16 March 2022

Future Pathways Policy Team
Ministry of Business, Innovation, and Employment
PO Box 1473
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Kia ora Future Pathways Policy team,

Thank you for circulating the Te Ara Paerangi - Future Pathways Green Paper, and for inviting feedback.

As the local economic development agency, ChristchurchNZ seeks to support local business and stimulate sustainable economic growth in Christchurch.

Summary of our points:

- Connecting to public research institutes to purchase technology and collaborate is now a key priority of all Christchurch knowledge intensive industry
- We recommend adding greater industry influence over research priorities, a vision for the best practice International tripartite arrangements and centres - and mechanisms to engage
- We recommend greater clarity and vision are built into the purpose of each research strand through creating innovative systems to support excellence and ROI to the taxpayer
- We recommend referencing physical centres as a focus, such as the UK Catapult network – to show what Good tripartite collaboration looks like

Over the last few years, ChristchurchNZ has seen an increasing trend in the willingness of knowledge intensive business to engage with research institutions. An example, Agri-Biotech is Canterbury's fastest-growing knowledge intensive industry, and on survey our industry cluster consistently rate connection to public research as their number one area of focus. While that is one sector, in general all knowledge intensive industry in Canterbury is keen to engage with public research, noting that such engagement can help support their own research and development activity, thereby being of significant benefit to their productivity and ability to grow. They are keen to both collaborate and purchase technology. In addition to people, the capability and equipment such as nano labs, mass spectrometers, mechatronics and other areas now sitting within our tertiaries, CRI's and other research organisations is highly attractive and desirable.

Despite their willingness, many businesses have expressed facing challenges that largely hamper their ability to engage. Many public research institutes are also willing to engage, but industry engagement is low on their internal prioritisation list due to the current funding and ranking systems. On examples ChristchurchNZ staff have been party to when there is successful industry collaboration, it is highly beneficial to both parties, and has spawned successful research application, start-ups or spin-outs. As such, we welcomed the review of the New Zealand research system and consider a restructure to be long overdue.

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We acknowledge the value of moving towards a priority driven system, where support is still available for other research areas. We hope that largely focusing the research systems efforts on pre-determined priorities will help us address the big issues of our time, that are of relevance for all New Zealanders. We also agree that the introduction of a base grant funding model will increase stability for research institutions. However, we strongly believe that commercialisation related metrics should be included in the funding allocation model, rather than relying purely on traditional academic metrics. While moving our research system to help mitigate some of the challenges of future generations, we encourage government to continue to invest in research. Science I Business magazine research on the EU public research system calculates their return on investment to be approximately 20%. Aotearoa's spend on research overall is

However, we feel that the current proposal does little to improve the ability of industry to engage with research institutes and that it falls short on supporting industry's research and development needs. We suggest that industry involvement and consultation should be an essential part of the priority setting process. Further consideration should also be given to how two-way engagement can be facilitated.

We have provided some more detailed feedback on key areas of the green paper, please see below.

1) Research Priorities

Ideally the research priority setting process would be non-political, utilising an independent body to make decisions on priorities and set the underlying scope and strategy. As above, industry representation in this decision-making process is essential. They are a user of research outcomes and so are key to improving research translation into practice, realising ongoing impact. Meeting industry's research and development needs has significant benefit for productivity and business growth, so is therefore of benefit to New Zealand more broadly.

Stability of research priorities is also essential. Impactful research and innovation outcomes are years in the making. The workforce cannot be expected to switch directions regularly (such as every three years if there is a change of government). Keeping priorities broad would be helpful in facilitating ongoing stability. The strategy within each priority could be reviewed and amended more regularly to reflect New Zealand's changing needs and requirements. Within each underlying strategy, the ability to support a range of different research areas and disciplines should be considered, as they can all make valuable contributions to the discourse on a priority area. Expected outputs and outcomes will differ across areas (pure vs applied science vs social science) and should be accommodated for.

Finally, we agree with the proposal that ongoing support for research outside the priority areas is still needed. There is potential for incidental discoveries to be of high impact or economic value, or for other priorities to emerge rapidly in the future (as we have seen with COVID).

