



Prime Minister's Science, Innovation and Technology Advisory Council: Refining Science, Innovation and Technology System Priorities Report

Purpose

1. This report provides high-level recommendations on the outcomes that New Zealand's Science, Innovation and Technology (SI&T) investment should seek to achieve, and how prioritisation decisions should be made. It is the second report developed by the Prime Minister's Science, Innovation and Technology Advisory Council (the Council) and builds on its first by aligning recommendations with the four-pillar SI&T framework and system-level direction it established.¹
2. The four pillars are:
 - Primary Industries and Bioeconomy
 - Technology for Prosperity
 - Environmental Sustainability and Resilience
 - Healthy people and a Thriving Society.
3. Research Funding New Zealand (RFNZ) is responsible for translating New Zealand's SI&T system priorities into investment decisions through the development of Pillar Investment Plans (the PIPs). The Council intends that the outcomes and guidance set out in this report be incorporated into the PIPs to inform those decisions.

Background

4. In its earlier report to the Prime Minister on prioritising SI&T, the Council recommended New Zealand develop a mission-led SI&T framework, redirect resources for outsized impact and use pillar-based priorities to signal change. The Prime Minister endorsed the report's findings and these recommendations.
5. The Council also outlined its intention to develop more granular investment priorities and outcomes within each of the four pillars. This would better enable RFNZ to translate the Council's advice into funding and capability decisions.
6. This paper delivers on that intention by:
 - providing further guidance on implementation (**pages 2-3 refer**)
 - applying core principles and criteria (**page 4 refers**)
 - outlined refined pillar priorities, outcomes and examples (**pages 5-12 refer**).
7. The Council has provided a **summary statement** for each of the four pillars, before setting out the **expected contributions** of SI&T and the **priority areas** for investment. These priority areas

¹ [Report to the Prime Minister: Prioritisation in New Zealand's Science, Innovation and Technology system](#)

are framed around the key **challenges** warranting prioritisation, and the **outcomes** investment is intended to deliver.

Council guidance on SI&T investment and prioritisation

8. **Prioritisation with scope for breakthrough opportunities**

The Council expects the majority of public research investment to be directed through the strategic pillars set out in its earlier report to the Prime Minister. However, a rigid application of the pillar framework risks overlooking emerging, cross-cutting or unconventional research with substantial benefit for New Zealand. The Council recommends supporting high-value opportunities outside of the pillars, provided they are directly linked to economic growth or the provision of public good, and at least 50% of the cash comes from non-government sources.

9. **Investment based on impact, not technological maturity**

Funding prioritisation should focus on where public investment can deliver the greatest national impact, regardless of technological maturity or position along the discovery-to-application continuum. This reflects the need for a healthy, connected innovation pipeline spanning discovery (basic science), applied science, deployment, and diffusion. Investment proposals should demonstrate a credible pathway to economic, environmental, human or social benefit, whether through early-stage research that builds understandings and future capability or later-stage activity focused on application and scale-up.

10. Importantly, “impact” is not confined to the creation of new knowledge or novel innovation. It can also be achieved through the application, integration, or scaling of existing science where this enables faster uptake, wider diffusion, or outsized benefits across sectors and society.

11. **Interdisciplinary approaches**

The four pillars provide an organising framework for investment decisions, but they are not intended to operate as closed or self-contained silos. Funding mechanisms should support inter-, multi- and transdisciplinary research and enable pathways across pillars (**Figure 1 refers**).² This recognises that foundational science in one area can generate applications, spillovers, and benefits in others.

12. **Applying the Council’s principles**

The Council’s principles identify core requirements that all proposals must meet, including relevance to New Zealand, justification for taxpayer investment, and research excellence (**Figure 2 refers**). Investment is expected to deliver impact through either economic or public good and stewardship outcomes. Stronger proposals will provide for SI&T translation and uptake, international connectedness, workforce development, and enabling innovation, recognising that national impact can be achieved through multiple, complementary pathways across the system.

