STRATEGIC PLAN

2019 - 2025

NEW ZEALAND
AGRICULTURAL GREENHOUSE GAS
Research Centre

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PURPOSE

This document presents the Strategic Plan for the New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC) for the period 2019-2025. It should be read in conjunction with the NZAGRC's 2019-2025 Science and Business Plans. Together, these documents set the governance and direction for the NZAGRC's work over the next six years and how this will help support New Zealand's climate change efforts.

The NZAGRC is a core component of the New Zealand Government's approach to understanding, managing and reducing greenhouse gases in agriculture. It was established in 2009 as a partnership between the leading New Zealand research providers[1] and the Pastoral Greenhouse Gas Research Consortium (PGgRc). It is a 'virtual' centre in that the research it funds is carried out by researchers working in their own organisations. It is legally hosted by AgResearch and has its main office on the AgResearch Grasslands Campus in Palmerston North and a smaller office in Wellington.

Note that this Strategic Plan should be viewed as a 'living document', not a prescriptive statement of the strategic direction. The NZAGRC will need to be flexible and agile and change strategic direction if this is needed to achieve its goal.

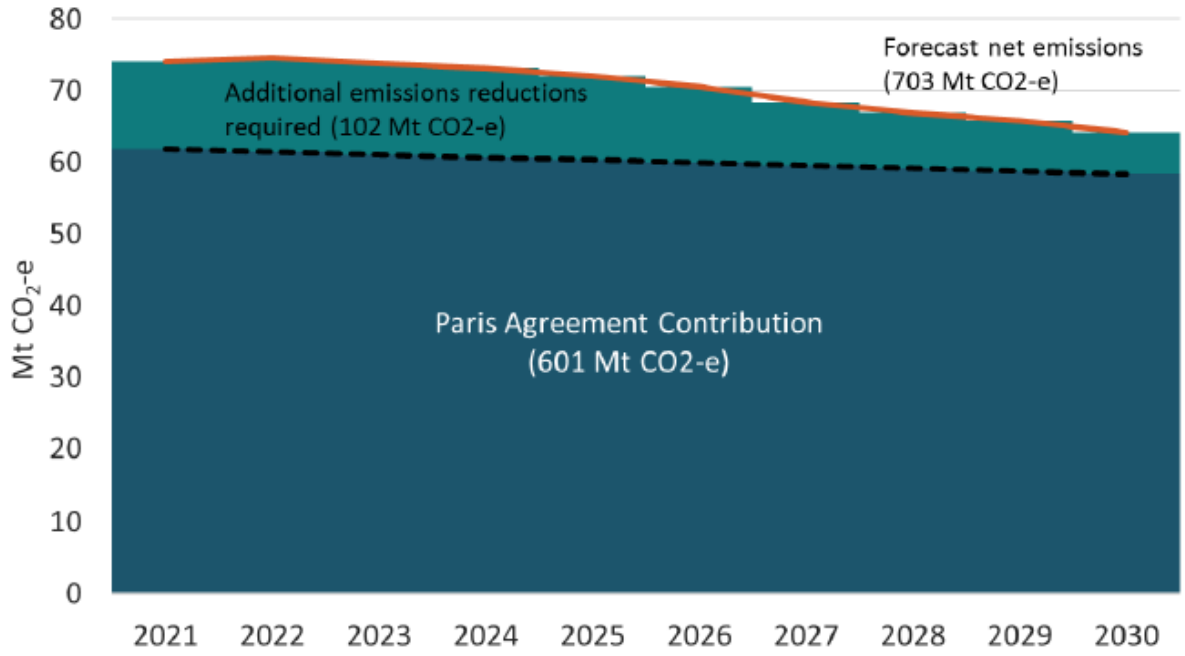
CONTEXT

New Zealand, along with 197 other nations, has committed to the UN Paris Agreement goal of 'keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius'.

Under the Paris Agreement, New Zealand has committed to a medium-term target to reduce greenhouse gas emissions by 30% below 2005 levels by 2030. Meeting this 2030 target will be a significant challenge. Figure 1 shows the difference between New Zealand's contribution and current emissions projections.

[1] AgResearch, DairyNZ, Manaaki Whenua Landcare Research, Lincoln University, Massey University, NIWA, Plant & Food Research and Scion

Figure 1: Paris Agreement Contribution and current forecast emissions



Source: Ministry for the Environment (2019). *Reforming the New Zealand Emissions Trading Scheme: Proposed settings – Consultation Document*.
https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/reforming-the-ets-proposed-settings-consultation.pdf

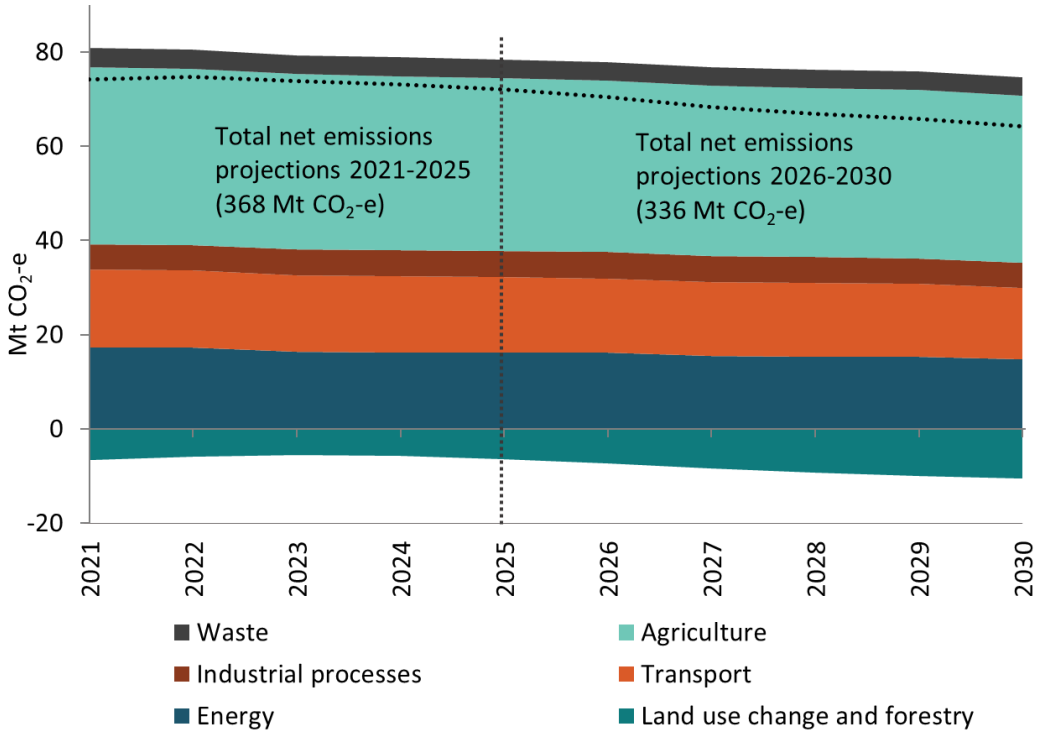
In addition to this international obligation, New Zealand has also legislated two long-term domestic targets:

- Carbon dioxide and nitrous oxide emissions to be net zero[2] by 2050
- Biogenic methane[3] to be 10% below 2017 levels by 2030 and 24-47% below 2017 levels by 2050.

