

Defining Science, Innovation and Technology Pillar Investment areas

PMSITAC Paper – 13 March 2026

Recommendations

Consider the pillar investment areas we have identified.

Agree on 5-6 priority investment areas per pillar.

Agree on the level of outcomes sought for investment areas.

Purpose

This paper seeks the Council's agreement to 5-6 priority investment areas per pillar, which will be recommended to the Prime Minister to guide future investment decisions.

Background

1. Your Priorities Report set out a four pillar, thematic framework to describe New Zealand's Science, Innovation & Technology (SI&T) investments and to guide where system investment should be directed for the greatest impact.
2. Building on this foundation, we have worked with relevant government agencies to identify up to 11 potential investment areas for each pillar. For ease of reference, the four pillars are:
 - Healthy people and a thriving society
 - Environmental sustainability and resilience
 - Technology for prosperity
 - Primary industries and bioeconomy
3. We are now seeking your agreement to:
 - a. whether the investment areas are fit for purpose;
 - b. the 5-6 investment areas per pillar you wish to prioritise and recommend to the Prime Minister;
 - c. the level of outcomes sought for each investment area.
4. To support decision making, we have mapped each investment area against pillar specific criteria derived from the prioritisation principles in your report to the Prime Minister (**Annexes 1-4 refer**).

Investment Areas

Categorising investment areas

5. We have worked with government agencies to identify 9-11 investment areas within each pillar. When identifying these areas, we:
 - a. considered your pillar mission statements
 - b. considered the Government’s Going for Growth agenda
 - c. considered government agency preferences
 - d. mapped investment areas against socio-economic objective (SEO) codes to capture most of the potential investments under each pillar
 - e. mapped investment areas against field of research (FoR) codes to support scientific clarity and bibliometric
 - f. framed investment areas to enable cross-sector application

Longlist of investment areas for each of the four pillars

6. The following sections set out the longlist for each of the investment areas for each of the four pillars, with a definition of the science and research aligned with each area. As noted, more detail on the analysis and definitions underpinning these areas is included in **annexes 1-4**:

Healthy people and a thriving society

Investment area	Definition
Prevention of high burden/prevalence conditions and diseases (incl. mental health)	Population level research to prevent and reduce high burden conditions by addressing life course risk factors, social determinants and inequities that shape health outcomes in New Zealand.
Digital health, data platforms and learning health systems	Digital tools, AI, data platforms and analytics enabling interoperable learning health systems, surveillance and evidence informed clinical and system decisions.
Workforce and capability for health research, delivery and translation	Building health and research workforce capability to generate, translate and apply evidence across health services and policy.
Foundational biomedical discovery	Generating foundational biological and clinical knowledge - including genomics, pathophysiology and mechanisms of disease - that underpins future precision medicine and targeted clinical care.
Biomedical translation and preclinical development	Applying biomedical discoveries through preclinical testing and validation to develop prevention, diagnostic and therapeutic interventions.
Health security (incl. emerging pathogens, diseases and preparedness)	Strengthening preparedness, surveillance and response to infectious threats through integrated human, animal and environmental health research.
Health systems, models of care, governance and performance	Designing and evaluating health system structures, models of care and governance to improve access, equity, quality and performance.
Māori and Pacific health and wellbeing	Māori and Pacific-led research strengthening health systems and workforce capability to deliver measurable gains in quality of life and life expectancy.

Environmental sustainability and resilience

Investment area	Definition
Ecosystem restoration and management.	Active management of land, soil, water, marine and air, including the protection and restoration of environs, native species and habitats, supported by monitoring, modelling and decision support.
Understanding, mitigating and adapting to climate change	Understanding and reducing climate change impacts across communities, species, ecosystems and the economy, including scenarios, attribution, and integrated assessment and adaptation planning.
Natural Hazard Risk Reduction	Understanding and mitigating geological, climatic and meteorological hazards, including risk analytics, early warning and impact reduction measures.
Solutions for resilient infrastructure	Transport systems and enabling infrastructure solutions that withstand climate and hazard risks, including design standards, asset management and system resilience.
Southern Ocean and Antarctic environmental stewardship	Environmental stewardship of Southern Ocean and Antarctic environs, including ice and ocean processes, ecosystems and biodiversity, long-term observations.
Renewable energy systems, energy efficiency and demand reduction (incl low emissions systems)	Renewable, energy systems analysis, and the reduction of energy demand through efficient systems, design and behaviour. Reducing emissions through technology, operations and system change.
Environmental policy, governance, standards and behaviour	Design, assess and improve environmental policy and governance, including regulatory settings, standards, incentives, behaviour change, decision frameworks and lifecycle assessment.
Circular economy and Resource efficiency	Reducing waste and pollution, increasing reuse, repair and recycling, and improving resource efficiency across production, services and infrastructure.
Foundational and enabling environmental science	Strategic research and enabling capabilities for environmental sustainability and resilience, including observation and monitoring systems, data and analytics, modelling, methods, and research infrastructure.
Nature-based enterprises and ecosystem markets	Scaling nature-based products, services and markets delivering measurable environmental outcomes and sustainable revenue, including biodiversity credits, ecosystem services, restoration enterprises and bioproducts.

