Te Ara Paerangi Future Pathways

Green Paper submission

The New Zealand Institute for Plant and Food Research Ltd

March 2022

Contents

Introduction

Plant & Food Research welcomes the invitation to present this submission in response to the information from MBIE outlined in the Te Ara Paerangi Future Pathways Green Paper 2021.

In late 2021 we launched a series of engagement and communication activities to build awareness across our organisation of Te Ara Paerangi Future Pathways and the Green Paper.

This Plant & Food Research submission draws on views expressed by science and general staff from across the organisation, examples of which are illustrated in the whiteboard graphics embedded within this submission. It was drafted by a writing team, sponsored by two members of our Senior Leadership Team. Details of the principles and processes involved are described in the Appendix.

Plant & Food Research's Māori Strategy, Partnerships and Enterprise Group (PFR-MSPE) also led the development of a submission (see Appendix). When drafting our two submissions, we sought to connect and complement perspectives. Our combined discussions were also guided by Plant & Food Research's Tono strategy for partnering with Māori.

Below, we present a set of 14 recommendations, and provide further discussion of each in the sections that follow. We note MBIE's commitment to further consultation and discussion as this process develops. Plant & Food Research will contribute strongly and constructively throughout.

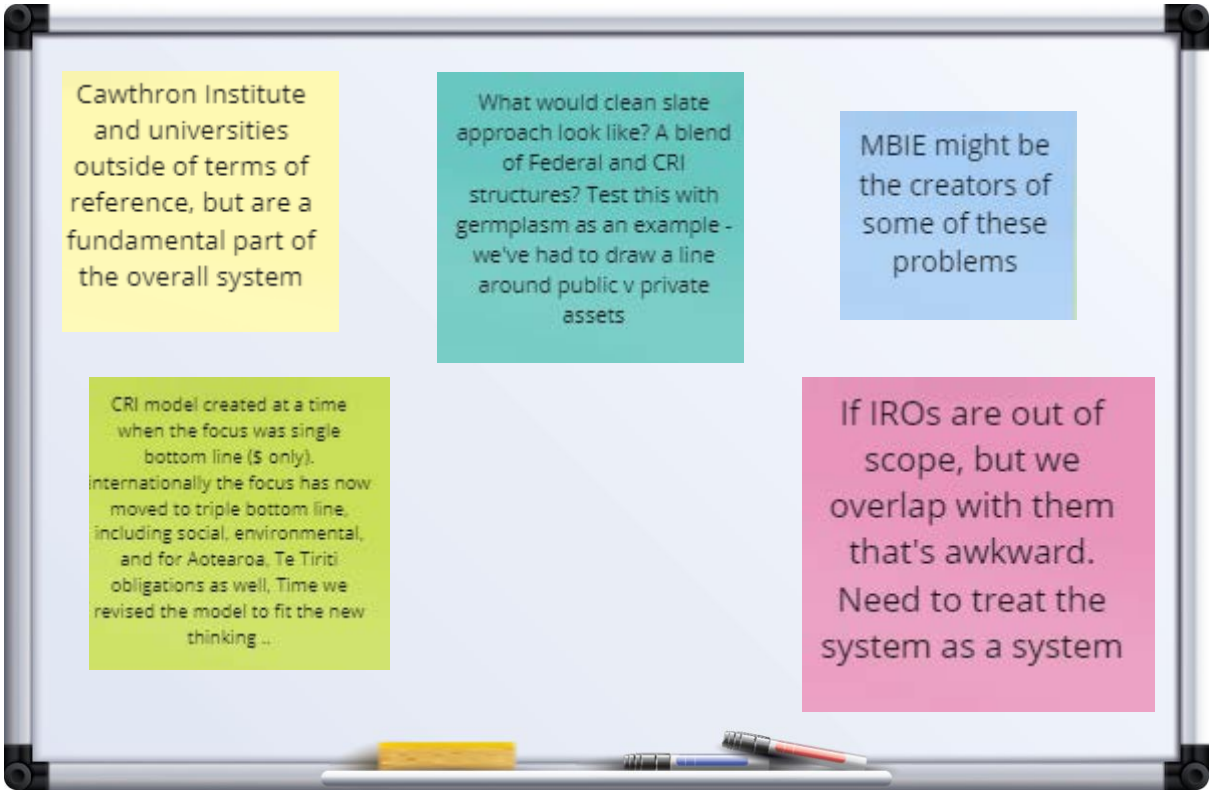
Summary of Recommendations

1. Use a systems lens if the goal is to reform the RSI system in its entirety *(General)*
2. Recognise Te Tiriti principles through a Government−Māori partnership to explore research priorities, then include research and business voices *(Research Priorities)*
3. Ensure significant reach and adaptability/agility are built into the research priorities *(Research Priorities)*
4. Avoid creating another competition for limited resources (if funding for research priorities is targeted at fewer, larger organisations with a largely public research focus) *(Research Priorities)*
5. Build capability and capacity to engage and embed mātauranga Māori *(Te Tiriti, mātauranga Māori and Māori aspirations)*
6. Establish and resource regional engagement, including through Māori knowledge hubs *(Te Tiriti, mātauranga Māori and Māori aspirations)*
7. Ensure research organisations remain well-connected with end-users *(Funding/Institutions)*
8. Provide stable funding for critical functions *(Funding/Institutions)*
9. Ensure any base grant for public research sufficiently covers the costs of delivering excellent science with impact *(Funding/Institutions)*
10. Better define, resource, and evaluate pathways to impact because they are the key to delivering value from science *(Impact pathways and commercialisation)*

11. Recognise and reward researchers who seek to work in applied and impactful areas of science *(Impact pathways and commercialisation)*
12. Recognise the role the Companies Act has played in enabling sector alignment and impact *(Impact pathways and commercialisation)*
13. Improve connectivity across talent pipelines *(Research workforce)*
14. Retain locus of decision-making for infrastructure investment close to those delivering the science *(Research infrastructure)*

