

NZ G2G SUBMISSION ON TE ARA PAERANGI — FUTURE PATHWAYS GREEN PAPER

Executive Summary

This response has been prepared by New Zealand G2G, a government-to-government organisation established as a partnership between the New Zealand Ministry of Foreign Affairs and Trade (MFAT) and New Zealand Trade and Enterprise (NZTE). NZ G2G has consulted with MFAT and been provided input during the preparation of this submission.

NZ G2G acts as a connector, of people, resources and expertise, selling our public-sector capabilities, partnering with overseas governments to help equip them to solve real-world problems and achieve sustainable change. NZ G2G is invested in the success of the RSI system and supports efforts to ensure that the system is future focused and fit for purpose. Our experience of supporting governments overseas gives us a unique perspective on the current operation and future direction of New Zealand's RSI system.

Summary recommendations

At the heart of our response is a firm belief that any changes to the RSI system must ensure that New Zealand remains committed to engaging globally. Connecting our research expertise to overseas markets helps New Zealand contribute to addressing the most important and significant challenges that the world currently faces, while also helping New Zealand respond to our own domestic challenges.

NZ G2G supports the objectives of the proposed reform while emphasising that any changes to the RSI system should consider:

- the impact that our RSI system has in strengthening our reputation and influence globally
- how the system enables commercialisation pathways that not only provide alternative sources of revenue but also offer a valuable means of addressing real social needs
- how NZ G2G can bring insight relating to international demand for New Zealand's RSI skills and expertise.

Priority setting

NZ G2G agrees with the value of a whole-of-system approach to setting research priorities. This process needs to also consider and balance the influence and reputation of our research system globally and the opportunities to engage with international research communities and end users, and should:

- seek to balance both national and international drivers for our research programme and ensure that the system is sufficiently flexible to allow institutions to pursue research outside of defined priorities
- be informed by established international partnerships and global demand for research, science and innovation expertise
- make clear any trade-offs decision-makers need to consider in pursuing research priorities that are necessary for New Zealand but that may not advance our reputation.

We also recommend that the process of operationalising priorities consider how the system develops its capacity to engage globally.

Institution design

Clear research priorities are likely to create strong incentives and focus for research institutions to deliver research that meets national and international needs. There are several ways to strengthen the design of research institutions to deliver on research priorities, including opportunities for commercialisation:

- ensure sufficient flexibility in whatever future organisational form CRIs take, to allow them to balance the public good benefits of research with commercial opportunities
- consider introducing an international development capability and function within research institutions that can support them to identify and deliver on commercialisation opportunities
- consider the use of broader performance indicators or metrics for institutions to measure how effective they are identifying and pursuing commercialisation opportunities
- consider introducing formal and informal mechanisms for collaboration between institutions
- should consolidation of institutions be explored, there needs to be clear evidence that the benefits of such an approach are sufficient to outweigh the potential disruption, cost and risks.

Funding model

NZ G2G understands the rationale for considering alternative funding models that can make research institutions more stable and resilient financially and that can reduce unproductive competition for revenue that shifts institutions' focus away from developing the best teams or ideas. In order not to unintentionally weaken an institution's capability or appetite to explore commercialisation opportunities, there is a need to ensure:

- that base grant funding takes into account the core commercialisation capabilities that a research institution needs to investigate and execute commercial opportunities
- that the future funding model allows institutions the flexibility to investigate a wide range of commercialisation opportunities, including where these may not strictly align with national research priorities.

Introduction

About NZ G2G

New Zealand G2G was established in 2014 to sell New Zealand's highly regarded public-sector knowledge and expertise to the world. We operate as a partnership between the New Zealand Ministry of Foreign Affairs and Trade (MFAT) and New Zealand Trade and Enterprise (NZTE). MFAT leads New Zealand's international trade policy and foreign relations. NZTE leads New Zealand's international market development. Consequently, NZ G2G understands the importance and value of global engagement and trade promotion through science and technology.

