

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 1:25:41 p.m.
Attachments: [Online-submission-form-uploadsdraft-research-science-and-innovation-strategy-submissionsBurton-Assoc.-Response-to-MBIE-RSI-Strategy-November-2019-template-form.pdf](#)

Submission on Draft Research, Science and Innovation Strategy received:

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

Organisation

Name

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

If you selected other, please specify here:

Gender

Ethnicity

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)

Research , Industry, Interface of research and industry

If you selected other, please specify here:

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

1

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.

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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 priorities included in Part 1 of the draft Strategy.

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

Question 1

The RSI system is a critical enabler to build a clean green carbon neutral economy. This will require a well co-ordinated approach across existing activities in the RSI system and supplemented by gap filling where needed. We need to resist the urge to add yet more mechanisms and further complicate what is already a very complicated and high overhead RSI system. We already have several entities, the CRIs, who were set up as centres of excellence, and purpose designed to undertake strategic research, partner with sectors and international research organisations, local and central government and Māori that if well-co-ordinated deliver on that vision. A business as usual approach will not be able to allow the above vision to be realised.

For example:

- How do we create sustainable land-use options that bring together land use into an integrated approach maximising value creation from the land while increasing environmental and community resilience?
- Develop viable new products derived from plants (including energy) that can substitute for fossil derived materials?
- Be able to manufacture products competitively in small scale in a way that can be commercially successful?
- Overcome a dispersed regional supply of raw materials and labour?
- Develop local solutions to energy supply and other infrastructure needs in a nation of mostly small communities.
- How do we protect our biological economic base in the face of climate change risk and a shrinking world? Such as protecting the health of our plants, creating biosecurity challenges, resilience to extreme weather events and increasing risk from fire.

- Diversify our economic base, by building on our strengths such as land-use, add knowledge to our product offerings and leverage brand value?

Question 2.

RSI has several ways in which it serves the nation.

1. By building talent and this means a greater integration with education most particularly with influencing young children (years 5 to 10) to encourage them into science or technical areas (more scientists, innovators, entrepreneurs, technical capacity in senior roles in our industries).
2. By purposefully building international collaborations in areas where New Zealand does not have the financial resources and yet are critical for New Zealand to achieve the vision you describe such as in industrial and plant biotechnology, artificial intelligence, managing data, precision and remote sensing tools etc.
3. By creating international collaborations that help us sustain market access and international trade alliances.

Question 3

Progress could be accelerated in delivering on the Government vision by:

- Vastly simplifying the system to make it more transparent to industry and reducing duplication and overheads
- Enabling a competition of ideas and removing what has become a competition between organisations
- Being totally transparent on how the government investment in science is applied. This could be achieved for example by investing endeavour fund based on the above stated vision but investing by portfolios such as:
 1. Protecting our economic base
 2. Strengthening our economic base
 3. Diversifying our economic base by building on our national strengths.
- Taking a whole of Government (and nation) approach to RSI. For example, education, government department, regional government and industry.
- Accept that New Zealand has a distinct approach to how we structure RSI and we streamline this to work for us as a nation. **This document frustratingly looks at RSI as if it were only undertaken in Universities.** We also have CRIs, IROs and other RSI organisations yet we treat them all the same. This is to our disadvantage. Be cautious about seeing those systems used in other nations as models for New Zealand.
- Build Te Ao Māori into the vision and stop using Vision Mātauranga as an add on.

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.

Question 4.

As an RSI strategy for New Zealand it should ensure it encompasses all activities in RSI. Not only creating new knowledge but how do we use knowledge to create opportunity. Leveraging the larger investments internationally into key areas such as remote sensing or robotics etc is mission critical for New Zealand.

Question 5 and 6

The greatest sustainable value creating activities for New Zealand are in solving those problems that New Zealand’s survival relies upon.

- Protecting our plants from the invasion of exotic diseases or pests.
- Dealing with extreme weather and related events (e.g fire)
- Overcoming our small size and dispersed natural resources and being able to manufacture competitively on a small scale.
- Adding value in ways that we can secure on-going advantage such as leveraging knowledge and brand from use of natural resources or solutions we develop. For example, designing sustainable packaging systems, building systems, or distributed manufacturing approaches.

We already have some of the elements to address the above but our fragmentation in our RSI challenges our ability to deliver to the level we must.

Question 7

The unique strength we have in New Zealand is to leverage greater value from our CRIs who already have the elements needed to deliver world leading solutions and most critically embed them into end-users or ensure uptake. Similarly, they can take a strategic

approach to embedding Te Ao Māori into their strategies and talent development as they have the scale to do this. However, their current operating models (large focus on winning money and domestic competition detracts from their being able to deliver to their full capacity.

Question 8

Refer answer to Questions 5 and 6

Question 9

If this question is referring to Crown Owned entities and Universities, then we have models that discourage collaboration across science and with end-users. Many investment mechanisms do create perverse behaviours.

For example PBRF encourage a focus on publication not connecting with end-users.

We have short-term programmes and typically very small programmes that discourage collaboration (having to share scarce resources with another organisation) or the ability to develop new talent.

