

# **Review of the Ministry for Primary Industries' Primary Growth Partnership**

**Phase Two: Independent review of benefits, eligibility criteria, management and implementation**

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**31 May 2018**

## **Acknowledgements**

This review has been conducted independently for MPI's Investment Portfolio (IPD) directorate. IPD's role is to maximise the impact of MPI's investments. IPD is independent of MPI's investment programmes. It undertakes evaluations and determines whether MPI is getting the desired impact from its investments so that MPI can fulfil its strategic goals.

The opinions, conclusions and recommendations contained in this report are my own. Factual data has been checked by MPI for accuracy and commercial sensitivity.

## **Background of reviewer**

Deborah Battell is an independent consultant specialising in organisational and programme reviews and governance. She was the former Banking Ombudsman; Director of Fair Trading and subsequently Director of Competition at the Commerce Commission; and a senior consultant in KPMG's Strategic Management Unit. Deborah holds an MBA and BA from Victoria University of Wellington, is the Ministerial appointee to the Telecommunications Dispute Resolution Scheme Commission, a trustee of the Life Flight Trust and Wellington Hospitals Foundation; and an adviser to and shareholder in a technology company.

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# 1. SUMMARY OF MAIN FINDINGS

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## 1.1 Overview

The Primary Growth Partnership's (the PGP) unique set of eligibility criteria and rules are designed to transform sectors, from volume to value, and generate long-term economic growth and sustainability. Substantial benefits are expected from 2025, but PGP programmes are already delivering financial and wider benefits, including environmental improvements, social resilience, new corporate investments, new jobs, and the necessary conditions for future investment in R&D: collaboration, capability and a culture of innovation.

Based on programmes' own assessments, the portfolio is likely to deliver financial benefits that are, on balance, close to their original expectations but later than envisaged. However, these positive results could have been better but for the following critical factors:

- Appropriations since 2009 have been underspent by about one third, \$145m (million).
- Annual budgets have been consistently underspent and reduced, with remaining appropriation diverted to other priorities.
- The PGP does not have a clear and agreed longer term strategy for optimising its value, although it has previously targeted smaller emerging sectors and horticulture.
- The demand for larger programmes has declined since 2013 and the pipeline consists of nine smaller programmes, only four of which have progressed to contracting.
- Prospects beyond the official pipeline are speculative at this stage.
- Projected budgets will fall by 40% by 2020 unless demand increases.

The PGP now has the opportunity to realise its potential and continue with the transformation goal. The team has shown that it can stimulate interest. It needs to do more of this, but to take a strategic and proactive approach, especially to attracting new programmes of a significant size. This should involve identifying target areas, e.g. specific sectors, outcomes, levels of risk, types of innovation.

MPI should work closely with industry to develop these strategic targets and encourage proposals. But proposals should remain industry-led, avoiding the temptation for government to pick winners: current programmes have shown that industry can be ahead of government, even without specific targeting, and that step changes will happen when firms have a commercial incentive and "skin in the game".

Room must also be left for untargeted industry-initiated programmes, e.g. from emerging industries, enabling greater economic diversification.

And MPI will need to commit the budget for new programmes, staff resources and benefit management systems, to ensure New Zealand realises the PGP's potential.

## 1.2 Background

### PGP goals

The PGP is a government and industry partnership aimed at transforming primary industry. Established at the height of the global financial crisis (GFC) in 2009, when the then National Government (consistent with the previous Labour government) wanted to provide a strong incentive to shift the primary sector from a focus on commodities to higher value products, it aimed to:

- Boost productivity, value and profitability in the primary sector.
- Deliver long-term economic growth and sustainability across primary industries, from producer to consumer.
- Encourage more private investment in research and development in New Zealand.

### Review goals

This is part two of a review whose goals are to improve the PGP's eligibility criteria, management and implementation. The overall review seeks to:

- a. Evaluate completed PGP programmes to assess project outcomes and benefits realised with their approved plan.
- b. Review outcomes achieved to date by the PGP programme and compare with government objectives and MPI strategy.
- c. Assess likely economic impacts and benefits from PGP programmes and compare with predictions as to economic impact and benefits.
- d. Develop recommendations for realignment and operation to support revised programme objectives and outcomes.
- e. Use the insights gained to recommend improvements to the stewardship and management of these funds, and to identify future options for the PGP that are aligned with the new government's priorities.

This report provides an independent view on the above to also draw conclusions on whether the PGP has been a successful model. MPI will produce an analysis of future options that takes into account this review's findings.

### Scope and limitations

Providing a benefits figure<sup>1</sup> for the portfolio in relation to the NZIER's<sup>2</sup> 2014 estimate of \$6.4b (billion) per year by 2025 was outside this review's scope. A valid and reliable finding

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<sup>1</sup> Note that all dollar amounts in this report are GST-exclusive.

<sup>2</sup> NZIER. (2014). Economic contribution of PGP. A cost-benefit analysis of potential impacts. *NZIER*

requires a repeat of the NZIER study. Even then, results would remain speculative given the long horizon for programmes to deliver on outcomes. The review therefore relied on programmes' self-assessments and independent consultant reviews of the likelihood of programmes achieving originally anticipated benefits and in what timeframes.

Section 2.2 sets out further factors, unique to the PGP, that limit a reviewer's ability to deliver a definitive portfolio level benefits quantum. My findings are therefore qualitative, and expressed relative to the NZIER's estimates.

### 1.3 Project outcomes and benefits compared with approved plans

The NZIER's lower estimate of \$6.4b in annual economic benefits by 2025 may prove optimistic for the companies it considered in 2014.

However, with two exceptions<sup>3</sup> the programmes that are anticipating the largest benefits – Transforming the Dairy Value Chain, FarmIQ and Red Meat Profit Partnership – report being on track. Four of the five recent programmes (these were not part of the earlier study) are also more confident of achieving their estimated economic benefits.

Although programmes on the whole remain optimistic about achieving the quantum of benefits, they consider it likely these will be realised later than 2025. Many factors have contributed to this, including the weather (droughts, rain), individual project failures, initial management and governance challenges, human factors, the economy and length of time to deliver research (e.g. genetics, breeding).

Previously unquantified environmental, social and other unanticipated benefits that have emerged since the NZIER's analysis would likely lift estimates of benefits if retested.

### 1.4 Outcomes delivered to date

The portfolio as a whole, based on achievements to date:

- Is already delivering on some longer-term outcomes such as new investment, new jobs, increased exports, higher value products and higher on-farm incomes.
- Is delivering very strong previously unquantified benefits: environmental, social resilience and animal welfare improvements.
- Is lifting capability (scientific, food structure and design, engineering, farm management, innovation management).

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<sup>3</sup> Stump to Pump which had estimated benefits of \$1.125b per annum by 2030 and which decided not to proceed with developing its bio-fuel due to economic conditions and Manuka Plantations was considered by an independent review to be highly optimistic. It is also not clear what information NZIER would have relied on for STIMBR as its benefits related primarily to maintaining New Zealand's trade access for logs (a significant market).

- Is improving collaboration amongst competitors and across the value chain.
- Is effecting the desired transformations in firms and building their confidence to further innovate and invest in future R&D.
- Will likely have already delivered greater financial benefits than the government's estimated \$272m invested to 30 June 2018.

## **1.5 Outcomes achieved to date compared with government objectives and MPI strategy**

Current programmes appear to be consistent with known government, MPI objectives and strategy. The programmes have begun to achieve the sorts of transformation envisaged, including from a focus on commodities and volume to higher value, customer-led products, and improved productivity and sector resilience.

## **1.6 Improvements to the eligibility criteria, management and implementation of the PGP**

### **Eligibility criteria**

The PGP's eligibility criteria appear to work well for a transformation programme, and current eligibility criteria have been sufficiently flexible to accommodate a wide range of programmes across different parts of the primary sector, business size and different types of innovation.

Key opportunities for lifting impact include:

- The seven year maximum funding period rule should be reviewed – it both encourages applications for the maximum period and prevents programmes from taking longer if justified.
- The minimum \$500,000 contribution should remain but be adjusted every three years for inflation.
- Partnering with corporates may have been contentious but has also been good for the PGP's transformation agenda. MPI should, however, consider whether additional hurdles should be introduced for companies applying for a second PGP programme.

### **Management and implementation**

The governance structure works well except for questions about MPI senior staff availability for PGP meetings. The Investment Advisory Panel (IAP) is widely respected and Programme Steering Groups (PSG) are effective. MPI staff add value to the programmes, and receive value in return from their inside view of industry challenges. In addition to a number of minor

recommendations, there is room for greater clarity with respect to the IAP's role in monitoring, and it should be more involved at the strategic level.

Reporting requirements are perceived to be a little burdensome, however the content of quarterly reports and annual plans is largely dictated by PSGs. The PGP does, however, need information for its own monitoring and accountability purposes and could help reduce compliance costs by developing streamlined quarterly and annual templates that enable it to regularly report progress, benefits and risks at a portfolio level.

The compliance requirements, combined with a generally held view that current programmes are unlikely to fail (partly due to the flexibility each programme has to focus on outcomes rather than the success of individual projects), reflect a strong culture of risk-aversion. This is somewhat at odds with an innovation and transformation agenda and raises a question about whether even more ambitious programmes could have been attracted. However, strong public and competitor interest in the PGP likely precludes this.

Concerns about the PGP seeming to be non-strategic are partly valid. Programmes must be consistent with sector strategies, but there appears to be an assumption that being industry-led limits the PGP's ability to proactively target. Perhaps as a consequence, there is no strategic plan for the PGP and proactive marketing has been sporadic.

Nothing precludes the PGP from engendering interest or identifying gaps in the programme, whether across sectors, risk profiles, types of innovation or types of firm. The PGP has done so before (e.g. attracting smaller, emerging industry applicants) but now finds itself in the following situation:

- By 30 June 2018, approximately one third of its \$432m appropriation since 2009 will have been unspent and diverted to other priorities.
- The average programme investment since 2013, when the last large programme started, has fallen to \$10m (reflecting smaller projects), compared with \$20m for earlier projects.
- Earlier large programmes are ending (all will end by late 2020).
- The pipeline average (proposed programmes at business case or contracting stage) is around \$6m.

As a consequence:

- The demand for investment finance is projected to drop by 43% from 2016/17 levels (\$42m) to \$24m by 2020 if there are no new larger programmes. This is based purely on existing programmes plus pipeline projects, and assumes all nine pipeline programmes are approved and no new larger programmes have been approved (both of which are unlikely as the PGP's staff expect further interest from the dairy, wool and red meat sectors).



## Conclusions: Overall success of the PGP model

Taking into account the financial and non-financial benefits already achieved, the likelihood of substantial future benefits and the firm and wider industry transformations taking place, the PGP has been, will be and can continue to be a worthwhile public investment.

The PGP's unique combination of eligibility criteria, rules and operating philosophy makes it ideally suited to effect longer term transformation or step changes. Through real world projects and private industry partnerships, where firms have a strong commercial incentive to succeed, the PGP is also supporting the conditions for future investment in innovation: collaboration, capability building and culture change.

In addition, the PGP generates and locks in public benefits such as intellectual property (after a three to five year period), and affords greater accountability for taxpayer dollars.

However, the transformation agenda is not yet complete. New cultures that embrace innovation and innovation management processes must be fully embedded into the participating companies and sectors, including the ability for competitors to collaborate on projects that benefit New Zealand, but which do not fall foul of legal obligations.

In my view, the PGP's heyday is not over, in fact it hasn't been reached. The primary industries are facing significant change and it is imperative they continue to innovate and invest. They will need continued incentives so that they do not revert, focus on the present or take the easier option of undertaking more limited, firm-focused R&D, losing the benefits of collaboration and effective sector-wide transformation.

Nothing precludes the PGP taking a more strategic approach. Strategy should be co-created with industry, the IAP and its own intelligence capability. The PGP should retain the capacity to accept untargeted, industry initiated projects.

## 1.7 Recommendations

Recommendations are presented in order of importance. Some related recommendations in the body of this report have been combined in the summary below.

### Strategic

1. The unique combination of the PGP's principles and objectives should continue including industry's ability to propose programmes that may not fit strategic priorities.
2. Existing and pipeline projects should continue.
3. The PGP needs to co-create a strategy with industry, the IAP and relevant MPI intelligence functions, having also identified potential large programmes and considered government priorities.
4. Provide the IAP (and the Senior Leadership Team) with better portfolio level information, including financial information so that it can be more effectively involved in regular strategic discussions about future directions for the PGP.

5. Develop a proactive marketing plan for the PGP based on its strategic plan.
6. Develop a benefits management and realisation system that includes records of cumulative benefits at both the individual programme and portfolio levels; wider environmental, social, animal welfare, collaboration and capability benefits; data on new permanent jobs created; and periodically check with programmes to ensure they identify and record unanticipated benefits.
7. Further consider a PGP-Lite model for smaller investments to reduce the compliance burden, and streamline proposal, business case and reporting templates in any event.
8. Clarify the IAP's role with respect to monitoring and include a statement on the monitoring process in programme guidance material for investors.

## Eligibility

9. Retain a significant minimum co-investor contribution but consider converting this to an annual amount rather than on a per programme basis to enable lower total amounts for shorter programmes and adjusting its minimum amounts every three years in line with inflation.
10. Makes the availability of support for developing business cases, and eligibility for this, more widely known.
11. Re-examine whether having a specified time limit on funding creates the right incentives for programmes to be efficient and cost-effective as well as whether it creates an unnecessary rigidity if programme funding needs to be extended.
12. Consider whether hurdles should be increased for large co-investors applying for a second or subsequent PGP programme, while carefully weighing their potential to chill investment in the PGP. From least to greatest impact, hurdles might include:
  - Not investing in programmes where there is one primary corporate co-investor and low potential collaboration benefits.
  - Requiring evidence that earlier PGP programmes have progressed and further investment made to realise the anticipated benefits.
  - Requiring evidence of increased investment in innovation additional to PGP programmes.
  - Introducing a limit on the size of investment contribution.
  - Reducing the government contribution to 30%.
  - Introducing suspensory loans<sup>4</sup> instead of funding contributions.

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<sup>4</sup> Suspensory loans can take a range of different forms, including interest-free but usually the first repayment is not required before a pre-determined future date.

## **Implementation and management**

13. In conjunction with the IAP, review its agendas to determine the possibility of more frequent contact between the IAP and programmes, if programmes identify a benefit in accessing the IAP's experience and wisdom.
14. Reconsider whether senior MPI staff are appointed to PSGs and explore the alternative of appointing an additional independent member.
15. Reconsider whether Investment Managers should be a formal member of the PSG or an observer.
16. Ensure all relevant MPI staff attend governance training, either in-house or through Institute of Directors' courses.
17. Consider making external dispute resolution capability available for PSG chairs in particularly difficult circumstances.
18. Change the name of the PSG to Programme Governance Group (PGG) to reinforce its governance role.
19. Explain to unsuccessful applicants, by telephone, the reasons for having proposals rejected as soon as possible after IAP meetings and before sending anything in writing.
20. Document the lessons learned from running the PGP programme for the benefit of future innovation programmes and PGP applicants.

## 2. REVIEW OBJECTIVES, SCOPE AND METHODOLOGY

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### 2.1 Objectives

This review was tasked with evaluating the PGP's eligibility criteria, management and implementation. The aims were to:

- a. Evaluate completed PGP programmes to assess project outcomes and benefits realised with approved plan.
- b. Review outcomes achieved to date by PGP programme and compare with government objectives and MPI strategy.
- c. Assess likely economic impacts and benefits from PGP programmes and compare with predictions as to economic impact and benefits.
- d. Develop recommendations for realignment and operation to support revised programme objectives and outcomes.
- e. Use the insights gained to recommend improvements to the stewardship and management of these funds, and to identify future options for PGP that are aligned with the new government's priorities.

The review was conducted in two stages, over a four month period. Phase one was completed in March 2018. This stage forms Phase two of the review and was started in February 2018.

### 2.2 Limitations

Some of the PGP's unique features make this an unusually challenging programme to evaluate, principally because the PGP has been operated as individual programmes (see Appendix 1) rather than as an investment portfolio, limiting the information available at the more strategic level. Although some quantitative information about numbers of programmes, by year, by amounts committed and paid is available, information relating to benefits has only been aggregated in a limited way. In addition:

- Most (15) of the 22 programmes (comprising 112 themes or projects, and, in some cases, a significant number of sub-projects) are still in progress. None of the 22 are expected to start delivering significant economic benefits at scale until 2020 at the earliest. Any estimates therefore remain speculative.
- All programmes have hurdles to overcome, or require further investment, before delivering benefits – PGP programmes typically stop before uptake.

- Innovation programmes are inherently risky, including the risk of not achieving benefits and the risk of failure. At this stage of the programme, higher risk programmes will more likely have failed to achieve their anticipated benefits and so the findings may have a disproportionately negative weighting in terms of achievements to date.
- Estimating the quantum of benefits without a full economic analysis is not possible. It is simply not valid to add anticipated benefits together and draw conclusions. Programmes have not stated economic benefits in a consistent or comparable way: they are variously expressed as increases in GDP, export earnings, or revenues; some give annual economic benefits, others cumulative; some are net benefits (although most have not considered the impact on what is being displaced); and many are targeting the same alternative land uses (e.g. alternatives to small dairy holdings, sheep farms and marginal land).
- As suited to higher-risk, long-term innovation projects, PGP governance allows considerable flexibility. The main governance concern is whether the programme as a whole continues to meet its intended overall outcomes. The PGP encourages projects to “fail fast”. Individual projects within a programme may therefore fail and be replaced by others, or remaining project funds may be diverted to speed up existing projects with better prospects. Some may not finish before the end of the programme. This is a positive aspect of the programme but means there are no straight lines between projects and projected benefits (as the Terms of Reference for this review assumes).
- MPI’s grant management system (GMS) has largely been used for maintaining a record of funds committed and paid. This has been a further constraint on eliciting insights from existing data. Benefits and other information have been created retrospectively and stored in separate and unconnected Excel databases.

## 2.3 Scope and methodology

Because of the limitations above, and available time, I have not evaluated individual programmes or validated their responses. Rather, I have used their responses, best available written and oral evidence and independent judgement to draw conclusions on:

- Whether the portfolio as a whole, based on deliverables to date, is *likely* to deliver substantial economic gains in growth and sustainability; in particular, whether four years after the NZIER’s 2014 projection of returns, there is *stronger evidence* as to the likelihood that PGP will achieve the NZIER’s estimated \$6.4b to \$11.1b in annual economic benefits by 2025.
- Whether other – environmental and social – benefits have been achieved, including whether the PGP programme shows signs of playing a role in changing cultures, lifting capability, improving collaboration, and lifting companies’ confidence in

undertaking innovation programmes, thereby increasing their propensity to reinvest in R&D.

I have also drawn independent conclusions on whether the PGP has been a successful model and whether there are any opportunities to improve its impact.

The review did not:

- Replicate the 2014 NZIER estimate of economic benefit.
- Seek to verify the Government's desired outcomes beyond broad statements of priorities – rather these were inferred by MPI from policy statements.
- Seek to discover whether all recommendations from previous reviews have been addressed. Rather, stakeholders were asked open-ended questions to elicit remaining issues.
- Evaluate individual programmes.

