

Frontier Firms follow-on review

The New Zealand Productivity Commission Te Kōmihana Whai Hua o Aotearoa

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Foreword

Tēnā koutou te inanahi,
te ināianeī, me te āpōpō.
E ngā iwi, e ngā mana,
e ngā reo, e rau Rangatira
ma, tēnā koutou katoa.



We were excited last year when the Ministers of Finance and of Economic Development invited the Commission to conduct a follow-on review to the final report of our *New Zealand Firms: Reaching for the Frontier* (*Frontier Firms*) inquiry. This was the first time the Commission has been asked to review the Government's progress in implementing recommendations made as the result of a major inquiry. I believe this speaks to the quality of the work undertaken in that inquiry and the robustness of the recommendations made.

The experience of the past couple of years – a global pandemic (albeit now thankfully abating), rising geopolitical tensions, and increasingly stark challenges in tackling climate change (both mitigation and adaptation), has further reinforced the benefits from well-developed focused innovation ecosystems and the accompanying recommendations made in the *Frontier Firms* inquiry.

However, we are conscious it has only been two years since we completed the inquiry, and this is too short a period to expect to see outcomes in the form of better economic performance and greater wellbeing. Our approach in the follow-on review has therefore been to observe initiatives undertaken, how far these have progressed, and the general direction of travel.

In undertaking the follow-on review, we have tried to assume the role of a critical friend to all those with roles to play in progressing Aotearoa New Zealand's economic fortunes. We have not shied away from criticism where we think that is warranted, but we have also endeavoured to provide constructive ways forward.

As a result of this follow-on review, it is clear to us that the Government's current course will not deliver the desired transformational change needed for a successful focused innovation policy. We point to six areas for actions that would improve the chances of success.

In conclusion, I note the word "resilience" and the need for more of it is now on many lips. The Commission will take the opportunity to build on our work in the *Frontier Firms* inquiry and this follow-on review in our *Improving Economic Resilience* inquiry. In this inquiry, the Government has asked the Commission to look into enhancing the economic resilience of industries and communities to persistent supply chain disruptions. Potential links between improved resilience and investment in vibrant and focused innovation ecosystems are not lost on us, noting other countries are seeking to increase their resilience through such investment.

I would like to thank the team for their efforts in completing this follow-on review, and especially those who have helped by meeting with us, sharing documentation, and pointing us to publicly available information.

I trust the findings and advice in this follow-on review will be helpful to policy and decision-makers as we continue to strive to lift the productivity of the New Zealand economy and improve wellbeing outcomes for all New Zealanders – now and for generations to come.

Ngā mihi nui,

Dr Ganesh Nana

Chair, Te Kōmihana Whai Hua o Aotearoa | New Zealand Productivity Commission

Part 1

Key insights and messages

Focused innovation policy is key to lifting productivity

The Productivity Commission | Te Kōmihana Whai Hua o Aotearoa completed its inquiry into frontier firms in April 2021, *New Zealand Firms: Reaching for the frontier* (NZPC, 2021). Frontier firms are the most productive firms in an economy and are vital to lifting national productivity and wellbeing. Our inquiry recommended that, to best enable these firms to emerge and flourish, the Government should focus on building strong innovation ecosystems in a small number of high-potential areas. This requires significant long-term investment in these focus areas. We emphasised the importance of effective governance and implementation for avoiding the failures of past attempts at focused innovation policy (Figure 1).

Figure 1 Execution is critical to avoiding the failures of past efforts



A follow-on review to assess progress

The Government's response to the *Frontier Firms* inquiry (New Zealand Government, 2022e) asked us to conduct a follow-on review to evaluate whether the Government is progressing in the right direction to shift the productivity dial, or whether more radical change is needed. This follow-on report sets out the key findings on the Government's overall direction of travel, along with recommendations for improving the chances of success. A detailed assessment of individual policies and programmes is presented in a companion report (NZPC, 2023a).

A critical crossroads for innovation policy

While some aspects of existing government processes and initiatives are promising, they lack key elements needed for successful focused innovation policy. These include a collaborative process for selecting a small number of focus areas; two-tiered governance arrangements, with appropriate membership and decision rights; and substantial funding for each focus area.

Existing arrangements – including those for developing industry policy and the research, science and innovation (RSI) strategy (Te Ara Paerangi: Future Pathways) – fall short in a number of ways. For example, the industry transformation plans (ITPs) lack the resources, co-investment by business, connections with researchers, and enough focus and ambition to spark transformational change. In addition, material decision making for the ITPs, National Research Priorities (NRPs) and other processes remains largely centralised and top-down, rather than being collaborative and devolved.

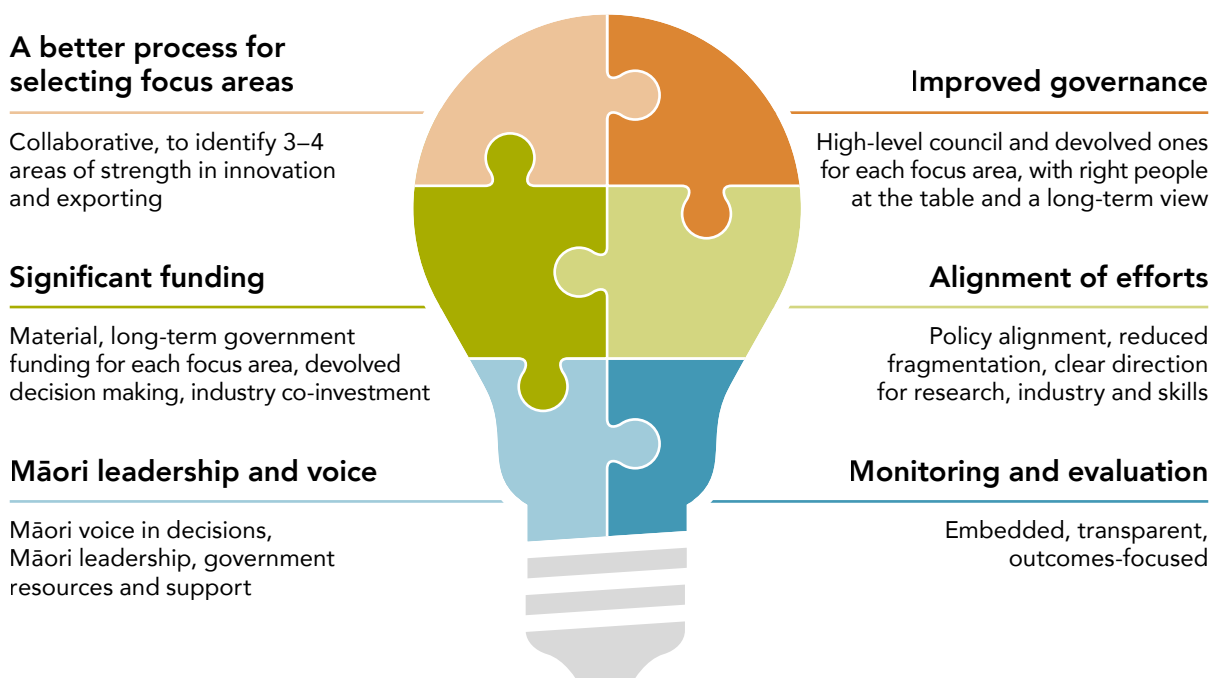
A package of actions to improve the chances of success

The current course will not deliver the desired transformational change. However, the chances of success can be materially lifted by improving existing initiatives and programmes in six key ways. These recommendations are a package – the elements are interdependent and interlocking, and success depends on having them all in place. Implementing all these pieces together will create conditions for successful innovation ecosystems that support high performing frontier firms, including Māori firms, which can drive faster productivity growth and greater wellbeing (Figure 2). Implementing these recommendations will require bolder efforts, and a sustained long-term approach.

- 1 Use existing initiatives to choose focus areas.** Use the national NRP priority-setting process to give effect to the Commission's recommended process for choosing a small number of areas for focused innovation. This should not be a top-down exercise led by government, but a collaboration with industry, researchers, iwi/Māori and educators.
- 2 Establish two levels of governance.** Establish a high-level national council to provide strategic leadership and broad coordination, along with a devolved governance body for each focus area. The national council would provide overall governance of the strategy, including choosing the focus areas and overseeing implementation. Each focus area should be governed by an independent body with devolved funding and decision rights.

- 3 Commit significant, long-term funding to the focus areas.** To make progress, material levels of investment are required. Finite government resources need to be deliberately focused on a small number of high-potential areas. International experience indicates this should be in the order of \$30 to \$50 million a year for each focus area, matched by industry contributions. Decisions on how to allocate this funding should be devolved to the governance bodies for each focus area, rather than being tied to specific government portfolios.
- 4 Align broader government and business efforts with the focus areas.** Identifying a small number of specific focus areas would help government agencies improve policy alignment and reduce fragmentation. These focus areas need not be based on standard industry classifications (for example they could span a range of industries), and one or two could be mission-based. Policy settings across areas such as exporting, innovation, infrastructure, education and training, immigration and regulation may all need to be improved, to support world class innovation ecosystems in the focus areas.
- 5 Māori leadership and voice.** Flourishing innovation ecosystems for Māori require iwi and Māori voices in decision making, and Māori leadership of efforts to improve support for Māori business. Māori leadership is required both within and outside government. This calls for ongoing efforts to build capacity and capability, and to adequately resource Māori contributions and leadership.
- 6 Embed evaluation, to enable learning and adaptation.** Arrangements for monitoring and independent evaluation need to be built in from the outset, with dedicated funding. Results measurement should focus on outcomes. Evaluation should be transparent and visible, with evaluation findings published as a matter of good practice.

Figure 2 Six recommendations for implementing focused innovation policy





Part 2

About this review

The Commission's *Frontier Firms* inquiry made recommendations for shifting the productivity dial

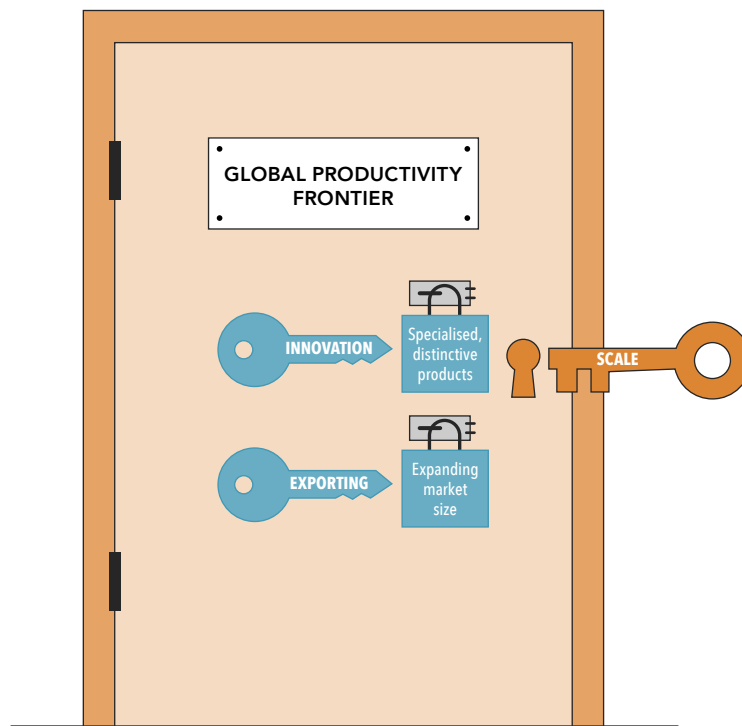
The Commission completed its inquiry into frontier firms in April 2021 (NZPC, 2021). Frontier firms are the most productive firms in an economy and are vital to lifting national productivity and wellbeing. They do this by lifting their own productivity closer to the global frontier, growing larger and diffusing innovation through the rest of the economy.

We found that creating conditions for frontier firms to emerge and flourish would be a feasible and promising route to significantly improve New Zealand's lacklustre productivity performance. This is what appears to have happened in small advanced economies (SAEs) in other parts of world – in countries such as the Netherlands, Denmark, Finland, Sweden and Singapore. Yet, strikingly, our inquiry found the average productivity of New Zealand's frontier firms to be less than half that of the best frontier firms in other SAEs. We concluded that much can be learned from the way these other SAEs organise their economies.

The frontier firms in other SAEs operate at or near the global productivity frontier; in other words, they are world leading. While New Zealand does have some world-leading firms, it does not have enough. Firms in successful SAEs are more internationally connected, so these countries also have much higher ratios of exports to GDP, and greater outward direct investment (ODI). These SAEs owe much of their prosperity to their frontier firms exporting specialised, distinctive, high-value products at scale. Specialised and distinctive products are knowledge intensive and hard for competitors to replicate. This requires innovation.

Innovation necessitates a lot of time-consuming and intensive R&D and other efforts, involving investment and cost, to achieve valuable novelty. When the domestic market is small, exporting is the way to recover these fixed R&D and other costs. Unfortunately, the step to start exporting creates additional fixed costs for firms. Making an investment that earns a good return over and above the fixed costs associated with both innovating and exporting requires scale (Figure 3).

Figure 3 Exporting innovative products at scale is key to success



The main recommendations of the Commission’s inquiry comprise our best judgements about how to achieve more New Zealand firms successfully exporting specialised, distinctive products at scale. At the heart of the challenge is building dynamic innovation ecosystems in specific areas of the economy. Frontier firms would contribute to, and be sustained by, these ecosystems. These strong ecosystems could emerge from traditional industries, promising new areas of technology and creativity, or from important national or “mission” goals such as achieving climate-neutral food and farming practices by 2050 (or even earlier).

Innovation ecosystems are made up of entities, their capabilities, and the networks between them. Firms are at the centre of the ecosystem, including larger “anchor” firms, small and medium enterprises (SMEs), and entrepreneurs. Ecosystems also include workers with the right skills, international links, researchers, education and training providers, mentors and investors with deep knowledge and understanding of the industry, and enabling infrastructure and regulations.

The successful SAEs we examined in the inquiry took a deliberate and selective approach to developing innovation ecosystems. We concluded that New Zealand should learn from them, while taking account of our own country’s existing situation and features.

For example, the Māori economy exhibits many of the characteristics needed for firms to innovate, grow and support higher living standards. Māori authorities and SMEs are more likely to export and have higher rates of innovation and R&D than New Zealand firms generally. Formal and informal networks among Māori firms are important mechanisms for diffusing knowledge, exploring innovations and enabling collaboration. Māori firms typically have shareholders with high ambition who are willing to take a long-term view – allowing time for experimentation, innovation and long-term value creation.

We recommended the Government take some specific, important steps to help build dynamic innovation ecosystems in areas of existing or potential strength.

- Run a broad and collaborative process to reach agreement on the areas of focus for high-performing innovation ecosystems. Choosing areas for focus should not be a top-down exercise led by government. Rather, government must partner with industry, researchers, workers, Māori, and education and training providers to understand emerging innovation possibilities. Through such an approach, partners can identify ways of collaborating and making complementary investments that will get the ball rolling faster and overcome bottlenecks and barriers.
- Set up the right governance arrangements for effective outcomes. These should be at two levels: a high-level council to exercise strategic leadership and broad coordination, and a more bottom up governance body for each of the areas for focused innovation.
- Overcome the tendency to spread resources too thinly and inadvertently create a “mish-mash” of uncoordinated and fragmented support schemes. Resources and schemes must be aligned and sufficient to avoid the risk of support “doses” being sub-therapeutic. This has happened often in New Zealand’s history.
- Use the ambitious reform of research, science and innovation (RSI) (Te Ara Paerangi: Future Pathways) to align national research priorities (NRPs) with the areas of focus and other policy priorities, and strengthen business–researcher links, which are often weak in New Zealand. A shift from “science excellence” to “excellence with impact” should be used as an opportunity to make science and research more responsive to industry needs.
- Coordinate efforts across government so that particular policies – like attracting foreign investment and high-skill migrants, providing support for exporters and innovators, regulation, education and training, and investment in infrastructure – are high quality in the areas of focus and aligned to the needs in those areas.
- Require transparency in decisions and regular independent monitoring and evaluation of projects undertaken in the areas of focus.
- Strike the right balance between long-term policy stability and a willingness to adapt when evidence shows that a particular approach or project is not working.

