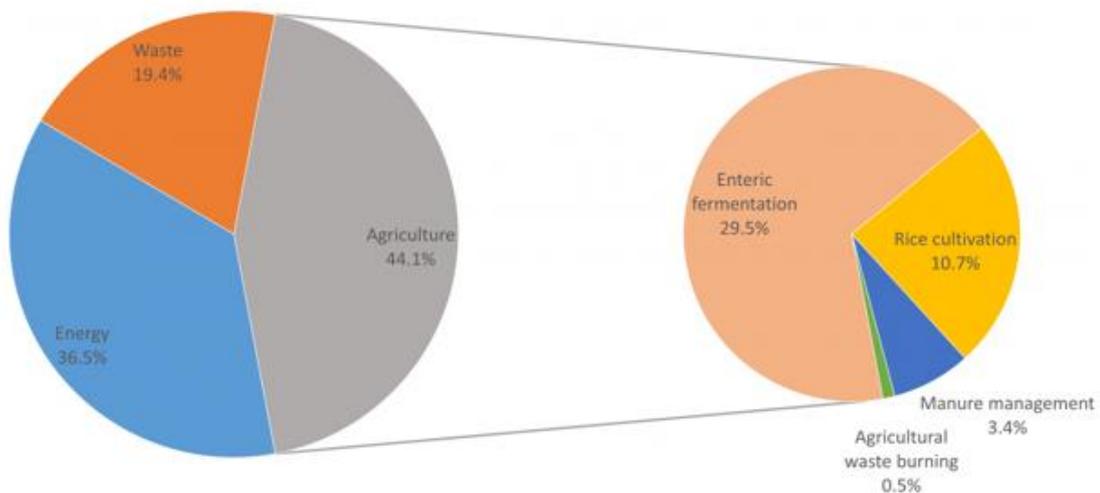




UK Methane Emissions

Globally, methane has increased significantly since pre-industrial levels with agriculture being the single largest source of methane emissions, and ruminants – cows, sheep and goats – contributing the most (Figure 1). Agriculture is also the biggest source of methane emissions in the UK. However, contrary to the global trend, methane emissions from agriculture in the UK declined by 16% between 1990-2008 and have remained stable for the past 10 years (2008-2018).¹



¹ Global methane emissions. Source: <https://foodsource.org.uk/building-blocks/agricultural-methane-and-its-role-greenhouse-gas>

Methane is a very potent greenhouse gas (GHG). One molecule of methane emitted into the atmosphere has a significantly greater immediate warming effect than one molecule of CO₂.

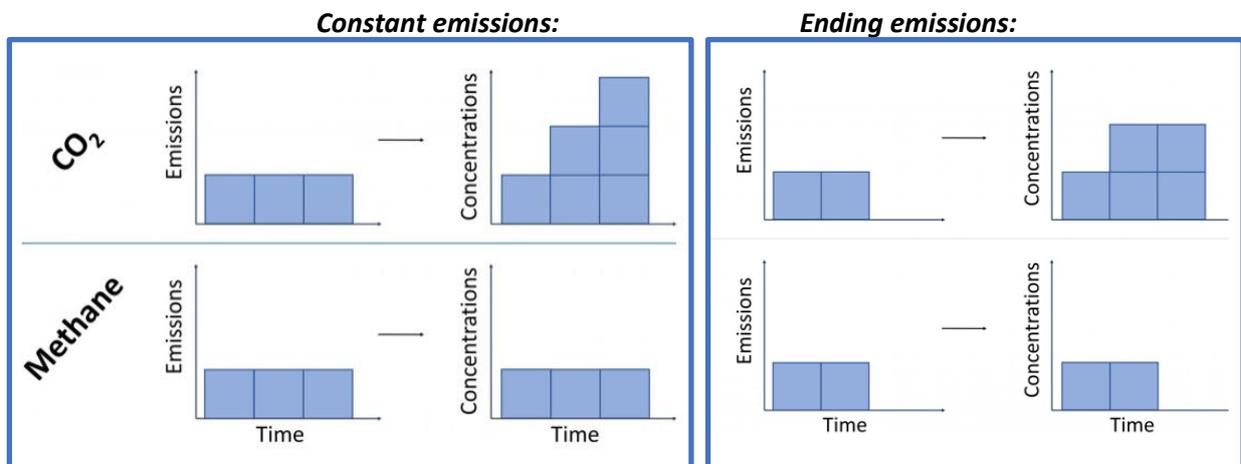
However, methane breaks down in the atmosphere much more quickly than CO₂ – the lifetime of atmospheric methane is around 12 years, compared to CO₂ which can stay in the atmosphere for well over 100 years. This means:

- **Constant** methane emissions lead to a roughly **constant** level of methane in the atmosphere, as it breaks down as fast as it is added, whereas **constant** CO₂ emissions lead to **increasing** levels of CO₂ in the atmosphere as it accumulates much faster than it breaks down (Figure 2, left image).²
- Due to its potency, even a **small increase** in methane emissions will lead to an **immediate increase** in warming.

