New Zealand's research, science and technology priorities

FEEDBACK DOCUMENT

How you can contribute

This document sets out the Government's goals for research, science and technology (RS&T) and the principles underlying the public funding of science. The document presents a new structure, for this investment, and outlines priority areas for investment in strategic research platforms.

We are seeking your views on:

- the overall investment structure
- the current weighting of funds within that structure
- where the emphasis should shift, given the Government's goals
- whether the proposed structure is flexible enough to respond to new opportunities and challenges as they arise
- whether the identified areas are of greatest priority for investment in strategic research platforms
- how well the proposed strategic research platforms fit with the new investment structure, and
- how you would rank the identified areas for strategic research platform investment, and why.

Send your feedback to: feedback@morst.govt.nz by 18 November 2009

CONTENTS

Foreword

Science is one of the foundations of modern society. The last twenty years have seen an increasing tempo of change, driven through global internationalisation and exponential advances in knowledge and technologies such as ICT.

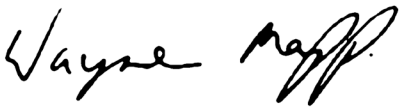
The Government's greatest priority is improving our economic performance. To do this, we must ensure that New Zealand gets the maximum benefit from its investment in research, science and technology (RS&T).

The total government RS&T expenditure in New Zealand is 0.51 percent of GDP. While this is significant, it is less than in other countries. As a small country we have to make the most efficient use of our resources. We need to extend our knowledge base, stimulate scientific activity and harness the results to improve our economy and our society.

This document outlines how we can better achieve this. It sets out overarching principles and clear objectives. This will enable spending to be effectively prioritised. Opportunities of critical importance to New Zealand, such as the biological economy and other high-tech industries where we have specific advantages, will be emphasised.

Alongside these economic drivers are vital areas such as the environment, climate change, health and societal research. Leading edge science applied to these issues will future-proof our economy and our society.

In summary, we have to concentrate our efforts on what matters most. What follows represents the views of scientists, users, and policy makers. I invite you to consider these ideas and contribute your views as to how we can get the best from science.



Hon Dr Wayne Mapp

Minister of Research, Science and Technology

1. The Government's goals

The Government's most important goal is to improve New Zealand's economic performance while continuing to strengthen our society and protect our environment.

In July 2009, the Prime Minister set out the three economic objectives that support this goal. These are:

- increasing New Zealand's productivity growth
- maintaining high levels of employment, and
- reducing New Zealand's vulnerability to adverse events.

The New Zealand economy has not grown at a rate that compares well with other OECD countries. That trend must be reversed if New Zealand is to compete globally and maintain our standard of living.

The Government has identified six main policy drivers that will underpin economic growth. These are regulatory reform, skills and education, infrastructure, taxation, public sector services, and innovation. A key driver is innovation; how people in firms can use science and ideas to increase the value of the goods and services they produce.

To develop New Zealand's innovation potential, the Government is looking at many ways of improving the conditions for businesses to innovate, and removing impediments such as excessive regulation. The Government is also working to create more effective business assistance to encourage research, development, commercialisation and international export growth opportunities. This work is led by the Ministers of Finance and Economic Development and has parallel work streams that will be completed by the end of 2009 for implementation in the 2010 Budget.

