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## SUBMISSION FOR SCIENCE SYSTEM ADVISORY GROUP – PHASE 2

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The Science System Advisory Group (SSAG) can publish my name and contact information with this submission and can contact me in relation to this submission.

The Building Research Association of New Zealand (BRANZ) welcomes the opportunity to give feedback on high level questions asked by the SSAG regarding the funding tools and mechanisms for the science, innovation and technology sectors. Background on BRANZ is provided as context to our responses below.

### ABOUT BRANZ

BRANZ<sup>1</sup> is an independent science-led organisation. We undertake and commission research, funded by the Building Research Levy<sup>2</sup>, which helps improve industry practices around the performance of buildings and how we use them. 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 investment processes of Vote Business, Science and Innovation.

Our core research programmes and research investment priorities are designed to meet long-term knowledge needs, gaps and desired outcomes.

As an independent research organisation, we collaborate with all relevant universities, CRIs, industry, various research providers and organisations that form the Independent Research Association of New Zealand (IRANZ)<sup>3</sup>. Independent research organisations provide important targeted research and expertise in specific economic, environmental and social areas not covered by CRIs and universities.

BRANZ also provides independent commercial product testing and assurance services.

BRANZ has a team of over 120 scientists, engineers and professionals primarily residing at our campus in Judgeford, near Porirua in Wellington. Scientific staff are supported to develop their careers, science and leadership capabilities through our unique Scientific Growth Framework.

Our Campus and Asset Management Plan ensures that our facilities, equipment and technology meet the industry research and testing needs for the future. We have recently supported a major redevelopment of the Judgeford campus and targeted investment in modern fit-for-purpose facilities to deliver world-class research and testing expertise.

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<sup>1</sup> <https://www.branz.co.nz/>

<sup>2</sup> The Building Research Levy Act of 1969 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.

<sup>3</sup> <https://www.iranz.org.nz/>

## BRANZ RESPONSES TO QUESTIONS

### 1. In what areas must New Zealand have or develop in-depth research-based expertise over the next two decades?

New Zealand has a unique building system, partly because of its unique environmental and climate conditions: ways of building, building materials and products, and the training and practice of people within that system. Our built environment requires a science and research-base that is local (acknowledging that, where possible, it collaborates with, adopts and adapts international knowledge, processes and products.)

Built environment research has relevance to, and connections with, research in many other areas, for example:

- physics, mathematics, chemistry, materials, engineering;
- mātauranga Māori;
- health, economics, psychology and behaviour;
- climate change, resilience to nature and environmental;
- energy and digital technologies; circularity and waste;
- data, computing, AI, modelling.

#### a. At what levels should research prioritisation occur?

Research prioritisation should occur at every level across New Zealand: National, sector and institutional level. Government could have a role in facilitating the development and articulation of enduring (i.e. long term and bipartisan) national level research priorities to provide direction, certainty and focus. Enduring national level priorities would enable collaboration (at all levels from researcher-researcher, programme, institutional, international, and with research users) to support the delivery of research that meets the goals of each priority.

#### b. What are some criteria for research selection?

Priorities for selecting research should:

- Consider the user impacted by the science, so that it strives to meet the needs of the community, industry or sector it serves, in order to have impact.
- Consider the people delivering the research, from workforce planning and pipeline to scientific growth and career progression.
- Consider the long term impact of research.
- Consider benefits to be had from collaborations.
- Align with research priorities.
- Ensure enduring prioritisation creates certainty and enables capability and infrastructure planning.
- Ensure prioritisation helps reduce duplication of effort, resources.

#### c. What is the value of research roadmaps in priority areas?

Research roadmaps are valuable to guide research direction, direct funding and support focus on outcomes. Research roadmaps have the greatest impact in a stable, secure science system.

## 2. Does New Zealand need to rationalise its funding mechanisms?

BRANZ does not have a view on whether funding mechanisms should be rationalised. The more important part is that clarity of purpose for the different funding mechanisms is defined. It will also be essential to consider the wider research funding system beyond the scope of the Vote Business, Science and Innovation. That is, consider how other research funding mechanisms connect, align, overlap together and towards agreed priorities (for example, funding in Tertiary Education Commission, Ministry for the Environment, Department of Conservation, Ministry of Primary Industries etc.)