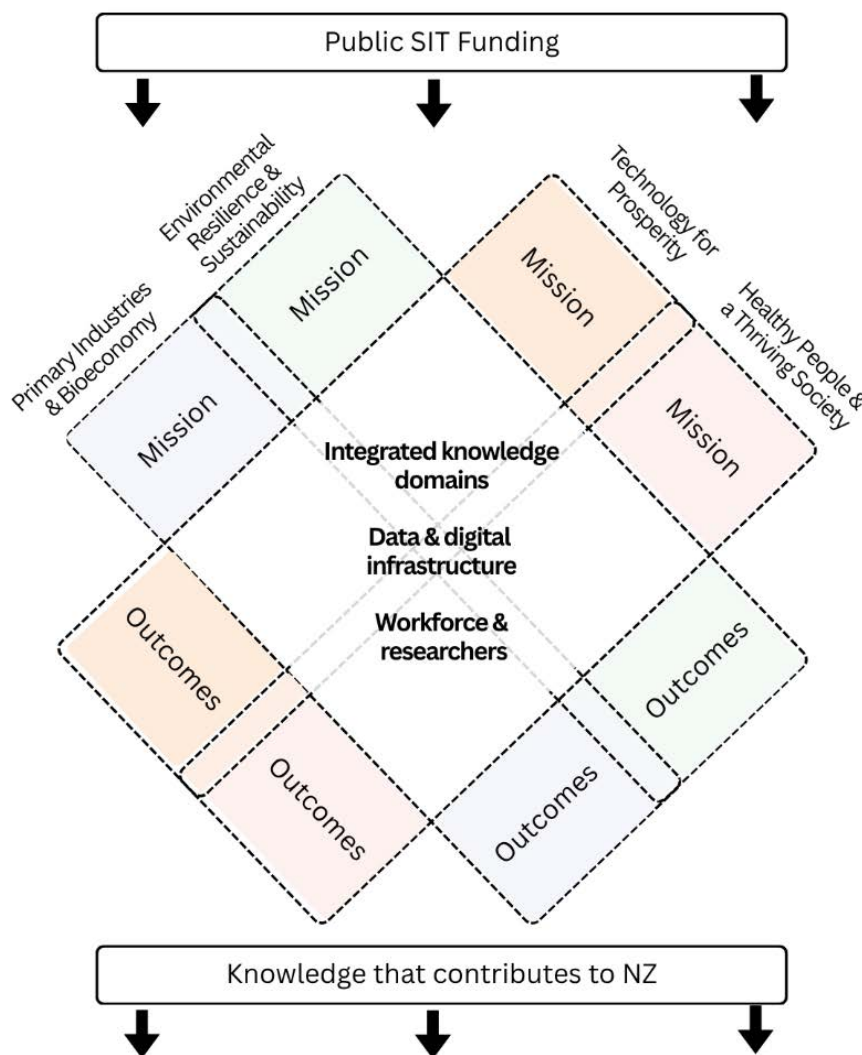
13. **Investment does not need to be equally distributed**

This paper outlines five-to-six priority areas per pillar, with a total of twenty-three across the SI&T system. Funding allocated to a pillar is not expected to be evenly distributed between the priorities within that pillar. Rather, investment should reflect differences in expected impact, the maturity of opportunities, national need, and the strength of the case for public funding. This approach avoids diluting investment where more concentrated funding could deliver greater national benefit.

² Transdisciplinary research is defined as engaging end-users both in the design and conduct of the research.

14. Importance of data collection for the SI&T system

Peer economies are deriving greater value from science investments by making data capture and sharing a key component of public funding. This reflects the role of reusable, machine-readable data in enabling reuse at scale and building long-term national AI capability. Where appropriate and where capacity allows, RFNZ should consider encouraging or requiring funding recipients to share data in line with the FAIR (findable, accessible, interoperable and reusable) principles, particularly where underlying data has potential value for nationally significant datasets.



- Knowledge translates across pillars over time.
- Fundamental research can originate in one pillar and have application in another.
- Knowledge can have commercial, public or socioeconomic outcomes.

Figure 1. Funding mechanisms should support inter- and multidisciplinary research and enable pathways across pillars

Research must demonstrate...

