MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

RESEARCH, SCIENCE AND INNOVATION

TE ARA PAERANGI FUTURE PATHWAYS SUMMARY 2021

Te Kāwanatanga o Aotearoa
New Zealand Government

MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Ministry of Business, Innovation and Employment (MBIE)
Hīkina Whakatutuki – Lifting to make successful

More information
Information, examples and answers to your questions about the topics covered here can be found on our website, www.mbie.govt.nz, or by calling us free on 0800 20 90 20.

Print: ISBN 978-1-99-100877-0 **Online: ISBN 978-1-99-100876-3**
Published: October 2021

A CONNECTED, RESILIENT AND ADAPTABLE MODERN SYSTEM

Our research, science and innovation sector has served Aotearoa New Zealand exceptionally well. From supporting our economy and society, to enhancing understanding of our natural world, helping us solve environmental challenges, and underpinning our response to the COVID-19 pandemic. We now need to consider how we best position our system for the future.

We want to create a modern, future-focussed research system for New Zealand. It needs to be adaptable for a rapidly changing future, resilient to changes, and connected; to itself, to industry, to public sector users of research, and internationally.

Such a system should reflect New Zealand's unique opportunities and challenges. It would embed Te Tiriti across the design and delivery attributes of the system, and enable opportunities for mātauranga Māori. It will also recognise that research is a global undertaking and seek to stand alongside the best systems in the world.

This Green Paper seeks to start a wide-ranging and open conversation on how to best achieve this vision. We need to address recent reports, such as Te Pae Kahurangi, that found the design of the current system incentivises fragmentation and unproductive competition, while struggling to adapt to changing national needs. Through your feedback, we hope to gather a broad base of views on the issues faced in the current system and the ideas and opportunities to improve it.

We have framed potential responses through six main areas:

1. Exploring the role that whole-of-system priorities could play in focusing research activities and concentrating resources towards achieving national goals.
2. Exploring how the research system can best honour Te Tiriti obligations and opportunities, give life to Māori research aspirations and enable mātauranga Māori.
3. Exploring potential ways to reshape the RSI funding system for the future. It covers how funding can be used to give effect to national priorities, reduce unproductive competition, and ensure our institutions can respond to emerging opportunities.
4. Re-examining how we design and shape public research institutions (focussing on CRIs and Callaghan Innovation) to enable them to give effect to national priorities, encourage greater connectivity, and be adaptable in a fast changing world.
5. Exploring how we best develop our workforce, ensure the RSI workforce is connected, diverse and dynamic and they are offered attractive and flexible careers and career pathways.
6. Exploring effective funding, governance and ownership arrangements for national research infrastructures and how we should support sustainable, efficient and enabling investment in research infrastructure.

Each area sets out a proposed set of opportunities for change and seeks your feedback on possible solutions.

THE CONSULTATION PROCESS

This consultation will be open from 28 October 2021 to 16 March 2022. MBIE will provide advice to Ministers once all feedback has been reviewed and considered. We expect Cabinet will take key decisions in 2022.

Some decisions may require further consultation or discussion with the research, science and innovation sector. We will work with the sector to make sure any changes are carefully considered and well communicated.

How to provide feedback
We want to hear from anyone in the broader research, science and innovation system. Whether you're a researcher, scientist, leader, manager or user of the system, we want your feedback. You can provide your feedback in a number of ways:

Email us directly at FuturePathways@mbie.govt.nz

Completing the online submission form available at www.mbie.govt.nz/futurepathways

By mailing your submission to:

Future Pathways Policy Team
Ministry of Business, Innovation & Employment
PO Box 1473
Wellington 6140

What will happen to your feedback
All feedback with be considered carefully by MBIE officials. A summary of feedback will be provided to Ministers and Cabinet.