The Government wants to know whether it is heading in the right direction

Our final report and associated documents from the *Frontier Firms* inquiry can be found [here](#). The Government’s response asked us to conduct a follow-on review to evaluate progress on policy settings, workstreams and initiatives relevant to the inquiry findings and recommendations:

Government has asked the Productivity Commission for a follow-on review of Government’s policy settings in 12 months, to determine whether we are shifting the productivity dial and progressing towards a more sustainable and inclusive economy, or whether more radical change is needed. (New Zealand Government, 2022e, p. 14)

Such a review is a first for the Commission.

This report assesses progress made to date

This report sets out the key findings of our follow-on review and makes recommendations on how we think the Government should proceed, given New Zealand's current situation, to improve the chances of establishing high-performing innovation ecosystems, so lifting productivity and wellbeing in Aotearoa New Zealand.

We note that it is not quite two years since we published the final *Frontier Firms* report in April 2021. It is too soon to expect to see outcomes in the form of successfully functioning innovation ecosystems in areas of focus. Rather, the review has examined the direction of travel, and the progress, of policy and programme implementation, within the context of the desired outcomes.

The review's approach has been to assess progress at two levels.

- What progress has the Government made on individual policies, programmes and recommendations of the *Frontier Firms* final report?
- What is our assessment of progress at an overarching "helicopter view" level?

The in-depth findings from the first level are written up in our detailed observations document (NZPC, 2023a). This main report contains the key messages from the first level, and it provides our overarching view from the second level of assessment. In this report, we also provide recommendations for how to move forward.

We have conducted well over 50 discussions, including with officials, key representatives and participants from industry, research institutions and iwi/Māori business leaders, to build a picture of what has happened, to date. We have reviewed published documents, departmental briefings and other material.

The structure of this report reflects our key findings about:

- establishing national priorities for focused innovation;
- designing and implementing governance arrangements that facilitate partnership, buy-in and co-investment;
- improving support for Māori businesses;
- alignment across government with the areas of focus;
- innovation-enabling regulation;
- monitoring, evaluation and learning; and
- moving forward from here to achieve success.

We believe that the findings and recommendations in this review are relevant to responses to global events that have been prominent since the *Frontier Firms* inquiry: heightened geopolitical tensions, awareness of pandemics, and the worsening impacts of climate change. Together, these events are prompting country leaders and policy makers to emphasise resilience. For example, the US and countries in Europe are using industry policy to reduce dependence on vulnerable supply chains, and to promote innovation. The US has enacted the Inflation Reduction Act and the Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act, which will authorise the investment of billions of public funds for resilience via infrastructure and support for strategic industries including semiconductors, artificial intelligence (AI) and renewable energy.

Aotearoa New Zealand also has strategic vulnerabilities and major challenges in climate change mitigation and adaptation. The challenge of achieving greater resilience adds to the reasons for following the Commission's recommendations in its *Frontier Firms* inquiry and in this review on developing effective areas of focused innovation. Indeed, our current inquiry on improving economic resilience builds on the base of ideas from our work on frontier firms (see NZPC, 2023b).

Part 3

Establishing effective focused innovation policy

Recap on key recommendations

Choosing areas of focus

The Commission in its *Frontier Firms* inquiry recommended that the Government work with a body of experts and senior leaders to choose a small number of areas of the economy in which to focus innovation effort, to raise firm productivity and export success (while ensuring other wellbeing objectives are met). The Government should support these focus areas with substantial funding (in the order of \$30 to \$50 million each year for each area). This should be conditional on the private sector at least matching this funding.

We recommended that, in deciding on areas for focus, the Government should take as a starting point the work underway in its industry strategy to develop industry transformation plans (ITPs).

We also recommended that the Government's research, science, and innovation (RSI) strategy should set priorities and provide substantial funding aligned with the Government's industry strategy.

Governance, implementation, monitoring and evaluation

The *Frontier Firms* report recommended that the Government should put in place transparent arrangements for the governance, implementation, monitoring and evaluation of its focused innovation strategy. We recommended a two-tiered approach.

- Overall governance of the strategy (including selection of areas for focus) should be through a body of experts and senior leaders that would be responsible for setting strategic directions, recommending areas for focus, and overseeing the strategy as it proceeds.
- Governance in each chosen area of focus should be devolved to independent multi-stakeholder bodies. Each body would make decisions on resourcing, implementation, monitoring and evaluation of initiatives within its area of focus.

We also stressed that focused innovation policy is necessarily experimental and adaptive, and requires a strong commitment to monitoring, evaluation and timely adjustment of the overall strategy and its component parts.

In contrast to these recommendations, we found that the Government had chosen areas for focus in its industry strategy "through interactions between officials, government ministers and bilateral

engagements with selected industry representatives, rather than through a visible, wider multi-stakeholder process” (F7.7, NZPC (2021, p. 127)).

The *Frontier Firms* report also found that administration of ITPs under the industry strategy “is largely in the hands of officials, when emerging international practice favours devolved multi stakeholder governance of strategy and specific initiatives in the chosen focus areas.” (F7.7). The report further notes that a commitment to monitoring, review and evaluation of the strategy and its component parts was lacking.

The Government has yet to establish a complete package of governance, funding and evaluation arrangements for focused innovation policy

Chapter 7 of the *Frontier Firms* report sets out the key features of effective focused innovation policy (in addition to those set out in the recommendations above). International experience suggests that, to be fully effective, focused innovation policy must put in place a near-complete package of all these features.

Focused innovation policy must, in selected areas of the economy, provide a credible path to material economic impact, which means having:

- governance and implementation processes that develop a shared view in chosen areas of what is needed for success, and that build links and collaboration among researchers, firms and government agencies;
- government and private co-funding of initiatives to bring forth common and realistic perspectives on opportunities for success;
- a focus on new activities (rather than support for business as usual) combined with a willingness to take an experimental “portfolio” approach, accepting that not all initiatives will succeed;
- transparent monitoring and evaluation of initiatives, adjusting the mix over time; and
- a consistent but adaptive approach to strategic direction that allows sufficient time for innovative initiatives to bear fruit.

To reduce the risk of established interests capturing policy for private benefit, focused innovation policy must also be transparent about the key judgement calls on where to focus effort, as well as about the nature, extent and target of government assistance.

Finding 1

Effective focused innovation policy comprises a near-complete package of complementary measures consisting of:

- collaborative governance and implementation;
- substantial government and non-government co-funding;
- a relentless focus on new activities;
- transparent monitoring and evaluation; and
- a consistent but adaptive approach to strategic direction.

We have reviewed progress in prioritising effort in the RSI system and through the Government's industry strategy

In reviewing progress on focused innovation policy, we have looked across RSI initiatives, the Government's industry strategy and other relevant initiatives.

At the time of the *Frontier Firms* inquiry, the Government had published a draft RSI strategy (MBIE, 2019a). The *Frontier Firms* report recommended that, in finalising the RSI strategy, the Government should clearly align it with the industry strategy and assign a significant quantum of RSI resources for that purpose. Subsequently, the Government replaced the draft RSI strategy with a new approach to designing a future RSI system: Te Ara Paerangi: Future Pathways (Box A).

Box A Te Ara Paerangi: Future Pathways

In 2021, the Government issued its Te Ara Paerangi Green Paper, on the future of the RSI system. After receiving extensive submissions, it published a White Paper in December 2022. Te Ara Paerangi sets out a high-level roadmap to enable the RSI system to better meet the needs of New Zealanders, now and into the future (albeit leaving details on resourcing, policy processes and implementation for later decision).

The Government aims to increase investment in innovation; grow connections between research, industry, and other end-users; increase investment in and deliver greater impact for Māori and Pacific people; attract more international investment and promote more international collaboration on innovation; and better attract and retain a skilled RSI workforce.

These aims reflect an assessment that New Zealand's RSI system is currently too small and fragmented, lacks system-wide direction, and is insufficiently responsive to evolving national needs. The White Paper also identifies under-representation of Māori and Pacific people in the workforce and women in senior roles; lack of career stability; and the need for more diverse pathways between academia and the industry, government, health, and social sectors.

Te Ara Paerangi sets out the Government's intention to establish National Research Priorities (NRPs) to align resources and focus collective action on areas of critical importance. The Government is designing a process for choosing NRPs and implementing them over the next several years. It intends to channel a greater proportion of RSI resources to mission-led research to tackle social, environmental, and economic challenges and opportunities.

Over time, the Government will also review the form of and funding arrangements for public research institutions – such as Crown Research Institutes (CRIs) – and make changes that better enable them to contribute to the Te Ara Paerangi vision.

Source: New Zealand Government (2022i).

Te Ara Paerangi could be a vehicle for focused innovation policy, as envisaged in the *Frontier Firms* report. However, much will depend on the way national research priorities are selected, funded and implemented in future years. For instance, while Te Ara Paerangi recognises the industry strategy, the extent to which the ITPs will be considered as part of the NRPs is undecided.

Te Ara Paerangi expresses a high-level commitment to increase the impact of an “adaptable” RSI system in achieving societal goals. Adaptability implies effective monitoring and evaluation – both of individual RSI initiatives and programmes, and of the overall strategy – but the White Paper does not say anything substantial about monitoring and evaluating the impact of policies and initiatives, or about adjusting the RSI strategy based on evaluation.¹

Industry transformation plans have made some progress

As part of its industry strategy, the Government, in 2020, identified five “high-potential” areas of focus to enable “the scaling up of highly productive and internationally competitive firms” (Box B). The Government has since made steady progress on developing ITPs in these areas of focus. The work has been led by the Ministry of Business, Innovation & Employment (MBIE) and the Ministry for Primary Industries (MPI). Officials have used advisory, steering and working groups to develop the ITPs, involving business and union interests, Māori and, in a few cases, academics and researchers. The Cabinet approves consultation drafts and final versions of ITPs.

Despite useful progress, the industry strategy and the five “high-potential” ITPs lack some key features that we have recommended for effective focused innovation policy. While these ITPs are at different stages of development (with some still in draft form), none of the ITPs yet has sufficient funding to support material innovation effort likely to make a significant economic impact. Lack of sufficient funding has adverse consequences for effective policy.

- With only a few exceptions, research and academic organisations do not appear to be significantly engaged in the design and implementation of the ITPs.
- None of the ITPs has yet identified and put in place innovation initiatives that have drawn in substantial co-funding from businesses – suggesting that they are still far from making a demonstrable economic impact.²
- Governance of the strategy for each ITP is still effectively in the hands of the Cabinet, which approves the final form of ITPs on the advice of officials (albeit taking into account advice from stakeholder groups).
- ITPs tend mostly to set out actions which cover their whole respective sectors, with a seeming reluctance to choose specific areas for more focused innovation effort. A few ITPs plan to identify areas for focused effort, and to investigate specific innovation infrastructure (such as expanding “product accelerator” provisions, or the Food Innovation Networks), but these are subject to further work and have uncertain outcomes in terms of future resources.

1 MBIE, as a complement to the Government’s then-draft RSI strategy, published a position paper on the impact of research. “It [did] this by presenting an impact measurement framework, and establishing principles, definitions and measurement approaches. It also [set] out MBIE’s expectations for public research funders, public research organisations and researchers” (MBIE, 2019b, p. 1). MBIE advises that this work is being taken forward through the Te Ara Paerangi process (pers. comm. 17 March 2023).

2 The Agritech ITP is one of the earliest dating from mid-2020. Business investment has since flowed into the Agritech sector at higher rates than previously (TIN, 2022). Potentially, the ITP is a factor supporting this increase.

- Most of the government funding allocated to ITPs is likely to be taken up by government officials implementing the identified actions and initiatives.
- In areas covered by the two primary sector ITPs, major government-supported innovation effort is taking place largely separate from the work of the ITPs. This calls into question the role of the ITPs in leading transformative innovation.
- The industry strategy as a whole – and individual ITPs – continue to lack a clear and well-resourced focus on monitoring and evaluation.

Box B High-potential industry transformation plans

Advanced Manufacturing: The Advanced Manufacturing ITP was published in March 2023. The plan identifies 20 initiatives under six priority areas for future action. The ITP does not focus on advancing specific technologies or product areas. Rather, it sets out a range of sector-wide actions, covering all manufacturing in New Zealand. One initiative (14) intends to “complete a map of the current networks of support for advanced manufacturing”, while another (15) aims to develop a preferred model to strengthen networks and collaboration. A further initiative (16) is to “prepare a Business Case for a potential *Aotearoa New Zealand Centre for Advanced Manufacturing Excellence*”. Initiative (17) aims to “review, adjust and expand initiatives that link innovation, research and development, and science with commercial outcomes” including the New Zealand Product Accelerator, and other initiatives aligned with Te Ara Paerangi priorities. Budget 2022 appropriated a contingency of \$30 million in total for the Advanced Manufacturing ITP to cover the 2022–23 and 2023–24 years. Initiative (3) includes investigating accelerated depreciation and other mechanisms to increase investments in advanced manufacturing technologies (New Zealand Government, 2022b, 2022j, 2023b); O’Riley (2023).

Agritech: A refreshed Agritech ITP was published in January 2023 (with submissions invited by April 2023). The first Agritech ITP was published in July 2020. Progress to date has been around better identifying agritech as a potential export sector in its own right, identifying issues facing the sector, supporting participation by New Zealand agritech firms in international trials, facilitating investment in the agritech sector through establishing the Finistere Aotearoa Fund,³ and better measuring and publishing the story (used in the United Kingdom) of the New Zealand agritech sector. Another ITP initiative, run with with New Zealand Trade and Enterprise (NZTE), was a regional accelerator programme for nine agritech companies, targeting Latin America. Callaghan Innovation and NZTE have also helped showcase New Zealand agritech companies in other markets. Subject to a detailed business case, the refreshed ITP includes a proposed Horticulture Technology Catalyst to build domestic alignment and access to international connections, access to skilled labour and overall critical mass.

3 This fund is valued at up to \$40 million with half of this investment coming from each of New Zealand Growth Capital Partners (established in 2002 by the New Zealand Government) and from Finistere Ventures (Finistere Ventures, 2021).

