BUSINESS PLAN

2019 - 2025

NEW ZEALAND
AGRICULTURAL GREENHOUSE GAS
Research Centre

Contents

PURPOSE

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

OVERVIEW

What is the NZAGRC?

The NZAGRC is a core component of the Government's approach to reducing greenhouse gases in agriculture. It was established in 2009 to fund New Zealand research and improve coordination in this area and be a key authoritative source of technical advice and support. It is a partnership between the leading New Zealand research providers[1] working in the agricultural greenhouse gas area and the Pastoral Greenhouse Gas Research Consortium (PGgRC)[2] – for more, see page 5. The NZAGRC also leads New Zealand's science input into the Global Research Alliance on Agricultural Greenhouse Gases (GRA), which is New Zealand's main way of fostering international research collaboration and helping to build global capability to address agricultural greenhouse gas emissions.

From 2009-2019, the Government invested $4.85 million per annum in the NZAGRC. Separate funding supported the NZAGRC's GRA activities.

In Budget 2019, the Government renewed its funding for the NZAGRC, confirming nearly $50 million for a further six years (ending 30 June 2025). Half the funding comes from the Ministry for Primary Industries (MPI) and the other half from the Ministry of Business, Innovation and Employment (MBIE) through its Strategic Science Investment Fund (SSIF). The funding from MBIE will be invested in a manner consistent with the SSIF investment principles, as outlined in the SSIF Investment Plan[3] (see also Appendix 2 of the 2019-2025 Strategic Plan).

The funding received will build on and extend research conducted to date, enabling investment in the following core areas:

- Methane, both enteric (produced by the digestion of feed by ruminant animals) and methane from animal wastes
- Nitrous oxide emissions from animal excreta and nitrogen fertiliser application
- Soil carbon storage on pastoral land
- Integrated solutions, encompassing farm systems research, extension and communications activities

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

[2] The PGgRc was formed in 2003 and is led by industry and jointly funded by industry and MBIE. It invests approximately $5 million per annum in work on agricultural greenhouse gas mitigation, mostly focussing on enteric methane.

[3] https://www.mbie.govt.nz/assets/436ecb3be9/strategic-science-investment-fund-investment-plan.pdf

- Supporting Iwi/Māori aspirations.

In addition, the NZAGRC will partner with others to undertake work on or advance:

- Land use change
- 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.

The NZAGRC will not undertake direct research into forestry issues (for example, the impacts of a changing climate on carbon storage) or agricultural adaptation research (for example, adapting to new pests and diseases or temperature change).

For more on the NZAGRC's planned activities, see the 2019-2025 Science Plan.

What is the NZAGRC's strategic goal and objectives?

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.

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.

Who are the NZAGRC's current members and stakeholders?

Nine organisations, between them representing research and development, education and industry, make up the NZAGRC:

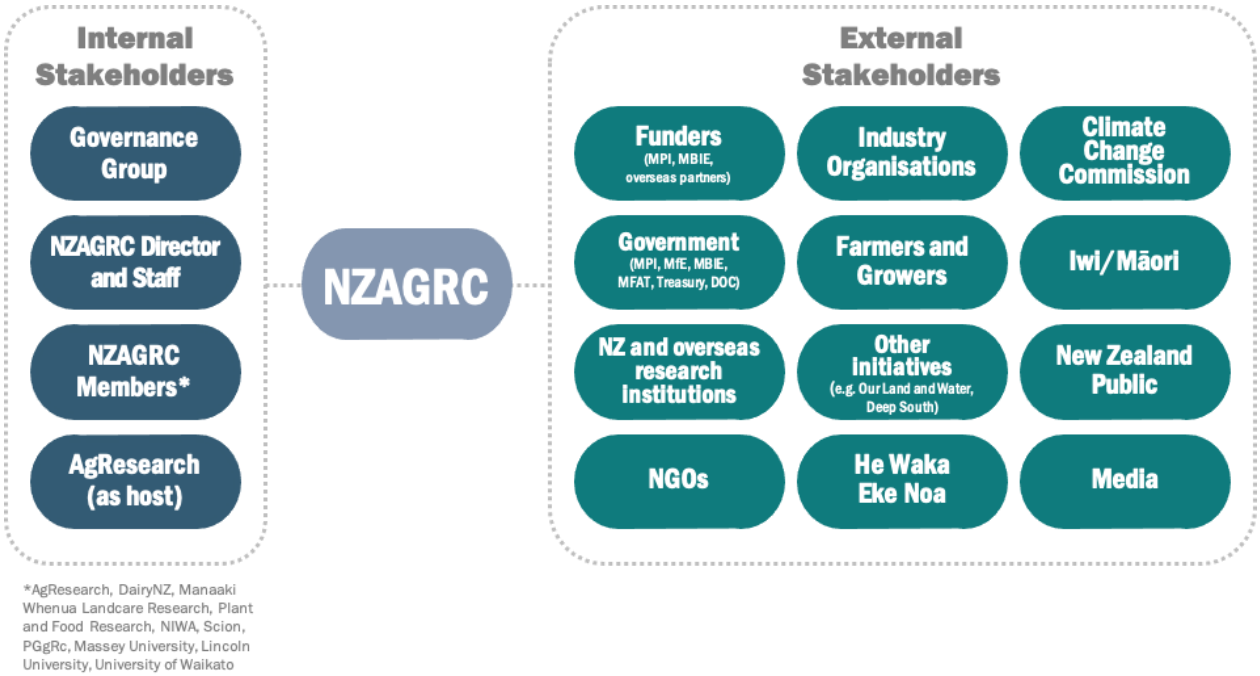
- AgResearch Ltd (also legal host of the NZAGRC)
- DairyNZ Incorporated
- Manaaki Whenua Landcare Research New Zealand Ltd
- Lincoln University
- Massey University
- National Institute of Water and Atmospheric Research (NIWA) Ltd
- Pastoral Greenhouse Gas Research Consortium
- The New Zealand Institute for Plant and Food Research Ltd
- New Zealand Forest Research Institute Ltd, trading as Scion

A Membership Agreement was signed in 2010 between the above parties and the NZAGRC. This detailed how these organisations would work together to meet the aims of the NZAGRC and outlined the roles and responsibilities of AgResearch as the host provider. This Agreement will be reviewed by the Governance Group in 2020 and updated as required. A policy on expanding membership of the NZAGRC from 2020 onwards will also be developed by the Governance Group.

AgResearch and the other NZAGRC members, through long-standing support from the Government and the sector, hold the majority of New Zealand's capability in agricultural greenhouse gas mitigation research. Historically, AgResearch has been the lead provider with respect to enteric methane production while Lincoln University, AgResearch and Manaaki Whenua have together taken a lead role in pastoral nitrous oxide emissions. Soil carbon research is more diverse: Manaaki Whenua, Plant and Food Research, Lincoln University, Massey University and Scion hold most of the relevant capability and receive a large portion of the New Zealand science investment in soil carbon-related work. The University of Waikato, which was not an original member of the NZAGRC, also has strong capability in this area of research. For more on the key contribution and role of each member of the NZAGRC, see Appendix 1.

