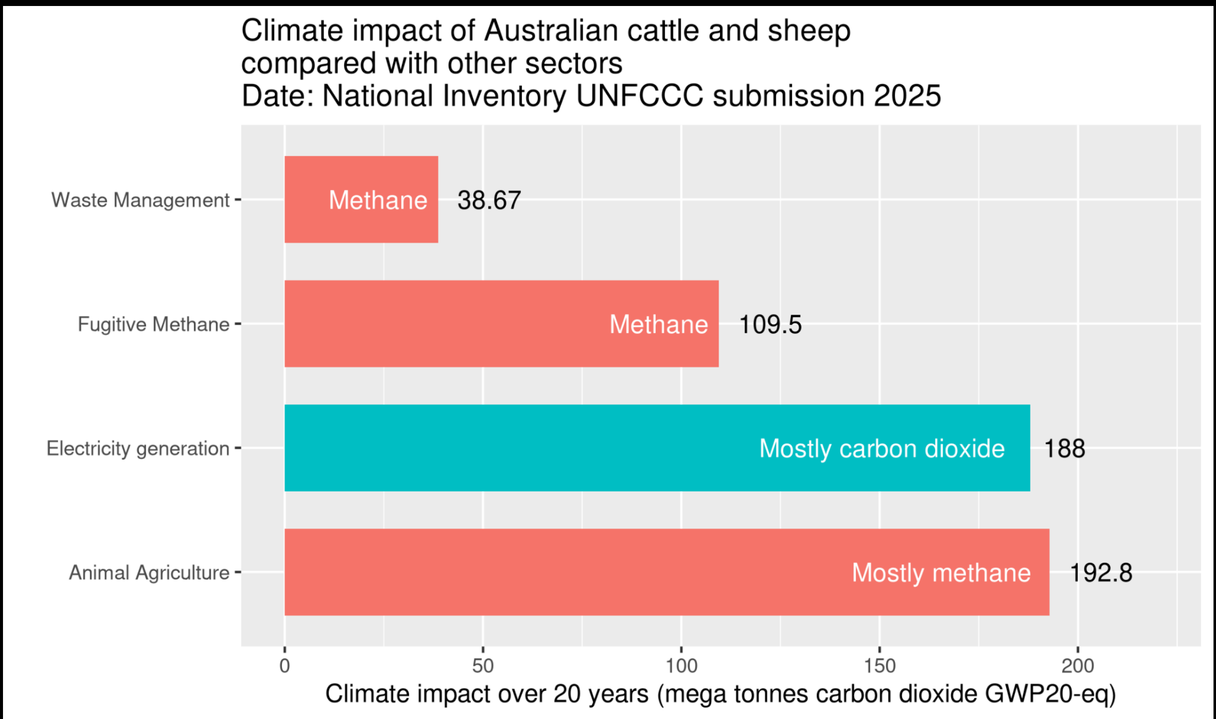
Animal Justice Party

Greenwashing

Submission to the Senate Standing Committee on Environment and Communications



September 2025

About the Animal Justice Party

The Animal Justice Party (AJP) is a political party established in 2009 to secure the interests of animals and nature through Australia's democratic institutions of government.

Our vision is a planet on which animals and nature have the right to live and thrive free from negative human interference, and a human society which functions with kindness and compassion within its ecological limits as a responsible member of the Earth community. The AJP seeks to foster respect, kindness, and compassion towards all species particularly in the way governments design and deliver initiatives, and the manner in which these initiatives function.

In New South Wales, the AJP has one elected representative in the Legislative Council of NSW, Emma Hurst MLC. In Victoria, the AJP has an elected representative in the Legislative Council, Georgie Purcell MLC, and one councillor in Local Government, Julie Sloan. In Western Australia, Amanda Dorn represents the AJP in the Legislative Council.

This submission was prepared by the South Australian Submissions Working Group within the AJP. The Working Group makes this submission on behalf of the AJP, with the approval and the endorsement of the Board of Directors.

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Introduction

This submission will address various Terms of Reference of the Inquiry, in particular:

> *a) the environmental and sustainability claims made by companies in industries including energy, vehicles, household products and appliances, food and drink packaging, cosmetics, clothing and footwear;*
> *d) advertising standards in relation to environmental and sustainability claims;*
> *e) legislative options to protect consumers from greenwashing in Australia; and*
> *f) any other related matters.*

AJP has already made two submissions to this inquiry. These 2023 submissions concerned

1. carbon farming and offsetting, and
2. 1080 poisoning.

The carbon farming and offsetting submission had a short section on greenwashing related to the use of seaweed feed additives for methane reduction in cattle. This third submission presents the latest research on this topic and considers the issue in far greater detail.

Greenwashing, as related to claims about feed additives and methane in cattle, isn't restricted to businesses with a financial interest. Government policy and press releases are also guilty; as are the Greens. We will establish that claims about the efficacy of feed additives are typically false and always grossly misleading. Belief in these claims delays the required deep cuts in the national herd size to meet our national obligations under the *Global Methane Pledge* (GMP) (signed by the Government in 2023).

Australia's attitude to climate action is driven more by wishful thinking and factional and political tribalism than by evidence. Greenwashing isn't just a corporate failing but a national addiction.

Political background

In late August, the Albanese Government was told that its renewable roll-out was seven years behind schedule; after just three years in power.

"*On Wednesday, Labor policy adviser Frank Jotzo said any 2035 target north of 60 per cent would require a significant rise in emissions reductions in the transport, industrial and agricultural sectors – assuming the government's clean energy rollout remained on track.*"
"*... according to new forecasts by Rystad – a global energy consultancy that provides research on fossil fuels and renewables – the clean energy share of Australia's grid is likely to be only about 60 per cent by 2030, and will not reach Labor's 82 per cent target until 2037.*"

In order to hit its targets, using its current *modus operandi*, the Government needs private companies to build renewable plants at a rate more than double what has been achieved previously. For example, it needs 5 gigawatts of wind built each year, but has rarely achieved 2 gigawatts.