The latest available emissions projections and removals out to 2030 broken down by sector are shown in Figure 2. These projections give total forecast net emissions of 368 Mt CO_2-e for 2021-2025, and 336 Mt CO_2-e for 2026-2030 and are based on reductions likely to be achieved via current policies. This leaves an emissions 'gap' of 102 Mt CO_2-e relative to New Zealand's commitments that will have to be achieved by further domestic action or via the purchase of international carbon units. Under the Paris Agreement, there is not yet an agreed system for the international trading of units. Based on the current price (~$25 in March 2020) of units in the New Zealand Emissions Trading Scheme (NZ ETS), the cost of meeting the gap would be approximately $2.5 billion.

[2] Emissions - sinks = zero
[3] Biogenic methane makes up around 40% of New Zealand's greenhouse gas emissions

Figure 2: Provisional baseline emissions and removals under current policies



Source: Ministry for the Environment (2019). *Reforming the New Zealand Emissions Trading Scheme: Proposed settings – Consultation Document*.
https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/reforming-the-ets-proposed-settings-consultation.pdf

The evidence is clear that without significant additional domestic action, New Zealand will not achieve its targets. Relying on being able to purchase international units carries a large and uncertain financial burden. Analysis by the World Bank[4] suggests that by 2030, a carbon price of between USD$50-100 will be needed for the goals of the Paris Agreement to be met.

Agricultural emissions make up about half of New Zealand's reported emissions, a profile that is unique in comparison to other developed countries (see Figure 3).

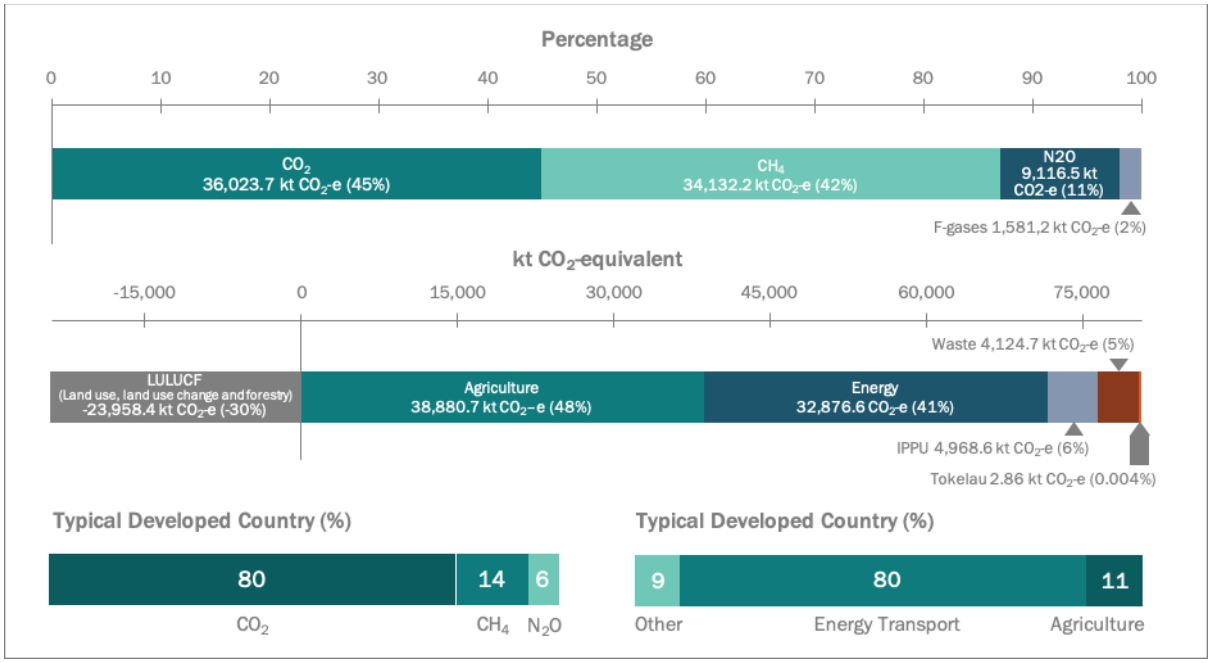
Over the last 25 years, New Zealand farmers and growers have become more efficient and have reduced emissions intensity – or greenhouse gas emissions per unit of product – by about 1% each year. These improvements have helped stabilise methane and nitrous oxide emissions. However, efficiency improvements on their own are not enough to bring absolute emissions down in line with our climate change commitments.

Although New Zealand does not have specific sectoral emission reduction targets, reductions in agricultural greenhouse gas emissions will be essential given the large proportion of CO_2-e emissions coming from the primary sector and the specific methane reduction target. Meeting

[4] "World Bank Group. 2019. *State and Trends of Carbon Pricing 2019*. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/31755 License: CC BY 3.0 IGO."

the 2030 and 2050 targets without reductions from agriculture would mean extremely large reductions in other parts of the economy.

Figure 3: New Zealand's emissions profile



Source: Ministry for the Environment (2019). *New Zealand's Greenhouse Gas Inventory 1990-2017*. https://www.mfe.govt.nz/publications/climate-change/new-zealands-greenhouse-gas-inventory-1990-2017

Pricing emissions has been the main policy instrument used in New Zealand to date to encourage lower emissions activities. Emissions from all sectors other than agriculture are priced through the NZ ETS. This was originally designed as an 'all gases, all sectors' scheme but the entry of agriculture into the scheme has been continuously delayed.

In 2019, the Interim Climate Change Committee (ICCC) recommended that a pricing scheme for agriculture be introduced as soon as practically possible[5]. Initially, pricing could be at the processor level, moving to pricing at individual farm level (indicative timeframe 2025) once the appropriate systems and estimation processes were in place.

However, rather than adopting this recommendation, the Government, primary sector and Iwi/Māori agreed to voluntarily work together to put in place the steps needed to put the primary sector on a downward emissions trajectory and to prepare it for farm-level emissions pricing in 2025. This partnership, known as 'He Waka Eke Noa[6]', is developing a five-year plan of action aimed at equipping farmers and growers with the knowledge and tools they need to deliver emissions reductions while maintaining profitability. The newly formed Climate Change Commission[7] will review progress being achieved by He Waka Eke Noa in 2022 and if commitments aren't being met, the Government can bring the sector into the NZ ETS at the

[5] https://www.iccc.mfe.govt.nz/assets/PDF_Library/f15921453c/FINAL-ICCC-Agriculture-Report.pdf
[6] https://www.mfe.govt.nz/climate-change/joint-action-plan-reducing-primary-sector-emissions
[7] Established under the Climate Change Response (Zero Carbon) Amendment Act 2019

processor level before 2025. If the farm-level pricing mechanism is not in place by 2025, agriculture will be brought into the NZ ETS with the point of obligation at the processor level.

To date, dedicated funding for agricultural greenhouse gas mitigation research in New Zealand has been via the PGgRc (industry: Government consortium co-funded through the Ministry of Business, Innovation and Employment (MBIE)) and the NZAGRC (100% government-funded through the Ministry for Primary Industries (MPI)). Total Government support for the PGgRc and the NZAGRC in the 2018-19 financial year was $7.15m. This dedicated Government funding is supplemented by industry funding for the PGgRc and further government funding through initiatives such as MPI's Sustainable Land Management and Climate Change (SLMACC) programme and the Government's fund to support the Global Research Alliance on Agricultural Greenhouse Gases (GRA). SLMACC funding is currently focussed on climate adaptation work plus work on capacity and capability building around climate change; current funding is approximately $1m per annum. The funding MPI receives to support the GRA has an international focus and facilitates the involvement of New Zealand scientists in international initiatives and/or builds an international element into currently funded domestic projects. Examples of this are NZ GRA funded research into vaccines, methane inhibitors and emissions from manure management. Investment in the 2019-20 financial year is $8m and a further investment of $34m over four years, commencing July 1, 2020, was announced in the 2020 budget.