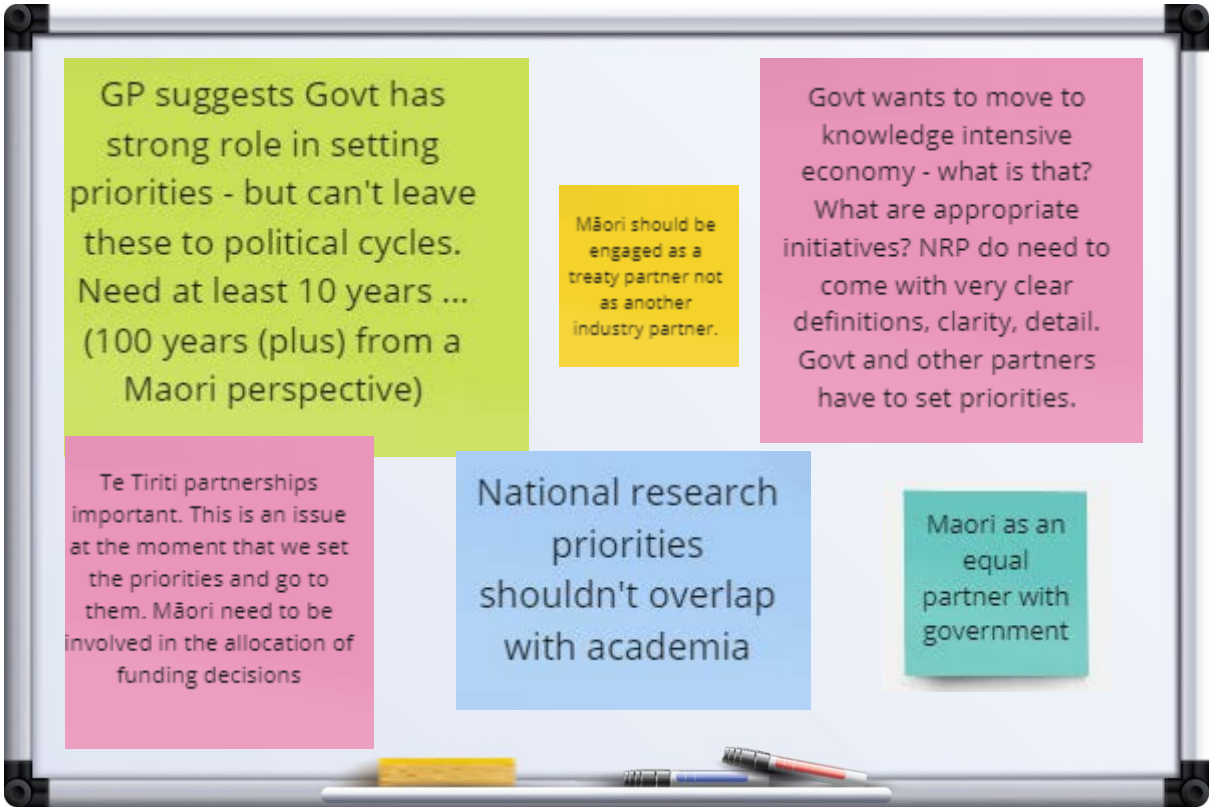
General

1. **Use a systems lens if the goal is to reform the RSI system in its entirety** – The Cabinet Paper states that the Minister intends to "reform the RSI system so that it is adaptable for the future, resilient to changes and well connected". The Green Paper identifies themes that transcend the RSI system, but then narrows the focus of the reform to the RSI Minister's portfolio, namely CRIs and Callaghan Innovation. It is our contention that the proposed RSI reform requires a systems approach. In the absence of this thinking, further patchy solutions to system-wide challenges may be generated, and current challenges may remain unaddressed.



Research Priorities

2. **Recognise Te Tiriti principles through a Government−Māori partnership to explore research priorities, then include research and business voices** – Our research and general staff consistently expressed the view that recognising Te Tiriti principles requires Government to partner with Māori first in identifying research priorities. Consultation with industry and research, with oversight from Government, is then required to help identify, scope and define the research needed to address agreed priorities.



3. **Ensure significant reach and adaptability/agility are built into the research priorities** – Our staff tell us that having a set of national research priorities identified by a structure/agency separate from the organisation responsible for funding allocation will help to target research. These priorities will go some way to addressing several recommendations made by the Productivity Commission[1] (particularly 7.1 and 7.2) calling for Government to confirm the choice of a small number of areas of the economy on which to focus innovation effort, and then to support these focus-areas with a substantial and enduring commitment of public resources. We anticipate that the clear identification of research priorities where science can make a difference will consolidate

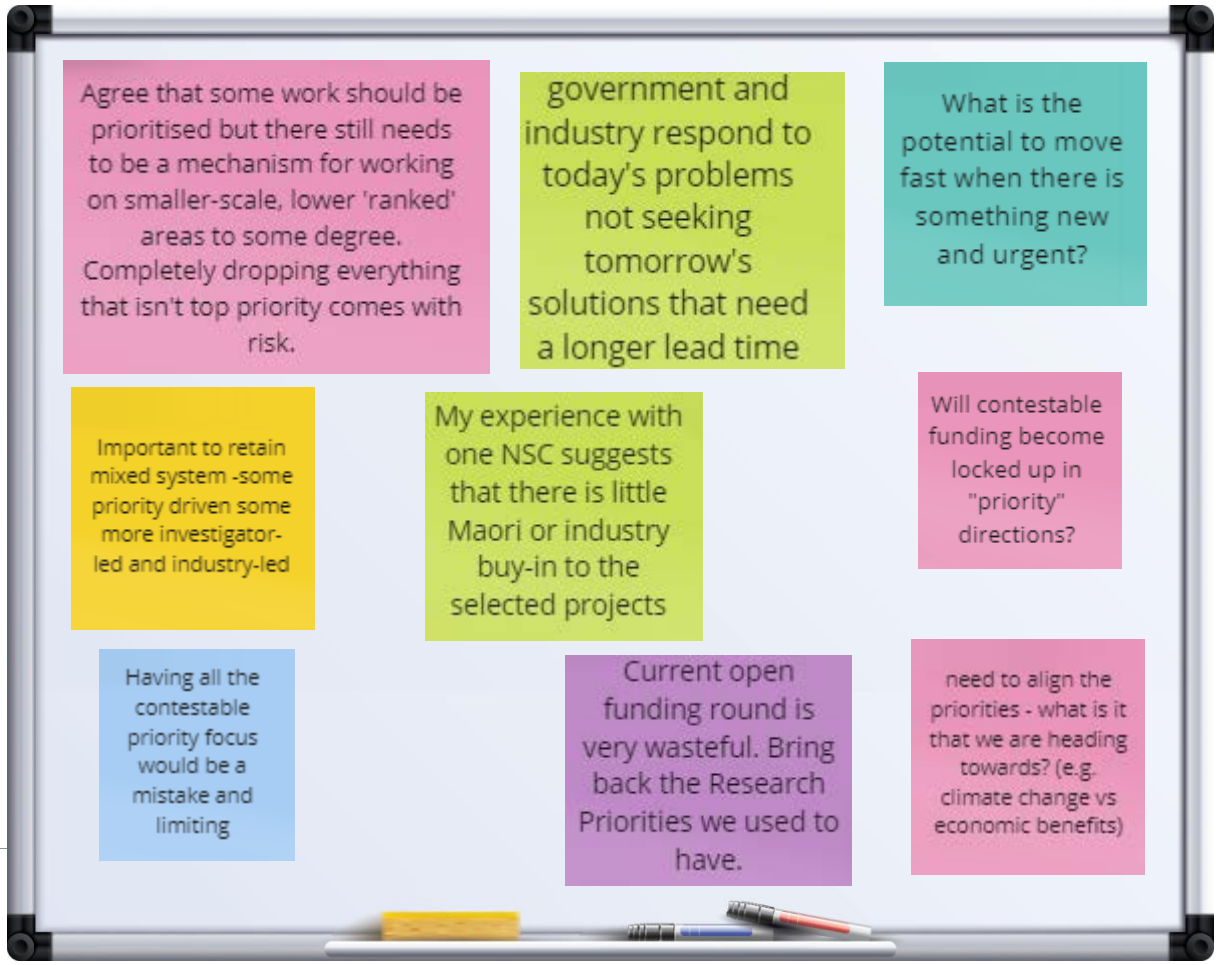
[1] https://www.productivity.govt.nz/assets/Documents/Final-report-Frontier-firms.pdf

New Zealand's innovation agenda and, over time, increase investment from non-Governmental sources.

Our science staff felt that it was important to be clear on the objectives or outcomes and impacts sought from investment in these national priorities. Sufficient trajectories for programmes to pursue long-term goals (and deliver impact) in a meaningful way must be created, and certainly persist beyond political cycles. In addition, the submission made by PFR-MSPE calls for an enduring commitment of substantial public resources to ensure equitable access to the RSI system for Māori in line with the current Vision Mātauranga policy settings. It also calls for the obligations of CRIs in relation to Te Tiriti to be clarified in the CRI Act. The views gathered through the consultation that led to the development of the current submission fully endorse these calls.