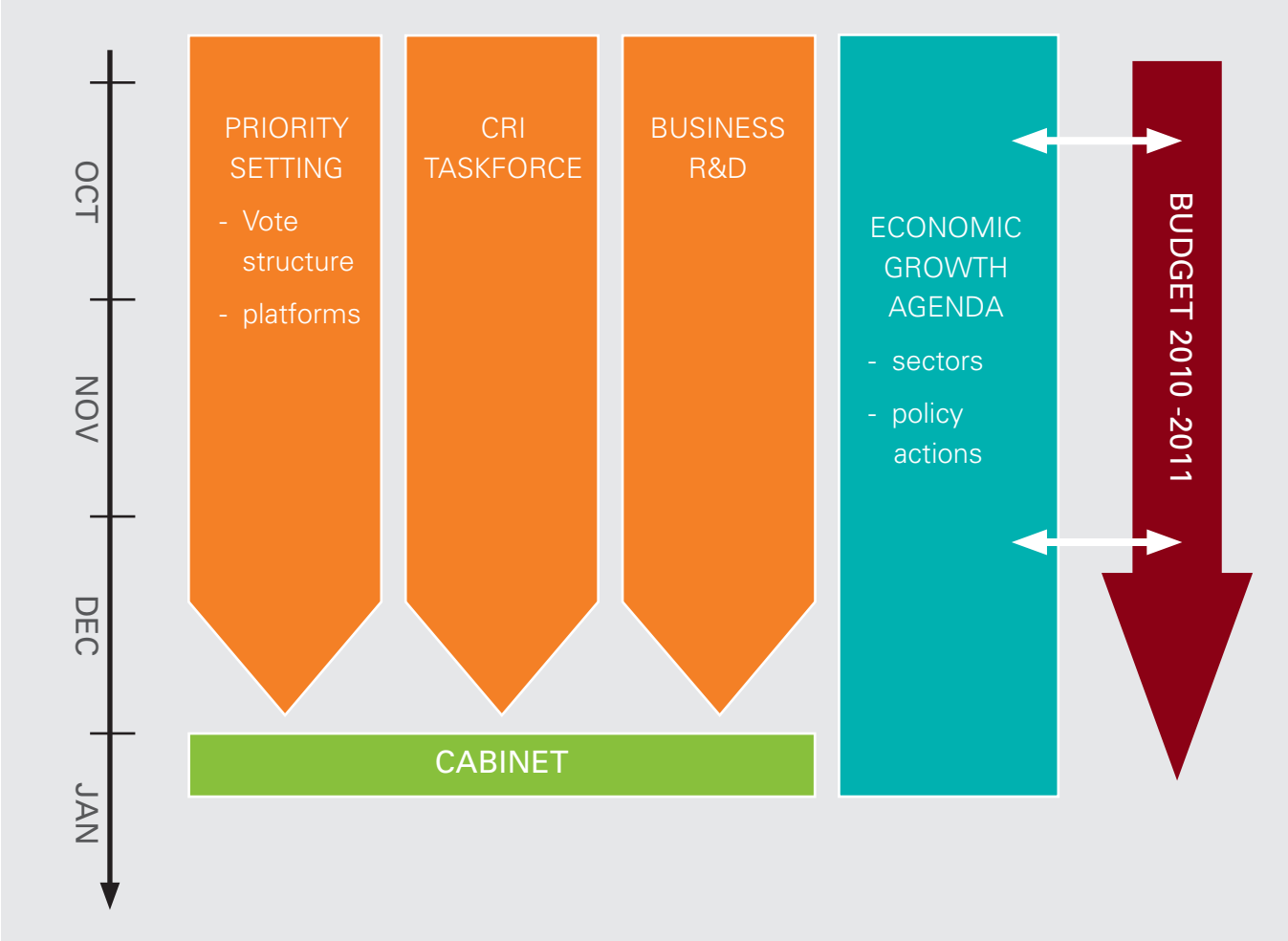
Effectively harnessing RS&T is essential to improving innovation which is the foundation on which the economy can grow. Thus Government is putting strong emphasis on science and innovation as economic drivers. This sits alongside other Government objectives where science plays a central role such as improving health, environmental and social outcomes.

Progress has already been made. Budget 2009 provided significant investment into building science capability through substantial increases to the Marsden Fund, the Health Research Council (HRC) funding, Crown research institute (CRI) Capability funding and the Performance Based Research Fund (PBRF). Professor Sir Peter Gluckman has been appointed as the Prime Minister's Chief Science Adviser. Vote RS&T was increased by 8 percent.

This document sets out the next steps. It sets out the strategic principles that will inform science investments and priorities that support the Government's growth agenda. It also addresses the need to simplify the system so that scientists and researchers can get on with the job and not be diverted by bureaucracy.

There are two other initiatives underway in RS&T that sit alongside this work. The first is examining how the CRI model can operate more effectively to support New Zealand's development. A small Taskforce will be established and report on this by December. The second initiative is looking at ways that business R&D investment can be lifted. This will examine ways to encourage businesses to engage in innovation, and how research organisations such as universities and CRIs can reach out to businesses more effectively and earlier. Recommendations on this will also be made before the end of the year.

The broader set of activity



The Prime Minister said at the launch of the Primary Growth Partnership, "It's my view that we need to put science at the heart of this National-led Government. If we don't do that, we are simply not going to get the economic gains that New Zealand needs and we won't have the standard of living that we deserve."

The measures outlined in this document are an important part of achieving that objective.

2. The strategic direction of the New Zealand science system

The primary purpose of the Crown's investment in RS&T is to advance the economic and social development of New Zealand and the protection of our environment. Science can also play a major role in establishing New Zealand's identity in the world and in building international relationships.

New Zealand faces the major challenge of increasing its productivity while protecting its environment. Meeting this challenge will increasingly rely on science to drive innovation both incrementally and transformationally.

The Government recognises that science is central to advancing New Zealand's national attitudes, approaches, skills, ambition and achievement.

Science is the way by which new knowledge is obtained. It follows that science, research and development are essential components of the innovation chain in a market-led economy. It is recognised that this can require a longer term focus beyond an annual funding cycle.

Science is also of critical value to New Zealand society well beyond direct and indirect economic growth. New Zealand faces major challenges that science must address. Science will play a major role in enhancing New Zealand's place in the world.