The NZAGRC's main stakeholders are shown in Figure 1. For more, see pages 19-23 and the separate 2019-2025 Strategic Plan.

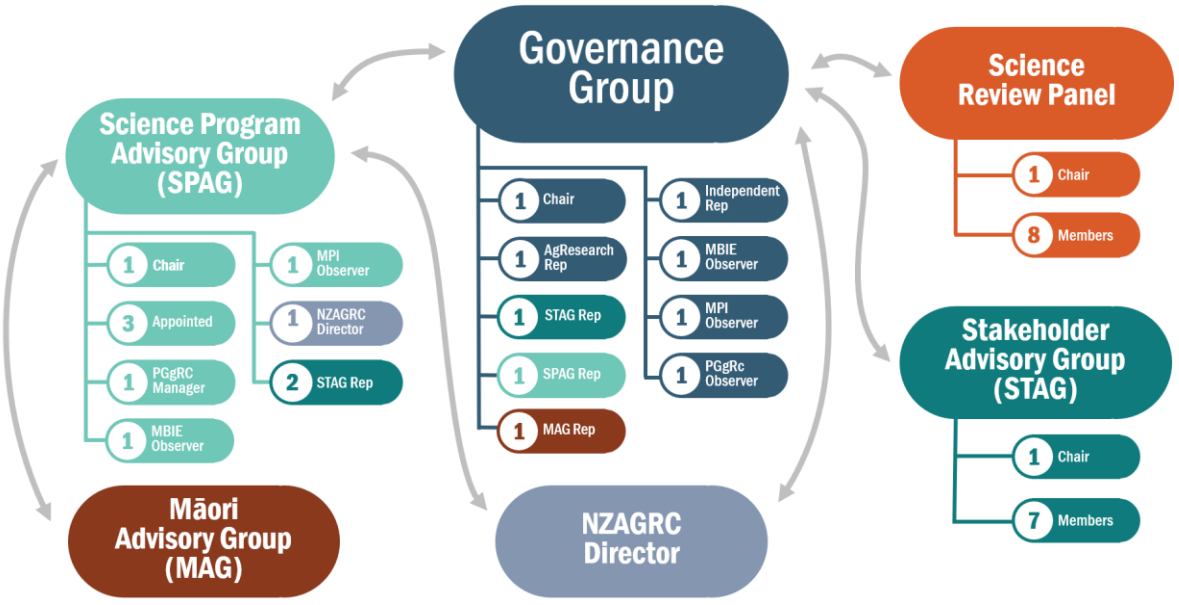
Figure 1: NZAGRC stakeholders



GOVERNANCE AND ADVISORY GROUPS

The structure of the NZAGRC is shown in Figure 2.

Figure 2: Governance structure for the NZAGRC



Governance Group

As the NZAGRC is set up as a business unit operating within AgResearch, the AgResearch Board and Chief Executive have legal responsibility for the performance of the NZAGRC. Between 2009-2020, responsibility for running the NZAGRC was devolved to an NZAGRC Steering Group, comprising an appointed representative from each of the member organisations, and Government observers. From 2020 onwards AgResearch will continue to be the legal host of the NZAGRC and devolve responsibility for day to day operation and decision making. However, a new governance structure will be implemented.

The NZAGRC's most recent independent review (December 2018) recommended a more independent, skills-based governance group. This recommendation has been adopted and will be in place from 2020. This will comprise:

- An Independent Chair (appointed by AgResearch, MPI and MBIE after nominations from NZAGRC members, Governance Group members and observers)
- An AgResearch representative (Research Director of AgResearch),
- 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)
- Observers from MBIE, MPI, the PGgRc and the Māori Advisory Group[4]

Draft terms of reference for the Governance Group will be agreed between the Chair, MBIE and MPI. These will be discussed and, after any proposed changes are accepted by MPI and MBIE, adopted at the first Governance Group meeting.

The Chair of the Governance Group and the independent member will be appointed for an approximate 2.5-year period, with the first term ending 31 December 2022. A new Chair and independent member will be appointed to cover the period 1 January 2023 to 30 June 2025. Holders of both positions will be eligible for re-appointment.

The Governance Group will meet quarterly. The NZAGRC Director will report to the Chair and via that person, to the AgResearch Board and Chief Executive. The Governance Group Chair and the NZAGRC Director will meet annually with the AgResearch Board and Chief Executive. Reporting will focus on the performance of the NZAGRC with appropriate quantitative measures linked to Key Performance Indicators to be negotiated with MPI and MBIE. These include:

- Approval of expenditure
- Relevance of the NZAGRC's research to the primary sector and New Zealand
- Performance to contracted goals and the Strategic and Science Plans
- Financial performance
- Human resource development and constraints
- Intellectual Property advice
- Risk management
- Communications Strategy delivery.

[4] Observers have speaking rights but not voting rights.

The Governance Group will receive independent advice from a permanently constituted Stakeholder Advisory Group and from periodic independent science reviews or other specialists as required, for example, Intellectual Property advice and commercialisation advice. With respect to science funding decisions, the Governance Group will base their decisions on advice and recommendations provided by the Science Programme Advisory Group (SPAG).

Stakeholder Advisory Group

A Stakeholder Advisory Group (STAG) will bring critical sector and societal perspectives to the work of the NZAGRC. It will meet twice yearly to support the Governance Group and will comprise eight members, appointed by the Chair of the Governance Group, MPI and MBIE via a nominations process. Representatives will be drawn from sector organisations, FOMA, Iwi Chairs Forum, relevant NGOs, research organisations, farmers and public sector organisations, for example, regional councils. The Chair of the Governance Group, MPI and MBIE will appoint the Chair who will assist in setting up the Group. The Terms of Reference for the STAG will be developed by the STAG and agreed between the STAG and the Governance Group.

The Chair of the STAG will also be a member of the Governance Group. Two members of the STAG will also be nominated by the Group to sit on the SPAG.

Members will be appointed for an approximate 2.5-year term with the first term ending 31 December 2022. New members will be appointed to cover the period 1 January 2023 to 30 June 2025. Members are eligible for re-appointment but at least four new members must be appointed for the second term.

The STAG's key functions are to:

- Provide input into the research prioritisation process
- Assess the strengths and weaknesses of the NZAGRC programme in terms of industry and policy relevance
- Provide independent advice to the Governance Group on the progress of the science
- Assist with reviews of the NZAGRC science programme.

