



1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240
New Zealand
P: +64 4 237 1170
branz.co.nz

16 March 2022

SUBMISSION ON TE ARA PAERANGI FUTURE PATHWAYS GREEN PAPER 2021

SUBMITTER CONTACT INFORMATION

Chelydra Percy
Chief Executive
BRANZ

Chelydra.Percy@branz.co.nz

MBIE can publish my name and contact information with this submission and MBIE can contact me in relation to this submission.

Further requested information about BRANZ is provided on page 12 of this submission.

PREFACE

The Building Research Association of New Zealand (BRANZ) welcomes the opportunity to give feedback on the ideas presented in the Research, Science and Innovation (RSI) Te Ara Paerangi Future Pathways Green Paper (the Paper).

We agree that it is timely to reflect on the current research system in Aotearoa New Zealand. This opportunity will help shape the system to ensure it is optimally positioned to contribute to addressing the future challenges and opportunities for our country. We recognise that this is the start of the discussion, and we welcome the opportunity to work with MBIE and others on the more detailed design of the future system.

In this submission, we provide some background on BRANZ's role. We describe our place in Aotearoa New Zealand sitting at the interface between the RSI and the building and construction systems. This background aims to provide the context through which we respond to some of the ideas presented in the six themes of the Paper.

Following the background on BRANZ, we make some recommendations regarding the design of a future RSI system which will cut across all areas.

This submission does not answer all the questions posed by the Paper. Rather we have addressed each of the themes in the Paper's six chapters and this response is structured accordingly.

ABOUT BRANZ

BRANZ¹ is a multi-faceted, independent science-led organisation. We use independent research, systems knowledge and our broad networks to identify practical solutions that improve Aotearoa New Zealand's building system performance. BRANZ is driven by the knowledge that to thrive as a society, New Zealanders need a built environment that is safe, healthy and performs well. The BRANZ vision is to ***Challenge Aotearoa New Zealand to create a building system that delivers better outcomes for all.***

To do this, BRANZ cultivates strong relationships with industry, government and building users through collaboration and facilitating the sharing of insights, opportunities and ideas. These relationships underpin the range and depth of BRANZ's knowledge and ability to understand the linkages and interactions that influence the building system. This uniquely broad perspective not only influences BRANZ's research, but also our commercial services.

BRANZ undertakes and commissions research, funded by the Building Research Levy, which is both practical and drives positive building and construction system change. This work helps improve industry practices around the performance of buildings and how we use them, through to informing policy and legislation and all points in between.

BRANZ also contributes to practical improvements in Aotearoa New Zealand's built environment through independent product testing, assurance and consultancy services. Evidence-based advice is available at all phases of the product life cycle from preliminary R&D and standards compliance, through to verifying end-use product performance. A BRANZ assessment is universally trusted, providing assurance that the products should do what the manufacturer says they will do.

Our legislative mandate

The Building Research Levy Act of 1969² established BRANZ as an incorporated society. Through this Act, authority is given to levy building contractors to provide money for research into improved techniques and materials for use in the building industry. The Act sets out how the Levy can be used which includes conducting and funding building and construction research, publication, provision of advice and investment in capital assets to support research.

Developing our capabilities to deliver on our priorities

Our people and extensive facilities to support our research, consultancy services and testing work primarily resides at our campus in Judgeford near Porirua in Wellington.

BRANZ has a team of over 100 scientists, engineers and professionals at its heart who are passionately committed to ensuring the built environment is the best it can be. These people are critical to our success. Our workforce development approach recognises career progression is unique to the individual and sits in a context and culture that includes performance, development, accountability and contribution to results. Scientific staff develop their careers, science and leadership capabilities in a variety of ways and are supported by our Scientific Growth Framework which is unique to BRANZ.

¹ <https://www.branz.co.nz/>

² <https://www.legislation.govt.nz/act/public/1969/0023/latest/DLM391231.html>

BRANZ uses a Campus and Asset Management Plan and Digital Futures Roadmap to ensure that our facilities, equipment and technology meet the industry research and testing needs for the future.

The major element of this Plan is the redevelopment of the Judgeford campus with a three-year construction project which started in 2021. Modern fit-for-purpose facilities are key to BRANZ delivering our world-class research and testing expertise. New laboratories and workspaces will allow us to better meet the present and future needs for Aotearoa New Zealand. This strategic investment will create an innovative workplace that invites collaboration across our networks.