Both the NZAGRC and the PGgRc have received Government support to continue their research programmes from 2019 onwards. Funding for the NZAGRC will increase to $9.7m per annum, with $4.85m per annum from MPI matched by $4.85m funding from MBIE's Strategic Science Investment Fund (SIFF). The PGgRc has received $2.25m per annum from MBIE from 2019-2021. This will be matched by industry investment. Industry also invests in work that supports greenhouse gas reduction, much of this via improvements in the efficiency of production rather than direct investment in the development of mitigation approaches. The He Waka Eke Noa initiative estimates the total value of the industry investment in climate change related work at $25m per annum.

An innovative, ambitious and well-connected NZAGRC research programme encompassing both science and extension will be essential to support farm-level emissions reductions by 2025. The NZAGRC's 2019-2025 Strategic Plan is designed to deliver on this ambition via the creation of an integrated and mission-led research structure that places climate change at the heart of a complex mix of environmental challenges facing farmers today.

NZAGRC GOAL, OBJECTIVES AND SCOPE

Strategic Goal

The NZAGRC's goal is to discover, develop and make available to New Zealand farmers and growers, products, tools and knowledge that enable the practical and cost-effective reduction of agricultural greenhouse gas emissions.

Strategic Objectives

The strategic goal will be achieved through eight objectives:

1. Develop practices and technologies, and the knowledge and understanding to support future developments, that will contribute to New Zealand's 2030 and 2050 reduction targets for agricultural greenhouse gases
2. Quantify and increase the understanding of how management practices, climate and their interactions, influence soil carbon sequestration in New Zealand's agricultural soils
3. Contribute to Iwi/Māori aspirations to play a leading role in the transition to a low carbon economy
4. Be a trusted knowledge source and broker, facilitating the ongoing alignment of industry and Government funding, and securing additional resources both nationally and internationally
5. Enhance New Zealand's international reputation as a leader in agricultural greenhouse gas research by:
    i. funding an innovative research programme of international quality and standing; and
    ii. leading New Zealand's science input to the Global Research Alliance on Agricultural Greenhouse Gases (GRA)
6. Ensure that national greenhouse gas research, development and extension activities are well-coordinated, developed with sector/stakeholder input and that progress in developing solutions is effectively communicated to the primary sector, Government and public
7. Enhance national capability and capacity, both human and infrastructure, to undertake agricultural greenhouse gas research, development and extension
8. Strengthen existing/build new collaborations with national and international organisations to increase the effectiveness of the NZAGRC's science programmes, Government investments in agricultural greenhouse gas mitigation, including the GRA programme, and Government-industry initiatives such as the PGgRc and He Waka Eke Noa.

Scope

The following issues are considered within scope for the NZAGRC in carrying out its role:

- Biogenic methane and nitrous oxide emissions from the land-based industries, including through land use change and redesigned farm systems
- Carbon sequestration in agricultural soils[8]
- Research and development to the point where it can be directly applied by industry or passed on for delivery/commercialisation.

The NZAGRC will partner with others (e.g. the Our Land and Water and Deep South National Science Challenges, MPI, DairyNZ, Beef + Lamb NZ, PGgRc, and commercial companies) to undertake work on or advance:

- Land use change

[8] Agriculture is used generically in this document and includes horticultural and cropping

- Technology transfer, extension and outreach
- The interaction between, and co-benefits of, mitigation and adaptation – developing resilient land-based industries, including with water, forestry and other natural resource management policies
- Commercialisation.

Direct forestry research (e.g. the impacts of a changing climate on carbon storage) and agricultural adaptation research (e.g. system change to adapt to new pests and diseases or temperature change) are considered out of scope. The latter is already covered by the Deep South 'Changing with our Climate' National Science Challenge, which aims to enable New Zealanders to adapt, manage risk and thrive in a changing climate. However, adaptation and mitigation research cannot be entirely separated and the NZAGRC will look to partner with the Deep South challenge as appropriate to ensure that the emissions consequences of proposed adaptation actions are quantified and communicated. In particular, the NZAGRC will look at the interaction of increased temperatures, increased atmospheric carbon dioxide concentrations and modified management processes on future soil carbon stocks.

PARTNERING WITH IWI/MĀORI

The NZAGRC honours Te Tiriti o Waitangi/Treaty of Waitangi and upholds the principle of partnership in working with Iwi/Māori. The value of the Māori economy has been estimated at around $50 billion, with close to a third of that owned by Māori collectives. Māori freehold land constitutes around 5-6% (approximately 1.5 million ha) of the total area of Aotearoa/New Zealand. Māori-owned agribusinesses control 30% of New Zealand's beef and sheep production, 10% of dairy production, 10% of kiwifruit production and 40% of New Zealand's forests. The contribution of Māori agribusiness to the New Zealand economy is expected to grow and diversify.

Māori-owned businesses are unique in that they are driven not only by financial outcomes but by principles of kaitiakitanga (responsibility), manaakitanga (supporting people) and taonga tuku iho mō ngā uri whakatipu (guardianship of resources for future generations).

Iwi/Māori have strong aspirations to play a leading role in the primary sector's transition to a low carbon economy. The Federation of Māori Authorities (FOMA), the Iwi Climate Change Leaders Forum and the He Waka Eke Noa Steering Group are working together to develop Māori sector climate change/low carbon strategies.

An area of focus for the NZAGRC will be communally owned Māori businesses that have complex decision-making structures with a diverse mix of enterprises. These provide challenges and opportunities; balancing the need for revenue generation with the challenges that climate change brings for the broader principles of kaitiakitanga and taonga tuku iho mō ngā uri whakatipu. Additionally, many Iwi have thriving agribusinesses and they are also increasingly looking at how to continue to develop these businesses within the context of the challenges posed by climate change.

The NZAGRC will dedicate a fixed amount of funding per annum to work with Iwi/Māori to help achieve their low carbon ambitions. Building enduring partnerships with key organisations and groups in the Māori sector and becoming a trusted science advisor to these entities will be a

critical focus. The investment programme will support the provision of tools, models, information, and processes that have been designed and developed in collaboration with Iwi/Māori. Areas where the NZAGRC can add value include:

- Baseline greenhouse gas emissions profiles for farms
- Assessment of systems changes and impacts on revenue, greenhouse gas profiles and other environmental constraints
- Land use change options including modified production/land use systems and new products based on resource constraints
- Facilitation of collective approaches to land, product and market diversification

A dedicated Māori Advisory Group will help prioritise funding and guide investment. More details on this group and the Māori work programme are included in the NZAGRC 2019-2025 Science and Business Plans.

INVESTMENT APPROACH

The Biological Emissions Reference Group (BERG) report[9] showed that breakthrough technologies will be needed to meet ambitious long-term mitigation goals, but that incremental gains can be made in the shorter term by developing and implementing current technologies.

In line with its strategic goal, the NZAGRC will focus its investments on the co-development of a collection of practices, products, tools and knowledge that have the potential to reduce greenhouse gas emissions substantially over time. Innovative and 'stretch' science will be balanced with a focus on applied, nearer-term, cost-effective solutions. This will be achieved through a mix of research across horizons of generating new ideas, developing emerging ideas, and leveraging proven ideas. The balance of research across these horizons will be guided by programmes' potential for, and time to delivery of, emissions reduction solutions.