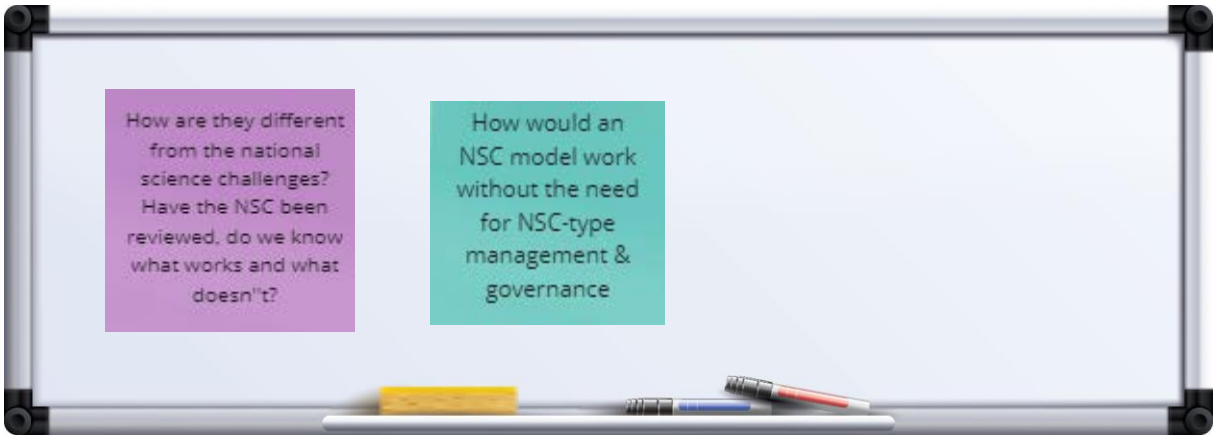
The experience of our staff suggests that the lack of continuity of funding for outcome areas and low application success rates make it difficult to develop relationships with companies and sector groups, and especially with Māori. The chances of building a science programme that will provide impact over the long term are low, despite researchers securing support from partners and stakeholders for these proposals.

Consideration must also be given to research areas that might appear to sit outside the current priorities, as breadth is needed in our RSI system. This research may sit beyond current horizons, and be relevant to challenges and opportunities that are yet to be articulated. The capacity to be agile and adaptable, and provide funding for emerging priorities will be essential to create future options and mitigate risks. We should avoid any strategic and operational limitations as those exposed by the National Science Challenges.



4. **Avoid creating another competition for limited resources (if funding for research priorities is targeted at fewer larger organisations with a largely public research focus)** – We acknowledge that competition helps to drive and identify 'excellence'. However, our staff have experienced inefficiencies (time, opportunity costs, unfulfilled expectations of collaborators and industry partners, etc.) when securing funding through competitive processes within a resource-constrained system. Competitive funding drives poor behaviours in terms of engaging with Māori and the short-term nature of such funds are insufficient to enable the establishment and growth of enduring relationships with Māori partners. Case studies about opportunities to innovate in this space are identified in the PFR-MSPE submission. Our science staff support the allocation of funding for research priorities in ways that reduce unnecessary 'bidding' and avoid expectation-hype. They acknowledge that high-level governance will be essential and an effective structure must be established to realise this. They suggest that models of past and recent structures are worth investigating, such as the National Research Advisory Council and National Science Challenges, as to what worked, what did not, and why.

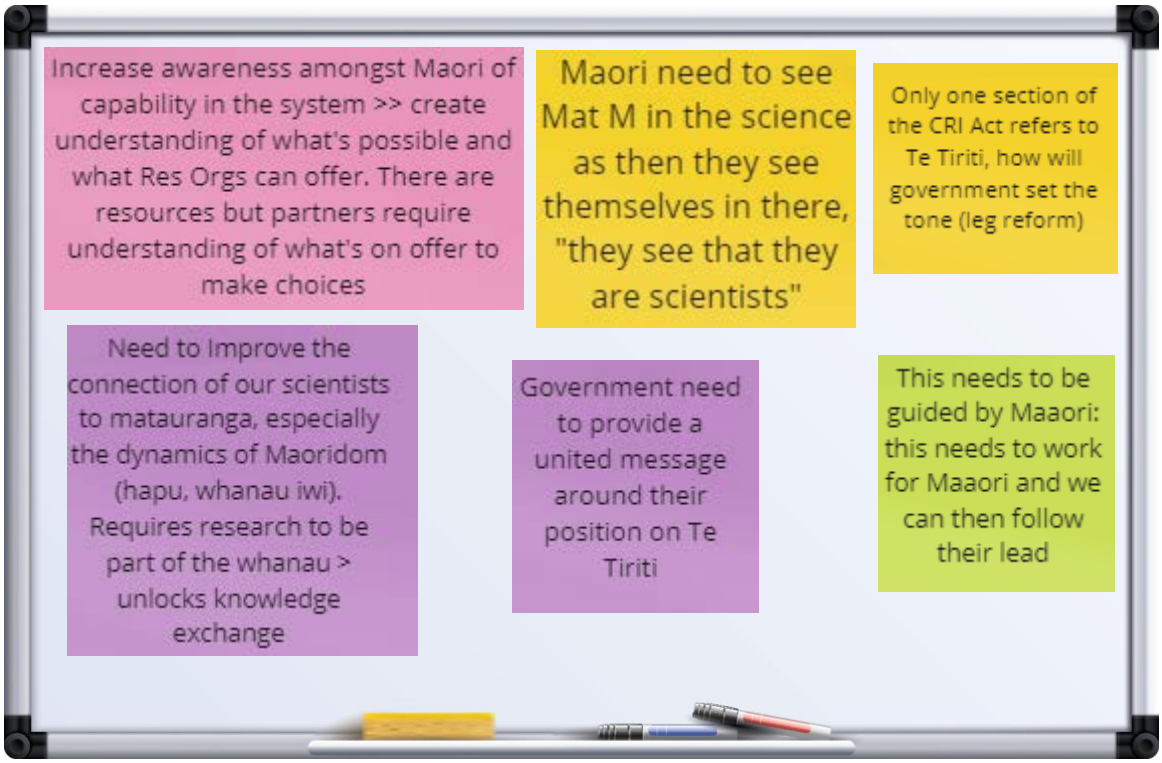
   An aligned innovation agenda to which science contributes is a positive development. However, these priorities need to be adequately resourced and a destructive contest for funding avoided.



Te Tiriti, Mātauranga Māori and Māori Aspirations

5. **Build capability and capacity to engage and embed mātauranga Māori** – Our staff fully support increasing the representation of Māori in science and resourcing mātauranga-based and Māori-led research. We believe there are bright futures for whenua Māori and moana Māori. Despite our best efforts, our staff experience resource deficits and power imbalances that hamper progress. Capability deficits are hard-wired into the system well before tertiary learning pathways, limiting our ability to correct these imbalances. Building Māori capability in science and trust of the RSI system requires investment earlier in the secondary education pipeline, particularly in STEMM (Science Technology Engineering Mathematics and Mātauranga) subjects. This will help to create an RSI system that is receptive to and trusted by Māori. Clarity around New Zealand's agenda for a more bicultural society and the role of RSI in realising that future would

progress this engagement. This is explored in more detail in the PFR-MSPE submission (e.g. Case Study 6).



6. **Establish and resource regional engagement, including through Māori knowledge hubs** – Our people support the concept of regional Māori knowledge hubs. We recommend that advice is taken from Māori on the resources they need, for example to support engagement with Whare Wānanga (Māori education institutes). Resources are also needed for regional organisations with science knowledge to engage effectively with regional stakeholders, and to ensure equity of engagement. It is insufficient for this engagement to be a simple koha; investment needs to be directly into the hubs.

   Researchers support the role of science in delivering value with, and for Māori, but often find themselves under-equipped and under-resourced to work at this engagement interface. Our experience is that many iwi lack experience in accessing the science system, or are not well-positioned to interact with it. Indeed they mistrust it. This must change as we weave our knowledge systems together. Plant & Food Research is addressing this gap in capability and resourcing through our Tono strategy. Delivery of this strategy is funded directly by Plant & Food Research to build Māori capability and capacity, including by investing in and developing trusted hūatahi partnerships with Māori to realise mutual benefits.