In recent years, we have invested in enabling works to replace aging plant to prepare for the campus redevelopment. We have advanced our research and testing capability by targeted investment in fire façade testing, climate/UV chambers and gas chromatography mass spectrometry.

Investing the Building Research Levy to address priorities

BRANZ invests the Building Research Levy to improve the building system performance by co-creating enduring solutions that make a real difference in the lives of people in Aotearoa New Zealand. Investment signals are developed through a range of means, from input by the Building Research Advisory Council³ and other stakeholders and through our biennial industry needs survey. We have core research programmes and invest in research across the system to meet the long-term knowledge needs and gaps as outlined in our Levy Investment Portfolio⁴. Research programmes are independently assessed against a framework to ensure the research outcomes meet the needs identified.⁵

Our current research is broadly aligned to four multi-year research programmes:

1. Transition to a zero-carbon built environment.
2. Warmer, drier, healthier homes.
3. Eliminating quality issues.
4. Building fire-safe densified housing.

We also fund other organisations across Aotearoa New Zealand to carry out research aligned with our priorities. Over the past 5 years (since 2017), we have directly funded 40 external research organisations to a total value of \$11.7 million. A component of this work is to support the future building and construction research workforce through funding, and in some cases jointly supervising, an annual cohort of Master's and PhD scholarships.

Given our stewardship of the Building Research Levy and the alignment of our work with this mandate, BRANZ does not in general apply for funding directly through the RSI investment processes of Vote Business, Science and Innovation.

Our networks

We have collaborative relationships with universities, Crown Research Institutes (CRIs) and other research providers that are essential to the outcomes we are striving to meet. Shared

³ <https://www.branz.co.nz/about/building-research-advisory-council/>

⁴ <https://www.branz.co.nz/investing-research/>

⁵ For more information on our investment approach and the programmes we fund please see our recent Levy in Action publication: https://d39d3mj7qio96p.cloudfront.net/media/documents/Levy_in_action_2021.pdf

information helps inform priorities for funding, ensuring we aren't duplicating effort and we are playing to our respective strengths and leveraging our respective resources.

BRANZ connects internationally with our counterpart organisations and through sitting on standard setting bodies. We have extensive connections across the building and construction sector in Aotearoa New Zealand. These networks ensure our work is relevant and of high standard and has actionable outcomes for the users of research. We are well connected with the government both as the building regulator and a facilitator of pan industry and government action such as the Construction Sector Accord. We have a strong history of system thinking in our work and this underpins our organisational strategy.

As an independent research organisation, we collaborate with organisations that form the Independent Research Association of New Zealand (IRANZ)⁶. We are also the institutional host for the National Science Challenge Building better Homes, Towns and Cities | *Ko ngā wā kāinga hei whakamāhorahora*.

It is with the above perspectives that we provide our feedback on the Paper through our submission. We welcome the invitation to be part of the initial conversation to shape the system to deliver on its future vision.

RECOMMENDATIONS

We have highlighted below six recommendations to be considered as work is progressed across the six areas discussed in the Paper.

Recommendation One: Articulate a core purpose for the RSI system

The Paper characterises well the issues with the current system and articulates some features of a desired modern future system. There is, however, an absence from the Paper and from the system generally, of a clear overarching statement of purpose. Having a statement that signals what the RSI system is there to do and achieve will provide greater clarity on the endpoint for the reforms. It will also support an analysis to determine what the desired shifts will be. A key question to help shape this core purpose could be: To whom or what is the system in service?

Flowing from this statement will be the opportunity to design and construct an optimal operating model for the system. This will enable much clearer identification of the capabilities, the structures, and the role of government's RSI funding and other levers to achieve the purpose.

Developing a core purpose and operating model will allow:

- a coherent and consistent view on what the system needs to do and how it should be structured.
- identification of priorities for the system at the macro scale.
- identification of the behaviours, attributes, incentives and capabilities needed to drive the system.
- clear understanding of the trade-offs across the system when allocating limited resources.
- the role of government to be identified in supporting this core purpose.

⁶ <https://www.iranz.org.nz/>

We recommend that a core purpose for the RSI system, an articulation of the operating model and a roadmap on how to get there is co-created with RSI stakeholders as a priority. This should be done before any significant reforms across the areas in the Paper are begun.

Recommendation Two: Design the system from first principles through a system lens

We think, through this Future Pathways process, there is an opportunity to look at the RSI system from a 'first principles' approach. Doing it this way will have the best chance to design an optimal model with its core purpose at its heart. There will be a clear line of sight for what the changes will achieve to address the many current and future challenges and opportunities signalled in the Paper.