## 2.4 Information sources

My independent conclusions are based on information provided by a wide range of sources. Where possible, programmes' information has been checked against independent reviews and MPI Investment Managers' views. The names of participants are contained in Appendix 2. Information sources include:

- Previous external reviews of the PGP programme, in particular the Rebstock governance review<sup>5</sup>, the Office of the Auditor General's review<sup>6</sup> and NZIER review.
- Existing portfolio level information prepared by MPI.
- Expert external reviews of individual programmes (mid-term and final).
- Programme-generated quarterly, annual and end of programme reviews as posted on the MPI website and collated for the IAP.
- Programmes' Annual Plans.
- Records of reasons IAP has declined PGP proposals and one interview with an unsuccessful applicant.
- MPI supplied financial records and projections.
- Internal documents including policy papers, Cabinet papers, Independent Advisory Panel (IAP) minutes, internal reviews.

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<sup>5</sup> Rebstock, P. (2015) Primary Growth Partnership Governance and Reporting Review. Strategas Consulting.

<sup>6</sup>Office of the Auditor General. (2015). "Ministry for Primary Industries: Managing the Primary Growth Partnership". OAG.

- Written survey: 16 of the 20 current and recently completed programmes responded to a survey (see Appendix 3); further information was obtained about benefits from the remaining four programmes by telephone; information about the two completed programmes was obtained from independent reviews.
- Semi-structured interviews with senior MPI staff, IAP, Programme Managers and/or Chairs, managers of other Government funds, science-based organisations, industry bodies.
- Group and individual interviews of the PGP's staff, Manager and Investment Programme Directorate advisory staff.
- Attendance at two IAP meetings.
- Attendance at PSG (Sheep – Horizon Three) meeting.
- Attendance at “Good Yarn” presentation.

## 3. BACKGROUND

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### 3.1 Origins

For many decades, New Zealand governments have tried to catalyse industry, particularly traditional primary industries, to become more innovative and customer-centric, and to increase the value of products exported, improve productivity, and develop and commercialise products of higher value.

By 2008/09, much progress had been made but some companies remained stubbornly commodity-based and needed strong incentives to pull existing basic research off the shelves and/or transform themselves. Others continued to have difficulties commercialising R&D.

Motivated by the global financial crisis (GFC) – which was chilling primary sector industries' propensity to invest in R&D – and a rapidly changing economic, social, environmental and technological environment, the then Labour government decided a strategy was needed to drive harder and faster change. This led to a short-lived programme, Fast Forward, which, with the change to a National Government in 2009 morphed into the PGP<sup>7</sup>. Both programmes were based on similar principles and eligibility criteria but had two essential differences: their funding mechanism and investment approach.

#### Funding mechanism

Fast Forward had initial capital of \$750m plus an endowment. The PGP was given an initial multi-year appropriation of \$30m, \$40m and \$50m, followed by \$70m per year, from 2012/13.<sup>8</sup> The PGP appropriation also included \$5m per annum for the New Zealand Agricultural Greenhouse Gas Research Centre.

#### Investment approach

Fast Forward had a “top down” approach to investment in which government and industry would partner on programmes of strategic importance. The PGP has a more “organic”, demand-driven approach and a long-term, transformative agenda, with ideas put forward by industry.

Industry applicants generate proposals and apply to have these assessed against the eligibility rules and assessment criteria. A strategic requirement remained, in that proposals needed to be consistent with sector strategy rather than areas specifically targeted by government (the government's target was transformation of primary sector companies to achieve its long term economic and sustainability goals).

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<sup>7</sup> (CAB Min (09)17/11)

<sup>8</sup> Appropriations supplied by MPI's Finance Department



The main assumptions were that industry players knew best where they could make a difference (i.e. avoiding the risk of government trying to “pick winners”) and that programmes would be more likely to succeed if they were going to benefit the co-investors as well as, ultimately, the wider public.

In 2012, the Ministry of Agriculture and Forestry, the original base for the PGP, merged with the Ministry of Fisheries and the New Zealand Food Safety Authority to become the Ministry for Primary Industries (MPI). This new organisation focused on supporting the whole of the primary sector, from producers through to processors and exporters.

## **3.2 About the PGP**

The PGP’s fund objectives are to:

- Boost productivity, value and profitability in the primary sector.
- Deliver long-term economic growth and sustainability across primary industries, from producer to consumer.
- Encourage more private investment in research and development in New Zealand.

Investment in the PGP enables primary industries to undertake ambitious and often higher-risk, innovation programmes that have the potential to deliver significant long-term growth. Such investment and risk would typically be too great for an entity to make alone or would take considerably longer, deferring benefits realisation.

The PGP comprises 45% of the current MPI investment portfolio allocation.

### **The PGP Programmes and eligibility**

Applications for co-investment can be made by most types of entity, including industry bodies, private research organisations, individuals and firms. Each programme is a joint investment between Crown and industry, with industry co-investors making at least 60% of the total investment (50% until 1 December 2015). Co-investors must demonstrate that their funding is not directly sourced from Crown or rate-payer funds.

To be eligible for the PGP funding, programmes must:

- Focus on activities in one or more of the primary industries.
- Be a coherent programme made up of a number of complementary and mutually supporting projects.
- Be for a maximum of seven years.
- Have a minimum industry co-investment of \$500,000 (plus GST) over the life of the programme, with Crown investment of a further 40% of the total programme value.
- Be beyond ‘business as usual’ (BAU).
- Be consistent with New Zealand’s international obligations and trade policies.

Proposals are assessed by the IAP against the following criteria:

- **Economic benefits:** Direct and indirect net economic benefits to New Zealand.
- **Spillover benefits:** Clearly identifiable spillover benefits to New Zealand.
- **Sustainability benefits:** Maintained or improved net sustainability for New Zealand.
- **Likelihood of success:** The intended outcome benefits from the programme are likely to be achieved.
- **Fit:** The programme fits well with the overall strategic direction of the sector.
- **Path to market:** The programme demonstrates a consideration of all steps on the value chain up to and including commercialisation and describes where changes will need to be made along the value chain for the outcome to be achieved.
- **Ability to deliver:** The co-investors have the ability to deliver on the programme.
- **Retention of benefits:** The benefits resulting from the investment programme are likely.
- **Cost:** The programme costings and contributions are adequately specified, realistic, and appropriate to be retained in New Zealand.

Programmes may address the whole value chain, or focus on areas such as: education and skills development, research and development, product development, commercial development and technology transfer. Where a programme only covers part of the value chain, its impact on the entire value chain must be outlined.

### 3.3 Current operating environment and alternative funds

#### Operating environment

There have been a number of changes in the PGP's operating environment since 2009:

- Primary industries have been affected by new substitute products, e.g. synthetic meat; changing consumer engagement (e.g. the influence of major supermarket chains on product acceptance); environmental concerns such as "food miles" and carbon footprints have become more prominent, along with concerns about residue levels, changing dietary and nutritional expectations, product provenance, and animal welfare issues.
- In 2017, MPI released its refreshed strategy and a new government was formed, bringing a change in focus and priorities. In particular, there is a more explicit focus on regional economies, sustainability and added value content.

## Alternative innovation funds

Other innovation funds available to the primary sector include:

- Government agency funds such as the Ministry of Business, Innovation and Employment's (MBIE) Endeavour Fund, New Zealand Trade and Enterprise's International Trade Fund, or MPI's Sustainable Farming Fund.
- Local government agencies' funds.
- Non-Government Organisations such as AgMardt (which for example provides "seed funding" to "kick-start" projects in the sector).
- Callaghan Innovation grants.
- Private sector borrowing or investment.
- Self-funding.

Programmes run by Crown Research Institutes and tertiary institutions provide indirect funding. Philanthropic investment is also becoming a significant source of funding for those seeking funding for innovation, but is not generally available to corporates.

The PGP is the only innovation programme to invest in longer term transformation, from applied research through to pre-uptake.

## 3.4 The PGP's operational framework

### MPI Director-General

The Director-General of MPI approves government investment in the PGP programmes along with contractual changes, including extensions of time and funding.

### Investment Advisory Panel (IAP)

The IAP recommends investment of government funds to MPI's Director-General as well as adjustment of existing expenditure to all the PGP investors. Its Terms of Reference<sup>9</sup> states that the role of the IAP is to:

- a) Provide independent and objective advice to the Director General MPI on the investment of Crown funds for investment programmes;
- b) Assess and determine which proposals are to be progressed to business plans;
- c) Monitor investment programmes and recommend adjustments to existing programmes to MPI;

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<sup>9</sup> The IAP's terms of reference can be located at: <http://www.mpi.govt.nz/funding-and-programmes/primary-growth-partnership/investment-advisory-panel/>

- d) Promote PGP, in accordance with a communications strategy developed by MPI;
- e) Report annually on matters contained in the IAP's "Terms of Reference."

The IAP reports to and meets with the Minister four times a year. Otherwise, the IAP meets monthly to consider proposals and business cases, and to monitor progress.

### **Programme Steering Groups (PSG)**

Each PGP programme must have a PSG, which meets at least quarterly to review progress and provide oversight of the programme. Members include representatives from the investing company or companies and MPI (at least two members), and may include an independent chairperson. Independent chairs have become a requirement since 2015.

Programmes are required to have an Outcome Logic Model (see example in Appendix 5) and to actively manage and monitor risks through risk management plans and schedules which the steering groups review regularly. They are required to furnish quarterly and annual reports and annual plans to the IAP. They are also required to have independent reviews of their programmes half-way through a programme and at its conclusion, and undertake MPI financial audits.

## 4. THE PGP: FACTS AND FIGURES

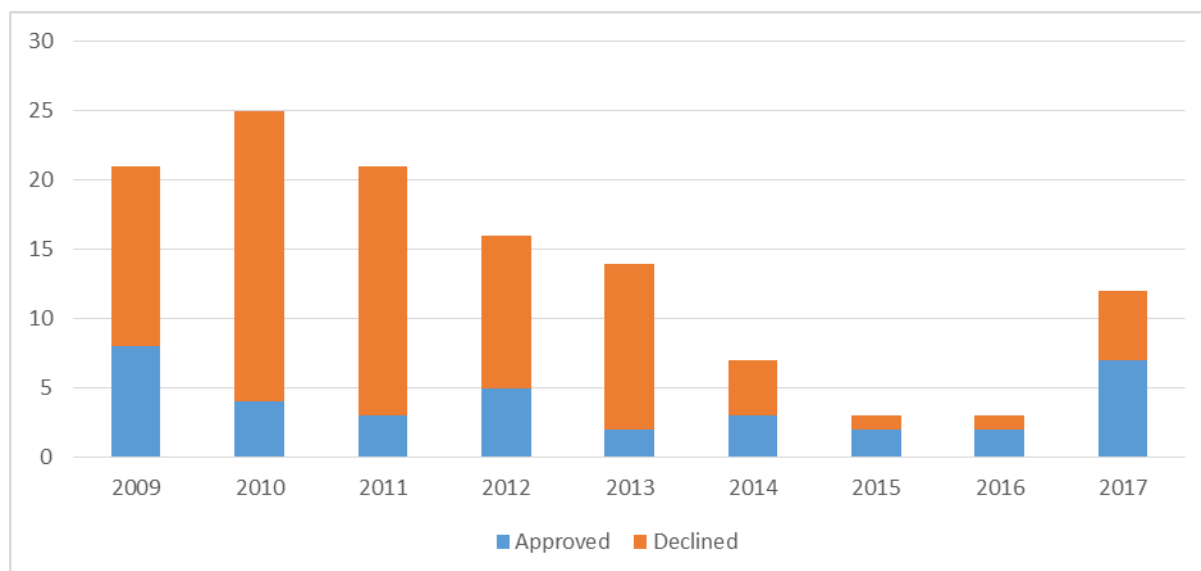
### 4.1 Applications and programmes

MPI has received 122 proposals since inception and the IAP approved 30% of these to progress to business cases. The majority of which proceeded to programmes or are in the pipeline (see Appendix 6). Of the remaining five, two did not proceed to business cases, one had its business case declined, one did not proceed because of “natural events” and one proceeded to a business case but could not meet the required conditions.

This appears to be quite a low percentage, although some companies or consortia have applied a number of times and clearly demonstrates the application of eligibility criteria.

The success rate (percentage of proposals approved to proceed to business case) for sectors has been highly variable (see Appendix 6), with none of the general agriculture proposals and only 10% of wool proposals being approved, compared with 34% for meat and 43% for dairy. There appears to be no particular reason for this other than the quality of proposals received. One interviewee who has been associated with three unsuccessful proposals, commented that the application (proposal) process, while disappointing, had shown the sector a need to be more strategic and collaborative. It is now focusing on this.

**Diagram 1: Status of the PGP applications by year**



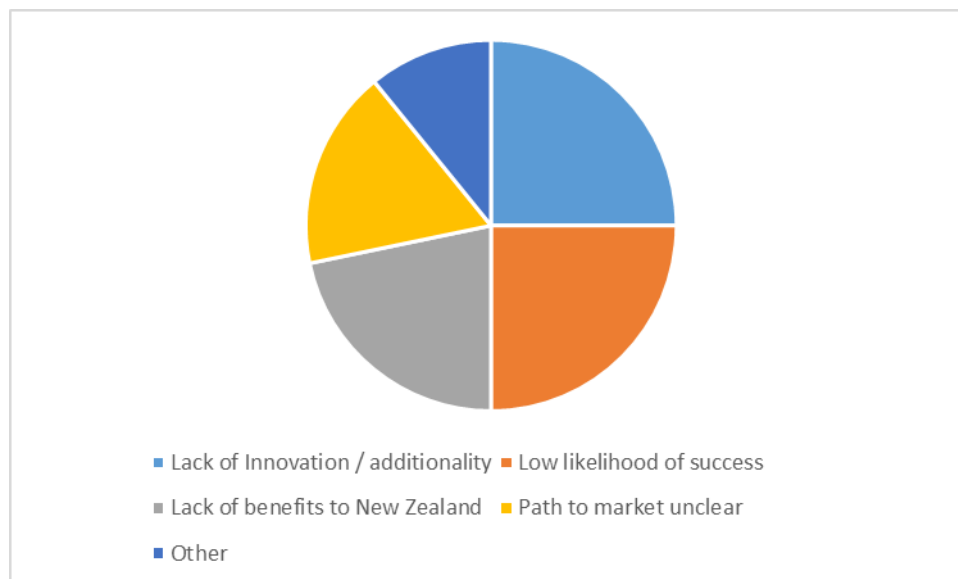
The number of proposals received by year is characterised by a flurry in the early years (47/122, or 39% of proposals received in the first three years), and a steady decline thereafter until 2017 when 12 proposals were received. This most recent interest follows active staff promotion to smaller industries. As a result, nine proposals have been approved to proceed to business cases and four of these have been approved for contracting.

## 4.2 Reasons for proposal rejections

Many programmes were rejected for multiple reasons. The main reasons were:

- Lack of additionality or innovation, 23%.
- Low likelihood of success (including IAP's assessment of a programme's ability to deliver), 23%.
- Lack of net economic and spillover benefits to New Zealand, 20%.
- Lacking a demonstrable path to market 16%.

**Diagram 2: Reasons for not approving proposals**



A review of the description of project proposals suggests many of the early proposals (and at least one recent one) focused on a single innovation and had not addressed how the relevant parts of the value chain would be mustered to ensure it delivered benefits. Examples include technology proposals that had not joined with other necessary players in the value chain (including no evidence of end user involvement) and/or process developments and projects that had so little novelty that they would have been regarded as BAU. Others involved primarily scientific studies that would have been better applying to other funds.

Without reading all the proposals in depth, it is not possible to say whether any promising opportunities were missed. Some of the early proposals were re-presented and approved after significant re-work, often with co-investors, demonstrating that the value chain/path to market had been further developed. These reworked proposals undoubtedly benefitted from IAP feedback and MPI staff assistance.

Overall, the IAP appears to have carefully considered the criteria, rules and aims of the programme and made appropriate judgements as to which proposals should be eligible for funding. Despite considerable differences between sectors in the numbers of applications received, and the proportion accepted, there has been no competition for the funding – the full appropriation has never been used. It cannot, therefore, be said that some sectors have benefitted at the expense of others. The only way to change the funding patterns would seem to be to change the eligibility criteria or for applicants to present more compelling and relevant proposals.

### 4.3 Current and completed programmes

All programmes are focused on effecting some form of transformation (see Appendix 1). This is true of both larger and smaller programmes. The following quote illustrates this:

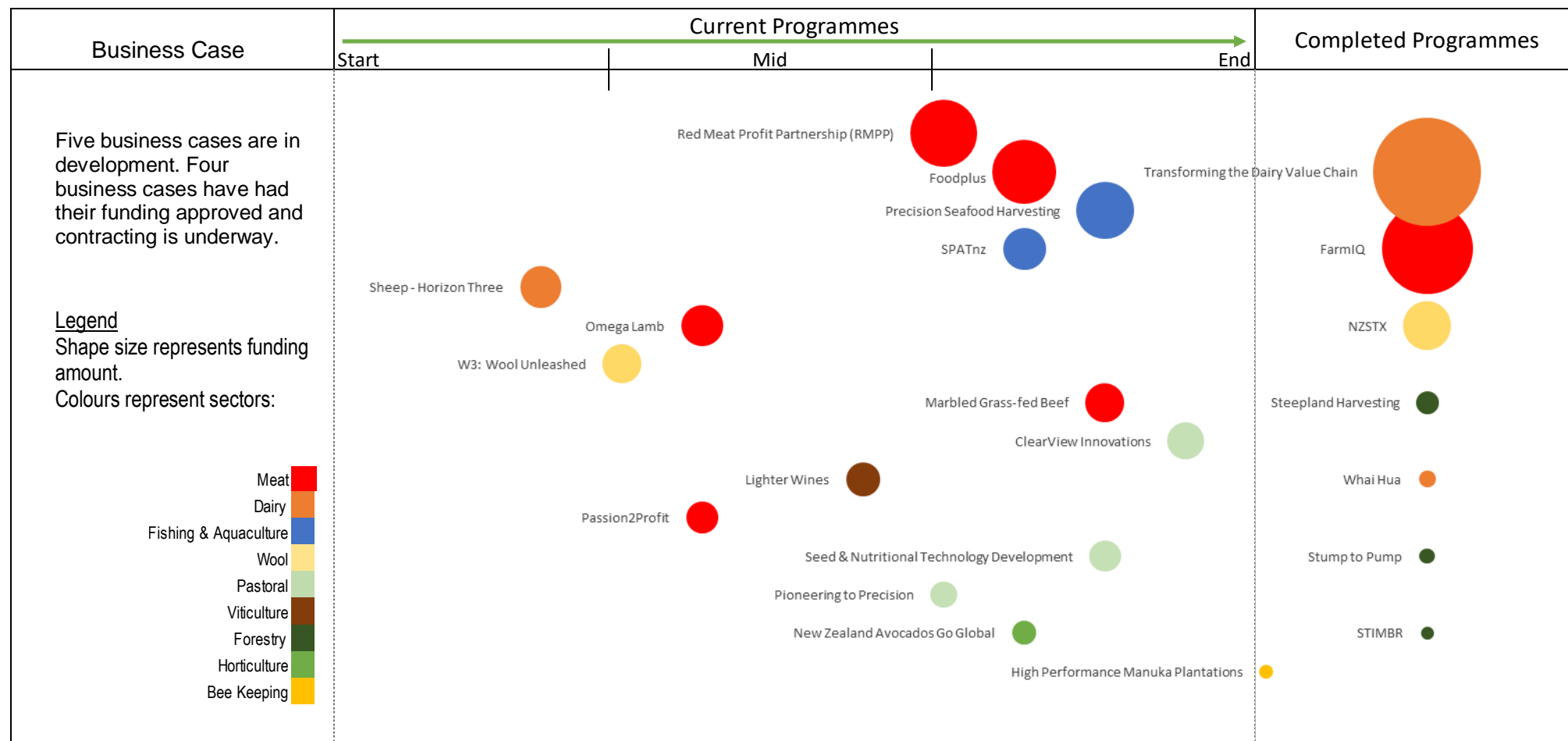
*It's very important to understand that Omega Lamb is not just a provenance story around some iterative improvements in quality control and branding ...[it] is a chemically different product ...with a unique health claim (high in polyunsaturated – omega – fats), cooking and taste benefits ... Omega Lamb is a step change and has the potential to disrupt the lamb meat value chain if executed properly.*

Diagram 3 shows the relative size and duration of the current and completed programmes along with their industry sectors. The diagram graphically illustrates that (note that the size of the circle represents the amount of investment):

- The biggest programmes have now finished.
- There are relatively few programmes in the early stages.
- More recent programmes are, on average, much smaller.
- Recently approved business cases (i.e. programmes-in-waiting) are also smaller than the original programmes.