- **Relevance to New Zealand** - Prioritise science that builds on existing strengths and comparative advantage or develops strategic capability where there is a clear national need.
- **Justification for taxpayer investment** - Must deliver meaningful outcomes for NZ's economic, social, or environmental benefit. Alignment with national SI&T priorities, or a demonstratable step-change against other criteria, is essential.
- **Research excellence** - Must be rigorous, innovative, ethically conducted, and internationally benchmarked. Expert-led assessment ensures coherence across pillars and disciplines.

And either economic uplift

- **Industry impact** - Supports economic growth by lifting productivity and competitiveness, including through the adoption of knowledge and innovation that enable higher-value exports.

Proposals are expected to also demonstrate either one or both of:

- **Sector interest** - Research must have a credible pathway to impact, either through end-user demand, collaboration and responsiveness or by creating knowledge that enables future applications and spillovers.
- **International connectedness** - Strengthens international connectivity and influence by attracting high-value partnerships, talent and investment, supported by access to shared assets that help NZ compete and lead in selected niches.

Stronger proposals will also demonstrate one or both of:

- **Workforce development** - Builds and retains a diverse, future-ready workforce and strengthens regional capability by developing the skills, mobility and depth needed to generate and apply knowledge in areas of national importance.
- **Enabling innovation** - Strengthens NZ's innovation pipeline by producing capability that can seed multiple downstream innovations across pillar priorities.

Or public good and stewardship

- **Public good nature of research** - Delivers value where markets do not operate effectively - including stewardship of national assets, systems and risks, and knowledge where benefits are diffuse, long-term or non-commercial.

Proposals are expected to also demonstrate:

- **Sector interest** - Research should have a credible pathway to impact, either through end-user demand, collaboration and responsiveness or by creating knowledge that enables future applications and spillovers.

Stronger proposals will also demonstrate some or all of:

- **International connectedness** - Strengthens international connectivity and influence by attracting high-value partnerships, talent and investment, supported by access to shared assets that help NZ compete and lead in selected niches.
- **Workforce development** - Builds and retains a diverse, future-ready workforce and strengthens regional capability by developing the skills, mobility and depth needed to generate and apply knowledge in areas of national importance.
- **Enabling innovation** - Strengthens NZ's innovation pipeline by producing capability that can seed multiple downstream innovations across pillar priorities.

Figure 2. Applying PMSITAC's prioritisation principles

Primary Industries and Bioeconomy

15. **Mission statement:** New Zealand’s primary industry sectors are central to national prosperity, exports and regional employment, but face mounting pressure from weak productivity growth, rising costs, climate impacts, biosecurity risks and tightening environmental limits. New Zealand’s long-term prosperity depends on lifting performance and resilience in existing systems and expanding into higher-value products through science that strengthens sustainability and enables new processes and intellectual property.

16. Expected contributions from SI&T:

- a. Productive, resilient and sustainable primary production systems.
- b. World-leading biosecurity prevention, preparedness, and response.
- c. Technology-enabled, data-driven production systems.
- d. Greater value capture and diversification by enabling high-value products, advanced processing and Intellectual Property (IP).

17. Priority areas:

Industry challenge	Investment outcome
<p>Exposure to biosecurity threats driven by increasing global trade and travel, climate-driven expansion of pest and disease ranges, and growing propagule pressure along supply chains.</p>	<p>Support world-leading approaches to biosecurity, by enabling prevention, early detection and rapid response to diseases and invasive species, through integrated surveillance, diagnostics and system-level monitoring of value chains.</p>
<p>Limited value capture and diversification across primary sectors leave economic value unrealised and expose exporters to price volatility, with an over-reliance on bulk, minimally processed outputs.</p>	<p>Create high-value products, advanced processing capability and IP by building on New Zealand’s primary strengths, including premium foods, ingredients, nutraceuticals, advanced materials, chemicals and bio-manufactured products.</p>
<p>Pressure from climate and environmental thresholds, with insufficient adaptive and genetic capability to sustain resources, productivity, value creation and resilience.</p>	<p>Promote resilient, productive and sustainable production systems, by developing science that supports adaptive, low-impact production systems, including through the genetic improvement of plants, animals, fish and forestry species to lift productivity and climate resilience.</p>
<p>Unrealised potential of advanced technologies is limiting productivity,</p>	<p>Develop high-tech-enabled production systems - technology to be integrated, tested and adapted to real-world primary</p>

efficiency and value capture across primary and extractive production systems.

production, unlocking precision production, resource efficiency, and robust traceability across supply chains.

