From:	no-reply@mbie.govt.nz
To:	Research, Science and Innovation Strategy Secretariat
Subject:	Draft Research, Science and Innovation Strategy submission
Date:	Sunday, 10 November 2019 4:24:35 p.m.
Attachments:	Online-submission-form-uploadsdraft-research-science-and-innovation-strategy-submissionssubmission-form-research-science-and-innovation-strategy-v10.docx

Submission on Draft Research, Science and Innovation Strategy recevied:

Are you making your submission as an individual, or on behalf of an organisation?
Individual

Name
Shaun Hendy

Name of organisation or institutional affiliation
Te Punaha Matatini, University of Auckland

Role within organisation
Director

Email address (in case we would like to follow up with you further about your submission)
shaun.hendy@auckland.ac.nz

Which of the below areas do you feel represents your perspective as a submitter? (Please select all that apply)
Researcher, Entrepreneur

If you selected other, please specify here:

Gender
Male

Ethnicity
Pakeha

Name of organisation on whose behalf you are submitting, if different to the organisation named above

In which sector does your organisation operate: (Please select all that apply)

If you selected other, please specify here:

How large is your organisation (in number of full-time-equivalent employees)?

Please indicate if you would like some or all of the information you provide in your submission kept in confidence, and if so which information.

Please upload your submission document here
submission-form-research-science-and-innovation-strategy-v10.docx - Download File

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Research, Science and Innovation Strategy

Submission form

The Government is developing a Research, Science and Innovation (RSI) Strategy to set out our vision for RSI in New Zealand and its role in delivering a productive, sustainable, and inclusive future.

We are keen to hear the views of New Zealanders on the draft Strategy so that we can get a better understanding of what our country needs from RSI. We also are looking for feedback on how we can take action to ensure New Zealand's RSI system is optimised for success. These views will inform the direction of Government investment in RSI and the research and innovation areas for us to focus on as a country, as well as help us understand the challenges we need to overcome.

We encourage anyone with an interest to make a written submission.

How to have a say

We have included a number of questions in the draft RSI Strategy document to highlight issues on which we would like further input. We encourage you to use these questions as a guide when submitting your feedback.

This document provides a template for you to provide your answers. Please upload the completed document using our online submission page.

You do not have to fill out every section – we welcome submissions on some or all of the questions.

The closing date for submissions is 10 November 2019.

After the consultation period finishes, we will analyse the submissions received and incorporate the feedback in the final version of the strategy.

Confidentiality

Please note: All information you provide to MBIE in your submission could be subject to release under the Official Information Act. This includes personal details such as your name or email address, as well as your responses to the questions. MBIE generally releases the information it holds from consultation when requested, and will sometimes publish it by making it available on the MBIE website.

If you do not want some or all the information you provide as part of this consultation to be made public, please let us know when you upload your submission. This does not guarantee that we will not release this information as we may be required to by law. It does mean that we will contact you if we are considering releasing information that you have asked that we keep in confidence, and we will take your reasons for seeking confidentiality into account when making a decision on whether to release it.

If you do not specify that you would prefer that information you provide is kept in confidence, your submission will be made public. While we will do our best to let you know that we plan to publish your submission before we do so, we cannot guarantee that we will be able to do this.

Contribution of Research, Science and Innovation

This strategy is about New Zealand's Research, Science and Innovation (RSI) at a high-level. Its aim is to identify challenges and opportunities that will have the broadest impact on our research and innovation activities. For this reason, it mentions few specific areas or sectors of research and innovation. For this draft version of the Strategy, we are keen to hear from researchers, innovators, businesses, and providers of public services on what the RSI system could be doing to accelerate progress on Government's priorities.

Question 1: Where can the RSI system make the greatest contribution towards the transition to a clean, green, carbon-neutral New Zealand?

Question 2: Where else do you see it making a major contribution?

Question 3: What else could else the RSI system be doing to accelerate the progress towards the Government's priorities*?

* see list of the Government's twelve prioritiesincluded in Part 1 of the draft Strategy.

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

The RSI system makes contributions in many ways, but this can also be enhanced in many ways.

There is still little value on the dissemination of research to the public. The outputs of most publicly funded research are still paywalled, while a number of research funding mechanisms actively restrict or discourage dissemination by researchers (e.g. MPI funding). This distorts the spectrum of knowledge and expertise available to the public and to policy-makers. Where there are good arguments for restricting dissemination (e.g. commercial reasons), then matching funding should be provided to balance public discourse and to ensure there is a reservoir of expertise available to the public.