The NZ G2G team acts as a connector, of people, resources and expertise, selling our public-sector capabilities, partnering with overseas governments to help equip them to solve real-world problems. NZ G2G has operated in 21 countries and completed over 100 projects, focused on sustainable food systems (food safety and food supply), educating for the future, ease of doing business, and government effectiveness and innovation.

Case study: Investigating the feasibility of using reject brine and aqua-brine, instead of groundwater, to grow salt-tolerant food and fodder crops in Abu Dhabi (UAE)

Since 2014 scientists at Environment Agency-Abu Dhabi (EAD) have been working with scientists from New Zealand Plant & Food Research (PFR). The partnership, which was brokered through NZ G2G, has focused on finding ways of increasing crop productivity while conserving precious groundwater and ensuring it does not get more salineated.

<https://www.nzte.govt.nz/blog/sustainable-use-of-water-for-crops>

NZ G2G is invested in the success of the RSI system

NZ G2G supports the intent of the Green Paper and agrees that New Zealand's RSI system should be future focused and fit for purpose. NZ G2G's experience of supporting governments overseas gives us a unique perspective on the current operation and future direction of New Zealand's RSI system. RSI is an important policy area not just for New Zealand's future but for the future of the global economy and societal wellbeing. New Zealand already makes a tangible contribution to addressing global challenges, and our acknowledged expertise in RSI can continue to make a critical contribution to addressing key issues such as climate change, food security and public health.

When considering the future direction of New Zealand's RSI system, it is essential to take a global perspective and recognise that its RSI capabilities need to be seen and to operate as part of a global system. Our RSI system already engages globally and there is clear demand for New Zealand's RSI expertise and experience. International markets and associated revenue are already an important part of the RSI system: roughly 30% of the export revenue generated by NZ G2G flows to existing Crown Research Institutes, including Plant and Food Research, GNS, Manaaki Whenua Landcare and NIWA.

Other public-sector suppliers have also benefited from participating in NZ G2G deals, including Universities, and Crown entities such as Orillon and AsureQuality. The revenue these public-sector entities generate can be used to fund their own development initiatives or support their own work programmes, further strengthening New Zealand's RSI system.

The importance of a global view

A global perspective is essential when considering system reform

Despite our small population and relative isolation, New Zealand has a strong reputation and can have a disproportionately large influence globally. Our public sector is well respected globally, and our RSI system already contributes to addressing global challenges. It is essential that any reforms take this into account and ensure that New Zealand continues to contribute to this outcome whilst building enduring global relationships and commercial partnerships using our world-class capabilities.

Global diplomacy

The strength of our global reputation has helped us develop the “soft power” that is critical in global diplomacy and trade promotion, helping us build and strengthen bilateral and multilateral trade agreements through cooperation. The strength and openness of our RSI system also supports our reputation as a credible partner for foreign governments.

Our experience shows that NZ G2G initiatives deliver meaningful results to foreign governments and their entities and support “NZ Inc” and New Zealand’s whole-of-government approach. Projects that solve complex challenges help build visibility and a tighter bond between countries and between counterpart agencies, and further enhance New Zealand’s reputation.

Case study: Helping Viet Nam strengthen the quality of their avocado production

Working with provincial officials, SAM Hi Technology Agriculture JSC (SAM Agritech) saw an opportunity to expand its agricultural production into avocado orcharding in Dak Nong. NZ G2G developed a scope of work and contracted Plant and Food Research to deliver a three-year technical assistance programme. The project has established a 200-hectare avocado orchard, expected to produce its first commercial crop in 2023.

<https://www.nzte.govt.nz/blog/helping-viet-nam-become-a-major-avocado-producer>

Diversifying revenue

There is proven demand internationally for New Zealand’s RSI capabilities, and ensuring our RSI system is responsive to this demand not only creates new export earnings, but it also offers opportunities for our research and science institutions to diversify their revenue streams and to generate a return on the significant public investment that is made into our RSI system.

Our experience tells us that there are currently more opportunities internationally than we can respond to and reforms to the RSI system would benefit from considering how to ensure that the system responds to overseas demand. NZ G2G has a key role to play in facilitating this, but a whole of government approach is needed.