Funding/Institutions

7. **Ensure research organisations remain well-connected with end-users** – Our staff responses reflected strong consensus on the critical importance of retaining proximity and connectivity with end-users rather than consolidating capability along disciplinary lines. Their experience is that these relationships are key to delivering impact from science. Furthermore, these industry connections help to target research directions towards un-met needs and important, relevant challenges. Our end-users and partners provide diverse resources that enhance science and enable its impact, including market insights, raw materials, in-kind support, equipment, wider networks, market access, and global connections.

   Our researchers confirmed that they can easily locate science expertise from within their own organisation or from other research-providing organisations. They can find each other and have done so for decades, including international collaborators, through extensive professional networks. Our scientists tell us that competition for resources in order to do excellent science with impact is a bigger constraint than finding research collaborators.

   Our customers also tell us that they prefer to engage with a single organisation, or a simple point of entry, to address their needs. Evidence for this comes from our customer surveys and constant interactions with them. Through these channels, our customers say they find it difficult to construct multi-disciplinary teams capable of addressing complex problems and opportunities when specialists are clustered around disciplinary lines.

   The PFR-MSPE submission references challenges associated with engaging with Māori and suggests ways to innovate within current constraints (Case Study 3).

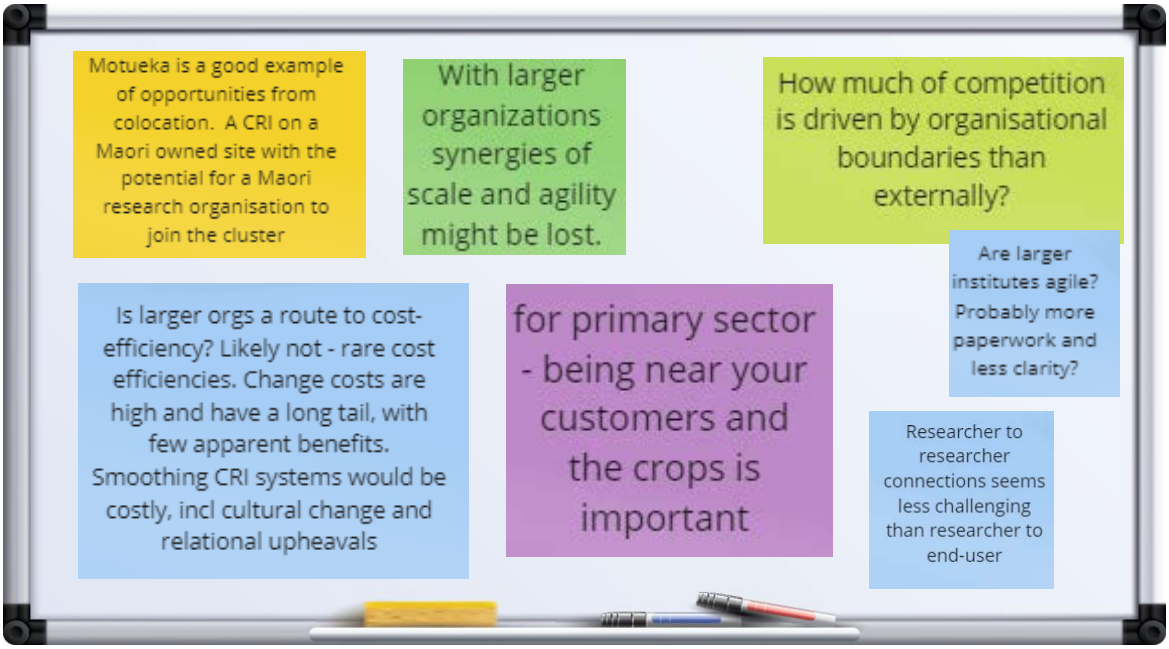
   Plant & Food Research delivers solutions across domains such as land use, climate change, bioprotection, agronomics, aquaculture, genomics, water, and social challenges. These all require interdisciplinary approaches to address problems challenging New Zealand's primary sectors. The clear alignment of organisational purpose with end-users has proven highly successful for Plant & Food Research.

   In summary, reinforcing the sectoral focus of research organisations is important in empowering them to build the collaborations necessary to achieve outcomes. It also makes it easier for end-users to identify the entities responsible for particular outcomes, preventing end-users from having to navigate multiple overlapping ownership, governance, funding and legal structures.

   Science staff were relatively comfortable with the concept of fewer, larger organisations as they tend not to find the locating of research collaborators to be a challenge. However, this view was largely held if a sector or end-user focus was maintained. They were generally of the view that a single large organisation would lack focus and be inefficient, and make access for end-users challenging.

   We fielded widespread concern from across our workforce around the potential interruptions caused by reforms on the scale that is intimated. Reorganisation at any

level invariably comes at a cost as well as being disruptive; the benefits need to be real and widely understood. Our staff also suggested that further discussion was needed around enabling organisational cultures for researchers: the roles of culture and values should be considered when reforming organisations as the effects on productivity and engagement can be long term.



8. **Provide stable funding for critical functions** – Our staff support the notion that it is important to provide stable and enduring funding to support research capability of national importance. This is particularly important where the beneficiaries of that research are not yet co-ordinated, or are among future generations. It is also important where an absence of knowledge poses risks to New Zealand's security and resilience, namely where there is evidence of market failure. They suggest that critical functions need to be broadly defined to avoid risk and ensure that we have the necessary skills and depth to address unforeseen and urgent challenges.

   Science carried out in New Zealand must protect the wellbeing and security of all New Zealanders and the interests of any current and future beneficiaries who do not have the capacity to invest.

   The PFR-MSPE submission provides a perspective on the criticality of resources to support engagement with Māori.

9. **Ensure any base grant for public research sufficiently covers the costs of delivering excellent science with impact** – Those who contributed to this submission were very supportive of a base grant for publicly funded research. However, they were concerned that a base grant (in combination with funding secured for research on Government priorities) may be insufficient to maintain key areas of capability, overheads and capital expenditure.

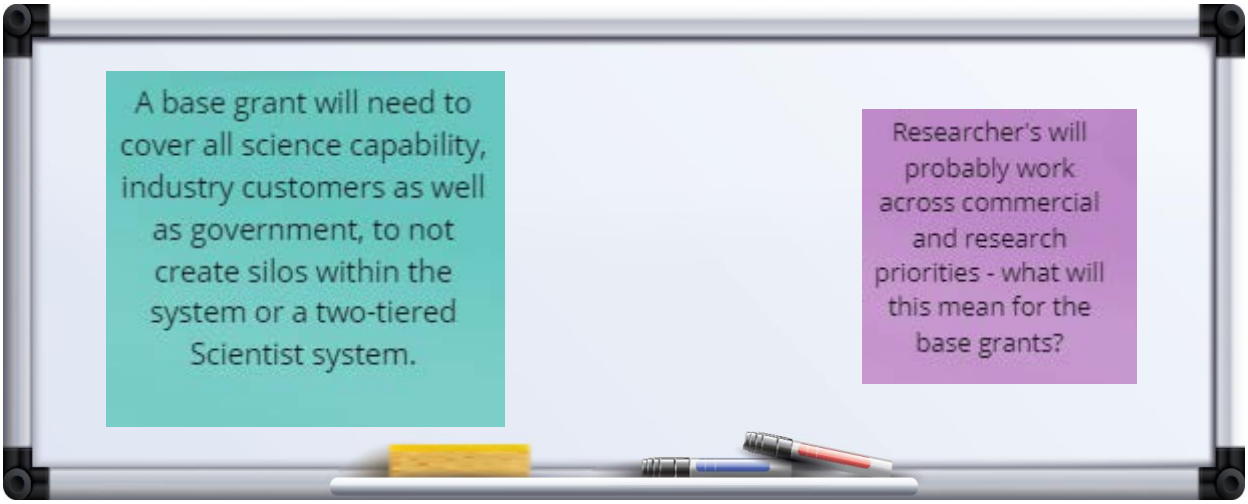
   In the case of Plant & Food Research, less than 40% of our revenue is from Government sources, and this share is declining. We predict that organisations like ours

may need to use revenue from commercial sources to supplement important capability, non-science activity and infrastructure.