¹ Source: [ONS](https://ons.gov.uk/)

² In fact, for methane concentrations in the atmosphere to remain completely stable, methane emissions must decrease at a rate of 0.3% per year. Source: [Oxford Martin School](https://www.oxfordmartin.ox.ac.uk/).

- Even a **small reduction** in methane emissions has a **significant immediate effect in reducing atmospheric concentrations** and therefore can lead to cooling (Figure 2, right image).



2 Source: <https://foodsource.org.uk/building-blocks/agricultural-methane-and-its-role-greenhouse-gas>

GWP₁₀₀ and GWP*

GWP₁₀₀ is the standard measure to compare warming effects of different GHGs relative to CO₂ over 100 years. This is the measure used in international accounting (like the IPCC) and calculates the warming caused by 1 unit of methane as 28 times more potent than 1 unit of CO₂.

GWP* was developed in 2019 to account for methane's short atmospheric lifetime.³ This shows that the rate of change in methane emissions is important as well as its potency. GWP* shows increasing methane leads to increasing temperatures, decreasing methane leads to stabilising or reducing temperatures, and maintaining methane at the same rate for more than a couple of decades leads to little additional impact on temperature. This reflects the non-cumulative impacts of stable methane emissions. This is scientifically correct, but has led to confusing claims regarding agricultural emissions.

Claim: Ruminant methane emissions are not contributing to global warming.

Fact: Globally, this is untrue, as methane emissions from ruminants continue to increase in many areas. Under either GWP₁₀₀ or GWP*, these increases in methane have a drastic warming effect.

From a UK perspective, it depends what you count as 'contributing'. As UK ruminant methane emissions are currently stable, sometimes slightly decreasing, the level of warming caused by UK ruminant methane **is about the same as it has been for 10 years**. Remember, if this was **stable CO₂**, the level of warming would have been **increasing** for 10 years.

But even stable levels of methane in the atmosphere create a greenhouse effect by trapping radiation and increasing global temperature. So, UK ruminant warming is not increasing temperatures compared to recent years, but it is causing a higher stable temperature than a scenario where there are fewer ruminants.

It's like wearing a blanket – the UK methane blanket is not getting any bigger, but it is still trapping heat.

³ <https://www.oxfordmartin.ox.ac.uk/publications/climate-metrics-for-ruminant-livestock/>

Claim: Ruminant methane emissions do not need to decrease – instead we should focus reductions on fossil fuels and CO₂ emissions.

Fact: It is indeed imperative to reach net zero CO₂ and other long-lived GHGs to halt warming. Methane, on the other hand, does not need to reach net zero for the climate to stabilise. So, we certainly don't need to get rid of all ruminants.

However, the process of reducing our CO₂ to zero will take years, and every extra molecule emitted will lead to further warming and stay in the atmosphere for centuries. As mentioned above, having any amount of methane in the atmosphere is still contributing to maintain global temperatures. This is where methane reduction comes in. Reducing methane emissions has such a powerful immediate effect (like taking off the blanket), reductions will give us a much-needed cooling effect, easing the ongoing impact of the hundreds of years of continually accumulating CO₂.

So, it is still important, and in fact very beneficial, to reduce ruminant emissions, because:

- We want to decrease the global temperature...
- We are highly concerned about future temperature rise...
- Methane levels are still rising in many parts of the world...
- Moving to lower density livestock systems is better for nature as well as the climate.

“Methane is one of the most powerful levers we have to slow global warming until the economy is decarbonised.” [Oxford Martin School](#), 2019

Summary

In summary, methane is powerful:

Increases in methane can have a huge warming effect, so we must avoid this.

Stable methane emissions, like in the UK, lead to a stable temperature impact – which will only be okay once we are happy with the global temperature trajectory (not yet!).

Even moderate reductions in methane emissions will enable the cooling that we so urgently need in the climate emergency.

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