Box B continued

The ITP sets out other initiatives in six areas, including building “a smart innovation ecosystem through collaboration that attracts international interest” (p. 14). This includes improving access to trialing and testing facilities for agritech solutions. The ITP sets out a high-level framework for measuring progress. Budget 2020 appropriated \$11.4 million for the Agritech ITP for the three years to 2022–23. Budget 2022 appropriated a further \$5 million for the Agritech ITP in 2023–24. (New Zealand Government, 2022b, 2022j, 2023a; NZPC, 2021)

Digital Technologies: The Digital Technologies draft ITP was published in January 2022, with a list of almost 50 actions. The ITP has a significant focus on skills and talent development (building on the Digital Skills and Talent Plan released in October 2021), growing exports (working with NZTE and Callaghan Innovation), building Māori participation, telling the sector’s story, increasing understanding of the economic value of data, developing a strategy for the safe adoption of artificial intelligence (AI) technology, and promoting changes in government procurement to benefit the sector. Budget 2022 appropriated \$7.26 million in 2022–23, \$7.04 million in 2023–24 and \$4.5 million in 2024–25 for the Digital Technologies ITP. (New Zealand Government, 2022b, 2022d, 2022j)

Food and Beverage: The Food and Beverage draft ITP was published in December 2022. The plan proposes 16 actions to achieve 4 broad transformations. The second transformation is “increasing investment in innovation and attracting capital for growth”. Actions under this theme include increasing support for the Food Innovation Network (FIN), developing between one and three open-access scale-up facilities in industries with significant opportunity, identifying a current entity as the entry point to the food innovation system, forming a network of specialist navigators (include Māori navigators) to support businesses with development requirements, and mapping and improving access to capital for scaling up. Other transformations are to strengthen the focus on consumers and markets; build capabilities in the sectors; and tackle regulatory issues to enable food innovation, while protecting Māori interests. Budget 2022 appropriated a contingency for the primary sector ITPs of \$7 million in 2023–24, \$15 million in 2024–25 and \$14 million in 2025–26. (New Zealand Government, 2022a, 2022h, 2022j)

Forestry and Wood Processing: The Forestry and Wood Processing ITP was published in November 2022. The plan sets out almost 40 actions in 12 priority areas. These areas include driving science and innovation across the sector, using data and analysis to lift performance and innovation, increasing the use of technology, and increasing the manufacture of advanced wood-based products. The ITP also proposes actions around developing the future workforce – building on the work of the Forestry and Wood Processing Workforce Action Plan. Budget 2022 appropriated \$4 million in 2022–23 for the Forestry and Wood Processing ITP, and a share of the primary sector ITP contingency in later years. (New Zealand Government, 2022g, 2022j)

Other initiatives have some of the key features of focused innovation policy

We reviewed a small selection of other initiatives that have some of the key features of focused innovation policy. Again, while these initiatives are promising, they lack some features – such as overall governance arrangements, or well-formed links with other initiatives – that would make them a more integral part of an overall economic strategy.

The Centre for Climate Action Joint Venture, announced by the Government and industry partners in October 2022, has the scale, mission and ambition of focused innovation policy we envisaged in our *Frontier Firms* report (Box C). The initiative could form part of a suite of NRPs, if these were already in place. Instead, the announcement of the joint venture has largely passed under the radar of the current thrust of both industry and RSI policy. This is illustrative of the fragmentation that often characterises current approaches.

Box C Centre for Climate Action Joint Venture

In October 2022, the Government announced a joint venture to tackle on-farm greenhouse gas emissions, as part of the establishment of the Centre for Climate Action on Agricultural Emissions. ANZCO Foods, Fonterra, Ngāi Tahu Holdings, Ravensdown, Silver Fern Farms and Synlait are participating with the Government in the 50:50 long-term joint venture. The Centre combines the new joint venture with the existing New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC) (created in 2009).

The joint venture will drive a targeted research and development programme, support the pathway and uptake of new tools and technologies, and develop partnerships and raise funds to finance the development of potential solutions to reduce agricultural emissions. Current research at the Centre includes jointly funded research on beef and lamb genetics, and on the development of a methane-inhibiting bolus for ruminants.

“Initial indicative commitments would see around \$172 million invested over the next four years by industry and government to develop and commercialise practical tools and technologies for farmers.” Industry partners in the joint venture have made indicative commitments that will rise to around \$35 million in 2025, matched by the Government. The Government’s contribution is part of almost \$340 million in funding over four years, announced in Budget 2022, to strengthen the role of research and development in reducing on-farm emissions.

The board of the joint venture, chaired by Sir Brian Roche, brings together senior leadership experience in the primary industries, research science and innovation, mātauranga Māori and government.

The Government is also working with the NZAGRC to attract PhD and post-doctoral students into this area of research. It will invest \$9 million over six years for this purpose.

Source: Minister of Agriculture (Hon Damien O’Connor) (2022); Centre for Climate Action on Agricultural Emissions (n.d.).

The Sustainable Food and Fibre Futures (SFF Futures) fund has substantial overall scale and draws in economically significant industry co-funding (Box D). Even so, it lacks a strong overall strategic focus, and has only indirect connections with the primary sector ITPs. According to some industry participants, the SFF Futures fund is light on support for food processing, as opposed to growing and gathering food. The SFF Futures fund's predecessor, the Primary Growth Partnership, included a strong commitment to evaluate funded initiatives, and the overall performance of the fund (NZPC, 2021, p. 137). Such a commitment is not yet evident for SFF Futures projects although MPI officials have assured us that evaluation will be rigorous. The officials have also recently promoted the fund to food processors which has stimulated applications from them (pers. comm. 26 April 2023).

Box D Sustainable Food and Fibres Futures fund

The Government established the Sustainable Food and Fibre Futures (SFF Futures) fund in 2018, to replace the Primary Growth Partnership fund and the Sustainable Farming fund. The SFF Futures fund provides co-funding for a deliberately broad range of primary sector research projects. Budget 2022 appropriated \$68 million for the SFF Futures fund in 2022–23. MPI expects private sector co-funding for projects expected to have commercial outcomes in the order of 60%. Funded projects can range from small (costing around \$100 thousand) and short term, to large multi-million and multi year programmes of research.

MPI, assisted by an advisory group, assesses eligible projects against nine criteria which include sustainable benefits to New Zealand, innovation that is beyond business as usual, a clear path to market or other application, the ability to deliver, good governance, the fit with relevant government strategies, and reflection of Te Tiriti o Waitangi partnership. Benefits to New Zealand can be environmental, economic, social or cultural.

The SFF Futures fund Investment Advisory Panel comprises six members with extensive primary sector business and research experience, including Māori business experience. MPI makes the final decision on projects where the government contribution is less than \$1 million, with the Minister of Agriculture making the final decision on projects larger than that.

Source: Ministry for Primary Industries (n.d.).

Innovative Partnerships is a programme led by MBIE. Though relatively small in scale, the programme has features that would contribute strongly to focused innovation policy in chosen areas (Box E). Innovative Partnerships attracts world-leading technology companies to base operations in New Zealand, and so contributes to developing innovation ecosystems here.

Box E The Innovative Partnerships programme

MBIE runs the Innovative Partnerships programme to help R&D intensive businesses connect, collaborate, and invest in New Zealand. Budget 2022 appropriated \$9 million in 2022–23 for the programme, half of which is to fund its administration.

The aim is to attract international businesses using world-leading technologies to take up opportunities for product development in New Zealand. MBIE helps such companies make connections with relevant New Zealand businesses, agencies, research organisations and universities. The programme promotes New Zealand's advantages as a location for innovation – pointing to its skilled workforce; favourable regulatory environment for businesses and for testing new technology; policies to support innovation through grants, assistance in kind tax credits, and the availability of investment visas.

The Innovative Partnerships programme has worked with a variety of international companies, often through signing memoranda of understanding. Partners include Axiom Space (a US firm that builds space programme infrastructure), the Japanese gaming development company JP (which is working with the New Zealand Centre for Digital Excellence in Dunedin), Maxar Technologies (a space and data analytics company), Wisk (a California-based company developing electric air taxi technology), Shiratori, a Japanese pharmaceutical and high-value nutrition company (working with AgResearch on probiotic bacterium products), and Airbus (which has signed a letter of intent around testing its unmanned aircraft technology in New Zealand).

Source: MBIE (2022a); New Zealand Government (2022b).

Recent expressions of the Government's economic strategy have put less emphasis on focused innovation policy

We have reviewed recent communications on the Government's high-level economic strategy. Earlier advice on the strategy (in the context of Budget 2022) recognised the importance of focused innovation policy. More recently, in September 2022, the Government released an economic plan in which it emphasised the need for innovation across "all businesses" in the economy (although it also referenced a range of specific initiatives, such as the ITPs) (New Zealand Government, 2022f). The Government appears to be working to implement existing initiatives in its industry strategy, rather than taking stock and launching a fresh approach based on the *Frontier Firms* recommendations.

Finding 2

The Government has yet to establish a complete package of governance, funding, and evaluation arrangements for focused innovation policy, as the Commission recommended in its *Frontier Firms* report. Even so, the Government is implementing a range of initiatives which could provide elements of an effective strategy for focused innovation policy.

The Government should build on existing and emerging initiatives to take focused innovation policy to a new level

Te Ara Paerangi provides an opportunity for the Government to build focused innovation policy along the lines recommended in the *Frontier Firms* report. A subset of the proposed NRPs should be in areas of focus that are chosen to raise firm productivity and export success (while ensuring other wellbeing objectives are met).

High-level governance of focused innovation policy

We strongly recommend the establishment of a high-level governance body to work with the Government to:

- select the NRPs;
- monitor the strategic direction as the NRPs are implemented; and
- advise the Government on adjustments or complementary policies and initiatives that would help the NRPs better achieve their desired outcomes.

In our *Frontier Firms* report, we recommended that the high-level governance body to select areas of focus should comprise a group of “stakeholders” (senior government ministers and officials, top industry representatives (firms and workers), and leading researchers and educators). We have heard strong reservations about whether “stakeholders” should have a role in selecting areas for focus. The concerns revolve around the risk that such stakeholders will adopt positions that benefit their own, rather than New Zealand’s collective interests. Another concern is that these stakeholders will favour existing businesses rather than yet-to-be-established businesses operating with novel technologies and/or in novel areas of production.

Looking at international experience with such bodies (Crawford, 2021; NZPC, 2021), we believe these risks can be managed by having a membership of experienced senior leaders balanced across industry, government, the research community and educators. The Government can reinforce this approach by selecting members for their individual expertise and promotion of New Zealand’s interests – rather than their representation of specific interest areas – and by setting expectations in a terms of reference. A governing body needs to have collective expertise in New Zealand’s strategic interests, research and innovation policy and practice, innovative business strategies, mātauranga Māori, the application of advanced technologies, skills development and building effective workforces.

Building areas of focused innovation

We strongly recommend that the Government work with other stakeholders (such as industry, researchers, Māori, educators) to build chosen areas of focused innovation.

Briefly, successful policy requires:

- a clear mission or focus on specific outcomes and impact;
- a credible path to successful outcomes;
- commitment of substantial government and private sector resources to achieve those outcomes; and
- devolved independent governance for each focus area, which recognises and takes care of the collective strategic interests of stakeholders (the form of such governance will likely differ across areas of focus to best match circumstances, such as the scope of innovation and the size and number of enterprises involved).

Current policies and initiatives have some, but not all, of these desired characteristics. The Centre for Climate Action Joint Venture has a clear mission, strong connections linking researchers with business outcomes, long-term commitment of substantial funding from Government and business, and independent expert governance. The ITPs have made substantial progress in working with industry and other interests to identify common perspectives on how to improve outcomes in each sector.

Te Ara Paerangi has identified a way forward for the RSI system which can produce greater prioritisation of effort (through establishing national priorities) and build stronger links between researchers and businesses. The primary sector collectively has a large resource devoted to research and innovation, with a focus on economic applications (for example through the CRIs and the SFF Futures fund), but various entities and initiatives would benefit from greater coherence and a more prioritised and strategic focus.

Officials have already learnt, in different ways, about collaborating with counterparts in business, worker organisations, research institutions and educators to get a shared picture of strategic directions. The Government should use this learning to renew the design and implementation of focused innovation policy. Most comparative small advanced economies (SAEs) have long experience with designing and implementing focused innovation policy, and they have built up a culture and understanding of how to do it effectively (Crawford, 2021).

Based on international experience and expert analysis, we strongly recommend that the Government adopt an adaptive learning approach to focused innovation policy. Not all initiatives will be successful, and others will meet unanticipated barriers and setbacks that require tackling through changes to policy or regulation, or by implementing further measures. Adaptive policy requires a commitment to the monitoring and evaluation of the broad strategy, and of component initiatives.

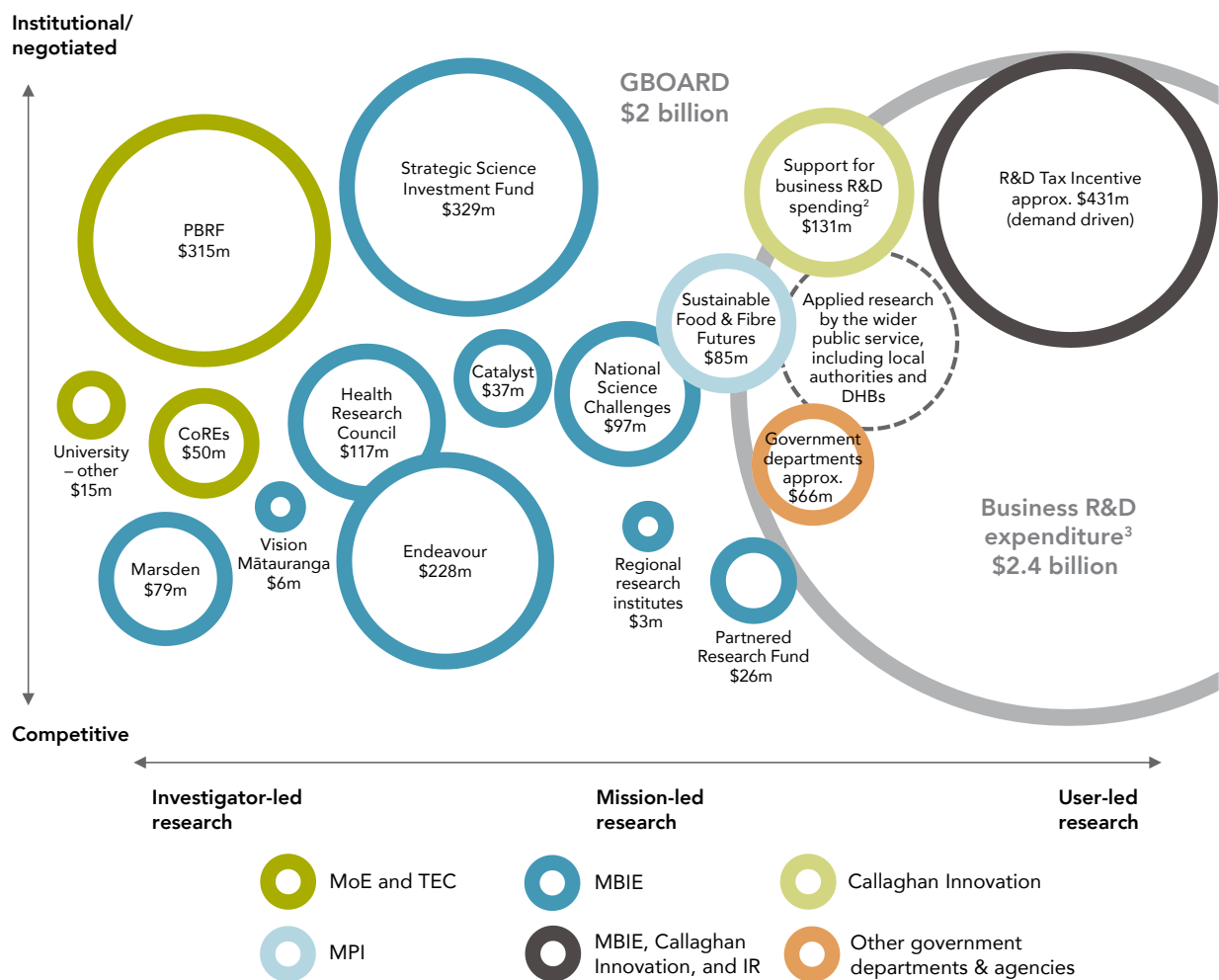
The Government should take strategic decisions about the balance of research, science and innovation funding

Te Ara Paerangi (Box A) sets out the Government's intention to increase government funding for the RSI system as a proportion of GDP, to increase total (public and private) spending on R&D to 2% of GDP (it stood at 1.4% in 2020), and to move a greater proportion of RSI resources to mission-led research. The Government also faces choices around how much of its RSI resources should support innovative activity that will have direct impacts through higher productivity and export competitiveness. We recommend that, in deciding on NRPs, a high-level governance group set up for the purpose should also help the Government to make choices around the overall balance of RSI funding.