Strategic principles for publicly-funded science

New Zealand's approach to publicly-funded science must be strategic. It needs to take into account size, geography, environment, sociology and economic structure. Accordingly, the science system should be underpinned by the following strategic principles.

General principles

1. The science system will be based on scientific excellence and impact.
2. It will invest where research can advance New Zealand's economic performance, productivity and future development and assist in developing our social fabric and protecting our environment.
3. It will recognise New Zealand's particular sectoral and societal interests (which to some extent have been given definition by the shape of the CRIs.
4. It will recognise the need for New Zealand to develop a full scientific value chain from discovery to exploitation (domestically and internationally) with long-term returns and value for New Zealand.
5. It must be flexible and responsive, because science by its very nature is serendipitous, generates unexpected results, moves fast and results in new opportunities and disciplines.
6. Science that does not show promise and pathways to results will not continue to be publicly-funded over time.

Principles underlying priority setting

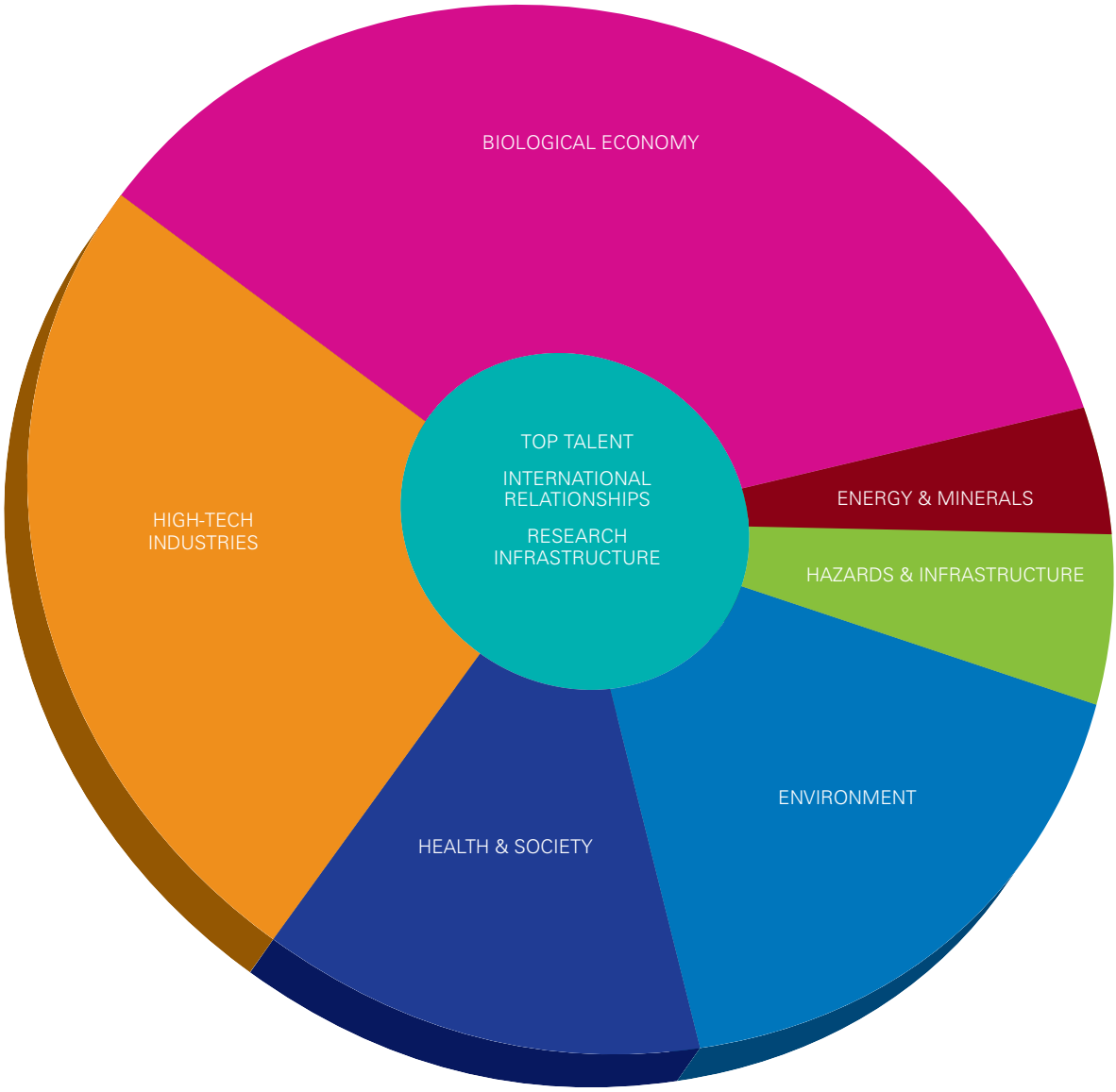
1. Investment in the training, development and retention of outstanding scientific talent will ensure the capacity for the most innovative scientists to contribute to their fullest potential. This requires appropriate infrastructure and critical mass.
2. Priority will be given to investment where New Zealand has competitive advantage. That advantage is in part already defined sectorally, but beyond that New Zealand, as a small country with advanced science capabilities, has unique, but as yet untapped, potential for multidisciplinary research.
3. Priorities also have to reflect the different types of research providers and the need to sustain a balanced programme from discovery to exploitation.
4. Priority will be given to assisting international partnerships in both scientific research and in accessing science infrastructure in domains where clear advantage can be obtained for New Zealand.