Design principles

A series of design principles underpin the development of the NZAGRC's overall science and extension programme, enabling it to deliver on the goal and objectives outlined on page 7:

- Ongoing development of a meaningful three-way partnership between Government, the primary sector and science with a focus on developing a comprehensive integrated work programme that ensures coordination of effort and alignment with the relevant Government and sector strategies and initiatives
- Strong stakeholder engagement as research programmes are developed, to harness the innovation of New Zealand farmers and growers
- Outcomes tailored to have the greatest positive impact on New Zealand farming systems and, where possible, broader global applicability

[9] https://www.mpi.govt.nz/protection-and-response/environment-and-natural-resources/biological-emissions-reference-group/

- An open view towards emerging technologies, to accommodate both push from new science opportunities and pull from refinement and improvement of currently emerging mitigations
- The delivery of economic returns for New Zealand, through direct reduction of emissions and opportunities arising from commercialisation and implementation globally
- Flexible and responsive to changes in policy settings and the farming environment with transparent decision-making
- Targeted but multi-pronged approach for risk management
- Balancing funding stability with innovation flexibility and an agile approach; build on most promising leads while providing opportunities for new approaches
- Where more rapid progress can be made, collaborating closely with key partners
- Alignment with MBIE and MPI investment principles (See Appendices 1 and 2).

Decision making

The NZAGRC will maintain an open, transparent and co-development process for identifying and prioritising research investments. The investment allocation outlined in the next section, and explained in more detail in the 2019-2025 Science Plan, was guided by the above design principles and by the following:

- An independent review of the NZAGRC that took place September-November 2018
- An open call to the New Zealand research community in October 2018 to suggest ideas for future projects that generated over 70 high-level proposals. This included ideas for further work on existing projects
- Discussion and refinement of those proposals with the NZAGRC's Director, the PGgRc Manager and the Science Leadership Team (six principal investigators). These were summarised and presented to officials from MBIE and MPI in October 2018 as a potential joint programme of work coordinated by NZAGRC and the PGgRc
- A two-day science planning and prioritisation workshop held in April 2019. This workshop was held to discuss potential priorities for NZAGRC investment emerging from the open call process. The workshop was attended by prominent New Zealand and international scientists, farmers, industry representatives, and people from other funding organisations. This process contributed substantially to the final 2019-2025 Science Plan

The NZAGRC's new Science Programme Advisory Group will recommend final investment allocation details to the NZAGRC Governance Group for approval, once those entities are established (see page 17 and the 2019-2025 Business Plan).

Investment allocation

The NZAGRC currently has dedicated funding from both MPI and MBIE of $4.85m per annum over different time periods; six years funding from MPI and four years funding from MBIE.

The funding is divided into six high level 'baskets' with indicative investment levels, as shown in Table 1. These refer to **average** investment per annum over the first four years of the jointly funded MBIE/MPI programme of work. All values are in New Zealand dollars and exclude GST.

Table 1: NZAGRC funding baskets

Basket	Value per annum	Start date
Domestic science programme The NZAGRC, in collaboration with the PGgRc, funds a well-prioritised domestic science programme with clear pathways to implementation. The Government's GRA investment also supports many elements of the domestic programme. Continued funding for targeted elements of the existing programme supplemented by new initiatives that show most promise will be the focus for 2019-2025.	$5.25m	1/7/19
Iwi/Māori workstream This workstream will focus on partnering with Iwi/Māori enterprises to support their progress towards lower emissions and greater resilience and profitability. It will emphasise improving knowledge of climate change issues amongst Iwi/Māori agribusinesses and the co-development of innovative land use change options including production systems and new products designed to meet resource constraints.	$0.5m	1/7/19
Competitive funding A competitive funding process will be initiated to ensure that the NZAGRC programme remains innovative, vibrant and relevant, harnessing new ideas from a wide range of scientists.	$1.5m	1/7/20
Capital investment Excellent science needs to be underpinned by state-of-the-art facilities and infrastructure. Without additional spending in this area, achievement of the NZAGRC's goals will be constrained, particularly with methane measurement facilities for cattle.	$0.75m (MPI funds)	1/7/2019
Outreach and policy support The NZAGRC programme will include a dedicated fund to help ensure that information arising from domestic and international research and implemented Government policy is supported and communicated effectively to relevant stakeholders.	$0.6m	1/7/19
Administration	$1.1m	1/7/19

TOTAL	**$9.7m pa**

The Outcome-Logic model presented in Appendix 3 shows the outcomes that will arise if the planned activities are successful.

Overview of science programme

The new investment from MBIE for the 2019-2023 period added to the MPI investment means that some existing work can be accelerated, some new projects initiated, greater investment made in targeted iwi/Māori projects and a new competitive innovation fund instigated.

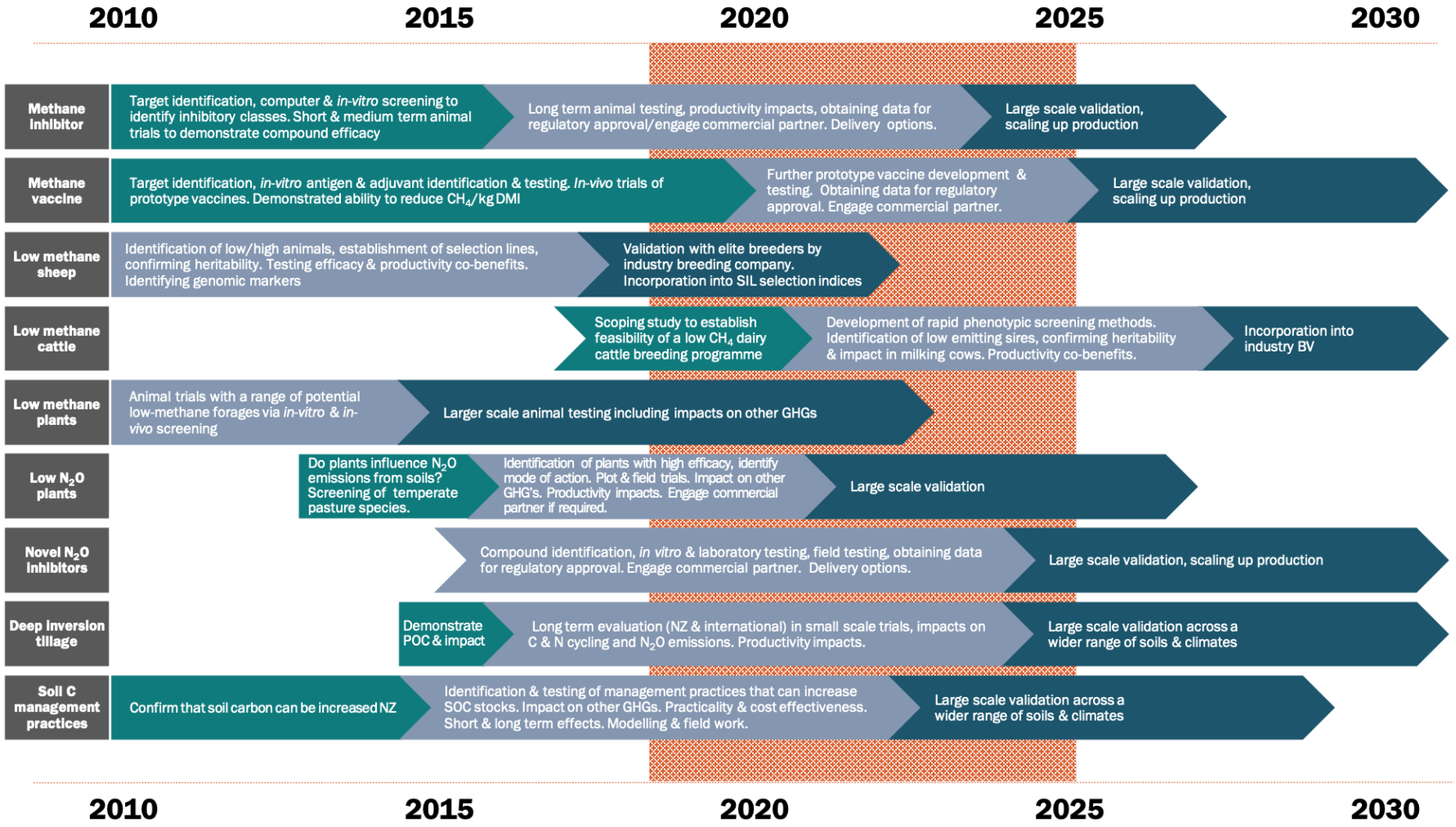
The NZAGRC's new science programme extends a subset of its existing science programme (contracts running between 2017 and 2019; see Figure 4 for details of existing portfolio), supplemented with a suite of new initiatives that build on the knowledge base of past science. The current portfolio of work was considered alongside other work arising from the general call for expressions of research ideas and by the stakeholder workshop held in April 2019.