This report comes on top of a Bloomberg analysis which predicts (based on the state of project pipelines) that the utility solar farm roll-out has peaked, when it needs to accelerate.

In short, there is a growing gap between glowing predictions and actual achievements. The definition of greenwashing is about making false and misleading claims about the environmental achievements of your company and its goods and services. The Federal election earlier in the year was a good example of greenwashing.

Under the Terms of Reference, greenwashing by political parties has to be relegated to item f); despite it being a frequent behaviour of most of our political parties.

Greenwashing by industry follows the Government's lead

For $100 per kilogram, you can buy Wagyu beef from Windsor Meats in South Australia. The website assures you:

> *This Wagyu has been raised on a diet supplemented with CH_4 Global's "Methane Tamer™", a natural seaweed-based feed additive proven to reduce methane emissions from cattle by up to 90% – all without compromising on taste or quality. It's beef that's better for the planet*

This website, to be clear, is making claims about meat from one supplier. But Australian Government press releases are happy to claim that seaweed may solve not just Australia's methane problems, but those of the entire planet. And those words "up to"? Imagine an investment advisor running with claims to get you "up to 90%" annual growth? How does Windsor Meats get away with it? Perhaps because the Government is even worse.

For example, in this 2021 press release (updated in 2022), a caption on the only picture in the release was pretty clear.

Australian scientists have found that a native Australian seaweed could provide a global solution to methane emissions from livestock. Image credit: CSIRO

Figure 1. Will this magic feed additive save the planet?

The release also claims: "*The potential climate impacts from this product are unprecedented. If just 10% of global livestock producers adopted FutureFeed as a feed ingredient, it would be like taking 100 million cars off the world's roads.*"

It’s easy to make grand claims about the future. People have to wait years or decades to check them. And the format of this particular claim has a very long history. People used to sell business opportunities in China the same way. “*If just 1% of Chinese buy our product, we’ll make a fortune!*”; they probably still do. The claim presumes that 10% is a small number, and those without knowledge of the industry will assume that this level of uptake is easy.

Here’s data from our *National Greenhouse Gas Inventory* (NGGI). We’ll use the NGGI extensively during this document in order to show exactly where our numbers come from so that readers understand that they aren’t based on any kind of biased study or heroic assumptions; they are all just consensus science from official sources.

TABLE 3.A SECTORAL BACKGROUND DATA FOR AGRICULTURE — 2023
Enteric Fermentation — AUS-CRT-2025-V1.0
(Sheet 1 of 1) — Australia
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GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTORS	EMISSIONS
	Population size (1) (1000s)	Average gross energy intake (GE) (MJ/head/day)	Average CH_4 conversion rate (Y_m) (2) (%)	CH_4 (kg CH_4/head/yr)	CH_4 (kt)
3.A.1. Cattle	29,941.50			53.07	1,588.86
Option B (country-specific): (3)					
3.A.1.a. Other	29,941.50			53.07	1,588.86
3.A.1.a.iv. Other *(please specify)*	29,941.50			53.07	1,588.86
Dairy Cattle	2,119.99	232.85	6.14	94.51	200.35
Beef Cattle - Pasture	26,658.55	123.73	6.21	50.81	1,354.43
Beef Cattle - Feedlot	1,162.96	185.72	2.39	29.31	34.08

Figure 2. Feedlot methane is a tiny component of all methane

Look at the emissions from cattle in feedlots; it’s 34 of 1,588 kilo tonnes of methane; about 2%, assuming we could eliminate it all. What about the dairy cattle? There has been plenty of speculation about seaweed as the answer to dairy methane. This 2023 ABC story featured a *Commonwealth Scientific and Industrial Research Organisation* (CSIRO) researcher with a financial interest in the industry, Dr Rob Kinley, saying how recent results were a “game changer” for the industry. The article referred to a paper published in March in the Journal of Animal Feed Science and Technology; except that it hadn’t been published.

It was published in March 2024, well after the article was published. The trials it described achieved a 20% reduction in methane; hardly a game changer. A recent 2025 study in dairy cattle found even less; a 9% reduction in emissions. So we can add very little of the 200 kt of dairy production emissions into any list of potential reductions. Kinley’s suggestion of seaweed “slashing” dairy emissions is clearly greenwashing.

What about the rest of Australia's cattle, those not amenable to controlled feeding; including virtually all of its sheep?

Is it feasible to deliver seaweed to the 71 million hectares of managed pastures in Australia?

A CSIRO researcher doesn’t think so. In a 2022 study, which included the financially conflicted Kinley as an author, concluded that the best the industry could achieve, under 7 scenarios they considered, was a 1-4% reduction in methane emissions by 2030. We’d suggest that this is pretty optimistic.

In a 2024 *Meat and Livestock Australia* (MLA) study (not yet peer reviewed), on “lick blocks”, intended for extensive grazing systems. In-vitro tests showed a 90% reduction in methane; while subsequent in-vivo tests achieved just 10.7%. Again, this is not slashing emissions.

The *raison d'être* of *in-vitro* (non-animal) testing is to reduce the use of, and harm to, animals, while also reducing costs and complexity. But if your in-vitro results are radically different from your results using real animals, then your in-vitro system isn't ready for production use.

If, after half a century of work, MLA doesn't yet have a good in-vitro assay, then the complexity of the rumen has been seriously underestimated. There are other projects into methane reduction using specially engineered pasture. The best way to do such research is with good in-vitro tests that you can automate to enable the testing of thousands of candidate plant varieties. Given the primitive state of in-vitro testing after decades of effort, spruiking the likelihood of breakthroughs within the window of time we have to reduce emissions is simply greenwashing.

Greens join the greenwashing rinse cycle

The rose-coloured glasses approach to seaweed's potential is widespread. It is shared not just by the various purveyors of ruminant meat, but also most of Australia's political parties; except perhaps the Nationals.