Technology for prosperity

Investment area	Definition
Quantum-enabled technologies for computing, communications and networking	Develop quantum-enabled capabilities for sensing, timing communications and computing that underpin future high-value industrial and security applications.
Photonics and sensing for increased precision and quality	Advance photonics-based sensing, imaging and measurement technologies to improve precision, quality and productivity across advanced manufacturing and adjacent sectors.
Autonomous systems, robotics and sensing for industry and environments	Enable autonomous systems and robotics that improve safety, precision and productivity in complex environments, including industrial, marine, air and logistics contexts.
AI and advanced computing for higher-complexity, data-rich products and services	Develop and apply AI and advanced computing to optimise complex systems, decision-making, and enable intelligent manufacturing and services.
Frontier bio engineering (incl. synthetic biology and engineering biology).	Design and engineer biological systems to create new or improved industrial products, processes and platforms.
Advanced materials for high complexity products	Develop materials with new or enhanced properties that improve performance, durability and sustainability in manufactured products and systems.
Space technologies and downstream applications	Grow space-related technologies and space-enabled services, including satellites, launch systems and observation.
Biomanufacturing and bioprocessing capability	Scale bioprocessing and biomanufacturing systems that convert biological feedstocks into high-value chemicals materials and ingredients.
Medtech, diagnostics and therapeutics for export	Develop and manufacture medical devices, diagnostics and therapeutic technologies with clear pathways to validation, production and export.
Advanced energy technologies and storage	Advance next-generation energy technologies that support low-emissions energy supply, storage, conversion and industrial decarbonisation.

Primary industries and bioeconomy

Investment area	Definition
Productive, resilient & sustainable primary production systems	Improving the performance, resilience and sustainability of agriculture, horticulture, forestry, fisheries and aquaculture, including production practices across the full on-farm and near-farm system.
Precision technology, automation, AI and decision-support for primary sectors	Enabling smarter data-driven primary production through on-farm and in-field agri-technologies, including sensing, robotics, automation, AI-enabled decision-support and integrated digital systems.
Genetic improvement of plants, animals, fish and forestry species	Accelerating productivity, resilience and value through breeding, genomics and related technologies, including underpinning biological research supporting long-term system improvement.
Climate mitigation, adaptation and resilient primary production systems	Reducing emissions, adapting to climate change and building resilience across production systems and value chains, including climate-resilient technologies, practices and infrastructure.
Better resource use including freshwater, soils, nutrients, marine space and waste management.	Improving allocation, efficiency and environmental outcomes for key natural resources, including precision use, monitoring and management across production and processing systems.
Biosecurity science for economic protection, human health, and protection of flora/ fauna	Preventing, detecting and responding to pests, diseases and invasive species, including surveillance, diagnostics and system-level monitoring integrated into production and value chains.
Creating high-value foods, ingredients and nutraceuticals	Creating higher-value food products, functional ingredients and nutraceuticals from primary production, including post-harvest processing, storage and transformation to increase value and export returns.
Building advanced, scalable and value-adding manufacturing capability	Developing advanced production and processing capabilities that enable scalable, resilient, sustainable and high-value manufacturing across domestic industrial value chains.
Enabling efficient, lower impact mineral and energy extraction and transition	Enabling efficient, resilient and lower-impact exploration, extraction, and processing of mineral and energy resources.

Prioritisation of investment areas

7. We have mapped these investment areas against a set of criteria developed from your prioritisation principles. These matrices are designed to support your work to identify 5-6 priority investment areas per pillar.
8. For each criterion, investment areas are assigned a high (green), medium (orange) or low (red) rating. These ratings represent relative strength of alignment, not absolute performance or funding priority:
 - **Green** indicates strong alignment and clear signals of relevance or readiness
 - **Orange** indicates partial or emerging alignment, or mixed evidence
 - **Red** indicates limited alignment or weak supporting signals at this time

9. Please note, these matrices are indicative and directional, providing comparative signals based primarily on qualitative analysis and judgement, rather than definitive quantitative measurement.

Outcome statements for investment areas

10. Each priority investment area will require an outcome statement to guide RFNZ in translating priorities into measurable investment decisions.
11. We have developed several draft outcome statements to test the level and ambition of outcomes you wish to apply. Subject to your feedback, we will develop an outcome statement for each of the priority investment areas that you select and provide them for your approval at the Council’s meeting in April.

Pillar	Investment area	Example outcome statement
Healthy people and a thriving society	Digital health, data platforms and learning health systems	Digital and data health platforms enable faster translation of evidence into practice, improved quality and safety, and more consistent performance measurement across services and populations.
	Māori and Pacific health and wellbeing	Māori health outcomes improve through kaupapa Māori research and mātauranga Māori leadership that strengthens whānau-centred models of care, Māori data sovereignty, and enduring Māori research and workforce capability.
Environmental sustainability and resilience	Southern Ocean and Antarctic environmental stewardship	New Zealand maintains and strengthens its leadership and stewardship role in the Southern Ocean and Antarctica through world-class environmental research that informs international governance, environmental protection, and global understanding of climate and earth system processes.
	Natural Hazard Risk Reduction	Flood and landslide prediction accuracy increased by at least 15% compared to 2025 levels, enabling earlier warnings, more targeted risk reduction, and reduced damage to communities and infrastructure.
Technology for prosperity	Quantum-enabled technologies for computing, communications and networking	By 2040, New Zealand is among the top three suppliers of specialised components, software, or services into global quantum computing communications, and sensing supply chains.
	Biomanufacturing and bioprocessing capability	Advances in bioengineering and biomanufacturing support new high-value bio-based materials, ingredients, and therapeutics, shifting New Zealand’s high volume primary products sectors towards higher-margin, technology-enabled products.

Pillar	Investment area	Example outcome statement
Primary industries and bioeconomy	Precision technology, automation, AI and decision-support for primary sectors	By 2035, widespread adoption of precision technologies, automation and decision-support tools lifts productivity across major primary sectors by 5–10%, reducing input use while maintaining or increasing output.
	Genetic improvement of plants, animals, fish and forestry species	Subject to regulatory and social licence settings, advances in genetic improvement accelerate gains in productivity, disease resistance and environmental performance across plants, animals and fish, shortening breeding cycles and compounding performance gains over time.

Next steps

12. Following agreement on the priority investment areas and their associated outcome statements, we will draft a letter to the Prime Minister setting out the refined priorities.
13. Subject to Ministerial agreement, the agreed priority investment areas will be provided to Research Funding New Zealand (RFNZ). As discussed in January, these will inform RFNZ’s development of Pillar Investment Plans (PIPs), translating Government agreed SI&T priorities into funding direction and investment decisions.
14. To meet PIP delivery timeframes, RFNZ will require advice on priority investment areas by pillar by late April or early May 2026.