Science Review Panel

The Science Review Panel will provide independent advice to the Governance Group and MPI/MBIE. The Science Review Panel will not be a permanently constituted group but will be assembled to meet the needs of a particular review. Its make-up and Terms of Reference will be agreed by the Governance Group and MPI/MBIE. It is expected that the Science Review Panel will have strong international representation. A minimum of two science reviews will be conducted between 2019-2025. The timing of these will be agreed between MPI, MBIE and the Governance Group, but tentative dates are 2021 and 2023.

Suggestions for membership will be sought from NZAGRC members, the SPAG, the Maori Advisory Group and the STAG.

The Science Review Panel's key functions are to:

- Provide feedback to the Governance Group and NZAGRC Director on strengths and weaknesses in science quality, direction and achievement
- Provide guidance to the Governance Group, NZAGRC Director and Principal Investigators on areas of concern, and recommend steps to address those concerns
- Report confidentially to the Governance Group, AgResearch Board and Chief Executive and MPI/MBIE summarising review conclusions (positive and negative) and recommending any actions that those bodies should take as a result.

Science Programme Advisory Group

A Science Programme Advisory Group (SPAG) will work with the NZAGRC Director to co-develop the science programme with stakeholders and oversee its implementation and monitoring. This will ensure that the NZAGRC's research investments are outcome-focussed and high quality. The SPAG will meet quarterly with the NZAGRC Director. The SPAG will work with the Director to provide advice and funding recommendations on science spending to the Governance Group.

The SPAG will comprise four representatives appointed from the eight NZAGRC member organisations (excluding the PGgRc), the PGgRC Manager, two representatives from the STAG, and representatives from MPI and MBIE. The Chair of the Governance Group and MBIE and MPI will appoint the chair of the SPAG, noting that MPI and MBIE representatives will not be eligible. The Chair of the SPAG will be a member of the Governance Group. The SPAG will meet annually with the Governance Group to provide an independent update on how it is functioning and discuss any changes that could improve its performance.

The initial term for SPAG members will run until 31 December 2022. From 1 January 2023 to 30 June 2025, two new members will be appointed from within the STAG. The NZAGRC member organisations will decide amongst themselves who will serve as members of the SPAG; the four-member structure allows for all members to be represented on the SPAG at some stage between 2020 and 2025 if the member organisations wish for a strict rotational approach, but other approaches are equally acceptable. The PGgRc Manager, MPI and MBIE will have permanent membership of the SPAG to ensure strong alignment with the PGgRc research programme and broader MPI and MBIE programmes of work. Individuals nominated by the NZAGRC member organisations should hold positions of influence within their organisations, have strong science knowledge in an area of agricultural greenhouse gas mitigation/carbon sequestration and be capable of taking a strategic view of science investment.

The SPAG's key functions are to:

- Help develop the Science Plan and funding recommendations
- Monitor science progress by reviewing quarterly reports
- Work with the Director to assess each individual science project on an annual basis
- Help assess any new requests for science funding prior to them being submitted to the Governance Group for approval.

Terms of reference for the SPAG will be agreed between the SPAG and the Governance Group.

Māori Advisory Group

A Māori Advisory Group (name to be decided by members of the Group) will work in partnership with the SPAG to identify priorities for the dedicated Iwi/Māori workstream and ensure that the needs of Māori agri-businesses are being addressed by the NZAGRC. Having a dedicated Māori Advisory Group explicitly recognises the special kaitiaki role that Māori play in managing our natural resources, and our responsibilities pursuant to Te Tiriti o Waitangi/Treaty of Waitangi. This group will meet annually face to face and quarterly electronically to recommend specific pieces of work to the SPAG (for ultimate approval by the Governance Group), and to monitor progress of relevant contracted work. The chair of the Māori Advisory Group will sit as an observer on the Governance Group. The NZAGRC Director, the Chair of the Governance Group and MBIE/MPI will work with Iwi/Māori organisations (for example, FOMA) to establish the Group. It is enviSTAGed that it will comprise a Chair and four other members. Terms of reference for the Māori Advisory Group will be proposed by the Group to the Governance Group.

Principal Investigators and Programme Leaders

Not shown in Figure 2, the Director will also work with a small group of Principal Investigators and Programme Leaders to help develop, implement and monitor the NZAGRC 2019-2025 Science Plan. These are individuals who have excellent science credentials, accompanied by strong leadership, communication, strategic and inter-personal skills, and who have the trust of their peers in the wider science community.

NZAGRC STAFF

NZAGRC staff will be located at the purpose-built NZAGRC offices on the AgResearch Grasslands campus in Palmerston North.

All the NZAGRC staff positions listed below are employed by AgResearch on permanent contracts. Recruitment of positions below the Director are by open competition following designated AgResearch recruitment processes. The NZAGRC Director is responsible for making these appointments.

The Governance Group will work with the Director on succession planning (this is also a component of risk mitigation). A particular area of focus will be a replacement for the current Director who has signalled that he is likely to retire within the term of the current contract. Recruitment will be via an open competition process. The Governance Group Chair and the AgResearch Governance Group representative approve appointment of the Director.

Succession planning for senior staff has already been factored into the current staff complement. A new Deputy Director was appointed in September 2019. His position is supported from GRA funding, but he is being familiarised with all aspects of the Director's position. The Senior Science Adviser was appointed three years ago and after comprehensive immersion in both the NZAGRC and GRA workstreams is taking on additional responsibilities and providing cover for both the Director and Deputy Director.

The current NZAGRC Director, Dr Harry Clark, has held the position since January 2010. He reports to the NZAGRC Governance Group. The Director is 0.8 of a Full Time Equivalent (FTE).

Five additional staff are employed to support the Director in delivering the NZAGRC's programme (3.2 FTEs). As of February 2020, this consists of:

- Operations Manager (0.6 FTE): responsible for the day-to-day operations of the NZAGRC, including negotiating and monitoring contracts, developing policies and procedures, managing governance groups and committees, and liaising with research providers and individual scientists to ensure adequate completion of science goals and programmes.
- Project Analyst (0.6 FTE): ensures that contractual obligations for the NZAGRC research contracts are met, including collation of scheduled reporting for science objectives, NZAGRC's own reporting to MPI and analysis of completed contracts. Responsible for financial budget preparation and monitoring and invoicing.
- Administrator (0.8 FTE): provides support to the NZAGRC Director to fulfil his/her international and domestic travel/meeting commitments, and provides office and financial support, event and meeting coordination and responds to NZAGRC general enquiries.
- Communications & Extension Manager (0.6 FTE): responsible for maintenance and population of website, organising communications and publicity activities, liaison with external stakeholders to coordinate extension and tech transfer actions.
- Senior Science Adviser (0.6 FTE): works with the Director to help develop and monitor the NZAGRC science programme, contributes to policy initiatives (for example, IPCC), develops website content and communication material (for example, fact sheets and videos), contributes to extension activities and leads liaison with external visitors.

