

Te Ara Paerangi – Future Pathways Green Paper

Submission from Universities New Zealand – Te Pōkai Tara
to the Ministry of Business, Innovation and Employment

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Contents

Te Whakamāramatanga – Introduction	3
Whakarāpopototanga – Executive summary	3
What should New Zealand’s future RSI system look like?	4
Required features of a future system.....	4
Diverse and inclusive	4
A new and independent New Zealand Research Council	5
The contribution of RSI to New Zealand recognised through substantially increased investment....	6
Te Tiriti o Waitangi, mātauranga Māori me ngā wawata o Te Māori-Te Tiriti, mātauranga Māori, and supporting Māori aspirations	6
Ngā whakaarotau rangahau – Research priorities	7
Te Tuku Pūtea – Funding	8
Decision making	8
Amount of national investment in RSI.....	8
Principles of future RSI funding	8
Future funding should drive system performance	9
Full-cost funding model versus base grants	9
Ngā Hinonga – Institutions	10
The Crown Research Institute model	10
Colocation	10
Te Hunga Mahi Rangahau – Workforce.....	11
What impact would a base grant have on the research workforce?	12
How do we design new funding mechanisms that strongly focus on workforce outcomes?	12
Early career researcher precarity	13
Measures of researcher success	13

Te Hanganga Rangahau – Research infrastructure 14
How do we support sustainable, efficient and enabling investment in research infrastructure?...14

Te Whakamāramatanga – Introduction

This submission reflects the views of the Vice-Chancellors of all eight New Zealand universities. The submission sits alongside those made by individual institutions. Universities New Zealand – Te Pōkai Tara (UNZ¹) thanks the Ministry of Business, Innovation and Employment (MBIE) for the opportunity to make a submission on the Te Ara Paerangi – Future Pathways Green Paper (‘the Green Paper’).

This submission does not answer all the questions posed by the Green Paper; however, we have addressed each of its six sections and this response is structured accordingly. We have also addressed key issues we consider have received too little or no attention in the Green Paper (i.e., the contribution of Pacific researchers and research and the importance of New Zealand’s participation on the global research stage).

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Whakarāpopototanga – Executive summary

UNZ commends MBIE on its willingness to rethink the research, science and innovation (RSI) system. In general terms, we agree it is timely to review the system and look for ways to ensure it is not only fit for purpose but builds further on its current international standing and quality.

We strongly encourage the Government to take a more contemporary approach to the system and to focus on structuring and funding it to enable research in New Zealand to ensure we are engaged with important developments in the international research community and can have the greatest impact on new knowledge for the wellbeing and prosperity of our people. The future system should be based on principles of excellence, adaptability to change in the economy and society, diversity, inclusion, transparency, and national approaches to investment where those are most effective.

Critically, the country must ensure investment in research in New Zealand is significantly increased if any future intervention is going to be effective in bringing about positive and lasting change for the country. While public funding must increase, we recognise promoting greater research intensity in private sector organisations will be necessary and likely have positive impacts on our international competitiveness in knowledge-intensive sectors and on the productivity of the whole economy, including the wellbeing of our society more generally.

In addressing the fundamental question of what New Zealand’s future RSI system looks like, it is important the institutional structure is designed to support the outcomes we wish to achieve.

UNZ believes New Zealand should establish an independent research council responsible for the country’s national research strategy (including setting national priorities), overseeing investment in national research infrastructure needed to deliver on the strategy, and advising on strategic investments over long-time horizons in research programmes and research capability to drive international competitiveness and enhance wellbeing. This includes a mandate for strategies to give greater effect to Te Tiriti o Waitangi and mātauranga Māori in research, and specific strategies for our internationally significant indigenous and Pacific research programmes.

¹ Universities New Zealand is the operating name of the New Zealand Vice-Chancellors’ Committee, a body established under Part 19 of the Education Act 1989. It has statutory responsibilities for university quality assurance, the approval and accreditation of university academic programmes, entrance to universities, and scholarships. It also represents the interests of the universities on a wide range of other matters, such as education and research policies.