Annexes

Annex 1: Healthy people and a thriving society

Annex 2: Environmental sustainability and resilience

Annex 3: Technology for prosperity

Annex 4: Primary industries and bioeconomy

Annex 1: Healthy people and a thriving society

Pillar criteria			
Top-level criterion	Sub-criterion	Measure, proxy	Definition
1. Research strength	<i>How much research strength already exists in the investment area in NZ?</i>	Field Citation Rates (FCR) (2020-2024 data)	The FCR is a field-normalised citation metric that measures how frequently a publication (or set of publications) is cited relative to the average citation behaviour in its research field. An FCR > 1 is average. Where most FCRs in an investment area are greater than 2 we have classified this as good
2. Materiality of national health gain	<i>How material would the national health loss be if this investment were not made?</i>	Scale of severity of avoidable harm	Assesses the scale and severity of avoidable population health loss if investment is delayed or not made, including irreversible or compounding impacts.
3. Strength of public justification	<i>How strong is the case for public investment over alternative funding or delivery mechanisms?</i>	Public good characteristics; ethical or Treaty obligations; system spillovers	Assesses whether public investment is warranted due to public good benefits, ethical or Treaty obligations, or system wide spillovers.
4. Leverage per dollar invested	<i>To what extent does investment unlock disproportionate downstream benefit?</i>	Enablement of multiple downstream uses	Assesses the extent to which investment enables multiple downstream uses, improves system efficiency, amplifies other investments, or unlocks disproportionate system level benefits.
5. Time profile of benefits	<i>When do material benefits accrue, and how does that balance with urgency?</i>	Short, medium or long-term (including intergenerational) benefits	Assesses when benefits accrue relative to urgency, balancing near term impact against long term or intergenerational health gains.
6. Equity and health impacts	<i>Who benefits first, most, and last from this investment?</i>	Impact on existing gradients; risk of widening disparities	Assesses how benefits are distributed across populations, including impacts on existing health gradients (including for Māori and Pacific peoples) and risks of widening inequities.
7. Strategic and economic value realisation	<i>To what extent does this investment position New Zealand to realise economic, commercial, or international value from health science?</i>	Future commercial pathways; attracting international talent, capital or participation	Assesses how investment positions New Zealand to realise international, commercial, or strategic value from health science capabilities or knowledge.

Pillar investment areas				
#	Investment area	Definition	Relevant ANZSRC SEO	Relevant FoR
1	Prevention of high- burden/ - prevalence conditions and diseases (incl mental health)	Population level research to prevent and reduce high burden conditions by addressing life course risk factors, social determinants and inequities that shape health outcomes in New Zealand.	2001, 2003, 2004, 2005, 2006, 2105, 2107, 2111, 2301	44, 42, 45, 52
2	Digital health, data platforms and learning health systems	Digital tools, AI, data platforms and analytics enabling interoperable learning health systems, surveillance and evidence informed clinical and system decisions.	2003, 2006, 2203, 2204	46, 42, 32, 44
3	Workforce and capability for health research, delivery and translation	Building health and research workforce capability to generate, translate and apply evidence across health services and policy.	2002, 2003, 2004, 1502, 1503	42, 44, 45
4	Foundational biomedical discovery	Generating foundational biological and clinical knowledge - including genomics, pathophysiology and mechanisms of disease - that underpins future precision medicine and targeted clinical care.	20, 28, 21	31, 32, 34
5	Biomedical translation and preclinical development	Applying biomedical discoveries through preclinical testing and validation to develop prevention, diagnostic and therapeutic interventions.	2001, 2003, 2006	32, 34, 31
6	Health security (incl. emerging pathogens, diseases and preparedness)	Strengthening preparedness, surveillance and response to infectious threats through integrated human, animal and environmental health research.	2008, 2006, 2005, 2001, 2004, 2002, 21	3207, 3107, 3009, 3103, 3702, 3102, 44, 4604, 4203, 41, 30, 31, 42, 4203
7	Health systems, models of care, governance and performance	Designing and evaluating health system structures, models of care and governance to improve access, equity, quality and performance.	2002, 2003, 2004, 2006	42, 44
8	Māori and Pacific health and wellbeing	Māori and Pacific-led research strengthening health systems and workforce capability to deliver measurable gains in quality of life and life expectancy.	Māori: 20, 2001, 2003, 2004, 2005, 2105, 2106, 2107, 23 Pacific: 2003, 2109, 2110, 2111, 20, 2001, 2002, 2004, 23, 2302-3	45, 44, 32, 42, 52, 4003