It was also unclear to those who contributed to this submission, how a base grant would provide the level of job security to researchers proposed in the Green Paper. To provide job security, the base grant would need to `even-up' the costs of doing research across the RSI system, and cover salaries for researchers who provide key capability that are at-risk (`underfunded'). If research funding models for public research do not apply across research provider types, costing disparities are likely to continue. Settings are likely to favour providers who can cross-subsidise their delivery from other funding sources (e.g. Vote: Education), or utilise low-cost capability (e.g. students). Cautions were voiced during our internal consultation workshops on the potential for funding disparities between types of research (e.g. publicly funded or privately funded research) to also create internal distortions or perverse incentives.

Our staff would also prefer an approach to funding research in New Zealand that aligns with international approaches (where research providers have some overhead costs covered). Currently, when we pitch for international funds, our costings make us unattractive.

The PFR-MSPE submission provides a perspective on the importance of base grant funding to support engagement with Māori and for Māori.



Impact Pathways and Commercialisation

10. **Better define, resource, and evaluate pathways to impact because they are the key to delivering value from science** – It can take a long time to deliver outcomes from research investments. As well, actions taken by stakeholders and end-users, often long after science outputs have been delivered, are key to delivering longer term impacts. Our staff tell us that they often struggle to implement robust impact pathways because of the way science contracts mainly focus on (and fund) deliverables (research outputs), even including publicly research funders. It is clear that knowledge-exchange

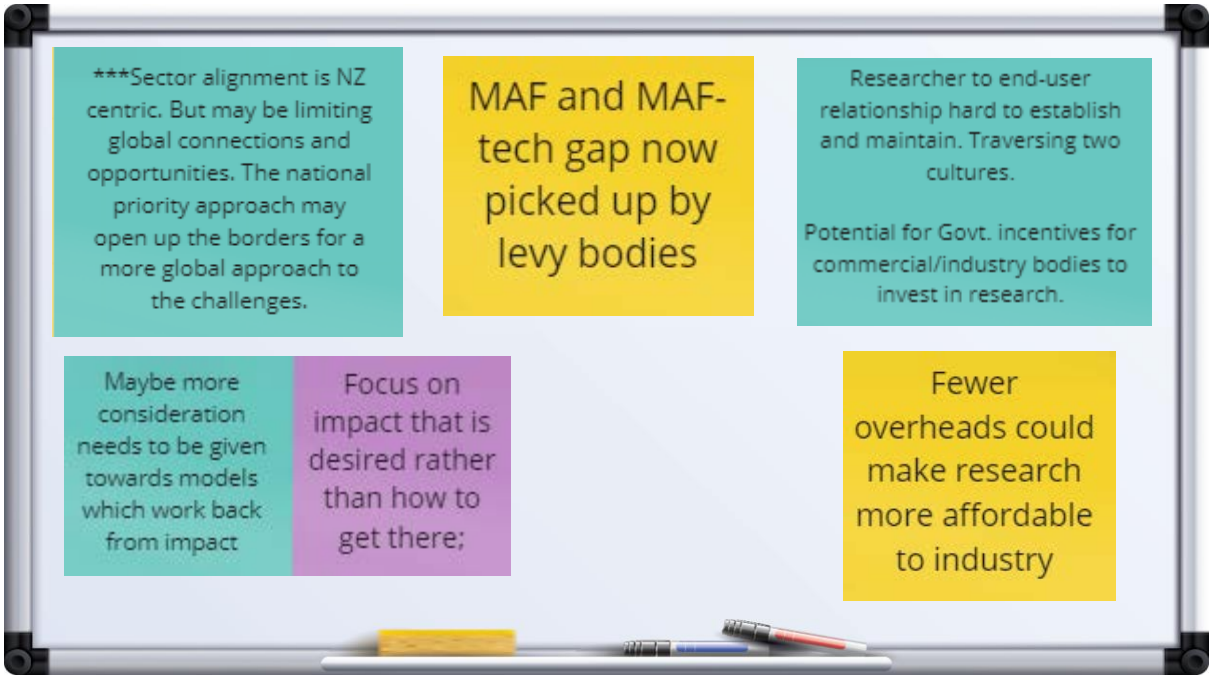
activities are required to deliver impact. Resources for these and the activities and skill sets involved must be explicitly identified and funded in contracts. Funding models need to be flexible and adaptive to the inherent risks encountered along impact pathways.

Many of our staff have attended training in impact evaluation offered by the CRIs' Impact Planning & Evaluation Network, and are building their competency in planning for, delivering, communicating and evaluating impact. As well, researchers recognise that many research programmes often contribute to particular impacts over several years, making line-of-sight challenging. Funding for *ex post* evaluation across clusters of contributing programmes is essential to generate evidence of impact.

Plant & Food Research's experience is that effective commercialisation also requires well-integrated support structures and resourcing, as well as input from subject-matter experts in legal matters, IP management, social dimensions, economic analysis, Māori engagement, communications, and evaluation. Commercialisation processes tend to be complex and take time, but throughout this process sustained and positive relationships between commercialisation specialists and researchers are critical. Plant & Food Research's success lies in our ability to bring together teams with these diverse skill sets. Our general staff firmly believe that these collective professional activities need to be embedded within public research organisations to guide and evaluate science-for-impact pathways. It is unclear to us whether the base grant will adequately support these essential inputs, which Plant & Food Research currently supplements from our diversified revenue base.

While acknowledging the core 'New Zealand benefit' role of CRIs and the RSI system, incentivising and recognising impact should consider our country's role in addressing global opportunities and issues. Many areas of research have applicability beyond New Zealand – such as globally secure and sustainable food systems, and climate change mitigations and adaptations. In these cases, benefit for New Zealand may be best achieved through impact for and with global players as they collaborate with us to translate our technologies and take our know-how to the world. We are guided in our global activities by our Mātauranga Māori and taonga principles, and our organisational Tono strategy.

The consideration given to commercialisation models in the Green Paper is welcomed. We recommend that consultation with relevant stakeholders in commercialisation would help to inform future settings. There is no standard business model for successful commercialisation. Rather, each opportunity brings a unique combination of technology and commercial challenges, and its own partnering context. Having commercialisation support embedded within the research organisation has proven successful for Plant & Food Research.



11. **Recognise and reward researchers who seek to work in applied and impactful areas of science** – Our science staff and their managers make choices about where they focus their time when meeting multiple delivery deadlines. Working on applied research programmes that deliver significant impacts for New Zealand's primary sector may mean they cannot publish results or, conversely, that the best channels for knowledge transfer / extension favour local publications rather than international, high impact factor journals. In either instance, this can restrict their CVs and limit career options, particularly when first establishing a science career. Through our performance processes, Plant & Food Research has done much to recognise those choosing to focus on generating outcomes and impacts for industry. However, the prevailing reward and recognition systems continue to favour science excellence, hefty CVs and academic outputs. The culture around excellent science equalling scholastic excellence can fail to reward impactful careers that are truly benefiting New Zealand.

12. **Recognise the role the Companies Act has played in enabling sector alignment and impact** − Our process identified significantly divergent views on how operating under the Companies Act may be enabling, or in some cases impeding, CRIs from operating effectively.