Case study: Helping smallholder orchardists in Himachal Pradesh improve productivity and fruit quality

The Himachal Pradesh Horticultural Development Project is harnessing New Zealand's expertise to improve production of the region's fruit crops, including apples, summerfruit, and tropical fruits. The New Zealand expertise is drawn from public-sector organisations, industry bodies, and private firms – this includes Plant & Food Research, Fruition Horticulture, and New Zealand Apples & Pears.

<https://www.nzte.govt.nz/blog/improving-rural-orchardist-production-in-northern-india>

Attracting talent

A globally connected RSI system will also make New Zealand attractive to the world's most talented researchers, scientists, and investors, with the additional benefit of attracting international students, particularly science-based postgraduate students. It would help facilitate our international market connections markets, further deepen our talent pool, and contribute to diversity of thought and experiences, all critical drivers of innovation.

A focus on global challenges will further cement New Zealand's reputation as a good global citizen, while still building our domestic capability and diversity of thinking. New Zealand can also bring specific insights, including on the impact of sea-level rises and what they mean for our Pacific neighbours, and we can also share our unique mātauranga Māori perspective and demonstrate our commitment to Te Tiriti o Waitangi.

Case study: UAE nationals complete PhDs on sustainable groundwater management through Massey University

Through the long-term working relationship brokered by New Zealand G2G between Plant & Food Research, OnlyFromNZ Ltd and Environment Agency Abu Dhabi (EAD), a partnership has been established to support PhD study for Emirati students, living in the UAE, solving real-world problems with sustainable groundwater management, supervised by New Zealand-based scientific experts.

<https://www.nzte.govt.nz/blog/phd-programme-solves-real-world-problems>

Issues of importance to NZ G2G

We have focused our submission on those aspects of the Green Paper that we believe are most important to enable our research system to thrive in a global context and strengthen New Zealand's reputation and influence. These areas are:

- 1 The priority-setting process and how this can better consider the opportunities for NZ from a global perspective.
- 2 The design of institutions and how this supports them to explore and capitalise on commercial opportunities.
- 3 The future funding model and how this can enable commercial opportunities.

Setting priorities

NZ G2G supports the proposed process of priority and strategy setting in the Green Paper. These priorities will be critical to a future research system, helping our research institutions decide on programmes and investments that would be strategically aligned with NZ Inc goals.

As part of this process, NZ G2G's experience might be helpful in providing some insight into the nature of global demand for New Zealand RSI. Through our established partnerships there are further opportunities to engage with international research communities and end users to identify priorities that may also have value to a global research audience.

NZ G2G supports efforts to introduce clearly defined priorities that encourage focus and collaboration

We agree that by introducing a set of clearly expressed, whole-of-system research priorities, the research system should in theory be better positioned to deliver excellence and innovation in scientific research, through making greater use of collaborative programmes that leverage scale and multi-disciplinary expertise.

Once determined, our research priorities may be used to encourage and enable commercialisation pathways, which we see as a complementary benefit given the role that these priorities are likely to play in improving the quality and international standing of our research. Generating a more collaborative culture across the RSI system would also assist in identifying these pathways.

The process for setting priorities needs to consider both local and international factors

We agree that research priorities should be strongly linked to the issues that are most important for New Zealand and that can be addressed through the research system. At the same time, it is important that the process for setting priorities also considers how our research system enables us to build our global influence and contribution.

The setting of priorities should be informed by a sound understanding of the local and international context within which the research system operates, balancing the international factors with the local factors noted in the Green Paper. There are two ways in which we think the priority-setting process can take international factors into account in a way that complements the consideration of local needs and objectives:

1. Requiring that the criteria for determining national research priorities include and seek to balance national priorities and Te Tiriti obligations with international factors such as the extent to which a priority:
 - a. contributes to the international knowledge base
 - b. leverages and strengthens the comparative advantages in our research system
 - c. helps New Zealand commercialise opportunities and generate revenue in international markets.
 - d. grows New Zealand's presence in international markets.
2. Allowing research institutions to pursue research outside of the defined priorities if they can secure a commercial return to fund the research, which are likely to require that institutions make an investment up front to complete such research, and recover those costs when they are paid on completion.