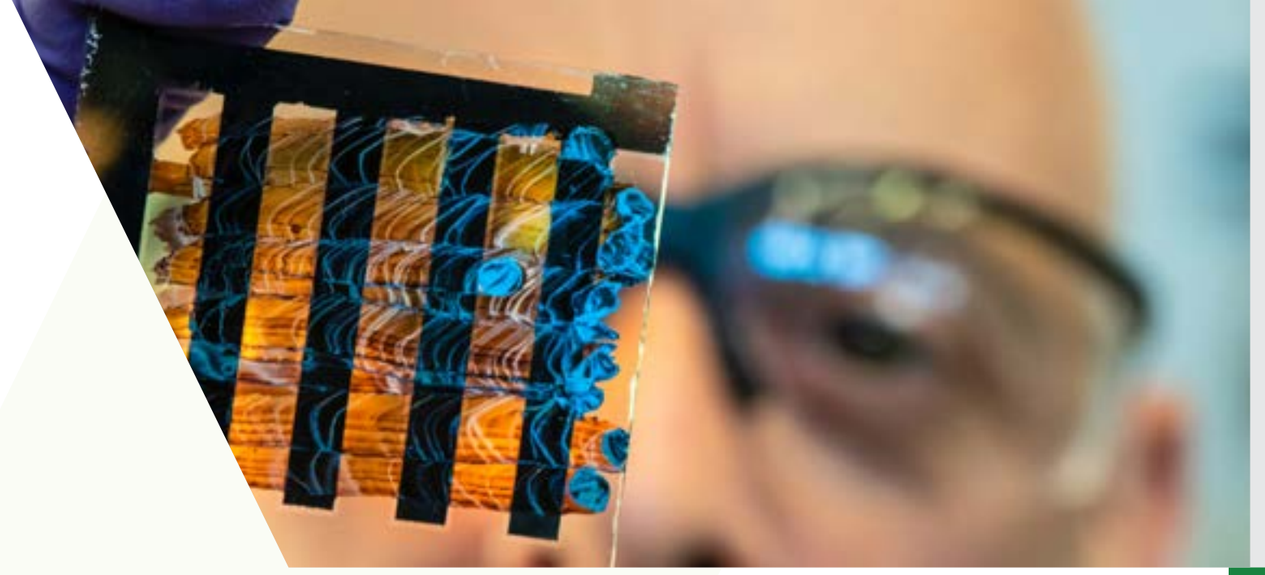
TE HŌKAITANGA SCOPE

The focus for this green paper is the design of the 'public' research system. A technical description is that we are considering changes to aspects of funding administered as part of the RSI ministerial portfolio, and changes to institutions within that portfolio, principally the Crown research institutes (CRIs) and Callaghan Innovation.

The research that takes place in other public institutions, such as universities, Te Pūkenga and wānanga, is also within scope of this green paper, as is the publicly funded research that takes place in independent research organisations and other independent entities.

We take a broad definition of research for the purposes of this paper (see the glossary for more info). The term 'research' when used as a single word should be read to encompass all activities usually understood as such, including but not limited to research into the arts and humanities, social research, and natural sciences.

We are not actively considering changes to Vote: Tertiary Education funds, such as the Performance-Based Research Fund (PBRF) as part of this work programme, nor are we actively considering structural or design changes to TEOs. But we recognise the importance of connections across the wider RSI sector, and that some organisations receive funding through both RSI and Tertiary Education mechanisms, so we are interested in feedback on the relationships between Tertiary Education funding streams and structures, and the



proposals suggested in this document. In general, at this stage, we would like to gather a broad range of feedback on all aspects of this system to get a wider understanding of intersects between the education and RSI systems.

We are not planning changes to business-facing RSI programmes as part of this work (such as the R&D Tax Incentive) so they can be considered as out of scope. However, we are interested in improving connectivity between businesses and other users of knowledge generated by our public research institutions, and the channels of knowledge exchange and transfer between research institutions, businesses and others to achieve greater impact. Along with aspects of system and institutional design that improve channels of knowledge exchange and transfer between businesses and research institutions, we remain interested in hearing feedback on business-facing RSI schemes, especially if they relate to parts of the system that are in scope.

A guiding principle for this reform is that we have no pre-commitment to specific solutions, unless otherwise noted. In general, we are keen on the most open exploration of the problems and opportunities we present. In qualifying this, we note the following:

- We consider that the problems we raise are real issues that need to be addressed in any future research system. This means we have to act in some way. This is the case for all the problems we raise, unless this green paper specifically asks for comment on whether you think we have identified the right problem. While we are interested in deep discussion about these problems, we will likely make changes to address them, unless presented with compelling reasons why we should not.
- Our proposals in this paper are intended to provide model solutions, to stimulate discussion on system design and test the robustness of those solutions. None are set in stone, and we are very open to discussion on alternatives.
- For some specific areas covered in this document, work is already under way, and may have been for some time. We are interested in feedback on these areas, but ask you to note that we have already taken steps in a particular direction. These are:
  - Accelerating the impact of Vision Mātauranga, via funding through Budget 2020
  - seeking to encourage combined property planning and co-location between CRIs and universities
  - ensuring a robust basis for future investments in our e-research infrastructure (currently through Research Education Advanced Network New Zealand and New Zealand eScience Infrastructure).