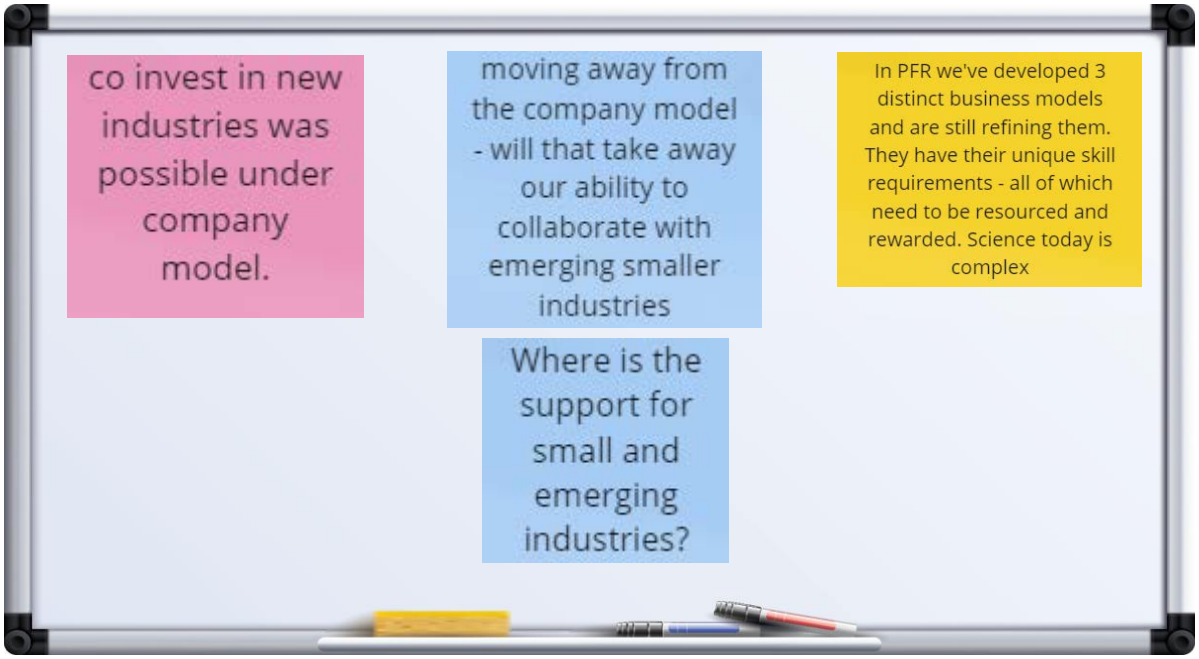
    Feedback from across Plant & Food Research emphasised benefits from the Companies Act: it is a well-understood mechanism to enable partnering with other companies and industry, and provides for the ability to plan forward investment (taking calculated risk) based on future returns.

    Notwithstanding the above, some researchers continue to have concerns linked to potential impediments of the profitability driver. In particular, some staff thought the Companies Act added to the perceived confusion about the roles of CRIs – organisational viability (including profit-generating) versus public good.

    The ability to take a portfolio view across Plant & Food Research's research programmes and their associated profiles for delivering value (timing, size and risk) has enabled Plant & Food Research and other research providers to co-invest and partner with entrepreneurial organisations to take science-enabled innovation to the world. This is a huge advantage for Plant & Food Research at the current time. Our ability to embrace commercial flexibility has been especially important in enabling long-term partnerships (which transcend single-project, transactional-based interactions) and has tended to result in more transformational outcomes and impacts.

    Plant & Food Research deploys a range of business models to ensure research discoveries deliver impact for industry, and for New Zealand, often through globally connected science. These models include offering research as a professional service, licensing products and technologies to carefully selected partners who have global market presence and distribution partnerships and, more recently, through spinout companies. At any one time, a closely monitored mix of these models, tailored to the type of technology and commercial opportunity, operates at Plant & Food Research. A portion of our retained earnings, including from royalties, are re-invested through our Technology Development business model in these activities. Diversifying the sources of revenue to deliver our science ensures organisational resilience and security for researchers who are delivering important outcomes for New Zealand (as noted elsewhere in this submission).

    This has created a virtuous circle, enabling our commercial partnerships and co-investments to seed new and successful initiatives. Our activities and investments across these commercial impact pathways remain fully aligned with our Core Purpose of enhancing "the value and productivity of New Zealand's horticultural, arable, seafood and food and beverage industries" and contributing "to economic growth and the environmental and social prosperity of New Zealand."



Research Workforce

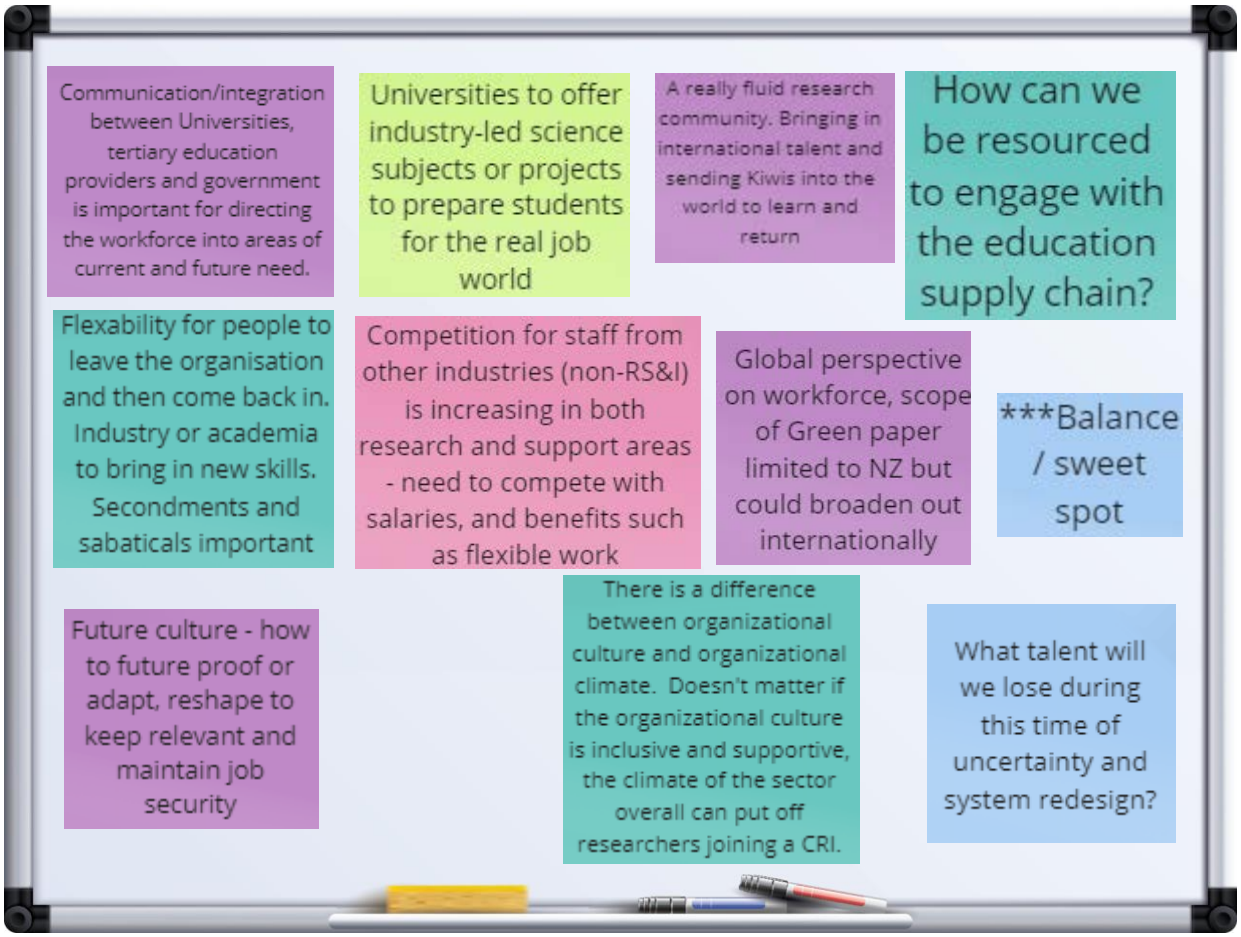
13. **Improve connectivity across talent pipelines** – Managers across both science and general areas of our organisation often struggle to fill talent gaps. Research providers are currently 'takers' of new talent that emerges from universities. When that supply fails, CRIs go offshore to seek some 40% of appointees. Skill sets generated by learning pathways in tertiary organisations reflect deep disciplinary silos, with a focus on traditionally defined 'excellent science'. However, addressing complex problems today requires more adaptive professionals who can operate in multi-disciplinary contexts, have communication and engagement skills, and are equipped to work in cultural contexts.

