



**clean air farming**

Reducing Ammonia and Methane  
Emissions from Agriculture



# Clean Air Farming

## LAYMAN'S REPORT

As of October 2022





## A long breath for change: The Clean Air Farming project and its successes

### ABSTRACT SUMMARY

We have brought fresh air and thus also movement into the political discussion on the mitigation of ammonia and methane. Both gases have strong environmental impacts: Methane contributes significantly to climate change, both are harmful to health and destroy biodiversity on land and in water. Methane and ammonia originate predominantly from agriculture, especially from intensive livestock farming. At the beginning of the LIFE Clean Air Farming project, there were no emission limits for polluters for either ammonia or methane. Methane is extremely damaging to the climate and yet the EU has not set any

binding mitigation targets for the greenhouse gas. However, the EU has passed several laws on air pollution control such as the National Emission Ceilings Directive (EU NEC), which sets reduction targets for five air pollutants. This also includes ammonia and by 2030 Germany must reduce its ammonia emissions by 29 percent and France by 13 percent.

Yet, these national targets and pledges remain theoretical. Germany and France exhibit the highest ammonia emissions EU-wide. Both countries are doing too little to reduce the two gases and thus fail to work actively with respect to the protection of the climate, human health and the environment. In the EU Life project Clean Air Farming of German, Belgian and French environmental and consumer protection organisations, we therefore focused our campaign on these two countries and the EU. Our primary goal was that Germany and France comply with established European law on air pollution con-

trol in agriculture. And that the states as well as the EU Commission adopt binding reduction targets for methane.

Hence, we see four developments as successes of our information and publicity campaign to mitigate ammonia and methane emissions:

1. The EU includes the agricultural sector in its Methane Strategy after we – together with other European environmental organisations – wrote letters to MEPs, submitted petitions and did extensive press work, including our own studies.
2. The three parties of the new German government – elected in September 2021 – commit to reducing methane and ammonia in agriculture as part of their coalition agreement.
3. The international Gothenburg Protocol on transboundary air pollution sets stricter reduction targets for ammonia and is working to include methane in the ongoing improvement rounds (review process).
4. France adopts a plan for agricultural application equipment that releases less methane and am-

monia into the environment. The technical emission reduction is part of the national air pollution control programme to implement the European National Emission Ceiling Directive (NEC).

## Agricultural ammonia and methane fuel climate change

Ammonia and methane contribute to climate change and fuel global warming. Current agriculture is responsible for around eight percent of climate gas emissions in Germany, compared to 13 percent in France. 55 percent of methane emissions in the EU come from agriculture, 94 percent of ammonia also originate from agriculture – mostly from animal husbandry. Ammonia and methane act as climate gases, but also damage human health and destroy biodiversity. The harmful effects of these chemical compounds on climate, nature and human health have been scientifically known for decades.

EU countries must significantly reduce ammonia and methane emissions to meet the EU's clean air