There is a significant commitment to and inclination for collaboration across the research institutions of New Zealand. However, the formal governance structures and the incentives provided to the leaders of the major research-provider organisations creates a tendency for – indeed, an obligation for – institutional focus rather than a national strategic focus. This particularly affects colocation and large research infrastructure issues.

What should New Zealand’s future RSI system look like?

Required features of a future system

The future RSI system should be capable of:

- Giving effect to the concept of partnership embodied in Te Tiriti o Waitangi and promoting research programmes that advance Māori knowledge and development and support and have impact on Māori communities and their aspirations for the future.
- Supporting current national research needs such as the productivity of existing industries, the health and wellbeing of our people, and our environment.
- Responding to strategic priorities – climate change, pandemic response, Pacific development, economic diversification, wellbeing, and social cohesion.
- Investing strongly in emerging knowledge-rich sectors likely to have a key role in technological change and the creation of globally successful businesses in the future, such as AI/VR, robotics, Med Tech, biology and health, gaming, climate change mitigations, sustainable agricultural practice and urban environments, and space.
- Promoting research that supports productivity growth and competitiveness in business while encouraging New Zealand businesses to set aspirational research programmes based on research of international standing.
- Supporting a range of disciplines and the advancement of knowledge and understanding even where the immediate application is not clear. The research system must be much more than a science system.
- Funding capability and individual projects or programmes to provide researchers with job security while also supporting basic, investigator-led, curiosity-driven research at the project or programme level. This is addressed in the section below on the workforce.
- Engaging with the global research community in ways that ensure we have researchers operating at the international frontier for the advancement of knowledge. This engagement is particularly important in areas of global challenge, in knowledge relating to the environment and society, and in knowledge that will build and drive internationally innovative business in the future.

Diverse and inclusive

Principles of diversity and inclusion should underpin the development of New Zealand’s future RSI workforce and research strategies. We support a system that incentivises and enables research that reflects and embodies the concept of partnership in Te Tiriti o Waitangi, engages with a diverse group of stakeholders and Pacific peoples, and includes diverse research agendas, such as those in the United Nations’ Sustainable Development Goals. This will result in innovative and meaningful social, economic, environmental and health research impacts aligned with the needs of our communities, peoples and nation, and produce research, researchers and research excellence that contributes to wellbeing in our society.

The Green Paper does not adequately emphasise equity for Pacific research and researchers². This neglects the importance of New Zealand's Pacific communities, its links with Pacific nations, its place in the region and the value Pacific research and researchers can bring to New Zealand's RSI. A robust RSI system should envision the potential of an expanded linked innovation model where innovation results from greater diversity in research projects, institutions and systems.

A new and independent New Zealand Research Council

We suggest establishing a specialist independent research council should be considered. This council could support and guide research in New Zealand as an independent body to ensure the needs of all parts of the system (including government) are considered in an objective way. The council could be required to articulate the national research strategy, manage a continuous process of national engagement that will identify and publicise emerging research areas of importance, and regularly update the national research strategy to reflect this new thinking.

The council structure and mandate should give direct effect to Te Tiriti o Waitangi, recognising *Article One – Kawanatanga*, and partnership with the Crown to enable Māori and mātauranga to be central to a framework for mutually defined success. This should include a dedicated fully funded capability operated by Māori for Māori communities. Māori should not be considered stakeholders to be consulted.

Other mandates could be considered to promote integration with international scholarship and a future focus while constantly engaging with domestic communities, including Pacific research priority needs.