When in 2021, the then Minister, Angus Taylor told *The Australian* that "no affordable, practical and large-scale way exists to reduce [methane from agriculture] other than by culling herd sizes", *The Greens* put out a press release titled "KELP CAN HELP" saying:

> *"This is simply negative politics and scaremongering. Exciting opportunities exist to tackle this problem, creating new industries and jobs. We just need to get on with it."*

The press release went on to approvingly cite claims by MLA and urge that the Minister fund companies like the Tasmanian company Sea Forest.

The ALP, like the Greens, is spruiking for kelp. With the Government supplying millions of dollars in funding via the MERiL (Methane Emissions Reductions in Livestock) program.

Building on a history of failure

It is possible that many current spruikers for seaweed don't know the history of the technology and aren't aware of how many failures litter the historical landscape.

The millions of dollars currently being invested in methane reduction are on the back of about half a century of hype and failure. For example, in 1972, 1974 and 1982, studies reported 82%, 83-86%, and 90% reduction in methane from ruminants fed with additives.

The additive in the 1974 study was bromochloromethane, a lighter molecule than the bromoform thought to be the active ingredient in seaweed. Periodically thereafter, there was a flurry of hype to attract funding. In 1999, the Australian Journal of Agricultural Research published two more articles, as shown on the CSIRO's website here and here). The two authors kept the topic running for quite some time and appeared in an ABC Landline in 2007.

Here's a quote from that episode by ABC presenter Mark Willacy.

"*MARK WILLACY: [Professor] Mark Morrison has joined forces with his fellow scientists, Dr Athol Klieve from the Queensland DPI and Roger Hegarty from the New South Wales DPI to work under the auspices of the Beef Cooperative Research Centre. By 2012, the Beef CRC hopes to cut Australia's livestock methane emissions by 20 per cent, while at the same time increasing the dietary energy of the* *nation's beef herd by up to 10 per cent. And while cattle are the main methane culprits, sheep also contribute to the problem.*"

In 2007, the enteric fermentation emissions were 2,266 kilo tonnes, and in 2012, they were 2,224 kilo tonnes. Failures like this are never as popular with journalists as promises of success.

Back in 2006 an Australian study proposed a "Plan B"; a way of reducing methane if the various additives failed.

This method of reducing methane used the time-honoured method of selective breeding focusing on natural genetic variation between animals. They did modelling suggesting that breeding for low methane production might yield a cumulative reduction in methane emissions in the Australian herd by 3.1 per cent by 2025. I don't know what happened with this project, but our NGGI data don't reveal any impacts.

This breeding approach is hardly earth-shattering, but it illustrates the ongoing history of failure for this research. By 2022, a new crop of researchers had come up with the same idea, a low methane beef breeding program.

The remarkable rumen

A group of Swiss researchers ran longish studies examining animals from 3 popular dairy breeds over 41 weeks; they found plenty of variability at different times but very consistent long term averages. They concluded:

"*The apparent lack of persistence of individual animal differences in methane yields suggests that genetic determination of this trait is of minor importance in dairy cows.*"

A cow's rumen is an assemblage of microbes which has its own DNA. The vast assemblage of genes in that DNA dwarfs the relatively tiny amount of DNA of the cow. Breeding is of little value in such a scenario. The study also showed that the cow's rumen tends to resist change. As a result, things that are thought to work in short studies may fail in longer ones. Both industry and political spruikers have no trouble finding short studies with stunning results.

In 2023 the results of a 300 day trial reported just a 28% reduction in methane emissions. The study also reported a 9.3% reduction in liveweight gain, something that may seriously damage its chances of acceptance by cattle producers.

Variability and marketing hype

The argument in the 1970s and 1980s for reducing methane emissions was that the generation of methane was wasted energy that could be diverted into more meat or milk production. It was a straight productivity push. Modern research has continued to measure the key productivity metrics because this would obviously help to sell the technology to farmers.

The hyper claims about methane have been turbocharged by Government funding, via the MERiL scheme mentioned above.

The good news is that, as of 2025, we may now have the first meta-analysis of the research. A meta-analysis collects all the studies and allows you to see the forest rather than the individual tree. It's easy to be seduced by a single study claiming some amazing effect without realising that many scientific studies simply fail at the replication stage. Research is expensive, so most fields start with a bunch of little studies; 5 steers here, 5 steers there. Perhaps 20 animals in 4 groups; one control group and 3 treatment groups.

But the number of variables which might affect your results is unknown. What exactly is it in seaweed that is having an impact on methane? If you can find it, you have to know how variable it is between species of seaweed and growing methods. This is drug development 101; and it is complex.

Here's a chart from a [2025 meta analysis](#) (in preprint, not yet accepted, but with authors having good credentials).

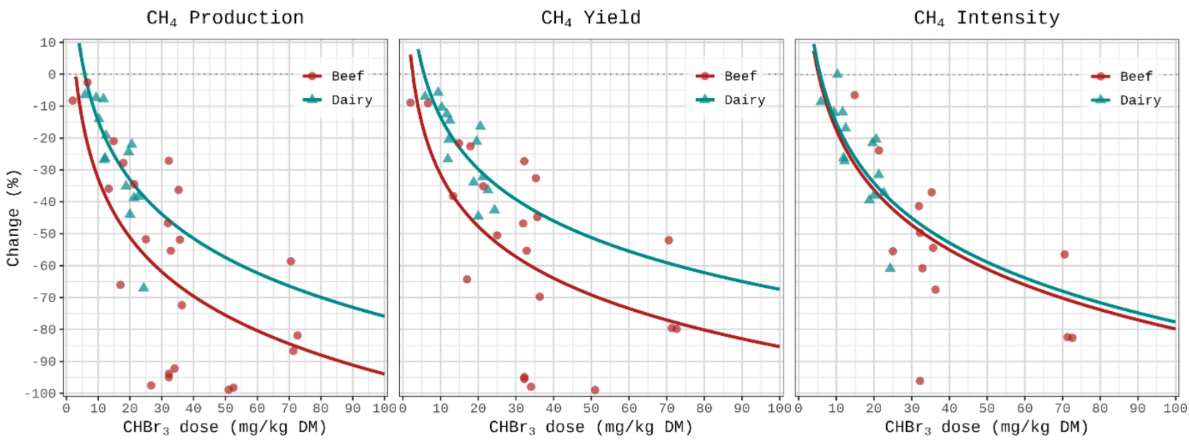

Figure 3. Meta-analysis of seaweed supplement studies

Look first at the red dots for beef cattle. The methane reduction results in different trials varied between virtually nothing to 100%. The claims about "up to 90%" refer to a small set of trials. Keep in mind that each dot is the *average* result of a trial and the results may have varied considerably between different animals on the trial.