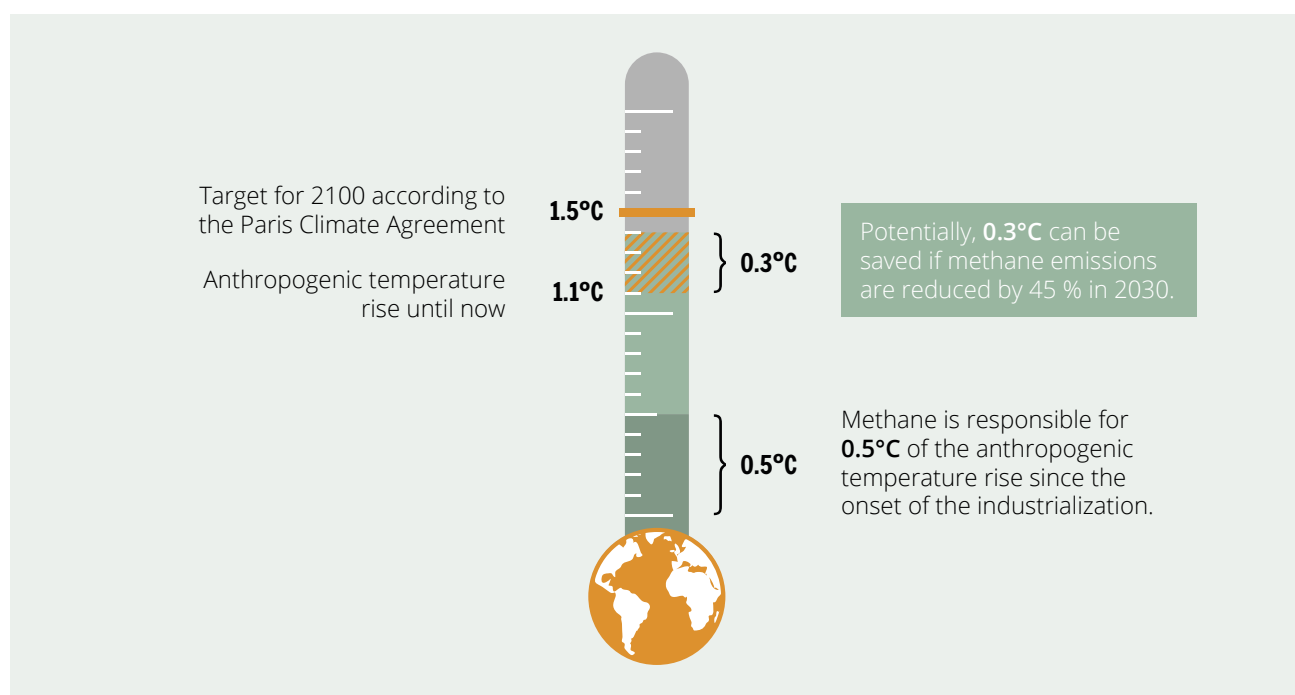


Figure 1: Methane is a powerful greenhouse gas and must be reduced as rapidly as possible.



# EAT LESS MEATHANE

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and climate protection targets. Countries must halve methane emissions from agriculture alone to slow the temperature rise and meet the goals of the Paris Climate Agreement. Ammonia emissions must be reduced by 30 to 50 percent by countries with high

livestock populations to avoid damage to nature and the environment. But this is all theory.

The EU Parliament and Council have adopted EU directives to reduce some air pollutants. However,

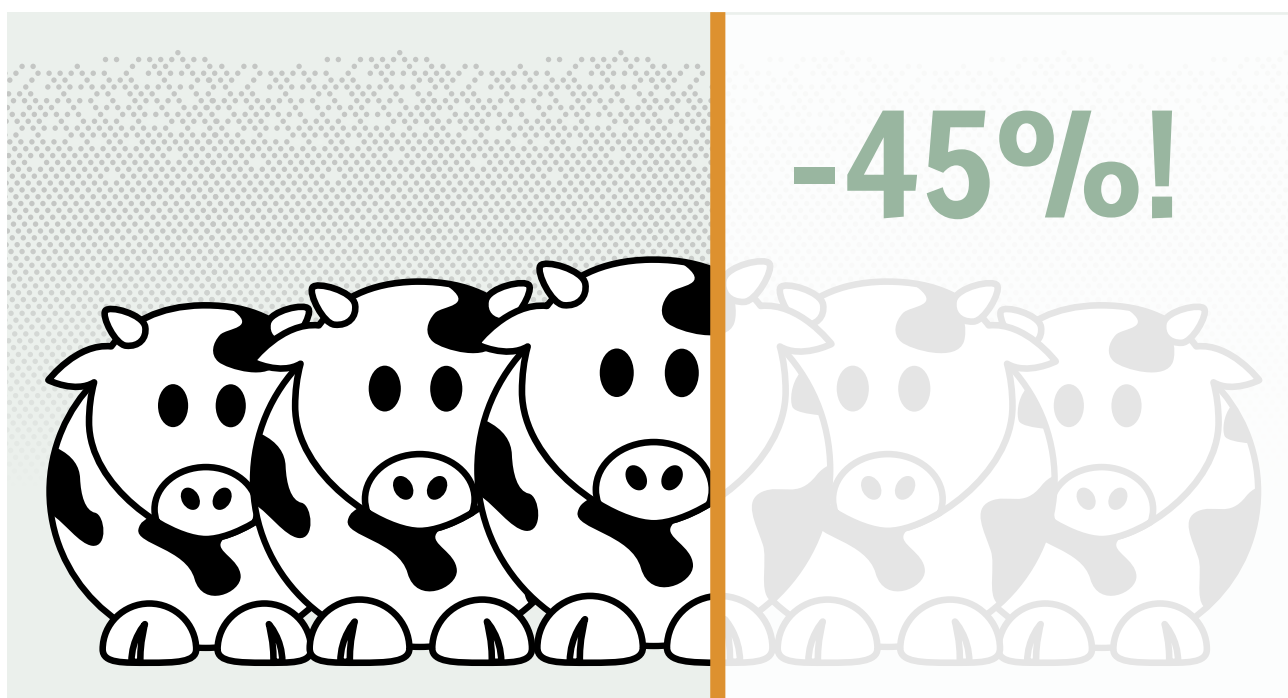
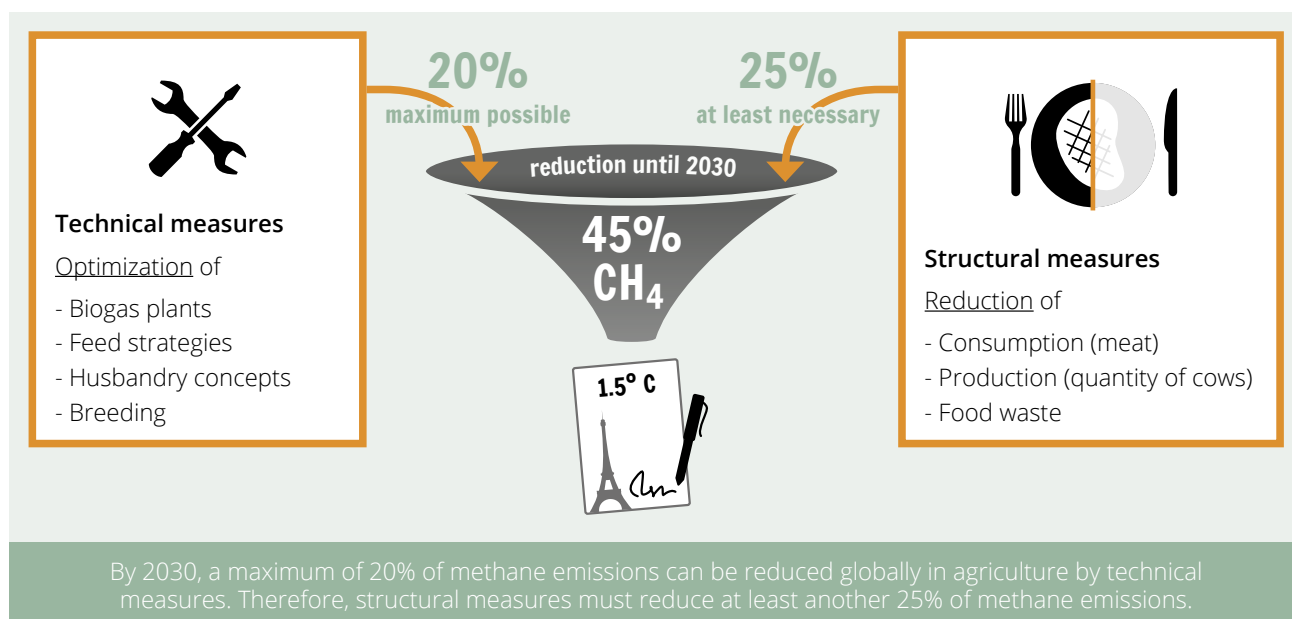