An independent research council could have oversight of the research system, including infrastructure, capability development and emerging frontiers of knowledge, and be responsible for setting research priorities. It could:

- Give effect to Te Tiriti o Waitangi by being responsible for prioritising mātauranga Māori and the careers of Māori researchers, while also dealing in a strategic way with boundary issues and the desirability of integrating Māori research into more general research programmes and having an interest in all research that advances the wellbeing of Māori communities.
- Be at arm's length from the Government to enable a focus on priorities extending beyond political cycles, although with effective mechanisms for the council to ensure engagement with political decision making.
- Give advice on strategic investments over long time horizons in research programmes and research capability to drive international competitiveness and enhance wellbeing.
- Commission research that enables it to analyse the RSI system, promote the development of capability and diversity in the workforce, address disparities internally, and promote exchange with the rest of the world – making New Zealand the "Place where talent wants to live".³
- Using an equity framing be responsible for promoting Pacific research and the careers of Pacific researchers, while also looking at integrating Pacific research into more general research programmes and having an interest in all research that advances the wellbeing of wider Pacific communities.

² Minor reference to it is made on page 66 of the Green Paper.

³ To quote the late Sir Paul Callaghan.

- Oversee investment in the research infrastructure needed to deliver on the national research strategy.
- Encourage excellence and international engagement as critical components of research capacity.
- Be comprised of leading researchers and big-picture thinkers who understand New Zealand’s social, health, economic and environmental context. The council should be supported by professional management so members can focus on critical thinking, horizon scanning, and analysis and priority setting.
- Be separate from the research advancement, promotion and academy functions of the Royal Society Te Apārangi, as research councils are in other key countries.

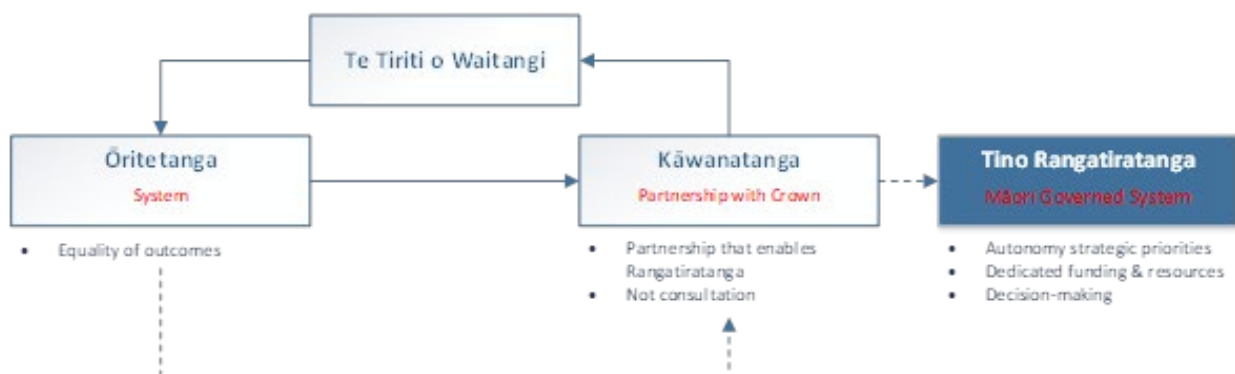
The contribution of RSI to New Zealand recognised through substantially increased investment

A substantial shift in the approach to, and the amount of investment in, research is required. New Zealand needs strategies to focus research on the knowledge-rich sectors that offer the highest dividend for the application of new technologies and new ways of thinking (see the Productivity Commission’s ‘Frontier Firms’ report), our persistent productivity deficit, and improving the health and wellbeing of our people and social cohesion in our communities. This in turn requires the generation, translation and application of knowledge through investment in research capability at a much larger scale than in the recent past. See Te Tuku Pūtea – Funding section below.

Te Tiriti o Waitangi, mātauranga Māori me ngā wawata o Te Māori-Te Tiriti, mātauranga Māori, and supporting Māori aspirations

Te Tiriti o Waitangi is best pursued through a coordinated, systems-change approach. The Green Paper provides an opportunity to disrupt the research system rather than investing in the same strategic and operational policies that reinforce the approaches used in the past.

A systems-design approach reflective of the distinctive articles of Te Tiriti (see diagram below) would provide an opportunity to embed a new way of operating for the research system, establishing an ‘and – and’ foundation and approach for operating.