    Our staff believe that more joined-up approaches are needed across talent development agencies, including universities, institutes of technology and Whare Wānanga, to develop a talent pipeline. It was suggested that the current capability pipeline in New Zealand be diversified to reflect the needs of today's employers as well as pay attention to the needs of today's learners, creating diverse entry, or re-entry, points. Incentives for universities to be flexible around the capability they develop through degree programmes need to be considered.

    Co-location is not a necessary condition for improved talent creation and access, but better links are required. Better, and truly two-way, conversations are needed between research organisations, universities, Whare Wānanga, and institutes of technology to ensure the right supply of the right graduates. Unfortunately, Te Ara Paerangi appears to locate these conversations outside the scope of the reform mandate.

    Delivering impact from science also requires skills in stakeholder engagement, business development, customer relationship management, communication, knowledge transfer, commercialisation and evaluation. Capability to support the delivery of impact from

science needs to be generated to enable a vibrant and effective RSI system. As well, in terms of researcher career mobility, it is not obvious how rapidly international measures for science excellence may move from traditional publication-derived metrics. However, a focus on impact is actively emerging in many science systems. New Zealand should ensure that its settings retain attractiveness for international researchers looking to relocate, and provide mobility for our existing researchers within the broader international research system.



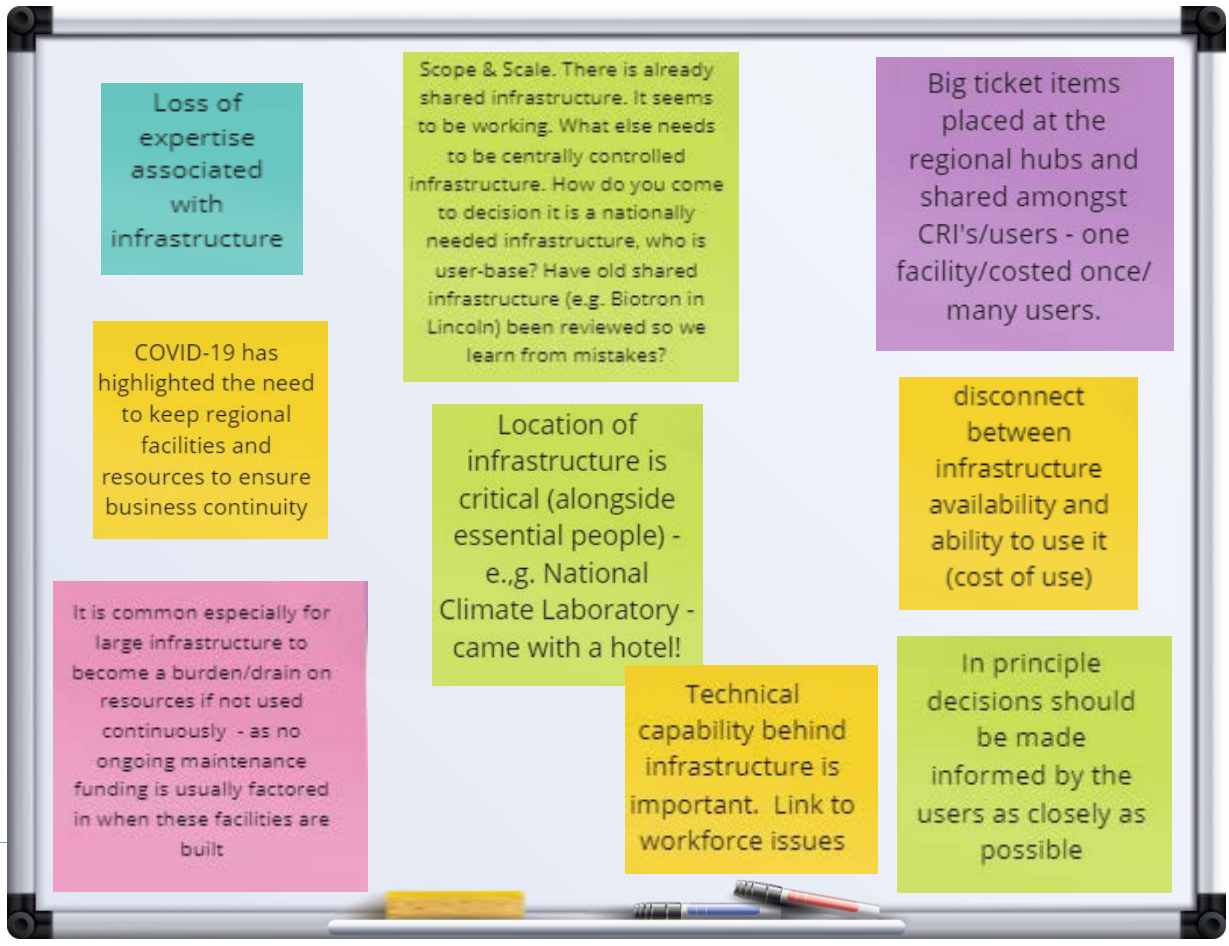
Research Infrastructure

14. **Retain locus of decisions for infrastructure investment close to those delivering the science** – Our research and general staff are of the strong opinion that those who plan and deliver research are best positioned to make decisions about investment in infrastructure, including databases required to undertake research of international and national significance and to support core functions. They acknowledge that investment in large-scale, costly infrastructure and equipment, or infrastructure and equipment of this nature, is best co-ordinated centrally. This approach can provide efficiency in capital use, including by addressing issues of interoperability and standardisation and facilitating technological advances.

Science staff strongly believe that resources must also be committed to maintain, refresh and provide access to key infrastructure (including personnel) and enable open innovation. When funding for a project that has invested in infrastructure to deliver outcomes comes to an end, associated infrastructure does not dematerialise until it is required to deliver on a future project. Organisations have to support these assets from other revenue sources.

We are concerned that centralising infrastructure investment will lead to lengthy processes that will slow innovation. The burden of cost will move to business case development. Some duplication and national spread of essential science equipment has proven valuable in ensuring science delivery during crises (e.g. COVID-19, kiwifruit Psa response), helping to buffer the system from disruptions or periods of intensive utilisation (including seasonal peaks in activity). Decisions to invest in infrastructure may need to be made rapidly to service secured science contracts. Lengthy approval processes can compromise delivery and revenue streams.

As joint owners of the New Zealand Food Composition Database (NZFCD), Plant & Food Research and the Ministry of Health has made a submission supporting the NZFCD as an example of key databases and collections that comprise critical elements of New Zealand's science infrastructure. The submission applauds and endorses the Green Paper's recognition of these resources as intrinsic components of a high-functioning science system of comparable worth to physical assets like facilities and equipment. The submission also outlines how the existence of the NZFCD streamlines performance of related research, enabling greater efficiency for research outputs. It recommends that the NZFCD (and like resources) are centrally funded and supported to provide greater security to its continued existence for all science.