Note: The Operations Manager, Project Analyst, Administrator and Senior Science Adviser are full time roles, with the remainder of their time funded from projects commissioned by the MPI GRA work programme. In addition, the GRA budget supports the employment of a Deputy Director (International) and a Senior Science and Capability Coordinator. Both positions sit within the NZAGRC because of the NZAGRC's contracted role to lead the New Zealand science input into the GRA. Specialist support (for example, video production and conference organisation) is contracted as needed.

Monitoring Staff Performance

As noted above, all permanent staff are employed by AgResearch as legal host of the NZAGRC. The performance of all AgResearch staff is monitored and reviewed through a formal annual Performance and Planning process that includes setting, monitoring and reviewing a series of Key Performance Indicators (KPIs). All staff working primarily on NZAGRC activities report to the Director who is responsible for this Performance and Planning process. Assistance and monitoring are provided by AgResearch Human Resources.

The performance of the Director is monitored in two ways. There is the AgResearch Performance and Planning process where the Director agrees a series of quantifiable objectives and KPIs each year with the AgResearch Research Director. In addition, the Governance Group provides direct feedback on the Director's performance to AgResearch, via the AgResearch Governance Group representative.

SCIENCE AND OPERATIONAL QUALITY ASSURANCE

Achieving the goals outlined in the 2019-2025 Strategic Plan will require a focussed portfolio of science projects (see 2019-2025 Science Plan) that are contracted to achieve ambitious but attainable outcomes via clearly defined milestones, associated deliverables and KPIs. Robust monitoring is also needed to ensure that performance matches expectations and that early signals are obtained for the modification/cessation of contracted projects.

The NZAGRC contracting and quality assurance processes have been designed with these issues in mind. The need for funding stability and agility is met by the mix of short- and medium-term contracts, alongside a contracting and monitoring process that balances rigour with the need to avoid overly onerous reporting requirements.

Development of the science programme

The NZAGRC follows a co-development model where stakeholders and scientists work together to develop a prioritised programme of work that best need the goals of the Strategic Plan. For more on that process, see the 2019-2025 Science Plan.

Contracting, monitoring and reporting

In the first iteration of the NZAGRC, contracting templates were developed that will continue to be used for future contracts. These allow for science to be described and milestones and quantifiable deliverables documented in a user-friendly way, and in a format that captures information for reporting against the NZAGRC's own contracted KPIs[5]. The templates also require standardised documentation of background IP, which is then appended to each contract. Standard contracting Terms and Conditions were agreed by the existing NZAGRC members and will continue to be used with those organisations, as well as being offered in contracts with non-NZAGRC members. Payment is made quarterly, subject to milestones and deliverables being met.

The NZAGRC contracting template has been used in the past to contract NZAGRC/PgGRc jointly funded research and this will continue in 2019-2025.

Contracted science programmes will report quarterly, with a more detailed report submitted annually. All quarterly reports will be scrutinised internally by NZAGRC staff for progress against milestones and production of deliverables before being submitted for approval by the SPAG at their quarterly meetings. The NZAGRC will continue to use the MPI Grants Management System (GMS) for additional science and financial reporting. All quarterly and annual reports will be provided to the STAG for comment and feedback.

Publication targets will be set for all science programmes where there is freedom to operate. All outputs are internally peer reviewed and formally approved by NZAGRC/MPI/PGgRc via the Release of Information process (See Data Management section below).

[5] KPI's for the NZAGRC are agreed between the Director and MPI when developing the MPI-AgResearch funding contract. These will be revisited annually to ensure that they remain fit for purpose.

In addition to the written annual progress report, scientists from every contracted programme will meet with the Director (plus the PGgRc Manager if appropriate) and representatives from MPI and MBIE to discuss progress and any changes needed to future milestones and deliverables. Science Programme Leaders are also required to present their work in person to the SPAG at least once during the lifetime of their contract.

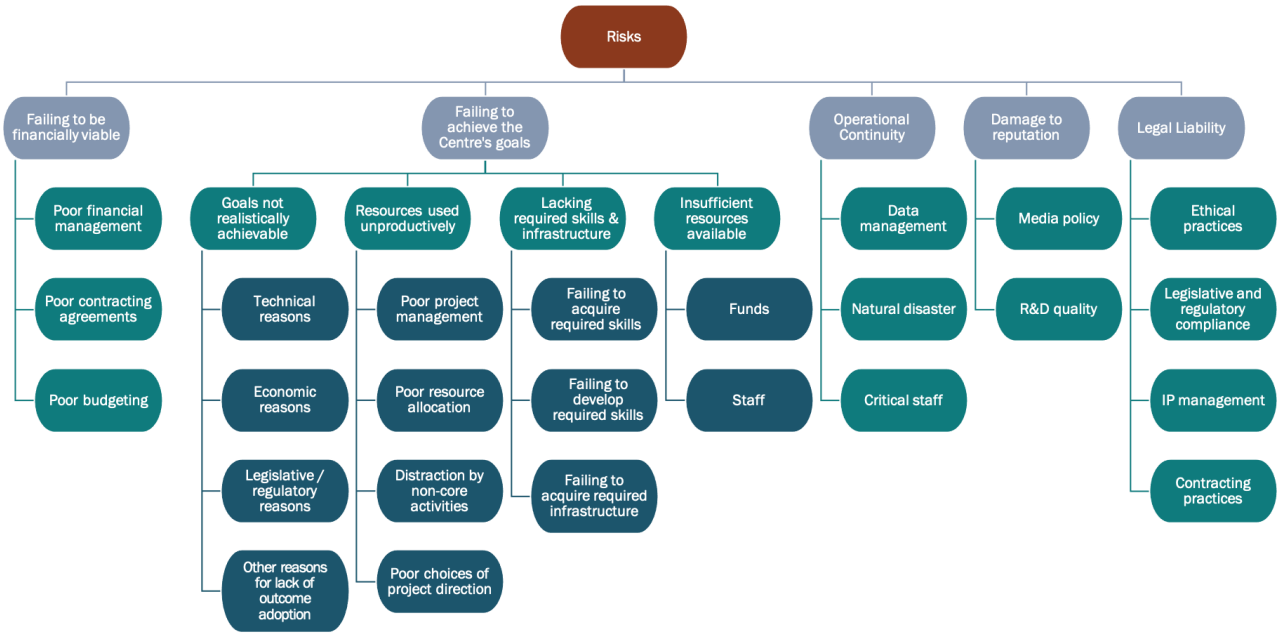
The Science Review Group will be the principal external vehicle for monitoring science quality of the NZAGRC programme. The timing of external reviews will be agreed by the Governance Group and MBIE/MPI along with the Terms of Reference. Membership of this group will be expertise-based. Collectively, these reviews allow for programme features to be refreshed in response to any scientific advances and/or changes in policy settings and farming practices. They also allow the scientists involved to suggest new directions to explore. See also page 8.

