



FOUNDATION FOR ARABLE RESEARCH



# **Greenhouse Gas Module**

# Farm Environment Plan Guide – Greenhouse Gas Module

Use this guide to assist you with filling in the Greenhouse Gas module of your Farm Environment Plan.

## Background

### What is a Farm Environment Plan?

A Farm Environment Plan is a plan to help farmers recognise and identify on-farm environmental risks and set out a programme to manage those risks.

Your plan should be specific to your farm and is developed by you or your farm consultant to reflect the environmental risks associated with your farm and farm business.

It is valuable to your business because it enables you to identify and manage your soil, water and nutrient resources, and reduce losses - which cost you money and may harm the environment.

A comprehensive Farm Environment Plan may consist of a number of management modules e.g. Freshwater, Greenhouse Gases, Biodiversity and Biosecurity.

### What is the Greenhouse Gas Module?

The Greenhouse Gas (GHG) module of your Farm Environment Plan includes an assessment of the risks and management practices that contribute to GHG emissions and carbon storage from the farm. The key aspects to consider are:

- Efficiency of crop (and pasture) production.
- Total feed eaten on farm.
- Matching feed demand with pasture growth and utilization.
- Management of livestock effluent.
- Reduced use of fossil fuels.
- Capturing and storing carbon in vegetation.
- Capturing and storing carbon in soils.

The development of the GHG module leads you through the process of:

1. Risk assessment - considering the management practices that contribute to or reduce GHG emissions from the farm.
2. Developing the action plan – ranking priorities, identifying cost and developing a time frame.
3. Collation of documents to support your plan and provide evidence that you are delivering on your planned objectives.

### Why do I need a Greenhouse Gas Module?

The Primary Sector Climate Action Partnership – He Waka Eke Noa (HWEN), has been established to work together with farmers and growers on practical solutions to reduce New Zealand's emissions and build resilience to climate change. It also links to the Climate Change Response (Zero Carbon) Act which sets out New Zealand's path to a low emission, climate resilient future.

Supporting farmers and growers to know their greenhouse gas emission numbers and develop a written plan to measure and manage their emissions is a key part to the success of He Waka Eke Noa.

## When do I use this template?

Use this template if your farm is mainly an arable cropping enterprise. This template enables you to assess the GHG emission risk of all the activities that are occurring on the farm, including crop harvesting, vegetable, grain and seed production, stock finishing and dairy grazing.

### But...

If your farm is primarily a pastoral enterprise; either sheep/beef, deer or dairy, use the GHG template developed for that pastoral system. Ensure that any cropping component of your farm can be included in the pastoral based template.

### And...

If you are a member of an industry assurance or irrigation scheme, use the template they have developed if available.

## How do I develop the GHG Module?

The Greenhouse Gas module is one of a number of modules which FAR have developed, or are developing, to form part of a wider Farm Environment Plan for your property.

The Greenhouse Gas module has three key sections:

1. Property details, farm maps and the GHG emission numbers.

### Farm Map

Include at least one farm map outlining the farm area covered by this Greenhouse Gas module. This may be similar to maps you already have for other Farm Environment Plan modules.

You may have an existing farm map or you can make a new one with Google Earth or a similar tool e.g. ProductionWise. Copy it several times, so that you can add specific information relating to different parts of your plan.

ProductionWise® is freely available to all FAR levy payers. [www.productionwise.co.nz](http://www.productionwise.co.nz)

### Greenhouse Gas emission numbers

To complete this section, you will need to have a documented annual total of on-farm greenhouse gas emissions, as calculated by a tool assessed as meeting the minimum reporting requirements (e.g. for arable that currently includes ProductionWise, E-Check, OverseerFM, MfE calculator, Toitu Farm emanage). Record the greenhouse gas emission numbers for your farm as well as the calculator (and version) used in the table provided.

Include a copy of the output from whichever greenhouse gas calculator or greenhouse gas report you have used as supporting evidence.

2. Farm management for reduction in on-farm greenhouse gas emissions.
  - Efficiency of crop (and pasture) production.
  - Total feed eaten on farm.
  - Matching feed demand with pasture growth and utilisation.
  - Management of livestock effluent.
  - Reduced use of fossil fuels.
3. Farm management for carbon capture.
  - Capturing and storing carbon in vegetation.
  - Capturing and storing carbon in soils.

Consider the relevance of the management practices outlined in each of these sections. Some of these may not be appropriate for your farm, but they should be helpful as you assess key on-farm risks.

Record any identified risks at the start of that management section and, from there, consider appropriate actions and how you might be able to demonstrate evidence for the completion of these actions.

Detailed information about the management of GHG emissions on your farm is in the HWEN Greenhouse Gases: Farm Planning Guidance booklet

<https://hewakaekenoa.nz/wp-content/uploads/2020/12/2020-He-Waka-Eke-Noa-Greenhouse-gases-Farm-Planning-Guidance.pdf>

Please refer to this information when developing your farm management plan.

## Completing your plan and providing supporting evidence for your activities

Your completed plan will consist of completed sections that are relevant to your farm. The information covered in some of these sections will not change very often but you should revisit the plan, at least annually, to review and revise your objectives.

You should provide supporting evidence that your plan and management practices are effective.

A good way to provide this evidence is to have photographs of the changes made or actions taken (e.g. riparian planting, vegetation/forest establishment) and records of changes in farm management (e.g., changes in animal numbers, fertilisers used, crops grown). Further evidence would be having emissions numbers calculated for different points in time, establishing a time series of calculations.

Other documentation to collate will be similar to other Farm Environment Plan modules and might include:

- Fertiliser recommendations, purchases and application records.
- Audit and maintenance records for your irrigators.
- Irrigation application dates and rates.
- Crop records: Plant and harvest dates, yields and residue management.
- Stock records: Purchase and sale dates. Breeding records.

The Greenhouse Gas module is designed to be filled in electronically. However, if you are not comfortable doing this, you may print-off the information sheets and fill them in by hand.

Whichever way you choose, it is a good idea to file all your plan documents in the one place. A ring-binder folder with partitions for each plan section is a good idea.

## Other Information and Resources

A number of resources and useful supporting information are available. Some potentially useful resources are highlighted below:

- Greenhouse Gases: Farm Planning Guidance  
<https://hewakaekenoa.nz/wp-content/uploads/2021/03/GHG-Farm-Planning-Guidance-March.pdf>
- Reducing Nitrous Oxide Emissions from Arable Farm  
[https://www.far.org.nz/assets/files/uploads/X94\\_Nitrous\\_Oxide.pdf](https://www.far.org.nz/assets/files/uploads/X94_Nitrous_Oxide.pdf)
- Climate change: The Science (NIWA)  
<https://niwa.co.nz/education-and-training/schools/students/climate-change/climate-change-the-science>
- AgMatters  
<https://www.agmatters.nz/>
- Pastoral Greenhouse Gas Research consortium (PGGRC) fact sheets  
<https://www.pggrc.co.nz/>
- He Waka Eke Noa  
<https://hewakaekenoa.nz/our-work/>