Pillar investment areas mapped to criteria							
	<i>How much research strength already exists in the investment area in NZ?</i>	<i>How material would the national health loss be if this investment were not made?</i>	<i>How strong is the case for public investment over alternative funding or delivery mechanisms?</i>	<i>To what extent does investment unlock disproportionate downstream benefit?</i>	<i>When do material benefits accrue, and how does that balance with urgency?</i>	<i>Who benefits first, most, and last from this investment?</i>	<i>Does this investment position NZ to realise economic, commercial, or international value from health science?</i>
Prevention of high burden/ high-prevalence conditions and diseases (incl mental health)	Good	Large avoidable population health burden from chronic and mental health conditions	Yes - strong public good, prevention systematically under provided by markets	Yes – reduces downstream demand, moderate system wide leverage	Medium to long term gains; benefits compound over the life course	High equity impact via social determinants and access	Limited commercial pathways; primarily domestic value
Digital health, data platforms and learning health systems	Good	Indirect but system-wide impact on quality, safety and efficiency	Requires public coordination and shared infrastructure	Yes – enables multiple downstream uses across services, conditions and research	Benefits accrue once implemented; not immediate	Equity impacts depend on design, access and uptake	Moderate – some commercial and export potential but value primarily realised through domestic system efficiency
Workforce and capability for health research, delivery and translation	Good	Foundational enabler across research, services and translation	Yes – strong coordination and public investment rationale	Yes – unlocks system wide capability and translation	Medium to long term gains; some near term effects	Equity depends on workforce distribution and design	Limited direct commercial return; primarily strategic system value
Foundational biomedical discovery	Good	Indirect contribution to future health gains	Yes – strong public good, high uncertainty deters private investment	Enables future translation but pathways and impacts are uncertain and long term	Long-term benefits; low immediacy by design	Broad but diffuse downstream benefits	Potential commercial value but uncertain and long term
Biomedical translation and preclinical development	Good	Meaningful impact if successfully translated	Addresses “valley of death” funding gaps	Yes – bridges discovery and clinical application	Medium-term benefits with clearer development pathways	Benefits depend on access, adoption and targeting	Stronger commercial and export potential than discovery
Health security and One Health (incl AMR, emerging pathogens, diseases and preparedness)	Good	High impact where low probability, high consequence risks materialise	Yes – strong public good and resilience justification	Yes – enables preparedness, surveillance and rapid response	High urgency despite uncertain timing	Disproportionately benefits vulnerable populations	Primarily protective public value; limited commercial return
Health systems, models of care, governance and performance	Good	High system level impact on access, quality and sustainability	Yes – requires public stewardship and coordination	Yes – improves effectiveness of all other health investments	Medium term gains - urgency driven by system pressure, but benefits accrue through implementation	Strong equity impacts through system design	Primarily domestic public value
Māori and Pacific health and wellbeing	Good (though more FCR<2 than other pillars)	Persistent, avoidable and inequitable health loss	Strong treaty, ethical and public interest basis	Yes – Builds long term system, workforce and community capability	Immediate urgency with long term gains	Very high equity impact	Primarily social and public value

Annex 2: Environmental sustainability and resilience

Pillar criteria			
Top-level criterion	Sub-criterion	Measure, proxy	Description
1. Research strength	How much research strength already exists in the investment area in New Zealand?	Field Citation Rates (FCR) (2020-2024 data)	The FCR is a field-normalised citation metric that measures how frequently a publication (or set of publications) is cited relative to the average citation behaviour in its research field. An FCR > 1 is average. Where most FCRs in an investment area are > 2 we have classified this as good
	Does this investment address a significant issue with high potential consequences for New Zealand if left unaddressed?	Level of risk or threat addressed	Assesses whether the investment targets an issue of high urgency and consequence for New Zealand, where delay would materially increase harm, costs, or foreclose future options.
1. Hazards and risk	Does it significantly improve NZ's ability to absorb shocks, recover, or adapt over time?	Threat or impact reduction	Considers whether the investment leads to meaningful reductions in risk exposure, vulnerability, or long-term impacts through improved preparedness, adaptation, or resilience.
	Is there a clear and justifiable lack of interest and demand from private sector?	Metrics of market failure	The extent to which the area is unlikely to be funded at sufficient scale by the private sector. For example, where benefits are exclusively public good, broad, diffuse, intergenerational, or difficult for markets to capture, making public investment necessary and appropriate.
3. Capability and Decision-making	Could the work substantially improve public decision making and on the ground practices?	Potential influence on decision making or improvement of evidence base	Outputs can inform decisions, regulation, planning, management, and on-the-ground practice through credible and identifiable pathways.
5. International connectedness	Does the research address challenges of transboundary significance, and strengthen NZ's role as a trusted leader in the global science system?	Alignment with current or emerging international agreements, strategic research collaborations or partnerships	Likelihood of attracting international research collaborations, strategic partners, external capital, or participation in global missions and programmes.

Pillar investment areas				
#	Investment area	Definition	Relevant ANZSRC SEO	Relevant FoR
1	Ecosystem restoration and management.	Active management of land, soil, water, marine and air, including the protection and restoration of environs, native species and habitats, supported by monitoring, modelling and decision support.	1801, 1802, 1805, 1806, 1899, 1005, 1803	3103, 3707, 3709, 4102, 4106
2	Understanding, mitigating and adapting to climate change	Understanding and reducing climate change impacts across communities, species, ecosystems and the economy, including scenarios, attribution, and integrated assessment and adaptation planning.	1099, 1599, 1901, 1903, 1905, 1999, 2699, 170302	3701, 3702, 4101, 4102
3	Natural hazard risk reduction	Understanding and mitigating geological, climatic and meteorological hazards, including risk analytics, early warning and impact reduction measures.	1904, 1905, 1999,	3701, 3705, 3706, 3709
4	Solutions for resilient infrastructure	Transport systems and enabling infrastructure solutions that withstand climate and hazard risks, including design standards, asset management and system resilience.	With environ. science applied: 1299, 2701, 2703, 2704, 2799	4011, 4005, 4012, 3702
5	Southern Ocean and Antarctic environmental stewardship	Environmental stewardship of Southern Ocean and Antarctic environs, including ice and ocean processes, ecosystems and biodiversity, long-term observations.	1804, 1905	3708, 3701, 3103, 3709
6	Renewable energy systems, energy efficiency and demand reduction (incl low emissions systems)	Renewable, energy systems analysis, and the reduction of energy demand through efficient systems, design and behaviour. Reducing emissions through technology, operations and system change.	1701, 1703, 1704, 1705, 1707, 1708 2202, 1903, 2702	4011, 4004, 4012, 3702
8	Environmental policy, governance, standards and behaviour	Design, assess and improve environmental policy and governance, including regulatory settings, standards, incentives, behaviour change, decision frameworks and lifecycle assessment.	1902	4407, 3801, 4104
9	Circular economy and Resource efficiency	Reducing waste and pollution, increasing reuse, repair and recycling, and improving resource efficiency across production services and infrastructure.	1001, 1101, 1105, 1206, 2202, 2406, 2501, 2601, 1803	4014, 4011, 4004, 4105
10	Foundational and enabling environmental science	Strategic research and enabling capabilities for environmental sustainability and resilience, including observation and monitoring systems, data and analytics, modelling, methods, and research infrastructure.	2801	3704, 4605, 3709, 4101, 4106
11	Nature-based enterprises and ecosystem markets	Scaling nature-based products, services and markets delivering measurable environmental outcomes and sustainable revenue, including biodiversity credits, ecosystem services, restoration enterprises and bioproducts.	Where relevant: 15, 18	Where relevant: 3508, 3801, 3504