The budget implications of these trends are set in section 4.4.

**Diagram 3: Size and duration of PGP Programmes**





## 4.4 Future programmes

Future prospects are few and rather uncertain. However, it appears one recently rejected large programme will resubmit in a different form once decisions are made about the PGP's future.

## 4.5 Financial facts

The initial annual appropriation for the PGP was \$30m in FY 2010<sup>10</sup>, \$40m in FY 2011, \$50m in FY 2012 and \$70.45m per year from FY 2013<sup>11</sup>, a total of \$542.1m. The appropriation included \$5m annually for the New Zealand Agricultural Greenhouse Gas Research Centre. Actual MPI expenditure is recorded in the tables below. Note that a portion of unspent appropriation was returned to the Crown in FY 2010 and FY 2012.

### The PGP: Annual expenditure

The PGP's annual expenditure since inception is set out Table 1 below.

**Table 1: The PGP government investment by year, excluding administration costs, 2011 to 2018 (projected), \$m**

FY	2011	2012	2013	2014	2015	2016	2017	2018 <sup>12</sup> (est)	Total
Appropriation	25.00	35.00	45.00	65.45 <sup>13</sup>	65.45	65.45	65.45	65.45	432.25
Programme cost	12.20	25.60	37.60	42.30	42.40	41.30	41.80	29.00	272.20
Operational costs <sup>14</sup>	0.50	1.00	1.20	2.40	2.40	2.40	2.40	2.40	14.70
<b>Difference</b>	<b>12.30</b>	<b>8.40</b>	<b>6.20</b>	<b>20.75</b>	<b>20.65</b>	<b>21.75</b>	<b>21.25</b>	<b>34.05</b>	<b>145.35</b>

<sup>10</sup> FY refers to financial year. This ends on 30 June.

<sup>11</sup> The data on which this section relies can be found in Appendix 4 and was supplied by both MPI's finance department and through MPI's Grant Management System.

<sup>12</sup> The 2018 estimates were based on actuals to 31/3/18 but do not include pipeline projects as these will not require funding this year. Their estimated funding has been spread across 2019 to 2022.

<sup>13</sup> Actual appropriations from 2014 were \$70,476,000 per annum.

<sup>14</sup> Operational costs have varied across the years, but \$2.4 m per annum was estimated by the Director, Investment Programmes to be a reasonable average from 2014. As a separate Directorate was not established until 2014, earlier years' operational costs are an estimate based on this average.

The PGP's expenditure peaked at \$42.4m in 2015 and remained close to this level until this year (2018). With seven programmes now having completed and new programmes being half the size of earlier programmes (average approximately \$10m compared with \$20m), demand for funding is falling. Pipeline programmes average \$5.7m, which shows a further projected reduction unless larger programmes apply (or reapply).

Current programme demand drops by \$12.8m this year from \$41.8 to \$29m and is projected to fall to around \$24m by 2020 (refer Table 1). This assumes all pipeline projects proceed.

Total spending to the end of 2018, at \$272.2m, is approximately two thirds (66%) of the total appropriation for the same period.

**Table 2: Total projected demand for the PGP to 2025**

FY	2019	2020	2021	2022	2023	2024	2025	2026	Total
Current programmes	26.3	14.4	5.3	3.5					49.5
Pipeline	9.5	9.8	10.2	9.8	6.5	4.1	3.6	0.0	53.5
Operational costs <sup>15</sup>	2.4	2.4	2.0	1.5	1.0	1.0	1.0	0.2	11.5
<b>Total</b>	<b>35.8</b>	<b>24.2</b>	<b>15.5</b>	<b>13.3</b>	<b>6.5</b>	<b>4.1</b>	<b>3.6</b>	<b>0.2</b>	<b>114.5</b>

Approximately \$49.5m has been committed to current programmes until the end of financial year FY 2022, bringing the total commitment since 2009 to \$322m. Adding the pipeline, total commitments are estimated to be \$385m by FY 2025.

### Operational costs

MPI's costs for administering the PGP programme are set out below. Note these do not include corporate overheads such as rent and corporate facilities management, management/leadership oversight (other than the PGP Manager), senior staff time attending PSG meetings, shared programme directorate staff, wider MPI staff input on proposals, programme audit costs and portfolio monitoring. As such, the costs of running the PGP programme are understated (a budget figure of \$2.4m has been used in Table 1 above, but this is also an under-estimate as it does not include overheads). Conferences and meetings refers to events that MPI organises for the PGP programmes.

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<sup>15</sup> Operational costs are assumed to remain similar to the last few years for FY 2019 and FY 2020. Thereafter they are expected to fall assuming new programmes are not forthcoming. It also assumes some residual resource would be required for FY 2026 as the PGP winds up.

**Table 3: Operational costs**

<b>Account Sub-Group</b>	<b>FY 13/14 (\$)</b>	<b>FY 14/15 (\$)</b>	<b>FY 15/16 (\$)</b>	<b>FY 16/17 (\$)</b>	<b>FY 17/18 (\$ forecast)</b>
Personnel, contracts and IAP	1,568,350	1,693,135	1,481,078	1,264,459	1,365,000
Conferences, meetings, communications, travel	137,465	158,080	194,762	242,171	212,200
Administrative costs	67,110	14,404	20,156	24,162	23,100
<b>Total</b>	<b>1,772,925</b>	<b>1,865,619</b>	<b>1,695,996</b>	<b>1,530,792</b>	<b>1,600,300</b>

Operational costs including senior management and advisory time have been estimated at \$2.4m. Available estimates, excluding this time, has been in the range of \$1.53m to \$1.86m over the past five years. The current year forecast expenditure is \$1.6m. Based on complete results for FY 2017, programme costs were approximately 3.66% of the Government's investment. As this percentage has not been compared with other funds, and much has not been included in the costs, it is not possible to draw conclusions about the PGP's internal efficiency.

However, the majority (87%) of directly attributable costs are personnel-related and MPI's programme team appears relatively lean for the size of the fund and number of programmes: five Investment Managers, one Manager and one Development Adviser. It calls on shared support and specialist staff in the Investment Programme Directorate for assistance as needed including, until this review began, two half-time Development Advisers. Arguably, more resource could be put into generating interest in new programmes.

Staff also facilitate a number of opportunities beyond monitoring of programmes. These are discussed in section 7.1 which looks at the value MPI adds as a "co-investor" and includes promoting the PGP programmes, technology transfer, and facilitating linkages with appropriate staff in MPI.

It is also likely that IM staffing numbers may not reduce in a way that reflects overall demand. An increase in smaller programmes which, even with a "Lite"<sup>16</sup> version of the PGP programme, may simply mean IMs end up managing more, but smaller, programmes. Small programmes will not necessarily take half the time to manage even though they require half the funding.

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<sup>16</sup> A PGP-Lite has previously been proposed to customise the PGP for smaller programmes. This proposal has not been fully developed, however.

## 4.6 Conclusions

The facts about applications, reasons for declines and financials taken together flag the following issues:

- The demand for the PGP has never met expectations (as set in appropriations).
- The nature of the demand has changed – from larger, and mostly corporate-led programmes to smaller emerging sectors, largely as a result of proactive targeting of these sectors.
- The changing nature of the portfolio is reducing demand for investment dollars.
- Staff knowledge of likely future demand, including whether larger corporates will reapply once their programmes end, is light (there is apparent potential for larger programmes in the dairy, wool and red meat sectors).

These issues could have arisen for a number of reasons, including:

- Initial appropriations may have been over-optimistic<sup>17</sup>.
- The PGP's criteria and rules may have limited attractiveness, e.g. intellectual property (IP) must be made widely available after a period; some companies already have an innovation ethos and well-established innovation processes; others do not want the complication of partnering with government.
- Completed programmes may not be ready for a second – PGP programmes are demanding and even corporates are unlikely to want to take on another while they take the first through to uptake.
- Programmes are waiting for decisions on the PGP's future.
- The PGP is not currently sufficiently proactive or well promoted.

However, the critical issue from an independent perspective is that all of the demand issues were foreseeable and have, in fact, been evident for some time. This suggests the PGP is not currently being managed strategically. It would also appear that MPI has not prioritised the PGP's budgets. As a result, the PGP has been unable to achieve its potential.

### **I recommend MPI:**

- **Undertakes research to find out whether existing and former co-investors are likely to reapply for investment.**
- **Develops a strategy for the PGP.**
- **Develops a proactive marketing plan for the PGP based on its strategic plan.**

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<sup>17</sup> While initial expectations may have been high, programme demand has never exceeded \$42.4 m of the \$70m appropriated annually since FY 13, and appropriations have not been adjusted.

## 5. BENEFITS

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This review focuses on benefits, or short to medium term outcomes. This is because the longer term outcomes are, in most cases, not anticipated to materialise until 2020 and beyond (NZIER's analysis assumes 2025).

The benefits achieved by individual programmes are too numerous to list individually which is why a summary, portfolio-based view has been attempted. Moreover, time did not permit an in-depth analysis of each individual programme or seek to validate each programme's reported achievements.

Rather, I have:

- Summarised and described the nature and range of economic benefits being targeted and provided examples of what has been achieved to date.
- Summarised and described benefits that may not have been considered or evident when the NZIER completed its analysis.
- Drawn conclusions on the likelihood of programmes achieving their anticipated financial benefits based on their own assessment of progress to date (see 5.5) and within what timeframes.

### 5.1 Challenges in estimating and measuring benefits

The challenges in estimating and measuring benefits were noted in section 2.2, headed Limitations. The following also affect the quantum and timeliness of benefits:

- External factors such as the value of the New Zealand dollar, global supply and demand, trade and non-trade barriers, regulatory barriers<sup>18</sup> and whether all affect delivery.
- Internal factors such as the length of time to conduct research, being human (illnesses, deaths, capability) and co-investor relations.
- End-user factors such as slower uptake than anticipated.
- Programmes or parts of them might not have completed when funding ends.
- Programmes may end without spending the full available funding.

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<sup>18</sup> Precision Seafood Harvesting, for example, has encountered significant regulatory challenges because existing regulations had not envisaged a new way of trawling for fish. This matter is still in the process of resolution, although temporary enabling legislation was passed during the programme.

As one programme said:

*Accurately projecting economic benefits 8-10 years before the target product is commercialised is almost impossible. The technical challenge in PGP projects is extremely high which is why they passed the test of not being business as usual. (Seed and Nutritional Technologies)*

In addition, environmental and social benefits, collaboration opportunities, capability-building and the impact on innovation and willingness of firms to engage in further innovation programmes have not generally been factored into the original estimates. In support of considering wider benefits, NZIER (2014) noted:

*...more work could be done to illustrate the more readily identifiable dollar values of non-use<sup>19</sup> values within the PGP programmes as they gather momentum and targets are reached, particularly for non-use values that are seen to be important.*

As an example, it stated:

*PGP programmes have a mix of expected non-use values. In the Transforming the Dairy Value Chain programme, for example, researchers identified a raft of non-quantified benefits from reducing nitrogen run-off on farms and more efficient use of natural resources per cow through to better health and animal welfare practices and building rural advisory capability that can be leveraged to other rural industries.*

Because many of these benefits have not yet been quantified, the real impact of the PGP programme will likely be significantly under-stated in dollar terms. Further, as NZIER noted, many of the wider benefits are likely to become more important as time goes on.

In addition, there are other limitations to evidence that support benefit delivery:

- MPI does not have a formal benefits management or realisation system<sup>20</sup>.
- Investment Managers are not required to keep a cumulative record of benefits achieved by their programmes.
- A full picture of the benefits achieved by the whole portfolio cannot therefore be reported regularly, either for the IAP on a quarterly basis or for MPI management.

**I recommend that MPI:**

- **Develops a benefits management and realisation system that includes cumulative benefits at both the individual programme and portfolio levels as well as wider environmental, social, animal welfare, collaboration and capability benefits.**

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<sup>19</sup> Wikipedia describes non-use values as “the value that people assign to economic goods (including [public goods](#)) even if they never have and never will use it. It is distinguished from [use value](#), which people derive from direct use of the good.

<sup>20</sup> The PGP team has developed some portfolio level measures retrospectively.

- **Investment Managers periodically check whether programmes are recording the full set of benefits achieved, including those they had not originally anticipated.**
- **Regularly captures information about new jobs created.**

It may also be appropriate to employ a suitably qualified person to develop and maintain the benefits management and realisation systems<sup>21</sup> however I have not included this as a recommendation as MPI may wish to implement a system across all its investment programmes.

## 5.2 The PGP portfolio benefits

The PGP portfolio delivers the medium-term benefits (see Table 4). The numbers of programmes aligned with these benefits has been inferred from programme-related material (see also Appendix 8).

**Table 4: Nature of current intended economic benefit**

	Programmes N= 20*	Programmes (%)
New higher value products	16	80
Better processing, faster, cheaper, less waste	14	70
More efficient, reliable supply	14	70
Higher volumes, more consistent supply	14	70
Marketing innovations, more customer-focused, differentiated products, more profitable markets	16	80

*Note that Stump to Pump and STIMBR have been excluded from this analysis because although they generated value, their products proved either uneconomic or ineffective<sup>22</sup>.*

Most programmes are aiming to deliver multiple benefits, the majority across at least three categories.

The PGP is already delivering the following additional benefits. Note that the fertiliser, seed and dairy programmes have always targeted environmental benefits.

<sup>21</sup> The relevant directorate may wish to refer to the New Zealand Treasury guide, *Managing Benefits from Projects and Programmes: Guide for Practitioners*.

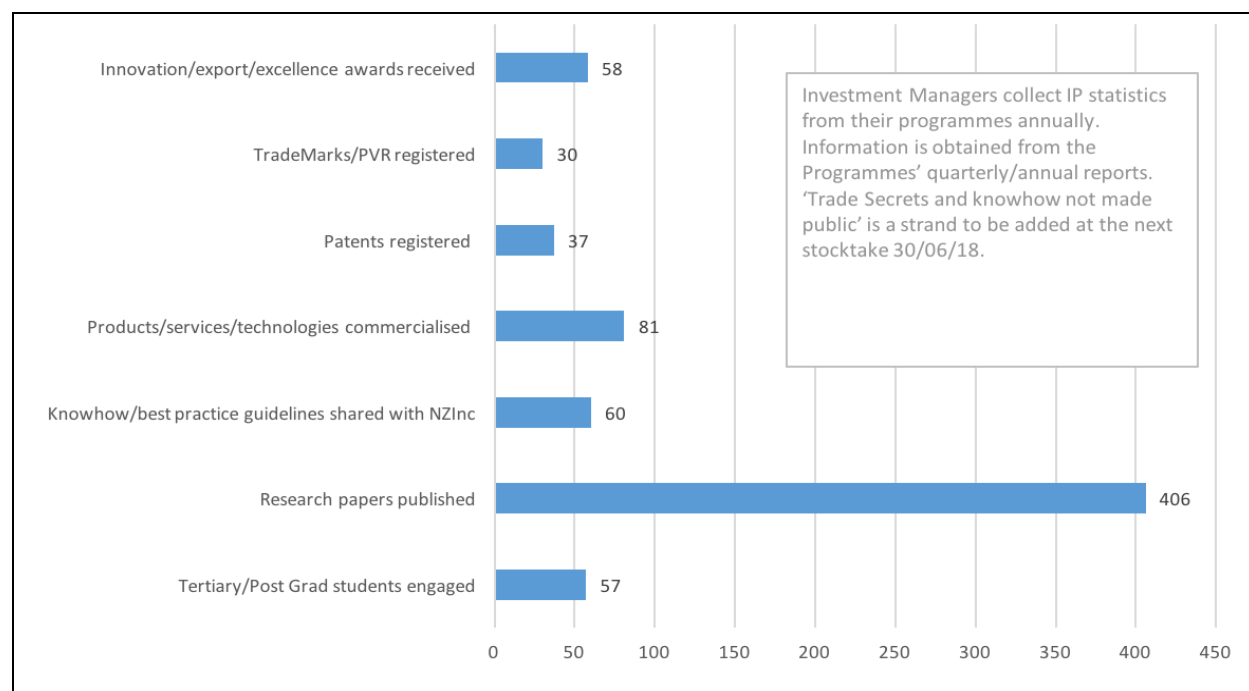
<sup>22</sup> Stump to Pump and STIMBR's deliverables are listed in Appendix 9.

**Table 5: Nature of non-quantified benefits delivered by PGP programmes**

	Programmes N= 20*	Programmes (%)
New knowledge, more skills, increased capability	20	100
Social resilience	7	35
Improved animal welfare	7	35
Improved environmental sustainability	15	75
Improved collaboration	14	70
Improved culture of innovation	17	85

MPI has also tracked the following outputs from the programmes.

**Diagram 4: Non-quantified PGP outputs**



The outputs reflect a portfolio that is both generating and sharing Intellectual Property along the way (even though some IP may be retained for three to five years, much is already available), has been active in commercialising products, services or technologies and has



lifted capability through best practice/knowhow guides, the employment of tertiary or post-graduate students and quite simply the process of being involved – experiential learning. The awards have been the icing on the cake for a number of programmes.

The creation of permanent new jobs is also an important measure of innovation projects' success, and an outcome of interest to governments.

**I recommend that the PGP collects information on the numbers of new permanent staff employed resulting from the PGP programmes.**

### 5.3 Quantified economic benefits

Completed programmes have begun to quantify economic benefits and a selection is set out on the following page.

The cost of funding Stump to Pump and STIMBR (finding an alternative to methyl bromide) was just under \$3m, or around 1% of forecast expenditure to the end of June 2018. STIMBR continued its research with an MBIE fund. Even if both these programmes were considered a failure, a 1% failure rate would be very low. In any event, I suspect neither of these programmes would have been approved if submitted today. Their focus on a single technology appears more suited to an alternative, R&D focused fund.

Other programmes still underway have reported economic benefits as follows.

- ANZCO has made sales of \$36m to date from its PGP-developed products.
- Marbled Grass-fed Beef is generating returns to shareholders that exceed prime steer prices and has delivered an additional \$36m in GDP to date.
- The avocado industry has grown from \$70m in 2013 to \$200m in 2017.
- Lighter wines has exceeded projections of domestic growth.
- W3: Wool Unleashed, Precision Seafood Harvesting, Omega Lamb and Marbled Grass-fed Beef have shown that price premiums are achievable.
- Passion2Profit has achieved average premiums of \$3,000 per tonne for chilled venison and increased volume sales.
- Omega Lamb has demonstrated average market premiums of 37%.
- Sheep – Horizon Three is achieving value-added margins for its calcium chew and nutritional powders.