Texts	Description	Te Ara Paerangi applied
Article I Kāwanatanga: Partnership with Crown	<p>Kāwanatanga provides the right for the Crown to govern and actively protect Māori rights and interests through legislation and policies.</p>	<p>As Tiriti partners it enables rangatiratanga and offers greater possibilities for mutually defined success. It requires the Crown and Māori working together, power sharing in a relationship of equals, co-designing and co-determining research opportunities in which the impact of research meets the needs of Māori communities.</p>
Article II Tino Rangatiratanga: Māori Governed System	<p>As part of the mutual recognition of kāwanatanga and ōritetanga, a Māori governed system as an expression of tino rangatiratanga guarantees to protect Māori autonomy and their ability to govern themselves and determine their own strategic priorities.</p>	<p>Crown investment in Māori research through Māori research centres and iwi research aspirations can be an indicator of Crown endorsement of tino rangatiratanga in research. As a kaupapa Māori initiative, it necessitates Māori control and autonomy that accommodate Māori ways of conducting research that are more effective than generic approaches. It should also involve Māori communities and hapū to ensure research impacts are meeting the needs of Māori communities and ensure accountability.</p>
Article III Ōritetanga: System	<p>It considers both historic and contemporary determinants of inequality and imagines a system in which Māori participate with the same capacity for influence as other citizens collectively determining pathways towards equality of outcomes.</p>	<p>It aims to restore balance between Māori and the Crown by achieving equitable outcomes for Māori through explicit statements, clear targets and a commitment to research deliverables and resourcing.</p>

Ngā whakaarotau rangahau – Research priorities

Setting New Zealand’s research priorities must not be subject to the vagaries of political cycles. To achieve this, as mentioned above, we strongly recommend an independent research council is established that is responsible for, among other things, setting research priorities. This is common practice in other countries such as the United Kingdom. Although the new council must be an independent public agency, it can and should still work with government, Māori, researchers, Pacific and other communities and stakeholders such as business to set national priorities, sustain focus on these priorities and rationalise the investments needed to deliver against them.

Te Tuku Pūtea – Funding

Decision making

Funding serves two purposes within the current RSI system: financial support of activities and a mechanism by which government can steer the system. If there is a robust process to set priorities (i.e., via the proposed new research council), with government and stakeholder participation, this replaces (or reduces) the second purpose, while maintaining the ability for funders to invest across a mix of longer-term activities and higher-risk, more speculative investments in emerging areas. As discussed above, strategic decisions on the public funding of research should be made by an independent public agency, as in many other countries.

The Green Paper correctly identifies issues related to unproductive competition but also that some competitive processes and benchmarks of international standing are required to drive system performance and ensure the most productive allocation of resources. This recognition needs to be codified more strongly in the design of the future RSI system to ensure the country can develop and attract highly mobile and talented researchers who want to operate in an environment recognised as world leading.

The Green Paper also identifies the issue of superficial engagement with iwi, Pacific communities and industry that is subject to 'light-touch' collaborations preceding and for the purposes of funding rounds. This behaviour has been driven by the funding settings and speaks to a deficit in our system where co-design and translational research are not sufficiently embedded and supported. The German Fraunhofer model⁴ provides an excellent template for effective translational research and aspects of it could be emulated by any future RSI system.

Amount of national investment in RSI

Successive governments have explicitly supported a target investment in research of 2% of GDP. However, even though 2% is below the OECD average of 2.5% of GDP, New Zealand is still well short of this target. We need to abandon our unrealised aspiration of being below average and develop an achievable pathway that will raise total research funding through greater public investment and stronger incentives for the private sector to build its commitment to research investment, especially in sectors that offer the highest dividend for the application of new technologies and ways of thinking.