Appendix − Engagement processes and communication tools

Principles guiding the development of Plant & Food Research's submission

In preparing this submission, Plant & Food Research sought to:

1. Establish a safe, equitable organisation-wide process to create open debate, leading to the articulation of high-quality, informed perspectives even if these offered divergent views.
2. Reflect our experiences when seeking to i) understand and honour Te Tiriti obligations and opportunities; and ii) better enable mātauranga Māori in our science and business through partnerships with Māori.
3. Consider what is best for New Zealand and the contribution that RSI can make to a sustainable future for all New Zealanders.
4. Contribute positively and constructively by i) confirming our support for features in the Green Paper that we believe will achieve this goal; ii) commenting on those that we believe may put at risk the future potential of RSI in New Zealand; and iii) identifying any gaps in the dialogue.
5. Participate actively in engagement opportunities created by MBIE through a range of virtual formats, including Phase I and II workshops.
6. Inform and advise our staff to support their contributions to a range of submissions constructed with colleagues from across the RSI system.
7. Ensure staff had the opportunity to prepare 'private' submissions if their views were not adequately reflected in the Plant & Food Research's final submission by circulating that submission in advance of the 16 March deadline.

The process adopted to facilitate engagement in Green Paper discussions

In late 2021, Plant & Food Research put together a group to develop both the process for and content of a Plant & Food Research submission on the Green Paper. The group consisted of:

- Dr Richard Newcomb, Chief Scientist (Senior Leadership Team Sponsor)
- Dr Gavin Ross, Group General Manager, Marketing & Innovation (Senior Leadership Team Sponsor)
- Dr Brent Clothier, Principal Scientist (Chair of group of nine science representatives)
- Kevin Hurren, Commercialisation Lead (Chair of a group of 18 general staff representatives)
- Dr Marc Lubbers, Operations Manager – Science Operations (Tactical support)

- Tracy Williams, Impact Evaluation Manager (Tactical support)
- Christine Lamont, Executive Assistant (Project Management)

The group was guided by the principles outlined above. Their goal was to ensure that our organisational submission drew on perspectives from those engaged in science and delivering impact from it, including research, legal, infrastructure, capability, communications and brand, commercialisation and evaluation.

Plant & Food Research also ran a parallel process led by our Group General Manager Māori Strategy, Partnerships and Enterprise that engaged our people in matters relating to our own Tono kaupapa, Te Tiriti obligations and opportunities, pathways to a future Aotearoa New Zealand RSI system that is Tiriti-led, and covered ways to give life to Māori research aspirations, and opportunities to better enable mātauranga Māori in our RSI system. As noted earlier in the current submission, that process led to a further submission from the MSPE Group. The PFR-MSPE submission and the current Plant & Food Research submission are mutually reinforcing.

Representing many voices

The written submission drew on views expressed by science and general staff from across our organisation during the consultation workshops. The group sought to identify clusters of views on themes identified in the Green Paper, and then to develop a statement that captured those views at the level of underpinning principles. Staff perspectives, as well as wider knowledge of Plant & Food Research's operating context and history, enabled the group to provide a rationale for the principles. The group sought to outline settings or arrangements to enhance excellent science that delivers impact and enduring value rather than offer structural or operational solutions. At times, views on thematic areas diverged, within science and within general staff groupings. As well, sometimes views differed between these two groups. Where divergence occurred, different perspectives are noted and explained. Science and general staff representatives who worked with the two chairs provided feedback on the principles and supporting rationales. The group then further developed recommendations.

Experiences when developing a submission

At consultation workshops on the Green Paper our staff raised may questions about what was proposed in the Green Paper. They also predominantly described their experiences across the six thematic areas identified in the Green Paper as well as one identified as missing – Pathways to Impact.

Time was taken to understand cause and effect in relation to their experiences. Whilst those who engaged in the consultation workshops have started to build their understanding of system-level factors and how they play out to influence the undertaking of excellent science and impact from it, more time is needed to contribute to improved settings that might address deficits or opportunities for improvement. The timeline for submitting perspectives

on the Green Paper (although extended by two weeks owing to COVID-19 “red traffic light” settings) is insufficient to build this knowledge base. Continuing engagement is essential. We expect to engage more meaningfully on future, more detailed change proposals (e.g. the White Paper) or in direct conversation with MBIE’s Future Pathways policy advisors and analysts.

Workshop conversations were particularly complex because of:

- The challenges listed in the Cabinet Minute, which confirmed how the Government views the current RSI system – a number of which are not shared by those providing impactful science currently.
- The lack of detail in the Green Paper broadly about the likely extent of change and any acceptable trade-offs or priorities that might guide the optimisation of system settings (e.g. the relative focus on excellent science versus impact, the relative extent of centralised decision-making over research infrastructure investments, the scale and coverage of the base grant).
- The testing of a few specific ‘solutions’ without sufficient context or detail to enable people to understand broader implications. These include messaging around ‘fewer, larger organisations’, funding for ‘core functions’, a ‘base grant funding model’, a set of research priorities, and the effects of the Companies Act.
- The need to think through unintended consequences of the proposed `solutions’ and inadequate detail to fully analyse effects.
- The strong focus on public research and an absence of recognition of the important role that next and end-users play in partnering for impact along impact pathways, particularly settings that enable effective knowledge mobilisation.
- The signal from MBIE officials that any reform of the RSI system needs to be achieved within more-or-less the current levels of funding, for now. Given that the Green Paper signals the Government’s intentions to address some under-powered and under-resourced elements within the RSI system, concerns were raised about the implications of this fixed-envelope approach.

Workshops were structured around the six themes in the Green Paper. However, experiences shared by participants did not always align with these themes, reflecting the complex nature of the RSI system. Therefore, our recommendations broadly follow the themes but each recommendation may relate to various questions posed across the Green Paper themes.

The content of this submission was particularly guided by Principle 4 (above). We sought to i) confirm our support for features in the Green Paper that we believe will be best for New Zealand and consider the contribution that RSI can make to a sustainable future for all New Zealanders; ii) comment on features that we believe may put at risk the future potential of RSI in New Zealand; and iii) identify any gaps in the dialogue. The Green Paper clearly seeks to establish conditions under which excellent research and impact thrive. Our submission is intended to help clarify those conditions. As a consequence, we did not comment on the importance of excellent science and its fundamental role in delivering outcomes and impacts that are scientifically defensible and minimise the risk of unintended consequences.

For the same reason, we have made several recommendations on *Impact pathways and commercialisation* − a dimension of the RSI system that we believe requires more attention than paid to it in the Green Paper.

Engagement and communication activities to generate perspectives

Plant & Food Research launched a series of engagement and communication activities to build awareness amongst staff from across the organisation of the Te Ara Paerangi Future Pathways process and the questions raised in the Green Paper. These activities included:

- Internal website communications to raise awareness.
- Briefing the Senior Leadership Team and developing a timeline for executive input, review and sign-off.
- Assigning sponsors from the Senior Leadership Team to support engagement with science (Chief Scientist) and general (Group General Manager Marketing and Innovation) staff.
- Identifying a Chair and representatives to lead engagement across each of these two streams, with responsibility for reaching out to experts in their relative areas. The representative group of science staff spanned seniority levels (from Early Career Researchers to Principal Scientists). The representative group of general staff spanned functions such as business management, legal, finance, and infrastructure.
- Facilitating workshops (three for research and two for general staff) with participants being provided with pre-reading based on the Cabinet Paper, Green Paper questions and some discussion prompts around areas of particular interest to Plant & Food Research. Miro boards and break-out rooms were used to encourage participation, and guiding questions encouraged discussion. Responses were discussed in korero at each workshop.
- A set of guiding positions for our submission was generated and shared with workshop participants, inviting them to identify any areas of strong misalignment with perspectives offered during the workshops.
- Feedback was consolidated and a draft submission generated by the Chairs of science and general representatives.
- The Senior Leadership Team reviewed and endorsed the final submission.
- The submission was shared with all staff in Plant & Food Research before being submitted.
- It was also shared with our Board.