Operational principles

1. The science system must be transparent and responsive with minimal compliance costs. It has to be regulated by appropriate scientific evaluation and accountability, allowing effective oversight and outcome focus.
2. It will comprise a mix of competitive and strategic funding tools and a balance of basic, applied and translational research appropriate to an overall strategy and appropriate to national size.
3. To foster efficiency, emphasis should be given to where a multi-organisational approach is possible so that critical mass can be achieved, duplication is avoided, advanced infrastructure can be developed, and latent and real synergies across partners can be exploited.

3. Vote RS&T: New investment structure

The diagram below illustrates the general investment structure. The outer ring shows the outcome areas of importance to New Zealand. At the centre are the investment areas that support the capabilities on which the surrounding outcome areas depend.



The intent of the new structure is to more simply and clearly show what the Government wants from its science investment. It clearly recognises the primary role of research that will contribute to economic growth through the primary and food sectors, the high-value manufacturing and services sector, and energy and minerals. Alongside this goal sits public good and 'enabling' research to support the Government's responsibilities in areas such as health, the environment and risk management.

The revised investment structure will:

- set out what RS&T is expected to contribute in terms of outcomes and results
- align with Government priorities so that choices can be made about where to focus effort, and
- align funding models with the outcomes and emphasis that Government wants.

The new structure separates the outcome areas that receive funding (such as Biological Economy) from the tools and investment processes available to deliver funding (such as strategic research platforms). The aim is to distinguish between outcomes and inputs.

The investment tools include:

- fellowships for individual researchers
- investigator-initiated research
- science-led contestable funding for smaller projects and larger programmes (for example, New Economy Research Fund)
- long-term strategic research platforms
- co-funded partnerships with users (for example, research consortia)
- funding for commercialisation support (for example, Pre-Seed Accelerator Fund)
- support to assist technology transfer (for example, Envirolink), and
- support to assist firm-led R&D (for example, TechNZ).

These tools are used in the RS&T portfolio. Other programmes to assist development and commercialisation will be addressed in the Government's broader Economic Growth Agenda.

Tools support objectives, they do not drive them. The intent is that investment tools will be driven by the priorities and outcomes.

There will be a move to greater strategic funding. This funding will be driven by New Zealand's needs, as opposed to individual institutions. This will encourage collaboration and a focus on the outcomes of the investment. It will also provide longer term stability and a sense of ongoing contribution.

The investment structure above is deliberately set at a high level. While investment areas are identified in broad terms, it remains the role of users, research providers and their partners to identify and shape the activity. This will include scope for the identification and support of emergent areas of innovative research. The intention is to empower the system rather than constrain it.

4. Priority investment areas

Funding constraints mean we must achieve more, and operate more effectively within current investment levels. If additional resource becomes available, it will be directed towards the key priorities that will drive growth.

To assist that intent, the following groupings distinguish between primarily economic outcomes, public good outcomes and capability building outcomes.

In practice, there is significant crossover among these groups. For example, the environment and climate change and the effective use of water are integral to economic success in agriculture.

There is also significant investment in some of these priorities through other initiatives such as the Primary Growth Partnership (PGP), Centres of Research Excellence (CoREs) and the PBRF.

We will continue to use the Vision Mātauranga policy framework to provide strategic direction for research of relevance to Māori innovation and communities. This provides a meaningful lens to identify policy, partnership and investment opportunities in Vote RS&T. This will focus on building research capability and research partnerships that respond to distinctive needs, issues and challenges for Māori. In the new structure, elements of Vision Mātauranga are interwoven throughout, as opposed to being a specific output class.

In this document the dollar figures (pp.10-12, and within the table, pp.19-21) map the current expenditure onto the new structure. Reprioritisation will occur in the 2010 Budget.

RS&T for economic outcomes

High-technology, biological industries, energy and minerals and the investment areas within them, align with the Government's economic growth agenda. An effective mix of public and private sector R&D plays a significant role in the success of firms and industries within these sectors.