Principles of future RSI funding

We recommend principles should include but are not necessarily limited to:

- Large capital infrastructure is funded by government (and not left to research institutions or customised one-off collective solutions to fund) and accessible to all relevant researchers.
- Funding should promote, incentivise and support domestic and international collaboration as a norm, not just for some funding streams.⁵

⁴ <https://www.fraunhofer.de/en.html>

⁵ Some government funding (e.g., Performance-Based Research Fund) comes with the expectation of the pursuit of international collaboration, but there is no overhead support to do this. Most countries incentivise and fund collaboration.

- Funding should recognise and support the expense of the rising cost of salaries of domestic and international research talent.⁶
- Research funding to universities must support research workforce planning and development.
- Equitable funding and resourcing of strategic research priorities as determined by and for the benefit of Māori.
- Funding should focus on strategic outcomes such as equitable health outcomes and research to benefit the Māori business sector, which in turn contribute to the economy.

Future funding should drive system performance

Currently only proxy measures of research productivity are used (e.g., number of publications and citations per \$million spend). Although we recognise the importance of these measures, we advocate the introduction of additional contemporary measures of achievement and impact. The success of the future RSI system should be measured by what it is intended to achieve (e.g., workforce development, strategic outcomes, impact on stakeholders and their communities). Internationally, there is a shift towards ‘catalysation’ of the research workforce to derive maximum productivity returns for the country. The system (and therefore funding) should focus on the things that matter even if they are hard to measure.

Full-cost funding model versus base grants

Research in New Zealand is not ‘expensive’. Indeed, global comparison would suggest we have one of the most efficient systems in the OECD in terms of productivity. That is, after all, how universities manage to meet the needs of many local stakeholders while also being credible participants at the international frontier of many areas of research despite the relatively small proportion of GDP research funding compared with other OECD countries. University research is significantly cross subsidised from teaching income, particularly by income from full fee-paying international students. The Covid-19 pandemic has revealed the fragility of that approach, resulting from the fact that, in the absence of an explicit government policy that universities should fund research in this way, the loss of the income did not induce an explicit policy response or replacement of the income from public funding.

The current full-cost and fully funded model makes costs transparent and therefore auditable. There are, however, two consequences of this approach:

- (i) It creates a two-tier system, with institutions having some research supported by full-cost external funding and other research (sometimes closely related) funded from teaching, commercial activities and other sources.
- (ii) Investment in research infrastructure that would serve national needs and international collaboration is not directly or easily funded unless a new and targeted infrastructure fund is established.

Universities are open to the possibility the funding system for research could be revised, but any revision needs to be comprehensive (and not just an arbitrary change to the approach to overhead funding), with due consideration of any potential unintended consequences. Furthermore, any

⁶ To maintain New Zealand’s international competitiveness, universities must attract international and retain domestic talented researchers. This rising cost is not fully covered by Student Achievement Component (SAC) funding from the Tertiary Education Commission. In fact, inflation typically exceeds the percentage increases in SAC funding. And legislation controls price increases on university revenue streams such as domestic student fees.

change to the funding landscape also needs to preserve complete transparency of the cost of conducting research.

Whatever gains might come from a new approach to funding, the biggest gains will come from more funding being injected into the system within an institutional structure designed to promote collaboration and the achievement of outcomes, including funding provided separately to support key research infrastructure investments.

Ngā Hinonga – Institutions

The Crown Research Institute model

Internationally, the university model of co-production of research and researchers through teaching, supervision and research activity is the dominant model for research. Institutions that do not have the ability to offer research degrees normally need to work closely with institutions that do. Institutions such as Crown Research Institutes (CRIs) that conduct sector-specific research and have no formal links with the university sector aside from voluntary co-operation agreements are therefore unusual.

Internationally, it is also unusual to have public institutions such as CRIs focused on and limited to the dominant sectors in the economy of the recent past. This model means there is a large degree of inertia in the research system and little capacity to support emergent, more knowledge-rich sectors. It is impossible (and risky) for one institution to have all the national capability in one area. Therefore, the future RSI system should move away from institutional structures focused on sectors. Instead, institutional structures should be designed to promote national and international collaboration and achieving outcomes to the benefit of New Zealand. Furthermore, the current ‘for profit’ model of CRIs has meant research infrastructure, (e.g., the Tangaroa, significant databases and collections) isn’t always used effectively. A company structure housing research infrastructure is fundamentally incompatible with driving public research outcomes.