At this stage, aside from ANZCO and Marbled Grass-fed Beef, it is not clear how much additional economic value can be claimed. But, if both the completed (see Table below) and current programmes are taken into account, it seems evident that the Government's investment has been more than returned already through investment in manufacturing, new jobs, increased exports, increased returns to shareholders and tax on additional revenues, not including other non-quantified benefits.

**Table 6: Economic benefits anticipated from the PGP Programme**

Programme	Government investment (\$m)	Economic benefits to date	Anticipated future economic benefits (\$m)	Likely achieved (\$)	Likely achieved (time)
Steepland Harvesting	3.7	<ul style="list-style-type: none"> <li>• Total benefits more than \$152m since 2010.</li> <li>• Increased mechanisation across whole industry with total investment about \$80m.</li> <li>• Major reduction in cable logging costs.</li> <li>• 30% increase in productivity since 2010, cumulative \$71.3m.</li> </ul>	129 pa by 2019	Lower	Later
Whai Hua	2.0	<ul style="list-style-type: none"> <li>• Information not available but programme successfully achieved deliverables and is continuing.</li> </ul>	5 to 16 pa by 2021	Lower	Later
NZSTX	16.6	<ul style="list-style-type: none"> <li>• Direct firm level benefits of \$95m to date from new and expanding markets from fibre and meat.</li> <li>• Cumulative additional value add of \$341m for industry.</li> </ul>	250 pa by 2025	Lower	Later
Transforming the Dairy Value Chain	76.7	<ul style="list-style-type: none"> <li>• More than \$310m investment in new manufacturing facilities.</li> <li>• 100 new jobs at Clandeboye.</li> <li>• \$60m pa from improved breeding.</li> <li>• Significant increase in mozzarella and UHT exports.</li> <li>• Strong sales forecasts for Anlene and Anmum.</li> </ul>	2,700 pa by 2020	Higher	Later (2025)

Programme	Government investment (\$m)	Economic benefits to date	Anticipated future economic benefits (\$m)	Likely achieved (\$)	Likely achieved (time)
Farm IQ	59.3	<ul style="list-style-type: none"> <li>Generated \$260m over the life of the programmes.</li> <li>Paid \$3.5m per annum in premium farmer payments.</li> </ul>	1,200 by 2025	No change	No change
Stump to Pump	1.8	<ul style="list-style-type: none"> <li>Proved its technology – turning forestry stumps into biofuels – but decided not to progress to commercialisation given cheaper petrol and fluctuating currency rates.</li> </ul>	1,000 by 2033	Not achieved	Not achieved
STIMBR	1.2	<ul style="list-style-type: none"> <li>Developed method to recycle methyl bromide.</li> <li>Implemented a nationwide monitoring protocol and methyl bromide reporting system to report annual methyl bromide use to the Environmental Protection Agency.</li> <li>Identified promising methyl bromide destruction technologies.</li> <li>Developed possible methyl bromide recapture/recycling technology.</li> <li>Confirmed ethyl formate as a promising fumigant for kiwifruit (and by default other horticultural crops).</li> <li>Identified that methyl bromide fumigation rates may be able to be reduced by 40 percent.</li> </ul>	Not stated	Not achieved	Not achieved

## 5.4 Longer term economic gains

In May 2014, NZIER estimated the economic impact of a fully developed PGP portfolio as:

- The gross economic output from PGP would be \$11.1b in 2025.
- Approximately \$6.4b increase in GDP after discounting for optimistic estimates of R&D success and uptake rates as well as “aspirational stretch.”
- \$2.2b could be attributed to the government’s contribution and \$4.2b to industry.
- A benefit-cost ratio (BCR) of 32.

At that stage, STIMBR and Stump to Pump, were still operating. Stump to Pump had estimated economic benefits of \$1b, STIMBR has no recorded estimate of aggregate economic benefits.<sup>23</sup> On the other hand, five new programmes have started since mid-2014: Lighter Wines, Sheep – Horizon Three, Omega Lamb, Passion2 Profit and W3: Wool Unleashed. Among them, these programmes are projecting economic benefits of around \$1b and generally earlier (Stump to Pump was estimating benefits from 2033) although I appreciate these programmes will not be an exact replacement.

Most independent external programme reviews have indicated that programmes are making good progress towards achieving benefits but that it is too early to tell whether the longer-term benefits will be achieved. Only the independent review of Mānuka Plantations<sup>24</sup> was explicit in saying that it was highly unlikely to achieve the \$1.2b in benefits by 2028.

When asked about the likelihood and timing of benefits, programmes responded as follows (see table 7):

- 65% said they expected to achieve or exceed anticipated economic benefits.
- 65% also said that the benefits would come later than expected.

However, Transforming the Dairy Value Chain, which has estimated benefits that account for a significant portion of total benefits, has recently finished and is estimating even higher benefits, albeit later. Other higher benefit programmes like FarmIQ (\$1.2b), which has completed, and Red Meat Profit Partnership, (\$880,000,000) are estimating they will generate the same as originally estimated.

Although I have not had the opportunity to critically evaluate each programme’s assumptions it appears likely that the PGP is on track to make strong returns on the Government’s investment, and likely stronger than usual R&D programmes which NZIER found to have a mean BCR of 11

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<sup>23</sup> STIMBR’s business case was based on maintaining New Zealand’s access to export markets and the economic consequences of not doing so. It was also testing an alternative that had potential cost-savings.

<sup>24</sup> MacIntyre, P. (Sapere). Progress Review of the High Performance Mānuka Plantations Primary Growth Partnership Programme. August 2017

**Table 7: Anticipated benefits from PGP Programmes**

\$	Comparison of originally anticipated benefits and programme reforecasts (\$m)		
Time	Earlier than anticipated	As expected	Later than expected
Higher than originally anticipated	Omega Lamb (400) Sheep – Horizon Three (200)		Transforming Dairy Value Chain (2,700) Seed and Nutrition Technology (195) Precision Seafood Harvesting (100) New Zealand Avocados Go Global (280)
As expected	RMPP (880)	FarmIQ (1200) SPATnz (81) Pioneering to Precision (120)	W3: Wool Unleashed (cumulative 335) Manuka Plantation (1,125) Lighter Wines (285)
Lower than originally anticipated	Passion2Profit (56)		Food Plus (178) Marbled Grass-fed Beef (200) Clearview (56) Steepland Harvesting (129) NZSTX (250) Whai Hua (5)

## 5.5 Additional benefits

Some of the additional benefits, as reported by programmes, are set out below.

### Environmental benefits

Appendix 10 sets out some of the reported environmental benefits delivered through PGP programmes. At least 75% of programmes reported environmental benefits. In summary, these include:

- Reduced and more targeted nutrient use.
- Reduced nitrogen losses.
- Cleaner waterways and reduced water usage.
- Reduced incidental catch of undesired fish species.
- Erosion control.
- Reduced greenhouse emissions (methane).
- Reduced flood damage.
- Reduced waste – extracting greater value from waste.
- Reduced pesticide use.
- Preparation for climate change through development of pastures with improved drought resistance/pasture persistence.

Some programmes have had independent reviews that canvassed environmental benefits. The Coutts Review<sup>25</sup> of Transforming the Dairy Value Chain, for example, concluded:

*There is strong evidence that PGP has enabled the dairy industry to take a major lead in the implementation of significant national environmental practice, targets and regulations – to an extent that would not have been possible without this intervention.*

### Social benefits

A number of programmes have incorporated initiatives that help build social cohesion as well as improve farm management practice:

- Improved farmer resilience/social cohesion: Transforming the Dairy Value Chain, Red Meat Profit Partnership, Passion to Profit and NZSTX all have groups that meet regularly.
- Transforming the Dairy Value Chain has developed an award-winning programme called Good Yarn that is designed to build farmer resilience and address mental

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<sup>25</sup> Coutts. J. & Transforming the Dairy Value Chain Pre-farm gate Impact Review, April 2017.

health issues. This programme is available more widely than the dairy sector and, anecdotally, has received excellent feedback.

- Steepland Harvesting reports having contributed to a significant reduction in serious workplace accidents in the forestry industry through increased mechanisation – (apparently to one sixth of the 2010 level, although Worksafe shows a halving of such accidents).
- Omega Lamb reports having developed a very strong farmer community. It also supports the development of leadership skills from people who don't become obvious farming leaders in the highly public and political New Zealand farming environment.

## Collaboration

Improved collaboration was reported by many respondents and considered by MPI staff to have been a major benefit in 70% of programmes. Collaboration is important for enabling:

- Benefits to be spread more widely.
- Competitors to work together to resolve industry-wide issues.
- Industries to build a strong New Zealand brand.
- Cross-fertilisation of ideas and capability-building.
- Sharing of costs.

The following comment is relevant:

*The PGP provided an alternative model of collaboration between forestry companies as specifiers, machinery manufacturers as suppliers and harvesting companies as customers of the new technology, resulting in a targeted programme of developments to solve sector-wide problems and meet future needs, and a reduction in risk on the path to market for manufacturers. (Steepland Harvesting)*

## Capability

Capability is one of the most enduring benefits from investment in R&D. In addition to the earlier mentioned IP, academics employed and research papers published, other benefits include:

- Improved animal health and welfare practices: Seed and Nutritional Technology Development, Omega Lamb, NZSTX, Precision Seafood Harvesting, Red Meat Profit Partnership, Sheep – Horizon Three, W3: Wool Unleashed.
- Development of genetic technology that supports new technology available to the wider industry to select for eating quality and productivity: Farm IQ.

- Information systems supporting farmer (and wider ecosystem) productivity, sustainability (environment and business) and accountability: Farm IQ.
- New product development process that will continue the rate of innovation in the future: Ballance, ANZCO, Fonterra.
- Research leading to the development of the first technical manual for sheep milking in New Zealand: Sheep – Horizon Three.
- New knowledge applicable to other species: SPATnz.
- Knowledge hub launched with over 150 schools signed up to use resources for teachers (RMPP).
- More than 800 women graduating from Understanding Your Farm Business programme (RMPP).

*[The greatest benefit has been] building technical, scientific and engineering capability in harvesting research and development. There is now a core of skilled engineers, foresters and project managers available to continue the momentum created by ... the PGP. (Steepland Harvesting)*

*One of the greatest benefits is the increased capability we have gained from partnering with AgResearch, Lincoln University and international collaborators. (Seed and Nutritional Technologies)*

## Increased industry investment in R&D

The PGP, by dint of its existence, increases private sector investment in innovation: Many of the programmes had not invested significantly before and have had to find their own funding sources. In some cases, this has come, in part, from industry levies, in others by banding together with other organisations to reduce the cost (Lighter Wines, for example, is funded by a mix of levies, its industry body and its 18 winery co-investors).

Indications from programmes as to increased investment during their PGP programme include:

- Ravensdown investing an additional \$900,000 to \$1,000,000.
- PGG Wrightson investing an additional \$500,000 per year in R&D since the PGP began.

Steepland Harvesting also noted the PGP's catalysing effect with respect to future R&D:

*The PGP has catalysed a level of change within the forestry industry in New Zealand as initiatives towards further mechanisation have developed and uptake has occurred. ...Now people are thinking about the next step – Automation and Robotics.*



## Other benefits

- New regulation for innovation and precedent for [regulatory] approval: Precision Seafood Harvesting.
- Traceability platform for NZ seafood: Precision Seafood Harvesting.

## 5.6 Likelihood of achieving economic benefits and risks

Appendix 7 shows the size of originally anticipated benefits; the dates by which they were expected to materialise at scale; the amount of investment approved; and programmes' views on the likelihood of achieving the benefits and in what timeframes. These benefits cannot be aggregated for the reasons earlier outlined.

Although the IAP may be concerned about the risk of some programmes not delivering the full anticipated economic benefits, it does not believe any current programme will completely fail. This is unsurprising as the PGP programmes are constructed to manage or mitigate the risk of failure; with a focus on achieving outcomes, each programme's portfolio of projects can be switched on and off, and new more promising avenues added, to increase the likelihood of success. Further, the industry-led governance model enables faster decision-making (e.g. decisions to "fast fail").

That said, in my opinion, Omega Lamb and Mānuka Plantations have particularly ambitious programmes and carry a higher level of both risk and potential returns. It is also critical that Precision Seafood Harvesting is able to work through the regulatory process effectively if its technology is to be successful in New Zealand, and Passion2Profit and the fine wool industries must be able to increase supply to achieve their benefits.

The co-investor requirement to resource the programme during the uptake phase is a risk. Of course, this matter should be addressed before a programme is approved, which is now the case. However, to mitigate the situation for some earlier at-risk programmes, MPI is working with them during their last two years of funding to ensure appropriate structures are put in place to ensure benefits are realised (see also discussion under section 6. Eligibility Criteria, \$500,000 (plus GST) minimum contribution).

The NZIER also noted how crucial assumptions around uptake were to the calculation of benefits. It considered that some programmes were more likely to have successful uptake because of who was involved and their proximity to the end user: in particular Transforming the Dairy Value Chain, FoodPlus, SPATnz, Precision Seafood Harvesting, and Steepland Harvesting were considered more likely to be successful. Red meat programmes (at this stage Omega Lamb had not started) and High Performance Mānuka Plantations, on the other hand, were considered to be more loosely connected with those who would take up the research, and therefore at higher risk of not achieving estimated benefits. I mention Omega Lamb because the whole value chain is closely involved in that programme and it could therefore be expected to have greater chances of success, despite its challenging agenda.

## 5.7 Conclusions

It is still too soon to predict the size of the PGP's impact, or to say that the programme will achieve the NZIER's projected increase in gross economic output and BCR. However, there is good evidence four years on to suggest the PGP is progressing well towards this outcome, albeit later than estimated, and it is very likely that economic benefits have already exceeded the government's investment.

Programmes themselves are, on the whole (65%, but this includes the programmes with the largest benefits), predicting benefits will be either as expected or higher (especially some of the larger programmes like Transforming the Dairy Value Chain, Red Meat Profit Partnership, FarmlIQ, and Omega Lamb) and the same percentage (65%) but not necessarily the same programmes (see Appendix 7), say the benefits will come later than originally anticipated.

No programme appears at risk of complete failure – but then programmes are constructed and managed to avert this situation.

The PGP programmes have also begun to deliver a significant range of benefits that have not been quantified: environmental, social, animal welfare, and the necessary conditions for future innovation – collaboration, capability and culture change.

Overall, the PGP is likely to have been very good value for money. It is unlikely this level of change would have happened without the funding. There is certainly evidence to show that other firms are innovating without government assistance. But, for around 0.1% of the value of primary sector exports it appears the Government will have made a worthwhile investment.

## 6. ELIGIBILITY CRITERIA

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Before the eligibility criteria can be reviewed, it is helpful to understand the PGP model's underlying assumptions.

### 6.1 Programme assumptions

Programme assumptions include:

- The PGP programmes are intended to be neither incremental nor breakthrough; rather they attempt transformations or ambitious step changes that are likely to achieve substantial economic gains.
- Government R&D programmes with industry co-investment are more likely to succeed.
- Government should not be involved in picking winners.
- Sharing the risk gets long contemplated R&D over the line, speeds the innovation process and increases private sector investment in R&D.
- Taking a market-led, value-chain approach is crucial in obtaining step changes.
- Having a flexible, outcomes-focused approach to governance enables projects to fail fast and achieve breakthroughs.

### **The PGP programmes attempt transformations or ambitious step changes**

As noted earlier, many applications to the PGP have been declined for lack of novelty and because they lacked a path to market. In effect, most of these applications failed to demonstrate that a substantial change or transformation would take place as result of the proposed programme, one that would not happen otherwise, or could be substantially accelerated.

All current programmes are innovative and are mostly considered to demonstrate a higher level of innovation than seen before in these companies and industries. But, what proportion could be considered transformative? (See also Appendix 1)

Some programmes have been highly transformative not only in what they have achieved but what they have set up for the future. ANZCO, for example reports being changed from a traditional commodity producer to a more consumer-centric and innovation-savvy business with added-value food, ingredients and healthcare businesses. As a forerunner amongst traditional processors, the programme is having a strong signalling effect, and its competitors are reported to be following ANZCO's path towards higher value products (a "green shoot" demonstration of the PGP's success in catalysing industry transformation).

Even programmes that appear lower in terms of industry transformation ability such as Lighter Wines have been successful in persuading countries such as Canada to open a new category of wine, increasing New Zealand's potential to access new markets and grow exports.

So, how innovative is the PGP portfolio of programmes? (See also Appendix 8):

- 80% of programmes are developing new, higher value products, most of which are also innovating at the marketing end.
- 70% are engaged in process innovation with the aim of better, faster, cheaper processes, more efficient and consistent supply, or higher volumes – the large traditional industries were more likely to have this as a key focus (e.g. FarmIQ, Marbled Grass-fed Beef, Transforming the Dairy Value Chain), along with newer industries (Avocados, Sheep – Horizon Three and Omega Lamb).
- 75% of programmes are developing marketing innovations, i.e. implementation of new marketing methods involving significant changes in product design or packaging, product placement, product promotion, distribution or pricing.<sup>26</sup>
- 10 of the 22 programmes are considered to be producing something new to the world, whether this be a new technology, a new product or a new process (see Appendix 1).

This is consistent with the aim of transforming and strengthening existing markets, changing industry behaviour in New Zealand primary industries and moving participants along the value chain.

In summary, the PGP programme has succeeded in attracting programmes that are transformational and innovative. The quote below illustrates this:

*The W3 programme aims to transform the New Zealand strong wool industry by moving from a commodity-based model to differentiated marketing, developing a consumer-focused supply chain that responds to specific market needs, therefore increasing the demand for strong wool. Creating new demand at a pace that enables transformational change for strong wool was beyond the scope and means of NZ M[erino].*

## **Government R&D programmes with industry co-investment are more likely to succeed**

*As both organisations are investing money then both organisations need to be confident, through their own internal review processes of the merits of the business case. In our situation approval needed to be granted by the CEO and Board. This*

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<sup>26</sup> As defined in the Oslo Manual, 3<sup>rd</sup> Edition. (2005) OECD.

*structure ensures the drive for commercially focused outcomes.  
(Pioneering2Precision)*

A partnership approach, where industry has real “skin in the game” de-risks the investment for all parties. It also provides strong incentives for the commercial parties to succeed.

### **Government should not be involved in picking winners (or programmes should be industry-led)**

The PGP is deliberately industry-led, meaning that programme proposals are generated by industry. This is a matter of economic philosophy but, like companies having a financial stake in the programmes, is likely to engender a greater incentive and determination to succeed.

However, some stakeholders criticise the PGP for being passive rather than driving a more top-down approach to investment.

This perception is only partly valid – the PGP requires programmes to demonstrate consistency with sector strategy. Where a sector strategy is lacking it has been successful in catalysing industry into developing one (e.g. Avocados Go Global), even when proposals have been declined (coarse wool). The quote from Steepland Harvesting below illustrates consistency with sector strategy:

*In the July 2008 strategy conference, a programme reducing the cost of steep country harvesting was identified as the number one priority.*

There is also some evidence to suggest that companies can have greater foresight. Ballance, for example, wrote of its programme’s origins:

*The company view was that nutrient constraints were coming (although not recognised by the sector) and that within the programme’s lifetime farmers would be seeking tools/products to address nutrient loss. These products would not have advanced quickly enough with status quo investment.*

The difficulty with foresight of course, whether government, sector or firm, is that assumptions about the future may not be realised or they may take longer to eventuate. This has been Ballance’s experience:

*...post GFC changes in market conditions and the slower introduction of nutrient constraints is leading to lower uptake and cost-benefit of the products developed.”*

When responding to questions in March 2018, Ballance noted that while it still expects to achieve the anticipated benefits, these will now take longer. However, Balance will be well-positioned when nutrient restraints are eventually introduced, increasing demand for its technology, helping realise benefits earlier and putting New Zealand ahead of the game.