NGĀ WHAKAAROTAU RANGAHAU RESEARCH PRIORITIES

We are seeking your feedback on the principles and features for designing, deciding on and operationalising a single set of system level Priorities for the research system.

Our current system lacks clearly articulated priorities at a system level and the priority setting landscape is cluttered and fragmented. Because of this, our research system struggles to clearly direct resources towards areas of the highest importance, while Government, as funder and steward of the research system, struggles to give effect to its priorities through the same system.

Clearly expressed research priorities will offer the opportunity for Government to make new, proactive investments in research areas of emerging importance. They could serve as more explicit drivers of focussed technology, innovation, or environmental policies. They could act as focal points for balancing research portfolios, ensuring an appropriate mix of leading-edge transformative research and experimental development in operational environments. Priorities could also offer the opportunity to monitor and evaluate translation of research activity into outcomes related to government priorities or strategies.

Key factors for the success of system level research priorities will be:

- **How we design these priorities.** For example, what should be the size, scope and focus of the priorities?
- **How we decide what these priorities are.** What process should we use for determining these priorities and who should be involved in the decision-making process.
- **How we operationalise and implement these priorities.** We need to determine who will be involved in determining the strategy for each priority, how they will be governed and how the priorities will operate on a day-to-day basis?

We are seeking your feedback on the principles and features for designing, deciding on and operationalising a set of system level priorities for the research system.

Our questions for you:

1. What principles could be used to determine the scope and focus of research priorities?
2. What principles should guide a national research priority-setting process and how can the process best give effect to Te Tiriti?
3. How should the strategy for each research priority be set and how do we operationalise them?

TE TIRITI, MĀTAURANGA MĀORI ME NGĀ WAWATA O TE MĀORI TE TIRITI, MĀTAURANGA MĀORI, AND SUPPORTING MĀORI ASPIRATIONS

We would like to explore how the research system can seek to understand and honour Te Tiriti obligations and opportunities, and explore pathways to a modern research system for New Zealand that is Tiriti led.

It is clear from multiple reports and our previous consultation exercises that more work needs to be done to explore how the research system can best uphold Te Tiriti obligations and opportunities.

We aim to reimagine how to give life to Māori research aspirations, and create better ways to enable and protect mātauranga Māori. We would also like to further explore the building of stronger connections with regionally-based Māori knowledge, including mātauranga practitioners.

Open and genuine engagement with Māori will be vitally important to the development of a research system that gives effect to Te Tiriti. We are interested to hear about Māori preferences for engagement as we move through any programme of work arising from Future Pathways. We do not expect this green paper to be our only avenue of engagement on this work programme and we will seek to create ongoing and appropriate opportunities to engage with Māori throughout any reform processes which follow this consultation.

Our questions for you:

4. How would you like to be engaged throughout the Future Pathways programme?
5. What are your thoughts on how to enable and protect mātauranga Māori in the research system?
6. What are your thoughts on regionally based Māori knowledge hubs?

TE TUKU PŪTEA FUNDING

We are investigating how to reshape the funding system for the future, to ensure that it gives effect to whole-of-system Priorities, reduces unproductive competition, and ensures our institutions can adapt to changing priorities and respond to emerging opportunities.

Funding research is the main way in which Government supports the research system. The Government funding that supports our research activities has increased significantly over the last ten years - by around 75% since 2010. However, the underpinning mechanisms by which that funding is distributed has led to ambiguity in organisational revenue for some institutions despite the overall increases, and we continue to see unproductive competition across the research system. Overall, we see a system where demand for its support far outstrips the supply of resources.

We would also like to investigate ways to improve revenue stability for research institutions. Some of our research organisations rely heavily on various streams of Government research funding for revenue stability. Unlike most other countries, New Zealand funds the 'full cost' of research via an overhead component calculated as part of project or programme specific research grants. We do not allocate grants to fund overhead costs for organisations, meaning research organisations are heavily exposed to the outcomes of funding competitions and national priorities. The stability of an overhead cost grant could allow research organisations to be far more adaptable and resilient to future changes in priority than they are at present. It could also allow our funding competitions to fulfil their policy intent completely, and become forums for a competition for the best new ideas generated by the research community.

We also need to consider how we can properly fund important activities or 'core functions' such as critical research functions, high priority services, emergency response, and databases and collections.

