From:	no-reply@mbie.govt.nz
To:	Research, Science and Innovation Strategy Secretariat
Subject:	Late submission on draft RSI strategy
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Attachments:	Online-submission-form-uploadsdraft-research-science-and-innovation-strategy-submissionsConsultation-Feedback-from-Manaaki-Whenua-Landcare-Research.pdf

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

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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 , Government

If you selected other, please specify here:

How large is your organisation (in number of full-time-equivalent employees)?
380

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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NEW ZEALAND'S DRAFT RESEARCH, SCIENCE & INNOVATION STRATEGY (RSIS), November 2019

Consultation Feedback from Manaaki Whenua Landcare Research

This feedback is in three parts:

1. Overview of feedback
2. Key points, following the order of the draft RSIS
3. Responses to questions in the RSIS and specific points by page number

Overview of feedback

While we welcome several aspirations in the RSIS, we are concerned by several perceived shortcomings.

We welcome:

- Support for enhancing RSI connections nationally and globally where these can facilitate progress towards national goals
- Support for attracting talent from overseas
- The intention to enlarge the Curious Minds Fund
- The intention to achieve "enduring, sustainable increases to existing funds" for strategic science
- Support for the provision of a sustainable future for national RSI infrastructure.

Our concerns are that:

- The RSIS reads as a starting point for developing a national strategy rather than a well-worked draft for consultation. Many questions asked in the RSIS are about what focus it should have, rather than seeking endorsement for a well-argued position.
- The 'At the Frontier/behind the Frontier' framework is too simplistic to cover the diversity of areas where RSI is needed (health, environment, business innovation, land-based industry, societal change, etc) and the types of RSI that are needed. A much clearer definition of 'frontier' is needed or a more nuanced concept to reflect RSI diversity.
- 'Behind the Frontier' does not equate to government departmental operations and services. Critically important is ongoing RSI to ensure its uptake to achieve New Zealand's priorities.
- The RSIS appears strongly focused on development of new products, services and start-ups in the private sector and does not give well considered attention to the needs of public good RSI, for example on matters of the environment.
- There are features of the RSIS that are not well explained, despite changes appearing to be proposed, for example in the table on Our Investment System where SSIF appears to have moved to the left and National Science Challenges to the centre, with a small proportion of investment in mission-led research.
- The RSIS does not address a widely held concern about the complexity of the RSI ecosystem, its fragmentation and consequent inefficiencies. There should be accountability for the system and return on investment.
- The sections addressing the RSI workforce are relatively lightweight and should more fully address diversity, future of work, Māori engagement and trends in public participation.

Key Points in the order of the RSIS draft

MBIE's investment focus on 'the frontier' needs more careful explanation. In this draft such investment appears focused on business innovation, while it is vague about public good RSI and it omits the adaptation of overseas RSI for NZ benefit.

The view of prosperity in the draft seems to be almost entirely economic and achieving 'productivity goals.' This is wealth, not prosperity. We see halting the decline of NZ's biodiversity, for example, as contributing to the nation's prosperity, whereas as the strategy seems more focussed on leverage further investment from business and industry.

The significant, intended growth in BERD will be for 'private value'. The growth in government investment should therefore be weighted towards social value and strategically address public good priorities. Here there is often 'market failure' and lack of non-government investment.

While important, we do not agree that connectedness is the biggest challenge. NZ's RSI people are well connected, but perhaps not to the global business investors and innovators that MBIE's 'frontier' focus espouses. The challenge is collaboration and partnership to achieve impact of benefit to NZ from RSI.

The value of pathways to impact is lacking in this draft. It talks of connectedness but not between and within the key NZ contributors to impact: government, industry, Māori, research and community. Complex public good problems have multiple roots, they generally span government departments, industry and community, and so require whole of system solutions. Care needs to be taken that specific opportunities do not become silos.

The need for understanding environmental change and its risks to NZ is missing in this draft. Climate change and related changes in other countries have the potential for major impact on all aspects of NZ society and economy. There is no sense in this draft of such issues being addressed strategically.

The RSIS needs to explain the apparent shifts in SSIF to the left of MBIE's investment spectrum and National Science Challenges to the right. These shifts imply 10x more MBIE investment in investigator-led compared to mission-led RSI ($1 billion per year versus $100 million).

The apparent shift in SSIF funding towards "investigator-led research" may further strengthen the perception in Government departments and agricultural sector bodies that there is no substantive focus on the achievement of national priorities via the RSI Strategy.

We believe there should be explicit accountability on MBIE for the impact of its investment in RSI. This would require clearer goals and indicators to be included in this RSIS. There should be a review of the impact of the 2015 science strategy (NSSI).

NZ is globally leading in many aspects of conservation management and the development of co-governance arrangements with its indigenous people. We are a suitable location for globally relevant exploration of social change towards goals such as zero carbon. This draft RSIS is almost dismissive of these and other examples of NZ RSI being globally leading.

The draft RSIS omits an analysis of the RSI ecosystem, which is widely considered to be overly complicated, fragmented and with excessive governance costs. As 'steward' of the system it would be highly appropriate for MBIE to address this issue.

Connectedness is a concept from social media and not the key challenge for RSI. Researchers are already collaborating in NZ, and this draft RSIS also identifies that individuals are strongly collaborating

with international researchers. But the goal of partnership is a major challenge – in which the partners combine their complementary strengths to achieve outcomes and impact.

We argue that 'people' should be the third pillar of the RSIS. People are at the heart of RSI – their talent, collaboration and well-being. The RSIS needs to elevate people as the most important opportunity and challenge for NZ's RSI system. We need to address the future of work in RSI, the future of relationships with employers, the future of talent needs, the RSI needs of NZ's people and the future of RSI supporting our Treaty Partner's people. There are so many dimensions of the 'people' theme that are missed by the draft RSIS.