Further, as earlier noted, the PGP has not precluded proactive approaches to fill perceived gaps, e.g. horticulture and smaller, emerging sectors.

A change to a top-down approach, where government identifies the sectors or areas it wishes to invest in and seeks businesses to partner with would require changes to the way the PGP operates. So long as industry is expected to contribute 60% of the funds, there would need to be a clear business rationale and potential commercial return for investment, as well as involvement in developing strategy.

The PGP's eligibility criteria and rules do not preclude a change in approach. Given the PGP's flexibility and the need to optimise its impact it would be possible to add criteria to ensure the fund achieves the government's goals in the primary sector or to identify specific gaps and call for applications. This should be done in conjunction with the IAP, industry and MPI's own intelligence capability.

In this event, it is possible that the PGP may need to revert to 50:50 partnership in order to engender interest.

In my view an element of top-down targeting could be introduced but government needs to continue to stay away from picking winners. And, an element of "industry-initiated" should be retained. This is because of the powerful incentives to succeed, and because the public benefits are wider and more likely to be retained.

**I therefore recommend that the PGP continues to retain the capacity for programmes to be proposed by industry.**

### **Sharing the risk gets long-contemplated R&D over the line**

Many of the PGP projects involve taking basic research to the applied stage and commercialising it. Some companies had sat on basic science for more than 15 years. The PGP has also enabled industries with low levels of previous R&D to get on (or back on) the ladder.

*Since the closure of the former Logging Industry Research Organisation over a decade ago, there has been no formal research effort in harvesting to support productivity, cost and safety improvements. As a result costs of harvesting, particularly on steep terrain, had continued to increase and NZ's international competitiveness had been eroded. (Steepland Harvesting)*

### **Taking a market-led, value-chain approach enables step changes**

Of the 11<sup>27</sup> programmes whose primary focus was the development of one or more new products, all also had projects focusing on marketing innovations. This suggests the PGP

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<sup>27</sup> The twelfth programme, Transforming the Dairy Value Chain, would presumably have used existing distribution channels to market its new products, or developed its marketing outside the PGP programme.

has been effective in incentivising programmes to take a customer-led approach to product development. The wool projects were particularly supportive of a market-led approach:

*The traditional model for R&D needs to go, and be replaced by one where all R&D and innovation is market-led, based upon deep consumer empathy insights.*

*For our primary sector our biggest challenge isn't what we are selling, it is how we are selling it. Innovation in terms of consumer insights, and market approaches that are focused on value rather than volume are therefore required. (W3: Wool Unleashed)*

### **Having a flexible, outcomes-focused approach to programmes has enabled projects to fail fast and has also been the source of some programmes' greatest breakthroughs**

Having a flexible approach was strongly supported. The following case study about developing a sheep dairy industry illustrates this.

Sheep – Horizon Three conducted an indoor trial, sorting sheep into four groups with similar production potentials. It then put the sheep under essentially different farming systems on the same site (outdoor, hybrid and indoor) and compared the systems.

They identified that a group of better performing sheep produced significantly less milk than they should have. They concluded that this traced back to a batch of silage that was standard for New Zealand dairy cows but that all but halted sheep milk production.

This set the programme on a deep dive into dairy sheep nutrition followed by a new trial to test a New Zealand dairy sheep nutrition model.

With the same sheep that had previously produced about 120L/ewe they achieved over 200L/ewe simply by adapting nutrition. This result was significantly above targets and would not have been achieved without the initial “failure”.

Similarly, RMPP fast-failed its group weighing technology because the algorithm was not working properly. Its PSG decided instead to focus on accelerating the Farmer Action Groups project which the PSG considered was the best way of achieving the RMPP's outcomes of lifting overall farm profitability. These are now at least a year ahead of target.

One programme suggested there could also be greater flexibility with funding limits – that if a company was willing to invest more to ensure benefits were achieved, it would like to have the potential for matched funding from the PGP. MPI may wish to consider this, but I suggest it would make for substantial extra complexity and may be hard to justify given the size of investments already made.

Flexibility is also the major reason why the PGP is managing risk so effectively. The following quote from ANZCO illustrates this:



*The programme started with development programmes in eight areas, and now has four. It is arguable as to whether some of the terminated projects actually failed fast enough, but MPI and PSG have been consistently supportive of moving into new areas that showed the best chances of delivering on the overall programme goals. The PSG has also been consistently supportive of moving into new areas where a good case could be made for such a shift. This is important in a seven year programme. It is not possible to know at the outset which projects will be successful, or what options will emerge during the programme. (FoodPlus)*

## **6.2 Eligibility criteria and rules**

Earlier in the PGP's life, the then IAP sought and received clarification on several eligibility criteria, in particular, "in-kind" contributions, and the principle of additionality – that is, over and above BAU. Papers were prepared and there now appears to be close alignment between staff and IAP members in their understanding.

A review of IAP decisions shows that all existing programmes have been assessed against the eligibility criteria. The 2015 OAG report recommended improvements to the recording of the reasons for approval or decline and MPI has addressed this aspect of its process.

## **6.3 Stakeholder issues with the eligibility criteria**

The key issues raised by stakeholders regarding eligibility criteria are:

- The seven-year limit for programme funding.
- The \$500,000 (plus GST) minimum contribution and whether this creates a barrier to entry for smaller, emerging industries.
- The 60:40 contribution.
- Additionality – i.e. whether the co-investor would or could have proceeded without government support and whether the additionality requirement is too strict.

### **The seven-year limit**

Because the PGP stops short of uptake, programmes will need further investment before anticipated economic benefits are realised. All but three programmes will complete the funding period with further steps to go and in part this is because MPI must adhere to international obligations which do not permit subsidies that are contingent on export performance. Provided the international obligations are not transgressed, the seven year "hard stop" seems arbitrary in light of how challenging it is to achieve step changes or transformation.



Moreover, having a specified programme length creates the perverse incentive for programmes to apply for the maximum length of time – it is possible that programmes could complete projects more quickly or with less money if they were compressed or if there were fewer sub-projects.

Crown funding of the High Performance Mānuka Plantations programme will finish in June this year following a seven year programme costing \$2.98m, of which the Crown funded \$1.4m. It aimed to increase the yield and reliability of supply of mānuka honey, especially the cultivars shown to produce medical grade honey (those with high DHA levels and very high market premiums). Plantation trials (400 hectares across 14 sites in both main islands) have shown that picking the right cultivar for the site is critical to mānuka plant survival, good nectar and honey production. Research has shown that genetics are the main driver of DHA, best practice information has been developed on establishing plantations, and a predictive tool is being tested.

Mānuka Farming NZ Ltd, the company formed to continue the programme, is providing a commercial consultancy to aspiring mānuka growers, and sales targets have been met for the seedlings produced. However, before the full anticipated benefits can be achieved, more data is required for the predictive tool and a large amount of land needs to be planted with the right mānuka seedlings. Moreover, mānuka takes some seven years to come into production.

It is not clear why a seven year “hard stop” was implemented by officials (it is not in original cabinet papers or minutes). In some circumstances it may make sense for programmes to take longer than seven years, particularly if limited (and well-defined) further work is required to ready a product for commercialisation or derive the economic benefits; if other funding sources are not available or uneconomic; or if sourcing additional funding would take too long.

**I recommend that MPI should re-examine whether having a specified time limit on funding creates the right incentives for programmes to be efficient and cost-effective, as well as whether it creates an unnecessary rigidity if programme funding needs to be extended.**

### **The 60:40 ratio**

The PGP’s original 50:50 contribution ratio was changed in 2015 because it felt that the benefits were likely to be disproportionately private. This also brought the PGP in line with other government innovation funds. The change seems to have been reasonably well accepted, and applications to the PGP have increased, albeit following marketing of the fund. One programme suggested that there should be an adjustment to the Intellectual Property (IP) expectations with the change to a lower government subsidy. Others have indicated there should be an adjustment to MPI’s expectations at the PSG table – it should not have 50% of the say with 40% of the funding contribution.

As these were raised by only two programmes and the PGP has continued to receive proposals from smaller industries, it does not appear to be problematic. It may, however, be appropriate to review the ratio for second and subsequent programmes. This is further discussed below.

### **\$500,000 (plus GST) minimum industry contribution**

Initially it appears some potential applicants were confused by the \$500,000 (plus GST) contribution, believing this amount was required per annum rather than over seven years. There was also some evidence to suggest this myth may continue to persist. Some contributors to this review, for example, suggested that the minimum contribution might be a barrier to smaller sectors.

The PGP may therefore need to make information about annual minimum requirements even more specific in its promotion of the fund, for example, it could spell out that \$107,000 per year would be required in a seven year programme and reiterate that some of the investment can be “in kind”. As an alternative, it could also convert its minimum requirements to annual amounts which would enable programmes taking less than seven years to reduce its contribution.

However, I also note that some programmes have proceeded despite coming from industries with tight margins. Lighter Wines, for example, pulled together 18 wineries plus its industry organisation, enabling it to contribute \$8.84m over seven years.

Further, smaller programmes may be eligible for funding of consultants to produce business cases. This is not publicised.

Accessibility concerns aside, co-investors must have sufficient means to support programmes after the PGP funding stops. In other words, they must be able to fund uptake. In my view, this outweighs arguments about access<sup>28</sup> and suggests a significant minimum contribution should remain. The PGP could, however, consider adjusting this figure for shorter programmes and move to an annual minimum figure.

It could also be argued that the minimum was set in 2009 and is due for review. Inflation since that time has been 13% (to Q1 2018) suggesting a new minimum of \$565,000 over seven years: Nine years is a long time for a co-investment programme to run without a review of contribution.

#### **I recommend that the PGP:**

- **Retains a significant minimum co-investor contribution.**
- **Considers converting this to an annual amount rather than on a total minimum basis to take account of varying programme lengths.**

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<sup>28</sup> I note the IAP has carefully considered this requirement in business cases and recently sought information to satisfy itself about downstream manufacturers' ability to manufacture at scale.

- **Adjusts its minimum amounts every three years in line with inflation.**
- **Makes its minimum requirements clearer in literature about the fund.**
- **Makes the availability of support for developing business cases, and eligibility for this, more widely known.**

## **Additionality**

The key issues with respect to additionality are whether some of the funding has gone to corporates that should have been able to carry out the programmes as a matter of business as usual and whether the fund is really a form of “corporate welfare”.

### **Business as Usual**

The PGP’s programmes include some of New Zealand’s largest primary sector company co-investors: Fonterra, Ballance, Ravensdown, ANZCO, LandCorp, Alliance, Z Energy, Norske Skog, Silver Fern Farms, Sealord, Sanford and Moana Fisheries, and PGG Wrightson.

It is not possible to determine, in hindsight, whether programmes were additional, however submissions provide reasonable explanations. When asked, programmes generally gave one or more of the following reasons:

- The company may have funded the programme but it would have been scaled back and run over a much longer timeframe (eligible due to acceleration additionality).
- The risks were such that government investment effectively de-risked the programme, giving companies greater confidence to proceed.
- The scale was such that it enabled transformative programmes that would otherwise have been unaffordable or too risky.
- Alternative private investment sources would not have been prepared to wait for returns (some programmes will not produce benefits at scale until 2030 and beyond).
- Having government backing gave potential partners – either along the value chain or in the same industry – the confidence to collaborate.
- Their programme had a strong element of industry and public good.
- It accelerated the innovation process.

### **The counterfactual**

When asked what would have happened if their programme had not been eligible for the PGP funding, most said the programme would not have proceeded. Some would have applied to funds such as those managed by MBIE or Callaghan Innovation or to offshore venture capitalists. Some may have proceeded internally but in all cases, the programmes would have been considerably scaled back or completed in phases over a much longer timeframe.

*Back in 2008/09 the industry partners had identified a number of key themes that needed to be addressed to put the industry in a stronger position both sides of the farm gate. Many of these involved addressing gaps in the overall innovation system and required the creation and development of capabilities outside of the organisations themselves (e.g. training rural professionals), including the Government R&D sector (e.g. NZ universities and CRIs) ...they were beyond the current investment remit and scope of both organisations and would generate a public benefit outside of dairy, strengthening the case for public sector investment. Even areas that in hindsight appear to have had strong commercial drivers for investment (e.g. food structure research relating to rapid mozzarella production) first required the development and growth of new skills and capabilities within the wider R&D system. (Transforming the Dairy Value Chain)*

*... the programme would probably have remained “stuck” in the scientific research pipeline ... attempting to improve reliability without achieving scale. (SPATnz)*

In 2014, NZIER observed that “the business cases generally do not have a good description of the counterfactual (i.e. what would happen in the absence of Crown funding).” I am satisfied this has since been addressed and that the IAP has been robust in its questioning. This is evidenced by a further recently rejected programme application involving a large corporate for insufficient evidence of additionality.

### **Benefits of co-investing with corporates**

The benefits of investing in larger companies are that they:

- Have the capacity to influence an entire sector through the breadth of their programmes and through the signalling effect of their own changes (see ANZCO quote below).
- Are more likely to deliver substantial economic benefits because they can contribute significant funds, they have the infrastructure to commercialise the products developed and because they can make the necessary investment in uptake at the end of the programme.

*[The greatest benefits] to ANZCO [are] the development of an innovation and added value culture. The programme has given ANZCO the confidence to buy Bovogen, downstream processing business, and TBE<sup>29</sup> the confidence to buy a commercial scale added value extract plant. For ANZCO the PGP programme has become the base for an added-value transformation of the company. Progress has been slower than anticipated, but ANZCO and its owners are committed to the added value strategy. (Food Plus)*

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<sup>29</sup> Taranaki Bio Extracts, an ANZCO joint venture with Taranaki By Products Limited which is part of Hawera-based SBT Group Limited.

Moreover, programmes with large corporate co-investors have not displaced other applicants – the PGP’s full appropriation has never been used.

### **Selected benefits delivered**

Selected benefits delivered by corporate recipients of PGP funds include:

- Fonterra investing \$310m in a mozzarella plant in Clandeboyne (near Timaru) following its success in substantially reducing the time to produce mozzarella, and securing contracts for its cheese to top half the pizzas in China. This will create 100 new jobs. In addition, through the PGP programme, grated cheese exports have increased along with very steep growth in UHT creams and its Anlene and Anmum products (also part of the PGP programme).
- Ballance winning innovation awards for Spreadmart™, a precision fertiliser technology for top-dressing aircraft that automatically applies fertiliser at the optimum rate, in the right place – avoiding environmentally sensitive areas – and improving returns to farmers. This will be launched in 2018.
- ANZCO commercialising 22 food, healthcare and food ingredient products, all with high value margins. It has also created 12 jobs through its new Taranaki Bio Extracts extraction plant.

Many of these companies have also partnered in the large dairy, beef and deer programmes such as Transforming the Dairy Value Chain, Passion2Profit and Red Meat Profit Partnership which have projects aimed at improving farming skills and farm management, farm profitability, improving farming community resilience and addressing mental health challenges (Good Yarn).

At least one company made the point that it would not retain the majority of benefits:

*... more than 90% of the benefits [will fall] to New Zealand farmers and tax payers.  
(Seed and Nutritional Technology Development)*

Smaller companies and programmes also reported views on the question of additionality:

*If a programme will benefit the whole of New Zealand through future access to novel IP, then does it matter if the conditions of “additionality” and “beyond business as usual” are met? (SPATnz)*

### **Acceleration additionality**

A number of programmes considered either that programmes should only be required to show that the government’s investment would significantly speed up the programme or that rules should allow the PGP to enhance existing company programmes where they would benefit from further investment. One echoed the concerns by saying there is a:

*...fundamental contradiction in the requirement that a new programme align with existing industry strategy while at the same time requiring that co-investors’ activities*

*must be in addition to existing work programmes. Often research and innovation activity is planned but not budgeted or actioned for lack of funding. The definition ....should be clarified to state that a programme will count as additional if the co-investor can provide satisfactory evidence that PGP funding will bring forward the activity by a minimum of 12 months. (Steepland Harvesting)*

These concerns show a potential misunderstanding of the PGP's additionality requirement which I suspect is widespread outside the programme. The PGP's guidance explicitly states that speeding up innovation (otherwise known as acceleration additionality) is within the eligibility criteria.

*Research and innovation activity is not "additional" if it is already planned but may count as additional if the co-investor can provide satisfactory evidence that PGP funding will bring forward the activity by a minimum of 12 months. Alternatively, additionality can be demonstrated if the programme delivers overall outcomes at a significantly quicker pace than business-as-usual activity would.<sup>30</sup>*

This aspect of additionality is a major benefit of government R&D funding to corporates and not unique to either the PGP or New Zealand. In the PGP context, however, it is unlikely to be the sole consideration.

### **Corporate welfare**

There is no doubt that corporates have been assisted through the PGP. However, it is not unusual for governments to invest in corporate R&D, either through direct subsidies or tax incentives (which are arguably also a form of corporate welfare).

The primary advantage of tax incentives is that they apply across the board and seem fair. In other words, they do not cause problems for government through competitor and other complaints.

To put things in perspective, current annual PGP funding comprises less than 0.1% of annual export earnings. Further the PGP programme is especially suited to long-term transformational projects and the New Zealand public retains the significant public benefits (environmental, social, employment, tax income, capability-building).

R&D tax incentives are not expected to affect demand for the PGP. A 40% contribution over a longer period is expected to be more attractive than smaller annual tax incentives.

### **Criteria for second and subsequent programmes from the same co-investors**

MPI may, however, wish to consider whether large corporate co-investors should be judged by the same criteria for a second application. Given the capability and cultural benefits they have already gained from first programmes, I would expect larger companies to at least demonstrate this by increasing their R&D efforts from their own resources in future.

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<sup>30</sup> Ministry of Primary Industries. (2015). PGP Guidelines for Investors. *MPI*. P7.

In my view, therefore, corporates making second applications for the PGP programme investment should not only comply with the existing additionality criteria, but demonstrate that they have increased internally-funded R&D since the original PGP programme and made investments that have ensured uptake of the previous PGP programme.

In other words, they should be able to evidence the benefits of additional innovation capability as well as improved culture and a commitment to seeing innovations through and continuing to invest in innovation.

**I recommend MPI considers introducing one or more of the following hurdles. From least to greatest impact, these might include:**

- **Not investing in programmes where there is one primary corporate co-investor and low evidence of collaboration and wider public benefits.**
- **Requiring evidence that the earlier PGP programmes have progressed and further investment has been made to realise the anticipated benefits.**
- **Requiring evidence of increased investment in innovation additional to the PGP programmes.**
- **Introducing a limit on the size of the government's investment contribution.**
- **Reducing the government contribution to 30% in some situations.**
- **Introducing suspensory loans<sup>31</sup> instead of funding contributions.**

## **6.4 Do the eligibility criteria and rules preclude other suitable proposals?**

Those interviewed could not generally think of any ideas that might be excluded. However, some people thought the \$500,000 minimum contribution over seven years might deter smaller parties from applying.

As stated earlier, I consider this threshold appropriate. The main deterrent is the resource-intensive proposal and business case process.