The objective of funding in this space is to boost economic growth particularly through exports. There is no arbitrary bias towards one sector or another. Funding will support outcomes that show a clear pathway to results. There must be a robust development and commercialisation case. The funding tools and assessment criteria will reflect this.

The major domains listed below reflect the Government's proposed priority investment areas. However, the Government's emphasis on economic growth means that prioritisation in the economic outcomes space will be driven by the quality of the science, the scale of the opportunity and the pathway to effective progress through research, development and commercialisation, rather than a prescribed list of domains.

Research undertaken by the private sector is a critical part of achieving economic outcomes. Firm-led research through TechNZ will cover both the high-technology industries and biological economy areas. There will be an emphasis on market opportunities and on linking both targeted-basic research and applied research undertaken in these areas to both firms and to sector productivity growth.

RS&T FOR ECONOMIC OUTCOMES

SECTORS	Proposed major domains
High Technology Industries ($119 million: TechNZ portion is $43.8m of this total) Accelerate growth in the high value technology-based products and services sector in New Zealand. Help diversify New Zealand's economy by growing and developing businesses that do not depend on the country's natural resources.	Novel materials, manufacturing and applications Information, communications and digital technologies Medical and health technologies Agri-technologies
Biological Economy ($165 million: TechNZ portion is $3.6m of this total) Accelerate the knowledge, capabilities and technologies needed to drive export growth in primary producing sectors. Promote diversification of the sector by developing from New Zealand's raw material base, new industries and firms producing higher margin products and processes for niche global markets.	Primary sector productivity and sustainability High value food and biological products and processes
Energy and Minerals ($21 million) Research that will lift the contribution of energy and minerals for New Zealand's economic growth; enhance security of supply for energy and minerals and lead to efficient and affordable energy use.	Energy and minerals

Enabling RS&T for public good outcomes

Central and local government are significant users of public R&D. The investment areas reflect core environmental, economic and social policy priorities that require a strong science base to inform policy, services and resource management.

Many of these priorities (outside health, which is largely funded through the HRC) will be funded through a platform approach administered through the Foundation for Research, Science and Technology (FRST) that will enable a more strategic approach and more effective use of resources.

ENABLING RS&T FOR PUBLIC GOOD OUTCOMES

SECTORS	Proposed major domains
Environment ($81 million) Research to provide and supply the understanding, knowledge and tools needed to manage New Zealand's environment sustainably.	Land and freshwater resources Terrestrial ecosystems Marine ecosystems Climate and atmosphere Antarctica
Hazards and Infrastructure ($25 million) Research providing the knowledge, capability and tools to mitigate risks and maximise infrastructure efficiency; to support quality urban development, and meet the challenges of longer term growth.	Hazards Urban development and infrastructure
Health and Society ($95.5 million) RS&T to advance understanding of human health, social change and wellbeing, and economic performance where New Zealand has research strengths and knowledge needs including indigenous knowledge. RS&T supporting improvements and innovation across New Zealand's public, not for profit, and private sectors, particularly health services.	Health Health services Society Economy Science and policy

RS&T capabilities and infrastructure

The RS&T system relies on having excellent people, facilities and connections. These underpin the sector's future success. Talent must be nurtured and retained through rewarding careers. The universities, in part through the PBRF and CoREs, are also significant and essential contributors to New Zealand's science capability. It is important that New Zealand's RS&T investment takes advantage of the significant research infrastructure and capability maintained through Vote Education.

Human and infrastructure capacity building is also referenced later in this document, in Section 7: Developing people and infrastructure.

SECTORS	Proposed current major domains
Top Talent ($55 million) Enhance the quality of research and advance knowledge in New Zealand through excellent investigator-initiated research; and support the career development of the country's most talented new and emerging researchers.	Marsden Fund Scholarships and fellowships
International Relationships ($13 million) Research to promote and support New Zealand's RS&T capabilities internationally.	International linkages and opportunities
Research Infrastructure ($97 million) Provides New Zealand researchers with access to the international-standard research facilities needed to maintain international competitiveness and advance our scientific capabilities.	CRI Capability Fund Backbone (databases, collections, research assets) Advanced Network (operating) Genomics Facility Australian Synchrotron

WE WOULD LIKE FEEDBACK ON:

- this overall investment structure
- the current weighting of funds, and
- where the emphasis should be placed.

5. Strategic research platforms

Research platforms will be long-term investments in the areas that need sustained commitment to science. The underpinning principle is that the science mission is funded, rather than individual institutions.

Platforms are a strategic funding tool. Their importance is that they are a key mechanism for delivering funding in areas of strategic significance over a longer term. This will encourage science stretch towards transformation rather than incrementalism.

The Natural Hazards Research Platform is the template for future platform developments.

These platforms give greater responsibility to research organisations to work with users to shape the type of research carried out. They drive collaboration rather than competition.