From the current work, research on the methane vaccine, breeding low emitting cattle and sheep, low nitrous oxide and methane emitting plants (particularly Plantain,) and the testing of soil carbon management practices were ranked as the highest priority for ongoing NZAGRC investment. Further NZAGRC investment in methane inhibitor research was not considered a current priority as this research is at the commercialisation stage and future investment would be via the PGgRc and/or its commercial partners. The NZAGRC will continue to liaise with the PGgRc as this situation is fluid and NZAGRC support could be needed in the future.

Nitrous oxide inhibitor research was ranked as high priority in general. The current nitrous oxide inhibitor programme has two elements. The first is a co-funded MPI:Industry discovery programme focussed on small-scale field evaluation of industry-owned compounds that have already been identified as promising in the laboratory. Support for this programme from the NZAGRC has not been requested at this stage. This will be re-visited once the results from the current field-testing phase are available (approximately two years). The second element is the development and testing of a specific group of compounds that have shown promise in laboratory and field trials. This is focussed on the novel use of existing compounds whose properties are well known. Funding for this will be prioritised.

Full details of the proposed initial work programme are presented in the Science Plan.

Figure 4: Existing NZAGRC and joint PGgRc/NZAGRC (methane workstreams) research programme and pathways to implementation



*Shaded area represents period of new NZAGRC funding

Co-funding and other sources of revenue

Since its inception, the NZAGRC has co-funded methane research programmes with the PGgRc. This will continue in the future and co-funded programmes are signalled in the 2019-2025 Science Plan. This includes work on the development of anti-methanogen vaccines and the breeding of low methane emitting cattle.

In addition to the investment allocation shown above, the NZAGRC also leverages other government and non-government revenue.

It works with MPI to administer a portion of the Government's dedicated funding for the GRA. This includes organising and co-chairing the GRA's Livestock Research Group, administering collaborative research initiatives between New Zealand and international research providers and organising and delivering capability building projects in developing countries. The NZAGRC currently administers 55 GRA contracts, worth a total of $21.3 million. This arrangement lasts until June 2021. NZAGRC will continue to work closely with MPI on GRA issues in the future; funding of $34m over four years was signalled in Budget 2020.

The NZAGRC will continue to work closely with MPI's Sustainable Land Management and Climate Change programme (SLMACC). For example, in 2018/19 and 2019/20, the NZAGRC received a series of SLMACC contracts (totalling $1.17m) to develop, test and deliver resources to help farmers and growers better understand climate change and agricultural greenhouse gas emissions and ways to reduce them. This included training for rural professionals, the production of videos and written material for 'Ag Matters' – a dedicated agriculture and climate change website, articles in Farmers Weekly, and analysis of farmer needs for greenhouse gas tools. Future planned work in conjunction with the SLMACC programme includes more material for the Ag Matters website and further training for rural professionals both in-person and via dedicated webinars. The revamped SFFF is increasing its investment in the climate change area and collaboration with industry initiatives seeking support from the fund will be explored.

Developing methods to accurately quantify emissions at both national and farm level are crucial for assessing emission baselines and monitoring progress against targets. NZAGRC staff will continue to work closely with the MPI national inventory team to identify opportunities to co-invest in inventory method development. The He Waka Eke Noa initiative has specific milestones for the development of on-farm accounting methods and the NZAGRC will look for opportunities to work with the initiative in this critically important area.

The research provider members of the NZAGRC will be encouraged to continue to align their own internal investments with those of the NZAGRC. To date, co-funding from members has enabled provision of state-of-the-art equipment and facilities and helped to expand the size and scope of core NZAGRC research programmes.

Opportunities for the co-development and co-funding of science programmes that align with the NZAGRC goal via the National Science Challenges, sector bodies such as DairyNZ and Beef + Lamb NZ, MBIE programmes and private sector entities will also be pursued.

Prioritisation of individual science projects

The following criteria will be considered when prioritising individual project investments:

a. The importance of the gases (methane vs nitrous oxide vs carbon sequestration) in New Zealand's emissions profile
b. Technical mitigation potential of identified solutions – both in terms of carbon dioxide equivalents and in meeting the separate methane target
c. Potential to meet the dual reduction targets in the short- and long-term, considering:
    i. Practicality
    ii. System fit
    iii. Cost effectiveness
    iv. Time to implementation
    v. Market acceptability
    vi. Regulatory requirements
    vii. Ability to be measured and accounted for in inventory and reporting
d. Pipeline approach: research undertaken within the context of uptake and commercialisation needed for a successful outcome
e. Strong focus on mitigation within the livestock sector, but broader land use change mitigation approaches within scope (see pages 7-8)
f. Harnessing the innovation of the New Zealand primary sector, both at the individual farm level and industry-wide; leveraging new technological advances including the future potential of genomic technologies.
g. Uniqueness of the research, or complementarity to other existing programmes
h. Whether/how the activity addresses science capability (facilities and people)
i. How it enhances the reputation of the New Zealand science system
j. International applicability and potential commercial opportunities
k. The balance of new ideas, development of existing ideas and implementation of proven approaches.