The New Zealand private sector are mostly small enterprises. This necessitates building cross industry collaborations and trying to work with the public sector where programmes are typically small and have high transaction costs.

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.

Question 10.

Enabling stronger connections is critical and yes, it is a key challenge for the RSI system because:

- We have a series of entities who must compete to meet commercial imperatives.
- Programmes are typically small and hence collaboration means sharing out limited resources
- We have many investment mechanisms where collaboration with end-users is not a driver e.g. PBRF.
- The MBIE partnership fund has been dis-established where excellent science and end-user connections were key.

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.

Question 11

We need to be excellent in all we do. Whether it is in discovery or technology transfer.

Question 12

New Zealand science sector is very diverse with many different nationalities represented within it. Ensuring that we encourage a focus on the STEM subjects from an early age, across New Zealand would provide the opportunity for the science sector to encourage the sector to better represent New Zealand in terms of gender and culture.

Question 13

The quality of science must be viewed in an international context. New Zealand is a small nation with a small R&D spend and this is unlikely to change. We must do excellent science so we can be part of large international collaborations and be able to bring something to that collaboration.

Question 14

Strong collaborations increase the ability to do world leading research and to ensure that science achieves impact. They are both important.

Guiding Policy – Impact

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

Please type your submission below.

Question 15

There are many ways to measure the impact of research.

The best is to be clear what success looks like at an outcome level. More value created, cleaner waterways, healthier population and so on.

The enunciated vision is helpful as measures can then be put in place to measure progress to it. We are then also clear that we are focussing on that science that is critical for New Zealand.

This is not a trivial exercise but if done well it could substantially enhance what we do.

We should avoid weak indicators (for example start-ups as a sole measure)

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.

Question 16, 17 and 18

Domestic connections are nowhere near as strong as they should be.

One cause is that we have a Government investment system that creates a competition between domestic science organisations as they each strive to deliver on a commercial imperative.

To deliver on the zero-carbon vision would require Plant and Food, AgResearch, Scion, Manaki Whenua and NIWA to come together in a very strategic way. Also to put aside past business models such as seeing pastoral, forestry, conservation etc as distinct activities.

The MBIE partnership model has been a successful model that brings together industry and science. It is disappointing that it was discontinued as it clearly focussed on collaboration across excellence and impact.

The development of large long-term programmes, that bring together science and industry are effective in attracting talent, succession planning, international experts and all the ingredients to deliver on many agendas.

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.

Question 19

To better nurture and grow emerging talent requires taking a long-term view and a consistent approach. For example:

- Encouraging youth into STEM subjects,
- Creating exemplars and showing a strong career pathway for those in careers that have a strong technical base.
- Long-term programmes that encompass science and science translation.
- Reducing overhead and transaction costs associated with RSI. If bidding becomes a perpetual activity then a career in science is both less attractive and achieves less.

Question 20 and 21

The New Zealand science community has a lot of international talent. The issue is more about retaining it. This requires:

Ensuring our immigration and reward systems are appropriate. We typically do not have competitive salaries, health or pension benefits.

Our programmes need to be larger and longer-term enabling and well governed. That is also have a focus on succession planning and talent retention.

Scientists are attracted to interaction with end-users and the ability to translate their ideas into real world solutions not just doing science. End-user partnerships and relations are therefore critical

Question 22

It is not very clear what the proposed initiatives are? A global statement about being a centre of innovation does not help. We need to be more specific.



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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.

Question 23 through 26

Long-term large programmes, doing science of an international standard, linked to end-users.

Removing mechanisms that require domestic competition.

Government investing in science clearly linked to a strategy with quality governance in place that looks at all the parts of the innovation spectrum.

Increased transparency For example what is the PBRF spent on?

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.

Question 27

I assume we are referring to US type start-ups. These are typically high cost and usually disappear overseas before they become investment positive. They have a place but are not typically part of the New Zealand commercial environment. Equally if not more important are new activities locked into existing enterprises. These create better value for New Zealand both short and long-term.

Question 28 and 29

It is not clear why we need to focus on encouraging start-ups as such. Rather focus on outcomes that show we are delivering on a vision.

Activities that encourage end-users and science to work together will create the best environment to see new enterprises emerge. We should not get fixated on start-ups.

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.

Question 30

Innovation for private good and public good are not mutually exclusive. Industry want to invest in those activities that have best benefits to people and the environment for example. These are increasingly attributes demanded by consumers.

New Zealand has a long history of Government and Industry working together and is essential for a small nation such as New Zealand. We should encourage this.

Question 31

Developing new land-use approaches where the boundaries between economic, environment and human equity can work hand in hand. This aligns perfectly to the zero-carbon vision, sustainability and resilience vision.

New Zealand has led the world in land use approaches and must do so again if we wish to achieve our vision. A perfect exemplar for public private partnership.

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.

Question 32.

Building scale in focussed areas. This is not simply about a large single focus project but about taking a strategic portfolio approach to investing. As stated above:

We would suggest using a portfolio approach.