Pillar investment areas mapped to criteria						
	<i>How much research strength already exists in the investment area in NZ?</i>	<i>Addresses an urgent or significant issue with high potential consequences for NZ if left unaddressed?</i>	<i>Significantly improves New Zealand's ability to absorb shocks, recover, or adapt over time?</i>	<i>Clear and justifiable lack of interest and demand from private sector?</i>	<i>Could substantially improve capability and public decision making and on the ground practices?</i>	<i>Addresses transboundary risks or global commons where NZ has a clear stewardship or leadership role?</i>
Ecosystem restoration and management	Good	Partly. Ecosystem and biodiversity damage can be irreversible or more costly if left unaddressed	Partly. Some ecosystems help mitigate climate change and hazards	Yes, this is clearly public good research	DOC and other agencies have clear responsibilities for this	Partly. There is potential for international relevance
Understanding, mitigating and adapting to climate change	Good	Yes. Not adapting and planning for climate change poses substantial long-term risk	Yes, there is a clear link	Yes, this is clearly public good research	Yes. MfE and other agencies have clear responsibilities for this	Yes. All countries are affected, and have a stake in, climate change
Natural hazard risk reduction	Good	Yes. Not adapting and planning for natural hazards poses substantial long-term risk	Yes, there is a clear link	Yes, this is clearly public good research	Yes. NEMA, MfE and other agencies have clear responsibilities for this	Yes. Many countries share similar hazards to NZ
Solutions for resilient infrastructure	Good	Yes. Infrastructure is essential for society and economy. Addressing infrastructure issues before they become an emergency is critical	Yes, there is a clear link	Partly. Businesses may depend on infrastructure	Yes. NEMA, MfE, NZTA and other agencies have clear responsibilities for this	Partly. Some NZ infrastructure challenges are unique to New Zealand
Southern Ocean and Antarctic environmental stewardship	Good	No. Antarctic issues facing NZ are abstract and tend to be global rather than specific to NZ	No. Links between Antarctica and NZ's vulnerability are abstract	Yes, this is clearly public good research	No. Links between Antarctic research, policy and operations are abstract	Yes. NZ are a steward and established leader in this space
Renewable energy systems, energy efficiency and demand reduction (Incl low emissions systems)	Good	Partly. Research in this area could improve long term energy security	Yes, research in this area could improve long term energy security	Partly. There is strong potential to commercialise energy solutions	Yes. MfE and other agencies have clear responsibilities for this	Yes. Many countries have obligations to improve energy efficiency and reduce emissions.
Environmental policy, governance, standards and behaviour	Good	Partly. Research in this area may address urgent issues	Partly. Good policy settings may improve resilience	Yes, this is clearly public good research	Yes. MfE and other agencies have clear responsibilities for this	No. There is no clear pathways to influencing international policy.
Circular economy and resource efficiency	Good	No. Research only improves existing processes, rather than tackling urgent issues	No. Links between circular economy and resource efficiency are abstract	Partly. There is strong potential for businesses to directly benefit from resource efficiency	Somewhat. There are potential links to multiple agencies including MBIE and MfE	Partly. Many countries have obligations to improve resource efficiency
Foundational and enabling environmental science	Good	No. Indirect links to urgent issues, but can help improve our understanding in the long term	No. Indirect links to improving resilience	No. Often weak commercial and public interests	No. Broad research may enable policy and operational decisions and practices, but only indirectly	No. Broad research is unlikely to directly be of interest to other nations, but it is variable
Nature-based enterprises and ecosystem markets	Good -(Possible area of particular strength)	No. Research unlikely to tackle urgent issues	No. Research is unlikely to directly improve resilience	No. These have direct relevance to the private sector	No. Research is unlikely to influence policy and operational decisions	No. NZ has unique flora and fauna

Annex 3: Technology for prosperity

Pillar criteria			
Top-level criterion	Sub-criterion	Measure, proxy	Description
1. Relevance to NZ	<i>How much research strength already exists in the investment area in New Zealand?</i>	Field Citation Rates (FCR) (2020-2024 data)	FCR is a field-normalised citation metric that measures how frequently a publication (or set of publications) is cited relative to average citation behaviour in its research field. An FCR > 1 is average. Where most FCRs in an investment area are >2 we have classified this as “good”.
	<i>If no strengths, is this an area of high value?</i>	Critical technology lists; long-term strategic importance	Area where current capability is limited, but future economic, societal, environmental, or strategic importance justifies proactive capability building.
2. Sector interest and industry impact	<i>Is there a presence of a mature or growing sector?</i>	Signalled interest and demand from industry	Evidence of an existing or emerging sector able to adopt, apply, or scale research outputs within NZ.
	<i>Are there adjacencies or potential for new to world products?</i>	Qualitative - but draws on OECD complexity data	Potential to extend existing strengths into more complex, higher-value, or more knowledge-intensive products, services, or capabilities.
3. Economic opportunity	<i>Is there a global and domestic growth market?</i>	Global and domestic market growth (CAGR); relevant FDI flows	Size, growth trajectory, and durability of relevant international and domestic markets associated with the capability or application.
	<i>Could this lift long-run productivity or value intensity (not just activity)?</i>	ECl adjacency potential; export unit values; productivity or wage indicators	Investment embeds knowledge or capability within production, lifting value density, efficiency, or complexity rather than increasing output volume alone.
4. Justification for taxpayer investment	<i>Is there a strong rationale for public funding (public good, market failure, resilience, sovereignty)?</i>	Evidence of market failure; non-excludable benefits; resilience or sovereignty need; crowd-in potential	Public funding is justified where markets under-invest, benefits are non-excludable, failure risks are high, or domestic capability must be retained.
5. International connectedness	<i>Does this strengthen access to global knowledge, markets, talent, infrastructure or partnerships?</i>	Alignment with current or future international science agreements, collaborations, or strategic partnerships	Strengthens access to international knowledge, talent, infrastructure, or markets in ways that materially build domestic capability and influence.