*The high administrative cost of the PGP process and the lengthy application/ approvals process often turns a lot of lean and agile companies, such as harvesting contractors and small manufacturing firms, away from applying. (Steepland Harvesting)*

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<sup>31</sup> Suspensory loans can take a range of different forms, including interest-free but usually the first repayment is not required before a pre-determined future date. For PGP, repayments could be tied to the realisation of profits, but programmes delivering significant public benefits should be excluded.

The requirement to share IP after a three to five years period could deter some companies from applying. Two current programmes, for example, commented that they were surprised during the contracting phase because they had not anticipated this condition. This is likely to have been pre-2014 as the contract template has been on the website since that time. However, it is something Investment Managers could ensure prospective applicants understand as it is a key criteria.

## 6.5 Other issues raised

### International obligations

Two companies considered that the criteria around ensuring funding was not awarded to programmes that would cause a breach of New Zealand's international obligations and Government trade policies needed further clarification. One said that "a development programme that is co-funded by a company is sometimes interpreted as a 'subsidy' when it is a co-funded development." Another company said that the IAP required programmes to address marketing but would then not fund it for fear of transgressing international obligations.

## 6.6 Conclusions

The PGP's eligibility criteria appear to work well for a programme attempting firm and sector-wide transformation. I have concluded that;

- The seven year rule should be reviewed.
- The minimum \$500,000 contribution should remain but be adjusted every three years for inflation.
- Partnering with corporates may have been contentious but has also been good for the transformation agenda.
- There is nothing in the criteria that precludes taking a more top-down approach to seeking programmes that may partner with the government in targeted areas.
- If government were to introduce an element of top-down targeting it would need to ensure there was a strong commercial benefit for its private sector partners and avoid putting itself in the position of picking winners.
- Room should be left for industry-initiated programmes – companies and sectors can sometimes be ahead of their sectors and the government.



## 7. IMPLEMENTATION AND MANAGEMENT

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This review reports on issues raised largely by external stakeholders – programme partners and IAP – or from insights obtained through the review process. As the PGP has a unique governance structure, and relies on this for achievement of outcomes, the operating framework has been described in section 3.4.

### 7.1 Governance

#### IAP

The IAP's role as set out in its Terms of Reference (TOR)<sup>32</sup> is purely advisory: there is no formal feedback mechanism or requirement for MPI Investment Advisers to report back to the IAP on actions taken following its advice. Following up comments such as “selective reporting of figures”, for example, is left to MPI's discretion.

The model appears to work well for MPI but causes some confusion for programmes in that they appear to understand that quarterly reports are completed for the IAP. MPI does require quarterly reports, but these are for PSGs. The reports are then provided to MPI and to the IAP for noting, along with IM commentary on programmes' progress. Annual plans are produced on the same basis. Actual governance is delegated to PSGs but it is not clear what happens if the IAP raises concerns.

**To assist programmes, I recommend clarifying the extent of the IAP's role and the process to be followed if the IAP raises concerns.**

This may not require a change to the TOR, but a brief explanation in programme guidance material would be helpful.

Nevertheless, presenting programmes' annual plans, and annual and quarterly reports to the IAP gives programmes the opportunity to obtain independent commercial views on risks and progress, something they value (as explained below).

And, as noted in section 5.1, quarterly and annual reports should enable MPI to monitor programmes' progress, risks, and achievement of benefits at both an individual programme and portfolio level. Templates can be developed that capture progress, risks and benefits simply, and that effectively reduce and streamline reports and meet the needs of both MPI and PSGs.

A review of IAP minutes and attendance at two IAP meetings provided evidence that the IAP appropriately challenges proposals and business cases for consistency with the criteria and

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<sup>32</sup> See footnote 8.

rules and particularly around both public benefits and commerciality/likelihood of success. Similarly, from a monitoring perspective, current programmes have been challenged on progress made and constructive suggestions given for future direction. In a rare case, funding was suspended for a period when a programme failed to provide an Annual Plan, a decision made by MPI rather than the IAP.

Those who criticised the IAP were in a minority, the main issue being that unsuccessful parties sometimes did not understand the reasons for being declined. Further discussions with MPI staff should be able to clear up any confusion (MPI staff attend IAP meetings and appear to have developed a good understanding of IAP requirements).

**I recommend that MPI staff explain to unsuccessful applicants by phone the reasons for having proposals rejected as soon as possible after IAP meetings and before sending anything in writing.**

Some applicants also felt IAP questioning was at times disjointed. This suggests misunderstanding of the process: the IAP has not made up its mind at the point when proposals or business cases are presented. The purpose of the questioning is to allow individual members to seek further information so that they can be individually satisfied and contribute to the panel decision. Applicants cannot necessarily have anticipated every question, but MPI staff can assist by ensuring applicants understand what will happen at the relevant IAP meeting. Questions will always come out of left field at such times.

The comment below is more reflective of overall sentiment:

*[IAP] has been very effective in reviewing progress and has really benefitted our project. [They are] quality IAP members with wide business experience. More frequent interactions might be helpful, rather than infrequent but at times truncated sessions. [They are helpful at] identifying strategic issues that need to be addressed. (Omega Lamb)*

**To the extent that it is possible, given demands on IAP's time, MPI and IAP should discuss whether greater access to IAP is possible.**

One further suggestion: a survey respondent suggested considering "appointing to the IAP a member from a completed programme to give the insider perspective". This idea has merit.

**I recommend the Minister gives consideration to appointing a member of a completed PGP programme to the IAP when making the next new appointment.**

Given the current situation the PGP, however, I question whether MPI is making the best use of the IAP from a strategic perspective. The IAP is not consistently provided with full information about the PGP and its performance at the portfolio level and cannot, therefore, raise or fully contribute to strategic discussions.

**I therefore recommend that the IAP be provided with better portfolio level information so that it can be more effectively involved in strategic discussions about future directions for the PGP.**

## PSG

The PSG is accountable to all co-investors for effective delivery of programme outcomes and benefits. It has the authority to change programme plans if/when necessary within approved funding and time constraints. As such it:

- Reviews progress and provides programme oversight.
- Manages the strategy to deliver agreed outcomes.
- Ensures programme plans are being executed effectively and have sufficient resources to succeed.
- Ensures programmes are on track to deliver target outcomes and benefits.

Some may see it as a bold move for government to effectively place the stewardship of its investments in the hands of PSGs. But it would be a mistake to think this means losing a focus on public benefits and accountability for taxpayers' money.

It was clear from reviewing past reports, and from interviews, that some PSGs had struggled in the early days. In particular, some programmes were not progressing as well as expected and the chairs of the larger and more complex programmes had difficulty getting the various programme co-investors headed in the same direction. The employment of independent chairs has done much to alleviate this situation and improve collaboration amongst often fiercely competing parties.

Independent chairs work through any disputes, keep programmes on track and ensure both parties' interests are met. From a government perspective, this means ensuring programmes will deliver benefits to the wider public in addition to the private benefits.

Having an independent chair means industry co-investors must cede a degree of financial control, especially once annual budgets are agreed.

Some co-investors have had difficulty doing this and it remains a cause of tension in one programme. It has been suggested appointing another independent member could improve this.

**MPI may wish to consider appointing a second independent member to PSGs in defined circumstances. This person could replace or supplement MPI's senior staff membership of the PSG.**

**As effective partnerships and governance are critical to the success of programmes, PSGs may also benefit from early access to external dispute resolution when they are experiencing difficulty.**

Overall, despite some lack of clarity and grumbling about compliance costs, the devolution of responsibility has largely worked well. In the past, MPI delegates, for example, have been viewed as overly risk-averse and commercially naïve. However, most programmes noted an improvement in the quality of MPI Investment Managers and were highly complimentary of their contribution: over the past few years MPI has sought staff with prior commercial experience and this appears to have paid off. The quotes below illustrates this.

*We have found the PSG process to work extremely well. Outside of the specific governance skills ...the complementary skills of the Ravensdown representatives in terms of technical and industry knowledge and MPI representatives in terms of wider crown linkages and processes have formed a very effective governance group. (Pioneering2Precision)*

*Over the life of the programmes, the steering group, and in particular the MPI appointees, moved from being an effective policeman or auditor, to being more focused on the programme and its outcomes. The governance workshops ... contributed significantly and positively to this change in approach. (NZSTX)*

The general view was that the quality of contribution and understanding of governance had improved over time, and especially with the governance training offered<sup>33</sup>:

The quality and attendance records of senior MPI appointees are the most mixed aspect of PSGs. This includes not attending PSG quarterly meetings, attending for only part of the meeting or sending others in their place. In addition, it would appear that not all senior MPI staff attended the governance training. This should be compulsory.

It is unclear how widespread the problems are, but MPI needs to set clear expectations of its PSG representatives and make time for this. The opportunity to be involved in governance is excellent for future careers. Alternatively, MPI could consider the option above of replacing the senior MPI representative with an additional independent member.

In addition, questions were raised about whether the Investment Manager should sit on the PSG rather than being an observer.

I have not explored these issues in depth but recommend that MPI:

- **Ensures all relevant MPI staff attend governance training (either in-house or through Institute of Directors' courses).**
- **Reconsiders whether Investment Managers should be a formal member of the PSG or an observer: there is a perceived conflict between their operational and governance roles and the corresponding co-investor position, the Programme Manager, is not a board member.**

Finally, in reviewing early literature about the PGP, it appears PSG were to be called Programme Governance Groups (or PGGs). This title better reflects the governance agenda. Accordingly, I recommend that:

- **MPI changes the governance group name to Programme Governance Group (PGG), from PSG, to reinforce its governance role.**

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<sup>33</sup> One contributor felt that only "converted" MPI staff had attended the training: those who would most benefit (typically the senior MPI appointees) had not. The quality of some MPI staff members' contributions had therefore not improved.

## MPI as co-investor

MPI aims to be an “active investor” by providing non-specialist expertise. Examples of the many ways MPI adds value as a co-investor include:

- Assisting access to relevant parts of MPI (e.g. regulations around food product claims, international trade issues, market access, and sector experts) and when needed arranging focussed workshops with relevant MPI staff and programme staff.
- Making connections across programmes.
- Facilitating links to relevant external experts.
- Running sector conferences and expos.
- Chairing workshops – workshops specifically for Chairs and/or Programme Managers on common issues, e.g. benefits management, risk, governance, communications, reporting.
- Arranging governance training.
- Running thematic workshops – connecting programmes together where they are working on complementary activities.
- Extension activities – e.g. a small group of programmes regularly meet to discuss extension activities.
- Bringing opportunities to programmes and co-investors through wider government activities & connections, e.g. the Farm IQ programme has been rolled out to farmers in Sri Lanka, utilising World Bank funds.
- Connecting PGP programmes into communications opportunities – e.g. the Radio Live series of interviews.

This impressive array of value-added activities demonstrates an investor who is willing to use their networks and skills to help programmes achieve their outcomes.

*This event (conference) has also improved communication ... between groups that might not have had the opportunity to interact. (Seed and Nutritional Technology Development)*

## Conclusions re governance

The PGP’s governance model has evolved over the last eight years and is appropriate for a transformational, partnership programme.

The main issue for co-investors is what could be described as a creeping bureaucracy and increasing risk-aversion, contrary to the programme’s original “light-handed governance” intent. This is reflected in a comment made by one programme:

*We have received mixed messages between wanting stretch and innovation but also certainty of outcome.*

This is a fair observation and the risk-aversion manifests itself in the reporting and auditing requirements. However, the state sector's need to account for its use of money and to deliver public benefit is high, especially when making such large and publicly scrutinised investments. Quite simply, these tensions will always exist but, as noted elsewhere, reporting requirements could be further streamlined to relieve the burden on programme managers.

Overall, the PGP's governance and delivery had evolved positively and lessons integrated. The IAP Chair, John Parker, noted:

*Now we can see a pattern to what makes some programmes work more effectively ... allowing better programme design and governance.*

Later programmes also felt they had benefitted from the lessons of the past nearly eight years. To name but a few, these lessons include the value of independent chairs, removing formal funding rounds, ensuring applicants have addressed potential regulatory and market entry barriers before applying, and ensuring that the PGP staff have had prior commercial experience.

**MPI should document the lessons learned from running the PGP programme for the benefit of the future PGP programmes and new innovation funds.**

## 7.2 The PGP processes

*Having been through the process again in more recent years..., there have been obvious improvements to the process. (NZSTX/W3 Wool Unleashed)*

This comment reflects the many process changes that have been made since 2014, of which removing funding rounds is the most important. MPI considers this has resulted in a more responsive process that is better aligned to commercial timeframes. Other changes include introducing:

- Programme audits and reviews.
- New template for quarterly reporting.
- Outcome Logic Models for programmes.
- Simplified proposal requirements, especially for smaller companies and industries.
- Simplified templates for IAP reporting focusing on benefits, risks and issues.
- Simplified programme plans required for the contract – this also reduced the number of contract variations driven by minor plan changes.

The above initiatives have tried to address criticisms about compliance costs. Some, however, have increased compliance (e.g. programme audits) but have been valuable in

recommending improvements and providing MPI with assurance over the use of funds (no fraud has been uncovered).

Views on compliance costs varied. Some felt the planning and reporting was a useful discipline (which it is), one commented that the Outcome Logic Model (example in Appendix 5) had stood them in good stead even after the programme finished, another that the business case was their strategic plan.

Programmes understand the need to be accountable for government funding but many, including the IAP, felt there was room for further streamlining. One suggested the problem might be that the same information was required whether the programme was seeking \$1 m or \$100m.

I am aware that MPI has previously considered a “PGP-Lite” model for smaller investments. In my view, this is worth resurfacing.

**I therefore recommend the PGP:**

- **Further streamlines proposal and business case templates.**
- **Further streamlines accountability documents and processes.**
- **Gives further consideration to a “PGP-Lite” model for proposals, business cases and accountability documents involving lower amounts of investment.**

## 8. CONSISTENCY WITH GOVERNMENT AND MPI PRIORITIES

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### 8.1 Consistency with government goals

The extent to which PGP programmes are aligned with known government goals for the primary sector is shown below. These goals have been inferred by MPI staff.

Government goals	Programme consistency (%)
Sustainable economic development	95
Supporting regional economies	86
Increasing exports	86
Working smarter – new technologies	68
R&D to add value to dairy and other products	64
More R&D to create new technologies	55
Reduce biological emissions, improve water quality, shift to more diverse and sustainable land use	75
Greater investment in fishing and aquaculture	9

The PGP programmes map closely to known government goals, with one exception: investment in fishing and aquaculture. In terms of value, however, this sector receives nearly 14% of the PGP's funding while contributing 5% to primary sector exports.



## 8.2 Consistency with MPI goals

### MPI's strategy

MPI's 2017 refreshed strategy is attached as Appendix 11. The PGP's alignment with this is described below.

The PGP:

- Fits neatly within MPI's purpose of "Growing and Protecting New Zealand".
- Aligns strongly with the ambition of New Zealand being the most trusted source of high-value products in the world. Many of the programmes aim to produce high value products that meet consumer demands for healthier, sustainably grown products.
- Aligns strongly with MPI's growth outcome in that the PGP is specifically designed to spur economic growth.
- Aligns reasonably well with the sustainability outcome – MPI's programmes were not required to address environmental sustainability but some 75% have done so in some form.
- Was not designed to align with protection and participation outcomes although some of the PGP programmes are targeting increasing participation in primary industries, e.g. through resources targeted at schools and encouraging farming as a future career.
- Is not clearly aligned with the strategic priorities as they have been expressed – this category effectively translates MPI's outcomes into organisational priorities.

### Conclusion

Even bearing in mind that the PGP was established in 2009, there is strong alignment with MPI's top level strategy, i.e. down to the level of outcomes.

## 9. OBSERVATIONS ON THE PGP MODEL

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### 9.1 The PGP model

Transforming a sector, or even a firm, takes a very long time – longer than seven years. The PGP is one tool in the government's arsenal, and in my view a smart one: It invites companies (or consortia) to put up their hands and their money, and to be the forerunners or champions of change. This means co-investors have “skin in the game” and a real incentive for commercial success.

The PGP programme design is particularly smart in that it locks in the public benefits – e.g., IP must be shared more widely after an agreed period, typically three to five years, during which time the programme partners can benefit and recoup their investment.

Further, because the programmes cross many areas of the value chain and usually have multiple co-investors and science providers, government obtains some of the necessary conditions for future innovation without having to specifically fund these: through real life experience it is able to facilitate collaboration, develop capability, and build both innovation cultures and companies' confidence to reinvest.

From a risk management perspective, the PGP is also smart in that its strategy of governing by outcomes reduces the risk of complete failure.

However, because the PGP funds only selected innovation projects in the primary sector, it is open to criticism in a way that incentives that apply across the board (e.g. tax incentives) do not. That is not to say the PGP model is wrong – just that it is harder to manage and an easy target for criticism, especially from co-investors' competitors or those parts of the industry that have not been covered, reinforcing an already risk-averse culture.

On the other hand, government can be more certain of what it is getting for its money than with blanket incentives and the public benefits are substantially greater. And, from a change management perspective, targeting corporates as the first agents and champions of change is smart. They are more likely to have the resources to succeed and their moves are closely monitored and subsequently followed by competitors (if successful), catalysing wider industry change.

On balance, I consider the additional challenge worthwhile. The PGP is uniquely suited to longer-term transformation or step change projects, and even if co-investors experience a greater demand for accountability than for other funds, most co-investors consider the experience to have been worthwhile and would recommend it provided applicants:

- Have the scale/ability to invest comfortably (see the project through) and systems (accounting, record, report)/culture (transparent, collaborative) to deliver the project.
- The programme is big enough to sustain the management and governance effort required and to benefit from the scale and flexibility offered by the PGP.

- Have a compelling commercial imperative.

*I would recommend it to others so long as they are aware of the administrative complexities that it does create for participating organisations. The reporting requirements of PGP are the highest of any Government fund that we have been involved with and this requires a much greatest management commitment from Industry. This is often the scarcest resource for private companies. (Seed and Nutritional Technology)*

*Yes, because no other fund has the same mix of term, flexibility and market-led focus. (FoodPlus)*

*...be prepared for a very rigorous and lengthy project, but if well designed, it is well worth it. (Omega Lamb)*

Programmes also advised:

- Think about creating industry wide transformational change – the ability to create a culture of innovation in an industry through the PGP is one of the most powerful aspects of the programmes.
- Work collaboratively with MPI on forming the business case.
- Get a copy of the contract before starting to view before you start this process to avoid any potential surprises.
- Put in the work early to ensure the programme management and governance teams are aligned and functional.
- Put an early focus on the path to market / adoption, the critical steps and expected duration, and how benefits will be tracked. The outcome logic framework is some use here, but graphical programme roadmaps are better.
- Emphasise communication.

*Emphasise communication. We were slow to get going on communicating what we were doing and as a consequence became a target for criticism of the scheme overall. Once we started getting more of our story out there this largely dried up. (Transforming the Dairy Value Chain)*

## 9.2 The PGP's achievements

In summary, the PGP's unique combination of eligibility criteria and rules has:

- Catalysed the transformation of some of the most important primary sector companies, those who have the capacity to innovate, put in the additional resources to ensure the benefits are realised and invest in future value-creating areas of business.

