FACTSHEET

Estimating your emissions costs

August 2022

While the Government has yet to make a decision on an agricultural emissions system and pricing, our farmers want guidance on what to expect, particularly in relation to potential costs.

Based on existing information and tools, this factsheet provides step-by-step guidance on how to use the estimated numbers within the B+LNZ GHG Calculator (and other tools) to help farmers get an idea of potential on-farm emissions costs.

Note: In the recommended system, you will also be able to get recognition for your on-farm sequestration and incentive payments for using technologies that reduce emissions. This factsheet concentrates on greenhouse gas (GHG) emissions costs only.

How cost is calculated in the He Waka Eke Noa recommended system – this factsheet relates to A + B:

A	+	B	−	I	−	C	=	$
The cost that each farm faces for their short-lived gas emissions (CH_4)		The cost that each farm faces for their long-lived gas emissions (N_2O and CO_2)		The incentive discount for approved actions that reduce emissions		The value that each farm is rewarded for their on-farm sequestration		The total net cost where A, B, I and C are all netted off as dollar values (not as gases through a carbon equivalency metric)
The weight of CH_4 gas emissions (kg) multiplied by the price for CH_4 ($/kg CH_4)		The weight of long-lived gas emissions (kg CO_2e) multiplied by the price for long-lived gas emissions ($/kg CO_2e)		Approved actions (practices or technologies) that have clear and credible emissions reductions The incentive value of each action reflects the implementation cost and emissions reduction		The area and category of eligible vegetation multiplied by the relevant sequestration rate/s in weight of long-lived gases (kg CO_2e) multiplied by the price for sequestration ($/kg CO_2e)		

Look for A as well as B1 and B2 in this factsheet

The first part of this factsheet uses the B+LNZ GHG Calculator - for information on the calculator go to www.beeflambnz.com/ghg-calculator-info

To see how to access the relevant information through Overseer and Farmax, see pages 3 and 4.

Not all calculations are equal

Depending on the tool used to estimate a farm's GHG numbers, farmers could get different estimates. This is mainly because **different tools require different kinds of inputs**. Some of the input requirements can be more detailed than others. On top of this, different tools will provide an estimate of their conclusions in different ways.

Many existing tools convert methane into a carbon dioxide equivalent (CO_2-e) using GWP100^, which multiplies the weight of methane by 25 to 28 times. **If farmers multiply their results in CO_2-e by potential methane prices it will significantly overestimate the costs**.

It's therefore really important to consider what metric the tool uses, as well as what weight the results are provided in.

The B+LNZ GHG Calculator follows a split gas approach – the 'Results' page shows the weight of individual gases as well as a conversion into CO_2-e.

In He Waka Eke Noa a split gas approach is also used, where methane has its own price that's not linked to the carbon price, and the weight is not converted to a carbon equivalent.

Pricing used in He Waka Eke Noa modelling

The information in this factsheet is based on the modelled pricing in the June 2022 He Waka Eke Noa^^ recommendations to Government. Note **these may not be what the actual prices end up being** - these prices were primarily used for modelling purposes. Prices will be determined at a later date and the He Waka Eke Noa partners – including B+LNZ – have recommended that:

- prices be kept as low as possible to achieve the desired outcomes, and that
- prices should be no higher than if agriculture had gone into the ETS.

GHG	Pricing used in modelling	Notes
Methane (CH_4)	Maximum of 11c per kg of CH_4	Starting in 2025 and held at this price for three years
Nitrous oxide (N_2O)	$4.25/t of CO_2-e	Starting in 2025
Carbon dioxide (CO_2)	$4.25/t of CO_2-e	Starting in 2025

^ GWP100 = Global Warming Potentials over 100 years. This metric converts gases to a common assessment and is widely used. While B+LNZ's GHG Calculator shows some results in CO_2-e to enable farmers to join those wider conversations. ***B+LNZ does not endorse the use of the GWP100 metric for short-lived gases*** *such as methane – this is why the weights of various gases are also shown on the calculator's results page with no metrics or conversion. ^^ He Waka Eke Noa = Primary Sector Climate Action Partnership made up of 13 organisations, working together to implement a framework by 2025 to measure, manage and reduce agricultural greenhouse gas emissions.*

Emissions example using B+LNZ GHG Calculator

This screenshot will be familiar to those who have used the B+LNZ GHG Calculator to estimate their GHG emissions. It shows the 'Results' page for a hypothetical 350ha Finishing-Breeding farm in the Waikato running approximately 4,800 stock units.

