From:	no-reply@mbie.govt.nz
To:	Research, Science and Innovation Strategy Secretariat
Subject:	Draft Research, Science and Innovation Strategy submission
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Submission on Draft Research, Science and Innovation Strategy recevied:

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

Name
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Name of organisation or institutional affiliation
Ministry for Primary Industries

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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
Ministry for Primary Industries, Ministry for the Environment, and Department of Conservation

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

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
RSI-strategy-feedback-from-MPI-DOC-and-MfE-CSAs.docx - Download File

Joint key messages on the Draft Research, Science, and Innovation Strategy from the Departmental Chief Science Advisors of the Ministry for Primary Industries, Ministry for the Environment and Department of Conservation

Dear MBIE

We are writing to you as a group to emphasise the consistency in our three agency's thoughts on the draft Research, Science and Innovation (RSI) Strategy.

The draft RSI Strategy is an improvement on the previous strategy (National Statement of Science Investment) and features a number of positive initiatives. While it is heading in the right direction, we still see the need for some key improvements and overall strengthening of purpose. We have summarised these in the seven points below, and attached further detail to explain these points.

1. **The Strategy would benefit from a more clearly articulated purpose. Expectations on how the Strategy will/should be used need to be outlined up front, particularly in relation to:**
   - Setting the scope and direction of RSI activities in New Zealand;
   - Guiding public and private RSI investment (including for capability and infrastructure);
   - Outlining implications for existing mission-led investment; and
   - If the purpose is to support the Government's 12 priorities, make this clear and provide a strategic framework through which government priorities can be delivered.

2. **The current Strategy needs to better reflect the Treaty partnership in both process and text**
   - The current Vision Mātauranga (VM) section is only a starting point. Te Ao Māori and Mātauranga Maori should be woven throughout the document - in addition to the Strategy having a standalone Mātauranga section.
   - It is very important that the next draft of the Strategy is written in partnership with Māori to enable a true partnership approach.
   - A commitment to action in this area needs to be clearer in the final document.

3. **RSI funding needs to support key capability for New Zealand and deliver government priorities. The following are of particular importance:**
   - Crown Research Institutes (CRIs) need stable, inflation-adjusted funding to reduce the reliance on contestable mechanisms to support important capability for New Zealand. Right-sizing and purposing the Strategic Science Investment Fund (SSIF) will be critical.
   - There is a critical need for a funding mechanism to support applied/operational research to deliver government priorities, particularly for cross-cutting issues that touch on multiple departments. [redacted] confidential advice to Government [redacted]

4. **The importance of continuity across (behind as well as at the leading edge) the frontier is not apparent. The concept of 'innovating at the frontier' needs to be either replaced or much more clearly articulated through examples that illustrate continuity across the frontier to address critical issues and grasp critical opportunities.**
   - More balance is needed within the Strategy between innovation at the frontier and the fundamental science 'foundation' required for innovation to occur (including infrastructure and capability).

5. **Assessment criteria and metrics for excellence and impact must be appropriate for different types of funds and must support equal opportunity for all disciplines and forms of knowledge, and this should be signalled in the Strategy**
    - Excellence must be measured in a way that gives equal opportunity to all types of research and knowledge (including social science and Mātauranga Māori).
    - Impact needs to be considered and measured more broadly. For example impact based on publication citations does not help us understand the impact of science on society, the environment, the economy or Māori.