The Government devotes substantial resources to support business R&D

Given that the directions set out in Te Ara Paerangi have yet to be implemented, funding for RSI is currently broadly similar to that described in the *Frontier Firms* report. Figure 4 shows the balance of funding on two dimensions: who determines the topics of government-funded research, and the way in which funding is decided. It also shows which agency administers each of the RSI funds.

Figure 4 Projected funding for research, science and innovation, 2021–22

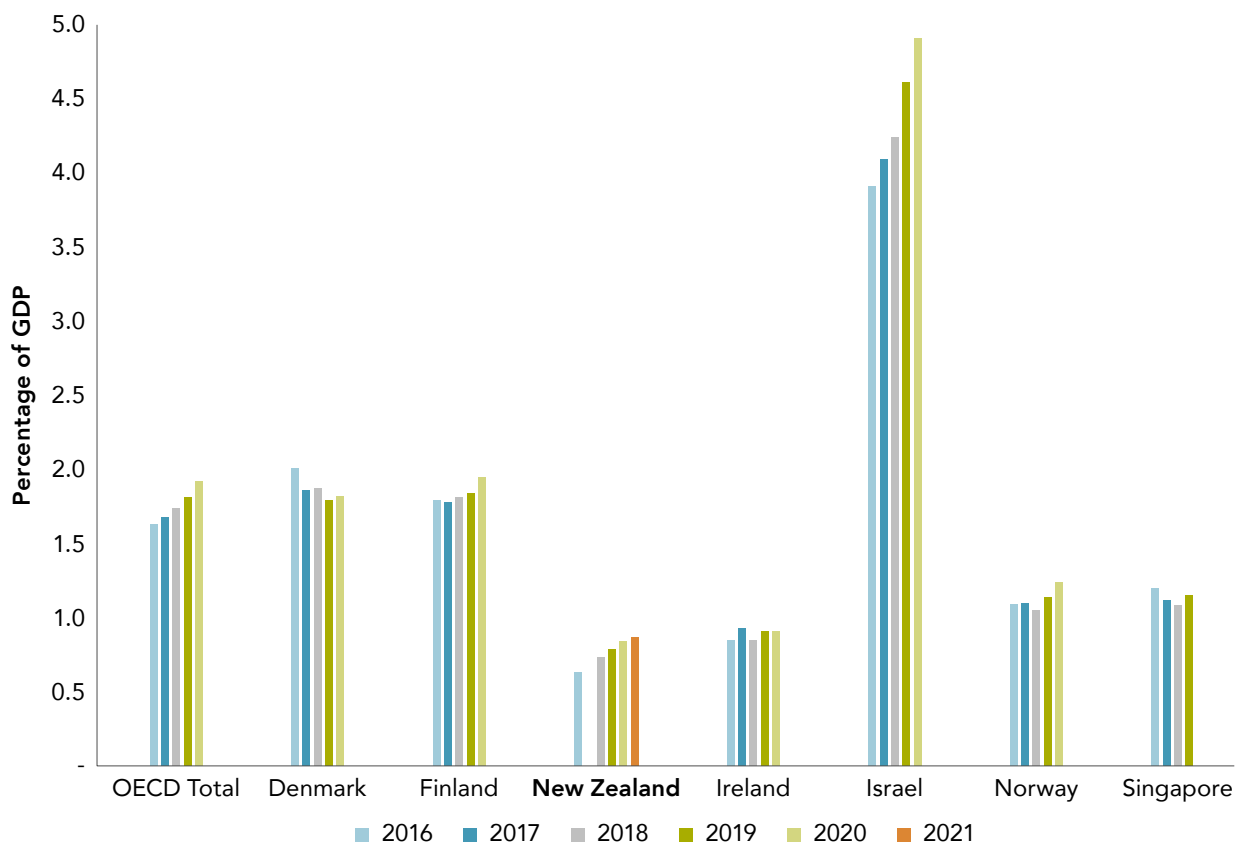


Source: MBIE, updated from MBIE (2019a)

- Notes:
1. Dollar amounts represent appropriations used in the GBOARD (Government Budget outlays and appropriations on R&D) calculation. The figure reports projected funding for the 2021–22 financial year, to exclude recent one-off funding in response to COVID-19.
 2. Support for business R&D spending, delivered by Callaghan Innovation, includes R&D grants, services and repayable loans. It excludes the R&D Growth Grant, which no longer accepts applications: the R&D Tax Incentive has replaced it.
 3. Business expenditure on R&D is based on the Business R&D Survey.
 4. Funds that support investigator-led research mostly go to universities and research institutes, and funds that support user-led research mostly go to innovative firms.
 5. Abbreviations: CoRE: Centre of Research Excellence, DHB: District Health Board, IR: Inland Revenue, MBIE: Ministry of Business, Innovation and Employment, MoE: Ministry of Education, MPI: Ministry for Primary Industries, PBRF: the Performance-Based Research Fund, TEC: Tertiary Education Commission.

Stronger growth in business expenditure on R&D (BERD) is the most significant change from the projections for 2021–22 in Figure 4. BERD stood at \$2.8 billion in 2021 – \$400 million higher than projected in Figure 4 (Stats NZ, 2022). Even so, while BERD as a proportion of GDP has risen strongly in New Zealand over the last five years from a low base, it remains well below BERD in comparable SAEs, and in the OECD overall (Figure 5).

Figure 5 Business R&D (BERD) as a percentage of GDP: selected countries



Source: OECD (2023).

Notes: Figures from some countries may pertain to the previous year.

Between 2019 and 2022, the Government replaced Growth Grants for business R&D with the Research and Development Tax Incentive (RDTI) (Box F). The RDTI (nominally 20% of government expenditure on RSI) should stimulate further growth in BERD.

Box F The Research and Development Tax Incentive

The Government has successfully introduced the Research and Development Tax Incentive (RDTI) over the last three years, replacing the previous Growth Grant programme that supported business R&D. The RDTI is an example of a desirable, broad-based innovation policy that recognises the wider social and economic benefits of business innovation. The *Frontier Firms* report noted that “strong evidence exists that tax incentives to raise firms’ R&D are effective both in increasing private sector effort and in raising productivity” (p. 90).

The RDTI provides a 15% tax incentive for eligible business R&D activity incurring eligible expenditures. The scheme is administered jointly by Inland Revenue (which assesses the eligibility of business entities and expenditures, and approves tax incentives), Callaghan Innovation (which advises Inland Revenue on the eligibility of R&D activity) and MBIE (which leads the design of policy and monitors the scheme in the context of wider RSI policy).

Firms can apply for General Approval in advance of undertaking R&D, which provides them with assurance that they will receive the incentive for their R&D activity, provided they continue to meet the eligibility requirements. General Approvals can be granted for up to three years. The Government is bringing in a system of “in-year” payments to help firms incurring the cost of R&D to better manage their cashflows.

Budget 2022 appropriated around \$473 million for the demand-driven scheme, representing about 20% of all government RSI outlays. Even for the 2021–22 tax year, the actual number of firms receiving tax credits and the total value of those credits will not be known for some time, as supplementary returns for that year are not due till May 2023.

Early teething problems with the RDTI appear to have been resolved with more business-friendly guidance, greater familiarity with eligibility criteria, and in-year payment of the RDTI. Officials have advised us that a majority of firms that previously received Growth Grants have transitioned to the RDTI. They have been regularly monitoring applications for and processing of General Approvals, as well as the submission and processing of supplementary returns. The number of applications and submissions has risen steadily. At the same time, processing times have shortened (in part reflecting applicants’ greater familiarity with requirements). The profile of firms participating in the RDTI scheme is a reasonable match for relevant firms reporting R&D activity in Stats NZ’s Business R&D Survey. Legislation prescribes that the RDTI be independently reviewed every five years, with the first review due after the end of the 2023–24 tax year.

Source: Inland Revenue (2021a, 2021b); Callaghan Innovation, Inland Revenue & MBIE (2023); New Zealand Government (2022c); NZPC (2021).

Finding 3

The Government has successfully replaced Growth Grants for business R&D with the R&D Tax Incentive (RDTI). The RDTI should stimulate further growth in business expenditure on R&D (BERD), from a low base. BERD as a percentage of GDP in New Zealand remains well below that in most comparator small advanced economies.

The Government is also introducing two new grant programmes, administered by Callaghan Innovation, that provide support for innovating firms who do not meet the eligibility criteria for the RDTI. First, the New to R&D Grant provides support (capped at \$400,000) for R&D and capability development, for up to two years, for firms that are at the beginning of undertaking R&D activities. The intention is to prepare them to access the RDTI in the future (Callaghan Innovation, 2023).

Second, the Ārohia Innovation Trailblazer is a contestable grant which will support non-R&D innovation activities not covered by other government funding initiatives. It is designed to help businesses whose innovation activity is likely to build capabilities or create opportunities with wider benefits across the New Zealand innovation system. It will be targeted at businesses doing pioneering innovation or building platforms that will help other innovators within New Zealand (Callaghan Innovation, 2022b).

Together, the two grant programmes will total \$250 million over four years (Minister of Research, Science and Innovation (Hon Dr Megan Woods), 2022).

Strategic choices around support for non-R&D innovation

The *Frontier Firms* report noted that “innovation involves far more than developing new products or new production technologies. It includes changes in supply chains, distribution networks, marketing and markets, and the network of relationships among researchers, firms and other economic actors” (NZPC, 2021, p. 89). Innovation in this broad sense can have broader economic benefits than those created by R&D alone.

Innovation is a learning process, as pioneer firms discover what they can produce and export successfully. This benefits other firms that follow in their footsteps, perhaps making their own adjustments to business activity (Hausmann & Rodrik, 2003). For instance, learning may involve adapting existing international technologies to New Zealand’s circumstances, or it may involve discovering how to build effective supply of suitable quality inputs.

Successful innovation may also require the establishment of shared facilities or the coordination of investments, across government, business, researchers and educators. Stalemates can happen when no single firm has the incentive to resource “industry goods”, or to make investments in the absence of necessary things like public infrastructure, skilled workers, regulation or complementary investments by other firms.

Difficulty in coordinating investments, plans and regulatory settings can mean that the potential for beneficial social and economic outcomes is not realised. Current settings in the forestry and wood processing industry illustrate this. The industry exhibits:

- harvesting technology that leaves waste biomaterials with adverse environmental, economic and social impacts;
- a strong contribution to meeting New Zealand's net greenhouse gas emissions-reduction commitments;
- an impending shortage of forestry-derived biomass for existing and new products with environmental benefits; and
- available technology to expand such uses, and to produce high-value biochemicals.

Current government and industry-led initiatives (including the Forestry and Wood Processing ITP) do not yet seem well organised to make the necessary collective strategic choices. These require decisions around regulation, complementary technologies, scale and the combination of business and government actions that will realise the potential for better economic, social and environmental outcomes in forestry and wood processing.

Strong arguments exist for extra focus and effort in areas where this sort of innovation effort is likely to have wider societal and economic benefits. In the manner described earlier, the Government should facilitate focused innovation areas, and contribute funding, taking these benefits into account. Where business commercial interests are involved, those businesses should also make a substantial contribution.

Balancing support for the “new” with realising the innovation potential of existing technologies and industries

Another tension revolves around whether NRPs should support new technologies, and even new industries, or whether they should support innovation in existing industries. We have heard concerns that current decision-making processes around priorities (for instance, in the Government's industry strategy) do not allow sufficient weight for the “new” and risk capture by the “old” (existing technologies and industries).

Innovation is complex, cumulative, risky and path dependent (and somewhat unpredictable) (NZPC, 2021). The economic complexity literature finds that innovation resulting in successful exporting will most likely build on an economy's existing capabilities (Hausmann et al., 2014). Existing capabilities are embodied in current economic activity and in the innovation ecosystem that supports that activity (including government provision of infrastructure, regulation, education and training; supply networks; and knowledge of markets).

Existing industries and technologies can be the platform for productivity-enhancing innovation and export success. A sizeable existing industry (for example, the food and beverage industry in New Zealand) can provide a platform for rapid development and application of new processes and new technologies, with substantial economic impacts.

Even so, successful innovation may also arise in technologies that are apparently novel to New Zealand (see Box E). Other capabilities of the innovation ecosystem – such as supportive regulation, availability of a skilled workforce, existence of suppliers of inputs to production, and complementary infrastructure investments – will be part of the attraction for new technologies.

Fears about the risk of capture of government resources by vested interests underlie some of the reluctance to fund more innovation in traditional industries. The *Frontier Firms* report outlines strategies to mitigate the risks of capture. These include maintaining a relentless focus on innovation; transparency about choice of areas for focus; transparency about the nature, extent and target of government assistance; a requirement for business co-funding for initiatives; and transparent monitoring and evaluation of initiatives (NZPC, 2021; Rodrik, 2008).

In practice, a considerable proportion of the Government's RSI expenditure does support innovation in existing primary industries (through the SFF Futures fund and primary sector CRIs). However, as argued above, this expenditure could achieve greater impact through focused innovation policy given effect through well-selected NRPs. Whether more support from RSI expenditure should be afforded to stimulate innovation in other existing New Zealand industries is a matter for strategic judgement.

Balancing “business pull” with “science push”

We have heard arguments that current funding policy and institutional arrangements place insufficient emphasis on “business pull” as opposed to “science push” as a significant driver of productivity-enhancing research and innovation effort. The Te Ara Paerangi White Paper signalled an intention to increase links between research organisations and industry end-users and, over the next three years, to strengthen support for commercialisation. This includes possibly expanding and adding to existing “entities and networks” such as the New Zealand Product Accelerator and KiwiNet (which link businesses and university researchers), and the HealthTech Activator (New Zealand Government, 2022i, p. 40). The Food and Beverage ITP looks at expanding the Food Innovation Network, while the Advanced Manufacturing ITP proposes expanding initiatives like the New Zealand Product Accelerator. More generally, universities are a large and incredibly important source of research excellence, yet a challenge exists to use that excellence for greater impact and benefit for Aotearoa New Zealand.

The White Paper proposals for expanding initiatives to increase the impact of “business pull” on New Zealand's RSI efforts do not yet have a clear path forward. The choice of NRPs to give effect to focused innovation policy should include attention to how to carry these proposals forward.

Finding 4

The Government has not yet made clear strategic choices around where the balance of its support for research, science and innovation (RSI) should lie. Choices include what proportions of support should be for:

- mission-led research;
- implementing technologies that are new to New Zealand vs supporting innovation in existing technologies;
- non R&D business innovation; and
- initiatives that facilitate “business pull” in shaping public research effort.

The Te Ara Paerangi process, combined with expert high-level governance arrangements for the choice of national research priorities, provides the Government with an opportunity to make clear and considered strategic choices around the balance of its support for RSI.