Colocation

Colocation of research organisations may provide many positive benefits. It can:

- Help in building relationships and enabling collaboration.
- Support the missions and goals of universities and CRIs.
- Result in efficiencies such as shared facilities.
- Importantly, work well for capability development (e.g., existing joint graduate schools), one of the key roles universities play in the RSI system.

However, colocation does not necessarily result in collaboration or cooperation and will not, in and of itself, drive the optimal level of collaboration and coordination (otherwise, how would multi-campus universities and CRIs survive?). The primary barrier to a more collaborative and productive research system in New Zealand is not geographical location but institutional boundaries and the funding system. Colocation of two very different institutions will not necessarily overcome the problems of alignment of vision and purpose, strategy and priorities, measures of success, rewards and drivers, and approaches to intellectual property ownership.

The term ‘colocation’ could apply to ‘centres of knowledge’ and not necessarily to where entire institutions are placed. ‘Knowledge hubs’ could be based near industry clusters and/or regional hubs could be established in partnership with iwi, for instance. We recognise that at the heart of MBIE’s ‘colocation’ desire is bringing together resources and capability to create critical mass in thematic

areas. Universities support the colocation approach where key thematic areas such as climate change/resilience or new energy technologies are the focus. Although there are significant costs upfront to bringing such resources together, the long-term benefits are far greater than the initial outlay. New Zealand shouldn't be confined to the types of institutions that exist and instead should create new fit-for-purpose centres.

Current funding settings have driven an environment where collaboration between research providers happens primarily where this is specifically incentivised through vehicles that require collaboration for success, such as Centres of Research Excellence and National Science Challenges. Where collaboration is not specifically incentivised, each institution is driven by its reliance on external funding to support staffing levels and infrastructure, and this means maximising the extent to which its grant applications use its own employees.

A map of the RSI system that implies the location of 'applied' research with some providers (CRIs) and 'fundamental' research with others is inaccurate. All New Zealand universities are driving transformational research programmes with direct relevance to industry and that result in commercialisation outcomes, and CRIs gain Marsden funding every year.

Where CRIs and universities have successfully colocated (virtually or otherwise), it is often in the form of co-supervisory arrangements of graduate students (e.g., joint graduate schools) or access to infrastructure. Such collaborations offer substantial research advantages and economies.

The CRI company model has driven perverse outcomes where incentives for the 'company' can be at odds with the interests of the country. We need critical national research capability (e.g., natural hazards, radiation labs, meteorology, monitoring functions, national collections and databases) but there is no reason these should be provided within 'for profit' corporate institutional frameworks instead of collaborative programmes and platforms involving relevant scientists from across the country.

Similarly, sectors of the economy requiring research support can and will source that support from the best researchers across the country. Setting up corporate entities to be primary service providers is artificial and belies the wide application of research conducted by researchers from different institutions and backgrounds across the country.

The approach embedded in the current model of sector-focused institutions is that emerging sectors (e.g., AI, AR/VR, advanced manufacturing, space) are not easily recognised and supported. These are more speculative, higher-risk, higher-return sectors critical to the future economy. They are a natural fit with a more Fraunhofer-type delivery model (see above) and indeed are the natural colocators with the university sector.

Te Hunga Mahi Rangahau – Workforce

The future shape and size of the research workforce is inextricably linked to other aspects of the national system such as (but not limited to) strategic research priorities, infrastructure and total national investment in RSI.