Pillar investment areas				
#	Investment area	Definition	Relevant ANZSRC SEO	Relevant FoR
1	Quantum-enabled technologies for computing, communications and networking	Develop quantum-enabled capabilities for sensing, timing, communications and computing that underpin future high-value industrial and security applications.	2201, 2203, 2404, 2801	5108, 4006, 4602, 4903
2	Photonics and sensing for increased precision and quality	Advance photonics-based sensing, imaging and measurement technologies to improve precision, quality and productivity across advanced manufacturing and adjacent sectors.	2404, 2410, 2203, 2701 Secondary: 1802, 2003	5102, 4009, 3406, 4016
3	Autonomous systems, robotics and sensing for industry and remote environments	Enable autonomous systems and robotics that improve safety, precision and productivity in complex environments, including industrial, marine, air and logistics contexts.	2701, 2704, 2404, 2203, 2412, 2703 Secondary: 1701, 1802, 2201	4007, 4602, 4611, 4009
4	AI and advanced computing for higher-complexity, data-rich products and services	Develop and apply AI and advanced computing to optimise complex systems, decision-making, and enable intelligent manufacturing and services.	2201, 2203, 2202, 2204, 2802 Secondary: 2003, 2701, 2404	4602, 4611, 4605, 4612
5	Frontier bio engineering (incl. synthetic biology and engineering biology).	Design and engineer biological systems to create new or improved industrial products, processes and platforms.	2403, 2001, 2002 Secondary: 2601, 1801	3106, 3101, 3105, 3404
6	Advanced materials for high complexity products	Develop materials with new or enhanced properties that improve performance, durability and sustainability in manufactured products and systems.	2402, 2403, 2404, 2501, 2407, 2409 Secondary: 1802, 2201	4016, 3403, 3406, 4014
7	Space technologies and downstream applications	Grow space-related technologies and space-enabled services, including satellites, launch systems and observation	2701, 2702, 2203, 2404 Secondary: 1802, 2201	5109, 4001, 4006, 4601
8	Biomanufacturing and bioprocessing capability	Scale bioprocessing and biomanufacturing systems that convert biological feedstocks into high-value chemicals, materials and ingredients.	2403, 2401, 2414 Secondary: 2001, 2602	3106, 4004, 3403
9	Medtech, diagnostics and therapeutics for export	Develop and manufacture medical devices, diagnostics and therapeutic technologies with clear pathways to validation, production and export.	2003, 2401, 2410, 2412, 2408 Secondary: 2404, 2203	4003, 3204, 3214, 3206
10	Advanced energy technologies and storage	Advance next-generation energy technologies that support low-emissions energy supply, storage, conversion and industrial decarbonisation.	1701, 1703, 1704, 1707, 1801 Secondary: 1708, 2402	4011, 4004, 4012, 3702