Now look at the green triangles for dairy cattle. Quite clearly there is a difference between beef and dairy trials. Those with a commercial interest may well talk about "slashing" methane, but this looks more like nudging it than slashing it.

The solid curves are fitted model curves drawn with statistical software. But the fit isn't very good. There is clearly a dose-response; meaning that more bromoform ($CHBr_3$) tends to reduce methane more. But the reductions at the dose of 70 mg/kg were lower than at 50 mg/kg. These doses look low, what's stopping them using higher doses and getting bigger reductions? It isn't just the cost. A later section on *Inconvenient Problems* will spell out the details.

Climate impacts in the here and now

At this point it's worth trying to understand why people are so desperate to greenwash these methane reduction technologies. To do this we need a deeper understanding of the role of methane as a greenhouse gas.

For some reason, probably buried in some *United Nations Framework Convention on Climate Change* (UNFCCC) archive, our NGGI is full of extremely accurate information presented in an extraordinarily misleading way.

You could call the UNFCCC reporting system the progenitor of all subsequent methane reduction greenwashing techniques. The "Australia Clause" allowed Australia to use changes in land use carbon emissions to offset our coal use. The standardisation of the 100-year *Global Warming Potential* (GWP) to compare greenhouse gases is a matching strategy to reduce our responsibility for our prodigious meat-based methane emissions. We have been a global greenwashing leader for over a quarter of a century.

Our latest inventory, 2025, is available here.

The next table is the most important of its tables for this submission. It presents Australia's greenhouse gas emissions for the agricultural sector. We need this information to examine a claim made by the Green's press release mentioned previously, and attributed to Peter Whish-Wilson:

"*Agriculture in Australia is responsible for about 13.5% of the country's emissions, most of them coming in the form of methane produced by burping livestock.*"

The 13.5% number is simply wrong. Numbers get recycled around news media and are rarely checked. Here's the data from our 2021 NGGI; the document Whish-Wilson should have used. 78254.24 is about 17% of 462600.07.

SUMMARY 1 SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES
(Sheet 1 of 1)

Inventory 2021
Submission 2023
AUSTRALIA

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Total

Agriculture

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs[1]	PFCs[1]	Unspecified mix of HFCs and PFCs[1]	SF_6	NF_3	NO_x	CO	NMVOC	SO_x	Total GHG emissions/removals[2]
	(kt)			CO_2 equivalents (kt)[3]			(kt)						CO_2 equivalents (kt)[3]
Total national emissions and removals	**307,223.26**	**4,370.12**	**79.83**	**11,405.41**	**291.48**	**NO**	**0.01**	**NO**	**3,396.42**	**17,992.34**	**1,489.93**	**2,221.65**	**462,600.07**
1. Energy	**363,913.56**	**1,264.93**	**9.53**						**2,763.77**	**2,095.66**	**715.37**	**589.26**	**401,856.29**
1.A. Fuel combustion	350,631.14	75.50	9.35						2,760.96	2,079.52	513.23	589.26	**355,222.62**
1.A.1. Energy industries	196,563.83	26.23	2.94						1,163.17	289.58	80.17	491.88	**198,077.78**
1.A.2. Manufacturing industries and construction	41,926.79	2.44	1.58						863.59	273.56	112.77	59.33	**42,412.98**
1.A.3. Transport	88,780.48	11.93	4.07						282.69	868.92	199.72	29.13	**90,192.36**
1.A.4. Other sectors	22,550.62	34.88	0.74						444.96	644.95	120.18	8.67	**23,723.34**
1.A.5. Other	809.42	0.02	0.02						6.54	2.52	0.39	0.25	**816.16**
1.B. Fugitive emissions from fuels	13,280.17	1,189.43	0.18						2.81	16.14	202.13	NO	**46,631.43**
1.B.1. Solid fuels	2,087.87	919.62	0.00						NO	NO	NO	NO	**27,837.62**
1.B.2. Oil and natural gas and other emissions from energy production	11,192.30	269.81	0.18						2.81	16.14	202.13	NO	**18,793.81**
1.C. CO_2 Transport and storage	2.25												**2.25**
2. Industrial processes and product use	**19,577.69**	**2.93**	**5.56**	**11,405.41**	**291.48**	**NO**	**0.01**	**NO**	**7.08**	**16.84**	**180.49**	**1,632.40**	**32,992.30**
2.A. Mineral industry	5,584.88								NO	NO	NO	NO	**5,584.88**
2.B. Chemical industry	3,104.46	0.43	5.50	NO	NO	NO	NO	NO	NO	NO	2.84	NO	**4,575.34**
2.C. Metal industry	10,499.87	2.50	0.05	NO	291.48	NO	NO	NO	7.08	16.84	0.07	1,632.40	**10,875.82**
2.D. Non-energy products from fuels and solvent use	162.71	NO	NO						NO	NO	125.59	NO	**162.71**
2.E. Electronic industry			NO	NO	NO	NO	NO	NO					**NO**
2.F. Product uses as substitutes for ODS				11,405.41	NO	NO	NO	NO					**11,405.41**
2.G. Other product manufacture and use	NO	NO	IE	NO	NO	NO	0.01	NO	NO	NO	NO		**162.36**
2.H. Other[4]	225.78	NO	NO	NO	NO	NO	NO	NO	NA	NA	51.99	NA	**225.78**
3. Agriculture	**3,083.39**	**2,194.57**	**51.78**						**29.62**	**471.33**	**27.49**	**NO**	**78,254.24**
3.A. Enteric fermentation		1,937.85											**54,259.67**

Figure 4. Australia's 2021 Inventory Summary Page

Of far more concern is the little word "most". But the explanation of why it is such a deceptive and misleading characterisation is more complex than a simple division.