Operationalising and delivering research priorities

The Green Paper contemplates the mechanisms that might be needed for strategy, governance, and leadership of each research priority. It also notes that different models may be needed for different priorities.

Where relevant, we believe it would be helpful if the strategy-setting process took into account how we connect to international research communities and pursue overseas opportunities to commercialise knowledge and research. We also believe it would be helpful to consider how we promote our research internationally, including by telling the story of the impact it is having for end users.

Facilitating international collaboration

The RSI system needs a suite of capabilities to effectively capture international collaboration and commercialisation opportunities. NZ G2G is well positioned assist with aspects of this and can provide a global perspective on research priorities, through using our market intelligence, international networks, and commercial nous. This could include:

- identifying market opportunities for commercialisation and making appropriate connections
- identifying barriers, including capability gaps that may be limiting opportunities for commercialisation
- advising on alternative pathways for commercialisation where there is global demand
- helping to tell the story of the global impact and value of New Zealand research.

Designing institutions to support commercialisation activities

We agree that it is important that the design and shape of research institutions enable the institutions to give effect to these whole-of-system priorities and to adapt in a fast-changing world. We consider that the design and structure of research institutions can be strengthened to support research priorities and better position the institutions to identify and realise opportunities to commercialise research:

The value of commercialisation

Commercialising research not only generates revenue, but it can also help maximise the impact of the research and address real social needs. Commercialisation can strengthen channels of knowledge exchange between end users and researchers by creating a dynamic feedback loop between the generation of ideas and the understanding of their real-world applications.

Current barriers within CRIs to realising commercial opportunities

There is a diverse range of practices, approaches, and outcomes in the commercialisation activities of universities, CRIs, and other research institutions in New Zealand. These pathways range from publication and contract research, through to assigning or licencing IP and on to spinouts and start-ups. Each pathway has advantages and disadvantages. There are also more general barriers to commercialisation that should be considered.

Barriers inherent in the way institutions are designed and funded

The existing company model for CRIs was established almost 30 years ago and Directors' obligations, as noted in the Green Paper, can sometimes impede activities such as collaboration or commercialisation that would contribute to the national benefit. Several features of the existing operating model are not working as well as they could, including fragmentation, overlapping activities, and missed opportunities for sharing resources, as well as aspects of public funding that sometimes incentivise unproductive competition and distort choices on ways to achieve impact from new knowledge.¹

Capability and appetite of institutions

Research institutions face several challenges with regard to commercialisation, including perceived tensions between publishing and commercialisation, variation in the size and quality of commercialisation functions and resources, variation in the size and quality of commercialisation functions and resources and process challenges:²

Greater collaboration, across the system and with international partners, could be an important way of leveraging scale and resource to address these challenges. This collaboration would also help reduce risk and create opportunities to explore riskier but higher-value opportunities for commercialisation.

Options for improving the existing model

Some of the challenges noted above will probably be addressed through the setting of research priorities nationally, provided this takes into account opportunities to commercialise research and strengthen our global position. By contrast, the following sections discuss how those challenges can be addressed through the design of institutions and their capability.

A more flexible organisational form for CRIs

Any future organisational form for CRIs will need to be flexible enough to support the broad range of activities and purposes that these institutions pursue. We support the recommendations in the Te Pae Kahurangi report for a future state operating model for CRIs that is strategy-led and configured to:³

- harness and focus the collective research capability
- enable high levels of adaptability in the face of ongoing change
- build new capabilities in response to new opportunities
- collaborate beyond organisational boundaries, across CRIs and with other science system participants
- partner long term with Māori
- use resources efficiently and effectively.

The Te Pae Kahurangi report also recommended that the future operating model be configured to ensure CRIs are organisationally and financially resilient, while continuing to be accountable for their performance. We believe this should extend to CRIs having the flexibility to pursue international commercialisation opportunities that can yield more diverse revenue streams.

