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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-submissionsRSI-submission.docx

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)

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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

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5

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Submission on the draft RS&I Strategy

From: Dr Andrea Byrom & Melanie Mark-Shadbolt; co-Directors

New Zealand's Biological Heritage National Science Challenge

November 2019

What we liked about the RS&I Strategy

Connections

We liked the emphasis on 'connections' (in addition to 'excellence' and 'impact') in the strategy. However, it's not clear how we might achieve better connections in the NZ science system, and the strategy is light on details as to how it can be achieved. This is worrisome when there is a relatively small investment in 'Mission led science' - arguably one of the primary investments that would achieve better connections across the system and with industry. Below we provide more detail on how to achieve better connections – answering questions 16, 17 and 18.

Towards an extended VM

The emphasis on expanding the VM policy is laudable. However, the draft RS&I strategy could go further - perhaps by starting with a Treaty-based RS&I Strategy. Below we make some suggestions for how that could be done.

A broader definition of excellence

We liked the reminder to the science sector that the definition of 'excellence' was always wider than simply academic excellence (e.g. as defined by citation metrics and/or H-indices for example). However, much of the strategy still has a focus on academic excellence in a fairly traditional sense (or will incentivise the science system to respond in that way).

Making NZ the best it can be

It is great to note that the vision is that NZ can and should shine on the world stage. This is aspirational and we think there is a lot that NZ science can, and should, offer the world. However, relative to many countries, our investment in science and research is modest (at best) and in fact miniscule (on the world stage). In turn this means that we might need to make choices, and in our opinion the Strategy is not clear about which areas we should be excellent in, and how we would go about choosing them.

Things we felt could be improved in the Strategy

The basic premise

The Strategy really does not ask the tough questions: what should the relative balance of investments across H1-H3 look like to achieve what we need to as a nation? And, is the current balance optimal to achieve those outcomes? At the moment, the assumption is that we do not need to change the relative balance of investments across H1-H3, so nothing much has changed relative to the NSSI in 2015. In fact, if anything, there is a shift in emphasis further towards the Discovery (H1) end. This in itself is not a bad thing, but it highlights the critical gap between fundamental science (and knowledge generation) and the work we need to do to ensure its uptake in the real world.

The 'input' side of science and research… cf. delivering real-world 'impact'

As above, the Strategy focuses almost entirely on the 'science input' side (i.e. primarily H1), with little thought as to how it will translate into H3. It assumes that somehow magic will happen (i.e. that new

knowledge will magically be taken up) without acknowledging that there is work needed to bridge the (currently massive) gulf between the input side and the 'adoption and scale out' of such knowledge.

Connections

On the subject of connections, the central framing is tautological:

A. We need connections (in addition to excellence and impact).

B. This is to break down barriers and add value across the system.

C. However, the investment approach then focuses on frontier science, and is heavily weighted towards H1. This will not achieve the breaking down of barriers and forge better connections - it will instead encourage competitive behaviour and fragmentation.

Building connections is sometimes seen as 'soft', or 'not science' because the transaction costs can be very high initially before results emerge. Indeed, it can be quite a costly up-front investment and better recognition of this is needed in the Strategy. Again, the investment in 'Mission-led' science, whilst perhaps not the only way to achieve connections, is one of the few mechanisms the NZ science system currently has to achieve connections - but the investment is extremely small relative to the other 'bubbles' of funding as shown on pages 4 and 17. This is one of the major barriers to building better connections (Question 16).

It is to some extent superficial to say that reducing competition will help forge better connections across the system, but it is true. Competition is one of the major drivers against innovation, because it discourages individuals and institutions to 'share' knowledge and to think 'big picture'. This cultural emphasis in our system on small, competitive funding grants is one of the issues hampering connectivity. We need to stimulate connectivity through larger funds that encourage connections to be built by encouraging a 'right teams' approach to new knowledge generation (Question 17).

Question 18 is interesting. There is little incentivisation at present to build connections outside the science system (e.g. with industry), except in as much as the need to identify 'end users' for example in Endeavour proposals. While the concept is one of the most useful things that could be done for the NZ science system (i.e. to ensure adoption and scale out of knowledge generated), there is little emphasis in the draft Strategy on how this would be achieved.

Partnership with Māori

In terms of a Treaty-Based framework, one option might be to work with a Treaty partner to develop the Strategy going forward. The emphasis on co-design is great, but needs to go much further if we are to achieve a system shift towards acceptance of Mātauranga and Kaupapa Māori as important scholarly activities – that will have enormous cultural, social, economic and environmental benefits for Aotearoa/NZ – in their own right. The current system is failing Māori, despite the VM policy – the statistics are woeful – so a deeper analysis is needed for the current systemic failure to ensure that Māori are trained, supported and empowered to make a contribution to the future of Aotearoa. There may also be more novel mechanisms to consider. For example, what about a Māori-led fund that the rest of the system needs to bid into? Non-Māori could be eligible for such a fund, but would be organised, led and run by Māori - redressing the current power imbalance in the system. That is just one mechanism that could be used to shift current paradigms and norms.

Excellence

The re-definition of excellence is good as we mentioned above. However, it will remain impossible to achieve a culture shift in thinking across the system (at individual or organisational level) with the Strategy's emphasis on frontier science. In other words, under the proposed Strategy, individuals and organisations will continue to assume that excellence can and should be measured in the same traditional ways, instead of being incentivised to seek different or novel metrics. We believe that

excellence can and should be measured in many different ways – not simply these traditional and increasingly outdated metrics.

The 'Frontier'

The focus on frontier science is worrisome, and in answer to one of the questions, we do not agree that the focus on frontier science (cf. 'behind the frontier') is the right approach for Aotearoa. There is much 'behind the frontier' science that NZ can and should be good at. The recent PCE report on the state of environmental reporting is a case in point: much of the research that needs to be done is not 'frontier' science – rather, involves hard graft, often over many years, in the field and in the lab, as kaitiaki and tohunga. Such science and/or knowledge generation is not well supported in this country, and the Strategy drifts away from it in favour of the 'shiny prize' that is the supposed light at the end of the frontier science tunnel.

What should NZ be really good at?

The strategy is light on detail as to the mechanisms needed to choose what NZ wants to be really good at - and how we will invest purposefully for both excellence and impact. Currently, the Strategy is weighted heavily towards H1 science – which naturally incentivises an emphasis on traditional metrics of excellence. This approach does not lend itself well to having a strategic overview or focus on what NZ can, and should, choose to do well – which would in turn incentivise investment in priority areas.

Where is te taiao / the environment?

Whilst we understand that the Strategy is not written to focus on particular themes or topics, its focus on frontier science could severely hamper our ability to deliver good environmental outcomes. As the PCE pointed out in his report just last week, much solid science, research and Mātauranga knowledge can be brought to bear to improve environmental outcomes for the benefit of Aotearoa. However, these areas of urgent need could easily be deemed mundane or 'BAU' under the Strategy as it stands, further limiting our ability to manage for environmental sustainability at a time when we need to be a global leader here.

The Endeavour fund – an over-emphasis on non-strategic science funding

Following on from this, having the Endeavour fund not being strategic and more connected to the Mission-led investment leads to many perverse outcomes in the NZ science system. Annually, at least 3-4 months are taken up with bidding by a great many stressed and distracted people. In a system where science funding is very scarce, the over-weighting of this fund relative to other, more strategic funds, is not creating optimal outcomes for our small country at the bottom of the world. It would be great to see a re-think on how we use the Endeavour fund – in ways that is more aligned with the needs of end users, and with Māori.