6. **The concept of connectivity needs to be unpicked and better defined as it relates to different activities within the RSI system, and needs to be appropriately incentivised in the science system.**
    - The document would benefit from tangible examples of connectivity in relation to a number of domains – provider collaboration and 'best teams'; research horizons and value chains; international and domestic collaboration; and connection with end users.
    - As it relates to Endeavour, there needs to be some criteria around assessment of connectivity to avoid subjective assessments.
    - Connectivity across providers must also be appropriately balanced with other RSI system drivers (e.g. government priorities, broader system direction, 'best teams').
    - We need to ensure that different entities and funds are appropriately incentivised to drive connectivity.
    - There is overemphasis on small advanced economies (SAE) as the main international connection point

7. **Departmental engagement, and in particular the Departmental Chief Science Advisors (CSAs) should be used more and hard-wired into the RSI system**
    - The CSAs are well placed to provide connection between government agencies involved in the RSI system, particularly in regards to direction and priority research needs**.**
    - The CSAs could be used in the assessment stage of the Endeavour fund, to provide consistency and a focus on impact**.**
    - Collective consideration of critical research priorities, across government, will be fundamental in terms of the 'frontiers' we want to pursue.

In addition to this formal submission, and as signalled in our meeting with you on 6 November 2019, we will continue to work on gathering further information to assist you in the next iteration of the draft RSI strategy. We will put a particular focus on examples and case studies that we hope you will be able to use to better illustrate the intent of the strategy.

We look forward to seeing our three agencies work more closely with MBIE during the next stages of the drafting process.

Kind regards,

Ken Hughey, John Roche and Alison Collins

On behalf of DOC, MPI and MfE

Joint feedback on the Draft Research, Science, and Innovation Strategy from the Departmental Chief Science Advisors of the Ministry for Primary Industries, Ministry for the Environment and Department of Conservation

1. The Strategy would benefit from a more clearly articulated purpose. Expectations on how the Strategy will/should be used need to be outlined up front, particularly in relation to:

Setting the scope and direction of RSI activities in New Zealand

The intent of the document and the five action areas needs to be carried through into the specific actions listed. The strategy also needs to have a funding commitment from current and future Governments to reach the targets that have been identified – including that of reaching the target of 2% GDP.

The Strategy currently gives the impression that investment should be about international reputation rather than impact for New Zealanders.

Guiding public and private RSI investment (including for capability and infrastructure)

A system is needed to target RSI investment towards Government priorities, perhaps with budget associated to specific priorities each year. This needs to be signalled in the Strategy as an action point.

The Strategy needs to include clear signals about funding capability and infrastructure.
The RSI strategy should also clarify expected roles in the system – where government has more or less of a role, and where we expect to see market led investment. There is particular need for roles to be better articulated when it comes to 'close to market' research that has significant public good benefit.

There needs to be a clear forward plan for infrastructure including new buildings and equipment. Institutes cannot be world leading if they do not have this. Even nationally significant databases are woefully underfunded. Infrastructure, including environmental monitoring datasets are critical for enabling scientific research and innovation, and ultimately meeting our government priorities.

Outlining implications for mission-led investment

The strategy needs to be clear about how the current RSI system will be impacted by the purpose of the Strategy. For example, will mission-led programmes such as National Science Challenges be expected to shift their focus to 'innovating at the frontier' and what impact, if any, would that have? How might this impact the CRI operating model and SSIF platforms? This clarity will help to ensure that the RSI system is able to continue to deliver the RSI that New Zealand needs to progress.

Providing a strategic framework through which government priorities can be delivered.

The government needs to work in a connected, collaborative way to develop priorities for science investment, including ongoing review and adjustment, and oversee implementation.

To prioritise areas of RSI action in a way that is fair, representative and creates a sense of community and ownership would require working with representatives from all relevant government agencies, Māori partners, research organisations and industry.

2. The current Strategy needs to better reflect the Treaty partnership in both process and text

The current VM section is only a starting point. Te Ao Māori and Mātauranga Māori should be woven throughout the document - in addition to the Strategy having a standalone Mātauranga section.

The RSI system must be relevant to Māori, delivered by Māori, link to and strengthen Māori leadership, and be informed by Māori aspirations. This includes ensuring Mātauranga is recognised as a knowledge system, and investment and decision making within it is done in an appropriate way.

The RSI strategy presents an opportunity to support more flexible frameworks for the assessment of excellence and impact of different disciplines. Acknowledging that excellence and impact in Mātauranga looks different than in physics or biology or economics or social sciences may ensure that we do not inadvertently bias our RSI system.