The lead research organisations for each platform will be required to appoint strong science advisory boards to ensure the research continues to be excellent, and engage with users to ensure the research has ongoing relevance.

The underlying criteria for potential strategic research platforms are:

- demonstrated strategic relevance to government and/or sector goals
- research that is significant in scope, size and duration, and
- developing at least one of these key areas:
  - pervasive technologies (for example, biotechnology)
  - underpinning or transformation of existing sectors (for example, primary sector industries)
  - maximising the advantages that New Zealand might have in science at the global forefront (for example, climate change)
  - responsiveness to natural hazards (for example, floods, earthquakes and volcanoes)
  - the ability to deal with specific challenges (for example, biodiversity)
  - characterisation and stewardship of New Zealand resources (for example, marine or energy resources)
  - delivery of New Zealand's international commitments.

The proposed platforms are set out below. They have been developed from feedback from stakeholders.

This list of platforms is not exclusive. There could be fewer, more, or different platforms. Sustaining and growing research capability will be integral to all platforms. The common theme is that they are 'outcome based' platforms that focus on the mission and the result.

There may be a requirement for a different type of underpinning science platform focused on ensuring New Zealand has the right capability in important areas that might be defined by technology or by cross sectoral need; for example, bioinformatics. Some of the CoREs are already providing capability in this way.

There will also be scope for new platforms based on need and opportunity, as well as entry points for new science to enter existing platforms.

PRIORITY AREAS FOR INVESTING IN POTENTIAL PLATFORMS

FUND	Priority areas for investing in potential platforms	Potential platforms
High technology industries	Transform New Zealand businesses' manufacturing systems and products.	Transformational manufacturing
Biological economy	Increase pastoral productivity in an environmentally sustainable manner.	Farm systems, feed and forage
	Increase animal productivity and improve post-farm gate activities to produce high value foods, nutraceuticals and bioproducts.	Animal productivity and products
	Protect New Zealand's biological economy from biosecurity threats by identifying, preventing and mitigating diseases, pests and weeds.	Biosecurity
	Produce high value foods, beverages, nutraceuticals and other products from plants.	Foods from horticulture
	Enhance forestry productivity and profitability by developing sustainable management and improvement systems.	Forestry production
	Derive higher value products from wood through improving processing technologies and developing alternative uses.	Higher value wood products
	Increase seafood production to deliver profitable, sustainable and added value from fisheries and aquaculture.	Fisheries and aquaculture
Energy and minerals	Increase New Zealand's wealth by identifying and exploiting hydrocarbon, mineral and other resources.	Hydrocarbons and mineral resources
Environment	Improve New Zealand's land and water resource management through better understanding how different uses affect soil and water quality.	Land and water use
	Improve New Zealand's ability to adapt to future climate changes by better understanding changes and predicting impacts.	Climate
	Manage and restore indigenous species and ecosystems through better understanding the distribution, genetic diversity and ecology of our fauna and flora.	Terrestrial ecosystems
	Preserve the integrity of our marine ecosystems through better understanding marine biodiversity, function, dynamics and resilience to change.	Ocean ecosystems
Hazards and Infrastructure	Increase the resilience of communities to natural disasters by developing new tools and knowledge to improve management of emergencies.	Natural Hazards Research (in progress)

WE WOULD LIKE FEEDBACK ON:

- whether these are the areas of greatest priority for investment in research platforms
- how well the proposed research platforms fit with the new investment structure
- how you would rank the identified areas, and why

6. Developing people and infrastructure

Scientific capability is based on people building science careers. High quality investigator-initiated research requires the career development of the country's most talented existing and emerging researchers.

Researchers need to be supported by high-class infrastructure and be constantly building global partnerships. In a small country co-ordination and prioritisation of scarce physical and human resources is of critical importance. These areas will be further addressed.

We also need increased engagement between the scientific community and the public. This highlights science as a worthwhile area of interest for young people. It puts science and its potential onto the radar of business and investors. It also provides for better informed debate about science and economic issues.

Further work is also needed on how best to use science to advance New Zealand's global position and interests.

The appointment of the Prime Minister's Chief Science Adviser has been a very positive initiative that has raised the profile of science.

This section expands on the priorities around the current capabilities.

For each section, we would like your comments on the objectives, priority areas and emphasis.

Top talent: Marsden Fund, scholarships and fellowships

The priority is to provide better opportunities for our excellent early- and mid-career researchers. It is important to give them the freedom to conduct high-risk, innovative research in supportive environments, to lead research teams, and to develop the technical, leadership and entrepreneurial skills needed to conduct research in the global RS&T system.

The Marsden Fund will continue to support excellence in investigator-initiated research, through contestable funding, and to offer support for emerging researchers through Fast Starts.