System(s) transformation takes a long time and requires a range of new competencies which will need to be developed across the system. All the areas of potential reform outlined in the Paper, will impact (positively and negatively) on the other areas depending on what path is taken. These impacts need to be carefully considered and any resulting trade-offs will need to be carefully weighed up.

The potential shifts in the system suggested in the Paper will need to be guided and adapted as change is embedded and new behaviours or barriers emerge that work against the desired outcomes. Having good success measures to track the impact of the desired change will be important as well as those that signal any unintended consequences.

Recommendation Three: Design the system with users and outcomes for those users in mind

We recognise that different forms of research are needed across the system, from basic to applied. The system, though, must be designed with the user or those representing the user in mind. These users will be different depending on how the system is viewed and what part you are designing.

Stakeholders tend to have other responsibilities or roles and do not have a strong sense, nor should they have, of the inner workings of the RSI system. Their interaction with the RSI system needs to be made as simple, engaging and rewarding as possible. They need to understand the role of research and know what they can expect from the research they are involved with. Equally, they will need to be clear about what the research process can expect of them.

There also needs to be equitable access for all users to contribute to shaping the system and its developing priorities. Access to, and benefit from, RSI should not correlate with stakeholders' ability to resource their influence. In addition, engagement with users by the system should be better recognised and fully resourced. Users need to be engaged at all stages – from policy design to priority identification, to funding decisions, through to research programmes.

In some instances, the user of the system will be the research community e.g., when researchers apply for funding. Designing the processes with the contribution and participation of the research community will make them as user friendly and aligned as possible.

Recommendation Four: Design for greater stability and scale

As the Paper identifies, the current system is fragmented and under resourced for the expectations that are placed upon it. There is a proliferation of strategies and priorities, both inside the system, through other Votes and by industry sectors. This leads to inefficiencies, with piecemeal and competing approaches. There is a role for the RSI system to align with other priorities across government and industry to ensure greater leverage and scale. Having priorities that are focussed on long term goals, missions or 'moon shots' and having research institutions that are not driven by unnecessary competition will allow the system to settle into a more mature state. It will also allow better focus on delivery. Greater stability and scale in the RSI system will lead to better outcomes and (perhaps counter-intuitively) enable more responsiveness to emerging opportunities and challenges.

Greater stability doesn't need to, and shouldn't, come at the expense of transparency and accountability. Integrity of decision-making is critical. Having independent, expert assurance for how research is responding to investment signals, complying with contracts and delivering impact are all important features of a system.

Recommendation Five: Core capability needs to be well identified, well planned for, resourced and nurtured – and this is the key role of research organisations.

Research organisations should be the capability 'powerhouses' of the system. Their primary role should be to nourish and enable the diverse workforce to be optimally positioned to deliver on current and future national research priorities. They should provide all the support required, including the 'tools of the trade', to do the best and most relevant research possible.

To do this well, research organisations need to:

- Think, plan and invest in the long-term.
- Have the best possible infrastructure and/or access to infrastructure.
- Have capability to scan developments and assess their impact on the direction of research and its impact on capability and disciplines.
- Be well aligned and connected to those who use their research outcomes.

Recommendation Six: Embed the Te Tiriti o Waitangi into system design

From a system perspective, embedding Te Tiriti o Waitangi at all levels across the RSI system must be done as a priority. This must consider and resource the shifts required across the system to enable this to happen. We believe the nearly 20-year-old Vision Mātauranga Strategy is no longer fit for purpose and needs to be replaced. Embedding Te Tiriti is a significant process and consideration should be given to doing this via a partnership model.

OUR COMMENTS ON THE SIX THEMES IN THE PAPER

Ngā Whakaarotau Rangahau – Research Priorities

BRANZ supports the RSI system having respected, treasured, well-articulated, and enduring mission-led research priorities. Research priorities will need to be considered as taonga for our country and to drive better outcomes for our future generations.