The system needs to allow Māori to 'speak their language' – not in terms of just te reo but also in terms of Te Ao Māori. The system needs to allow flexibility around how to tell a story, the assessors for science investment decisions need to be the right people that can understand this. Collaborative science prioritisation undertaken under the leadership of MPI and DOC and supported by MBIE in the kauri dieback context is already demonstrating the benefits of practicing such an approach.

It is very important that the next draft of the Strategy is written in partnership with Māori.

The Strategy currently does not focus enough on partnership with Māori and Māori-led research. It needs to clearly recognise Māori as partners with the Crown (not stakeholders).

There is an opportunity for MBIE to lead the way in "understanding and articulating the Crown's role in supporting or protecting this system of knowledge". They should be working **with** Māori to determine principles for what successful, culturally appropriate use and investment in Mātauranga looks like. They should also be working to support the general public, science community and science users to understand Mātauranga Māori and their role/responsibility towards it. Government Departments and many researchers are already taking this path (in the case of DOC supported strongly by the Ngāi Tai High Court decision of December 2018) and see it is as logical and necessary for MBIE to lead in a similar way.

A commitment to action in this area needs to be clearer in the final document.

3. RSI funding needs to support key capability for New Zealand and deliver government priorities. The following are of particular importance:

CRIs need stable, inflation-adjusted funding to reduce the reliance on contestable mechanisms to support important capability for New Zealand. Right-sizing and purposing the SSIF will be critical.

Due to the SSIF funding model not increasing to meet the needs of inflation, let alone growth, the CRIs rely on contestable funding for some of their core functions and human resourcing. There are also perverse intractable drivers in the CRI operational model: public good science vs commercial returns. The reliance of CRIs on contestable funding for some of the core capability needs and science functions has led to unconstructive competitive behaviour and restricted the ability of organisations to be dynamic, connected and able to keep up with the leading edge in RSI. It also takes away focus from performing the RSI that New Zealand needs to progress. This puts our science capability at risk. Science capability is not a tap that can be turned on and off – capability lost due to changes in priorities or insecure funding will be very hard to get back.

RSI Infrastructure needs stable, inflation-adjusted long-term funding

There are very strong concerns about funding for RSI infrastructure, including for collections and databases, especially those that are outside the designation of 'nationally significant collections and databases' (which themselves are very insecure and poorly funded). Loss of this infrastructure would severely impact on public sector innovation. We also are not looking ahead far enough as to what New Zealand may require for **new** collections and databases – e.g. germplasm for indigenous species or databases for environmental data. This is a public good problem.

Environmental monitoring and reporting is another good example of this need – such emphasis would be consistent with the PCE's (2019) just released report: Focusing Aotearoa New Zealand's environmental reporting system.

There is a critical need for a funding mechanism to support applied/operational research to deliver government priorities, particularly for cross-cutting issues that touch on multiple departments. confidential advice to Government

The RSI system also needs to include a funding mechanism that is more directly linked to government priorities that can be accessed by all government agencies (for singular or collaborative projects) for research that supports direct, operational, near-term government needs. confidential advice to Government

Currently there is very limited funding that can be efficiently directed towards policy needs, and there is a non-collaborative environment that does not facilitate effective sharing of resources (not only funding, but also data, procured research, etc). There are also large gaps in our fundamental understanding of our environment and in baseline monitoring data, which results in gaps in the information the public sector has to inform advice and work. Access to research and timely, fit-for-purpose information remains a problem.

The information needs of the public sector/policymakers to innovate and provide advice are often incompatible with conventional science production cycles – particularly when it comes to timeframes.

4. **The concept of 'innovating at the frontier' needs to be either removed or more clearly articulated, with examples used to illustrate the importance of continuity across (behind as well as at the leading edge) the frontier to address critical issues and grasp critical opportunities.**

More balance is needed within the Strategy between innovation at the frontier and the fundamental science 'foundation' required for innovation to occur (including infrastructure and capability).