The proposed definition of excellence as 'doing the best thing possible' is overly simplistic in a national RSI strategy document. Excellence is dependent on context. We advocate that in the context of public investment in RSI the term excellence should be used to reflect rigorous scientific or innovation process, conducted by the right team for the job, achieving standards of transparency and integrity, and fit for uptake to achieve impact.

It is notable and disappointing that the impact section of the report is not reached until page 27. The 'pathway to impact' drives connectedness to user; it drives the diversity of talent; it focuses strategy on key priorities for NZ; and it focuses on return on investment. Without impact, what is the return? What will have been gained by NZ from MBIE's investment in RSI?

What evidence is there for the statement that "the most talented researchers and entrepreneurs in the world will be transformative to our RSI efforts in New Zealand"? Some of those people are originally from New Zealand and the strategy should address why it is that they are not now in New Zealand. Is it something to do with the RSI ecosystem, resources, availability of investment, culture, or whatever? Why do they not return to New Zealand? What will the proposed new initiative target as the challenge?

Overseas talent is often attracted by NZ's commitment to national and global outcomes and impact and by the close links between CRIs and users of our RSI. We need to offer stable investment in those areas on meaningful timeframes. For example, addressing environmental challenges is a decadal horizon and overseas talent will not be attracted by three to five-year investment with no investment certainty after that.

We recommend the reinstatement of MBIE post-doctoral fellowships. Many permanent staff in CRIs came via this route. Currently there is no career progression pathway into excellent applied research from universities (Rutherford Fellowships do not fill this gap). MBIE fellowships could be targeted to prospective skills shortages – e.g. data science, AI/machine learning, kaupapa Maori approaches. They could also support research at the frontier whilst embedding researchers in mission-led contexts designed to maximise outcome benefit to NZ.

We applaud the suggestion of expanding the Understanding Curious Minds Fund but it should provide for a multi-year engagement that favours breadth (in number of schools contacted) and depth of experience for the students.

The investment system should reward collaboration focused on government and/or national priorities. Presently it rewards competitive behaviour at the leading edge where people are protective of their ideas and inventions. This is particularly apparent in the Endeavour settings. Rewarding the right team to make an enduring change would require a different approach.

The CRI joint report to the S&I Minister on Māori engagement and co-innovation contained more insight, evidence and ambition in relation to this matter than the current draft RSIS. The coverage of the issue is the RSIS is light, narrow and shallow.

There are significant challenges around the way the RSI system supports Māori-led research, the recognition of the Māori world view in MBIE investment approaches and the system-wide support for engagement between western science/scientists and Māori world view and people. Efforts are needed to bridge this gap both to address Māori needs and aspirations and to honour the Treaty Partnership.

"Enduring, sustainable increases to existing funds" is needed and a welcome aspect of the draft strategy. The erosion in the real value of SSIF investment has caused a loss in national capability in significant areas such as national databases and collections.

Achieving a "coordinated, dynamic network of research" sounds admirable but the reality is that we have a highly complex system of RSI entities with overlapping roles and high governance costs, in which the drivers are a complex, contestable investment system and heavy pressure on the entities to achieve financial sustainability. We do not see a model for "coordinated and dynamic" in government or industry. So, a wider look at the system is warranted, reviewing the investment mechanisms, delivery of national priorities, and ability of key RSI stakeholders to support a coordinated and dynamic network.

We strongly support the provision of a sustainable future for national infrastructure such as Collections, Databases and eResearch infrastructure. These are all services designed for public good. Collective ownership and benefit need to be adequately provided for. We are wholly supportive of the need for this infrastructure to maximise benefit to NZ and to adhere to FAIR principles for accessibility (in the case of databases and collections) and to increase national capability (in the case of eResearch infrastructure).

The RSIS should focus on upgrading and updating existing R&I infrastructure rather than adding new. Much existing infrastructure is old, not fit for purpose and cannot be presented to overseas talent as appealing and state of the art. Further splintering infrastructure between additional institutions and governance arrangements simply ties up more effort in transactional cost to the direct detriment of innovation and research advancement.

The changing nature of research will require increasing amounts of foundational real world data, for example from remote sensing networks and longitudinal studies. Foundational data also allows increased international RSI participation. It is an attractor of overseas investment and talent (people will want to work with our data sets) and can drive excellence. The Dunedin longitudinal study is an excellent example. Such data collection is a critical foundation for NZ's RSI future. Within the strategy there is no obvious mechanism to invest in this RSI foundation.

Where is the strategy to ensure that uptake and impact are maximised? Where are the priorities for investment goals? And where are the indicators that application of outputs provides a return on the public investment in RSI? This return is as much the responsibility of MBIE as it is of the other actors in the system. MBIE should be seen to deliver on its accountability.

Table of comments by page number and responses to MBIE's questions

Page / Question	Comment
P6	MBIE's interpretation of 'frontier' needs to be much more explicit. It is too generic to cover the different needs of sectors (health, environment, land-based industry, ICT/hi-tech, societal change and the different types of RSI needed. The focus on NZ at the frontier appears to omit the option of NZ being a fast-follower, adapting innovations from the other 99% of global RS&I to our specific needs. Does MBIE believe that such investment should not be the domain of the RSI portfolio? If so, this should be explicit. MBIE should clarify for example if the adoption of genomic technologies, conservation strategies and data science from other countries is in the domain of their investment. They should state where investment for such adoption will originate. See comments below about 'behind the frontier' and the critical importance of RSO on the pathway for impact.
P6	While we support the emphasis on improved connections, it is important to emphasize collaborative action towards impact. It is not enough to connect. This sense of pathways to impact appears lacking in the RSIS.
P9	As a matter of fact, several other countries (e.g. USA and Ireland) have significant programmes developing technologies for reducing methane emissions from livestock – hence the international GPLER initiative of which New Zealand is a member. Controlling possums is a better example.
P9	The following statement suggests incomplete thinking and analysis. It is vague and undermines confidence in the strategy: "As we proceed to implement this strategy, we plan to deepen this analysis and conduct similar analysis under other priorities to help identify alignment and duplication." It is worth noting that some duplication (especially with international efforts) is worthwhile, especially as the New Zealand context is often quite specific.
P10	The table suggests there was an overarching strategy for investment across this range of climate change topics that was not evident at the time. The lack of a national RSI investment strategy for key areas of public good research such as understanding change in our key ecosystems is our biggest concern. Q1 and 2 below begin to address this, but what role will they play in the RSIS, since they are missing in the draft?
P11	Is it worth tackling the issue of other government priorities and particularly prosperity? The view of prosperity in the RSI seems to be almost entirely economic and achieving 'productivity goals.' This is wealth, not prosperity. We see halting the decline of NZ's biodiversity, for example, as contributing to the nation's prosperity, whereas as the strategy seems more focussed on leverage further investment from business and industry.
P12	Accelerating progress with government priorities can be helped by relevant sectors agreeing on pathways to impact and on their respective roles. The RSIS avoids that responsibility. The examples given on P12-13 are notably cross-government connections that do not mention government-business sector connections to agree on pathways. MBIE must adopt its own principles of better connection both with science and the users of science.