The existing system can be advanced by introducing a prestigious Top Talent fellowship scheme that will enable New Zealand to attract, retain and develop the best RS&T researchers in a stable environment. Additional work will be undertaken to look at other ways to attract and retain the most talented individuals.

The desired outcomes are:

- an increase in research quality and quantitative contribution to the global knowledge base
- an increase in uptake of knowledge by firms and research-users
- RS&T careers being perceived as attractive by a broad range of people and valued by society, and
- fellowship recipients having success in securing permanent positions and acquisition of external research funds.

International relationships

New Zealand can bring specific skills and expertise to the global scientific arena. We can also leverage our relatively small size through international relationships. These are vital to building research collaborations, investment and access to advanced facilities. Major economies are also increasingly organising their international research cooperation on a regional, rather than a bilateral, basis.

Tapping into global activity requires a two-way flow to connect our researchers with their overseas counterparts working in areas of strategic interest.

Priorities include strengthening our critical bilateral and multilateral relationships.

There are significant opportunities in large global projects, in particular the Square Kilometre Array (SKA) and greenhouse gas research. Being well connected across these and other projects is vital.

This requires promoting and supporting New Zealand's RS&T capabilities internationally, including:

- researcher mobility
- participation of New Zealand researchers in international research collaborations
- formal bilateral and multilateral research agreements
- membership of international scientific bodies, and
- recruitment of highly skilled researchers from overseas.

Research Infrastructure

The current national infrastructure outputs and budgets are:

- KAREN (Kiwi Advanced Research and Education Network) capability build: $1.3 million (for 2009/10 only)
- Australian Synchrotron: $0.7 million
- National genomics facility: $12.0 million
- Backbone (databases, collections, research assets): $22.0 million
- CRI Capability Fund: $61 million

The CRI Capability Fund supports the maintenance of overall science capability in this sector. It effectively increases the capital of the CRIs. This enables CRIs to expand their human, infrastructural and project capabilities in support of their strategic plans.

A greater level of strategic funding through outcome based platforms will also provide a more stable basis for business planning for CRIs. As noted in Section 5, the issue of whether there should be greater strategic funding to support national infrastructure and advanced disciplines via a platform approach could also be considered. This approach could change following the outcome of the work of the CRI Taskforce.

Exploiting 'big science' opportunities like the SKA may require building key capabilities. The cost/benefits analysis needs to be done carefully and effectively and consider other dimensions such as diplomatic and trade benefits.

Ongoing assessment of New Zealand's needs for modern research facilities, to help plan for future investments and explore improved access to international research facilities is needed. Encouraging private sector investment partnerships where they enable the establishment of new research facilities that are optimally used is a further priority.

FOR EACH SECTION, WE WOULD LIKE YOUR FEEDBACK ON:

- the objectives
- priority areas, and
- emphasis.

7. How funding and investment agents will give effect to the priorities

The Minister and funding and investment agents have different roles in implementing these priorities.

THE MINISTER WILL:

- issue a new Statement of Science Priorities as part of Budget 2010, setting out the principles and priorities for funding. This document will drive the way funding and investment agencies will implement priorities. The statement will have a timeframe of 3–5 years.
- publish new Ministerial Directions for each outcome area. These will describe the scope and results wanted from investment, and suggest the relative emphasis for the investment tools, and
- use the annual contracts with each funding and investment agent to set out expectations and performance measures.

THE FOUNDATION FOR RESEARCH, SCIENCE AND TECHNOLOGY WILL:

- ensure that advisory groups to inform investment plans are established for each platform
- use the investment areas under each outcome area for its investment portfolios, so there is strong alignment between the Government's priorities and the science that is funded, and
- report on what it invested in and why, and the results of those investments.

THE HEALTH RESEARCH COUNCIL WILL:

- invest in accordance with the Government's overall priorities reflected in both this strategy and through the Ministry of Health, and
- utilise assessment processes that align with the objectives of the new targeted investment.

8. Other investment areas

For completeness, areas of the overall investment structure that relate to administration and other support areas, together with their current costs, are included here. Feedback is not being sought on these areas.

- Global Expert: Funding to enable New Zealand firms to access information about international RS&T markets and expertise ($0.4 million).
- National Measurement Standards: Funding to meet the Minister of Research, Science and Technology's obligations under the Measurement Standards Act 1992 ($5.8 million).
- Research and Development Facilitation and Promotion Service: Funding for purchasing services that promote the commercialisation of research and development, and facilitate linkages between New Zealand firms and New Zealand and international research organisations ($5 million).
- Engaging New Zealanders with RS&T: Supporting activities, determined by the Minister, that engage New Zealanders with the RS&T community to enhance and facilitate the role of RS&T in supporting innovation ($7.1 million).
- Research Contract Management: Purchasing services from FRST, HRC and RSNZ to select, manage and monitor contracts with research organisations and individuals ($21.8 million).
- Advice on Shaping the Science System (MoRST funding): This comprises two components, contract management and policy advice (total funding $13.8 million).