Environmental, social and cost pressures constrain New Zealand’s ability to capture value from critical minerals.

Work to become a trusted, low-impact supplier of critical minerals by doing science that supports lower-impact exploration, extraction, and processing of mineral and energy resources.

18. Examples of investments that would and would not be funded:

Priority area	Within scope	Outside scope
Create high-value products, advanced processing capability and IP.	High-value marine biomaterials from NZ shellfish by-products for biomedical and regenerative applications.	Biomaterials research primarily based on imported or globally commoditised inputs, with no meaningful reliance on New Zealand-derived species, systems, or capabilities.
Resilient, productive and sustainable production systems.	Genomic selection and breeding of pasture species, crops, forestry, livestock or aquaculture species to improve tolerance to heat, drought, pests and disease.	Firm-specific genomic or propriety herd research that delivers incremental gains under current conditions and/or relies on closed or imported genetic resources and does not materially expand NZ-wide capability.

Technology for Prosperity

19. **Mission statement:** The next wave of economic growth and human development depends on advanced technologies that are being rapidly developed and scaled offshore. New Zealand needs to invest in advanced technologies to lift productivity, remain internationally competitive, and deliver stronger public good and stewardship outcomes. This requires a distinct approach that builds capabilities aligned to New Zealand’s unique settings and strengths, generates broad spillovers, and connects key sectors into global value chains.

20. Expected contributions from SI&T:

- a. Capability for smarter decision-making and system performance.
- b. Measurable productivity, competitiveness and stewardship gains.
- c. Knowledge that supports higher positioning in global value chains.
- d. Improved value proposition for international talent, capital and partnerships.

21. Priority areas:

Technology challenge	Investment outcome
Demand for tailored decision-making tools to leverage data-intensive systems and support national productivity transformation and data-rich products and services.	Build advanced computing and AI capability for adaptive decision-making across complex, end-to-end systems - with a specific focus on applied AI tools that leverage New Zealand's size, unique domain datasets, and shared platforms that make this capability accessible to small and medium operators across the country.
Biological and biomedical strengths are not yet consistently converted into high-value products and exports , reflecting limitations in scale-up, advanced processing and integration with engineering and data	Back engineering biology, biomedical science, synthetic biology and biomanufacturing to create new high-value products, processes and platforms, linking innovation with advanced engineering, data and processing capability to enable new biological and medical industries and exports
Advanced technologies are shaping future paths of development, but scale advantages sit offshore raising the risk that New Zealand becomes locked in lower-value roles in the global economy.	Support enabling-technologies at key adjacencies that underpin high-value products, efficiencies and participation in global value chains. Areas of niche strength include, advanced materials, photonics and sensing, autonomous systems, and applications in agritech and medtech.

<p>Realising long-term value from structural advantages in space and ocean access with a deliberate focus on downstream capability.</p>	<p>Support space-enabled innovation so New Zealand becomes preferred global launch partner, supporting the development of downstream space applications that translate capability into economic, environmental and security value.</p>
<p>Access to global capital, talent, and strategic partnerships for advanced technology development, testing, and deployment at scale.</p>	<p>Position New Zealand as a trusted real-world innovation sandbox, enabled through investment in workforce capability, secure environments, regulatory science and de-risking, and living laboratories that attract global capital, talent and partners.</p>
<p>Ensuring energy security, reliability and affordability in an increasingly complex and distributed energy system that existing grid, control and market arrangements are not equipped to manage.</p>	<p>Create smarter, intelligent energy systems supported by advanced generation and storage, digital control and system intelligence, grid optimisation, and emerging hydrogen and ammonia energy vectors.</p>