Suggesting that 'behind the frontier' belongs exclusively in the industry strategy leaves a significant gap in terms of applied science, extension, and commercialisation for the benefit of non-industry groups. While on page 18 you state that applied research can be 'innovation at the frontier', this is not apparent in the rest of the document. There is a greater need for more applied research to address the many current day problems that NZ faces.

There are also types of 'frontier' research that are required for 'behind the frontier' innovation, such as social research about adoption, barriers to uptake, social licence and impact. The RSI strategy could look at whether New Zealand has the right platforms and funding to support this. Note there is no CRI or SSIF platform focused on social research.

The strategy also needs to make it clear that the use of the term 'research' includes social research, using examples to illustrate this, and consider how to target funding accordingly.

5. **Assessment criteria and metrics for excellence and impact must be appropriate for different types of funds and must support equal opportunity for all disciplines and forms of knowledge, and this should be signalled in the Strategy**

Excellence must be measured in a way that gives equal opportunity to all types of research and knowledge (including social science and Mātauranga Māori).

All science should be excellent, it should be a given not a criteria. Any framework for excellence must be flexible to ensure against bias towards some disciplines, knowledge bases, and priorities, and considered in a way that is appropriate to the type of funding mechanism.

Additionally, the global focus is not relevant to all research contributing to New Zealand's priorities (e.g., soil mapping). Focussing on global runs the risk that we get further and further behind in some areas that have aspects unique and of significance to New Zealand (e.g. Mātauranga Māori research on taonga species, or unique primary sector systems).

There needs to be better support in the criteria to show how applied science is also excellent.

The excellence criteria also need to consider the need for an extension plan and impact evaluation plan for all research. Some RSI can only be excellent if it is conducted with the end-user and impact in mind from the beginning.

Impact needs to be considered and measured more broadly. For example considering impact of publication citations does not help us understand the impact of science on society, the environment, the economy, or for Māori.

We need to develop fit-for-purpose, specific, tangible criteria to measure impact, and ensure that these can be reviewed and re-developed on a regular basis in order to stay current and relevant.

Measuring impact can include criteria around demonstrated connection to end-user – this is where rewarding co-development and co-innovation can be placed. A pragmatic start would be developing the impact measures in collaboration across government, with treaty partners and the stakeholders that benefit from the research. Any criteria should be based on both international evidence and New Zealand treaty partner and stakeholder needs.

In some cases impact should be considered before excellence, or exclusively. Gathering essential underpinning data may be unlikely to meet excellence criteria (such as novelty), yet is critical for government decision making and as the foundation for innovation.

The CSA network is well-placed to have a role here and should be used much more than it is now in deliberating and advising on impact.

6. The concept of connectivity needs to be unpicked and better defined as it relates to different activities within the RSI system, and needs to be appropriately incentivised in the science system.

The document would benefit from tangible examples of connectivity in relation to a number of domains – provider collaboration and 'best teams'; research horizons, value chains; international collaboration, and connectivity with end-users.

End-users often need to be involved from the beginning of the RSI process – you cannot develop a solution without first understanding the problem. Involvement of the end-user shapes the research questions and a research programme can take a very different route if the end users are involved from the beginning and throughout the programme. This strategy needs to include more detail about extension, and send clear signals about the importance of co-design, co-development and co-implementation (especially when partnering with Māori), including a commitment to make these aspects of research design a priority in bid assessment.

Weak connections: in-person collaboration. Some connections are physical, and in many instances true collaboration requires meeting and collaboration in person. However New Zealand is relatively large geographically with a small population and core funding for research institutes is not sufficient to support regular travel between agencies that are located in different regions. Digital communication methods are not sufficient to bridge this gap.