Farm emissions			Kilograms of greenhouse gases		
Source		Kilograms of Carbon dioxide equivalents CO_2-e*	Carbon dioxide CO_2	Methane CH_4	Nitrous oxide N_2O
Livestock emissions	Dairy cattle (incl. grazing dairy)	0		0	0
	Beef cattle	435,695		13,492	330
	Sheep	805,699		27,593	389
	Deer	0		0	0
Fertiliser and lime use	Non-urea nitrogen fertiliser	0			0
	Urea without urease inhibitor	0	0		0
	Urea with urease inhibitor	42,870	14,061		97
	Limestone	19,800	19,800		
	Dolomite	0	0		
	Total kg	**1,304,064**	**33,861**	**A 41,085**	**816**
	Kg / total ha	**3,726**	**97**	**117**	**2**
	Production region & Farm class average emissions (kg / total ha)	**3,871**	**181**	**122**	**2**

Tonnes of carbon dioxide equivalents CO_2-e		Tonnes of greenhouse gases		
Carbon dioxide CO_2	B1 34	Carbon dioxide CO_2	Methane CH_4	Nitrous oxide N_2O
Methane CH_4 (tonnes CH_4 x 25)	1,027	34	41	1
Nitrous oxide N_2O (tonnes N_2O x 298)	B2 243			
Tonnes (X)	**1,304**			
Tonnes / total ha	**3.73**			

Estimating emissions cost per year

For each GHG, multiply the weight of the gas by the modelled price to get an indicative cost for emissions (note that methane is per kg while nitrous oxide and carbon dioxide are per tonne of carbon dioxide equivalent).

GHG		Weight	Modelled pricing	Indicative cost (emissions only)
Methane (CH_4)	A	41,085kg	11c/kg CH_4	$4,519
Nitrous oxide (N_2O)	B2	243t CO_2-e	$4.25/t CO_2-e	$1,033
Carbon dioxide (CO_2)	B1	34t	$4.25/t CO_2	$145
			TOTAL COSTS	**$5,697**

Note: The calculation above is for emissions costs only. Under the He Waka Eke Noa recommendations, farmers will be able to reduce what they pay by getting credit for a wide range of sequestration and a discount for using technologies or practices that reduce their emissions.

Understanding your GHG position

This information has been provided to help farmers better understand how emissions pricing may translate to on-farm costs, using available tools and modelled pricing to date. Because the Government has not made any decisions on the final system, tools or pricing, **all information is indicative only**.

B+LNZ has key resources to guide you through understanding your operation's GHG position.

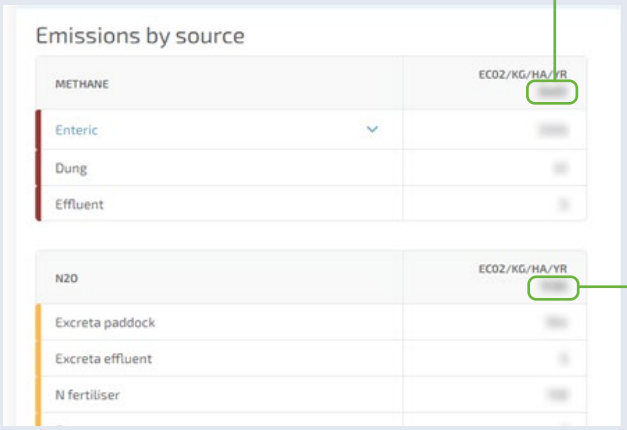
1. **Factsheet: GHG calculator** www.beeflambnz.com/knowledge-hub/PDF/blnz-ghg-calculator.pdf
2. **User Guide: GHG calculator: Know your numbers** www.beeflambnz.com/knowledge-hub/PDF/-ghg-calculator-user-guide.pdf
3. **Factsheet: Estimating your emissions costs – this factsheet**
4. **Factsheet: Greenhouse gas management and mitigation for sheep and beef farmers** www.beeflambnz.com/knowledge-hub/PDF/greenhouse-gas-management-and-mitigation-sheep-and-beef-farmers.pdf
5. **Your action plan to lower your number** www.beeflambnz.com/knowledge-hub/PDF/FS293-ghg-action-plan-example.pdf

If you work your way through these resources – in this order – you will be well placed to understand your operation's GHG numbers, potential emissions costs, and how you can start developing an action plan to lower those costs.