Our questions for you:

7. How should we determine what constitutes a core function and how do we fund them?
8. Do you think a base grant funding model will improve stability and resilience for organisations? How should we go about designing and implementing such a funding model?

NGĀ HINONGA INSTITUTIONS

Our CRIs were created in the early 1990s with design features focused on the sectors of the economy such as food and fibre, and aspects of the environment and natural hazards. They have performed exceptionally well for the areas in which they are focussed. Our economic and social make up and aspirations have shifted since then, and it is timely to check in on the design and organisation of our institutions to make sure we continue to have sound design principles.

Currently, it is not clear if a CRI's objective is to create value for itself, as a company under the Companies Act, or to generate value for New Zealand as specified in the CRI Act. This creates a tension and a strong focus on individual CRIs' commercial performance that may impede collaborations that would contribute to the national benefit.

Any alternative organisational format will need to consider the appropriateness of different models for the types of research that institutes undertake, such as emergency responses and core services, as well as research that generates commercial revenue. We need to consider how the remit and focus of research institutions are decided and how this enables interdisciplinary collaboration, and addressing complex challenges and allows research users, particularly Māori, to build strong research relationships and navigate the system. Fewer, larger, more resilient organisations could result in greater connectivity and inter-disciplinary research, more co-ordinated investment in research infrastructure creating hubs of capability across multiple sectors.

The role of Callaghan Innovation in the RSI system

The changes that we will make to our research system to make it more connected, adaptive and resilient, also require us to think about how that interacts with our innovation system.

New Zealand's innovation agency, Callaghan Innovation, which is a Crown Entity, performs a wide range of roles within a single entity. Sometimes these diverse roles conflict with each other or are perceived to compete with the interests of potential partners in the public research system in ways that form barriers to collaboration across the system. While we are considering the design of our public research system, we should also consider its interactions with the innovation system and institutions so that we can increase collaboration and connections across the system.

Our questions for you:

9. How do we design collaborative, adaptive and agile research institutions that will serve our current and future needs?
10. How can institutions be designed to better support capability, skills and workforce development?
11. How should we make decisions on large property and capital investments under a more coordinated approach?
12. How do we design Te Tiriti enabled institutions?
13. How do we better support knowledge exchange and impact generation? What should be the role of research institutions in transferring knowledge into operational environments and technologies?

TE HUNGA MAHI RANGAHAU
WORKFORCE

Our research workforce is at the centre of a connected, resilient and adaptable research system. We need to ensure the research system attracts and retains excellent talent, whilst offering attractive and flexible careers and career pathways.

Our current system does not have a strong focus on funding mechanisms that explicitly support workforce development. There is also a general lack of information about the RSI workforce to assess progress against. We are currently developing an RSI workforce survey that will help inform our policy development around workforce issues and opportunities. In the context of the Future Pathways programme we will be able to use the survey to consider responses to issues such as:

- Equity diversity and inclusion.
- Career precarity for early career researchers.
- The RSI education pipeline.
- Movements within the science system.
- International connections.

We are seeking your feedback on how we design a research system that is more connected, diverse and dynamic, attracting and retaining excellent talent.

Our questions for you:

14. How should we include workforce considerations in the design of research Priorities?
15. What impact would a base grant have on the research workforce?
16. How do we design new funding mechanisms that strongly focus on workforce outcomes?

TE HANGANGA RANGAHAU
RESEARCH INFRASTRUCTURE

We are seeking feedback on future funding, ownership and operational models for research infrastructure, and how we can maximise related investments.

Research infrastructure such as laboratories, equipment, and collections and databases are key inputs into research activities and science services. Our overall approach to research infrastructure faces several issues including:

- Small investment and a lack of sustainable support.
- A lack of overall co-ordination of major RSI system property and capital investments.
- The absence of coordinated mechanisms to identify where focused investment in research infrastructure would deliver more value for New Zealand.

Research infrastructure can also include key data infrastructures such as those containing weather or environmental data. Lack of specific ongoing funding can mean that some of these data infrastructures struggle with maintenance over time.

Effective models for research infrastructure should appropriately balance system, institution and user needs, and support the sustainable operation of and access to infrastructure. To drive high research performance, we also want to see investment at sufficient scale and targeted to high-priority areas.

Our questions for you:

17. How do we support sustainable, efficient and enabling investment in research infrastructure?

FOR MORE INFORMATION VISIT US
ONLINE AT WWW.MBIE.GOVT.NZ

PUBLISHED BY THE MINISTRY OF
BUSINESS, INNOVATION & EMPLOYMENT

LSE 7042