Pillar investment areas mapped to criteria								
	How much research strength already exists in the investment area in NZ?	If no strengths, is this an area of high value?	Is there a presence of a mature or growing sector?	Are there adjacencies or potential for new to world products?	Is there a global and domestic growth market?	Could this lift long-run productivity or value intensity (not just activity)?	Is there a strong rationale for public funding (public good, market failure, resilience, sovereignty)?	Does this strengthen access to global knowledge, markets, talent, infrastructure or partnerships?
Quantum-enabled technologies for computing, communications and networking	Good	Strategic enabling technology with wide cross-sector spillovers	Very small firm base and adoption pathways	Yes - potential to supply components (quantum memories, transducers, cryogenic electronics) into global quantum supply chains	Rapid global growth; NZ mainly export -oriented	Productivity gains indirect and long-term	Long horizons, spillovers and sovereignty risks	Anchors access to global infrastructure and talent
Photonics and sensing for increased precision and quality	Good	N/A	Existing and research-industry collaborations + demand from defence, space, agritech, energy and geoscience sectors	Yes - strong capability signal for adjacent high-precision products across agritech, medtech, space	Sustained global growth in precision technologies	Enables high-value, precision-driven productivity gains.	Shared infrastructure and spillovers justify support, though some capacity for private sector to fund	Well-embedded in global research and supply chains
Autonomous systems, robotics and sensing for industry and remote environments	Good	Major benefits for remote, hazardous NZ environments	Growing cluster of companies and research programmes in UAVs, maritime robotics and autonomous sensing, though still fragmented	Yes - autonomy platforms (marine robotics, drones, remote ops) strong adjacency to AI, sensing and space	Growing global and domestic demand	Direct automation-driven productivity improvements.	Testbeds, safety and coordination failures evident, but some capacity for private investment	Global platforms useful; NZ adds field validation
AI and advanced computing for higher-complexity, data-rich products and services	Good	General purpose technology with economywide benefits	Strong demand signalled by hundreds of NZ firms seeking AI, analytics and automation support, limited frontier capability	Yes - unlocking value from sensing, robotics and quantum tech via optimisation, forecasting and decision support	Large, fast-growing global and domestic markets	Yes - supports data-centric design, digital twins and automation foundational for NZ's future competitiveness	Data, skills and safety are public-good issues. Limited existing private R&D capacity	Global collaboration critical for capability access
Frontier bio engineering (incl. synthetic biology and engineering biology).	Good (weaker than the rest of the pillar – esp biochemistry and cell biology)	High future value across health and sustainability	Emerging but diverse startup ecosystem – but constrained by regulation	Yes - bio-based materials, ingredients, alternative proteins and high-value molecules for food, health and industrial apps	Strong global growth; export -led opportunities	Productivity gains depend on successful scale-up, hard to identify market niches	Platform spillovers and biosecurity/resilience risks justify funding. Regulation > funding.	Global collaboration critical for capability access.
Advanced materials for high complexity products	Good	Benefits depend on well-chosen niche focus	Pockets in composites and coatings	Yes - material basis for high-complexity products, super-conducting hardware, and advanced composites	Global growth; NZ niches exportable	Lifts value density through performance materials, though may be challenging to retain NZ benefits (eg Mint)	Shared facilities and risk justify limited public role. Clear role for public investment in discovery research	Offshore facilities needed for scale and testing, but NZ may struggle to break in
Space technologies and downstream applications	Good (strong in pillar, some potential strength (space sciences))	Strategic importance for resilience and monitoring	Established sector with strong global integration.	Yes - high-value upstream exports (launch services, propulsion, components) and downstream markets in Earth observation	Rapidly expanding global space economy	Productivity gains via monitoring and optimisation, and high-value domestic space industry	Strong sovereignty interests	Inherently international partnerships and missions. Launch capability a strong draw
Biomanufacturing and bioprocessing capability	Good (though relatively weak in pillar)	Critical platform enabling multiple bio-based sectors	Some capability; scale and skills constrained	Yes - new high-value bio-based materials and process innovations that can lift export complexity beyond bulk commodities.	Strong global growth; export potential	Embeds high-value process capability domestically – synergies with domestic industries	Capital intensity requirements and coordination failures clear.	Global partnerships essential for standards and access.
Medtech, diagnostics and therapeutics for export	Good (though relatively weak in pillar)	Significant export and health system upside	Active firms; scale-up and capital constrained	Yes - high-margin exportable devices, diagnostics, biologics and digital health solutions leveraging AI and advanced sensing	Robust global growth; exports essential	High-margin exports lift value intensity	Nascent ecosystem, but still too undeveloped to stand alone. High public interest in health spillovers	International trials and regulatory access critical NZ trial/testing potential
Advanced energy technologies and storage	Good	Essential for decarbonisation and system resilience	Growing transition activity; limited storage firms	Opportunities for high-value energy systems, grid optimisation tools, hydrogen/ammonia value chains and novel storage solutions	Strong global and domestic investment momentum	Reliable energy underpins economy-wide productivity, export potential in niche energy technology areas	Infrastructure, decarbonisation and security justify funding	Strong global interest in eg geothermal, carbon capture and energy storage

Annex 4: Primary industries and bioeconomy

Pillar criteria			
Top-level criterion	Sub-criterion	Measure, proxy	Description
1. Relevance to NZ	<i>How much research strength already exists in the investment area in New Zealand?</i>	Field Citation Rates (FCR) (2020-2024 data)	The FCR is a field-normalised citation metric that measures how frequently a publication (or set of publications) is cited relative to the average citation behaviour in its research field. An FCR > 1 is average. Where most FCRs in an investment area are > 2 we have classified this as “good”.
	<i>If no strengths, is this an area of high value?</i>	Critical technology lists; long-term strategic importance	Area where current capability is limited, but future economic, societal, environmental, or strategic importance justifies proactive capability building.
2. Sector interest and industry impact	<i>Is there a presence of a mature or growing sector?</i>	Signalled interest and demand from industry	Evidence of an existing or emerging sector able to adopt, apply, or scale research outputs within NZ.
	<i>Are there adjacencies or potential for new to world products?</i>	Qualitative - but draws on OECD complexity data	Potential to extend existing strengths into more complex, higher-value, or more knowledge-intensive products, services, or capabilities.
3. Economic opportunity	<i>Is there a global and domestic growth market?</i>	Global and domestic market growth (CAGR); relevant FDI flows	Size, growth trajectory, and durability of relevant international and domestic markets associated with the capability or application.
	<i>Could this lift long-run productivity or value intensity (not just activity)?</i>	ECI adjacency potential; export unit values; productivity or wage indicators	Investment embeds knowledge or capability within production, lifting value density, efficiency, or complexity rather than increasing output volume alone.
4. Justification for taxpayer investment	<i>Is there a strong rationale for public funding (public good, market failure, resilience, sovereignty)?</i>	Evidence of market failure; non-excludable benefits; resilience or sovereignty need; crowd-in potential	Public funding is justified where markets under-invest, benefits are non-excludable, failure risks are high, or domestic capability must be retained.
5. International connectedness	<i>Does this strengthen access to global knowledge, markets, talent, infrastructure or partnerships?</i>	Alignment with current or future international science agreements, collaborations, or strategic partnerships	Strengthens access to international knowledge, talent, infrastructure, or markets in ways that materially build domestic capability and influence.