Priorities should:

- Be aligned with Aotearoa New Zealand's, and where appropriate, our international aspirations which have a long-term knowledge needs component.
- Address research needs over the long term. Timeframes for delivery will depend on the priority and their strategy will need to be refreshed periodically to ensure relevance and achievement towards outcomes/Missions.
- Cover all of government RSI resource and where possible incentivise the private sector to co-invest or align their R&D investment. This will avoid duplication and fragmentation and enhance leverage and scale.
- Be framed to address a mission and be 'SMART'. They should acknowledge the opportunities for outcomes to arise along the way and for those (unintended but valuable) outcomes to be supported.
- Have bespoke and measurable impacts, recognising that impact will be unique to each priority based on the goals and desired outcomes.
- Be managed as a portfolio to allow for cross priority synergies, opportunities and challenges to be managed across the portfolio.
- Be carefully designed to understand the impact on research institutions and capabilities and sequenced to allow for future planning of workforce and capability requirements.
- Be proportional to the size and scope of the problem if solved or opportunity if acted on.
- Strive for clarity between what a priority does and what the institutions do.

In designing the process to develop research priorities the following desirable attributes should be considered:

- Regularity of process is well known, signalled, and embedded into the system to create certainty for all.
- Decisions around what will be a priority will be made in a way that is transparent, inclusive, and understandable to all.
- The process should be broad and involve all parts of society – from expert to layperson, from sector wide organisations through to individual companies. There should be broad consensus on what the research priorities are, including by those across the political divide.
- There will be robust evidence and analysis to underpin decisions on priorities (which includes mātauranga Māori, systems and futures thinking) to input into this decision-making.
- The system and its users will be resourced to participate in any process to review and refresh the priorities. There shouldn't be an imbalance in what the priorities are, based on the ability of a sector to engage and influence the prioritisation process.
- Priorities will be well signalled and sequenced to ensure that capability to deliver on the priority is resourced and planned for.

In operationalising the research priorities there will be:

- Strong involvement of users in developing strategy for priorities.
- Strong assessment of the right team to deliver on the priority to ensure the research outcomes and impact are being met. Bespoke measures beyond traditional academic measures will need to be developed to both assess the delivery team and track progress.

Te Tiriti, Mātauranga Māori Me Ngā Wawatao te Māori – Te Tiriti, Mātauranga Māori and Māori Aspirations

As signalled in recommendation six, BRANZ supports embedding Te Tiriti o Waitangi at all levels across the system. It is also timely to replace the current Vision Mātauranga Strategy, given it is outdated.

Embedding Te Tiriti o Waitangi fully across the system will require investment in both Tāngata Whenua and Tāngata Tiriti partners.

Investment is required to grow the capability and capacity of both partners to work confidently in a system where Te Tiriti is being embedded.

We support work to deepen understanding of how Māori aspirations can be further embedded into the RSI system, including how stronger connections with regional Māori knowledge are developed. This work should be led by Māori. Māori need to be being provided with the resources to determine what a Māori led RSI system looks like by Māori, for Māori, with Māori.

Te Tuku Pūtea – Funding

BRANZ supports the need to identify what constitutes core functions and for the system to resource those functions appropriately. We note that this cannot be done in advance of identifying the core purpose of the RSI system and nor can it be done through the RSI portfolio lens alone. There are functions that sit outside of those supported through this vote that are likely to be considered core functions for Aotearoa New Zealand's RSI system. Core functions (and their funding) cannot be considered separately to institutions, workforce and infrastructure.

We consider that core functions, funded through a base grant, should be:

- aligned to capability and housed in institutions if the dominant use for that function is by the research institutions. Functions where the predominant use is through that of an operational government department should be considered outside of core RSI system functions.
- made equitably accessible for all, regardless of where they reside.
- adequately supported to curate the data (or physical collections) associated with these core functions, and
- aligned, where relevant, with international core function research/research activity, particularly where they underpin standards and regulation.

We recommend the development of a core function 'stocktake' which includes those core functions that do not necessarily get support through the funding mechanisms of the RSI portfolio.

We agree with the Paper, that the full cost funding model requires a rethink, given the need for core capabilities to be more adequately supported.

Many of the challenges of funding would be eased if the overall funding 'pot' for RSI in Aotearoa New Zealand was increased to be comparable with other advanced economies we like to be compared to in the OECD.

Ngā Hinonga – Institutions

We do not think institutions should be designed in advance of developing a core purpose for the system (refer recommendation one). Institutional design and structure can only follow from this work.