Decisions about research priorities at a national scale will have immediate implications for the precarity of the workforce. Given it takes many years to train high-quality researchers, research priorities would need to be set with at least 20-year horizons to enable training, recruitment and retention of talented international and domestic research staff. Capability platforms within research organisations should align with national research priorities. There will be existing capability in likely

priorities such as climate change that will no doubt be swiftly ‘mapped’ into a new set of national priorities. Depending on the timeline of those priorities, this might better enable New Zealand to grow our own talent and therefore also help address issues of diversity and inclusion (precarity is disproportionately borne by women, Māori and Pacific researchers). In the section on infrastructure below, we will reiterate the importance of increasing New Zealand’s national research infrastructure. This, too, will have implications for the workforce, including technical support capability. Improved research infrastructure will also help in training, recruiting and retaining research talent

It is also critical for New Zealand to invest in building career pathways and capability for pure research roles and less traditional roles such as policy development. This enables the infusion of research skills (such as analysis, data interpretation and application) into all relevant parts of the economy, which will further contribute to New Zealand’s economic, social and environmental outcomes.

Systemic change that will positively impact New Zealand’s research workforce will only be effective if the Government significantly increases its total investment in the RSI system and incentivises the private sector to do likewise.

What impact would a base grant have on the research workforce?

The impact of a base grant on the workforce would depend on the size of the grant. A base grant would have to be significantly greater than the amount currently covered by overheads if it is to reduce the precarity of the research workforce. Base grants aligned to capability platforms would further enhance job security for researchers and would also provide high-quality career pathways. However, a base grant is not the panacea to the challenges faced by New Zealand’s workforce and care should also be taken to preserve the transparency of the current funding approach. As discussed in other parts of this submission (funding and infrastructure), a base grant approach needs to be accompanied by systemic changes to prevent unintended consequences, such as underfunding of fundamental research.

How do we design new funding mechanisms that strongly focus on workforce outcomes?

The current funding system is not designed to fund capability but rather to fund individual projects or programmes for a finite period. This results in a degree of workforce precarity. However, a balance needs to be struck between funding capability and funding individual projects or programmes. This balance can be achieved through a base fund for capability and discretionary funding for projects or programmes. This would provide greater workforce stability than is currently the case while also ensuring we retain the current agility of the research workforce to pursue new lines of inquiry through basic, investigator-led and curiosity-driven research.

The future RSI funding system also needs to support increased diversity in the research workforce. Diversity is a prerequisite for innovation given the broad range of views and expertise a diverse workforce offers. Currently, and particularly in universities, New Zealand has a diverse workforce based on nationality, but the lack of equity for women, particularly in STEM disciplines, persists, and Māori and Pacific peoples are under-represented. Furthermore, the small number of Māori researchers in the system are overloaded, as funding settings (correctly) emphasise mātauranga Māori approaches to research and rangahau. The doubling up of responsibilities of Māori researchers to include cultural leadership on top of their research leadership can be addressed through separate funding of specialist cultural leadership. Universities have many initiatives under

way to address institutional barriers to Māori, Pacific peoples and women. These include a collective effort overseen by UNZ with support from MBIE's Equity, Diversity and Inclusion Capability Fund.⁷

Early career researcher precarity

The precarity of early career researchers is not specific to New Zealand, with many other jurisdictions also grappling with this phenomenon.⁸ However, it is an inbuilt phenomenon specific to the research profession and UNZ is of the view it deserves focused attention. We believe it needs to be addressed at a system level if any intervention is to be effective and the over-representation of women, Māori and Pacific peoples in the precariat is to be reduced. Furthermore, solutions should only be offered once the precarity is further understood⁹, as solutions will likely need to be targeted to a narrow part of the research workforce.

A strategic national approach to enabling the inter-sectoral mobility of researchers could further reduce the precarity. Alternate career paths or the interchange of researchers between academic research, industry, government and the non-profit sector could also infuse research skills into these sectors to achieve desired outcomes (e.g., evidence-based policy making in government¹⁰ and innovation in industry). Furthermore, we are also considering ways in which PhD programmes can better prepare graduates for careers beyond academia. Finally, we encourage the introduction of a national postdoctoral programme and the reintroduction of government-funded postdoctoral fellowships to provide career paths for those doctoral graduates wishing to pursue an academic career.