- Put emergent industries on a much sounder footing to achieve significant and sustainable growth (e.g. avocados, mānuka honey, sheep dairy, alternative cow dairy proteins, lighter wines), thereby further diversifying future primary sector exports.
- Empowered a large number of farmers and orchardists to adopt best practice, enabling improved productivity, profitability and ultimately the sustainability of sectors (deer farming, sheep meat and wool, beef farming, avocados, dairy farming).
- Enabled technical innovations that will support industries to become more productive and profitable (nutrients, seeds, technologies to enable more productive steepland harvesting, domestication of wild spat, the proving of new trawler harvesting technologies, high-performance mānuka plantations, IT programmes to support best practice farming and environmental management, and technologies that enable faster production).
- Enabled innovations that may increase the value of traditional products exported by meeting consumer demands for healthier, tastier, more convenient and more natural products with traceable provenance; a range of added-value dairy and meat products; new uses for coarse and fine wools; new, lower alcohol wines that have the same flavour profiles as full strength wines; dairy products with immune-enhancing properties; alternative dairy proteins.
- Enabled improved environmental sustainability: E.g. cleaner waterways, reduced emissions, reduced nitrogen run-off, erosion prevention/land stabilisation, reduced flood damage, reduced incidental catch of undesired fish species, extracting greater value from waste (reduces waste).
- Enabled programmes that will improve both human and animal health, including the Transforming the Dairy Value Chain's award-winning Good Yarn programme; Red Meat Profit Partnership and Passion to Profit's extension programmes; Precision Seafood Harvesting's technology that returns by-catch to the sea in better condition and Steepland Harvesting innovations that have contributed to a steep reduction in serious harm injuries (one sixth of those in 2010).
- Supported the development of Maori agri-business (Whai Hua).
- Enhanced New Zealand's reputation as an innovator in the primary sector through conference papers, patents and trademarks, e.g. New Zealand is now recognised as a world leader in mechanised steep land harvesting and phytosanitary treatment.
- Enhanced science, innovation management, and emerging capabilities such as food structure design.
- Led to the creation of more than 112 new jobs (e.g. Fonterra alone has created 100, ANZCO 12) and the employment of 57 tertiary graduates and PhD students).

### 9.3 Key challenge for the PGP

Assuming the PGP continues with a similar set of eligibility criteria, the key challenge is to continue to effect the transformation to a higher value and consumer-led economy (from volume to value) particularly by encouraging greater collaboration and lifting capability.

Although demand from larger companies appears to have fallen at this stage, there is no evidence to suggest that the transformation agenda is complete or that the demand does not exist.

Moreover, there is a risk that although companies will continue to innovate after finishing their PGP programmes, they will do so individually simply because they can retain the benefits themselves, and because working alone is easier. If this happens, New Zealand will lose the emergent benefits of increased industry collaboration and sectors will lose access to future IP.

As earlier recommended, MPI must therefore take a more strategic and proactive approach to the management of this programme, and improve its ability to report on the benefits these programmes are achieving.

## 10. APPENDICES

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### Appendix 1: The PGP programmes and transformations anticipated

Programme	Innovation new to:	Nature of the transformation
Clearview Innovations	World	Developing new products that will make nitrogen and phosphorus use and application more efficient, increasing farm productivity and reducing environmental impact.
Farm IQ	Market	Create a demand-driven, integrated value chain for red meat that delivers sustainable benefits for all participants. Developing high value products aligned with consumer preferences and implementing traceability systems, providing product and animal quality data back to farmers, underpinned by a farm management system developed as part of the programme.
FoodPlus	Market	Create a sustainable path for the red meat industry by transforming ANZCO (and the red meat industry) from a commodity focus to consumer-centric and innovation savvy, focused on food, ingredients and healthcare.

Programme	Innovation new to:	Nature of the transformation
High Performance Mānuka plantations	Market	This aims to move from a reliance on the harvest of wild mānuka to a (domesticated) science-based approach that improves yield, quality, reliability and returns for the industry. The programme will help enable the expansion of the industry and the production of higher quality mānuka honey.
Lighter Wines	World	This programme creates a new category of wine that will open up new market opportunities for NZ wines. Considerable experimentation has gone into producing this product, and market research supports demand for lower alcohol, lower calorie wines that also retain the essential character of the original varietal.
Marbled Grass-fed beef	World	This programme uses surplus calves from the dairy industry and Wagyu genetics to develop a high value marbled product, generating greater returns for farmers.
New Zealand Avocados Go Global	Market	Professionalising the growing of avocados along with all other parts of its value chain so that it is collaborative, cohesive and globally competitive.
Omega Lamb	Market	Creating a sustainable path for the NZ red meat industry by taking an integrated approach to developing a high end product with characteristics attractive to consumers (Omega 3, taste).
Passion2Profit	Market	Grow and capture the full value available to New Zealand by collaboratively positioning farm-raised venison as a premium non-seasonal meat, and by better aligning supply with demand through industry-wide improvements in productivity.

Programme	Innovation new to:	Nature of the transformation
Pioneering to Precision	World	Transforming the way fertiliser is spread on hill country farms using geospatial and nutrient information, and GPS-guided aircraft. This will help minimise the discharge of nutrients and improve farmer profitability.
Precision Seafood Harvesting	World	Transforming the way fish are caught with the potential to change the way the world fishes, improving sustainability and producing higher quality seafood.
Red Meat Profit Partnership	Market	Lifting the performance and profitability of the whole red meat sector through collaboration that brings together farmers, advisers, banks, processors and the Beef & Lamb industry body. The programme comprises projects that encompass people and capability development, extension, data, systems and tools as well as farm baseline assessments.
Seed and Nutritional Technology	Market	Seed and Nutritional Technology Development: developing new products to help pastoral farmers improve pasture performance, reduce the impact of pests and diseases, overcome animal health disorders, and reduce both greenhouse gas emissions and losses from droughts.
Sheep – Horizon Three	Market	Building a new sheep dairy industry that produces sheep milk at scale and develops innovative and high value sheep milk-based products.
SPATnz	World	Domesticating the production of wild spat and developing mussels whose characteristics align with consumer expectations.
Steepland Harvesting	World	Delivering improvements in harvesting techniques that improve productivity and worker safety.



Programme	Innovation new to:	Nature of the transformation
STIMBR	World	The STIMBR programme sought to identify alternative methods to methyl bromide as a fumigant for the treatment of logs and horticultural products, reducing costs and ozone depletion. It was successful in ruling out a number of prospects but stopped short of finding an alternative solution.
Stump to Pump	Market	Aimed to generate significant additional returns to the New Zealand forestry sector through validating the technology and establishing the commercial viability of converting forestry waste to liquid biofuels.
New Zealand Sheep Industry Transformation Project (NZSTX)	Market	Generating premiums for fine wool growers by shifting NZ sheep production to a “fit for market” model, focused on consumer preferences, and contracting directly with manufacturers, bypassing the commodity auction system.
Transforming the Dairy Value Chain	World	Transforming the NZ Dairy Value Chain: Innovations throughout the value chain to lift on-farm productivity, reduce environmental impact, improve agricultural education and create new value-added products, all of which ultimately lift the performance and profitability of the industry.
W3: Wool Unleashed	Market	Create a template for a sustainable wool industry by shifting strong wool from a commodity product to a high value product that meets consumer expectations, and that brings longer-term certainty and premium back to growers through supply contracts,
Whai Hua	World	Aimed to lift NZ dairy industry capability to create high-value products. Involved developing dairy herds that produce milk with high immune-enhancing properties.

## Appendix 2: List of review participants

Written submissions	Programmes
Programme Manager: Nick Hammond	Sheep – Horizon Three
Programme Manager: Dave Woods	Precision Seafood Harvesting
Programme Manager: Rod Roberts Chair of programme: Garry Wilson	SPATnz
Programme Manager: Brad Siebert	Avocados Go Global
Programme Manager: Fraser Broom	Food Plus
Chair of programme: Tony Nowell Programme Manager: Mark Williamson	Omega Lamb
Chair of programme: Bruce Wills	Passion2Profit
Chair of programme: Gary Monk Programme Manager: Warwick Catto	Clearview Innovation
Chair of programme: Mike Manning Programme Manager: Mike White	Pioneering to Precision
Chair of programme: Dr Derek Woodfield Programme Manager: Dr John Caradus	Seed & Nutritional Technology
Programme Manager: David Jordan	Lighter Wines
Programme Manager: Rhiannon James	W3 Wool Unleashed
Chair of programme: Alison Paterson Programme Manager: Collier Isaacs	Farm IQ ( <i>Closed Programme</i> )
David Hemara	Caprine Innovations ( <i>Pipeline</i> )

Interviews	
<b>PGP Programmes</b>	
Chair of programme: Neil Walker	High Performance Mānuka
Programme Manager: Nick Hammond	Sheep – Horizon Three
Programme Manager: Rod Roberts	SPATnz
Programme Manager: Fraser Broom	Food Plus
Chair of programme: Tony Nowell Programme Manager: Mark Williamson	Omega Lamb
Chair of programme: Bruce Wills	Passion2Profit
Chair of programme: Malcolm Bailey	Red Meat Profit Partnership

Chair of programme: Mike Manning Programme Manager: Mike White	Pioneering to Precision
Programme Manager: David Jordan	Lighter Wines
Chair of programme: Chris Kelly Programme Manager: Andrew Fletcher Chief Executive: Tim Mackle Strategy and Investment Leader for Productivity: Bruce Thorrold	Transforming the Dairy Value Chain (Closed Programme)
Chief Executive of Miraka: Richard Wyeth	Whai Hua (Closed Programme)
Co-investor: Tom Greally	Brewing Success (Pipeline)
Sandra Faulkner	Previous applicant, wool sector
<b>Science and Crown Research Institutes</b>	
Chief Executive: Anthony Scott	Science New Zealand
Chief Executive: David Hughes	Plant and Food Research
General Manager: Malcolm Nitschke	Agmardt
<b>Industry bodies</b>	
Chief Executive: Sam McIvor	Beef & Lamb
Chief Executive: Mike Chapman	Horticulture NZ
National President: Katie Milne	Federated Farmers
Chief Executive: Gary Hooper	Aquaculture NZ
Chief Executive: Tim Pankhurst	Seafood NZ
Independent Chair: Bruce Wills	Apiculture NZ
<b>Advisory/Governance</b>	
John Parker (Chair), Sir Maarten Wevers, Steve Smith, Barry Brook, Harry Burkhardt	Independent Advisory Panel (IAP)
Rob Tanner (Independent Chair), Michael Ahie (Chair, Spring Sheep), Peter McClure (Director, Spring Sheep), Mela Greenslade (MPI Investment Manager), Nick Maling (MPI Director)	Sheep – Horizon Three Programme Steering Group (PSG)
<b>MPI – interviewees and contributors</b>	
Director General: Martyn Dunne	
Deputy Director General: Dan Bolger	Fisheries

Deputy Director General: Ben Dalton	Sector Partnerships and Programmes
Acting Deputy Director General: Justine Gilliland <sup>34</sup>	Sector Partnerships and Programmes
Acting Deputy Director General: Nick Maling	Office Of The Director General
Deputy Director General: John Ryan	Corporate Services
Acting Deputy Director General: Jarred Mair	Policy & Trade
Manager of Science Policy: Naomi Parker	Science Policy
Director: Cathy Robinson	Investment Portfolio Directorate
Manager: Cheyne Gillooly	Investment Portfolio Directorate
Acting Director of Sector Policy: Emma Taylor	Sector Policy
Principal Adviser: Richard Lynch	Policy Development
Director of Assurance and Evaluations: Teresa Williams	Assurance & Evaluation
Senior Adviser: Clare Bear	Research & Evaluation
Investment Manager: Ross McIsaac	Primary Growth Partnership
Investment Manager: Guy Tapley	Primary Growth Partnership
Investment Manager: Eflamm Allain	Primary Growth Partnership
Investment Manager: Mela Greenslade	Primary Growth Partnership
Investment Manager: George Strachan	Primary Growth Partnership
Principal Adviser: Shiromani Jayasekera	Investment Portfolio Directorate
Principal Adviser: Anna Crosbie	Investment Portfolio Directorate
Manager of PGP: Steve Penno	Primary Growth Partnership
Senior Policy Analyst: Annette Carey	Policy & Trade – Resource Policy – North Island Region

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<sup>34</sup> Justine was Director of Investment Programmes at the start of the review, and subsequently acted in the role of Deputy General. Justine provided feedback on the report.

## Appendix 3: Survey questionnaire

### **Independent Review of PGP - Questionnaire**

#### **Completing the questions**

Please attach your responses in a separate document or use this editable Word document.

Name of organisation: \_\_\_\_\_

Name of submitter: \_\_\_\_\_

Name of programme: \_\_\_\_\_

Sector: \_\_\_\_\_

#### **Purpose of the review**

Having operated for nearly nine years, MPI is reviewing what has been achieved, whether the funded programmes meet the new Government's stated outcomes and how the programme can be improved. The overall purpose of the review is to evaluate the eligibility criteria, management and implementation of PGP. The review aims are to:

- a. evaluate completed PGP programmes to assess programme outcomes and the benefits realised against the approved programme plan
- b. review outcomes achieved to date by PGP programme and compare with government objectives and MPI strategy
- c. use the insights gained to recommend improvements to the stewardship and management of these funds, and to identify future options for PGP that are aligned with the new Government's priorities.

#### **Reason for applying**

1. Why did you apply for PGP investment? (Please indicate whether you had considered other available public funds or private investment avenues, why the programme was not fully funded by industry, and what particular aspects of PGP best met, or are meeting, your needs).
2. What alternatives were you considering if the programme had not been eligible?

#### **PGP Purpose**

PGP was established to enhance the performance of the primary and food sectors and drive innovation and substantial gains in economic growth and sustainability.

3. Please describe how your programme will contribute to this objective, as well as the transformation envisaged.

The PGP is also designed to increase investment in innovation.

4. To what extent is this happening in your company and/or industry? Where applicable, please give specific examples of additional investment (that is, outside PGP) and how this is being funded.
5. What additional non-government investment, if any, has been made into your current programme?
6. What do you consider to be the greatest barriers to investment in innovation in your sector?
7. How could PGP be enhanced to increase support for R&D and innovation in your sector?

### **Eligibility criteria and rules**

A list of the current eligibility criteria is attached.

8. PGP's eligibility criteria have remained the same since 2009. How appropriate do you think the eligibility criteria are in the current environment? Could they be improved to deliver other programmes that would meet Government aims? If so, please describe how they could be changed.
9. Are you aware of programmes that have been excluded by the eligibility criteria or that would not currently fit? If so, can you please describe the nature of these programmes, why they would not be eligible for funding and their anticipated impact

### **Process**

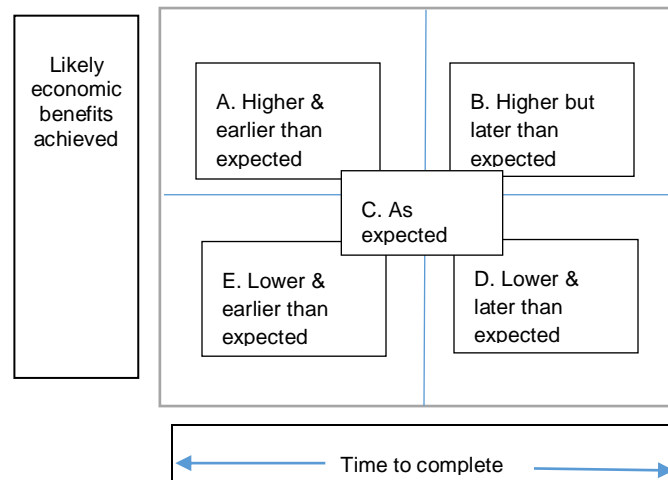
10. How well did the initial proposal and business plan process work for you? How could it be improved?
11. Programmes are accountable for delivering on outcomes. This gives co-investors the opportunity to "fail fast", introduce new projects or change the balance of resources applied to other projects within available approved funding. Please state your views on this level of programme flexibility and its advantages/risks for your programme, and give examples where appropriate.

### **Governance**

12. How effectively has the Independent Advisory Panel (IAP) process worked for your programme? Please describe the value it has added – or otherwise. How could the IAP process be improved?
13. How effectively has your programme steering group (PSG) worked? Please describe the value it has added – or otherwise – to the programme. How could the PSG process be improved?
14. MPI describes itself as an active investor. What has this meant for your programme? Please give specific examples.

## Impact/benefits

15. Thinking back to the initial business case, and with the benefit of experience, would you say the estimated economic benefits for your programme were: highly optimistic, optimistic, about right, pessimistic, highly pessimistic? Why was this?
16. Which statement (see diagram below) best describes the likely economic benefits your programme will deliver in relation to the original business case:



17. What factors have caused you to form this view?
18. What would you say have been the greatest economic, social and environmental benefits from your PGP programme to date for your:
- a. organisation?
  - b. sector?
  - c. New Zealand?
19. What do you consider are/will be the greatest spill-over benefits to your organisation, sector and/or NZ?
20. Which regions of New Zealand will likely benefit from the programme, assuming its success?
21. What unanticipated consequences (positive or negative) have resulted/ or might result from your PGP programme?

## General

22. Overall, how well do you think PGP as a whole has delivered on its original objectives? What specifically has led you to this conclusion?

The PGP aims to:

- boost productivity, value and profitability in the primary sector
- deliver long-term economic growth and sustainability across primary industries, from producer to consumer
- encourage more private investment in research and development in New Zealand.

23. Would you recommend PGP to other organisations contemplating substantial innovation projects in the primary sector? Why/why not? What advice would you give to these organisations?

Thank you for responding. Please send your completed responses, attention Deborah Battell, to [pgp.review@mpi.govt.nz](mailto:pgp.review@mpi.govt.nz) by **5pm Monday 9 April**.

## PGP Eligibility and Rules

1. **PGP sector focus:** on activities in one or more PGP sectors: pastoral (including wool) and arable; horticulture; seafood (including aquaculture); forestry and wood processing; food processing (including nutraceuticals and bio-actives).
2. **A coherent programme:** comprising a suite of complementary and mutually supporting projects.
3. **Maximum duration for funding:** maximum of seven years, subject to any subsequent agreed contract variations which may in certain circumstances amend the duration of the programme.
4. **Minimum size:** industry co-investors must contribute \$500,000 (GST exclusive) over the life of the programme, meaning a minimum total value of \$833,333 over the life of the programme. Co-investment may include qualifying co-investor in-kind contributions.
5. **Co-funding:** qualifying co-investor contributions must be at least be sixty percent of the total investment in the programme. In-kind contributions are accepted by agreement.
6. **Additionality:** co-investors' activities must be in addition to existing work programmes (that is, be beyond the co-investors' "business-as-usual").
  - a. *Research and innovation activity is not "additional" if it is already planned but may count as additional if the co-investor can provide satisfactory evidence that PGP funding will bring forward the activity by a minimum of 12 months.*



*Alternatively, additionality can be demonstrated if the programme delivers overall outcomes at a significantly quicker pace than business as usual activity would. Innovation includes the introduction of new methods of production and harvesting, new goods, new qualities of existing goods, development of a new market and development of new raw materials or ingredients derived from the primary sector. It may occur at any point along the value chain.*

7. **Consistency with New Zealand's international obligations and government trade policy.** PGP programmes must be consistent with New Zealand's international obligations and trade policies.

### **Reputation of New Zealand**

In addition to the above eligibility rules, MPI reserves the right to decline any proposed programme investment which it regards as likely to be detrimental to New Zealand's reputation.