NO FEEDBACK IS REQUIRED FOR THIS SECTION.

Annex one

Mapping between the existing Vote RS&T structure and the proposed new Vote RS&T structure

EXISTING STRUCTURE	New structure
Research for Industry (Manufacturing and Services output) **Pre-Seed Accelerator Fund** No longer a separate output expense. Funding for commercialisation support will occur within High Tech Industries and Biological Economy. **Technology New Zealand** No longer a separate output expense. Funding for business R&D and the TechNZ brand will be retained but incorporated within High Tech Industries and Biological Economy. **New Economy Research Fund** No longer a separate output expense. Funding for targeted basic research has been transferred to High Tech Industries and to Biological Economy.	**High Technology Industries** Includes all of RFI— Manufacturing and Services and part of the New Economy Research Fund (FRST's portfolios New Physical Technologies and Medical and Health Technologies). Includes the part of RFI—Food and Fibre related to agri-technologies. Includes most of TechNZ (92.5%) and the Pre Seed Accelerator Fund (70%), and a small portion of Research Consortia (8%).
Research for Industry (Food & Fibre output) **Research Consortia** Funding is now mostly incorporated into Biological Economy, however the research partnership model will be retained as an investment tool that FRST will use.	**Biological Economy** Includes the majority of RFI-Food & Fibre and most of Research Consortia (87%) plus the biotechnology / genomics part of the New Economy Research Fund (FRST's New Zealand Strengths portfolio). Includes a small part of TechNZ (7.5%) and Pre Seed Accelerator Fund (30%).
Research for Industry (Infrastructure Output)	**Hazards and Infrastructure** Includes parts of RFI-Infrastructure (all of FRST's Resilient Infrastructure and Communities; and part of Optimising Resource Use and Infrastructure portfolios). Includes part of Environmental Research (FRST's Sustainable Cities and Settlements portfolio). Includes a small proportion of Research Consortia (5%).
	Energy and Minerals Made up of part of RFI-Infrastructure (part of FRST's Optimising Resource Use and Infrastructure portfolio).

EXISTING STRUCTURE	New structure
Environmental Research (all existing outputs)	**Environment** Includes all of Environmental Research except for Backbone which is now in Research Infrastructure and FRST's Sustainable Cities and Settlements portfolio which is now in Hazards and Infrastructure (Urban development and infrastructure area). Environment includes $2 million funding from MKDOC that relates to the Vision Matauranga theme Taiao.
Maori Knowledge and Development (MKDOC) This is no longer a separate appropriation. Instead, the implementation of Vision Mātauranga (the policy framework and strategy used within MKDOC) will become a Vote-wide activity rather than retained within a single appropriation. MKDOC is $4.8 million. It will be divided in relation to current Vision Mātauranga themes indicatively as follows: • Environment $2.0 million–related to the theme Taiao • Health and Society - Health $1.9 million–related to the theme Hauora - Society $0.6 million–related to the themes Oranga and Mātauranga - Economy $0.26 million–related to the innovation theme	**Health & Society** Includes all of Health Research, Social Research, Cross Agency Research and a small part of economic and social research in Research for Industry (FRST's SET portfolio). It also includes approximately $3 million from the Maori Knowledge and Development Output Class. Health research capability grants that were previously funded in Supporting Promising Individuals are now included within Health.
Health Research	
Social Research	
Cross Agency Research	
Marsden Fund	**Top Talent** Includes both Marsden Fund and the scholarships and fellowships within Supporting Promising Individuals that have an excellence-focus. These are retained as two separate investment areas: • Marsden Fund • Scholarships and Fellowships
Supporting Promising Individuals (SPI)	

EXISTING STRUCTURE	New structure
International Investment Opportunities Fund **International Linkages**	**International Relationships** Includes both existing funds merged into a single investment area.
CRI Capability Fund **Research for Industry-Backbone output** **Environmental Research-Backbone output** **Genomics Facility** **Advanced Network** **Australian Synchrotron**	**Research Infrastructure** Includes all existing funds each retained as separate investment areas with no change: • CRI Capability Fund • Backbone funding is a new investment area comprising existing Backbone funding in Research for Industry $3.9 million and Environmental Research $18.1 million • Genomics Facility • Advanced Network • Australian Synchrotron
Engaging New Zealanders with RS&T	**Engaging New Zealanders with RS&T**
National Measurement Standards	**National Measurement Standards**
Research Contract Management Advice on Shaping the System • Policy Advice • Contract Management	**Research Contract Management** Advice on Shaping the System • Policy Advice • Contract Management