To understand the "most" claim we need to focus on the Agricultural emissions data. The next table, which will be over the page, is the official table, except that I'm using the most recent data now, from our 2025 submission, which gives the data from 2023. The submissions take quite some time to prepare and are typically submitted about 18 months after the year to which they apply.

TABLE 3 SECTORAL REPORT FOR AGRICULTURE
(Sheet 1 of 1)

2023
AUS-CRT-2025-V1.0
Australia

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GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_x	CO	NMVOC	SOx	Total GHG emissions [1]
	(kt)							CO_2 equivalents (kt) [2]
3. Total agriculture	3,432.83	2,381.45	46.32	33.36	518.95	30.27	IE,NA,NO	82,388.42 Total
3.A. Enteric fermentation		2,110.78 Animal						59,101.90
3.A.1. Cattle[3]		1,588.86						[illegible]
Option B (country-specific):								
3.A.1.a. Other		1,588.86						44,488.11
3.A.1.a.iv. Other *(please specify)*		1,588.86						44,488.11
3.A.2. Sheep		509.28						14,259.79
3.A.3. Swine		4.10						114.66
3.A.4. Other livestock		8.55						239.34
3.B. Manure management		248.78	2.37			NA,NE,NO		7,593.10
3.B.1. Cattle[3]		157.19	1.03			NA,NE		4,675.14
Option B (country-specific):								
3.B.1.a. Other		157.19	1.03			NA,NE		4,675.14
3.B.1.a.iv. Other *(please specify)*		157.19	1.03			NA,NE		4,675.14
3.B.2. Sheep		25.84	NA			NE		723.62
3.B.3. Swine		60.84	0.21			NE		1,757.95
3.B.4. Other livestock		4.90	0.48			NO		264.85
3.B.5. Indirect N_2O emissions			0.65					171.54
3.C. Rice cultivation		8.59				NO		240.46
3.D. Agricultural soils[4,5]		NE	43.38	NO	NO	NO		11,494.56
3.D.1. Direct N_2O emissions from managed soils			34.73					9,203.11
3.D.1.a. Inorganic N fertilizers			12.58					3,333.23
3.D.1.b. Organic N fertilizers			1.47					388.57
3.D.1.c. Urine and dung deposited by grazing animals			10.65					2,823.09
3.D.1.d. Crop residues			9.83					2,605.45
3.D.1.e. Mineralization/immobilization associated with loss/gain of soil organic matter			0.11					29.45
3.D.1.f. Cultivation of organic soils (i.e. histosols)			0.09					23.32
3.D.1.g. Other			NO					NO
3.D.2. Indirect N_2O Emissions from managed soils			8.65					2,291.45
3.E. Prescribed burning of savannahs		IE	IE	IE	IE	IE	IE	IE
3.F. Field burning of agricultural residues		13.31	0.58	33.36	518.95	30.27	NO	525.57
3.G. Liming	1,318.39 Animal							1,318.39
3.H. Urea application	2,114.44							2,114.44
3.I. Other carbon-containing fertilizers	NE							NE
3.J. Other *(please specify)*	NA	NA	NA	NA	NA	NA	NA	NA

[1] "Total GHG emissions" does not include NO_x, CO, NMVOC and SO_x.

Figure 5. Australia's 2023 Agricultural emissions

Notice the last column is labelled "CO_2 equivalents (kt)".

The 2nd footnote says that each Party (country) shall use the 100-year GWP, but you are also allowed to use other metrics provided you cite the *Intergovernmental Panel on Climate Change* (IPCC) report they came from. The next section will explain this fully, but for now just accept that the GMP (Global Methane Pledge) uses a 20-year GWP, but our NGGI uses the 100-year GWP.

The components of the total due to animal agriculture are circled in red. Obviously "enteric fermentation" is from animals, but the liming and urea are also processes applied to pasture and also need to be attributed to animals, according to CSIRO agricultural scientist Bradley Ridoutt. All the amounts circled in red need to be multiplied by the GWP factor (see next section for an explanation of this term) and summed. When you do the math, animal agriculture is responsible for over 93% (GWP20) or 85% (GWP100) of agricultural greenhouse impacts, depending on the choice of GWP. The next section explains the difference in detail. The take-home message is that "most" isn't 55%, or perhaps even 65%; it's almost everything.

The exact details of the calculations are in the Appendix.

What is a GWP?

Let's explain in detail what the GWP is. In a climate model, the complex computer code that runs on supercomputers, the impact of greenhouse gases is done on a gas by gas basis over time. Each gas (in addition to other causally relevant phenomena) has a complex impact over time on the energy balance of the planet. The situation is analogous to food science. We sometimes compare foods by looking at a single nutrient such as calories. But the reality is that each food is very different, and comparisons made using a single nutrient are pretty crude simplifications.

When we say methane has 28 times the impact of carbon dioxide, this is like saying olive oil has more calories than pasta; it's a statement which ignores almost all of the complexity.

It's the same for greenhouse gases. GWPs are a crude simplification of a complex process. How does methane compare with carbon dioxide? We want to say something simple like "it's 3 times worse", or "30 times worse"; we want a number. The GWP over a 100 year period gives you a number; 28. It says that if you emit one tonne of methane today, its impact after 100 years is the same as if you emitted 28 tonnes of carbon dioxide today.

This is technically true, but *profoundly* misleading. This is because all of methane's impact occurs within about 12 years; the tonne you emit today will have almost entirely been broken down by then.