The NZAGRC will also write a formal Annual Report for MPI and MBIE. An annual 'Highlights' document will also be published each year, summarising science progress and other noteworthy developments. These reports, with any confidential information removed, will be uploaded to the NZAGRC website and distributed to key Ministers.

RISK MANAGEMENT

The NZAGRC will actively manage risk via the implementation of a risk management framework, including maintaining a risk register[6]. The main risks are identified in Figure 3.

Figure 3: NZAGRC risk tree



[6] The NZAGRC's current risk register can be made available on request

The likelihood of occurrence, impact and residual risk after mitigation for the risks in the register are assessed on a scale from 1-5. The likelihood scale is derived from the IPCC Guidance Notes on Addressing Uncertainties. The impact scale is specific to the NZAGRC.

Scale value	Probability of occurrence at least once during the remaining life of the NZAGRC	Impact
1	Exceptionally unlikely (<1%)	Slight (can be ignored if it occurs)
2	Very unlikely (<10%)	Small (can be dealt with at a cost <$5000)
3	Unlikely (<33%)	Moderate (can be dealt with at a cost <$50,000)
4	About as likely as not (between 33% and 66%)	High (can be dealt with at a cost <$500,000)
5	Likely (>66%)	Extreme (cost to address an occurrence of >$500,000)

The residual risk after mitigation is assessed as the residual expected value of the impact over the remaining life of the NZAGRC (initially assumed to be 10 years).

Once the Governance Group is formed, it will review the risk management framework and register and suggest any changes. The risk register will be re-visited and updated at each Governance Group meeting as necessary, including assessing the consequent risk of COVID-19.

In addition to its own risk management process, the NZAGRC is included in the broader AgResearch risk management process, which all staff must follow. This includes things like data management and security, provision and maintenance of an IT systems and pandemic response.

FINANCIAL PERFORMANCE

Day-to-day financial transactions are managed using the AgResearch financial management system (Navision). Financial information is also entered into MPI's contract management system (GMS). The Governance Group and MPI/MBIE will receive quarterly financial updates. NZAGRC finances will also be audited as part of the general AgResearch annual audit. The NZAGRC Director has financial delegations equivalent to an AgResearch Level 3 manager; for example, authority to sign revenue contracts up to a value of $500,000 and expenditure contracts up to a value of $50,000. Research funding is paid quarterly in arrears and no payments are made until all milestones due in that quarter have been achieved.

From 2009-2019, on average the NZAGRC spent 85% of its revenue on science research projects and research infrastructure. A further 2% was devoted to science reviews, the biennial conference

and workshops and communication activities. Administration costs were approximately 13% of total revenue[7]. Administration costs for GRA contracts averaged 6% of total research contracts managed ($17.6m 2013/14 to 2017/18)[8]. In the future, administrative costs will be approximately 12% of total revenue with research and extension (including communications) being 82% and 6% respectively.

The following table provides a high-level summary of the operating revenue and expenditure for 2019-2025. All figures are GST exclusive.

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Administration	$1.1m	$1.1m	$1.1m	$1.1m	$0.75m	$0.75m
Research	$5m	$8m	$8m	$8m	$3.8m	$3.8m
Outreach & Policy	$0.6m	$0.6m	$0.6m	$0.6m	$0.3m	$0.3m
Infrastructure	$3m	$0	$0	$0	$0	$0
Total	**$9.7m**	**$9.7m**	**$9.7m**	**$9.7m**	**$4.85m**	**$4.85m**

Detailed financial projections are provided in Appendix 2, along with a breakdown of the administrative costs.

Note that salary and costs for staff dedicated to domestic NZAGRC initiatives and NZAGRC buildings and equipment are itemised separately in the NZAGRC's budget, and the remainder are included as part of the AgResearch overhead charge. For the researchers working on NZAGRC projects, all costs are included within the project budgets. Because the NZAGRC is managed as a unit within AgResearch, it can utilise AgResearch's support structures and process, including:

- Facilities – administrative and research
- IT resources and knowledge management
- Human Resources
- Learning and development support for staff
- Financial management
- Legal services.

Regarding each of the science projects that the NZAGRC funds, the NZAGRC contracts for a specific piece of work to be delivered each year for a fixed amount of money. The contractor takes responsibility for building in any increases in costs by adjusting the amount of science they undertake. Pricing of all science contracts is undertaken by the providers using their standard commercial costing templates, which ensure costs are covered and margins achieved.

[7] The percentage split is approximately 50/20/30 between salary, operating and overhead costs respectively.
[8] This figure refers only to contract negotiation and contract monitoring and does not include involvement in science planning, running funding rounds etc.

Regarding infrastructure, the NZAGRC has budgeted specifically for this in the 2019/20 financial year, aiming to rapidly build the infrastructure base for greenhouse gas mitigation research in New Zealand. The main priority will be methane measurement equipment for cattle. Other projects will be considered depending upon the costs of the cattle facilities. In general, the organisation where the MPI-funded equipment is located and operated will own the equipment and will be responsible for its maintenance and upkeep. If the equipment is likely to be moved between locations and organisations, other arrangements will be negotiated. Co-funding will be sought from organisations receiving infrastructure support from the NZAGRC. No further funding has been committed to infrastructure post-30 June 2020. The cost of building and maintaining research facilities owned by providers is included in the full cost of each NZAGRC contract with that organisation.

Regarding the costs of the NZAGRC's governance structure, the following assumptions apply:

i. Members of the Governance Group who are members of the NZAGRC will meet their own costs. The Chair and the Independent Member will receive a daily stipend for each meeting attended.
ii. Corporate members of the Stakeholder and Māori Advisory Groups will meet all their own costs, but travel and a daily stipend will be paid for members not representing an organisation.
iii. Travel and associated accommodation and meal costs will be paid for members of the Science Review Group.

It is assumed that AgResearch will receive the funding for the NZAGRC from MPI quarterly in arrears. The NZAGRC will then negotiate delivery contracts with research groups from inside and outside the NZAGRC members. All financial transactions, financial information management and financial reporting are handled through the AgResearch accounting system by specialist AgResearch accounting staff. In addition, all contractual information is entered in the MPI GMS.

INTELLECTUAL PROPERTY MANAGEMENT AND COMMERCIALISATION

The NZAGRC does not own any Intellectual Property (IP) arising from the research that it funds. From 2009 to 2019, all IP was owned by MPI or jointly owned by MPI and any other parties providing co-funding and/or Background IP (BIP). The NZAGRC had a formal role in advising MPI on IP issues. A formal IP evaluation process was developed and agreed with MPI to assist the NZAGRC fulfil its role at the outset of the NZAGRC. (This process was externally reviewed in 2011 and modified in line with the review's recommendations (see Appendix 3)). All BIP is recorded at the time of contracting and all contracts report on new IP developed and any potential IP issues on a quarterly basis. This process of recording IP will continue from 2019-2025.