Pillar investment areas				
#	Investment area	Definition	Relevant ANZSRC SEO	Relevant FoR
1	Productive, resilient & sustainable primary production systems	Improving the performance, resilience and sustainability of agriculture, horticulture, forestry, fisheries and aquaculture, including production practices across the full on-farm and near-farm system.	10, 11, 26, 2405	3002, 3003, 3004, 3005, 3007, 3008, 3009
2	Precision technology, automation, AI and decision-support for primary sectors	Enabling smarter data-driven primary production through on-farm and in-field agri-technologies, including sensing, robotics, automation, AI-enabled decision-support and integrated digital systems.	109903, 109904, 150401, 269902, 269903 Secondary: 2201, 2204, 2402, 2404, 2412	3002, 3003, 3004, 3005, 3008, 4603, 4605, 4611
3	Genetic improvement of plants, animals, fish and forestry species	Accelerating productivity, resilience and value through breeding, genomics and related technologies, including underpinning biological research supporting long-term system improvement.		3001, 3003, 3004, 3007, 3101, 3102, 3105, 3008
4	Climate mitigation, adaptation and resilient primary production systems	Reducing emissions, adapting to climate change and building resilience across production systems and value chains, including climate-resilient technologies, practices and infrastructure.	109901, 190302, 190309, 190310, 269901 Secondary: 1901, 1903	3002, 3003, 3004, 3005, 3701, 3702, 4101
5	Better resource use including freshwater, soils, nutrients, marine space and waste management.	Improving allocation, efficiency and environmental outcomes for key natural resources, including precision use, monitoring and management across production and processing systems.	110504, 110599, 120604, 180304, 180305, 180308, 180603, 240603, 240605, 250102, 250104, 120602, 260102, 260104	3002, 3003, 3004, 3005, 3701, 3702, 4102
6	Biosecurity science for economic protection, human health, and protection of flora/ fauna	Preventing, detecting and responding to pests, diseases and invasive species, including surveillance, diagnostics and system-level monitoring integrated into production and value chains.	180204, 180302, 180405, 180501, 180502, 180503, 180602, 240101, 240103, 240901, 241602	3003, 3004, 3107, 3109, 4101, 4102
7	Creating high-value foods, ingredients and nutraceuticals	Creating higher-value food products, functional ingredients and nutraceuticals from primary production, including post-harvest processing, storage and transformation to increase value and export returns.	2405, 2413, 2604,	3006, 3106, 3404, 3004, 3008
8	Building advanced, scalable and value-adding manufacturing capability	Developing advanced production and processing capabilities that enable scalable, resilient, sustainable and high-value manufacturing across domestic industrial value chains.	Where relevant: 12, 24	401 family, 4003-8, 4013
9	Enabling efficient, lower impact mineral and energy extraction and transition	Enabling efficient, resilient and lower-impact exploration, extraction, and processing of mineral and energy resources.	Where relevant: 17, 25	3402, 3703, 4019

Pillar investment area mapped to criteria								
	How much research strength already exists in the investment area in NZ?	If no strengths, is this an area of high value?	Is there a presence of a mature or growing sector?	Are there adjacencies or potential for new to world products?	Is there a global and domestic growth market?	Could this lift long run productivity or value intensity (not just activity)?	Is there a strong rationale for public funding (public good, market failure, resilience, sovereignty)?	Does this strengthen access to global knowledge, markets, talent, infrastructure or partnerships?
Productive, resilient & sustainable primary production systems	Good	N/A	Mature sector, however, could private sector play a greater role?	Yes, but at a low complexity level	Yes	Yes, but not significantly up the value chain	Yes, in terms of economic resilience, No in terms of existing private enterprise	Arguable whether NZs position could be further strengthened given maturity of sector
Precision technology, automation, AI and decision-support for primary sectors	Good	N/A	Yes, with possibility to scale	Yes, strong adjacencies given nature of technologies	Strong forecast for global agritech markets	Yes, given size of sector could lead to relatively significant productivity gains	Partially, but also role for private sector given maturity of firms/sector	Significant opportunity for NZ
Genetic improvement of plants, animals, fish and forestry species	Good (lower FCR for Biochemistry)	N/A	Yes, with possibility to scale	Yes but somewhat contingent on progress of Genetech reforms	Yes but somewhat contingent on progress of Genetech reforms	Yes but somewhat contingent on progress of Genetech reforms	Low justification for public R&D investment through a public good lens	Yes
Climate mitigation, adaptation and resilient primary production systems	Good	N/A	Mature sector, however, could private sector play a greater role?	Yes, potential to generate further high-value IP from NZs existing strengths in this area	Yes given domestic and global climate efforts	Large gains likely given scale of sector	Partially, but spillover benefits also accrue to private sector	Yes
Better resource use including freshwater, soils, nutrients, marine space and waste management	Good	N/A	Yes	Yes, but not necessarily through creation of new complex products and services	Degree of uncertainty on domestic policy focus, but science and research in demand globally	Yes, although at different scales depending on field of research/sub-sector	Partially, but spillover benefits also accrue to private sector	Yes, particularly important given NZs large EEZ
Biosecurity science for economic protection, human health, and protection of flora/ fauna	Good	N/A	Yes	Yes, but not necessarily through creation of new complex products and services	Yes	Yes, particularly from an economic resilience perspective (ie protection against future losses)	Yes, high level of importance for NZ economy and society	Yes
Creating high-value foods, ingredients and nutraceuticals	Good	N/A	Yes, with growing pipeline of new firms	Yes, but remains reliant on commodity inputs	Yes, particularly growing demand globally	Yes, value-added products create greater returns versus commodities	Yes, but not necessarily funded through MBIE SI&T funds	Yes
Building advanced, scalable and value-adding manufacturing capability	Good, though lower FCRs than in other areas of the pillar (Some potential area of strength)	Yes, particularly given global context	Yes, with large number of R&D performing firms sector	Yes, potential to generate further high-value IP from NZs existing strengths in this area		Yes, although question of whether greater SI&T investment would support this increase Vs eg greater capital intensity	Low justification for R&D investment through a public good lens	Yes
Enabling efficient, lower-impact mineral and energy extraction and transition	Good, though lowest FCRs in the pillar	Yes, particularly given global context	Partially; shifting regulatory landscape can create investment uncertainty	Yes, across the value chain	Export markets limited, ability to scale reduced	Partially, although would require particular focus on cleantech/renewable technologies	Partial public good role of SI&T system through eg geological data collection which can also benefit mineral exploration	Yes, again particularly given ongoing challenges globally