How ever this is done, one of the fundamental principles needs to be system stability - including institutional stability. Long term sustainability enables research to focus on delivery, rather than concentrating effort on securing funding. This includes stability of science and science roles within core government functions, for example, the science basis to policy-making and regulation that occurs within Department of Conservation, Ministry of Primary Industries etc.

### a. Should we have multiple funding agencies or combine them into a single entity?

This depends on clarifying the purpose for the funding mechanism, as mentioned above.

Yes, there should be consistency in funding processes and yes, there may be some efficiencies with a single entity. However, having a diversity of funding agencies will bring a diversity of research, applicants, outcomes and impact.

### b. What kind of funding instruments should be used and in what circumstances?

In order to seek stability, increasing institutional funding will be important. This would mean less competition for funding core institutions and encourage more competition of ideas at the margins.

### c. How would a funding agency balance these different expectations?

National research priority setting and infrastructure needs assessments would give direction and guide this. A framework for balancing expectations once developed should be made available for the whole sector.

### d. How should high-intellectual risk but potentially high-reward research applications be identified and funded?

Once overall institutional funding is made more stable, contestability of ideas can come more into play. High-intellectual risk research cannot come about from researchers who are concerned for their long term career prospects. It will be important keep the likes of the Marsden Fund, which identifies, funds and supports individuals who have a track record, rather than focusing on outcomes. High reward outcomes result when individuals are working in emergent areas of research and at the interface between disciplines, where outcomes and discoveries are not necessarily known upfront.

### e. How should research involving the study of or the application of Mātauranga Māori be managed and funded?

BRANZ supports embedding Te Tiriti o Waitangi at all levels across the system. It is also timely to review the Vision Mātauranga Policy. 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 research and science 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 science system looks like by Māori, for Māori, with Māori.

f. **How should New Zealand address expensive research infrastructure needs such as access to supercomputing, bespoke lab equipment or spaces, and data requirements?**

Factors to consider include:

- Ensuring equitable access to infrastructure for all, regardless of size and location of host institution or user.
- Careful planning and alignment of future disciplinary needs associated with the infrastructure.
- Aligning our country's unique contribution with international infrastructure.
- Aligning any new research infrastructure with existing data and collections, particularly those not supported by the science system.

We suggest consideration be given to adopting the approach taken in Australia through their National Research Infrastructure Roadmap. 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 every five years to ensure continued relevance and has an open transparent process around how choices are made. Their scaled approach of institutional / national / landmark / global resonates as it allows for alignment 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 infrastructure 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 to ensure operational funding does not solely come from contestable research processes.

We recommend exploring whether there is value in aligning with other (non-research) infrastructure as it is being planned and built. This could ensure broader efficiencies, as well as outcomes, are accrued. We suggest a connection be made with Te Waihanga Infrastructure Commission's work for this purpose<sup>4</sup> and the development of a research infrastructure pipeline be explored. Development of a national research/science infrastructure stocktake and pipeline will be important to know and understand more clearly what we have in Aotearoa New Zealand and our future needs.

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<sup>4</sup> <https://tewaihanga.govt.nz/the-pipeline>

**3. What does New Zealand do to improve workforce retention and develop the research workforce from the early career to the mature? How does New Zealand ensure the retention of research/innovation leaders?**

To improve workforce development and retention, there is an urgent need to foster a valued research and science culture in Aotearoa New Zealand. Identifying and understanding the attributes of this culture is important, urgent work that aligns with identifying the system's core purpose and ensuring stability. Desirable cultural attributes would enable diversity, comfort in Te Ao Māori approaches, encourage and support lifelong learning, support excellent work and research impact. Workforce considerations across the system need to have a much greater focus, as they are inextricably linked to other aspects of the system design. Much of our current workforce, which drives the science system, 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, to allow ease of movement between institutions and between academia and industry. The recently announced applied doctorates scheme is a great start.

**4. Are there other key issues (beyond the quantum of funding) that should be considered in the science and innovation system not yet addressed in this or the previous report and consultation?**

**A clearly defined core purpose**

The science and innovation system needs to have its core purpose clearly defined to 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.

**User-centred design of system**

We recognise that different forms of research are needed across the system, from basic to applied. The system, though, should be designed with the user, or those representing the user, in mind.

Yours sincerely

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