22. Examples of investments that would and would not be funded:

Priority area	In scope	Outside scope
Space-enabled innovation.	Space domain awareness or space traffic management technologies (for example ranging systems, orbit determination methods, conjunction management systems).	Space initiatives designed as autonomous, nationally self-contained systems, with minimal interoperability or integration into international missions, standards, data networks or value chains.
Backing enabling technologies at key adjacencies.	Multi-functional carbon-composite structures with embedded fibre-optic or printed sensor networks and self-diagnostics (such as damage detection, strain mapping, fatigue prediction).	Material substitution (e.g. alternative fillers, fibres or coatings) to reduce cost or meet regulatory requirements, without delivering a step-change in performance, capability or innovation potential.
Build advanced computing and AI capability.	Applying machine learning to integrate biosecurity surveillance, border, and climate spread data into a	Building a sovereign foundational AI model without a clear application pathway or demonstrable

	real-time national risk platform for councils and primary operators.	advantage over existing offshore models.
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Environmental Sustainability and Resilience

23. **Mission statement:** New Zealand faces compounding environmental pressures from increasing exposure to natural hazards and weather extremes, ongoing biodiversity loss, stress on land and resources and the need to transition energy and production systems at pace. These pressures are amplified by changing climate conditions and global responses to the causes and impacts of climate change. Science is critical to reducing risk, restoring natural capital, enabling clean and circular systems and supporting confident, long-term environmental decision-making.

24. Expected contributions from SI&T:

- a. Improved resilience to natural hazards and weather impacts.
- b. Improving allocation, efficiency and environmental outcomes for key natural resources.
- c. Protection and restoration of biodiversity and New Zealand’s distinct natural heritage.
- d. Climate mitigation and adaptation informed by robust science.
- e. Trusted environmental data, monitoring, and integrated decision support.
- f. International leadership in Antarctic and Southern Ocean stewardship.

25. Priority areas:

Environmental challenge	Investment outcome
High exposure to natural disasters and weather extremes is a threat multiplier across health, infrastructure, ecosystems and the economy, and are increasing disruption, losses and recovery costs.	Enable integrated multi-hazard and climate risk science that strengthens forecasting, engineered preparedness, land-use and infrastructure decisions at national, regional and local levels.
Biodiversity loss and ecosystem degradation are weakening natural capital, but interventions are constrained by high costs, competing interests, limited monitoring and evaluative capability and fragmented science and data systems.	Supporting system-scale nature recovery through science to deliver real-world tools and integrated methods for prioritised, demonstrable and cost-effective recovery of species and ecosystems across land, freshwater and marine environments.
Decision uncertainty under changing climate conditions is preventing effective mitigation and adaptation by limiting	Actionable climate science that provides robust, accessible evidence, models and decision support tools to inform mitigation and adaptation choices and build

confidence in long-term planning, investment and regulatory choices.	long-term environmental resilience across regions and sectors.
New Zealand’s energy and fuel systems must become cleaner without compromising supply, affordability and reliability, while managing environmental impacts.	Support cleaner energy systems by investing in effective renewable generation and economy-wide electrification, with evidence to site, design and operate clean electricity and low-emissions fuel systems.
Human activities and industry are increasing pressure on land and natural resources , yet production and material systems remain largely linear and resource-intensive.	Create integrated circular systems where science supports system-level methods, processes and decision frameworks that allow circular production and Greentech solutions to be designed, integrated and scaled across the economy.
Environmental governance and regulation lack integrated evidence , data, behavioural insight and lifecycle analysis to support effective, coherent and defensible policy and regulatory decisions.	Science to support environmental governance, policy and regulation covering settings, standards, incentives, behaviour change, decision frameworks and lifecycle assessment.