The Contribution of Research, Science, and Innovation	
Question 1:	**Where can the RSI System make the greatest contribution towards the transition to a clear, green, carbon-neutral New Zealand?**
Question 2:	**Where else do you see it making a major contribution?**
Question 3:	**What else could the RSI system be doing to accelerate the progress towards the government's priorities?**
Q1	Clean green carbon-neutral NZ. Answers to this question are reflected in your P10 table. Elements are missing such as the social dynamics of the change NZ society needs to make; assessment of risk from climate change; adaptation to climate change impacts (completely missing!); addressing changes in global consumer and pressure group expectations in our export industries; and scaling down long-term national goals to achievable local targets. In all these areas there is frontier work to do to answer the questions and achieve impact. Perhaps not the stuff of Nature papers, so would Endeavour invest? In terms of clean and green there is still much more: water quality, food safety and quality, protecting and enhancing biodiversity (and associated biosecurity issues) as examples.
Q2	NZ's adaptation and risk management around climate change is a gap. Also, NZ's development of a circular bioeconomy. Optimal use of Māori-owned land. New foods and bioactives from NZ's endemic flora, fauna and fungi. The social dynamics of change to address society's challenges with technological disruption, climate change, intergenerational equity, etc. Supporting thriving and sustainable regions is a key research focus for several CRIs – this draws upon novel products, changing land uses, focussed tourism research (hardly a "frontier" topic), understanding consumer preferences/changes, resilient communities etc
Q3	The critical need is for frontier and behind frontier RSI to be both strategically planned around government's priorities and supportive of pathways to impact. In this draft both are under-cooked. MBIE talks about picking winners (e.g. NZ space agency) but then says the themes are not the focus of the strategy (box bottom of P12). 'Behind the frontier' does not equate to government departmental operational activities. RSI is needed behind the frontier to ensure uptake and impact. Pathways to impact depend upon third party investment (this strategy should be more explicit about the strategy for that) and some yet-to-be developed pathways in government departments. The apparent shift in SSIF funding towards "investigator-led research" will further strengthen the perception in Government and agricultural sector bodies that there is no substantive focus on the achievement of national priorities via the RSI Strategy. The RSI Strategy should not be silent on its interaction with either the Conservation and Environment Science Road Map or the Primary Sector Science Road Map.

P14	It is good to recognise that stable long-term funding is important to build and grow teams. But what examples are there of "targeted strategic funds"? How are topics to be prioritised for increases or new 'targeted strategic funds'?
P15	Changes from the equivalent diagram in the 2015 NSSI are not explained but should be. SSIF has moved to the left and NSCs have moved to the centre. Investigator-led appears to be around $1bn while mission-led is little over one-tenth of that. This gives the impression of low-level RSI funding on strategic and targeted impacts. The "Frontier" suggests that third parties must fund impact from RSI. This does not appear to support government priorities especially in the public good spaces of environment, freshwater, climate change, public health, where 'market' interests are undeveloped or there is market failure.
P15	Question: where is MBIE's accountability and performance assessed in the allocation and investment return on the $1 billion "frontier" RSI funding? What are the measures used in that assessment?
P16	The comment is made that the RSI investment must focus "on areas where we can make the biggest difference to New Zealand" etc. Yet the RSI strategy does not really address the question of what those areas are. Nor does it comment on what proportion of governments investment should go into focus areas versus other areas critical to NZ.
P16	The significant growth in BERD will be 'private value'. The growth in government investment should therefore be weighted towards social value and strategically address social value themes. This puts more emphasis on the need for RSI investment to be strategically targeted at public good, where the market is unformed or where there is market failure (e.g. climate change risk, environment, public health).
P16	The RSI strategy should address the volume of RSI capability needed to effect this growth to 2% GDP. The draft addresses only the talent matter in terms of getting quality not quantity. We need both. So how will that be achieved? Where is the link to MoE and TEC and to Māori education providers and immigration authorities?
P17	Definition of innovation as "process of doing something new" could be sharpened up for this context. Sounds too simplistic. This definition of innovation is essentially a business view.
P17	Māori knowledge should be acknowledged here as a different and complementary source of knowledge. This RSI strategy is presently very western-centric with a weak nod to Māori.
P18	"Innovation at the frontier means …. New to the world". This is a narrow perspective that suggests NZ RSI is not about adapting leading-edge science and technology from the rest of the world. This strategy will suit academic researchers and companies seeking patents at the leading edge, but it will short-change research that is needed by NZ to benefit from innovation happening in the other 99.99% of the world's RSI. Adaptation can be as much challenging RSI as true frontier work. But it will be (by definition) suited to NZ's needs.