Part 4

Improving support for Māori business

Recap on key recommendations

Māori firms offer significant potential contribution to sustainable and productive economic growth, but they face barriers and challenges that are constraining their ability to achieve their aspirations. The *Frontier Firms* report made recommendations about how the Government should act to reduce these constraints, to better support Māori firms to thrive, innovate and expand offshore, and to help the Crown meet its obligations under Te Tiriti o Waitangi (Te Tiriti). Key recommendations included:

- accelerating work to protect mātauranga Māori and intellectual property;
- support and resourcing for a national Māori business hui (Hui Taumata), to develop actions for improving the ecosystem of supports for Māori businesses;
- capability-building supports for Māori businesses to participate in government procurement processes;
- enhancing the Māori–Crown relationship to unlock Māori business potential;
- reforming Te Ture Whenua Māori Act 1993 and improving the coordination of government supports to Māori landowners for development purposes; and
- investing in more research into the performance and productivity of Māori businesses.

Refreshed efforts on protecting mātauranga Māori and intellectual property

The 2011 Waitangi Tribunal’s *Ko Aotearoa Tēnei* report (known as the “Wai 262 report”) included recommendations for changes to legislation and government policies and practices relating to indigenous flora and fauna, intellectual property and science (among other things) (Waitangi Tribunal, 2011). The Government’s approach to responding to the issues raised through Wai 262 is Te Pae Tawhiti: a cross-government strategy led by Te Puni Kōkiri (TPK). In January 2022, Cabinet noted that progress with implementing Te Pae Tawhiti had been impeded by the impact of COVID-19. Cabinet agreed to a refreshed work programme to refine and refocus efforts on Te Pae Tawhiti. It also committed \$27 million over four years for TPK to support this work, as part of Budget 2022.

The refocused work programme – Te Tumu mō te Pae Tawhiti – has ten priority areas, including developing a policy and legal system for the protection, promotion and preservation of mātauranga Māori; creating a measurement and evaluation framework to track results; developing a domestic bio-prospecting regime; and undertaking work to support Māori engagement in international treaties and instruments.

Te Tumu mō te Pae Tawhiti includes nine areas of aligned work that are already underway. These include work on the protection of taonga species through reforms to the Plant Variety Rights Act (which was passed in November 2022) and the Resource Management Act 1991.

The work programme also includes strengthening the way the research, science and innovation (RSI) system enables and protects mātauranga Māori. This is being led by the Ministry of Business, Innovation and Employment (MBIE), in the context of Te Ara Paerangi: Future Pathways, and the White Paper set out policy directions (emphasis in original).

We will:

- Partner with Māori to explore development of a dedicated platform for mātauranga Māori expertise in RSI.
- Support the stronger deployment of RSI system resources to the regions, potentially through supporting Māori to establish regional research platforms, or through leveraging improvements in digital connectivity...
- Encourage and support RSI institutions to develop standards and guidelines to ensure researchers have the competency to engage with Māori and te ao Māori, and vice versa (New Zealand Government, 2022i, p. 45).

It also states intentions to ensure appropriate Māori representation at all levels, and to include Māori led priorities in national research priorities (NRPs).

The proposed changes present a double-edged sword for Māori, as they will rely heavily on the capacity and capability of Māori in the RSI system to respond to requests for engagement and support. Their constrained capacity, together with growing demand for engagement with Māori researchers and communities, has been recognised and explored by the Science for Technological Innovation (SfTI) National Science Challenge. SfTI has also observed that Māori input is often assumed to be provided pro bono (Science for Technological Innovation National Science Challenge, 2022, n.d.). Alongside building the future pipeline of Māori researchers, SfTI has identified a variety of mentoring models for supporting the capability of Māori researchers. SfTI has also described changes to research processes that can support Māori innovation in science teams (Science for Technological Innovation National Science Challenge, n.d.).

The overall direction of travel in protecting mātauranga Māori looks promising, but it requires Māori leadership. The Government will need to consider how it can help build the necessary capabilities across the RSI system, to give effect to its policy intentions. Māori should be adequately resourced for their engagement and contributions.

Any new platform that is created as part of the RSI reforms should start by engaging with the existing communities that are deeply involved in this mahi. For example, Rauika Māngai is the existing collective of Māori researchers across the Science Challenges. It is the leading platform for mātauranga Māori implementation, and includes a resource hub (Rauika Māngai, n.d.). Rauika Māngai includes representation from Ngā Pae o Te Māramatanga, which is Aotearoa New Zealand's Māori Centre of Research Excellence, comprising a large network of Māori researchers (Ngā Pae o te Māramatanga, n.d.).

Finding 5

The Government has refreshed and refocused its efforts to protect mātauranga Māori and intellectual property. The Commission believes that the direction set out in the work programme, Te Tumu mō te Pae Tawhiti, looks promising.

Finding 6

Te Ara Paerangi sets out proposed changes to the research, science and innovation (RSI) system to better enable and protect mātauranga Māori. These changes must be Māori led, and they will rely heavily on the capacity and capability of Māori in the RSI system to engage. They are unlikely to succeed unless Māori are adequately resourced for their engagement and contributions.

Government has not proceeded with a single national hui

We recommended that the Government should provide support and resourcing for a Hui Taumata to identify ways to better support the Māori business ecosystem, and to lift Māori firm productivity and growth. The idea was that the Government would not lead this conversation, but support and enable a national discussion by Māori for Māori. A national hui would provide a forum for strategic-level discussions that rise above local-level interests. It would also provide opportunities for making connections and networking across iwi and Māori businesses from different parts of the country.

In its response to the *Frontier Firms* inquiry report, the Government stated that it agreed with the recommendation for a Hui Taumata and would continue to work on this. A national, one-off event has not yet been planned. However, TPK reports that there is a desire among iwi to be able to engage with the Crown on broad economic issues, including government supports for the Māori economy.

Several Māori business leaders who contributed to this review said that an effective way to pursue national-level conversations could be focused discussions on particular topics, rather than an all encompassing discussion across the Māori economy. This might involve a relatively small group of iwi and Māori business leaders – perhaps in a “hackathon”-type format,⁴ focused on developing practical actions. It would require careful background thinking and ideas to facilitate a meaningful conversation.

TPK has been progressing work to support a review of the Māori economic ecosystem. This review is looking at how the Government can better support a resilient Māori economic ecosystem and address barriers, such as difficulties accessing capital, and finding and retaining talent.

4 Hackathons are events where computer programmers gather to develop new approaches to solving problems or completing large projects that require collaboration.

Over 2021–2022, TPK held regional focus groups with over 150 Māori businesses. These hui elicited insights into Māori businesses' strategies for managing the impacts of the COVID-19 environment, the barriers they have encountered, and how they are responding to new opportunities (TPK, 2022e, p. 23).

Other organisations are also progressing work to improve government supports for Māori business. For example, work is underway to improve access to capital by Māori businesses (discussed below).

Māori business leaders who provided input to this review had observed little improvement in supports for Māori business since publication of the *Frontier Firms* report. For instance, one person described examples where government funding/grants are still unresponsive to the circumstances of Māori businesses (for example, by being too bureaucratic or cumbersome for Māori land trusts and structures).

Finding 7

A single national Hui Taumata has not yet been planned. Te Puni Kōkiri has held some regional business hui, and various government agencies are progressing work to improve government supports for Māori businesses.

Progressive procurement policies have exceeded targets

The *Frontier Firms* report noted that Government procurement processes offer potential for stimulating Māori business growth, and that the new 5% target for the number of public service contracts awarded to Māori businesses is a good start. However, to achieve its objectives, this target will need supplementing with capability-building support for suppliers and procurement process improvement by procuring agencies.

The 5% target was part of a suite of progressive procurement settings agreed to by Cabinet in 2020. Progressive procurement is about buyers of goods and services looking beyond price to wider social and public value. It combines elements of social procurement, supplier diversity, indigenous procurement, and wellbeing measures.

Funding of \$7.3 million was allocated through the COVID-19 Response and Recovery Foundation Package to support the Māori economy by accelerating progressive procurement. This resulted in the establishment and funding of a project team, Te Kupenga Hao Pāuaua, to support the design and implementation of the progressive procurement policy. The project is led jointly by MBIE and TPK. Budget 2022 provided the project with an additional \$26 million over two years.

To date, to build Māori business capability, the project team has:

- designed a tender-ready assessment tool called Te Tomokanga, which assesses the capability and needs of Māori businesses to engage in government procurement processes (aimed at supporting businesses that are not currently engaged);
- set up prototypes and initiatives to support agencies to implement the policy and increase the number of Māori businesses engaging with government procurement;

- provided targeted support to 168 Māori businesses so they were tender-ready for government contracts. These businesses subsequently secured government contracts valued at around \$816 million (Minister for Economic and Regional Development (Hon Stuart Nash) & Te Minita Whanaketanga Māori (Hon Willie Jackson), 2023);
- engaged with over 600 Māori businesses spanning 25 industries; and
- piloted the provision of intermediary services through a single organisation, which has included some capability building services and support for verifying Māori businesses.

All mandated government agencies are required to report against their progress in implementing the progressive procurement policy and the procurement target of contracts awarded to Māori businesses.

The project team reviewed the progressive procurement policy and reported back to Cabinet in December 2022. The review found that the 5% target is already being achieved. The first full year of data indicated that 6% of government contracts were awarded to Māori businesses. This meant more than 3,200 contracts were awarded to Māori businesses across the public sector, worth a total of about \$930 million. In December 2022, Cabinet agreed to increase the procurement target to 8%. The target will be reviewed again in 2024.

Some of the Māori business leaders who contributed to this review said they were yet to see a shift in the attitudes and capabilities of public sector procurers, who were struggling to move away from conventional, conservative attitudes and a rules-based approach. This echoes the more general difficulty in effecting a culture shift in public procurement (see p. 44). Some also expressed a desire for greater aspiration and moving beyond a volume target. Suggestions included:

- introducing a value target;
- including reporting breakdowns by sector, and by incumbent vs new entrant firms;
- building greater understanding of what Māori businesses can bring (reflecting their different delivery value); and
- measuring the contribution of procurement to wider outcomes that enable iwi and Māori community development and whānau wellbeing (such as creating employment opportunities, upskilling whānau, and growing the value of assets).

Finding 8

Initiatives to grow public purchasing from Māori businesses have included support to grow the capability of Māori businesses to participate in public procurement processes. The initial 5% target for the number of public service contracts awarded to Māori businesses has already been exceeded, and was recently increased to 8%.

Major reforms to Te Ture Whenua Act 1993 have not been progressed

Major reforms to Te Ture Whenua Act 1993 have not been progressed. The Māori Purposes Act 2022 made some minor amendments to extend certain timeframes for decision making and allow assembled owners of Māori land the option of meeting by electronic means (TPK, 2022a).

However, TPK has expanded its Whenua Māori Service, which provides support to Māori landowners, trustees and whānau to realise their whenua aspirations. Following a pilot programme of regional advisory services, the programme became permanent and nationwide in September 2021 (TPK, 2022e, p. 25).

The Reserve Bank of New Zealand released an issues paper on Māori access to capital in August 2022 (Reserve Bank of New Zealand, 2022a). The issues paper reported the findings of firm-level research that showed Māori businesses face higher financing costs than non-Māori businesses. The issues paper also reported on the findings of stakeholder engagement, which identified additional constraints on Māori access to capital, including challenges in borrowing against community-held whenua Māori, and systemic leadership and decision-making shortcomings in the financial sector. The issues paper set out potential solutions that were raised in wānanga, including improving the ability to use whenua Māori as loan collateral.

The majority of submitters on the issues paper considered that interventions related to establishing a Māori capital provider and use of whenua Māori as collateral should be prioritised (Reserve Bank of New Zealand, 2022b).

The Government has started working with the National Iwi Chairs Forum to address the issues that have been identified. This will include ensuring Māori are able to fully access existing government business support, and exploring how to provide Māori with better access to capital while these changes are made. The Reserve Bank is working with the banking industry to support the development of improved data, and products and services, for Māori.

Some Māori business leaders who provided input to this review emphasised the paramount importance of protecting the land, as it is much more than a business asset. Some also commented on the importance of maintaining aggregation of control and profits, to enable meaningful re-investment and delivery of long-term sustainable growth and value.

Finding 9

Major reforms to Te Ture Whenua Act 1993 have not been progressed. However, Te Puni Kōkiri has expanded its Whenua Māori Service. The Government has also started working with the National Iwi Chairs Forum to address issues raised through the Reserve Bank's work on Māori access to capital.

Te Puni Kōkiri has progressed a research work programme

Te Puni Kōkiri (TPK) has proceeded with a quantitative research work programme and, with our analytical support, is building its in-house capability for firm-level research.

In July 2022, TPK released its second Te Matapaeroa report – *Te Matapaeroa 2020: More insights into pakihi Māori* (TPK, 2022c). This provides updated analysis of trends in Māori businesses and sole traders, including new insights on the role of wāhine Māori in business. Alongside Te Matapaeroa, TPK released a new data visualisation tool that allows users to explore data on Māori businesses, including trends over time, differences by region and industry, and preliminary data on the impacts of COVID-19 (TPK, 2022d).

Most of the Māori business leaders who provided input to this review were unaware of this data set and tool. However, they emphasised the importance of data – particularly data that provide insights at a regional level – to Māori businesses and iwi, for understanding and planning, and ultimately for supporting rangatiratanga. This suggests scope exists for increasing communications to lift awareness and use, and ensuring the tools are accessible.

Planned future research includes longitudinal analysis of the determinants of Māori business growth, and analysis of productivity differences between Māori and non-Māori businesses.

Finding 10

Te Puni Kōkiri (TPK) has progressed a programme of research into Māori business. In July 2022, it released its second Te Matapaeroa report. Alongside Te Matapaeroa, TPK released a new data visualisation tool that allows users to explore data on Māori businesses. Other research projects are underway or planned.

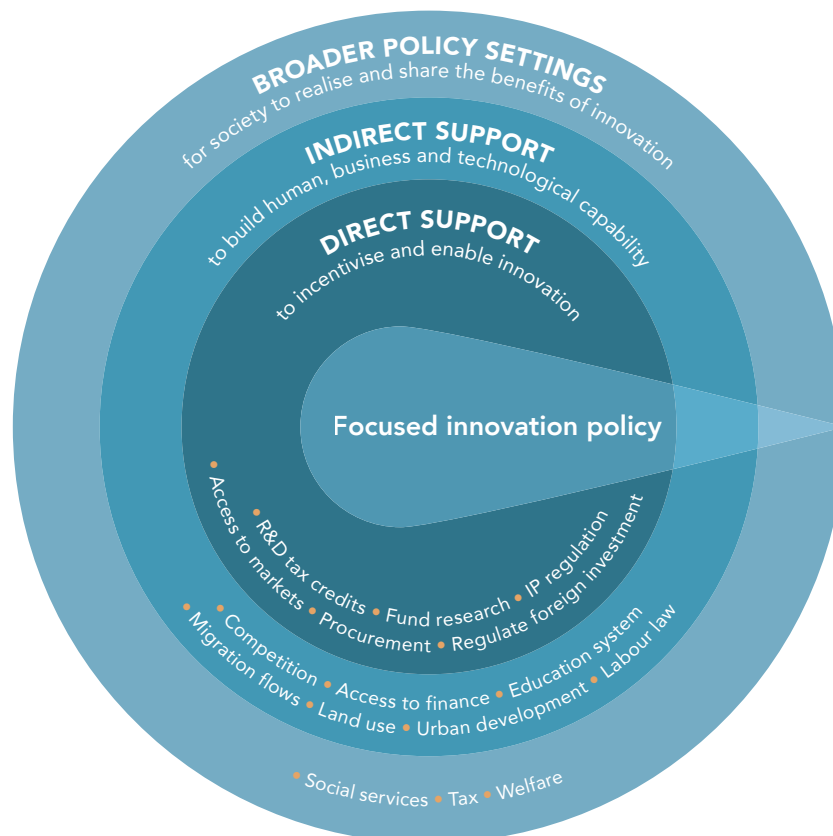
Part 5

Alignment with areas of focus across government

Recap on key recommendations

In its *Frontier Firms* report the Commission found that a successful strategy of focused innovation requires policy settings and institutions in the focus areas to be world class, and that the Government and others need to devote sufficient attention and resources to that end. The *Frontier Firms* report illustrated this with a diagram, replicated in Figure 6.