26. Examples of investments that would and would not be funded:

Priority area	In scope	Outside scope
Actionable climate science.	Transforming complex climate and impact science into usable formats (like tools, guidance, scenarios) that decision-makers can apply directly in policy, planning and investment contexts, rather than remaining in academic outputs.	Climate science where outputs are unlikely to exceed or meaningfully differentiate or add to that from major international centers, and/or do not link results to national mitigation or adaptation.
Integrated circular systems.	Developing integrated material-recovery and re-manufacturing systems that change how products are designed, processed, collected and reintroduced into supply chains.	Piloting novel waste-processing technologies (e.g. chemical recycling, pyrolysis, advanced separation) without the systems integration needed to align product standards, offtake arrangements, and

		upstream product redesign for scalable use.
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Healthy People and a Thriving Society

27. **Mission statement:** New Zealand’s societal resilience and health systems face growing pressures from demographic change, persistent inequities, rising demand, and constrained fiscal and workforce resources. Without innovation, these pressures risk undermining affordability, effectiveness, and long-term sustainability. By leveraging New Zealand’s distinctive population characteristics, integrated data assets, and pragmatic policy and service environment, science can enable more effective, equitable, and efficient health, social, and economic outcomes, while generating robust evidence and solutions of global relevance.

28. **Expected contributions from SI&T:**

- a. Enable longer, healthier and more participatory lives.
- b. Support smarter, more sustainable communities, social and health systems.
- c. Build inclusive human capital and societal resilience.
- d. Establish New Zealand as a globally recognised and trusted environment for real-world testing.
- e. Translate clinical research and medical innovation into improved prevention, diagnosis, treatment, and care.

29. **Priority areas:**

System challenge	Investment outcome
Unrealised potential of unique population and cultural knowledge plus longitudinal data assets to inform policy, service and through prevention, implementation and delivery.	Deliver health and social impact by leveraging our unique and diverse population and data to enable earlier effective interventions and disease prevention.
Fragmented innovation pathways, slow translation from research to practice, and limited integration across research, industry, and health systems mean New Zealand’s strong transdisciplinary biomedical research capability is not fully realised, constraining its potential to deliver health and economic impact through diagnostics, therapeutics, and technologies.	Deliver social and economic impact through biomedical innovation by advancing new diagnostics, therapeutics, and technologies to improve outcomes, and drive life sciences growth.

Health and social systems face chronic fiscal and workforce constraints, yet innovation has not consistently translated into lower-cost, higher-impact models of care.

Improve value and efficiency of health and social services to deliver smarter healthcare through better models of care, technology, decision-making, and service delivery.

Rising longevity without comparable gains in healthy life expectancy, including increasing rates of high-burden, preventable health conditions placing pressure on health and social systems and limiting participation in work and community life, particularly for Māori and Pacific populations.

Extend healthy lifespans by reducing the impact of high-burden physical and mental health conditions to extend productive lives, participation in work and society, and sustainable use of health services.

Under-utilisation of technology and data-driven solutions due to social licence, trust and human-centred design challenges that slow adoption across public and private sectors.

Create human-centred innovation to improve the adoption and effective use of new technologies in health, address barriers to trust and acceptance, and resolve people’s challenges interfacing with technology.

Structural demographic change, inequality, and weak productivity are straining social institutions and exposing gaps in human capital, highlighting the need for evidence-informed approaches to strengthen resilience, reduce inequities, and lift skills and productivity in a high-value economy.

Improve societal resilience, equity, and productivity by investing in science, innovation, and technology to strengthen social and education systems to meet New Zealand’s needs given the changing social and economic conditions in a small, high-value economy.

30. Examples of investments that would and would not be funded:

Priority area	In scope	Outside scope
Extending healthy lifespan	Validating tools or interventions that identify disease risk associated with major NZ burden conditions and enable timely, low-cost action that preserves function and reduces downstream demand on acute services.	Research that does not engage with, or demonstrate relevance across, key population groups (including different ages and life stages), and therefore does not contribute to narrowing gaps in healthy life expectancy or participation.

Resilient society	Applying evidence to design and evaluate early, preventive interventions that enhance societal resilience and/or reduce long-term demand on social services (e.g. child wellbeing, family stability, long-term unemployment), generating durable fiscal and social returns.	Approaches driven primarily by normative positions or advocacy aims, rather than robust evidence and evaluation of what strengthens societal resilience over time.
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