P18	"innovation at the frontier does not imply exclusively novel activities … blue sky" etc. Reading the RSI strategy does indeed suggest that interpretation. So MBIE needs to clearly express what is meant here and sort out any difference of opinion in its own organisation about the purist interpretation of frontier RSI.
P18	The 'behind the frontier' comments reinforce the perception that MBIE will invest primarily at the frontier and someone else should invest behind it. This risks 'public good' RSI being severely restricted in its delivery and impact.
P19	Innovating in the public sector. There is no doubt that there should be innovation in the public sector. That innovation may adapt overseas best practice however and require RSI to adapt it to NZ. It is very unclear who MBIE suggests be the principal funder. The impression is that this is left to the public sector who tend to be under-resourced for RSI.
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?**	
Q4	No. The focus should be integrated across the frontier and behind the frontier in order to achieve impact from RSI investment. Mechanisms exist and can be strengthened for co-investment in RSI to achieve impact. This strategy is too purist in its focus on the global frontier.
Q5	Areas that are specific to NZ such as its species conservation, climate change risk management, and biosecurity are different from other countries' problems. The invasion profile for NZ is quite different to that in other parts of the world – this is partly because of being an island nation only recently inhabited by humans. The challenge biological invasions pose to NZ rank far higher than in many other parts of the world. Because of NZ's small population size and inherent "connectedness" we are also a good place to experiment with how to effect social change (such as improved environmental stewardship) – the way to achieve these changes could be picked up elsewhere albeit at a slower rate of adoption.

	NZ is also globally leading in co-governance models – NZ legislation enshrined in Te Urewera and Te Awa Tupua is highly innovative and arose, in part, from embracing the role of Mātauranga in governance models.
Q6	• Integrating indigenous world view into social, environmental and business development. • Small island nation resilience to climate change. • NZ indigenous biodiversity as a source of biomaterials, food and medical products. • Biodiversity conservation • If we succeed with a Predator-Free vision, this will also be globally leading. For example, NZ has been innovating at the frontier for many years in how it saves species from extinction (e.g., black robin). This research was primarily achieved through small incremental steps however and a well thought-out pathway to impact – any one project alone would not have yielded the outcome itself or been seen as especially "novel".
Q7	Strong connectedness with RSI users. Southern hemisphere (out of N Hemisphere season), English-speaking, relatively low-cost, trustworthy, competent partners in global or bilateral RSI endeavours with transparent and relatively low-level regulatory hurdles. Unique physical environment and one of the largest continental shelves. National goal for carbon neutrality. Strong and capable indigenous population. Small population size and already strongly connected research community.
Q8	Anything to do with the NZ environment, which is specific to NZ while having the same generic issues. Therefore unique but relevant at the same time. Refer question 6 above.
Q9	Limited resources for RSI – investment and capacity. Relatively unstable investment levels and priorities, changeable with government of the day and subject to public sector internal budgetary pressures (RS&I is an early target for savings as reduction in delivery is not politically acceptable). Lengthy, highly competitive and political investment process (Budget). A perception of very low risk appetite in Departments and Ministers' offices likely to hinder experimentation. Frequent turnover of staff in government departments hinders capability-building and relationships into external RSI. Lack of trust perceived e.g. between farmers and government hinders RSI.
P20	What evidence is there for the statement "NZ has been less successful in converting this research …"? How is "using research to inform products and services" assessed to support this assertion? Does this point to a failing in RSI providers or in its adoption and use? The statements support our argument that more needs to be invested in impact pathways, not just at the frontier.
P20	Gender and diversity are glossed over lightly and with lack of clarity and evidence. What is meant by "we suspect these disparities by gender and ethnicity are also reflected in our innovation activity"? Is "we suspect" a valid evidence base for a national strategy document?

P21 fig 2	A reading of these data is that there is already too much focus on the frontier (high publication rate and cited researchers) and too little on behind the frontier to get it adopted (low BERD and patents). The RSI strategy appears to favour more of the same.
P21	What evidence is there of progress with impact since the NSSI? What review of the outcomes of the NSSI has been undertaken? Is it published?
P21	Incentives for connectedness. The term "investigator-led" suggests that future investment will be in individuals to build their own lines of enquiry. The strategy document should better explain the differences between investigator and mission-led RSI. One suggests individuals and the other teams. The strategy appears to want connection – does that mean more teams?
P22	Māori engagement with RSI is inhibited by a focus on the frontier when what they want is adoption of less elevated RSI and RSI that can make a difference for them. See the CRI's joint report on Māori engagement and co-innovation (2018).
P23 fig 3	Evidence exists. Ask Science New Zealand for stats on business investment into CRIs – at least two-thirds of their R&D investment (relevant to CRIs) goes into CRIs. This should be recognised.
P23	The strategic goal of connectedness needs to be clarified otherwise connections will be created for their own sake. The RSI strategy should be clear about the strategic goal and provide clear priorities and mechanisms. For example, the GPLER established formal connections to link RSI on agricultural greenhouse gas emissions. CRIs are establishing formal connections with overseas institutes (e.g. INRA in France) for access to talent and staff development. Levels of international co-authoring of papers are high in CRIs but it does not lead to international investment in our R&D. Most countries' governments fund their own people, not ours. Many multinational firms do not outsource RSI. If they do, they may tie up IP and our staff. The gain to NZ must be carefully assessed.
Our Key Challenges – Strengthening Connections **Question 10: Do you agree that the key challenge for the RSI system is enabling stronger connections? Why or why not?**	
Q10	We agree Connections is an important area but not the key challenge. In our view the key challenge is people. The importance of people is alluded to in Action 1 (pg 30) and elsewhere in the document, but the thinking and issues have not been developed, nor has any data/information been explored. The best people will improve all 3 pillars – impact, excellence and connectedness. Not attracting or losing talent is also the biggest threat to the objectives of the draft strategy. This whole area has been severely underplayed in the document. Linked to this of course is our ability to offer globally competitive renumeration – which should be a key issue addressed up front. Connections are important, but it is a belief that connections are the key challenge. This strategy does not analyse the evidence, prioritise the potential impacts of connectedness, or propose a strategic response. Adding connectedness as a pillar needs a lot more work to provide clarity of thinking and purpose. For example,