Figure 6 Policy in the focus areas needs special emphasis and to align



The concentric circles show policy settings that support businesses, workers and researchers to succeed and to achieve wellbeing across all industries in the economy. The horizontal tear drop represents how these same policies should operate at a higher level in the areas of focus. The difference is largest for direct support policies such as research funding and smallest for broad policies such as social services.

What this means is that while policies in the following non-exclusive list of domains should serve all users, they need to be excellent in, and aligned to, the areas chosen for focused innovation.

- Support for exporters
- Support for innovation (eg, Callaghan Innovation services, intellectual property (IP) regulation)
- Investment attraction
- Skills: education and training
- Research system and research funding (see Part 3 on “Establishing effective focused innovation policy”)
- Immigration
- Government procurement
- Regulation (see Part 6 on “Innovation-enabling regulation”)
- Infrastructure

It is difficult to review progress on such alignment without agreement on areas of focus. As noted, industry transformation plans (ITPs) are only a partial step towards such agreement and the process to determine national research priorities (NRPs) has a long way to go. Even so, with the exceptions noted, this part of the report describes what has been happening in the above policy domains and notes progress with, and opportunities for, focus-area alignment.

The *Frontier Firms* report called for rationalising and simplifying the confusing plethora of support initiatives across multiple government agencies. Businesses and others require greater clarity about, and easier access to, programmes designed to help them grow and thrive (NZPC, 2021, R6.4, p. 115).

The Government is reviewing support for exporters and internationalisation

The *Frontier Firms* report recommended that the Government should assess the effectiveness of the support for exporting and exporters provided by New Zealand Trade and Enterprise (NZTE) (NZPC, 2021, R5.2, p. 88). In response, the Government asked the Ministry of Business, Innovation and Employment (MBIE) to lead an Internationalisation Support Review (ISR).

After starting with a wide scope, the ISR’s focus has narrowed. MBIE is working closely with NZTE on ways to improve alignment of NZTE’s Focus Customer support⁵ with the Government’s Economic Plan⁶, generate greater spillovers to the wider economy, and improve additionality of support.

5 NZTE’s Focus Customers are the 1,400 firms that it works with most intensely because of the capability and capacity of these firms to grow, their international ambition, their direct economic impact to New Zealand, and the NZTE’s ability to add value to their activities (NZTE, 2022a, p. 18).

6 The Government’s Economic Plan is set out in New Zealand Government (2022a).

The ISR is not focusing on NZTE's potential to strengthen innovation ecosystems. However, it is exploring options for how the International Growth Fund can be used to make a greater contribution to the Government's broader economic objectives (pers. comm. from MBIE 6 April 2023). The review progressed through 2022 but is not yet complete.

NZTE remains committed to its strategy to grow a larger New Zealand cohort of value-adding, at-scale, international companies targeting niches where New Zealand has (or can build) competitive advantage (NZTE, 2022b, 2022a). It deploys most of its resources and support on a sub-set of exporters most likely to fit the characteristics of a frontier firm (or potential frontier firm). This is the NZTE Focus portfolio. In addition, and partly as a response to our *Frontier Firms* recommendation for NZTE to support innovation ecosystems, NZTE has re-structured and formed three sector teams (Food, Beverage and Consumer Goods; Technology and Services; and Manufacturing) to support the Government's Industry Transformation Plans (ITPs) (NZPC, 2021, p. 142; NZTE, 2022a). NZTE sees ITPs as the Government's chosen mechanism for building areas of focused innovation. (pers. comm. from NZTE 6 April 2023). NZTE leads several ITP workstreams that support innovation and exporting.

If the Government backs the development of areas of focused innovation in the way we recommend in *Frontier Firms*, we would expect to see NZTE services emphasise the needs of firms in those areas, and for NZTE to apply a preference to serving such firms.

Finding 11

The Internationalisation Support Review is not yet complete, but indications are that the Government and officials are using it as an important opportunity to:

- examine the mix of services to evaluate those that are most effective in helping innovative firms overcome the fixed costs of starting to export or expanding to new products and/or markets; and
- tailor NZTE services and funding to some extent to the needs of firms within industry transformation plans, as potential areas of focused innovation.

Another important dimension of internationalisation consists of flows of knowledge, which includes absorbing knowledge from overseas; collaborating internationally to create and use knowledge; and transferring domestically generated technologies, products, and services. The Te Ara Paerangi: Future Pathways White Paper pledged to put greater funding into supporting researchers to collaborate internationally, including in relation to NRPs. (New Zealand Government, 2022i, p. 41) It promised to complete a formal Association with Horizon Europe but otherwise gave no details on how these aspirations will be implemented.

Support for innovation

Callaghan Innovation has built into its new strategy the concepts of frontier firms and areas of focus (it calls them “sectors with high potential”) and has started a Frontier Ventures programme. “Frontier ventures” is Callaghan Innovation’s term for frontier firms – “the most productive and innovative New Zealand businesses, with a global outlook and huge export potential” (Callaghan Innovation, 2022a, p. 2). Callaghan Innovation also states that it will “focus on high potential sectors [which] provides a mechanism to offer targeted innovation support aligned with Government priorities, such as ITPs or research priorities” (Callaghan Innovation, 2022a, p. 2). Callaghan Innovation is therefore trying to build into its strategy and programmes the vision of frontier firms and innovation ecosystems in areas of focus. Yet, until the Government is clear on its priorities, Callaghan Innovation will have to somewhat guess these, or choose what they are.

Finding 12

Callaghan Innovation has responded to the *Frontier Firms* report by building the concepts of frontier firms and focused innovation ecosystems into its new strategy. Yet, until the Government is clear on focus areas, agencies like Callaghan Innovation must choose these themselves, and this risks fragmentation of efforts across government.

Callaghan Innovation and NZTE work with large but separate sets of business “customers”. NZTE has 1,400 firms with which it works intensively, and Callaghan Innovation has around 1,000 such customers, and they have told us that around 400 of these are customers of both. NZTE and Callaghan Innovation are collaborating better by identifying common customers, sharing some information about them, and improving handovers. Yet our view, based on discussion with the two agencies, is that scope exists to improve alignment across these two core frontline agencies.

Finding 13

While Callaghan Innovation and New Zealand Trade and Enterprise are collaborating better to serve common business customers, scope exists to improve alignment across them to support innovation ecosystems in areas of focus.

Education and training

Areas of economic strength in countries are crucially underpinned by the availability of workers with the requisite specialised knowledge and skills in those areas. Yet a common feature across the high potential ITPs is a serious shortage of skilled workers in those industries.

The main source of skilled workers is the domestic education and training system, with immigration providing a supplementary channel of varying importance, depending on the country.

The domestic education and training system has the important task of building human, social, business and technological capabilities broadly. Even so, under a focused innovation strategy, it also needs to emphasise skills, knowledge and training in the areas of focus. Just how the system best does this is a difficult, long-term challenge involving aspects of university and vocational education, as well as primary and secondary education.

In higher education, an example of targeted skills development is the Centre for Climate Action on Agricultural Emissions. As part of the Centre, the New Zealand Agricultural Greenhouse Gas Research Centre is funding a strong programme of PhD and post-doctoral research in the area (Box C).

Te Ara Paerangi recognises the need to improve career pathways for young researchers including by reducing the current overreliance on short-term and casual contracts. It noted that stable and rewarding career pathways are needed, to attract and retain a talented and diverse workforce (New Zealand Government, 2022i, p. 29). The White Paper also recognised the need to “facilitate researchers to address the challenges” reflected in the NRPs (p. 38). Yet it does not include a concrete plan to achieve this desirable goal, and Te Ara Paerangi has not yet identified a clear set of NRPs.

New Zealand is implementing a new architecture in vocational education: the consolidation of separate former polytechnics in a single national institution (Te Pūkenga) and the creation of industry specific Workforce Development Councils and Regional Skills Leadership Groups. The reforms are still bedding in, and it remains to be seen how far they will realise their intended benefits. So far, little or no deliberate strategic targeting of resources to producing skills in areas of focus is apparent in the new architecture. For example, the shortage of skilled digital workers prompted the umbrella group IT Professionals NZ, under the auspices of the Digital Technologies ITP, to produce a 2021 report on the significant shortfall and mismatch in the domestic supply of digital skills and talent (IT Professionals New Zealand, 2021).

Immigration is essential for a high-skills industry such as Tech, however it's currently at an unsustainable level – more than 50% of new roles are filled via immigration. Other highly skilled industries often operate at 20-25%.

Industry needs to invest in domestic skills development, not just expect they can just keep buying skills in. Government needs to support initiatives and help drive change, and the Education Sector needs to support this transformation. (p. 5)

The report contains a skills plan with ten actions. Other similar digital skills plans exist (New Zealand Digital Skills Forum and NZTech, 2021), and the industry has launched some initiatives. Despite these, the scale of industry, government and education sector efforts and collaboration is not enough for digital technologies, as a potential focus area, to thrive and achieve its potential.

Finding 14

The supply of enough workers with specialised skills and knowledge in focused innovation areas is critical to the success of these areas. This task falls primarily to the domestic education and training system and secondarily to immigration policy. The domestic education and training system is not yet geared up to play this role effectively.

An investment attraction strategy is still a work in progress

The *Frontier Firms* report recommended that the Government take a more proactive and deliberate approach to attracting foreign direct investment (FDI) that is innovative, oriented to exporting, likely to stay long term and a source of spillover benefits. (NZPC, 2021, R5.1, p. 86). It should also align FDI attraction to areas for focused innovation.

In its 2020 election manifesto, the Government signalled an intention to develop an investment attraction strategy (IAS). MBIE officials told us that they are working on aspects of investment attraction and expect to progress this work with the Minister of Economic and Regional Development over the next few months. New programmes to attract desirable FDI may emerge when the new IAS is revealed. We have pointed to successful programmes run by other small advanced economies (SAEs) such as Ireland, Denmark and Singapore. These are clearly more deliberate and better resourced than New Zealand efforts.⁷

NZTE is primarily responsible for investment support on behalf of the government. Its dual focus is attracting high-quality FDI to New Zealand and assisting New Zealand firms to raise capital. NZTE seeks to facilitate international investment that is “good for New Zealand” so that it makes the greatest positive impact on the wider economy. It has specific criteria for judging when international investment is “good for New Zealand” (NZTE, 2022b, p. 12). These criteria are consistent with FDI that creates spillover benefits although export orientation receives less emphasis. Since July 2020, NZTE advised us that it has helped complete 61 deals involving international investors, bringing FDI of \$1.98 billion to New Zealand (pers.comm. 6 April 2023).

In the absence of an explicit IAS, officials across several agencies (that is, MBIE, NZTE, MFAT, MPI, Callaghan Innovation and the Overseas Investment Office (OIO)) work collaboratively to smooth the pathway for attractive FDI prospects. Agreement exists on the desirability of investments that are greenfield, cutting-edge and in areas novel to New Zealand. One strength is the country’s ability to get some things done quickly (such as OIO clearances and developing some regulatory regimes, like regulations for a space industry). New Zealand also gains from its reputation for lack of corruption, ease of doing business, and being clean and green. NZTE has recently launched a marketing campaign pointing to some of these potential attractions (New Zealand Trade and Enterprise, n.d.). But, competition is tough, especially when other countries often allocate greater resources and are more proactive, in addition to offering generous financial incentives to attract investment.

⁷ For more information about FDI attraction programmes in other countries, see Box 5.2 in the Commission’s *Frontier Firms* report (NZPC, 2021, p. 84).

Overall, there is a sense that New Zealand is opening and increasing its efforts to attract international investment following COVID-19 border shutdowns. However, New Zealand's efforts remain low-key in comparison with those of many other SAEs, and, in the absence of clear areas of focus, explicit targeting of investment attraction to them is not yet on the agenda.

Finding 15

Work on developing an investment attraction strategy is an opportunity to set policy to attract foreign direct investment (FDI) that is innovative, oriented to exporting, likely to stay long term and a source of spillover benefits. Policy design can also make provision to align FDI attraction to areas for focused innovation once these areas are chosen.

Immigration settings

Immigration policy is not being used to foster innovation ecosystems

Immigration is another policy area that needs attention, if it is to support thriving innovation ecosystems in areas of focus. The Government has introduced a new investor visa, the Active Investor Plus Visa. However, this visa applies neutrally across the economy and is aimed at attracting investors (albeit active as opposed to passive ones, which is a welcome shift) rather than migrants with high-level skills.

In the final report for our *Immigration: Fit for the Future* inquiry, we recommended that the Government make it easier for top talent to enter New Zealand to help develop innovation ecosystems in areas of focus. We called for Immigration New Zealand to work with businesses, researchers, educators, iwi and other stakeholders to identify, prioritise and refine, over time, the conditions of entry of top talent (NZPC, 2022, p. 65). Applying greater weighting to migrants with talent and skills in focus areas would be one way to achieve this. Top talent consists of migrants with the skills, knowledge, smart capital and international connections to help innovation ecosystems become world class.

To date, the Government has not made significant moves to use immigration tools to foster high performing focused innovation ecosystems.

The Edmund Hillary Fellowship Programme selects an annual cohort of international and domestic fellows that, over several years, has built to a sizable community of over 500 people. The programme's aim is to attract innovators, entrepreneurs and investors to New Zealand:

...to collectively solve pressing issues facing humanity, through a globally unique visa programme. Today, the Fellowship is a community of 500+ people from New Zealand and around the world who are tackling local and global challenges, from climate change to social inequities to business growth and productivity. (Edmund Hillary Fellowship, n.d.)

This programme is another example of where selection could be weighted towards those with talent and expertise in the areas for focused innovation. Currently, this does not happen, and it will be difficult to do until areas of focus are well defined.

No clear commitment to transition away from seasonal migrant labour

The *Frontier Firms* report found that some New Zealand industries, including in the primary sector, rely heavily on temporary migrant labour to meet their seasonal employment needs. We concluded that this dependence is likely to be stifling innovation and investment in labour-saving production methods such as automation, and therefore acting as a brake on achieving higher productivity and wages.

If horticulture were identified as an area of focus, the industry would have to lift its productivity game and reduce its reliance on a continuing and growing supply of low-wage temporary migrants. Immigration policy settings would need to be aligned to support the industry's transition away from seasonal migrant labour. However, recent policy changes work against this objective, and could undermine other government initiatives to stimulate technology development and automation.⁸

Changes that have been signalled in the Government's "rebalancing" of immigration policy include a reduction in the number of temporary visas, and increased limitations on routes to residency for some temporary migrants. However, while the reforms introduce median wage thresholds for most employers, exemptions will apply for some sectors that currently rely on lower-skilled migrant workers (Immigration New Zealand, 2022a). Meanwhile, in September 2022, the Government raised the cap on the number of Recognised Seasonal Employers (RSE) workers by 3,000, to 19,000 for the 2022–2023 year (Immigration New Zealand, 2022b). This is the largest single increase in the cap since 2009.