Separate contracts and procedures are in place to handle IP associated with co-funded PGgRc-NZAGRC projects and with projects where BIP held by either party is needed for individually or jointly funded programmes. These procedures involve a separate MPI:PGgRc IP Council and the NZAGRC is only involved upon request. All IP generated in the methane vaccine and methane inhibitor programmes is now controlled by the PGgRc under a time-limited deed of assignment. All commercialisation activities with respect to vaccine and inhibitor programmes is handled by the PGgRc.

The current situation with respect to IP ownership and management will be modified since MBIE and MPI take different approaches to the ownership and management of IP; MBIE pass on IP ownership to research providers rather than own it themselves.

The following principles with respect to IP ownership and management have been developed and agreed with MPI and MBIE. They will be discussed (and modified if necessary, with MPI/MBIE approval) with the Governance Group prior to being formally adopted.

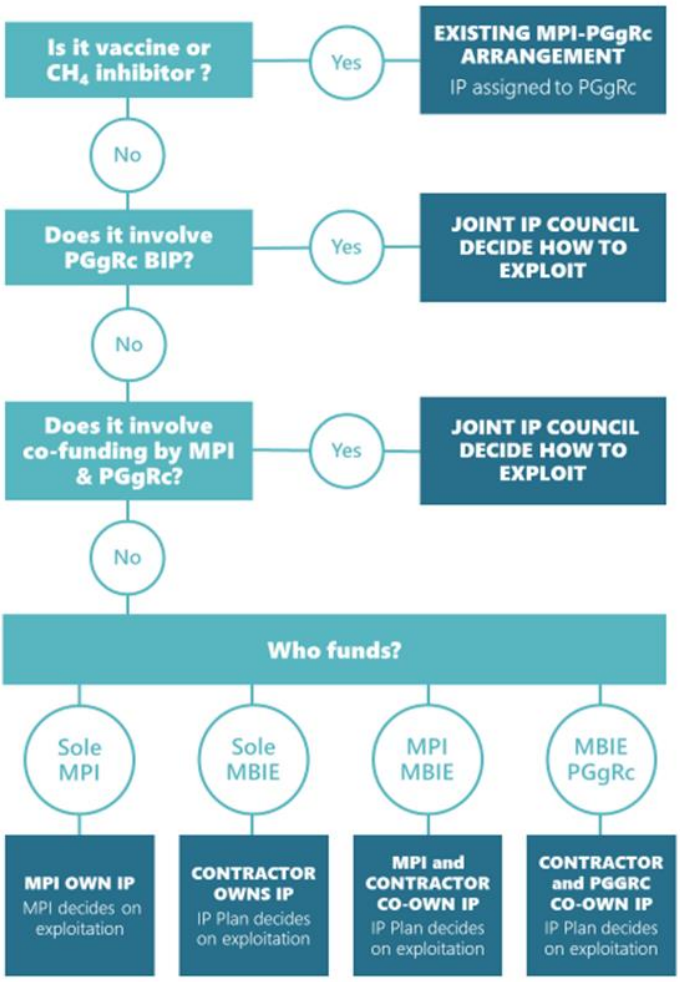
IP Ownership Principles

i. MPI owns IP when it is the sole funder
ii. Contractor owns IP when MBIE is the sole funder
iii. IP shared between contractor and MPI if co-funded by MPI and MBIE
iv. IP shared between contractor and PGgRc if co-funded by MBIE and PGgRc
v. IP shared between contractor, PGgRc and MPI if all three parties co-fund.
vi. If there are BIP owners or co-funding parties other than the PGgRc, the IP will be negotiated on a case-by-case basis at the time of contracting.

IP Management Principles

i. IP management plan required for all contracts
ii. Non-commercialisable IP will be placed into public domain as soon as possible
iii. MPI:PGgRc IP Council will decide how IP is exploited when there is PGgRc BIP and/or co-funding between MPI and PGgRc in the non-vaccine and methane inhibitor programmes.

IP Assessment Process



Commercialisation

As the NZAGRC does not own IP it cannot make decisions on its commercialisation. For MPI-owned IP these decisions can only be made by MPI. For MBIE-funded work, it will be up to the research organisations involved to manage the commercialisation process.

The PGgRc will lead the commercialisation process for activities in which it is involved. This includes methane vaccine and methane inhibitor development and the rollout of low methane-emitting sheep.

In cattle breeding, research is being conducted in partnership with commercial breeding companies who have well-developed commercial processes. In nitrous oxide inhibitor research, New Zealand companies are at the forefront of commercialisation nitrification inhibitors and urease inhibitors and they already partner with New Zealand research organisations.

When contracting all its programmes, the NZAGRC ensures that an IP management plan is in place, irrespective of who owns the IP. The over-riding principle will be that IP management and associated commercialisation should, as a primary consideration, strongly benefit New Zealand – including the primary sector.

RESEARCH INFORMATION AND DATA MANAGEMENT

Good research practice entails the retention of complete, accurate, retrievable research data and records for a period of at least seven years after the publication of results[9]. In accordance with this, the NZAGRC has worked with AgResearch to build a secure Data Repository which sits within the current AgResearch IT systems, is easy to use by its nine partner organisations, and is low cost to use, administer and maintain.

The Data Repository is located on an AgResearch server, uses SharePoint as the framework and allows for the:

- Retention of complete, accurate and retrievable data and records
- Re-use of data by third parties, maximising public value from research spending through the NZAGRC
- Re-analysis of primary data in the light of new evidence or hypotheses
- Verification of the research, such as might be required to refute allegations of falsification of data or for Government audit or international greenhouse gas inventory or national communication review
- Intellectual Property verification and exploitation.

All scientists undertaking work for the NZAGRC are contractually obliged to adhere to the NZAGRC Data Storage Policy. NZAGRC is responsible for all obligations regarding entering information into the MPI GMS.

STAKEHOLDER RELATIONSHIPS, KNOWLEDGE TRANSFER AND COMMUNICATION

Achieving effective mitigation outcomes from the NZAGRC and other Government/industry investments will involve:

- Excellent science-based solutions that deliver sound value propositions
- Efficient processes that link science-based results with end users
- End users who understand how mitigation can be achieved and include mitigation as a component of their business planning and actions.

The emphasis must be on:

- Win-win solutions, for example, those that maintain or increase profitability while reducing greenhouse gas emissions

[9] The exact duration is dependent upon the provisions of the Public Records Act (2005), contracts with R&D investors, Intellectual Property considerations, potential for third-party re-use and archival/historical value.

- Development of effective communication channels and approaches that can cater for the diversity of farm enterprises, geography, climate and markets of New Zealand products
- End users who see the relevance of greenhouse gas mitigation for future business success.