	connectedness may not enhance collaboration or partnership that is needed nationally and internationally. Connected is a word from social media, not collaborative RSI. Connected is the first step towards collaboration and partnership. The RSIS would do better to focus on the later steps from which benefit comes. Researchers are already strongly collaborating in NZ and this draft also identifies that individuals are strongly collaborating with international researchers. But it is the goal of partnership that is the key challenge –in which the partners combine their complementary strengths. Additional national collaboration could be achieved through competitive funding settings with increased stringency in the "best team" approach (best should not be interpreted through the narrow lens of researchers with highest H factors – rather focus on cross-institutional teams that have the greatest ability to innovate AND contribute to enduring national or international change). In broadening the strategy to include innovation the recognition of connectedness is more important as this more strongly brings a focus onto new areas of connectedness within the wider system that may have been less of a focus in the past. How do businesses as CRI's/universities develop stronger long-term relationships. The low levels of BERD in the past have meant that businesses, in general, have not developed the strong relationships with research institutions that they do in other countries where BERD is much higher. We are not sure that tax incentives on their own will be enough to change this as businesses are likely to focus their R&D activity internally rather than seeking partnerships. This may change with time. Are there other schemes that will incentivise businesses in research institutions. Some aspects of TechNZ in the past did this.
Guiding Policy – Excellence **Question 11:** **Question 12:** **Question 13:** **Question 14:**	**Do you agree with the definition of excellence presented here as the best thing possible in its context? Why or why not?** **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?** **Do you agree that excellence must be seen in a global context, and draw from the best technology, people, and ideas internally? Why or why not?** **Do you agree that excellence is strengthened by stronger connections? Why or why not?**
Q11	No. The proposed definition of excellence is overly simplistic in a national RSI strategy document. For example, if excellence is doing the best thing, then what is the best thing? Is it most citations, best team), best ideas, best adoption, best impact? Is excellence restricted to the frontier – never been done before – or does it encompass the value achieved by the investment? A recent editorial in Nature (2018) commented that "excellence depends on context."

	The RSI Strategy suggests that a broader definition of excellence (beyond conventional academic metrics) is called for, but, without substantive definitions or alternative metrics, excellence will continue to be assessed according to the widely available academic indices because these are, at least, defensible in their consistency. We advocate that in the context of public investment in RSI the term excellence should be used to reflect rigorous scientific or innovation process, conducted by the right team for the job, achieving standards of transparency and integrity, and fit for uptake to achieve impact.
Q12	Increasing diversity includes marketing RSI to younger people and nurturing their interest through their education. It means lowering the boundaries between RSI organisations and their users so there can be more interaction and exchange of personnel and ideas. It means addressing bias and social norms around RSI. It means providing career appeal, flexibility, advancement despite career breaks. It means bridging across different world views. The current state of all those factors contributes to the current lack of diversity.
Q13	Yes and no. Excellence can be seen at a range of scales from institute to country to global. It should be seen in an appropriate context. NZ RSI should be excellent in terms of fit for purpose. It may not be at the global cutting edge but don't reject it if it nonetheless provides what NZ needs. Our own experience in global collaborations is that global researchers can contribute some novel (and excellent) ideas but the application of research to real-world problems is where NZ researchers surpass their international counterparts.
Q14	Excellence may be strengthened by strong connections where those provide: complementary talent in the team, bringing necessary skills; a broader outlook on issues and opportunities from a diversity of backgrounds and world-views; co-investment that supports the depth and continuity of the team; and greater potential for impact where connections join forces across boundaries.
P27	Impact is rightly a pillar of the RSI strategy. NZ cannot afford to invest in RSI that does not have impact within NZ. It is notable that the three pillars of the strategy are not evident in the A3 summary. It is also notable (and disappointing) that the impact section of the report is not reached until page 27. The pathway to impact drives connectedness to user; it drives the diversity of talent; it focuses strategy on key priorities for NZ; and it focuses on return on investment. Without impact, what is the return? What has been gained by NZ from MBIE's investment in RSI? Further to this, the proposed indicators of success in terms of impact (Appendix 2), are actually indicators of Outcomes by MBIEs own position paper definition. MBIE should make more explicit its thinking about impact priorities and "mission-led" RSI. Prime focus on the "frontier" is non-specific in the way described at the bottom of P28.

P29	Impact is not merely papers published. They are outputs. The international RSI community has a better understanding of that difference now and seeks evidence of social value. Impact is achieved through the alignment of many players – RSI, policy, regulation, business, community, etc. This is another rationale for connectedness.
Guiding Policy – Impact **Question 15: How can we improve the way we measure the impact of research?**	
Q15	MBIE and researchers should have a clear line of sight from investment to impact. More accountability should be put on both sides for achieving positive indicators of impact, both leading and lagging indicators. It is not enough (and may not be helpful) to use only lagging indicators – stories of what happened. Their information is often too late to influence the direction of projects in-flight. Leading indicators of impact are preferable. The CRIs are working collectively on indicators and pathways to impact and MBIE should keep in touch with this work. Other countries provide models for impact assessment (e.g. the UK). MBIE's *The Impact of Research Position Paper* discusses measuring impact and evaluation in depth and its challenges. If NZ wants to improve the way it measures impact so we can demonstrate the value of RS&I and learn how to improve the return on investment, then investment need to be made in monitoring and evaluation. There are currently little of no incentives or requirements in the system to invest in monitoring and evaluation, which includes formative evaluation, using leading indicators.
P28	Connections. This text appears to be duplication from the previous section on connectedness, or misplaced.
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, international experts, business communities and markets?**	
Q16	There are strong to weak connections in all facets of RSI in NZ. The key question is more about how to strengthen them where they are strategically important e.g. access to new ideas, talent, technologies, market understanding, market access, etc. Connections are inhibited by the cost of engagement and increasing pressure on researcher time. This should be acknowledged. Our culture is still based on face-to-face interaction. Budgets have been constrained and one of the first things to be cut is trips to visit overseas colleagues, businesses, innovators and markets. Schemes such