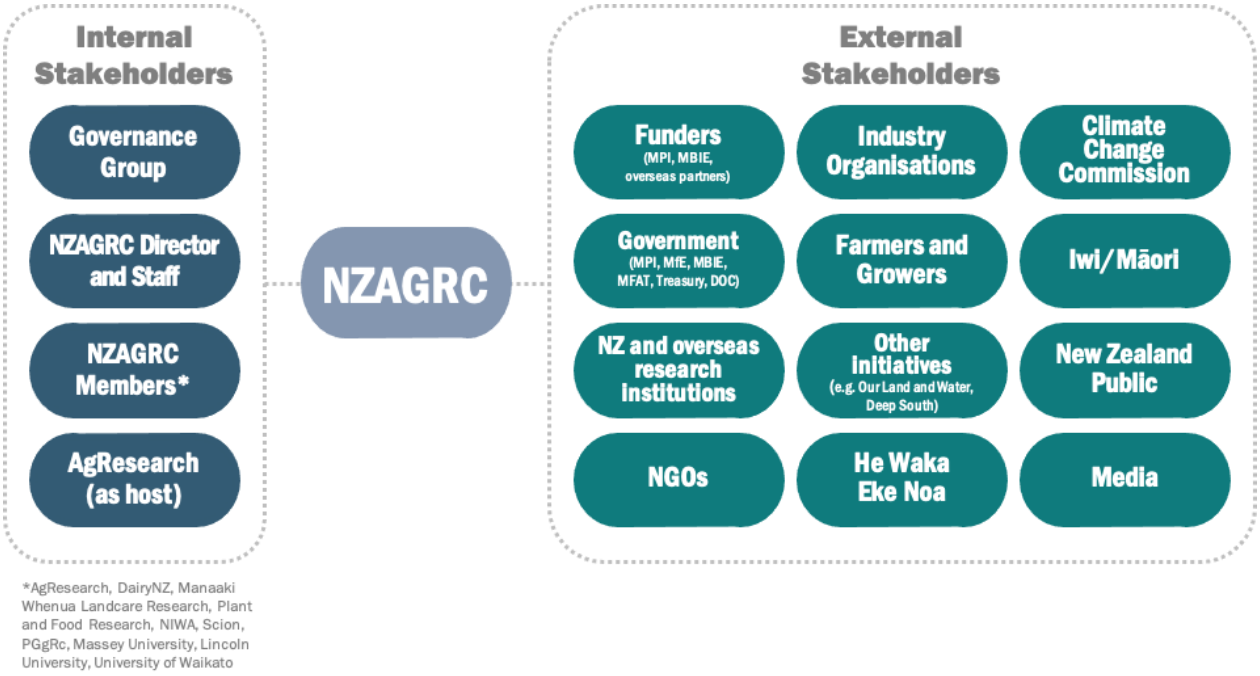
For more on investment decision-making, see pages 11-12.

KEY RELATIONSHIPS

The NZAGRC's success in achieving its goals depends on maintaining effective working relationships with, and leveraging research programmes of, stakeholders, of which there are many – both nationally and internationally (see Figure 5) – reflective of the NZAGRC's goal and objectives, scope and operating environment.

The NZAGRC's partnership with Iwi/Māori recognises the special kaitiaki role that Iwi/Māori play in managing New Zealand's natural resources and our responsibilities pursuant to Te Tiriti o Waitangi/Treaty of Waitangi.

Figure 5: NZAGRC stakeholders



The NZAGRC has been developing relationships with key stakeholders since it was established in 2009. However, the complexity of environmental and other challenges now facing the primary sector means that the NZAGRC will need to work hard to ensure that its work on agricultural greenhouse gas mitigation does not happen in isolation. Farmers and growers do not approach environmental issues separately and joined-up thinking is required by the research, industry and policy communities in response.

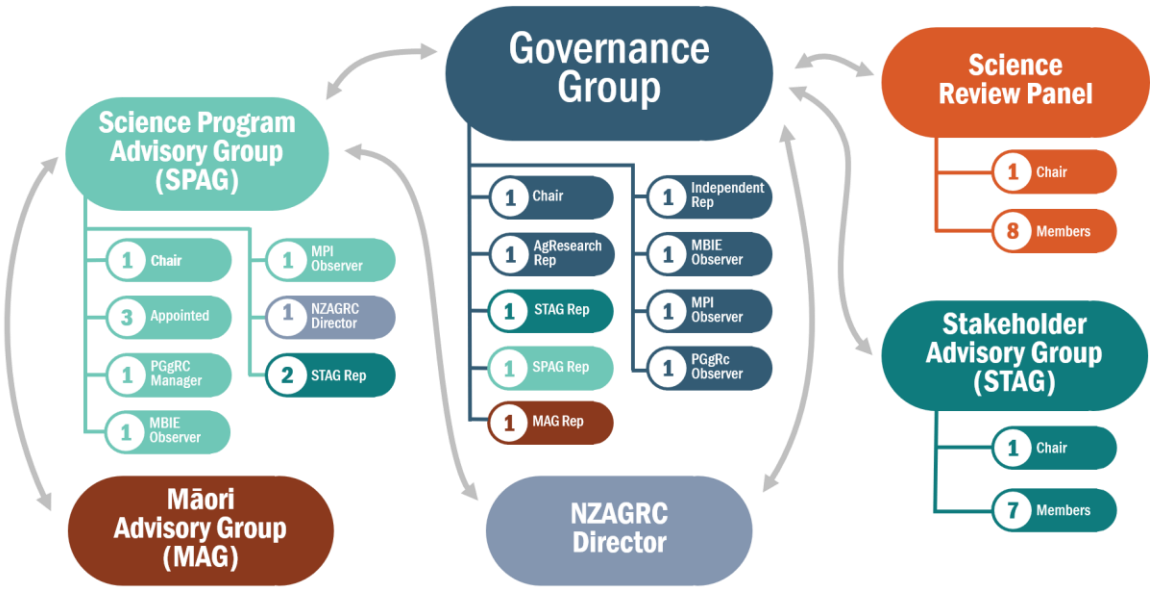
NZAGRC will engage with He Waka Eke Noa (see page 6) to ensure that its work complements and supports the activities instigated by that joint Government/industry/Iwi/Māori partnership. The NZAGRC will continue to work closely with other funding entities, most notably the PGgRc, for aligned research into methane mitigation and MPI in its role in administering the Government's budget for the GRA and administering other climate change initiatives such as SLMACC. Other relevant funding initiatives where the NZAGRC will align its activities include the National Science Challenges 'Our Land and Water' and 'Deep South' and ongoing development of New Zealand's agricultural greenhouse gas inventory. Input from NZAGRC member organisations in the co-development of the research programme will help to ensure that members' own discretionary funding on agricultural greenhouse gas mitigation complements the activities undertaken by the NZAGRC. Further details of the NZAGRC's key relationships are summarised in Appendix 4.

GOVERNANCE

AgResearch will remain as the NZAGRC's legal host from 2020, meaning the NZAGRC can continue to access AgResearch corporate services such as HR, finance, legal and IT.

Although the NZAGRC will continue to have no legal status and AgReseach is the legal entity responsible for the NZAGRC, day to day governance and oversight of decision making will be devolved by the AgResearch Board to a separate NZAGRC Governance Group, supported by Stakeholder and Science Advisory Groups (See Figure 6 and Business Plans for full details).

Figure 6: Governance structure for the NZAGRC



The Governance Group is a skills-based group that will oversee the NZAGRC's work. It will comprise an Independent Chair (appointed by AgResearch, MPI and MBIE), an AgResearch representative, a Stakeholder Advisory Group representative, a Science Programme Advisory Group representative, an Independent member with Government experience/industry knowledge (appointed by Chair, AgResearch, MPI and MBIE), and observers from MBIE, MPI, the Māori Advisory Group and the PGgRc.

The Governance Group will set the strategic direction of the NZAGRC and monitor performance against strategic and contracted goals, approve expenditure, ensure relevance of the NZAGRC programme to the primary sector and New Zealand, oversee financial performance, HR development and constraints and provide IP advice. It will also actively monitor risks. The NZAGRC Director will report to the Chair of the Governance Group. The Chair of the Governance Group and the NZAGRC Director will meet annually with the AgResearch Board to update them on NZAGRC progress.

The Governance Group will receive independent advice from a permanently constituted Stakeholder Advisory Group (STAG) and from periodic independent science reviews undertaken by a Science Review Panel and the Māori Advisory Group[10] (MAG) as required. The Science Programme Advisory Group (SPAG) will provide advice and recommendations on science funding on a quarterly basis to the Governance Group and the Governance Group may request advice from them at any other time if required. For further details of the structure and function of these groups, please see the 2019-2025 Business Plan.