The NZAGRC recognises that it is not alone in seeking to support successful greenhouse gas mitigation at scale across the primary sector. For example, the PGgRc will continue to invest in methane mitigation research, industry organisations such as DairyNZ and Beef + Lamb NZ also invest in work that contributes to mitigation outcomes and the Government/industry/Māori 'He Waka Eke Noa' partnership has an innovation and extension workstream. Effective coordination and collaboration mechanisms will be needed with these other players, as will effective knowledge transfer processes to end users. Communication of both the underlying issues and of the progress of mitigation solutions will be a core component of the knowledge transfer process.

Stakeholder engagement

The NZAGRC's top-level engagement with stakeholders will take place through the Stakeholder Advisory Group (STAG) given it will include representatives of a wide range of end-user organisations across the primary sector. The STAG will have a key role in ensuring that the science conducted is highly solution-focussed and cognisant of the need for practical and cost-effective solutions. STAG involvement in the co-development of the NZAGRC science programme will also help to ensure that the organisations they are involved with are cognisant of the NZAGRC programme of work and can consider it when undertaking their own activities.

MPI and MBIE, as the NZAGRC's main funders, will be fully integrated into NZAGRC investment decision-making via their roles at the governance and operational levels (SPAG). This will help ensure that NZAGRC funding decisions and funding priorities in related areas controlled by MPI and MBIE (e.g. SLMACC and Endeavour Fund) are made in the full knowledge of what the other is funding. The NZAGRC will continue to engage in broader Government initiatives wherever the expertise of its staff can be of value. In the past this has included writing reports for MPI/MfE and the Biological Emissions Reference Group on the national mitigation potential of current and under-development technologies, contributing to the work of the Parliamentary Commissioner for the Environment and providing continuous input into the development of the New Zealand Agricultural Greenhouse Gas Inventory as well as regular contributions to the New Zealand National Communications to the UNFCCC and subsequent reviews. NZAGRC staff will continue to participate in Intergovernmental Panel on Climate Change assessment reports.

The NZAGRC will continue its deep engagement with industry and industry organisations. It will partner with industry in its research programme wherever opportunities arise (past collaborations have been with SMEs, fertiliser companies, dairy companies and levy-funded bodies). It will also engage at a variety of levels to inform and influence decisions by these organisations.

Communication material, tailored for industry organisations, will be produced as part of the general NZAGRC communications activities and in addition the NZAGRC will actively reach out to industry to engage on a one-to-one basis wherever possible. Past examples of this include presentations to the Fonterra Board, DairyNZ Board and the Meat Industry Association.

Engagement with the farming community will be via two principal routes:

- Engagement with farmer-funded organisations and those that have direct contact with farmers such as DairyNZ, Beef + Lamb NZ and Horticulture NZ, and members of the New Zealand Institute of Primary Industries Management
- Farmer-focussed actions delivered as part of the general NZAGRC Communications Strategy.

Joint activities already underway with DairyNZ and Beef + Lamb NZ include involvement in farmer field days, benchmarking farms for their greenhouse gas emissions and designing effective delivery mechanisms for greenhouse gas learning and information packages to farmers. Broader work with rural professionals has focussed on the development and delivery of greenhouse gas training courses. The audience for these has included farm consultants, bankers, fertiliser representatives, policy analysts and industry representatives.

Farmer interaction via general communication activities include the preparation of videos, fact sheets, research updates etc (See Communications section below).

The **PGgRc**, which is owned and managed by a cross sector of New Zealand agricultural organisations, and the NZAGRC will continue to coordinate their funding processes and decisions. The PGgRc will have a permanent position on the SPAG and it will also have an observer on the NZAGRC Governance Group. The NZAGRC Director will continue to sit as an observer on the PGgRc Board. Joint funding will continue in the areas of vaccine, animal breeding (cattle and sheep) and low greenhouse gas-emitting plants.

Other New Zealand funded initiatives also have relevance for achieving NZAGRC outcomes, most notably the National Science Challenges - Our Land and Water and The Deep South. The Director of the NZAGRC will meet 6-monthly with representatives of these two initiatives to ensure that synergies are exploited and duplication at the margins avoided.

He Waka Eke Noa, the joint action plan agreed by the Government, Iwi/Māori and industry to prepare the sector for emissions pricing, is in its establishment phase and details of how it will function are unclear at the time of writing. How its activities will intersect with and/or influence NZAGRC actions will evolve over time. However, the He Waka Eke Noa initiative is highly relevant to the NZAGRC and staff will actively engage at different levels. For example, subject to agreement by MPI/MBIE, a He Waka Eke Noa Steering Group representative could be invited to sit on the STAG. At an operational level, NZAGRC staff have already been involved in their initial workstream meetings and this engagement is expected to continue as working groups are established.

The **members of the NZAGRC** are a key internal stakeholder (see Figure 1) and they are an important vehicle by which greater coordination can be brought to the national research effort. All members of the NZAGRC have control over some discretionary funds (for example MBIE SIFF) and the NZAGRC can have some influence over how some of these funds are spent. The mechanism for this is that NZAGRC-appointed members of the SPAG will be individuals who have influence within their own organisations and these individuals will have a key role in helping internal funding decisions complement those made by the NZAGRC.

The **New Zealand public, NGOs and domestic and international media** are also stakeholder groups important to the NZAGRC. Interaction with these groups is via the targeted Communications Strategy outlined below.

Knowledge transfer and communication

A fund of $0.5 m per annum will be allocated to knowledge transfer and communication activities (collectively described as $0.6m Outreach and Policy Support within this document; $0.1m per annum being dedicated to policy support). Some of the NZAGRC's deliverables will take the form of knowledge that would help end-users reduce greenhouse gas emissions. The processes to transfer this knowledge will be custom designed to suit the specific needs of the knowledge package.

The NZAGRC's role in knowledge transfer will be supportive rather than leading as other organisations have the required networks, expertise and resources to undertake these activities. The NZAGRC support will take the form of co-funding industry initiatives and/or providing specialist knowledge that can be incorporated into these initiatives. A particular focus will be increasing the capability and capacity of rural professionals to engage with and influence their farmer clients in the greenhouse gas mitigation area.

The NZAGRC will continue to promote itself as a trusted and independent source of information and knowledge on agricultural greenhouse gas issues. It has already established its presence in the public, science and policy arena, helped to increase the reputation and influence of New Zealand in the agricultural greenhouse gas area and attracts international collaborators and potential employees. The NZAGRC has developed a strong brand identity of its own, while at the same time acknowledging that its members and research partners have had a major role in making the NZAGRC a success. The NZAGRC's internal brand identity means that researchers working in its funded programmes identify working both for the NZAGRC and their own employer.

The NZAGRC's communication activities are underpinned by a Communication Strategy which was developed in 2010 and subsequently updated in 2013 and 2018. The strategy covers:

- Release of research publications and information arising from NZAGRC funded programmes
- NZAGRC publications - newsletters, annual research report etc
- Media interaction - media briefings, regular communications in the farming press etc
- Publicity material.