	as innovation missions are piecemeal and follow-up may not be strategic. More systematic engagement and funding are needed. Connections are inhibited by the complexity of the RSI system. There are too many entities needing to connect; too many different RSI funding sources with continuous bidding and the need for bidding teams to gather; and too many reporting and governance lines all requiring meetings, advisory panels, strategies, etc. Where does accountability for the efficiency of the RSI lie? With MBIE we presume as the steward of the system. A question that vexes many in the system is 'Why so much complexity is needed or beneficial?'.
Q17	Address the barriers mentioned under Q16, especially complexity and lack of strategy in the purpose for connection. A change in Endeavour Funding to genuinely reward the most collaborative projects that still meet the excellence criteria for "excellent applied research" would enable existing infrastructures to be used without the need to rely on additional complicated governance arrangements with excessive transaction:research costs.
Q18	Ditto. Be more strategic than saying 'we need more of it'. Be purposeful, prioritise and set goals for connectedness. Hold organisations to account for effectiveness and efficiency in connectedness. Drive out the complexity that drives excessive and wasteful connectedness.
P30	It would help to include an extract of the Economic Development Strategy relating to RSI. The expectation around productivity is an important driver for the RSIS. What about similar connections to Biodiversity, Biosecurity, Water and Low-carbon Economy Strategies and their expectations of RSI? Including in this document a map of the government ecosystem would be helpful if it showed the roles of the different players – MBIE, R&S providers, NZTE, Callaghan Innovation, other government departments including Education, TEC, Environment, Primary Industries. Does such a map exist? If not, why not? What connection is there between "the government's industry strategy" and the strategies of industries themselves, especially in the context of RSI?
P31	What evidence is there for the statement that "the most talented researchers and entrepreneurs in the world will be transformative to our RSI efforts in New Zealand"? Some of those people are originally from New Zealand and the strategy should address why it is that they are not now in New Zealand. Is it something to do with the RSI ecosystem, resources, availability of investment, culture, or whatever? Why do they not return to New Zealand? What will the proposed new initiative target as the challenge?

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?**
Q19	We must understand and provide what makes an attractive career pathway for New Zealand's emerging RSI people. This is changing with demographics and with competition from other countries trying to achieve the same goal. The highly contestable and uncertain nature of NZ investment into RSI is often cited as a barrier to individual commitment. Stability of career opportunities should be a reward for continued productivity in RSI. At present it is not, especially in the CRIs where large and often unpredictable swings in RSI investment undermine such stability. Further, NZ salaries are not seen as competitive in a global marketplace for talent. Traditional attractants such as "lifestyle" are no longer as persuasive given the lifestyle-unfriendly reality of surviving in a research career in NZ (working excessive hours on small contracts for multiple clients simultaneously, or working full-time for >4 months on competitive funds for large grants with a low success rate).
Q20	In our experience our RSI offering is no better and may be worse than other countries' offerings, but NZ offers a lifestyle benefit, in theory. We need salaries to reflect international competition and the cost of living in cities like Auckland and Wellington. Overseas talent is often attracted by NZ's commitment to national and global outcomes and impact and by the close links between CRIs and users of our RSI. We need to offer stable investment in those areas on meaningful timeframes. For example, addressing environmental challenges is a decadal horizon and overseas talent will not be attracted by three to five-year investment with no certainty after that. Foundational data sets, for example from remote sensing networks and longitudinal studies can attractor of overseas investment and talent (people will want to work with our data sets).
Q21	We could restructure the reward system such that ongoing productivity in RSI, measured by outcomes and impacts not just published papers, is rewarded by ongoing investment and growth in opportunities – growing teams, international linkages, partnerships with relevant sectors – on a meaningful timeframe. By contracts SSIF

	investment has remained largely static and Endeavour investment is piecemeal and unpredictable. Neither allows for an attractive reward system such as this.
Q22	The details of the proposed scheme are unclear so it is hard to comment. Solutions to challenges are not described. The Rutherford scheme is not without problems, not least in its lack of adequate investment and lack of continuity. More specifically, the Rutherford Discovery Fellowship scheme, requires a host organisation to subsidise the recipients for over 50% of the actual costs of the researcher. The scheme itself does not adequately position a researcher to be integrated within the broader research ambitions of the institute because of its requirement for full-time commitment to one project for its duration. Whilst the scheme is particularly unfavourable to CRIs, we are aware that many universities are also unhappy with the financial demands of the scheme on scarce internal resources. We recommend the reinstatement of MBIE post-doctoral fellowships. Many permanent staff in CRIs came via this route. Currently there is no career progression pathway into excellent applied research from universities (Rutherford does not fill this gap – as detailed above). These fellowships could be targeted to prospective skills shortages – eg data science, AI/machine learning, kaupapa Maori approaches etc. They could also support research at the frontier whilst still embedding researchers in contexts designed to maximise outcome benefit to NZ. We applaud the suggestion of expanding the Understanding Curious Minds fund but within realistic parameters. Currently, there is no mechanism for institutes to build more than a short-term, "touch point" experience with science – the funding does not provide for a multi-year engagement and favours breadth (in number of schools contacted) over depth. Whilst this may provide an "awakening" (to science) experience for some school children it is unlikely to be sufficient to allow the students to develop a strong enough connection to consider science as a realistic career option. Other things to consider are "micro credentials" and what career pathways are possible without the 6+ year commitment to an undergraduate degree and PhD (these are necessary experiences/qualifications for many roles but there are other supplementary roles that could be fulfilled with different skill sets if impact is genuinely valued by the system). Our schemes should be relationship-based, which is a good strategy in a very competitive market. Our relationships should be with sources of talent both in NZ and overseas. Pipelines of talent should be created from the best entities – schools, universities and businesses. We should give people a taste of the New Zealand RSI environment through exchange schemes. We should ensure that NZers and staff already in our RSI system get equivalent opportunities. We must avoid creating a two-tier system of pampered overseas talent and under-appreciated local talent, which quite clearly can be as good as any. NZ RSI policy staff need to have strong familiarity with the RSI sector, its dynamics, strengths and constraints.