¹ Te Pae Kahurangi: Positioning Crown Research Institutes to collectively and respectively meet New Zealand's current and future needs. Available from <https://www.mbie.govt.nz/assets/te-pae-kahurangi-report.pdf>

² KiwiNet (2020). New Zealand Research Commercialisation Practice in Real Life: Lessons from Universities, CRIs and Research Organisations. Available from <https://kiwinet.org.nz/files/KiwiNet-Real-Life-Practices-Report-2021.pdf>

³ Te Pae Kahurangi: Positioning Crown Research Institutes to collectively and respectively meet New Zealand's current and future needs. Available from <https://www.mbie.govt.nz/assets/te-pae-kahurangi-report.pdf>

Making greater use of performance indicators and metrics to measure performance

New organisational models should allow for the use of broader performance indicators or metrics to measure how effective the institutions are in identifying and pursuing commercialisation opportunities. Currently this is measured by commercial revenue per FTE. In future, performance measurement could consider other measures, including fee-for service contract research fees, financial returns from licencing, as well as other measures previously identified by KiwiNet.

A wide variety of indicators, including those related to overseas activities, and a rigorous approach to evaluation can provide a rich source of data for tracking performance and understanding the key differences between success and missed opportunities.

Use of formal and informal collaborative mechanisms to achieve scale benefits

There is recognition that the approach of New Zealand's CRIs to commercialisation is fragmented and subscale.⁴ There are varying levels of commercialisation capability and different approaches within each CRI. Individually CRI's often lack the scale and diversity to manage risk and build end-to-end excellence in commercialisation capabilities.

There is a spectrum of options for increasing collaboration, from informal arrangements (such as a Memorandum of Understanding setting out processes and principles for collaboration), to formal contractual arrangements that enable sharing of people resources and materials, through to mergers and consolidation of institutions and greater centralisation of resources. While there are advantages and disadvantages with each option, NZ G2G favours trialling and using informal and formal mechanisms as relatively nondisruptive, low-cost, and low-risk means of increasing collaboration.

There is also the opportunity to consider introducing mechanisms such as those in the Public Service Act 2020 into a future research system, including the use of joint ventures and inter-departmental boards to support joined-up planning and delivery.

We note that other countries, such as Ireland, have experimented with centralised tech transfer offices – these were unsuccessful because the model did not enable ease of access to institutional knowledge and trusted relationships between researchers and commercialisation professionals to be established.⁵

Role for NZ G2G in supporting international collaboration and commercialisation

When considering global opportunities, NZ G2G can play a role in facilitating cross-system collaboration and generating commercialisation opportunities. This includes bringing our commercial experience to the process and connecting New Zealand's RSI system to overseas opportunities, partners and customers.

For this to be achieved, it is important that national priorities provide the right incentives for institutions to collaborate and pursue commercialisation opportunities, and also that the design, capability, and appetite of institutions themselves be fit-for-purpose for identifying and taking advantage of those opportunities.

⁴ Te Pae Kahurangi: Positioning Crown Research Institutes to collectively and respectively meet New Zealand's current and future needs. Available from <https://www.mbie.govt.nz/assets/te-pae-kahurangi-report.pdf>

⁵ KiwiNet submission on draft research, science and innovation strategy. Available from <https://www.mbie.govt.nz/dmsdocument/10488-kiwinet-draft-research-science-and-innovation-strategy-submission-pdf>

Consideration should also be given to introducing an international development capability and function within research institutions that can support them to identify and deliver on commercialisation opportunities, working with NZ G2G who can play a role supporting international collaboration.

Funding model

We understand the rationale for considering alternative funding models that can make research institutions more stable and resilient financially and that can reduce unproductive competition for revenue that shifts institutions' focus away from developing the best teams or ideas. At the same time, we are aware that funding mechanisms vary a great deal across institutions, many of whom identify funding as a barrier to pursuing commercialisation activities.⁶

A shift to a base grant funding model could potentially have two unintended consequences: it could affect an institution's financial capability to engage in commercial activities, and it could weaken the need to pursue alternative sources of revenue that could be made available through commercialisation.

