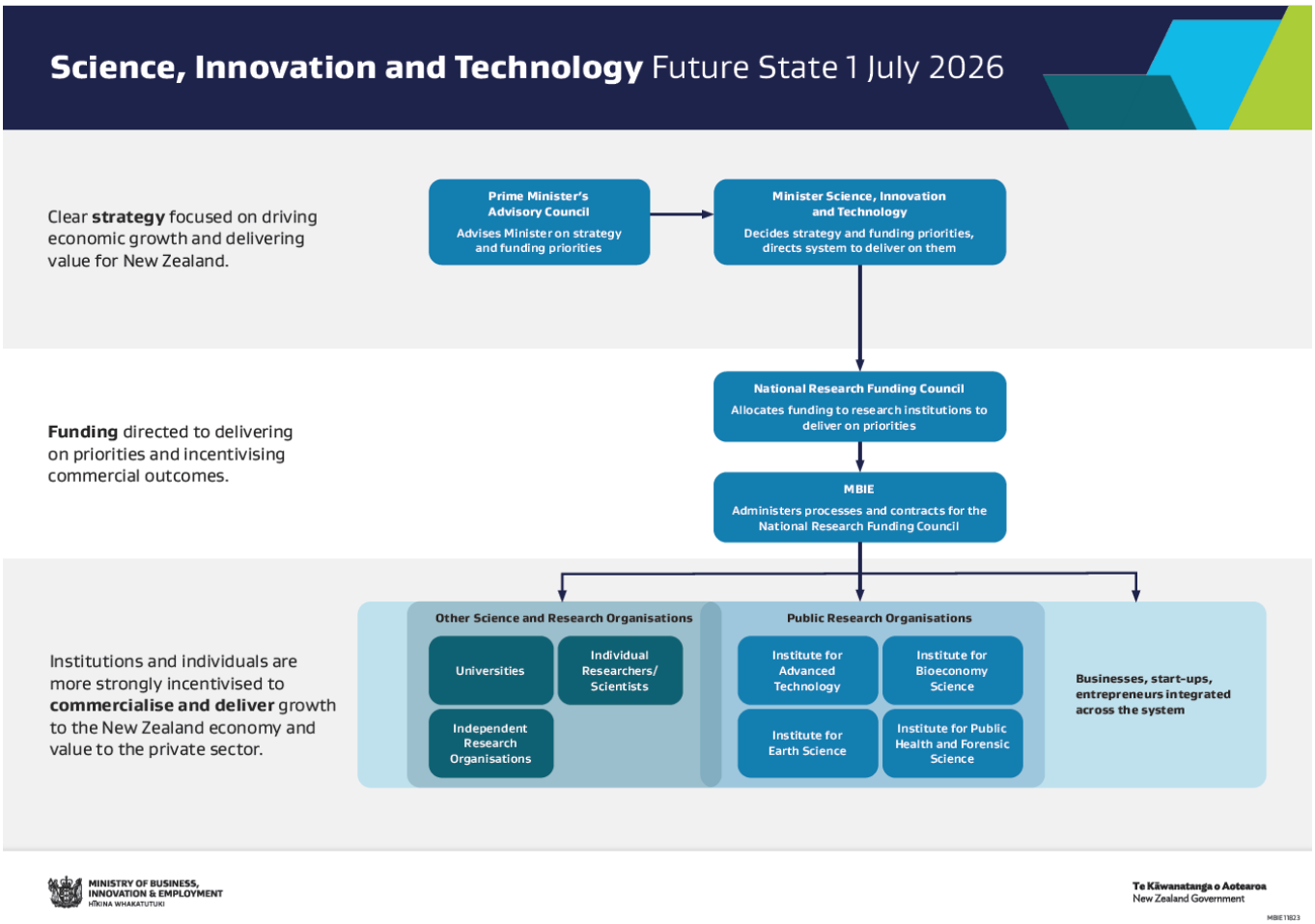
28. The SI&T Reform Programme includes the following specific decisions and changes:

    - **Prime Minister's Science, Innovation and Technology Advisory Council (PMSITAC)**: Establishing a high-level body to set strategic direction and oversight of the SI&T system and identify opportunities to leverage SI&T for economic growth and ensure alignment with strategy.
    - **Organisational consolidation**: Merging the seven existing CRIs into three public research organisations (PROs) focused on bioeconomy, Earth sciences (including climate and hazard resilience), and health and forensic science services. These PROs will be designed to be more responsive to Government priorities and deliver science for economic growth.
    - **Advanced Technology Research Organisation (ATRO):** Establishing a fourth PRO specifically focused on advanced technology research, capability building, and commercial outreach in areas like AI, synthetic biology, aerospace, medical technology quantum technology. This aims to address the investment gap in advanced technology and drive economic transformation.
    - **Invest NZ**: A dedicated government agency to attract multinational R&D and foreign direct investment across industries and technologies.
    - **Innovation support reform:** Restructuring support to better connect research with commercial applications. This includes the disestablishment of Callaghan Innovation as an innovation agency, with its important functions redistributed elsewhere.
    - **Funding reform**: Shifting the balance away from competitive funding toward more stable funding. A key proposal is the establishment of a single independent funding decision maker.

29. The future SI&T system is designed to be simpler, more strategic and responsive to Government priorities. It aims to quickly deliver benefits such as streamlined industry engagement, better use of infrastructure, and improved capacity to harness emerging technologies. Figure 7 illustrates a high-level overview of the future SI&T system.

30. A successful reformed system will deliver world-class research with strong economic returns for New Zealand. A key sift will be significantly increasing investment in advanced technologies, moving from 30% towards the OECD average of 60%. This rebalancing is critical to lifting productivity and enabling a higher-return, investment-ready system. By addressing systemic barriers, and setting clear priorities, the reforms will create a solid foundation for progressively increasing public R&D investment toward OECD benchmark levels.

Figure 7: Future SI&T system architecture



How future investment is likely to be structured

31. The reforms aim for a more strategic and coordinated approach to SI&T investment. A key proposal from the first SSAG report and currently under consideration, is the establishment of a single independent funding decision maker, referred to as a National Research Council (NRC).

32. The NRC would play a central role in delivering science outcomes through a more coordinated and priority-driven investment system:

- It would advise on and make funding decisions about the most effective ways to deliver science outcomes.
- Its decisions would be informed by advice from PMSITAC and the Minister of SI&T.

CAVEAT: Information relating to the NRC is outdated and represents the role and design of entitles in the wider SI&T system being continuously developed.

- It may operate through distinct, expert-assessed pillars, potentially including a dedicated pillar to support mātauranga Māori.
- It is proposed to be established as an independent board with secretariat and administration provided by MBIE.

33. The PMSITAC would identify priority areas and advise on the appropriate proportions of funding by "pillar" (potentially aligned with technological, life, natural, social and health science and humanities) as well as suggest specific technologies or granular areas to develop or de-prioritise.

34. The NRC would then give effect to this strategy by designing and publishing an overarching investment strategy and a strategy for each pillar in consultation with MBIE and PMSITAC.

35. It is assumed that existing MBIE administered SI&T funding (at least the majority) would be discontinued and transitioned into a new funding pool managed by the NRC. This would involve consolidating funding mechanisms like the Strategic Science Investment Fund (SSIF), the Endeavour Fund, the Marsden Fund, and the Health Research Council (HRC) funding under the NRC.

36. Funding boards, appointed by the Minister will continue to make specific funding decisions but would be obliged to align those decisions with the SI&T priorities. Legislation would clarify this requirement.

37. The proposed legislation (SI&T Bill) would enable funding decisions to be made for proposals generated from either contestable or non-contestable funding processes.

38. As part of this transition, the 2026 round of the Endeavour Fund has been paused to allow funding to transition to the new model through a reallocation process developed with sector consultation.

39. Investment in a platform of advanced technology research and capability under the SSIF is planned as a first step for establishing the advanced technology focused PRO.