P32	It is unclear what is intended by the two bullet points on Technology Incubator scheme / deep technology and a 'regulatory systems approach'.
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 market need to be successful?** **Question 26:** **Are there any themes, in addition to those proposed in the RSI Strategy (research commercialisation and international connections), that we need to take into consideration?**	
Q23	Reward from the investment system for the behaviours that are wanted. The current system does not routinely reward collaboration focused on government and/or national priorities. It rewards competitive behaviour at the leading edge where people are protective of their ideas and inventions. This is particularly apparent in the Endeavour settings. Rewarding the correct/best team to make an enduring change would require a different approach.
Q24	Lower participation costs for users of innovation and raise the reward for RSI providers to engage with users. In an RSI investment environment driven by leading edge RSI the researchers focus on leading edge, not transfer to innovation developers.
Q25	We will need to be clear about our competitive strengths and build those because we are in a very competitive world for connections and global RSI funding. One such strength is the nature of NZ as English-speaking, skilled people, southern hemisphere, diverse natural environment (for simulating other countries), good infrastructure, low corruption, low regulation, etc. Be clear whose role it is to drive the overseas efforts – MBIE, NZTE or others?
Q26	Yes. Be clear why the people on the other end of connectedness would want to connect with us. A relationship approach is needed rather than a swarm of NZ RSI 'bees' going out seeking honey-pots, which is how the strategy reads.
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?**	

Q27	The current system with CPN has done a lot to help public funded research get out of institutions startups being one route for this to happen. The players have learned a lot and the extra injection of investment by MBIE in 2016 has made a difference. There is still a challenge in obtaining the levels of investment to support startups through there early stage however more support for incubators and the emergence of NZVIF in this area could make a critical difference.
Q28	The role of Callaghan Innovation in commercialisation seems to be highlighted in the strategy. CI have been active in helping business grow their innovation and research intensity but broadening their role into playing a role in commercialisation could be more disruptive than helpful especially as they have no track record in the space. Existing players like CPN have much to offer and a focus on how to make this model work even better would seem more worthwhile.
Q29	Generally the biggest challenge for a startup is burn rate and having enough capital to give their business a real chance at success. Engaging in R&D is expensive and many NZ startups do not have the investment to invest in R&D. Startups in the US would often be able to raise 10x what NZ startups raise in their early phases, this allows them much more scope to innovate around their core business both in terms of business model and in terms of R&D.
Actions – Innovating for the public good **Question 30: What elements will initiatives to support innovation for the public good need to be successful?** **Question 31: What public good opportunities should our initiatives in this area be focused on?**	
Q30	Efforts to support innovation for the public good need clarity about the desired impact (the public good), the actors in achieving the impact and their roles. For example, who are the actors in addressing climate change and what are their roles? Very unclear. Efforts need to incentivise collaboration and they should build on existing initiatives rather than create further fragmentation. Efforts should recognise the important role of social dynamics – awareness, willingness to change, connectedness, risk appetite, competing world views, political agendas, etc – in the concept of public good. The low investment in the science of these dynamics is a barrier to progress. Efforts need to be mindful of initiatives already in progress and build on relationships. MBIE could be unhelpful in organising an innovation mission on the kaitiakitanga of bioheritage with an inadequate knowledge of the high regard in which NZ RSI is already held in this field and the relationships with leading edge RSI organisations that exist. National Science Challenges have been established in some of these public good areas. In some cases the role of the Challenges is not well communicated, understood or accepted across the range of important stakeholders. By not describing or explaining the RSI ecosystem the RSIS fails to help readers understand their role and that of CoREs, SSIF Platforms, etc.

Q31	The examples on page 34 of pubic good sound more like private good. Opportunities include current government priorities, which deserve a mention, helping NZ communities manage risk from climate change, reduce the loss of treasured biodiversity and landscapes, enhance our water resources, protect soils that underpin 20% of the national GDP, etc. Innovation in these areas is not limited to new products and services but include the ways in which communities engage with the issues and achieve their own progress towards solutions. It is recognised that complex public good problems have multiple roots and generally span government departments, and so require cross agency and RSI discipline whole of system solutions. Therefore care needs to be taken that specific opportunites do not become silos. A 'theme' based approach may be worth examination, for example, equity, health and sustainability, rather than sector or topic based approaches.
	Aerospace, renewable energy and health technologies are areas where there has been massive overseas investment for many years and where overseas infrastructures and investment are magnets that hold talent. NZ might become a place where some local testing is done by overseas firms. NZ has advantages in this respect. How much of the value-stream will NZ capture? Other focus areas to consider (where there is emergent global interest, we have potential expertise and where NZ as a country can serve as a test bed, See Qs 5&7 page 4 of this submission): • Climate change adaptation • Regenerative agriculture • Generating population level behaviour change
Actions – Scale up **Question 32:** **What elements will initiatives to build scale in focused areas need to be successful?** **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?**	
Q32	Building scale requires investment and investment requires return. Maximising return means extracting value from the value chain. The important element is having the smarts to understand the value chain and NZ's opportunity to tap it at the right point. Where do those smarts lie? Do they lie in an RSI policy agency? Or elsewhere in MBIE? Where is the coordinated assessment of such opportunities – between government, industry and RSI occurring? In Te Hono, for example? The other dimension is "where NZ has a unique challenge or specific need" which applies to many public good issues. Here we suffer the tragedy of the commons – that issues affect individuals not enough to support substantial investment in finding solutions. Yet we suffer collectively. It is very hard to scale public good RSI.