Averaging the impact of methane over 100 years misses that huge surge of heat which methane produces during the actual decade when it is significant. Imagine piling 10 tonnes of bricks in one corner of a timber verandah and then calculating its average weight over the entire area of that verandah. It really is that wrong. At the risk of overstating what should now be obvious, imagine driving from Sydney to Newcastle in an hour but averaging your speed over 12 hours. That would be lying; and so it is with using the GWP 100 for methane. It is grossly misrepresenting methane's impact; qualitatively as well as quantitatively.

Climate modellers, of course, don't use such a factor because they care about getting the right answer and using the 100-year GWP would just be plain wrong.

A reasonable way of representing methane's impact on the climate relative to CO_2, without being too ridiculously wrong, is to average methane's impact over 20 years rather than 100. Not only is it closer to the physical reality, it's also much better because we have good reason to think that the next 20 years are critical. If we don't change the climate's trajectory soon, we may not be able to do so later.

These dual arguments are precisely the motivation behind the *Global Methane Pledge* Australia signed in 2023.

The Global Methane Pledge and GWP20

If you use the 20-year time horizon, as the GMP does in its arguments for rapid methane reductions, then you find that livestock, on its own, is responsible for about 27% of the warming impact of Australia's greenhouse gas emissions.

Let's explain where this number comes from.

All we need is Australia's official NGGI and the 20-year methane GWP; 80. The latest IPCC report actually gives two 20-year GWP figures for methane, 79.7 for biogenic methane (i.e., from livestock, wetlands and rice paddies) and 82.5 for methane from fossil fuel sources. Why the difference? Methane is CH_4, if it's from livestock, then it doesn't represent new carbon being added to the atmosphere; it is "merely" supercharging the impacts of existing carbon for a decade or so. Methane from fossil fuels is new carbon. Hence the slight difference.

Here's the summary page from our 2025 inventory.

SUMMARY 1 SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES
(Sheet 1 of 1)

2023
AUS-CRT-2025-V1.0
Australia

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GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions/ removals	CH_4	N_2O	HFCs [1]	PFCs [1]	Unspecified mix of HFCs and PFCs [1]	SF_6	NF_3	NO_x	CO	NMVOC	SO_x	Total GHG emissions/removals [2]
	(kt)			CO_2 equivalents (kt) [3]					(kt)				CO_2 equivalents (kt) [3]
Total national emissions and removals	**288,491.55**	**4,741.59**	**76.57**	**11,428.14**	**331.17**	**NA,NO**	**0.01**	**NA,NO**	**3,546.29**	**21,753.22**	**1,645.11**	**2,137.68**	**453,448.91**
1. Energy	**361,299.62**	**1,236.42**	**7.79**						**2,765.21**	**2,105.02**	**700.86**	**553.00**	[illegible]
1.A. Fuel combustion	345,038.34	71.59	7.67						2,762.31	2,092.82	519.77	553.00	349,074.87
1.A.1. Energy industries	185,490.92	21.25	2.87						1,175.32	305.36	86.76	451.07	186,846.57
1.A.2. Manufacturing industries and construction	41,534.41	2.47	1.65						884.61	278.90	111.55	61.20	42,042.05
1.A.3. Transport	95,644.78	11.53	2.43						299.30	844.74	204.23	31.35	96,610.73
1.A.4. Other sectors	21,319.36	36.31	0.68						392.49	660.74	116.71	8.98	22,517.58
1.A.5. Other	1,048.87	0.04	0.03						10.59	3.08	0.52	0.40	1,057.94
1.B. Fugitive emissions from fuels	16,258.95	1,164.82	0.12						2.90	12.20	181.09	NA,NO	48,905.75
1.B.1. Solid fuels	1,951.05	888.42	0.00						NA,NO	NA,NO	NA,NO	NA	26,827.21
1.B.2. Oil and natural gas and other emissions from energy production	14,307.89	276.40	0.12						2.90	12.20	181.09	NA,NO	22,078.54
1.C. CO_2 Transport and storage	2.33												2.33
2. Industrial processes and product use	**19,550.54**	**2.94**	**5.48**	**11,428.14**	**331.17**	**NA,NO**	**0.01**	**NA,NO**	**7.09**	**16.96**	**253.38**	**1,584.68**	**32,986.56**
2.A. Mineral industry	5,461.91	NA	NA						NO	NO	NO	NO	5,461.91
2.B. Chemical industry	3,422.65	0.43	5.42	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NO	NO	2.84	NO	4,871.34
2.C. Metal industry	10,276.73	2.50	0.05	NO	331.17	NO	NO	NO	7.09	16.96	0.07	1,584.68	10,692.50
2.D. Non-energy products from fuels and solvent use	169.16	NA,NO	NA,NO						NA,NO	NA,NO	198.48	NA,NO	169.16
2.E. Electronic industry			NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO					NA,NO
2.F. Product uses as substitutes for ODS				11,428.14	NA,NO	NA,NO	NA,NO	NA,NO					11,428.14
2.G. Other product manufacture and use	NA	NA	IE,NA	NA,NO	NA,NO	NA,NO	0.01	NA,NO	NA	NA	NA	NA	143.43
2.H. Other [4]	220.09	NA,NO	NA,NO	NA	NA	NA	NA	NA	NA,NO	NA,NO	51.99	NA,NO	220.09
3. Agriculture	**3,432.83**	**2,381.45**	**46.32**						**33.36**	**518.95**	**30.27**	**IE,NA,NO**	**82,388.42**
3.A. Enteric fermentation		2,110.78											59,101.90
3.B. Manure management		[illegible]	2.37								NA,NE,NO		7,593.10
3.C. Rice cultivation		8.59									NO		240.46
3.D. Agricultural soils		NE	43.38						NO	NO	NO		11,494.56
3.E. Prescribed burning of savannahs		IE	IE						IE	IE	IE	IE	IE
3.F. Field burning of agricultural residues		13.31	0.58						33.36	518.95	30.27	NO	525.57
3.G. Liming	1,318.39												1,318.39
3.H. Urea application	2,114.44												2,114.44
3.I. Other carbon-containing fertilizers	NE												NE
3.J. Other	NA	NA	NA						NA	NA	NA	NA	NA
4. Land use, land-use change and forestry [5]	**-95,824.50**	**642.50**	**15.60**						**740.64**	**19,112.30**	**420.31**		**-73,701.41**
4.A. Forest land [5]	-75,159.99	264.41	6.22						247.28	6,596.99	**211.19**		-66,108.95
4.B. Cropland [5]	-7,813.13	0.57	0.05						0.43	16.81	2.03		-7,782.68
4.C. Grassland [5]	-9,033.22	289.16	8.68						470.95	11,965.97	204.98		1,363.51
4.D. Wetlands [5]	1,980.84	87.87	0.33						21.60	517.85	0.33		4,528.83
4.E. Settlements [5]	-817.18	0.50	0.04						0.37	14.69	1.78		-793.35
4.F. Other land [5]	NO	NO	NO						NO	NO	NO		NO
4.G. Harvested wood products [5]	-4,981.82												-4,981.82
4.H. Other [5]	NO	NO	0.28						NO	NO	NO		73.04
5. Waste	**33.07**	**478.28**	**1.39**						**NA,NE,NO**	**NA,NE,NO**	**240.29**	**NE,NO**	**13,792.40**
5.A. Solid waste disposal [6]		**374.27**							**NO**	**NO**	**3.07**		10,479.66
5.B. Biological treatment of solid waste		4.77	0.61						NA,NE	NA,NE	NA,NE		295.56
5.C. Incineration and open burning of waste [6]	**33.07**	NA,NE,NO	NA,NE,NO						NO	NO	NO	NO	33.07
5.D. Wastewater treatment and discharge		99.23	0.78						NA	NA	237.22		2,984.11
5.E. Other [6]	NE	NE	NE						NE	NE	NE	NE	NE
6. Other (*please specify*) [7]	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Figure 6. Australia's emissions in summary

