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Background briefing

Methane and global climate goals

2024

Contents

Key points

- Methane emission reductions are essential and integral to meeting the climate goals of the Paris Agreement.
- The UK needs to accelerate domestic methane reductions to be in line with a 30% reduction by 2030 (compared to 2020), which is the global target set out in the Global Methane Pledge.
- The UK can also support delivery of the Global Methane Pledge by using its role as a financial hub to stimulate innovation in methane-reducing technologies.
- Great care needs to be taken when selecting metrics, such as GWP100 or GWP*, to assess the warming impact from methane. If they are used incorrectly, it may result in misleading messages or could even undermine policy outcomes.

What reductions in methane emissions are necessary to meet the Paris Agreement?

Substantial reductions in methane emissions will be necessary to meet the Paris Agreement goal of holding global warming well below 2°C while pursuing efforts to limit it to 1.5°C relative to pre-industrial levels.

The IPCC estimate of the remaining carbon budget for limiting warming to 1.5°C (the total net amount of carbon dioxide that can still be emitted while keeping global warming below the 1.5°C threshold) assumes that methane is reduced by about 50% between 2020 and 2050. Limiting warming to a weaker 1.7°C of global warming assumes that methane is reduced by about 45% over the same period.

If methane emissions are not reduced, this could in theory be compensated by even more stringent reductions in carbon dioxide, but there are questions about how feasible this might be in practice. If there were no reduction at all in methane emissions by 2050, this would shrink the remaining carbon budget to such an extent that in effect the 1.5°C ambition of the Paris Agreement would be out of reach.

Which sectors contribute to methane emissions and what reductions are necessary from each?

According to the IEA's Global Methane Tracker, in 2023, 40% of human-caused methane emissions were from agriculture, 34% from fossil fuels and 20% from waste. There are more opportunities for low-cost, high-impact measures to reduce methane from the fossil fuel sector than for agricultural emissions, which are more complex and challenging to address. Therefore, the IPCC's calculations for the remaining carbon budget assume greater reductions in fossil-fuel methane emissions: to

limit warming to 1.5°C, it is assumed that methane from oil, gas and coal energy will fall by around 73% in 2050 relative to 2020 as extraction is decreased and made more efficient. For agricultural emissions the reduction is 32% over the same period, as reductions here are harder.

What action should the UK take to meet the Global Methane Pledge?

The Global Methane Pledge, which the UK helped to launch at COP26 in Glasgow, calls for a global 30% reduction in methane emissions by 2030 from the 2020 level of emissions.

In terms of its own emissions, despite having achieved significant reductions in methane emissions in recent decades (largely from the coal mining and landfill sectors), the UK is not yet on track to meet a 30% reduction between 2020 and 2030. The Climate Change Committee has reported that the pace of recent reductions will need to approximately double. This will likely require managing and controlling agricultural emissions, which now make up half of the UK's methane emissions.

Methane emissions from landfills have decreased significantly since the millennium, but levels have remained static over recent years, despite existing regulations. The UK government aims to nearly eliminate biodegradable waste going to landfill by 2028. The plan is to divert this waste to anaerobic digesters for biogas and biomethane production, as well as to composting facilities. However, this approach raises another important issue: the need to address methane emissions from the biogas and biomethane supply chain, which have been underestimated. This suggests a need for enhanced monitoring, reporting, and verification mechanisms to better understand and manage emissions from this sector.

A recent study suggested that the National Atmospheric Emissions Inventory (NAEI) may be underestimating emissions from some sectors, such as fossil fuels and biomass combustion, and there may be a need to reassess the sources contributing to methane emissions to ensure that their emissions are accurately represented and addressed in policy development.

Beyond its own emissions, the UK can also play a wider role in delivering the global goal by helping other countries to cut their emissions. In particular, as a world-leading financial hub, there is the potential to catalyse innovation through incentivising investment in methane-reducing technologies and limiting the finance available for methane-generating activities.

How are methane's potency and lifetime accounted for in global targets?

The impacts of methane on the climate differ from those of carbon dioxide. On the one hand, it is much shorter lived, remaining in the atmosphere for around 12 years (compared with hundreds of years for carbon dioxide). On the other, it is much more potent, absorbing much more energy than carbon dioxide and therefore leading to greater levels of warming while it is in the atmosphere.

Metrics are available that can help to make it easier to compare the impacts of different greenhouse gases, despite their different characteristics. For example, GWP100 considers both the lifetime and potency of greenhouse gases and describes how much warming (technically, the amount of 'radiative forcing') they would cause over 100 years, relative to the same amount of carbon dioxide. This metric is helpful for thinking about our long-term climate goals and is the standard metric used for reporting to the UNFCCC and in the carbon budgets developed by the UK's Climate Change Committee. It is less useful in other contexts, such as reflecting the near-term impacts of greenhouse gas emissions. Other metrics – such as GWP20 and GWP* - have been designed for these situations.

Great care needs to be taken when applying metrics to policy analysis as if they are used incorrectly, they can lead to misleading messages, create inconsistencies and loopholes, or even unintentionally undermine targets.

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Further reading

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