	Increasingly NZ is looking to philanthropists to invest in our public good initiatives. If that is to be the solution then we need a more coordinated and better orchestrated approach. Overseas philanthropists like overseas businesses need a compelling reason to seek public good outcomes in NZ. Perhaps MBIE needs a team devoted to ODI from philanthropy. Care needs to be taken that philanthropists do not overly drive RSI agendas.
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 world views are integrated throughout our RSI system?** **Question 37: How can we strengthen connections between the RSI system and Māori businesses and enterprises?**	
Q34-37	These are for Māori to address. The CRI joint report to the S&I Minister contained more insight, evidence and ambition in relation to this matter than the current draft RSIS. The coverage of the issue is the RSIS is light, narrow and shallow. There are significant challenges around the way the RSI system supports Māori -led research, the recognition of the Māori world view in MBIE investment approaches and the system-wide support for engagement between western science/scientists and Māori world view and people. Efforts are needed to bridge this gap both to address Māori needs and aspirations and to honour the Treaty Partnership. Supporting Māori researchers is a system-wide issue requiring action from school-level to encourage uptake of STEM subjects, through universities/wananga and into tertiary, CRI and/or business RSI. The CRI joint report recommended that MBIE review its investment mechanisms to ensure the unique and distinctive aspects of Mātauranga Māori were supported with investment. At present it is believed that such proposals are not assessed by people who understand them and they fail at the first hurdle in MBIE Endeavour. Additionally, talented Maori knowledge workers have a vast array of career options open to them – scientific research is mostly seen as poorer paid and potentially having less lasting impact for their people, compared with IT, law or finance.

P37	"enduring, sustainable increases to existing funds" is needed and a welcome aspect of the strategy. The erosion in the real value of SSIF investment has caused a loss in national capability in significant areas such as national databases and collections. Achieving a "coordinated, dynamic network of research" sounds fine but the reality is of a highly complex system of RSI entities with overlapping roles and high governance costs in which the drivers are a complex, contestable investment system and heavy pressure on the entities to achieve financial sustainability. We do not see a model for "coordinated and dynamic" in government or industry – indeed, often the opposite. So, a wider look at the system is warranted, reviewing the investment mechanisms, delivery of national priorities, and ability of key RSI stakeholders to support a coordinated and dynamic network.
P38	The strategy should refer to the CRI collective review using its terms of reference, not some aspects that are 'out of scope' in those terms of reference (e.g. CRI operating model) – unless that is explicitly part of an additional review intended by MBIE. We strongly support the provision of a sustainable future for national infrastructure such as Collections, Databases and eResearch infrastructure. These are all services designed for public good. Collective ownership and benefit needs to be adequately provided for. We are wholly supportive of the need for this infrastructure to maximise benefit to NZ and to adhere to FAIR principles for accessibility (in the case of databases and collections) and to increase national capability (in the case of eResearch infrastructure). The RSI Strategy is extremely light on details for this section – does this indicate that this infrastructure is less of a priority than other components of 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 globally leading 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?**	
Q38	The current structures, policies and funding mechanisms are currently disjointed and fragmented, reflecting the diversity of ownership and motivation. A fragmented system cannot be expected to drive a coordinated, dynamic network. Only if the ownership and investment motivations are coordinated and dynamic will such a network have a chance of existing. Therefore to reach that goal the RSIS would need to be better integrated with TEC, MoE, and industry strategies in the key areas of how entities interact and work towards shared goals. At present those goals are not articulated and the RSIS does not help to achieve that.

Q39	The CRI presently supports dynamic, connected and globally leading research. There are many stats supporting this claim including the global standing of CRI research (as high or higher than that of universities), the high levels of coordination between CRIs in joint programmes, and dynamism in support for their sectors, as much as the slow speed of government investment mechanisms allows. Instability in funding (and decreasing value of SSIF investments) will encourage all entities (not just CRIs) to compete in the areas seen as having greatest potential to boost funding. This is especially exacerbated through a screening of "excellence" prior to "impact" which automatically downplays the benefits of putting the best team together across institutions (here "best" is defined as that best able to provide lasting impact). This system also disincentivises Government sector (public good) participation given the lack of alignment with national strategies. Funding mechanisms that reward genuine collaboration are the best way to leverage stronger working relationships between parties with complementary skills and abilities.
Q40	The question should focus on upgrading and updating existing R&I infrastructure rather than adding new. Much existing infrastructure is old not fit for purpose and cannot be presented to overseas talent as appealing, and state of the art. Further splintering infrastructure between additional institutions and governance arrangements simply ties up more effort in transactional cost to the direct detriment of innovation and research advancement. Opportunities to share are already exploited but more could be achieved from co-location in the same buildings, sharing expensive plant and even staff. But clear "common purpose" is needed in such an arrangement for it to be effective and culture change is likely to be needed. Examples exist overseas and lessons can be learned (e.g. national laboratories in France)
Q41	See above. The changing nature of research will require increasing amounts of foundational real world data, for example from remote sensing networks and longitudinal studies. Foundational data also allows increased international RSI participation. It is an attractor of overseas investment and talent (people will want to work with our data sets) and can drive excellence. The Dunedin longitudinal study is an excellent example. Such data collection is a critical foundation for NZs RSI future. Within the strategy there is no obvious mechanism to invest in this RSI foundation.
Actions: General **Question 42: How should the government prioritise the areas of action, and the initiatives proposed under each area?**	
	Government should work from a set of national priorities, looking into the future, and use investment to incentivise joint programmes (national and international).
General **Question 43: Do you have any other comments on the Strategy which have not yet been addressed?**	

Q43	The summary of the strategy again focuses on the inputs of an innovation hub generating new ideas. It fails to address the uptake and impact of those innovations. This concern is strengthened by the comment that MBIE plans to monitor research outputs to see how they are being applied by public and private sectors. Where is the strategy to ensure that uptake and impact are maximised? Where are the priorities for investment goals? And where are the indicators that application of outputs provides a return on the public investment in RSI? This return is as much the responsibility of MBIE as it is of the other actors in the system. MBIE should be seen to deliver on its accountability. Where is the discussion about the optimal level (or ratio) of monitoring and evaluation and the benefits it would bring, and the policy and investment mechanisms to make it so? The paper discusses and addresses issues associated with increasing private sector/good investment, but thought it talks about the need for and importance of increased public sector/good investment, shys away from suggestion how this can be addressed.