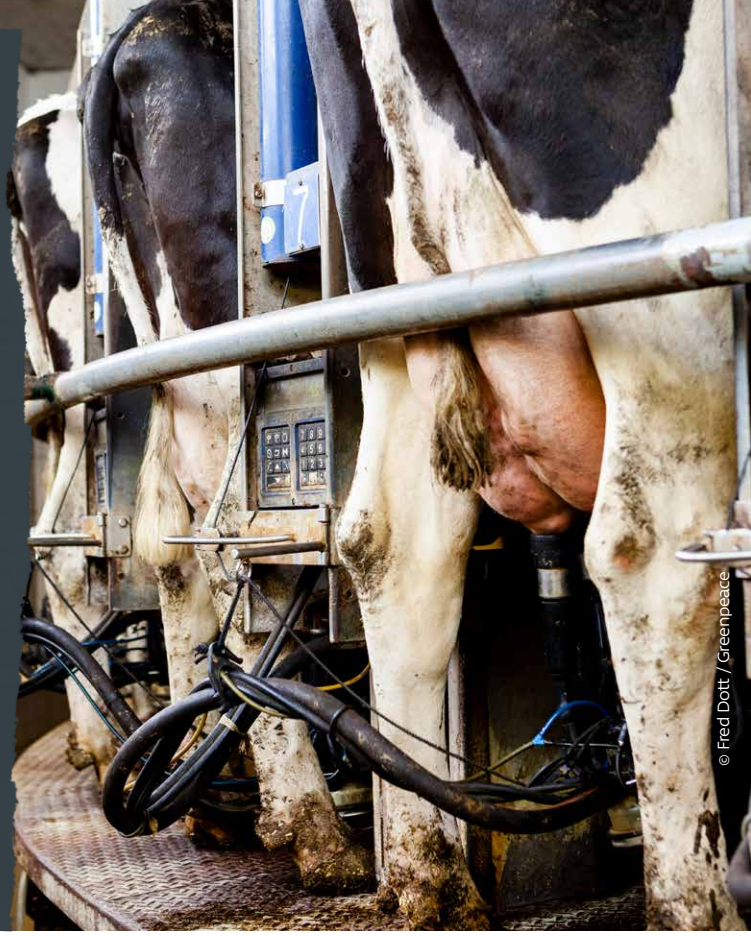
METHANE: GLOBAL HEATING AT FULL THROTTLE

HOW METHANE, A POWERFUL GREENHOUSE GAS, IS BOOSTED BY OVERPRODUCTION OF MEAT AND DAIRY



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WHAT IS METHANE?

Methane (CH_4) is an odourless, colourless and flammable gas. It is the main component of fossil gas and is produced by natural processes like decomposition and digestion. Methane is a powerful greenhouse gas that contributes to climate change.

AGRICULTURAL METHANE EMISSIONS COME MAINLY FROM LIVESTOCK FARMING, AND MORE SPECIFICALLY FROM CATTLE

Globally, methane emissions linked to human activity are estimated at around 360 million tonnes per year, 40% of which are of agricultural origin. Livestock farming accounts for 78% of agricultural methane emissions globally[1].

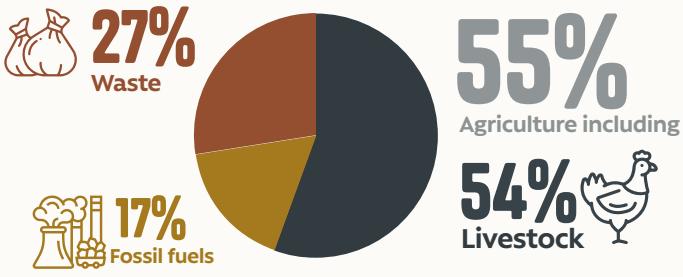
31% of global methane emissions come from **livestock production,** which is **as much as all fossil fuels** combined.

In the EU, livestock farming accounts for 54% of the methane emissions linked to human activity and accounts for almost all emissions from agriculture. The countries with the highest emissions are France, Germany, Spain and Italy[2].

1. Global Carbon Project; average 2008-2017, global values. https://www.globalcarbonproject.org/methanebudget/20/files/MethaneInfographic2020.png
2. European Environment Agency, National emissions reported to the UNFCCC and to the EU Greenhouse Gas Monitoring Mechanism, 2019. https://www.eea.europa.eu/en/datahub/datahubitem-view/3b7fe76c-524a-439a-bfd2-a6e4046302a2

> BREAKDOWN OF ANTHROPOGENIC METHANE EMISSIONS
by sector for the EU-27

(Source: European Environment Agency, 2019)



Methane comes from the fermentation of biodegradable materials in the absence of oxygen, driven by micro-organisms called archaea. This is known as «anaerobic digestion» and takes place in a wide variety of environments: in the digestive systems of animals, in the mud of marshes, in flooded rice fields, in the heart of manure piles, in underwater hydrothermal springs, etc.