There is also a strong bias in our RSI system towards the natural sciences. A good example of this is the list of projects and platforms contributing towards climate change. A quick glance at the infographic on Pg 12 reveals that the RSI system is supporting very little work on policy solutions towards climate change or the associated social science, with funding overwhelming directed towards climate modelling or technological solutions. The RSI system could make a much more significant contribution to Aotearoa New Zealand if this was balance was corrected, as noted on Pg 19 'Innovating in the Public Sector'.

Public sector users of research should adopt common standards for systematically citing research. This creates incentives for researchers (and their institutions) to work on policy-relevant problems, to make their work available to policy-makers and will allow for measurements of policy use (as suggested on Page 43).

Researching and innovating towards the frontier

Question 4:	Do you agree that the RSI Strategy should be focused on innovation at the "frontier" (creating new knowledge) rather than behind the frontier (using existing knowledge to improve the ways we do things)?
Question 5:	In which research and innovation areas does New Zealand have an ability to solve problems that nobody else in the world has solved? Why?
Question 6:	In which areas does New Zealand have a unique opportunity to become a world leader? Why?
Question 7:	What do you consider to be the unique opportunities or advantages available to the RSI system in New Zealand?
Question 8:	What RSI challenges are unique to New Zealand, that New Zealand is the only country likely to address?
Question 9:	What are the challenges of innovating in the public sector? How do they differ from those in the private sector?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Q4: I would argue that it is important to realise that 'frontier' research and 'behind-the-frontier' research are causally connected. There is good evidence base that suggests that the ability to absorb 'behind the frontier' knowledge from overseas is strongly coupled to the ability to perform 'frontier' research, so it is not clear that the trade-offs between the two options are completely understood. A strategy to pursue only 'behind the frontier' research would likely be unsuccessful. Rather, the two should be considered together: where we invest in 'frontier' reserch, the opportunities for spill-overs into 'behind the frontier' uses should be considered and supported where possible.

Q6: One of our key strengths lie in our institutions with low corruption and generally good standard of civil engagement. This suggests that policy-leadership, public sector innovation, and govtech should be areas in which we excel. However the public RSI system has generally provided little support for the types of research that could support this strength.

Q8: Our economy is much more specialised than other comparable small economies, with agriculture and tourim dominating our export earnings. This leaves us very exposed to the risks of technological change and climate change. In these circumstances our RSI system needs to continue to support diversification of the economy.

Q9: Innovation in the public sector occurs within a political economy that favours risk-shifting rather than risk-taking. A strong, independent RSI system potentially mitigates this by enabling ideas to be developed outside this political economy. However, the public sector then needs incentives that drive the adoptions external innovations at the right times in the policy cycle.

Our key challenge – Connectivity

Question 10: Do you agree that a key challenge for the RSI system is enabling stronger connections? Why or why not?

Please type your submission below.

There are often strong governance and accountability costs imposed on initiatives to increase connectivity e.g. National Science Challenges often have two to three governance and advisory boards. This is compounded by our tendency to support multiple initiatives in overlapping domains (e.g. there are significant overlap in investigators across CoREs and NSCs), which combine these increased governance costs with diminishing returns to connectivity. This is also very evident in the climate change space (pg 12), with multiple entities possessing overlapping objectives. The large number of public sector entities operating in particular domains is also a barrier to external engagement. Private sector organisations are often confused by complicated overlapping IP arrangements and relationships.

Furthermore, initiatives to scale-up activity can also increase complexity if new mechanisms are created (e.g. National Science Challenges). The RSI system needs to take steps to reduce the complexity of the system if it wants to scale-up or grow connectivity. This requires discipline at the policy level, where the political economy favours the creation of new mechanisms for funding delivery rather than guiding or reinforcing existing mechanisms. Scaling-up areas of strength needs to be done in a way that does not increase costs for connection, and vice versa. Policy makers should consider the trade-offs e.g.

- If scale up is the principle aim, then existing mechanisms (with strong governance) should be supported in preference to creating a new mechanism;
- If existing mechanisms are insufficient, then any new mechanism should consider subsuming other initiatives. Strong governance should be put in place.
- If connectivity is the principle aim, then low governance budern options should be preferred, with a focus on supporting individuals to connect and collaborate rather than new entities on top of existing NSCs, CoREs, or research centres.