## Appendix 4: The PGP Statistics and financials

### Statistics

Application and programme statistics	
Total proposals received to December 2017	122
Total proposals approved, N (% of those received)	36 (30%)
Total programmes started	22
Programmes complete	7
Programmes in contracting phase (pipeline)	4
Programmes completing business cases (pipeline)	5
Potential applications (on hold pending review)	4
Programme duration, pipeline – average	5.8 years
Programme duration, completed programmes (7)	6 years, 1 month (range 15 months–7 years)
Programme duration, current – average, (range)	6.5 years (range 5–7 years)

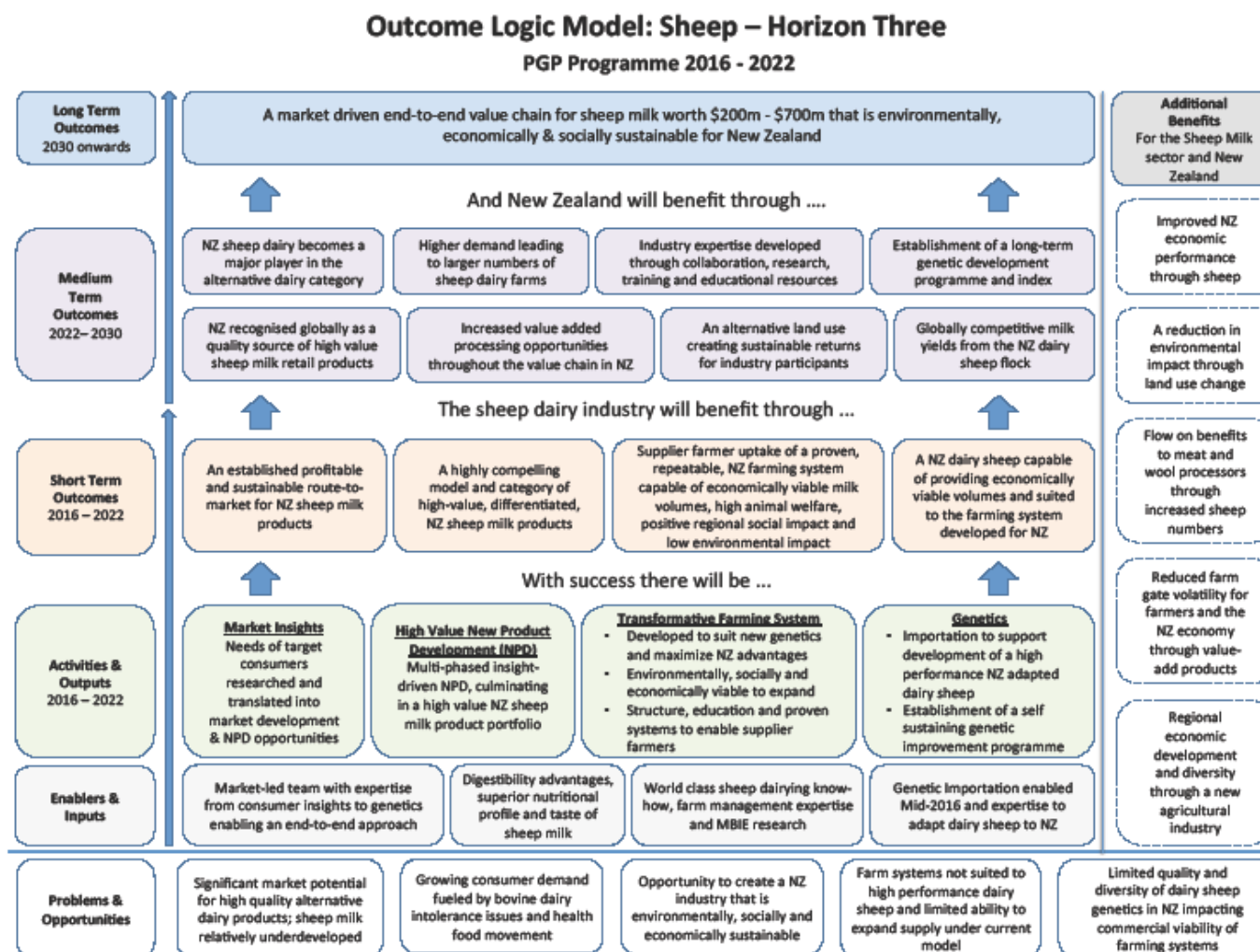
## The PGP financials

Government expenditure <sup>35</sup>	\$m
Total Government investment FY09 to FY18 (current programmes, projected to year end)	272.2
Total \$m forecast for pipeline, nine new programmes, to 30/6/25	51.3
Total required to complete current programmes plus pipeline, to 30/6/25	100
Government investment per programme – range (government only, committed before 2017/18)	1.4 to 84.6
Government investment per programme – average, median (government only)	16.3, 9.8
Pipeline average investment (range)	5.7 (1.0 to 11.9)
Maximum whole portfolio investment per annum <ul style="list-style-type: none"> <li>Programmes</li> <li>Administration</li> <li>Programme enhancement (conferences, communications etc.)</li> <li>Total maximum required per annum</li> </ul>	42.4 1.6 0.2 44.4
Total investment to 30/6/2022 (actual to date, accrued and forecast, current programmes only) <sup>36</sup>	321
Total projected investment to 30/6/25 (including pipeline)	372

<sup>35</sup> Note that the figures in this table have not been “derated” – a practice MPI uses to take into account the difference between estimates and likely expenditure, based on past experience of investment programmes.

<sup>36</sup> The original commitment was for \$258.3. Approximately \$28.6m may be underspent as a result of delays (with the result that some projects fell outside the funding period or were not completed within the period), because less funding was required, projects completed early or a project’s scope was reduced.

## Appendix 5: Example Outcome Logic Model



## Appendix 6: Applications received and rejected, by sector

Sector	Total proposals submitted	Declined	Approved (N)	Approved (%)	At contract stage	Business case
Agriculture	9	9	-	0.0		
Apiculture	1	-	1	100.0		
Aquaculture	8	5	3	37.5		
Biofuel	4	1	-	25.0		
Biotechnologies	2	2	-	0.0		
Dairy (cow, sheep, goat)	14	8	6	42.9	1	2
Deer	2	1	1	50.0		
Fertiliser	6	3	3	50.0		
Fishing	2	1	1	50.0		
Forestry	19	14	5	26.3	2	1
Horticulture	12	7	5	41.7	1	2
Irrigation	2	1	-	0.0		
Pastoral	7	5	2	28.6		
Poultry	1	1	-	0.0		
Red meat	12	8	4	33.3		
Viticulture	2	1	1	50.0		
Wool	19	17	2	10.5		
<b>Total</b>	<b>122</b>	<b>86</b>	<b>27</b>	<b>22.1</b>	<b>4</b>	<b>5</b>

## Appendix 7: Anticipated benefits

Programme <sup>37</sup>	Length	Completion date	Committed to 2022 (\$)	Original benefit \$m	Revised benefit	Date anticipated	Revised delivery
STIMBR	1.75	Jun-14	1,186,000	Not stated	not stated	Not stated	on hold
Stump to Pump	1.2	Sep-14	1,810,586	1,000	not stated	2033	uncertain
Whai Hua	4.75	Dec-16	2,041,000	5	lower	2021	later
NZSTX	7	Aug-17	16,770,000	250	lower	2025	later
Steepland	7	Oct-17	3,682,500	129	lower	2019	later
Dairy	7	Mar-18	84,610,000	2,700	higher	2020	later
Farm IQ	7	Oct-17	59,342,000	1,200	no change	2025	no change
Mānuka	7	Sep-18	1,400,000	1,125	no change	2028	later
Clearview	7	Sep-18	9,750,000	56	lower	2023	later
Seed & nutritional	6	Jan-19	7,145,169	195	higher	2025	later
Precision Seafood	7	Mar-19	24,021,610	100	higher	2025	later
Avocados	5	May-19	4,281,402	280	higher	2023	later
Marbled Grass-fed	7	Aug-19	11,046,562	200	lower	2029	later
SPATnz	7	Oct-19	13,032,452	81	no change	2026	no change
FoodPlus	7	Nov-19	29,100,000	178	lower	2025	later
Pioneering 2 Precision	7	Sep-20	5,175,000	120	no change	2030	no change
RMPP	7	Oct-20	32,154,636	880	no change	2020	no change
Lighter Wines	7	Mar-21	8,125,766	285	no change	2024	later
Passion2Profit	7	May-22	7,392,000	56	lower	2022	earlier
Omega Lamb	7	Jun-22	12,500,000	400	higher	2040	earlier
Sheep – Horizon Three	6	Jun-22	12,556,607	200	higher	2030	earlier
W3: Wool unleashed	7	Jan-23	11,049,000	Cum 335	no change	2025	later

<sup>37</sup> The darker blue shaded programmes have already completed; the lighter blue have started since 2014.

## Appendix 8: PGP benefits

Programme	New higher value products	Better processing faster, cheaper, less waste	More efficient, reliable supply	Higher volumes, more consistent supply	Marketing and distribution innovations	New knowledge more skills	Improved social resilience, worker safety	Improved animal welfare	More sustainable environment	Improved collaboration	Improved culture of innovation
Clearview Innovations											High
Farm IQ											Medium
FoodPlus											
High perf Mānuka											
Lighter Wines											
Marbled Grass-fed beef											
Avocados Go Global											
Omega Lamb											
Passion2 Profit											
Pioneering to Precision											

Programme	New higher value products	Better processing faster, cheaper, less waste	More efficient, reliable supply	Higher volumes, more consistent supply	Marketing and distribution innovations	New knowledge more skills	Improved social resilience, worker safety	Improved animal welfare	More sustainable environment	Improved collaboration	Improved culture of innovation
Precision Seafood Harvesting											High
Red Meat Profit Partnership											
Seed & Nutritional Technology											Medium
Sheep – Horizon Three											
SPATnz											
Steepland Harvesting							Worker safety				
NZSTX											
Dairy Value Chain											
W3:Wool unleashed											
Whai Hua											
<b>Totals – count and (%)</b>	<b>16 (80)</b>	<b>14 (70)</b>	<b>14 (70)</b>	<b>15 (75)</b>	<b>16 (88)</b>	<b>20 (100)</b>	<b>5 (25)</b>	<b>7 (35)</b>	<b>15 (75)</b>	<b>14 (70)</b>	<b>High (10) Med (7)</b>



## Appendix 9: Completed Programme benefits

Programme	Benefits
<b>Steepland Harvesting</b> (funding \$3.6m)	<ul style="list-style-type: none"> <li>• Total benefits more than \$152m since 2010.</li> <li>• Increased mechanisation across whole industry with total investment about \$80m.</li> <li>• Major reduction in cable logging costs.</li> <li>• 30% increase in productivity since 2010, cumulative \$71.3m.</li> <li>• Expansion of forestry machinery manufacturing sector (3 companies).</li> <li>• Seven new technologies commercialised.</li> <li>• Three prototypes in train.</li> <li>• Supported the development of four technology developers.</li> <li>• Three NZ companies manufacturing total 25-30 winch assist machines pa with half exported.</li> <li>• Reduction in serious harm incidents – in 2016 these were one sixth the number recorded in 2010.</li> <li>• Built technical, scientific &amp; engineering capability.</li> <li>• Achieved international recognition and taking leadership role in development of mechanised forestry harvesting on steep slopes.</li> <li>• Spillovers in skills and training – University of Canterbury workshops on cable-assist harvesting on steep slopes, and professional development courses in forest engineering and harvest planning.</li> </ul>

Programme	Benefits
<b>Farm IQ</b> (funding \$59m)	<ul style="list-style-type: none"> <li>• On track for NZIER revised outcome of \$1.2b by 2025.</li> <li>• \$260m additional revenue over life of programme from branded, value-added, consumer-ready beef, lamb and venison.</li> <li>• \$3.5m pa in premium farmer payments.</li> <li>• Premium now being paid on all stock meeting EQ (eating quality) grade.</li> <li>• Single nucleotide polymorphism chip technology – most accurate genomic-based breeding selection tool for sheep and only one providing for eating quality.</li> <li>• Farm Management System now supporting close to 6m stock units over 1.4m hectares resulting in +3% carcass conversion/weight/hectare; =5% Eco farm surplus and +6% lambing increase.</li> <li>• Red meat carcass traceability designed and built in plant.</li> <li>• Beef eating quality system linked to farm (and software).</li> <li>• Increased productivity through management using Farm IQ (anticipated 10%).</li> <li>• FarmIQ piloted with over 1400 farmers in Sri Lanka; will lead to other opportunities and is positioning FarmIQ as a leading Agri-Tech provider.</li> <li>• Significantly reduced cost of gene-testing.</li> <li>• Farm Management System approved by number of regional councils as suitable online Farm Environment Plan, enabling lowering levels of nutrients to be applied and environmental risk management at farm level.</li> <li>• Genomics tool now being used to understand Greenhouse Gas Emissions across the whole genome sequence for sheep.</li> </ul>

Programme	Benefits
<b>NZ Sheep Industry Transformation</b> (funding \$17.46m)	<ul style="list-style-type: none"> <li>• Direct firm level benefits of \$95m to date from new and expanding markets from fibre and meat.</li> <li>• Estimated cumulative additional value add of \$341m for industry.</li> <li>• Benefits of \$88m per year expected after 2020.</li> <li>• Development of breeding value for footrot resistance and new fine wool sheep type.</li> <li>• Development of Te Hono, a collaborative movement of around 80% of exporters.</li> <li>• NZ wool suppliers adopting FFM contract model.</li> <li>• Prototyping merino leather.</li> </ul>
<b>Transforming the Dairy Value Chain</b> (funding \$85m)	<ul style="list-style-type: none"> <li>• Benefits of \$2.7b per year expected by 2020.</li> <li>• Better informed and skilled sector.</li> <li>• New products developed (discovery of number of gene variations linked to dairy cow productive traits.</li> <li>• Optimised spray drying technologies enabling potential new products.</li> <li>• More efficient dairy processing – faster, less cost, reduced waste.</li> <li>• Established data standards and codes to enable a range of new products.</li> <li>• Devolvement technologies enabling the efficient manufacture of improved, customised mozzarella products.</li> <li>• Better informed and skilled sector.</li> <li>• Range of best practice guidelines including Farm Dairy Effluent Design Code of Practice and Code for Nutrient Management.</li> <li>• Interest built in dairying as a career.</li> <li>• Improved infrastructure supporting farmers' decisions.</li> <li>• Better advice available to farmers.</li> </ul>
<b>Whai Hua</b> (funding \$2.04)	<ul style="list-style-type: none"> <li>• Developed new milk powder product with value-added properties, and herd to support this.</li> <li>• Developed new processing method (awaiting provisional patent).</li> <li>• Work continues outside the PGP.</li> </ul>

Programme	Benefits
<b>Stump to Pump</b> (\$1.8m paid of original commitment of \$6.7m)	<ul style="list-style-type: none"> <li>• Proved its technology – turning forestry stumps into biofuels – but decided not to progress to commercialisation given cheaper petrol and fluctuating currency rates.</li> <li>• The IP is on hand when the time is right.</li> </ul>
<b>STIMBR</b>	<ul style="list-style-type: none"> <li>• Failed in its bid to find an alternative to methyl bromide (MB), but has made its findings available which will narrow options for future research and switched to an MBIE fund to pursue sustainable alternatives to current fumigants.</li> <li>• Benefits delivered through the PGP included: method to recycle MB, enhancing New Zealand's reputation as leading researchers in phytosanitary treatment, capability building, collaboration, and uptake of technology by other primary sectors.</li> <li>• Implemented a nationwide monitoring protocol and methyl bromide reporting system to report annual methyl bromide use to the Environmental Protection Agency.</li> <li>• Identified promising methyl bromide destruction technologies.</li> <li>• Developed possible methyl bromide recapture/recycling technology that is a candidate for commercial development.</li> <li>• Confirmed ethyl formate as a promising fumigant for kiwifruit (and by default other horticultural crops).</li> <li>• Identified that methyl bromide fumigation rates may be able to be reduced by 40 percent.</li> </ul>

## Appendix 10: Environmental benefits

Programme	Environmental benefits
<b>Transforming the Dairy Value Chain</b>	<ul style="list-style-type: none"> <li>• 100% of dairy regions have tailored riparian rights.</li> <li>• 800 professionals trained in effluent design and pond construction.</li> <li>• 200 certified nutrient advisors (from 0 in 2013).</li> <li>• 97.2% of waterways have cattle excluded.</li> </ul>
<b>Farm IQ</b>	<ul style="list-style-type: none"> <li>• Farm IQ Management System approved by a number of regional councils for online Farm Environment Plans, enabling the lowering of nutrients level application and incorporation of environmental risk management at a farm scale level.</li> <li>• Genomics tool now used to understand Greenhouse Gas Emissions across the whole genome sequence for sheep.</li> </ul>
<b>Seed and Nutritional Technology Development</b>	<ul style="list-style-type: none"> <li>• Reduced use of pesticides.</li> <li>• Developing a clover product that has potential to reduce methane and nitrates produced by animals.</li> <li>• Tackling climate change.</li> <li>• Increasing resilience to drought stress and pest attacks.</li> </ul>
<b>Precision Seafood Harvesting</b>	<ul style="list-style-type: none"> <li>• Reduced by-catch.</li> <li>• Non-desired species returned unharmed to sea.</li> </ul>
<b>Pioneering to Precision</b>	<ul style="list-style-type: none"> <li>• Fertiliser not applied where it would be ineffective or where the land was sensitive.</li> </ul>
<b>High Performance Mānuka plantations</b>	<ul style="list-style-type: none"> <li>• Alternative land-use and reforestation of marginal areas.</li> <li>• Stabilisation of erosion-prone land.</li> </ul>
<b>Clearview Innovations</b>	<ul style="list-style-type: none"> <li>• Support tool to more accurately predict pasture responses to nitrogen, helping improve the efficiency of nitrogen fertiliser and reduce losses to waterways.</li> <li>• Precision fertiliser technology for top-dressing aircraft that automatically applies fertiliser at the optimum rate, in the right place, avoiding environmentally sensitive areas.</li> </ul>

Programme	Environmental benefits
	<ul style="list-style-type: none"> <li>• Support tool that develops farm risk maps that identify where losses of phosphorus, nitrogen, sediment and bacterial contaminants are more likely to occur.</li> <li>• Development of a new slow-release fertiliser with lower risk of phosphorus loss.</li> </ul>
<b>Passion2Profit</b>	<ul style="list-style-type: none"> <li>• Lower environmental impact.</li> </ul>
<b>Sheep – Horizon Three</b>	<ul style="list-style-type: none"> <li>• Sheep dairy has lower environmental impact.</li> </ul>
<b>Avocados Go Global</b>	<ul style="list-style-type: none"> <li>• Large commercial players are investing heavily into large greenfields orchards, mostly converting dairy farms.</li> </ul>
<b>STIMBR</b>	<ul style="list-style-type: none"> <li>• Implemented a nationwide monitoring protocol and methyl bromide reporting system to report annual MB use to the Environmental Protection Agency.</li> <li>• Developed possible MB recapture/recycling technology that is a candidate for commercial development.</li> <li>• Confirmed ethyl formate as a promising fumigant for kiwifruit (and by default other horticultural crops).</li> <li>• 40% MB potential reduction in fumigation rates identified.</li> </ul>
<b>Food Plus</b>	<ul style="list-style-type: none"> <li>• Reducing factory water consumption and environmental footprint.</li> </ul>
<b>Stump to Pump</b>	<ul style="list-style-type: none"> <li>• Alternative to oil-based products.</li> </ul>

## Appendix 11: MPI Strategy

Our purpose:

*Growing and Protecting New Zealand*

Our ambition:



Our Four Outcomes:

To best support our ambition we have four outcomes that describe the long-term effect we're trying to achieve.



Our Six Priorities:

Our priorities provide a common focus for all of our branches as they develop and deliver their respective work programmes.