We make some observations for consideration, once this work has been completed:

- As signalled earlier, our view is that government research institutes should be the 'power houses' of RSI capability (workforce, infrastructure etc) in Aotearoa New Zealand to drive current, and help shape future, priorities. Research organisations need to be a 'step ahead of the curve', look over the horizon as to what capability is needed and plan for it. They should have a role in supporting development from within and recruit and work with the tertiary education institutions to train the future workforce.
- The main economic drivers underpinning the current structures of the RSI system, including the company structure of CRIs, has had a detrimental impact on workforce and capability from a system and country perspective. Having stable government research institutes, where research capability is clustered meaningfully, will improve collaboration across the system and reduce unnecessary competitive behaviours and duplication. Competition arises when organisations are 'doing the same thing' or have similar capabilities who are bidding for scarce resources.
- We do not agree with the conclusion in the paper that larger and fewer organisations would lead to a more resilient system. Decisions on institutional structure should be more around where capability best resides (and multiple capabilities can logically be coalesced). For example, if there is a niche research capability/workforce, it may not be better served sitting within a larger organisation where there are no links to the dominant capability of that organisation.
- We support consideration of colocation opportunities, as well as alignment of 'back office' support where appropriate. We wonder whether there would be benefits in considering RSI infrastructure (including government research institutions) alongside Aotearoa New Zealand's other infrastructure plans in The New Zealand Infrastructure Commission Te Waihangā's pipeline. Planning and design, alongside other infrastructure plans of the government, has the potential to enable broader outcomes to be achieved.
- When thinking about knowledge exchange, there is an important role for the RSI system to support enhancing the absorptive capacity of sectors of our economy. Uptake of new knowledge and technology in complex systems does not, in general, happen easily when sectors are fragmented, have low productivity, low R&D investment and are highly regulated, such as the case in building and construction.

Te Hunga Mahi Rangahau – Workforce

Workforce considerations across the system need to have a much greater focus and they are inextricably linked to other aspects of the system design. It is important to acknowledge the current system design has been to the detriment of supporting the critically important people who must drive the system. Much of this workforce has niche or unique skills which have taken many years to train and develop. These skills are not easily transferable across other parts of our economy. There needs to be stronger recognition and support for the different types of career pathways across the system, which includes allowing ease of movement between institutions and between academia and industry.

For us, a major focus needs to be on creating the right, and uniquely Aotearoa New Zealand, RSI culture to help the system to perform better and to its potential. Identifying the desirable attributes for this culture across the R&D spectrum will be important.

This culture will enable diversity, comfort in Te Ao Māori approaches and encouragement to support lifelong learning, while at the same time supporting excellent work and impact. The system cannot wait until the new generation (which will need to be educated with the right skills) to move through, given the amount of time it takes to train specialists.

Te Hanganga Rangahau – Research Infrastructure

We recommend consideration is given to adopting the approach taken in Australia through their National Research Infrastructure Roadmap⁷. This assesses the requirements for national research infrastructure needs and makes recommendations based on a set of principles, including alignment with research priorities. This takes a long-term view and is refreshed five yearly to ensure continued relevance and has an open transparent process around how choices are made. Their scaled approach of institutional-national-landmark-global resonates and allows alignment of approach across these different scales.

While there are some common elements associated with large-scale infrastructure, there are many decisions around them that are specific to the unique nature of the type of infrastructure that is being considered. It is essentially a principle of funding and support of national research infrastructures because they are of the scale and complexity that no one organisation in the system can support. Support needs to be provided for both capital and operational funding and that operational funding should not solely come from contestable research processes.

We recommend exploring the possibility of whether there is value in aligning with other (non-research) infrastructure as it is being planned and built. This would ensure broader efficiencies as well as outcomes can be accrued. We recommend that there is a connection made with the Infrastructure Commission work for this purpose and whether there could be a research infrastructure pipeline developed.

Other factors to consider include:

- Funding the infrastructure (regardless of size and scale) that allows equitable access for all, regardless of where institutionally the infrastructure sits/is hosted and where the users are based.
- Future aligned disciplinary needs associated with the infrastructure, need careful planning alongside the infrastructure planning.

⁷ <https://www.dese.gov.au/national-research-infrastructure>

- Clear consideration of the Aotearoa New Zealand unique contribution needs to be aligned with international infrastructure.
- Alignment of approach with non-RSI supported data and collections.

Development of a national RSI infrastructure stocktake, and pipeline will be important to know and understand more clearly what we have in Aotearoa New Zealand and our future needs.

SUBMITTER INFORMATION

This submission is on behalf of BRANZ.

BRANZ is:

- an Independent Research Organisation;
- not a Māori-led organisation; and
- headquartered in Wellington.

BRANZ uses some Mātauranga Māori, but it is not the main science knowledge.