Example using Overseer

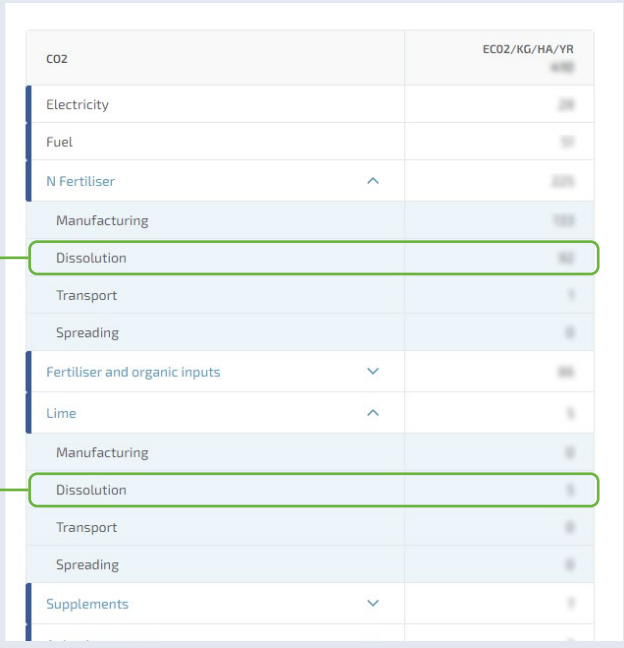
Methane A

1. Take this number which is methane emissions per hectare in kg CO_2-e and divide it by 25 to convert from CO_2-e to kg of methane.
2. Multiply that number by $0.11 to get your methane cost per hectare.
3. Then multiply by your farm area to get your total methane cost.



Nitrous oxide and carbon dioxide B2 B1

4. Take the N_2O value and add the values for dissolution for N fertiliser and Lime.

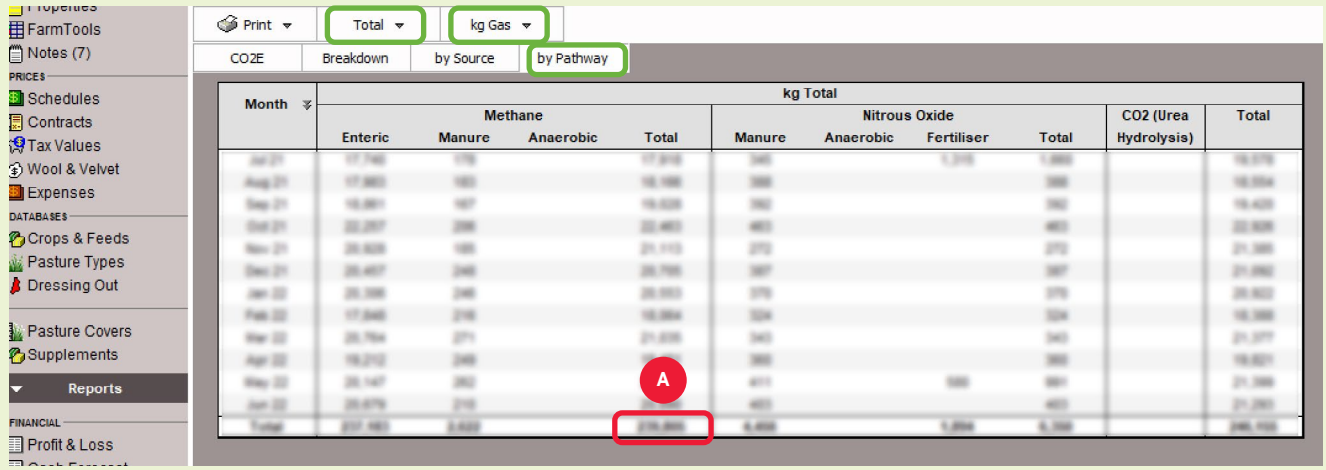


5. Divide the resulting value by 1000 to convert the kilograms to tonnes and multiply that value by the price for long-lived gases, in this scenario that is $4.25/t. This will give you your long-lived gas cost per hectare.
6. Then multiply by your farm area to get your total long-lived gas cost.
7. Take total methane cost (step 3) and add long-lived gas cost (step 6) to get total cost.