1. A large programme that focusses on protecting our economy and improving brand New Zealand. This could address plant health. Addressing extreme weather events, reducing the risk form climate change, fire and developing new approaches to land use that deliver benefits across the whole living standards framework.
2. A large programme that enables us to use our natural resources better – new products, from our forests or food and so on. How do we build in knowledge-based value into our products? For example, we lead the world in tree harvest systems how do we realise returns from that knowledge? Programmes that will enable us to build on our strengths and make a step change in value e.g. developing design/build solutions based on our natural resources, taking our solutions (e.g. small manufacturing systems) to the world
3. Programmes that take us into new markets and diversify our customer base.

To achieve the above, we need to celebrate our ability to adapt and adopt not just see science about discovery.

Question 33

It is not clear what these initiatives are that are referred to in the document.

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.

Choosing our areas of focus

There is a danger that we try and pick our successes in too narrow an area or simply see success as doing globally leading science?.

What is it New Zealand has to get right and then focus on these as being where we need to be global leaders?

Create a larger context that ensures everything we do; delivers on a zero-carbon agenda and improves community health and resilience, and human equity.

1. Create greater sustainable value from our land-based activities (protect, add value, diversify). Spin out will be new products including energy, higher margin products, value from adding intangibles such as brand and knowledge.
2. Deliver community health and resilience. Spin outs are also in new technologies and knowledge.

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.

Question 34 to 36

This is a very disappointing part of the strategy.

The past VM approach has clearly not worked. In Endeavour Fund proposals it is treated as an add on, typically not understood by national assessors let alone international assessors. It is also confused with benefits to Māori.

We are not going to get this right by tweaking the current VM approach.

The national vision for New Zealand should include Te Ao Māori – start at the top and we can demonstrably show a true partnership between Māori and the Crown.

Every programme that the Government invests in must then reflect that vision and all its elements.

Increase a focus on the science, engineering, mathematics, technology and Mātauranga Māori early in schools.

This is a long-term initiative, but quick fixes are unlikely to be successful. Having worked in kaupapa Māori programmes, New Zealand has a lot to learn from this approach and can itself add a distinctive and attractive dimension to science in New Zealand.

Question 37

I have worked with many Māori enterprises. They are typically well connected to science use or are developing very innovative approaches. Almost all follow a kaupapa Māori approach and we can all learn from this.

It is disappointing that the RSI strategy defaults that Māori are not connected to the RSI system.

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.

Question 38

The current structures of funding limit public research organisations in forming co-ordinated approaches at any level. There is a focus on competition between organisations, high transaction costs, short-term programmes and limited transparency.

There are a lot of investment mechanisms that drive behaviours to win money not to create the best long-term outcomes. For example, PBRF to focus on publication not end-user connections. The mechanisms typically are short-term. For example, Curious minds – a great programme to encourage youth to connect with science, but when they finish what happens then?

Question 39

CRIs are doing dynamic leading-edge research as well as any other part of the New Zealand system.

They should be a strength of the New Zealand RSI system. Yet they have a different operating model and must work in a national competitive RSI system that increasingly sees primary sector as a sunset activity when to create a zero-carbon nation we should see these as being sunrise activities.

Their core purpose expects them to do excellent science, partner internationally and partner with end-users as well as sustain capability of national importance.

Their challenges seem to lie in:

- Having to win money to meet a financial imperative which means a greater emphasis on science and less on creating impact.
- Having to compete with other science entities in New Zealand's including universities etc that have quite different operating models.

- Their core purposes are based on historic approaches that forestry is discrete from pastoral is discrete from conservation etc.
- Having too many programmes that are short-term with a consequence that the very capability they seek to protect is being reduced and similarly negatively impacting on building meaningful relationships with the sector.

CRIs should be seen as a strength.

- They can lock in long-term strategies where clear alignment to a national agenda (e.g. carbon free New Zealand) is transparent.
- Deliver on other agendas for New Zealand (e.g. partnering with Māori)

It is odd that this question is asked and not a similar question about how the Universities fit into the national RSI system!

Question 40

A clear vision for what New Zealand needs to achieve is an excellent start. A vision that is only about science is too narrow. The vision about simply being an international hub for innovation is weak. We need to be clear where we need to be excellent, and then make us the international exemplar in those activities.

Question 41

It is good that there are questions about systems. This suggests a broader more holistic view will be taken. From this flows what mechanisms are needed.

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.

Question 42.

Priority comes after clarity of the national vision, clarity how the RSI system needs to look after that and then how the parts within the system need to work.

Set some higher-level goals e.g. efficient, focussed, low transaction cost and so on.

PROACTIVELY RELEASED

General

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

Please type your submission below.

Question 43.

This RSI strategy uses a university research model as the norm which is not the case in New Zealand. It is odd that the question is asked about the CRI operating model but not the University science operating model. New Zealand has many enterprises focussed on RSI such as Independent Research Organisations, Regional Research Organisations and so on.

The biggest single omission is not including industry RSI activities. As success is seen as growing industry investment into RSI this is a strange omission.