The total figure on the far right at the top is the total. It is arrived at by multiplying each of the three weights on the top red highlighted row by the appropriate GWP and adding the result to the other figures in the row (which have already been converted to climate impact units). When you switch between GWP100 and GWP20, the only big difference is methane. For N_2O, for example the GWP100 is 265 and the GWP20 is 273. For CO_2, the GWP is always one, by definition.

Instead of being multiplied by 28 to estimate its contribution to the total of 453,448, it is multiplied by 80. So the 4,741 figure in the top row bumps up the total from 453,448 to about 700,000.

Just to be explicit, instead of 4741 x 28 in the total, we have 4741 x 80 … meaning we add 4741 x 52 = 246532 to the total. 453,448 + 246,532 = 699980.

The rest is simple. Livestock's biggest number is the Enteric Fermentation figure of 2110. Multiply that by 80 and divide by 700,000 and you get about 24%.

So where did the 27% come from? Once you account for all of the factors and details, the total comes to about 27%.

Inconvenient problems

Recall the use of the word “natural” in the description of the feed additive by Windsor Meats early in this submission. This is another favoured greenwashing strategy; playing on the success of this vacuous marketing term in the well-founded belief that for many people, “natural” is the ultimate seal of approval.

The putative active ingredient in seaweed causing methane reductions is bromoform. Bromoform has been listed as a probable carcinogen by the US EPA. A recent assessment explains why:

“*Bromoform belongs to a group of compounds known as halogens, which include bromoform and chloroform. Halogens have elements with large negative electron affinity that combine with other compounds to reach stability. The chemical similarity of bromoform to chloroform, which is a known carcinogen, has triggered scientific assessments of bromoform for its safety*”

The standard industry strategy for dealing with the carcinogenicity of red and processed meat is to try to deflect the blame onto something associated with the way the meat is processed or cooked. So, for example, industry typically blames the nitrites added to processed meat as the cause of the problems. This ignores the science; which is pretty clear. Eat a red meat meal and your body produces nitrosamines that damage DNA. The smoking gun is that the type of damage matches the type of damage found in bowel cancer patients.

None of this is news to people doing the research on seaweed. Read any study and you will see they are careful to monitor the levels of bromoform in milk and meat from participating animals. In the context of red meat, worries about bromoform might seem bizarre, a little like worrying about dyes in cigarette paper, but the public is fickle about “additives”.

Apart from misleading people about the potency of seaweed in reducing emissions and tricking them using the word “natural” for a pretty potent chemical, there are serious welfare risks for animals that are totally ignored by feed additive advocates. A recent review found the following. Note that these results are from a variety of studies; so inconsistent results on bromoform, for example, are of concern.

- Decreased acetate to propionate ratio by 14%, 29% and 35% from 0.05%, 0.1% and 0.2% Asparagopsis inclusion rates, respectively.
- Decreased milk production by 11.6 %.
- Decreased milk protein.
- No change in milk bromoform content.
- Bromoform excreted in milk; between 10 μg per litre and 35 μg per litre.
- Ulcers, haemorrhages, and signs of inflammation in the rumen.
- Regularly refused feed or selectively excluded Asparagopsis biomass.
- 9 out of 12 cows dropped from the experiment prematurely due to reduced feed intake, reduced Asparagopsis intake and loss of physical condition.
- Decrease in milk fat, protein and lactose yield.
- Decreased acetate to propionate ratio.
- Blunting of rumen papillae, nodular proliferation and blunting of rumen floor.
- Reduced voluntary Asparagopsis intake.
- Milk yield reduced 6.5% under 0.5% Asparagopsis inclusion.
- Reduced milk fat, protein and lactose production under 0.5% Asparagopsis inclusion.

- Decreased acetate to propionate ratio and milk fat content.
- 3 animals removed from trial due to reduced feed intake.
- Increased bromoform present in milk of Asparagopsis treated milk, to 2.13 μg per litre, and 2.69 μg per litre

Note; the current guidelines for bromoform limits in drinking water are highly variable, 20 μg per litre in the US, 100 μg for the WHO and 250 μg per litre in Australia; indicating the kind of wide variations when there is little evidence and everybody is using educated guesswork.