Example using FARMAX

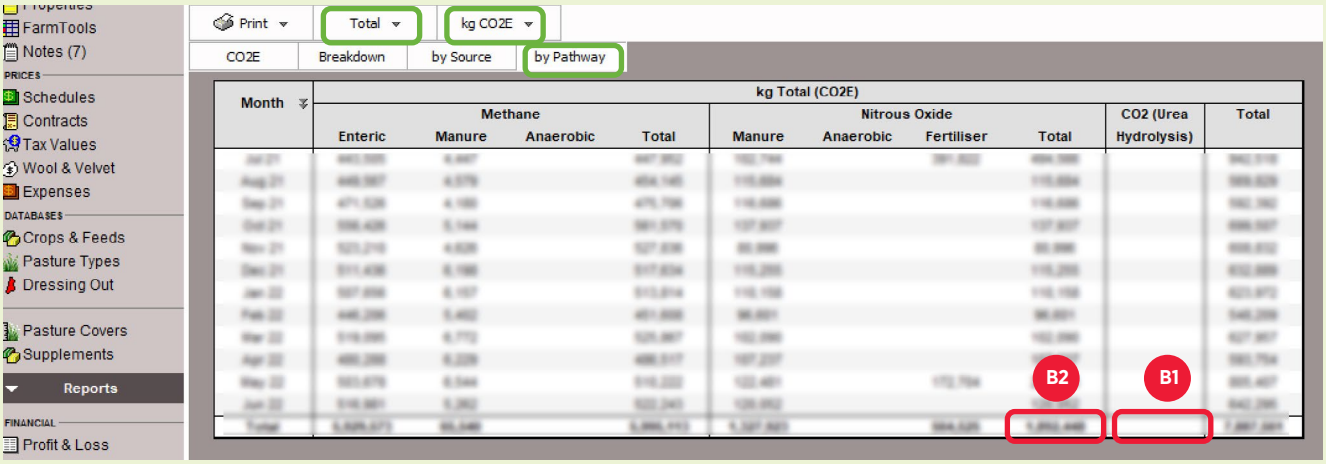
Methane A

1. From the Greenhouse Gas report select **'by Pathway'** then to display as **'Total'** and in **'kg Gas'** from the respective drop down menus. This will then give you your total kg of methane (circled) which you multiply by $0.11 to get your cost.



Nitrous oxide and carbon dioxide B2 B1

2. From the Greenhouse Gas report select **'by Pathway'** then to display as **'Total'** and in **'kg CO2E'** from the respective drop down menus. This will give you your kg nitrous oxide and carbon dioxide which you divide by 1000 to convert to tonnes of CO_2-e. This is then multiplied by $4.25 to get an indicative long-lived gas cost.



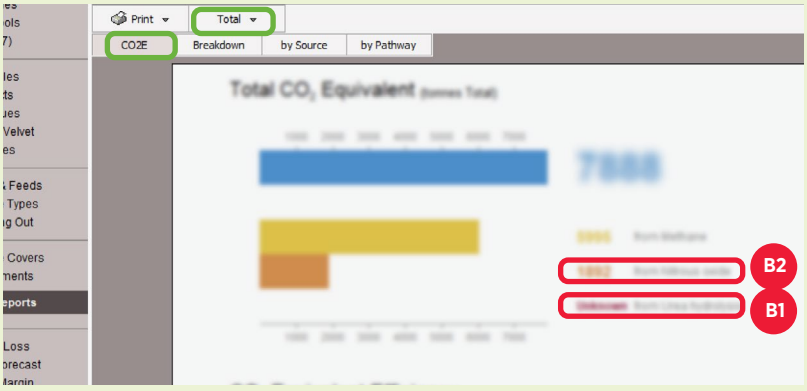
Or

From the Greenhouse Gas report select **'CO2E'** and to display as **'Total'**.

This will then give you your total nitrous oxide and carbon dioxide emissions in tonnes of CO_2-e.

3. This is then multiplied by $4.25 to provide an indicative long-lived gas cost.

4. Take your methane cost and add your long-lived gas cost to get your total cost.



Note: The examples using Overseer and FARMAX cover emissions costs only. Under the He Waka Eke Noa recommendations, farmers will be able to reduce what they pay by getting credit for a wide range of sequestration and credits for using technologies or practices that reduce their emissions.