Weak connections: pipeline support. There is no real support that focuses on the full pipeline of science and innovation, from basic research to commercialisation or knowledge transfer. There are poor connections between the outputs of science and the stakeholders who might best use them. Support is fragmented and focus on one small part of this pipeline will not automatically lead to other aspects falling into place. Stronger focus on the entire pipeline in the policy settings, from basic research to commercialisation and from researcher to end-user would stimulate connectivity. The key barrier is that there is no dedicated funding mechanism and resource to carry out this

activity in the science system. Further, there is no encouragement or clear incentives for extension/co-implementation of science at scale, which should be an inherent part of the process, from the very beginning (i.e. not separate). This issue is compounded by a general gap in RSI funding for social science; social science has the potential to support understanding and the implementation of research.

As it relates to Endeavour, there needs to be criteria around assessment of connectivity to avoid subjective assessments.

Purposeful connectivity (not only between scientists but with end-users) should be valued in balance with impact and excellence. The value of connections will vary between projects and research areas, as will the types of connections required (e.g. some areas will require more New Zealand based connectivity such as supporting priorities that are unique to New Zealand).

Connectivity along the pipeline from basic research to commercialisation needs to be specifically encouraged and rewarded (including through funding bids), and there needs to be a clear signal regarding expectations for use of co-design and co-innovation methods where appropriate – not just knowledge transfer and adoption. Involving stakeholders and end-users in the entire pipeline is critical, and this must be considered in the cost of research and allowed for in funding decisions.

Connectivity across providers must also be appropriately balanced with other RSI system drivers (e.g. government priorities, broader system direction, 'best teams').

A culture of competition still exists between organisations, although diminished from previous years. We need to move away from the notion of "best teams" (based on science excellence) and instead focus on the "right teams" (based on connection, cohesiveness and willingness to be open minded to different points of views). There is little incentive to have a "right teams" approach and often projects are supported that do not have the core experts in them.

We need to ensure that different entities and funds are appropriately incentivised to drive connectivity

There is overemphasis on SAEs as the main international connection point

As currently stated, the measure of international connectivity appears overly constrained to SAEs. Many of these SAEs do not share the same challenges of geography, demography or economy as New Zealand.

7. Departmental engagement, and in particular the Departmental Chief Science Advisors, should be used more and hard-wired into the RSI system

The CSAs are well placed to provide connection between government agencies involved in the RSI system, particularly in regards to direction and priority research needs.

The CSA network is an ideal group to provide direction for mission-led research and ensure that mission-led investment decisions are appropriately informed about the landscape of New Zealand's research needs, including bringing to the fore existing roadmaps and research agendas.

There should be a group that is looking at return on investment. The measure of success of the RSI system is about how much investment is made, rather than how much value (in $ or as a %) is extracted. It does not seek to provide any confidence that the right investment was made. "Growing our system" (p16) is very insisting on the need to increase R&D investment as GDP %, but there is nothing around increasing the value returned from the current investment. The CSAs might be able to help here.

The CSAs should be used in the assessment stage of the Endeavour fund, to provide consistency and a focus on impact

Consistency in Endeavour assessors would be of benefit to re-submitted bids, as the panel would be able to see that feedback on the rejected bid had been taken on board and incorporated.

Researchers perceive some Endeavour decisions as 'random' and/or not optimised for impact. MBIE's impact assessment process could be improved. As some of the impact assessment issues relate to difficulties in ensuring that assessors have both sufficient expertise and knowledge of the New Zealand operating context, one solution to provide better consistency and priority consideration to Endeavour would be to involve the CSAs in the impact assessment.

Finally, giving researchers a sense of validation that a bid was 'good enough' but there were 'limited funds' would be a better message to start with and again, CSAs would be well placed to do this.

Collective consideration of critical research priorities, across government, will be fundamental in terms of the 'frontiers' we want to pursue

There needs to be a culture of working across government to ensure a strong and purposeful RSI system. The system is much bigger than MBIE and its ongoing evolution must be joined-up.