Review of RSE scheme is not focused on productivity

MBIE has commenced a review of the RSE scheme, which is due to report back to Cabinet for policy decisions in June 2023. This review could be used as an opportunity to incentivise growers to innovate and shift towards lower reliance on seasonal migrant labour, and to address human rights concerns with the scheme. However, MBIE notes that resolving the range of issues that have been identified with the scheme involves balancing the benefits to workers with the costs to employers, and will not guarantee either productivity or Pacific development outcomes in the long-term (MBIE, 2023, p. 11–12). From a productivity perspective, failure to ensure (and price in) basic worker wellbeing – and, more fundamentally, to address the power imbalances inherent in the scheme – imply that productivity differentials between RSE and local workers are overstated. In turn, this will encourage ongoing firm reliance on underpriced seasonal migrant labour and do little to support the development of automation and innovation.

Finding 16

The current review of the Recognised Seasonal Employer (RSE) scheme provides an opportunity to incentivise growers to innovate and shift away from a reliance on seasonal migrant labour, and to address human rights concerns. However, the way the review is being undertaken suggests it will do little to encourage innovation, or to address the needs and concerns of Pacific Island countries and their RSE workers.

⁸ See the more detailed *Frontier Firms* review document for a description of initiatives in the Horticulture Technology Catalyst initiative under the Agritech ITP (NZPC, 2023a)

The fragmentation of support has not been fundamentally addressed

The *Frontier Firms* report recommended the Government review the large collection of programmes intended to assist firms with innovation and exporting, and make it easier for businesses to learn about and access programmes by:

- reducing and consolidating the number of programmes;
- simplifying the process for firms to apply for assistance; and
- making it easier for firms to identify and access relevant programmes, including by providing a common platform and “front door” across programmes. (NZPC, 2021, R6.4, p. 115)

Officials told us about taking steps to help businesses by means of the third method mentioned above, but did not report using the first method – of rationalising, reducing and consolidating the number of programmes offered by different agencies. At best, these efforts have provided web-based tools to help businesses navigate the underlying complexity, rather than reducing it.

Even so, agencies seem to be achieving greater awareness of the overlaps between the supports that they offer, and many of them serve common clients. As noted above, Callaghan Innovation and NZTE have taken steps to identify common clients, share information and improve handovers.

An initiative from the Fit for a Better World (FfBW) primary sector programme illustrates how much overlap and complexity exists across agencies. Officials from MPI, MBIE, Callaghan Innovation, NZTE and Kānoa – Regional Economic Development and Investment Unit have formed the FfBW Investment Acceleration Team, with a shared Microsoft Teams platform and fortnightly meetings. This initiative has revealed a lot of overlap in the businesses supported by the different agencies and prompted a “one door in” approach for new inquiries from businesses. This is a worthwhile step, but scope clearly exists for rationalisation across individual-agency programmes and initiatives. Officials acknowledge this, but work on it is yet to begin.

Further efforts are needed to build innovation-supporting skills in public procurement

In the *Frontier Firms* report, we noted that the Government can play a role in supporting innovation through its purchases. However, even when innovation is made an explicit objective of government procurement policy, it can conflict with traditional procurement goals such as ensuring value for money. The effectiveness of government procurement in stimulating innovation therefore depends on the skills and capacity of procurers – in particular the ability and appetite to manage risk and uncertainty.

In November 2021, Cabinet agreed to a reset of the government procurement system, to achieve greater public value from government procurement. In February 2022, the Government agreed to refreshed strategic priorities for procurement. One of the desired features of the refreshed system is that it will “encourage and foster innovation” through the way the Government manages its contracts and supplier relationships (Minister for Economic and Regional Development (Hon Stuart Nash), 2021 para 36 and footnote 4, p. 10).

Guidance material mentions innovation, but does not provide practical advice on how to weigh innovation with other dimensions of value, or balance it against risk (New Zealand Government Procurement and Property, 2021a, 2021b). A report back to Cabinet in 2022 found that the capability of public procurement practitioners remains patchy, with many continuing to take a “rules-based approach”, rather than the desired outcomes-based approach (Minister for Economic and Regional Development (Hon Stuart Nash), 2022).

These findings suggest further efforts are needed to build the new skills and capacity required to support innovation through public procurement. Research shows that the specific qualities needed in public procurement professionals include a culture of experimentation and risk taking, and top-level management support for allowing a higher level of procurement risk and uncertainty (Stek, 2021). More practical guidance is also needed on how to balance traditional procurement objectives with the risks and uncertainties inherent in innovation.

Finding 17

Policy development and implementation in activities such as innovation, exporting, investment attraction, education and skills, procurement and immigration should be excellent in the areas agreed for focused innovation, and should be aligned with the needs of those areas. However, this is not happening much. Where it is happening, the efforts are hampered by lack of clarity about the areas for focused innovation.

Part 6

Innovation-enabling regulation

As part of well-functioning innovation ecosystems, it is important that regulation is conducive to innovation. While it's desirable to have good regulation across the economy, it is especially important to have it in the prioritised areas of focus. In the *Frontier Firms* report, we emphasised the need for good regulatory stewardship to achieve these goals, and made recommendations on some specific regulatory regimes, as part of case studies of significant industries.

A good system of regulatory stewardship ensures that regulation keeps pace with technology and enables innovation. The Treasury has recently published a new regulatory stewardship resource for departments (The Treasury, 2022). This guidance prompts departments to consider how well their regulatory systems can accommodate emergent and potential future innovations in technologies or business models.

Regulatory Systems Amendment Bills (RSABs) are omnibus legislative vehicles that enable statutory provisions to be kept up to date, in line with the original intent of the legislation (they do not permit significant policy change). They were created in response to the Commission's 2014 inquiry into regulatory institutions and practices, which noted that it can be difficult to find time on the parliamentary calendar for "repairs and maintenance" of existing legislation (NZPC, 2014). RSABs are used by the Ministry of Business, Innovation and Employment (MBIE) and other large regulatory agencies. To date, five RSABs (developed by MBIE, the Ministry of Transport and the Department of Internal Affairs) have been passed, each of which amended between six and 24 Acts. Several more are underway.

We have also identified some isolated examples of work to review, improve and develop innovation-enabling regulatory systems that has occurred since our *Frontier Firms* inquiry was completed. For example, work under the Government's Innovative Partnerships programme to support the development of ecosystems in transformative technology areas and emerging sectors. This includes supporting regulatory and policy settings, such as work by the Ministry of Transport, the Civil Aviation Authority (CAA) and MBIE to create an enabling regulatory environment for advanced unmanned aircraft (MBIE, 2020). It is important that regulatory regimes are designed and resourced in a way that enables and does not stifle innovation.

Progress against our recommendations on specific regulatory regimes has been mixed.

The latest amendments to Dairy Industry Restructuring Act risk reinforcing Fonterra's market power

In 2022, the Government passed further amendments to the Dairy Industry Restructuring Act 2001 (DIRA) that further shore up Fonterra's ability to maintain its high market share of farmer suppliers. This appears to be another case of changing regulations at the company's behest (in this case to facilitate Fonterra's capital restructure), with too little regard to the potential negative impacts on competition and innovation in the wider sector. The capital restructure dramatically reduces a farmer-supplier's requirement to own Fonterra shares and has reduced the share price by a large amount (around 50% at one stage). This further inhibits existing suppliers leaving Fonterra (because it would crystallise a large loss on sale of their shares) and encourages new entry. An important context for this move is that total milk supply in New Zealand appears to have peaked, making it more difficult for processors to find suppliers of raw milk. At the same time, Fonterra is still the dominant milk processor in New Zealand – the purchaser of 79% of total milk volume (down from 96% in 2001) – and so still possesses substantial market power.

Encouragingly, Fonterra states that it is committed to innovation as part of its new strategic direction to achieve greater value from existing milk supply, given that the days of a growing supply are over (Fonterra, 2021). Added to this, Fonterra and New Zealand dairy generally need to retain or gain social licence for their industry, in terms of a smaller negative environmental impact.

Fonterra says its higher-value products will centre on business-to-business ingredients associated with the huge rise in interest in nutrition as part of healthy and active living. This interest is strengthening as the incomes of the large populations in Asia grow.

To enhance its social licence, Fonterra is converting the energy source for some of its milk dryers from coal to either wood biomass or electricity (using highly efficient industrial heat pumps). It is also participating in the Centre for Climate Action on Agriculture Emissions, which aims "to strengthen the role of research and development for new tools and technology to reduce on-farm emissions." (Minister of Agriculture (Hon Damien O'Connor), 2022) Under the umbrella of the Centre, a joint venture has been set up – involving the Government, ANZCO Foods, Fonterra, Synlait, Ravensdown, Silver Fern Farms and Ngāi Tahu – which plans to spend \$170 million over 4 years, with that figure co-funded by the Government and the private partners (see Box C).

The Government is introducing a regime for consumer data rights

The *Frontier Firms* report recommended the Government introduce a regime to enhance consumer data rights (NZPC, 2021, R10.3, p. 177).

The Government (with MBIE leading) is progressing the introduction of a regime for consumer data rights, to allow consumers to securely share data held about them with trusted third parties. The regime will be rolled out sector by sector, starting with banking – which is key to the development of innovative services and greater competition through what is known as "open banking". Other countries such as Australia are ahead in open banking but have encountered teething problems.

Sensibly, the Government is taking time to develop policy, to learn from the Australian experience and avoid those problems. MBIE is working effectively with key stakeholders such as banks, the banking API Centre⁹, the Commerce Commission, the Office of the Privacy Commissioner, the Department of Internal Affairs, and Māori (especially regarding indigenous data rights).

In his opening statement to Parliament on 21 February 2023, the Prime Minister, Hon Chris Hipkins said the Government will introduce legislation establishing a consumer data rights framework this year. The Minister for Commerce and Consumer Affairs, Duncan Webb, is enthusiastic, having stated, “it’s a real ambition of mine...If I can move this along, and it makes things more effective, better for people, better for the finance sector and better for consumers, I think that’s something to be really proud of” (Moore, 2023).

Potential innovations and wins from an effective open-banking regime include e-invoicing, cheaper and easier payment services, auto receipts and reconciliation, identity and trust services (such as for anti-money laundering purposes), lower compliance and administrative costs for business, mortgage services, and paperless guarantees and warranties. Overall, it ought to enhance competition and consumer choice in financial services.

The Government has signalled discussions on genetic modification with the primary sector

The *Frontier Firms* report found that the regulation of genetic modification (GM) does not reflect technological advances, since the regime was last reviewed in 2001. It recommended that the Government should undertake a full review of the GM regulatory framework, to ensure it is fit-for-purpose and supports domestic innovation.

In its response to the *Frontier Firms* inquiry, the Government stated that it considers it timely to start informed conversations around New Zealand’s use of GM technologies. Some progress has been made since then.

- The Ministry for the Environment has begun work to improve the regulatory requirements for genetically modified organisms (GMOs) for laboratory research, and for biomedical research and development. This work does not include reviewing the regulatory settings for field trials, conditional releases, or full releases of GMOs.
- The draft Food and Beverage ITP included a proposed action to “hold a discussion with the food and beverage sector on the role of genetic technologies in the sector’s future” (New Zealand Government, 2022h, p. 5).
- The *Aotearoa Horticulture Action Plan* released by the Government in February 2023 includes an action to “lead formal discussion on the role of advanced breeding techniques ([for example], gene technologies) to speed innovation” (Ministry for Primary Industries, 2023, p. 18).

⁹ The banking API Centre is managed by Payments NZ, an organisation owned by New Zealand banks for the purpose of enabling an efficient payments system. APIs (application programming interfaces) are software tools that set standards that enable different software systems to “talk” to each other and perform a set of tasks.

- Te Puna Whakaaronui has published a report on the current state of genetic technology and its regulation (Te Puna Whakaaronui, 2023). The report aims to provide a neutral evidence base to support an informed conversation around GM and its regulation. It notes that, among Aotearoa New Zealand and its main trading partners, the UK, the EU and New Zealand are the only jurisdictions where the regulations remain purely process based, as opposed to the product traits-based approach of other countries. Both the UK and EU are in the process of regulatory changes that (if passed) would exempt certain gene-editing techniques from broader GMO regulations.

Work is underway to improve systems for importing new plant varieties

The *Frontier Firms* inquiry found that constraints in the post-entry quarantine (PEQ) system for new plant material are choking innovation in the primary sector. We made recommendations for the work undertaken by the Ministry for Primary Industries (MPI) on designing new PEQ facilities and improving the efficiency of the import health standards processes.

Progress appears to be in line with the *Frontier Firms* recommendations, including working on investing in larger interim and permanent PEQ facilities, looking for ways to speed up plant importation times, and exploring cost recovery options. MPI is working with industry to implement a joint industry/government strategy for the plant germplasm import pathway (Plant Germplasm Import Council, 2022).

Health reforms show mixed indications for innovation

Under the recent major health reform, Te Whatu Ora – Health New Zealand and Te Aka Whai Ora (the new Māori Health Authority) appear to be taking health innovation seriously. Dr Dale Bramley has been appointed to fill a new position – the National Director, Service Improvement and Innovation. This is in addition to a position of General Manager Emerging Health Technology and Innovation, Data and Digital (held by Jon Herries), as well as an Institute for Innovation and Improvement based at Te Whatu Ora, Waitematā with a Director – Evidence, Research and Clinical Trials, Dr Robyn Whittaker, who was previously a champion of innovation at Waitematā DHB. These appointments and positions are a positive sign for health innovation following the reform.

A \$350 million investment is going into a national health computer/information system, Hira. This is a flexible, multi-use platform for health consumers and providers for which some 200 APIs have been built, with new ones coming onstream over time. Te Whatu Ora, as a Crown Entity, has the flexibility to enter into commercial partnerships; DHBs did not have this flexibility. Te Aka Whai Ora is a world first for indigenous healthcare. As a new organisation unencumbered by legacy systems and precedents, it is pro-innovation and open to new thinking.

On the negative side, from the perspective of the healthtech sector, two valued ecosystem institutions are losing government funding: the MedTech Centre of Research Excellence and Precision Driven Health. There was optimism in the digital health sector at the start of the reform, but the feeling now is that momentum has slowed – short, one-year interim service contracts have become the norm and many existing IT projects have been put on hold for review. Uncertainties about where authority and regional boundaries lie complicate negotiations.

A risk exists that the Therapeutics Products Bill, currently before parliament, will stifle innovation and create unnecessary costs because it classifies low-risk health software as a medical device (the definition of Software as a Medical Device is very broad in the current draft). The risk is that new health software would have to be authorised by a Therapeutic Products Regulator. Australia and other jurisdictions have narrower definitions which do not catch low-risk health software (Jensen & Maennchen, 2023).

Finding 18

Progress against the recommendations in the *Frontier Firms* report case studies on specific regulatory regimes has been mixed. It is important that regulatory regimes are designed, resourced and maintained in a way that enables and does not stifle innovation.