Ruminants are the most methane-intense livestock. Their particular digestive system (the rumen) allows them to digest cellulose-rich plants, such as grass and fodder, which most other animals cannot do. But this rumination mechanism generates methane emissions: it is enteric fermentation, the «burping» of cows, which contributes to methane emissions in Europe to the tune of 5.7 million tonnes per year[3] – as much as the total greenhouse gas emissions of 24 million Europeans[4].

3. European Environment Agency, National emissions reported to the UNFCCC and to the EU Greenhouse Gas Monitoring Mechanism, 2019. https://www.eea.europa.eu/en/data-hub/datahubitem-view/3b7fe76c-524a-439a-bfd2-a6e4046302a2
4. Id

The 'burping' of cows in Europe emits as much greenhouse gas as 24 million Europeans (the populations of Greece and Belgium combined).

Livestock manure management also emits significant amounts of methane: manure and slurry, stored before being spread on fields, ferments and emits methane. Of the 8.1 million tonnes of methane emitted by European livestock farms annually, 18% comes from manure storage, half from cattle and half from pigs[5].

Methane is also the main component of biogas, a type of renewable energy produced from biodegradable organic material.

5. Id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METHANE CONCENTRATION CONTINUES TO RISE

Natural methane emissions come mainly from wetlands such as marshes, and from the release of methane through melting permafrost. Chemical reactions in the atmosphere convert methane into carbon dioxide relatively quickly: the average lifetime of methane in the atmosphere is only about ten years. In addition, there are natural sinks, as some soil bacteria feed on methane. However, these «sinks» do not make up for the increase in emissions, and the concentration of methane in the atmosphere continues to rise ever more rapidly.

METHANE, A POWERFUL GREENHOUSE GAS

Methane is a powerful greenhouse gas. It is responsible for a 0.5°C increase in the average global temperature since the pre-industrial era, compared with 0.8°C for carbon dioxide[6]. Its global warming potential over 100 years (GWP 100) is 28 times that of carbon dioxide. Though the average lifetime of methane is much shorter than that of carbon dioxide, its 20-year global warming potential (GWP 20) is 81 times that of carbon dioxide[7].

The global warming power of methane over 20 years is 81 times that of carbon dioxide.

To limit global heating to 2°C (which would already mean overshooting the 1.5°C limit),[8] global methane emissions would have to be cut by about half by 2040 under the scenarios examined by the IPCC. This is also the rate of reduction that Europe would have to achieve. This level of reduction does not take into account the risks of thawing permafrost, which could release pockets of methane, and the possible increase in methane emissions from wetlands such as marshes.

Reducing methane emissions, because of the enormous warming power of this gas, is the fastest option available to humanity to rapidly curb global heating,[9] and thus allow time to decarbonise the whole economy.