There are two broad ways in which we believe a future funding model can mitigate those two risks:

1. Ensuring that base grant funding considers commercialisation capabilities as a critical function. Base funding could provide a base level of capability for research institutions to investigate and execute commercial opportunities. This could align with other parts of the new system – for instance through funding being linked to the research priorities set nationally, and funding models taking into account any collaborative mechanisms in place (such as shared services models or joint ventures).
2. Ensuring that the future funding model allows flexibility for institutions to investigate and invest in commercialisation opportunities. A future model should retain the flexibility for institutions to investigate opportunities for commercialisation that may not be eligible for funding. This allows institutions to pursue opportunities where there is a real-world need and commercial value, even if it may not necessarily be aligned with national priorities. This is an important way of fostering innovation and collaboration within the sector.

Recommendations

General recommendations

NZ G2G supports the objectives of the proposed reform while emphasising that any changes to the RSI system must ensure that New Zealand remains committed to engaging globally. Therefore, as MBIE continues to develop policy advice and recommendations on the future system, we encourage it to consider:

- more broadly what good for NZ Inc means, taking into account the impact that our research system has in strengthening our reputation and influence globally
- how the system enables commercialisation pathways that not only provide alternative sources of revenue but that, more importantly, also offer a valuable means of addressing real social needs and maximising the impact of New Zealand research
- how NZ G2G can bring insight relating to international demand for New Zealand's RSI skills and expertise, given NZ G2G's commercial acumen and experience.

⁶ KiwiNet (2020). New Zealand Research Commercialisation Practice in Real Life: Lessons from Universities, CRIs and Research Organisations. Available from <https://kiwinet.org.nz/files/KiwiNet-Real-Life-Practices-Report-2021.pdf>

Priority setting

NZ G2G agrees with the position in the Green Paper on the value of clearly expressed, whole-of-system research priorities to provide focus for the resources and activities of the research system. We consider that this process needs to also consider and balance the influence and reputation of our research system globally and the opportunities to engage with international research communities and end users.

To that end, we recommend that the process for setting priorities should:

- seek to balance both national and international drivers for our research programme and ensure that the system is sufficiently flexible to allow institutions to pursue research outside of defined priorities to deliver additionality and spill-over benefits.
- be informed by established international partnerships and global demand for research, science and innovation expertise
- make clear any trade-offs decision-makers need to consider – for instance, pursuing research priorities that are necessary for New Zealand at this time but that may not advance our reputation or influence globally.

We also recommend that the process of operationalising priorities consider how the system develops its capacity in relation to each priority, build opportunities to strengthen its international contribution and consider the opportunities to commercialise and promote our research internationally.

Institution design

Clear research priorities are likely to create strong incentives and focus for research institutions to deliver research that meets national and international needs. We agree that it is equally important to ensure that research institutions have the right capacity and structure to deliver on these priorities.

NZ G2G considers that there are several ways to strengthen the design of research institutions to deliver on research priorities, including opportunities for commercialisation:

- ensure sufficient flexibility in whatever future organisational form CRIs take, to allow them to balance the public good benefits of research with commercial opportunities that can strengthen both the intrinsic and extrinsic value of the research
- consider introducing an international development capability and function within research institutions that can support them to identify and deliver on commercialisation opportunities, working with NZ G2G
- consider the use of broader performance indicators or metrics for institutions to measure how effective they are identifying and pursuing commercialisation opportunities
- consider introducing formal and informal mechanisms for collaboration between institutions
- should consolidation of institutions be explored, there needs to be clear evidence that the benefits of such an approach are sufficient to outweigh the potential disruption, cost and risks.

Funding model

NZ G2G understands the rationale for considering alternative funding models that can make research institutions more stable and resilient financially and that can reduce unproductive competition for revenue that shifts institutions' focus away from developing the best teams or ideas.

To ensure that such a model does not unintentionally weaken an institution's capability or appetite to explore commercialisation opportunities, we recommend that the following adaptations to the model be considered:

- ensure that base grant funding takes into account the core commercialisation capabilities that a research institution needs to investigate and execute commercial opportunities
- ensure that the future funding model allows institutions the flexibility to investigate a wide range of commercialisation opportunities, including where these may not strictly align with national research priorities.