Measures of researcher success

The future RSI system should retain the value currently placed on our researchers' contributions to international literature if New Zealand is going to continue to be seen as globally competitive. Being globally competitive is key to us retaining and attracting local and international research talent. However, retaining the value placed on international publications can occur while also recognising and rewarding excellence in the New Zealand context. We support the Tertiary Education Commission's move to be more inclusive in Performance-Based Research Fund definitions of excellence¹¹. New Zealand universities have already moved to a broader view of a researcher's contribution and impact than international publications can provide and can do more in this respect. We encourage the evaluation of grant applications by research funders to also look beyond publication records to assess potential value. This is particularly important when recognising the contributions of Māori, Pacific peoples and early career researchers who may publish less often in international journals. We believe, for instance, our commitment to mātauranga Māori can sit in harmony, not tension, with international ambitions, publications and research rankings.

⁷ The Equity, Diversity and Inclusion Capability Fund seeks to support research organisations to identify and break down barriers to attracting, retaining and growing an equitable, diverse and inclusive workforce.

⁸ OECD (2021), "Reducing the precarity of academic research careers", OECD Science, Technology and Industry Policy Papers, No. 113, OECD Publishing, Paris, <https://doi.org/10.1787/0f8bd468-en>.

⁹ MBIE is in the process of collecting data on the research workforce.

¹⁰ UNZ is currently engaged, in collaboration with the Department of the Prime Minister and Cabinet and the Office of the Chief Science Advisor to the Prime Minister, in a project on evidence-based policy development, implementation and evaluation through knowledge-sharing between university academics and policy makers.

¹¹ The Tertiary Education Commission's Performance-Based Research Fund sector reference group is currently considering how research excellence in a New Zealand context is defined and measured.

Te Hanganga Rangahau – Research infrastructure

New Zealand needs a national plan providing a better way to build national research infrastructure that is in selected cases Crown-owned and fully funded. Developing a national plan could be the role of the proposed research council mentioned above. Currently the full-cost funding model does not support infrastructure being used fully, nor does it support purchasing large capital items.

Researchers currently rely on serendipity for large infrastructure being available (e.g., the Primary Growth Partnership Fund from the Ministry for Primary Industries has recently funded a magnetic resonance imaging machine). Furthermore, in most other key jurisdictions (e.g., the United Kingdom and Canada), there is separate funding for research infrastructure, making the New Zealand-specific approach to costed overheads difficult for our international collaborators to understand.

How do we support sustainable, efficient and enabling investment in research infrastructure?

The current system funds projects or programmes for a finite period (e.g., three to seven years), which leaves it to research institutions to decide on and invest in supporting infrastructure.

Setting national priorities must include research infrastructure requirements, including datasets, archives and other forms of digital research infrastructure. Deciding where and how to invest should be the responsibility of the new research council based on the national research strategy. This independence of the council from government, research institutions and industry would help ensure investment is designed to meet national objectives as well as the most important areas of mission-led and investigator-led research. These decisions should also consider our need to provide an attractive base for outstanding researchers who could be developed domestically and recruited from overseas.

The council would need to make strategic decisions regarding the purchase of Crown-owned infrastructure, the geographical location and host organisation (based, for example, on relevant concentrations of expertise, likely patterns of use, and capability of institutions to host it). National infrastructure investments should sit on the Crown balance sheet and operating (including depreciation) costs should not be the responsibility of the host institution. The host institution should be required to ensure open access and national use of the infrastructure.

There would also be implications for the technical support workforce that would need to be assessed and appropriately managed. Good examples of where research infrastructure is shared among multiple institutions but accessed by all relevant researchers include the Australian National Nanofabrication Facility¹² and the Microscopy Australia consortium.¹³

¹² <https://www.anff.org.au/>

¹³ <https://micro.org.au/>