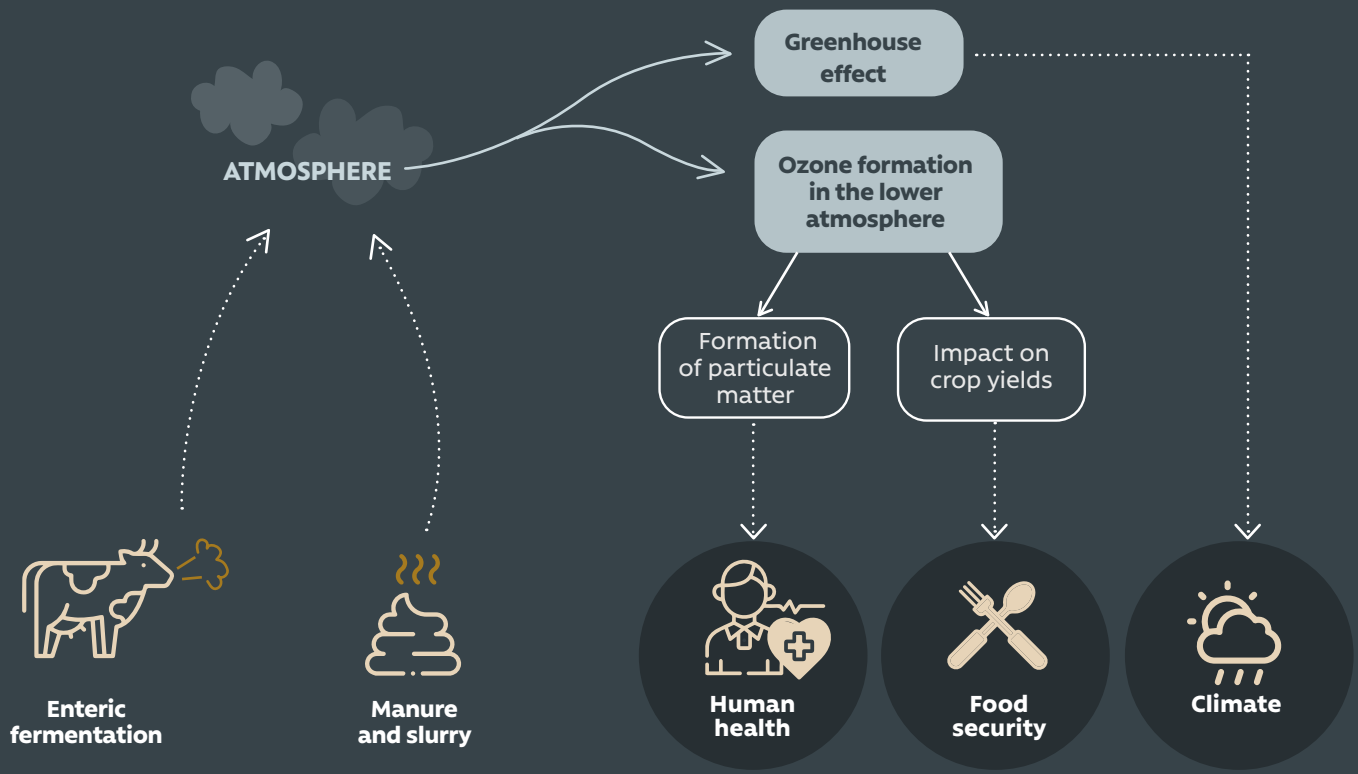
AN OZONE PRECURSOR THAT AFFECTS HUMAN HEALTH AND FOOD SAFETY

Methane by itself has no effect on health. However, it breaks down into ozone. Ozone is a gas that contributes to respiratory illnesses and reduced photosynthesis, thus lowering agricultural yields.[10]

255,000 premature deaths could be avoided by 2030 by reducing anthropogenic methane emissions by 45%.[11]

6. IPCC, AR6, WGI, SPM-8
7. IPCC, AR6, WGI, 7.SM.6, Tables of Greenhouse Gas Lifetimes, Radiative Efficiencies and Metrics.
8. The objective of limiting global temperature rises to 2°C is not sufficient. The IPCC scientists indicate that the warming should be limited to 1.5°C. https://www.ipcc.ch/sr15/
9. United Nations Environment Programme and Climate and Clean Air Coalition, Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions, 2021. https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions.
10. Id.
11. Id.

THE MAIN IMPACTS OF METHANE EMISSIONS FROM LIVESTOCK



THE INDUSTRIALISATION OF LIVESTOCK FARMING NORMALISES THE OVERPRODUCTION OF MEAT AND DAIRY PRODUCTS

Methane emissions depend on the **type of anima**l (poultry, pigs, cattle, etc.), the **type of product** (milk, meat, eggs, etc.), the **farming system** to a certain extent, but above all the **number of animals** raised. So although the most intensive livestock farms may have lower emissions when measured per kilo of meat or per litre of milk, the number of animals on these factory farms is so large that their emissions in absolute terms are much higher than smaller livestock farms.

Methane emissions are much higher from ruminants (cattle, sheep) than from monogastrics (pigs, poultry). This confirms the need to include cattle farms in the EU's industrial emissions directive (2010/75/EU), currently under revision.

Methane emissions in Europe are directly linked to livestock farming and the overproduction of cattle, which is a major emitter of this powerful greenhouse gas that contributes to climate change.

The industrialisation of livestock farming has led to an unprecedented increase in the production and consumption of animal products, which has drives harmful pollution and greenhouse gas emissions, while breaking the link between livestock farming and the land needed to feed the animals and safely absorb their waste.

Reducing the number of animals farmed, and in particular cattle, would make it possible to act very quickly to limit global heating. This reduction must be accompanied by public support for ecological livestock farming, which works with nature instead of against it.

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April 2023
Published by: Greenpeace European Unit
Layout and design: Baptiste Prat