Agricultural research is highly variable with respect to the side effects of treatments. Not all studies will have indwelling cannulas to monitor rumen pH to pick up inflammation. As long as the animal is eating, they may just assume that all is well. Our farmers spent decades dehorning and mulesing without anaesthesia and that kind of attitude to animal welfare rubs off on most people associated with the industry; scientific or otherwise.

Reafforestation and foregone sequestration

The focus on methane from Australia's extensive grazing industry detracts from its other impacts. In particular the climate impact of *foregone sequestration*; the carbon drawdown we could achieve if not for the continued operation of our extensive grazing industries.

Rolling back the last couple of hundred years of deforestation has long been recognised as a key requirement for preventing the worst that global warming would otherwise deliver. In his 2008 paper, "Target CO2, where should humanity aim?", NASA climate scientist James Hansen put it succinctly, after noting that there were no large-scale technologies for CO2 capture:

> *"Improved agricultural and forestry practices offer a more natural way to draw down CO2. Deforestation contributed a net emission of 60±30 ppm over the past few hundred years, of which ~20 ppm CO2 remains in the air today (2, 58a, figs S11, S13). Reforestation could absorb a significant fraction of the 60±30 ppm net deforestation emission."*

Now, almost 20 years later, there are still no technologies which look feasible at the scale required. In 2024, the largest such plant was in Iceland. The plant, Climeworks, was built by a Swiss startup and draws down just 36,000 of the 41 billion tonnes of CO2 emitted globally each year. Climeworks reckons its plant is like taking 8,300 cars off the road each year; but that's about the average hourly sale of cars (see Appendix).

In Australia, we have cleared over 100 million hectares since white arrival and we have 71 million hectares of managed pasture. Most of that pasture was once forest and would regrow if left to do so. The much hyped plans to make the cattle industry carbon neutral conveniently ignore foregone sequestration. In the early 1990s, the wool market crashed, and Australia's sheep population went from 173 million down to 100 million in 2005 (see NGGI for 1990 and 2005); with a corresponding drop in enteric fermentation and reafforestation as farmers walked off farms. This wasn't a planned event, but the devastating impact of market forces. While various Governments later claimed credit for meeting Australia's Kyoto Protocol targets, without the wool crash, we'd have failed dismally.

This wool crash of the 1990s showed what destocking and reafforestation could do to reduce our climate impacts. AJP would definitely prefer it to be done in a planned manner without the suicides and other catastrophic human and animal impacts. But the fantasy that it can be business as usual in Australia's grazing industry isn't sustainable.

Concluding remarks

The greenwashing and hype around seaweed and its potential impact on Australian and global farm animal methane is extensive and comes both from industries with a vested interest as well as political parties and our current Government. Greenwashing in some contexts is of little consequence. The consequences of an imperfectly compostable coffee cup are tiny, even when considered at national and international scale. In contrast, there are multiple large scale adverse impacts from our large ruminant populations:

1. methane emissions are a major component of our total climate impact,
2. a significant fraction of land occupied by ruminants would reforest and draw down carbon if we destocked,
3. land clearing has been, and continues to be, a major driver of Australia's biodiversity losses. Land clearing is primarily driven by cattle and sheep grazing.
4. bowel cancer is a tragic and expensive consequence of red meat heavy diets.

The reasons for steep reductions in our sheep and cattle populations are many. We should not be distracted by a technology with a 50 year record of failure and virtually no potential for reducing methane by more than a few percent.

Thank you for the opportunity to contribute to this consultation.

Recommendations:

1. False and misleading claims in advertising need stronger regulation. In particular, the use of “up to” in relation to methane reductions must not be used. Companies need to use the average of numbers found in research applicable to the production environment. For research to be cited in support of a claim, it must use the same species and feed formulation. It must also be of sufficient length to capture any decline in long-term efficacy.

2. Government and industry press releases need to be more honest about the risks and potential for failure. In the life sciences, most research fails and even the research that succeeds faces replication challenges. When the Government is investing millions of dollars in a field, it needs to be honest about the risks of failure. Researchers seeking funding need to be similarly honest. Risk assessment is complicated, but when a field has failed to yield production-ready results for 50 years, as is the case with feed additives for ruminants, then it is clear that further investment is extraordinarily high risk. This isn’t so much a matter for black-letter law as sound judgment.

Appendix: Some details

Proportion of agricultural emissions from farmed animals — 93%

Here's the arithmetic to calculate, using the 20-year GWP, the percentage of agricultural emissions from animal agriculture. The figures in the CH_4 column are multiplied by 80 and the figures for CO_2 are used as is. The N_xO (nitrous oxides) use the 20-year GWP figure of 273; which is almost the same as the 100-year GWP of 265. I've ignored the small amount of animal N_xO and just assumed all of this is from "Agricultural soils". We'll need to recalculate the total (circled in black in the figure) because it was calculated with GWP100.

The rounded animal agriculture total is (1318.39 + 2114.44 + (2110.78 + 248.78) x 80) = 192,200

This is divided by the agriculture total. The total in the table is calculated with GWP100, so we need to calculate it with the GWP20. So we take the three left hand figures in the top row (3432.83 + 2381 x 80 + 46.32 x 273) = 206,600 (rounding)

Then we divide these two numbers and multiply by 100 to get a percentage; 93%.

Car sales and the hype around direct carbon capture

Globally, there are about 1.8 billion cars on the road, with about 60 million new petrol cars being added annually. I don't have data on the number leaving the fleet, but it is less than 60 million. The fleet is growing. The only good news is that the number of new petrol cars seems to have peaked. In addition to cars, there are a variety of trucks, which will be harder to electrify. The potential for direct carbon capture has been over-hyped by even more than the potential of seaweed for methane reduction. The difference between when Hansen was writing in 2008 and the current best effort of Climeworks is tiny. Progress has been glacial.

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