2) Base Grant Funding

Moving towards a base grant funding model could provide institutions with more stability, allowing them to bridge research grant funding cycles where needed. However, it should be acknowledged that providing funding via this model will drive institutions to focus on whatever the metrics are that determine their allocation. In other countries metrics such as patents, publications and student numbers are used to determine base grant allocations. These traditional academic metrics are not

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necessarily correlated with the most impactful research outcomes, or with the greatest commercialisation potential.

When designing a base grant funding model we should start with the overall outcome first, what we wish the New Zealand research and innovation system to achieve, and then work backwards to identify the markers of success for this aim to develop a scorecard for funding allocation. We suggest that a core aim of the system should be to produce high-value transformational research outcomes with a pathway to commercialisation. As such, a possible scorecard could include metrics on amount of industry and public engagement, value of industry investment, and uptake of research outcomes (i.e., through governmental policy change or industry process change). These metrics should be reviewed regularly to ensure that they are helping to drive behaviour that delivers to the systems aims, such as commercialisation. The total value of base grant funding should also be reviewed regularly to ensure that it meets the needs of the system.

Adding a focus on innovation and continuous improvement in the base grant funding mechanism will ensure a strong return on investment, and a focus on excellence that government is seeking in the reform.

3) Infrastructure

Greater collaboration between research institutions is needed when planning for research infrastructure and capital investment to ensure that such investment is used to its full capacity, reducing redundancy. Funding and support could be allocated based on the value of the infrastructure to New Zealand (either as a whole or sub-region), rather than supporting individual institutions. The Australian Research Council Linkage Infrastructure, Equipment and Facilities scheme is one possible model of this. Facilitating industry use of research equipment and infrastructure, where there is unused capacity, would also be beneficial, and another source of ongoing funding. A successful local collaboration example is Canterbury's FoodSouth, run by Callaghan Innovation where it comes to food production. We encourage government to look at the UK Catapult model in how future focused research and industry collaborations can occur. In Canterbury at present, our Agri-Biotech sector are preparing a business case for a shared production and research centre which ChristchurchNZ is supporting. We are also supporting Centres of Excellence in Healthtech (Healthtech Quadrant / Arts' Centre); Agritech (EARTH with ECAN – 1000-person centre) and Aerospace under NDA. All of these are industry led trying to solve big problems, and we feel Aotearoa is missing a trick without our Crown Research function being able to meaningfully engage and collaborate with these centres.

4) Research Impact

Encouraging interaction between research institutions and industry is invaluable as this engagement helps drive research translation thereby improving research impact and return on investment. This proposal focuses on encouraging researchers to engage with industry, doing little to encourage engagement in the other direction. To be most effective, this interaction must be two-directional. As noted above, industry is increasingly willing to engage, but need to be supported and facilitated to do so. Reviewing the mechanism for industry to engage with research is recommended.

Reviewing the research collaboration mechanisms developed at the Wyss institute or many other American research institutes will be beneficial.

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Given the public sector spend less on research than industry (source: Statistics NZ), it would be useful to see how they can better collaborate to support both systems. Israel is successful at public/private research collaborations, which provides the comparison AgritechNZ CEO Brendan O'Connel often cites "When we look at Israel and do the inevitable comparison very carefully, and look at something like science investment, we have similar levels of investment in the agritech space," he said. "But when you look at exports, we are at NZ $1.4 billion in New Zealand, and Israel is at US $10.4 billion. That's many times more, in fact, nearly 10 times the output of how (their) commercialisation happens from science."

5) Separation of research type to increase focus

We understand that not all public research is relevant to commercialisation, industry and application which is the focus of our submission. We believe the proposal would strengthen all aspects of research if there was a clearer delineation between applied research, pure research and social or other research. All areas may ultimately focus on the missions and priorities developed by government, nuanced to their area of expertise. However, by separating and focusing the areas, it will make it clearer for all what the purpose of the science or research is. That in turn will make it clearer to motivate the teams and cross-institutional collaboration, and ultimately provide a greater return on investment to the taxpayer.

If any further detail is needed on the above, please don't hesitate to get in touch.

Ngā mihi,

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