[10] Note that the Māori Advisory Group will confirm its name once formed.

KNOWLEDGE TRANSFER AND COMMUNICATIONS

Some of the NZAGRC's deliverables will take the form of knowledge that will help end-users reduce agricultural greenhouse gas emissions. The processes to transfer this knowledge will be custom designed to suit the specific needs of the knowledge package.

The NZAGRC role will be a supportive rather than leadership role as other organisations (see Appendix 4 for information on key relationships) have the required networks, expertise and resources to undertake these activities. This will take the form of co-funding industry initiatives and/or providing specialist knowledge that can be incorporated into these initiatives. Liaison with He Waka Eke Noa will be prioritised as the success of this initiative is dependent on farmers and growers having the knowledge and tools to instigate mitigation actions.

NZAGRC will continue to work closely with MPI to support its knowledge transfer work programme. Specifically, it will lead further work on the maintenance and expansion of the content of the Ag Matters website and the development and delivery of further climate change related training courses for rural professionals and farmers.

The NZAGRC has established a profile in the public, science and policy arena and helped to increase the reputation and influence of New Zealand in the agricultural greenhouse gas area. It will continue to promote itself as a trusted and independent source of information and knowledge on agricultural greenhouse gas issues via the production of a range of science-based material in various formats tailored to specific audiences. It will continue to maintain an easily navigable website for the repository of its science reports and outputs. Its communications activities are guided by a Communications Strategy that was refreshed in 2017 and will be revisited once the new governance structure is in place. An annual Communications Plan guides activity in any particular year. Specialist support will be contracted as needed to support the implementation of the Communications Plan.

A dedicated fund of $0.5m per annum will be established to ensure that knowledge transfer activities and communication activities are resourced adequately. Further details of knowledge transfer and communication activities are provided in the Business Plan.

RISK MANAGEMENT

The NZAGRC will actively manage risk via the implementation of a risk management framework covering financial and non-financial elements. This will be under the oversight of the Governance Group. The generic process is:

- Risk identification
- Risk assessment
- Risk mitigation
- Risk monitoring and reporting
- Risk governance.

Risk identification

This is via the use of a risk tree that ranks risks under five main headings:

- Financial viability
- Failure to achieve goals
- Operational continuity
- Reputation
- Legal liability.

Currently these are then broken down into 16 sub-categories. This risk identification framework is visited annually and updated where necessary.

Risk assessment and mitigation

Potential impacts are assessed using a 1-5 scale, mitigation actions proposed, and residual risks reassessed. Risks are incorporated into a risk register which is maintained by NZAGRC staff.

Risk monitoring and reporting

The risk register is a standing item on every Governance Board meeting. The impact rating of individual items on the risk register is re-assessed if necessary and additional risks identified, assessed and incorporated.

Risk governance

The Governance Group has overall responsibility for identifying and assessing risk. Day to day management and mitigation of risk is the responsibility of the NZAGRC Director.

As the staff of the NZAGRC are AgResearch employees and the NZAGRC operates as a business unit of AgResearch, the NZAGRC is also encompassed by the broader AgResearch risk management framework. This is particularly important for areas such as financial viability, operational continuity and legal liability where AgResearch implements processes to manage and mitigate risks.

More details on the NZAGRC's operational approach to risk management are provided in the 2019-2025 Business Plan.

APPENDIX 1: MPI INVESTMENT GOALS

MPI's vision is that 'New Zealand will be the world's most sustainable provider of high-value food and primary products'. The organisation is working towards four outcomes:

Prosperity: High-value food and primary sectors build prosperity for more New Zealanders

MPI's priorities under prosperity are to focus its expertise and resources to support innovation, to partner with the food and primary sectors for their success, and to help New Zealand producers increase the value of their goods.

Sustainability: Future generations will benefit from improved environmental performance by our primary industries

MPI's priorities under sustainability are to support farmers and growers to adopt more sustainable land use practices, to rejuvenate the forestry sector to improve environmental outcomes, and to advance fisheries practices for a healthier marine environment.

Protection: Our products are safe and New Zealand is protected from biological risk

MPI's priorities under protection are to protect New Zealand from harmful pests and diseases, demonstrate New Zealand's food safety system is world class, and to partner to preserve New Zealand's native plant and animal life.

Visible leadership: We enable the food and primary sectors to thrive

MPI's priorities under visible leadership are to have a diverse and capable workforce, to take a visible leadership role wherever they work, and to grow their partnership with iwi and Māori.

To read more about MPI's strategy, see here: https://www.mpi.govt.nz/about-us/our-strategy/

APPENDIX 2: MBIE INVESTMENT GOALS

Four principles guide the management of the MBIE Strategic Science Investment Fund (SSIF):

Principle 1: The SSIF is a Strategy-Driven Investment

This principle reflects the strategic focus of the SSIF – that Government is taking a stronger role in the management of this investment, and that the science sector can expect more clarity about what government is seeking. This principle has three parts:

- *SSIF is strategy-driven.* All investment aligns with the SSIF Investment Plan 2017-2024, which reflects a whole-of-system strategy (including the National Statement of Science Investment 2015-2025 (NSSI))
- *SSIF investments deliver a portfolio* that meets strategic priorities, balancing across relevant spheres of impact, horizons and types of investment within the SSIF.
- *SSIF is a stable, longer-term investment to support capability that builds science strength and depth*. SSIF investments provide sufficient surety of future funding to plan long-term for scientific activity to support New Zealand's economy, environment and wellbeing in priority areas.

Principle 2: SSIF Investments are Primarily Mission-Led

SSIF investments focus primarily on mission-led science. As described in the NSSI, mission-led science supports a clear goal, agreed between Government and the research provider. Mission-led science is focussed on impact for New Zealand, delivering excellent, relevant science. This principle has three parts:

- *SSIF investments are primarily mission-led.* The bulk of SSIF investment focuses on mission-led research, although provide some room for a 'pipeline' of investigator-led research, extension into industry-led research, and underpinning scientific services as appropriate.
- *SSIF investments deliver national benefit* by enabling research and supporting access to research and infrastructure across the science sector and to end users.
- *SSIF investments leverage an appropriate contribution*. In particular, co-funding or other forms of contribution are required for investments with economic benefits where the beneficiary is clear, at a level comparable to other funding instruments in the system.

Principle 3: The SSIF is a Purchase Mechanism

The SSIF seeks to support critical mass and depth of scientific expertise, which requires stable investment streams and a strategic approach to managing the provider base, but also the ability to adapt as priorities change. This calls for a purchase-based approach, managed through a partnership between the Government and SSIF providers. The principle has four parts:

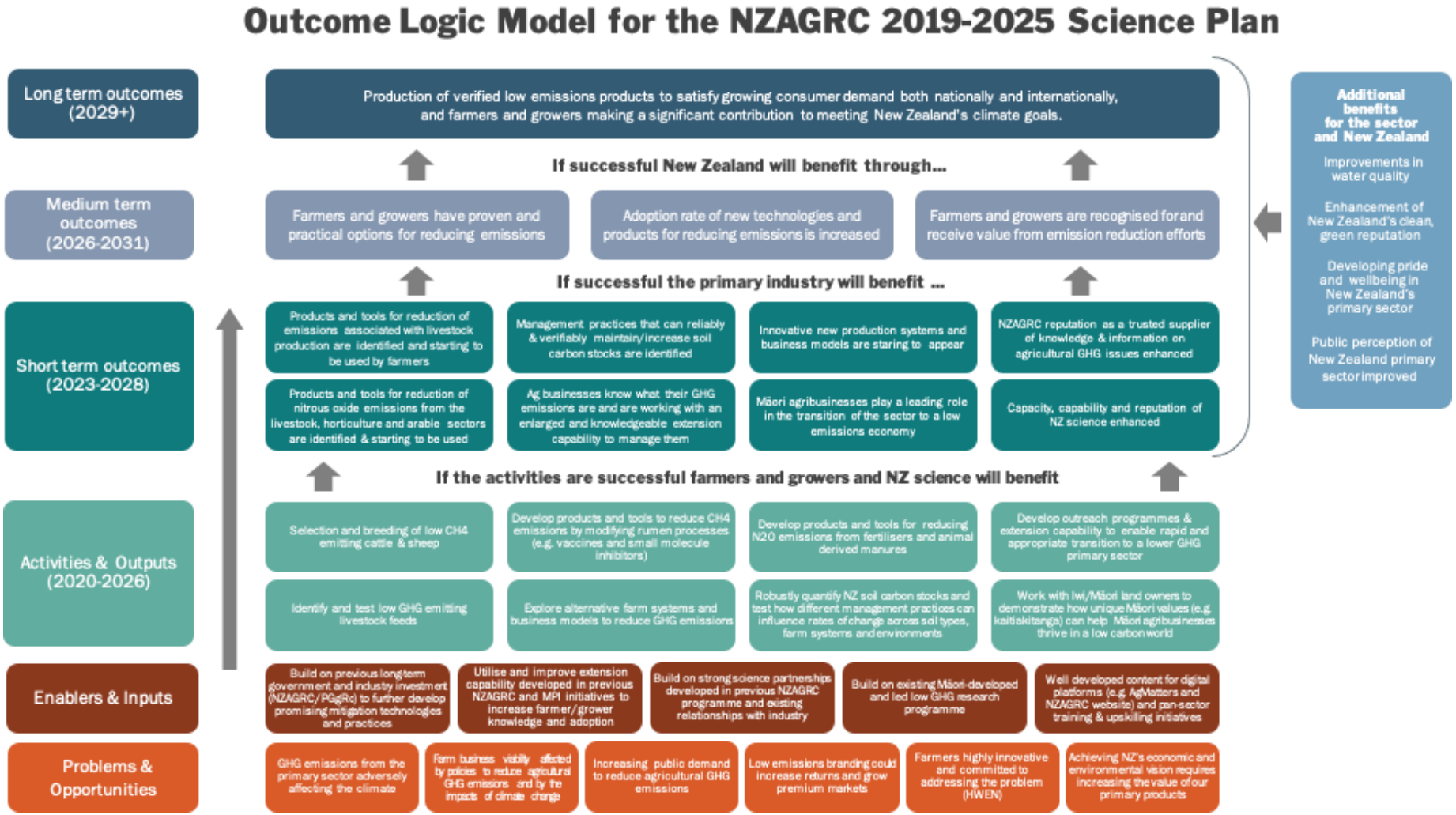
- *SSIF is focussed on purchasing science.* The SSIF purchases science that advances strategic goals (which also build strength and depth in key areas). Whilst contracts are with organisations, it is the science or science platforms, not the organisation, that is being invested in.
- *SSIF is primarily a non-contestable, partnership-based mechanism.* Investments are managed through a partnership between Government and SSIF providers. However, where Government decides to invest in a new strategic priority, competitions may be used to test the market, in order to identify the best capability and fit for delivering the new priority.
- *SSIF is provider-neutral.* Purchase decisions are made on the basis of best fit or best proposal rather than the organisation or individual providing the science. This drives the approach to investing in a new priority.
- *SSIF provides a mechanism to adapt the investment portfolio.* The SSIF provides Government with the flexibility to adapt the portfolio as priorities change and opportunities emerge. Individual investments may be grown, shrunk, or halted altogether, and new investments may be made through the mechanism.

Principle 4: The Performance of SSIF Investments is Clear

Clear, comparable performance information is required to support the operation of a purchase mechanism, and to provide accountability for the use of the funds.

- *SSIF investments are transparent and high-performing.* It allows Government to understand clearly what it is investing in, and to assess the overall size and performance of those investments.

APPENDIX 3: OUTCOME LOGIC MODEL



APPENDIX 4: NZAGRC RELATIONSHIP DETAILS

The following is a summary of key aspects of the NZAGRC's external relationships

Government: MPI (as funder and in providing policy support and alignment with other funds, e.g. SLMACC, Sustainable Food & Fibre Futures (SFFF), Sustainable Land Use Initiative, Inventory funding etc), MBIE (as a new funder, including ensuring the NZAGRC meets the priorities of SIFF plus delivers to MBIE's reporting requirements). Other departments for input to policy processes, funding relationships, e.g. MfE and MFAT, and the Climate Change Commission.

Iwi/Māori: a Māori Advisory Group will advise on priorities for the ring-fenced fund dedicated to addressing the specific needs of Māori agribusiness. Partnership with Iwi/Māori input will be further developed via representation at stakeholder and governance level.

PGgRc: since its inception, the NZAGRC has co-funded research with the PGgRc, particularly on methane. The PGgRc has a strong focus on taking technologies through to commercialisation and hence together the NZAGRC and the PGgRc provide a pathway from discovery through to uptake by the agricultural sector. Maintaining this symbiotic relationship will be essential to the continued success of both parties.

Industry: in the past, the PGgRc has represented sectoral interests in the NZAGRC. However, with specific reduction targets now in place for agricultural greenhouse gases and a coordinated industry/Government action plan underway via He Waka Eke Noa, stronger and more direct sectoral input into the NZAGRC's science planning processes is needed. In addition, the NZAGRC will need to more actively communicate with farmers and growers (both directly and via industry organisations).

He Waka Eke Noa: this joint industry: Government initiative is still in its formative stages, but currently available information suggests that much of its work will have strong relevance for the NZAGRC's work programme. NZAGRC will liaise closely with He Waka Eke Noa staff to identify synergies, avoid duplication and identify opportunities for joint activities.

Partners in NZAGRC: scientists delivering NZAGRC-funded projects, NZAGRC staff, NZAGRC members (key relationship in maintaining support for NZAGRC and what it wants to achieve, alignment of internal investments, co-funding etc).

Other science initiatives (e.g. National Science Challenges): ensuring that the work of the NZAGRC is not happening in isolation from the work of other science initiatives aimed at helping farmers reduce their environmental impact (e.g. freshwater, biodiversity). Aligning science activities will be essential for ensuring that synergies between research programmes can be identified and exploited (e.g. efforts to reduce nitrogen leaching to waterways also having positive benefits for nitrous oxide emissions).

International relationships: the NZAGRC has existing relationships with several international organisations (e.g. IPCC, FAO, World Bank, CGIAR system and its individual centres, Climate & Clean Air Coalition), and bilaterally with various GRA member countries and the European Union. NZAGRC staff are also frequently invited to sit on bilateral and multilateral advisory boards and steering groups. These relationships need dedicated attention given the NZAGRC's lead role in

the GRA and in administering the Government's GRA budget. In addition, the NZAGRC will need to stay abreast of international developments, identify opportunities for new partnerships, and obtain expertise if it doesn't exist domestically.

External communications: enhanced and proactive relationships with mainstream and sector-specific media channels in order to improve knowledge and understanding of agricultural greenhouse gases and soil carbon sequestration. Similar relationships to maintain with the Science Media Centre, various journals and journalists, Science Learning Hub, House of Science and other providers of climate change information to the primary sector and the general public. See also Communications section in the NZAGRC Business Plan.