Guiding Policy – Excellence

Question 11:	Do you agree with the definition of excellence presented here as the best thing possible in its context? Why or why not?
Question 12:	How can we achieve diversity within our research workforce? What are the current barriers preventing a diverse range of talent from thriving in the RSI system?
Question 13:	Do you agree that excellence must be seen in a global context, and draw from the best technology, people, and ideas internationally? Why or why not?
Question 14:	Do you agree that excellence is strengthened by stronger connections?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Guiding Policy – Impact

Question 15: How can we improve the way we measure the impact of research?

Please type your submission below.

More work is needed on measuring the dissemination of research via

- research communication and engagement;
- the use of research by policy-makers and/or regulators;
- the use of research by communities;
- its embodiment in new skills that become available in the labour market

Guiding Policy – Connections

Question 16:	Where do you think weak connections currently exist, and what are the barriers to connections at present?
Question 17:	What actions will stimulate more connectivity between parts of the RSI system?
Question 18:	How could we improve connections between people within the RSI system and people outside it, including users of innovation, and international experts, business communities, and markets?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Q16: There are still weak connections between public sector researchers and the private sector. The full-cost recovery model operated at universities is a barrier to working with the private sector, particularly given the market distortion this creates to favour PhD students over post-doctoral fellowships, but also because work at the public-private interface tends to subsidise more specialised public sector research. Furthermore the CRI funding model tends to encourage appropriation of research and in an economy with low capacity for IP management this is often an insurmountable challenge.

Q17/18: I would suggest:

- Increasing the number of post-doctoral fellowships, particularly where these can be targeted at projects that span the public-private interface.
- Longer term, more stable operational funding and capital would enable CRIs to better engage with the private sector.

Actions – Making New Zealand a Magnet for Talent

Question 19:	How can we better nurture and grow emerging researchers within New Zealand and offer stable career pathways to retain young talent in New Zealand?
Question 20:	How could we attract people with unique skills and experience from overseas to New Zealand?
Question 21:	What changes could be made to support career stability for researchers in New Zealand? What would be the advantages and disadvantages of these approaches?
Question 22:	Do you agree with the initiatives proposed in the Strategy to support and attract talented researchers and innovators? Are any changes needed for these initiatives to be successful? Are there any other initiatives needed to achieve these objectives?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Q19/22: Vote Tertiary Education currently subsidizes activities in Vote RSI by covering a substantial portion of the full cost tuition fees for PhD students. Research grant funding via Vote Research, Science, and Innovation (e.g. MBIE's Endeavour fund) will typically pay a portion of the tuition fee, but grants do not see the full costs of PhD tuition. This is distortionary as post-doctoral fellowships and investigator buyout do attract full cost recovery overheads, favouring the use of PhD students to carry out research programmes rather than more experienced staff. One of the effects of this distortion is a lower number of post-doctoral fellowships than would otherwise exist. There is evidence from the Marsden fund for example, that shows a switch from support of post-doctoral fellowships to PhD scholarships as grant size has failed to keep up with inflation.

This distortion is likely to have an adverse effect on the RSI system in a number of ways:

- It reduces skills and experience in the public sector research system, by subsidizing the participation of less skilled researcher;
- It reduces the capacity of public sector researchers to engage with the private sector, as PhD students are not best placed to translate the results of their work outside the academic domain;
- It is likely to result in a skills misallocation in the labour market, with PhD students excessively incentivised to respond to demand in the public research system rather than the broader research ecosystem.

Removing this subsidy so that Vote RSI was exposed to the costs of PhD tuition where students are funded by grants would be cost-neutral, but may result in a reduction in the number of funded positions for PhD students with flow-on consequences for our universities. I would therefore recommend that MBIE create and maintain a national post-doctoral fellowship scheme, such as the scheme that was scrapped earlier this decade. Such a scheme could also be used to enhance the diversity of the RS&I system, increasing the

participation of Māori and women in the research workforce.

Actions – Connecting Research and Innovation

Question 23:	What elements will initiatives to strengthen connections between participants in the RSI system need to be successful?
Question 24:	What elements will initiatives to strengthen connections between participants in the RSI system and users of innovation need to be successful?
Question 25:	What elements will initiatives to strengthen connections between participants in the RSI system and international experts, business communities, and markets need to be successful?
Question 26:	Are there any themes, in addition to those proposed in the Strategy (research commercialisation and international connections), that we need to take into consideration?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Actions – Start-up

Question 27:	How can we better support the growth of start-ups?
Question 28:	Do the initiatives proposed in the draft Strategy to support growth of start-ups need to be changed? Are there any other initiatives needed to support start-ups?
Question 29:	What additional barriers, including regulatory barriers, exist that prevent start-ups and other businesses from conducting research and innovation?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

As a founder of two tech start-ups, the difficulty in accessing publicly funded research and expertise is a key barrier.