The Communications Strategy and Associated Action Plan (CSAP) was developed in partnership with the PGgRc. This aims to increase the both organisations visibility and relevance, reflect the combined focus and accommodate the range of different audiences. The Strategy outlines:

i. Target audiences
ii. Main mesSTAGes
iii. Communication activities
iv. Measurement of communication effectiveness

An annual Communications Plan is drawn up to deliver to the Communications Strategy.

The Communications Strategy will be updated in 2021 and submitted to the Governance Group for approval.

A priority action for the immediate future will be to update the NZAGRC website. This was developed at the start of the NZAGRC and is now out of date with respect to both design and

utility. Insufficient resources have been allocated in the past to ensuring that it is up to date, easy to access and contains information in formats suitable for effectively communicating with a diverse audience. The underlying issue of resourcing will be addressed by having a fund dedicated to knowledge transfer and communication. New material will be provided in video, audio and written formats. Social media will be used to promote the website. A business case to support the investment in the updated website will be submitted to the Governance Group at its first meeting.

The NZAGRC will continue to produce material for publication in the popular press and actively engage with journalist via such outlets as the Science Media Centre and targeted press releases.

The regular New Zealand Agricultural Climate Change (NZACC) conference has been a major outlet for showcasing the NZAGRC/PGgRc science programme to policy and industry stakeholders. The COVID-19 pandemic is likely to constrain large public gatherings in the immediate future so alternative modes of delivery are being explored. This will involve shorter, targeted webinars using pre-recorded videos and custom software that allows for audience participation via moderated question and answer sessions. This will be trialled in 2020 by delivering the content of the postponed 2020 NZACC Conference via this method. If successful, this approach will become a standard method by which the NZAGRC communicates to its stakeholders.

APPENDIX ONE: NZAGRC MEMBERSHIP DETAILS

AgResearch: AgResearch is the host of the NZAGRC and is New Zealand's largest provider of pastoral agriculture research and development particularly in ruminant animal agriculture. AgResearch includes teams of scientists with skills relevant to the NZAGRC in rumen function, rumen microbiology, ruminant physiology, soil science, environmental science, agricultural systems management, forage plant growth and development, on-farm practice change, social science, technology uptake, genomics, proteomics and metabolomics of animals, plants and microorganisms. AgResearch scientists are taking leading roles within the NZAGRC in the area of methane emission mitigation and nitrous oxide emission mitigation and will contribute to research on increasing soil carbon sinks.

DairyNZ: DairyNZ coordinates on-farm dairy research and development in New Zealand. DairyNZ includes teams of scientists with skills relevant to the NZAGRC in dairy farming systems management, dairy cow feeding and growth, milk production performance, environmental science, on-farm practice change and technology uptake. DairyNZ scientists are taking leading roles within the NZAGRC in integrating research outcomes for the dairy industry, applying those outcomes in dairy farming systems and in stimulating practice change within the dairy industry.

Manaaki Whenua Landcare Research: Manaaki Whenua is New Zealand's leading provider of solutions and advice for sustainable development and the management of land-based natural resources. Manaaki Whenua includes teams of scientists with skills relevant to the NZAGRC in agricultural greenhouse gas emission measurement, carbon exchange and inventory development, soil science, lifecycle assessment and social science. Manaaki Whenua scientists are taking leading roles within the NZAGRC in emission measurement and soil carbon research and contribute to nitrous oxide research.

Massey University: Massey University combines leading capability in fundamental sciences with application to the agriculture sector and hosts the New Zealand Biochar Research. Massey includes teams of scientists with skills relevant to the NZAGRC in soil science, biochar production and integration into soil, and animal science. Massey scientists are taking leading roles within the NZAGRC in developing new capability and capacity in greenhouse gas mitigation research and in transferring management practices that reduce greenhouse gas emissions to the agricultural sector.

Lincoln University: Lincoln University is the university within New Zealand for which the land-based industries are most important and the home of world-leading expertise in nitrous oxide emission mitigation. Lincoln includes teams of scientists with skills relevant to the NZAGRC in nitrous oxide emission mitigation and measurement, agricultural economics, soil science, environmental science and agricultural systems management. Lincoln scientists are taking leading roles within the NZAGRC in nitrous oxide emission mitigation and in developing new capability and capacity in greenhouse gas mitigation research.

NIWA: NIWA's mission is to conduct leading environmental science to enable the sustainable management of natural resources for New Zealand and the planet. NIWA includes teams of scientists with skills relevant to the NZAGRC in atmospheric chemistry, climate change predictions, climate change impacts and adaptation. NIWA scientists are taking leading roles within the NZAGRC in assessing the effectiveness of mitigation outcomes on climate change impacts in New

Zealand and by linking the mitigation research conducted by the NZAGRC to climate change impact research conducted in New Zealand and overseas.

PGgRC: PGgRc is an industry-administered research consortium that aims to decrease total agricultural emissions of greenhouse gases through the identification, development and commercialisation of low greenhouse gas emitting practices and technologies. PGgRc has formed excellent links between the primary sector and greenhouse gas mitigation research. The PGgRc is a key conduit for industry guidance to ensure the applicability of the NZAGRC's research to the primary sector and will be an important pathway for commercialisation and practice change to apply the NZAGRC's research outcomes. In 2012 the NZAGRC and PGgRc proactively agreed to align their research efforts more formally. Contracting, strategy development and communications are now coordinated between the two organisations.

Plant and Food Research: Plant & Food provides research and development that adds value to fruit, vegetable, crop and food products. Plant & Food includes teams of scientists with skills relevant to the NZAGRC in soil science, environmental science, plant growth and development, genomics, proteomics and metabolomics of plants. Plant & Food scientists are contributing substantially to research on soil carbon and nitrous oxide mitigation research.

Scion: Scion is dedicated to building the international competitiveness of the New Zealand forest industry and building a stronger bio-based economy. Although the NZAGRC's scope does not include forestry, Scion includes scientists with skills relevant to the NZAGRC in the area of integrated farm systems and soil carbon. Scion scientists are leading the dedicated Māori research effort.

APPENDIX TWO: DETAILED BUDGET BREAKDOWN 2019-2025

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Salaries	$0.57m	$0.57m	$0.57m	$0.57m	$0.359 m	$0.35m
Operating	$0.17m	$0.17m	$0.17m	$0.17m	$0.15m	$0.15m
Overheads	$0.36m	$0.36m	$0.36m	$0.36m	$0.25m	$0.25m
Research	$5m	$8m	$8m	$8m	$3.8m	$3.8m
Extension & Policy Support	$0.6m	$0.6m	$0.6m	$0.6m	$0.3m	$0.3m
Infrastructure	$3m	$0	$0	$0	$0	$0
Total	**$9.7m**	**$9.7m**	**$9.7m**	**$9.7m**	**$4.85m**	**$4.85m**