Part 7

Monitoring and evaluation



Evaluation practices across government programmes remain weak

As emphasised in the *Frontier Firms* report and the first part of this review, focused innovation policy is necessarily experimental and adaptive. It requires a strong commitment to transparent monitoring and evaluation, as well as timely adjustment of the overall strategy and its component parts. Generally, in our review of progress on focused innovation policy, we have not observed a strong commitment to rigorous monitoring and evaluation. Below are two examples of areas in which we recommended more rigorous evaluation should be adopted.

Evaluation of New Zealand Trade and Enterprise services

The Ministry of Business, Innovation and Employment (MBIE) and New Zealand Trade and Enterprise (NZTE) have been discussing how to improve the evaluation of NZTE services as part of the Internationalisation Support Review (ISR). The aim should be to determine which services are most effective in helping New Zealand firms to internationalise and increase the quantity and value of their exports. NZTE is committed to monitoring and evaluation. It has a suite of measures for engagement and impact that are outlined in its Statement of Performance Expectations (NZTE, 2022b). NZTE has recently restructured and expanded its data team to improve the quality and consistency of its data. This progress is welcome. Even so, implementing our *Frontier Firms* recommendation to tag the firms that NZTE works with in the Longitudinal Business Database, including which services it has received and when would allow more rigorous and objective evaluation. This could be made a condition for firms to receive NZTE services (their anonymity would be protected). Interestingly, Callaghan Innovation's new Ārohia Innovation Trailblazer grants to support firms undertaking non-R&D innovation include such a condition (Callaghan Innovation, 2022b). MBIE and NZTE have both indicated that tagging is likely to happen following the ISR.

Finding 19

The Internationalisation Support Review is an opportunity to progress the Commission's recommendation to improve the evaluation of New Zealand Trade and Enterprise (NZTE) services, by tagging which firms receive which services in the Longitudinal Business Database and making this a condition for firms to receive NZTE services.

Evaluation of schemes to improve leadership

The *Frontier Firms* report described the importance of high-quality management and governance in lifting firm performance – in particular the role of “dynamic” leadership capabilities in fostering innovation. We recommended that the Government take stock and evaluate the range of existing government support for leadership capabilities before developing new schemes, and that any new supports be developed through a collaborative process involving industry, central and local government, iwi and Māori business interests, and private sector providers.

Strong evaluation disciplines are important for ensuring interventions are meeting their objectives. They can also inform the rationalisation of support, by indicating which programmes are not effective, or do not represent good value for money, and should be dropped.

We did not find evidence of a systematic governmental approach to evaluating existing leadership capability building programmes. Some new initiatives are underway or proposed, including a pilot programme on dynamic capabilities by Callaghan Innovation to build innovation and commercialisation skills. This programme has shown promising results for its first cohort. However, in the absence of systematic monitoring and evaluation, and rationalisation of supports, even if this programme proves to be successful, its visibility and effectiveness could be lost in the existing clutter of programmes.

Finding 20

The Commission did not find evidence of a systematic approach to taking stock and evaluating existing supports for leadership capabilities. A new pilot programme for building dynamic capabilities, run by Callaghan Innovation, shows promise. However, in the absence of systematic monitoring and evaluation, and rationalisation of supports, even if this programme proves to be successful, its visibility and effectiveness could be lost in the existing clutter of programmes.

Part 8

Moving forward

Put in place all the elements needed for focused innovation policy

International experience demonstrates that a complete package of measures is needed to establish and implement effective focused innovation policy. This is because the necessary elements are complementary and interlock – deficiencies in one aspect undermine the effectiveness of other dimensions, and thereby the whole approach.

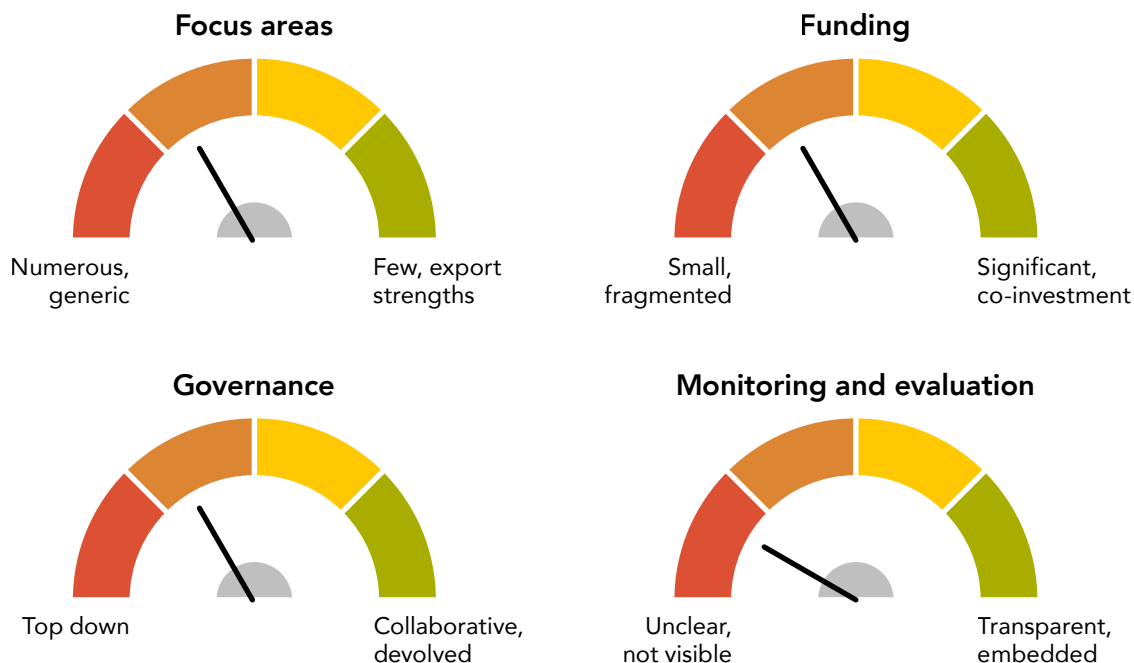
While some aspects of existing government processes and initiatives are promising, key missing elements are:

- a collaborative process for selecting a small number of focus areas aimed at shifting the productivity dial;
- two-tiered governance arrangements, with the right membership and decision rights;
- substantial funding for each focus area; and
- transparent monitoring and evaluation arrangements.

Existing arrangements, including those for developing industry policy and the research, science and innovation (RSI) strategy, fall short in a number of ways.

- The industry transformation plans (ITPs) are underpowered, with insufficient funding and no means of marshalling resources across government portfolios.
- Other initiatives, such as Sustainable Food and Fibre Futures (SFF Futures) have substantial funding, but this funding is scattered, lacking in strategic direction and unconnected to the ITPs.
- Partly because of the lack of funding, most ITPs lack the necessary connections with researchers.
- The actions proposed in the ITPs are too generic – they lack sufficient focus and ambition to spark transformational change.
- The ITPs also lack substantial actions and co-investment by business, with most activities being assigned to government officials.
- Material decision making for the ITPs, selection of the national research priorities (NRPs), and other processes such as SFF Futures, are largely centralised and “top down” (by Cabinet), rather than being collaborative and devolved.

Figure 7 Existing arrangements will not shift the productivity dial



In the *Frontier Firms* report, we emphasised the importance of effective implementation for avoiding the failures of past attempts at focused innovation policy. We made six key recommendations for how to move from the current situation and put in place all the pieces for achieving focused innovation. Implementing these pieces together will create conditions for successful innovation ecosystems that support high-performing frontier firms, which can drive faster productivity growth and greater wellbeing.

1 Use existing initiatives to choose focus areas

Given the current status of government initiatives and programmes, we recommend building on these existing arrangements rather than starting from scratch. The NRP priority-setting process (as a key part of Te Ara Paerangi: Future Pathways) and the high-potential ITPs are the most obvious arrangements to build on. Te Ara Paerangi has significant resources available and involves researchers and (to some extent) businesses. The ITPs have built valuable experience in collaboration on common problems, between government officials, business, workers and te ao Māori.

Not a top-down process

The Government should use the process for setting the NRPs to run our recommended process for choosing areas for focused innovation. To help improve this process, the Government should draw on the experiences with the ITPs and other initiatives (such as SFF Futures and the Centre for Climate Action Joint Venture on reducing agricultural emissions).

Importantly, selecting focus areas should not be a top-down process led by government – rather, the Government must collaborate with industry and other parties to understand emerging innovation possibilities. The Government will need to relax control and demonstrate a high degree of trust in this process. We have looked to successful experiences in other small advanced economies (SAEs) to understand what kind of governance arrangements are effective for selecting and implementing focus areas (discussed below).

Characteristics of a focus area

Not all NRPs would be areas of focus for innovation policy. The focus areas would be a subset of the NRPs (perhaps three or four, initially), and would be:

- specialised areas of production with high existing or emerging exporting strength and capabilities, where Aotearoa New Zealand could be world leading;
- focused on innovation for the purposes of raising firm productivity and export success;
- areas in which the private sector is prepared to make material co-investments; and
- more specific than the generic areas so far identified through the ITPs.

The focus areas need not be based on standard industry classifications, but could span a range of industries (like the creative sector), include upstream and downstream industries (such as biotechnologies that depend on a supply of primary products) or cover technologies that are used across different parts of the economy (for example, digital technologies). One or two of the areas could be mission led; climate change mitigation and adaptation would be a prime candidate.

2 Improve governance arrangements

The Government should establish two levels of governance: a high-level council to provide strategic leadership and broad coordination, and a devolved governance body for each focus area.

The high-level council would provide overall governance of the strategy, including choosing the focus areas and overseeing implementation. Its members would be recognised leaders providing a national or Māori perspective in technical disciplines, mātauranga Māori or other relevant knowledge areas. They would not be there to “represent” particular interests but would take their sector hats off at the door.

International experience shows that having senior political leaders (such as the Prime Minister) on this high-level council can help achieve government buy-in and commitment. Senior political leadership also provides the means to make things happen, including aligning broader policy settings with the focus areas and unlocking resources across government portfolios.

Each focus area should be governed by an independent body with devolved funding and decision rights. The independent body would include senior leaders from research, education, iwi/Māori, workers, and business. These groups would be ongoing, continue to meet regularly, and play a key role in commissioning evaluations and identifying new directions.

3 Commit significant, long-term funding to the focus areas

Aotearoa New Zealand tends to spread funding thinly across numerous areas. These “sub-therapeutic doses” are insufficient to achieve meaningful change. To make progress, material levels of investment are required. Finite government resources therefore need to be deliberately focused on a small number of high-potential areas.

The Government should commit significant funding to each of the chosen focus areas. International experience indicates this should be in the order of \$30 to \$50 million a year for each focus area, matched by industry contributions. Decisions on how to allocate this funding should be devolved to the governance bodies for each focus area, rather than being tied to specific government portfolios.

The Government must be patient and stay the course with its innovation investments, as innovative effort requires time to play out and demonstrate success. This means providing funding and policy certainty over long-enough time horizons. Securing cross-party support for the strategy would help provide policy and funding stability over the long term.

4 Align broader government and business efforts with the focus areas

Boldly identifying a small number of specific focus areas would help government agencies start improving policy alignment and reducing fragmentation. Policy settings across areas such as exporting, innovation, infrastructure, education and training, immigration and regulation may all need to be improved to support world-class innovation ecosystems in the focus areas.

Clearly identified focus areas would also better signal direction to research institutions and businesses, so they could align and coordinate their efforts and investments.

5 Facilitate Māori leadership and voice

The *Frontier Firms* report recommended that iwi and Māori need to be represented in both tiers of governance arrangements for focused innovation policy. It also recommended that Māori should lead a process for generating ideas to improve Māori business ecosystems (perhaps initiated through a Hui Taumata), with resourcing and support from government.

Flourishing innovation ecosystems for Māori will require iwi and Māori voices in decision making, and Māori leadership in efforts to improve support for Māori business. Māori leadership is required both within and outside government. This calls for ongoing efforts to build capacity and capability, and to adequately resource Māori contribution and leadership.

6 Embed evaluation, to enable learning and adaptation

Focused innovation policy is a learning process, requiring the right governance arrangements, as well as monitoring and evaluation to learn and enable adjustments in direction. Focus areas will not be set in stone, but should be refreshed and adapt over time.

Arrangements for monitoring and independent evaluation need to be built in from the outset, with dedicated funding. Results measurement should focus on outcomes. Evaluation arrangements should be transparent and visible, with evaluation findings published as a matter of good practice.

Priority actions for shifting the productivity dial

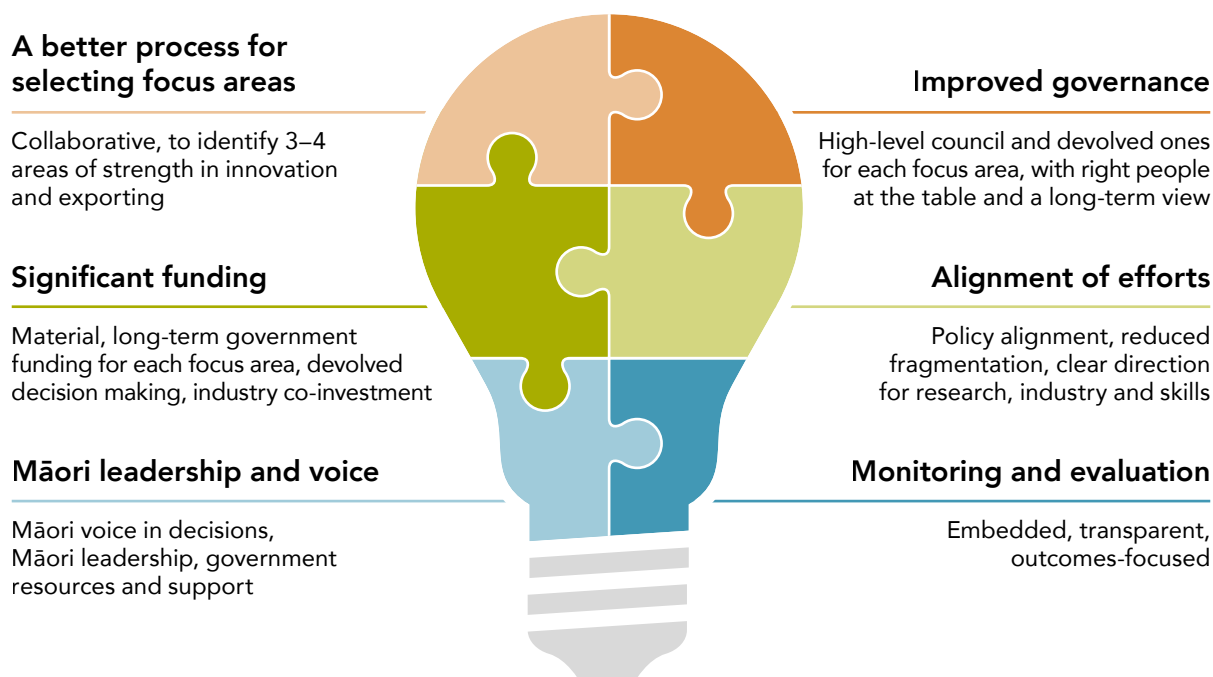
The Government commissioned this review to find out whether it is progressing in the right direction and set to shift the productivity dial, or whether more radical change is needed.

We have found that the current course will not deliver the desired transformational change. However, the chances of success can be materially lifted by improving existing initiatives and programmes in the six key ways outlined above.

These recommendations are a package – the elements are interdependent and interlocking and success depends on having all these pieces in place. If one of these elements is not present, the effectiveness of the others is undermined.

Implementing these recommendations will require bolder efforts and a sustained long-term approach.

Figure 8 Six recommendations for implementing focused innovation policy



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