Actions – Innovating for the public good

Question 30:	How can we better support innovation for the public good?
Question 31:	What public-good opportunities should our initiatives in this area be focused on?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Actions – Scale up

Question 32:	What is the best way to build scale in focused areas?
Question 33:	Do the initiatives proposed in the Strategy to build scale in focused areas need to be changed? Are there any other initiatives needed to build scale?

Note: see following page to comment on possible areas of focus

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Scale up has the potential to add to the complexity of the RSI system as new entities are created to grow or diversify the research portfolio. This complexity makes external engagement more difficult, and loads further goverance and management responsibilities on the RSI system. I would strongly favour utilising existing entities where possible (e.g. set up new teams at Callaghan for instance, rather than creating new stand-alone institutes).

Scale up – Choosing our areas of focus

For this draft iteration of the strategy, **we seek input on the selection of possible areas of focus**. We will consider establishing around five focus areas, but, depending on the eventual selection, are likely to introduce them over time, rather than immediately. In addition to the criteria set out in the Strategy document, we invite stakeholders to consider the following factors in their suggestions –

- The ambition of this strategy to focus efforts in the RSI portfolio at the global frontier of knowledge and innovation.
- Ways in which the RSI system can accelerate progress on the government's goals.
- The focus areas already determined by *From the Knowledge Wave to the Digital Age*.
- Work already underway where we are already seeking to build depth and scale in the RSI system.

The following areas could be a useful start, and are highlighted in *From the Knowledge Wave to the Digital Age:*

- **Aerospace**, including both autonomous vehicles and our growing space industry.
- **Renewable energy**, building on recent investments in the Advanced Energy Technology Platform.
- **Health technologies** to improve delivery of health services and explore opportunities in digital data-driven social and health research.

We invite comment on these suggestions and welcome input on other possible focus areas.

Please type your submission below.

Actions – Towards an Extended Vision Mātauranga

This section of the draft Strategy signals our intention to consult and collaborate further with Māori stakeholders to co-design our responses and initiatives. From that perspective, we consider the signals in the draft Strategy to be a start, rather than a set of final decisions. Nonetheless, we are keen on initial feedback in the following areas.

Question 34: Does our suggested approach to extending Vision Mātauranga focus in the right five areas? If not, where should it focus?

Question 35: How can we ensure the RSI system is open to the best Māori thinkers and researchers?

Question 36: How can we ensure that Māori knowledge, culture, and worldviews are integrated throughout our RSI system?

Question 37: How can we strengthen connections between the RSI system and Māori businesses and enterprises?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Honouring Te Tiriti would also involve increasing rangatiratanga in the RSI system e.g. devolving funding to Māori organisations for allocation and delivery, for instance. Furthermore, many aspects of our RSI system reflect its colonial origins (e.g. James Cook Fellowships, Endeavour Fund, and the Royal Society). An extended 'Vision Mātauranga' should touch all parts of our RSI system, and eliminate these some of these symbols of colonisation.

Actions – Building Firm Foundations

Question 38:	Do the current structures, funding, and policies encourage public research organisations to form a coordinated, dynamic network of research across the horizons of research and innovation? What changes might be made?
Question 39:	Is the CRI operating model appropriately designed to support dynamic, connected institutions and leading edge research? What changes might be made?
Question 40:	What additional research and innovation infrastructure is necessary to achieve the goals of this Strategy? What opportunities are there to share infrastructure across institutions or with international partners?
Question 41:	What elements will initiatives in this area need to be successful?

Please type your submission below. If applicable, please indicate the question(s) to which you are responding.

Overall, the sector is a very poor creator and user of business intelligence. Our universities, in particular, have fallen behind their Australian counterparts in capability here and this is something that is leading to a decline in university rankings. NZRIS is crucial here, but progress has been slow and there have not been significant efforts to grow capability for its use.

Actions – General

Question 42: How should the Government prioritise the areas of action, and the initiatives proposed under each area?

Please type your submission below.

General

Question 43:	Do you have any other comments on the Strategy which have not yet been addressed?

Please type your submission below.