Figure 2: In order to meet the 1.5°C target, methane emissions must be reduced by 45% as of 2030.



*Figure 3: Technical measures are not enough to comply with the Paris climate target of 1.5°C.*

er, these measures are not sufficient for bringing about a reduction in emissions and for meaningful improvement. Politically, the EU and the member states lack the will to implement the scientific findings and to set effective targets for reducing ammonia and methane emissions.

### **ONLY ONE THING HELPS: RESTRUCTURE AGRICULTURE, REDUCE LIVESTOCK NUMBERS**

EU countries can only reduce ammonia and methane significantly if they transform agriculture and reduce livestock numbers substantially. Ammonia emissions fall by 43 percent if the meat consumption of EU citizens is halved. (Source: UN ECE Report, Assessment Report on Ammonia, UN Economic and Social Council, 2021). To limit climate change and meet the global Paris climate target of 1.5°C, methane emissions must be reduced by 45% until 2030.

### **EAT LESS MEAT, PRESERVE CLIMATE AND NATURE**

With technical means, farmers can reduce methane and ammonia emissions by giving cattle and cows emission-optimised feed, by storing manure and slurry separately from each other and in a closed area, or by converting the stables. However, these

technical changes are not enough. Only a significant reduction in livestock numbers will lower harmful emissions. This means fewer cattle, milk cows and pigs – as well as a decreased consumption of meat and dairy products. EU-citizens have to shift their diet to more plant-based foods so that agriculture is forced to produce fewer animal products and keep fewer farm animals. This means that the whole of society is called upon to contribute with its behaviour to a climate-friendly and environmentally compatible agriculture.

### **WE PROPEL THE PROCESS OF CHANGE**

Deutsche Umwelthilfe, France Nature Environment, the European Environmental Bureau as well as the Lake Constance Foundation have built up political pressure in Germany, France and in the EU institutions in Brussels. With events and during intensive discussions with MPs, representatives of ministries, political parties, agricultural associations and the food industry, we succeeded in putting agricultural methane and ammonia reductions on the political agenda. In doing so, we have impelled the process of change for a more climate-just and environmentally friendly agriculture. Yet this remains a procedure that the project partners will continue to animate politically beyond the project duration of EU LIFE Clean Air Farming.

## Ammonia - a big load of bullshit

Ammonia is a gaseous nitrogen compound that originates to 94 percent from slurry and manure from animal production. Together with other air pollutants such as sulphur dioxide and nitrogen oxides, ammonia forms the harmful particulate matter PM<sub>2.5</sub>. Ammonia is thus a precursor to one of the largest air pollutions in Europe. In regions with dense populations of pigs, cattle and other animals in agricultural production in Germany and France, ammonia is responsible for more than half of the particulate matter.

Ammonia from agricultural animal husbandry in fattening and breeding stables endangers human health and, as particulate matter, can reduce lifespan by several months. According to the European Environment Agency, hundreds of thousands of people die prematurely each year in the EU as a result of particulate matter. In 2019, 53,800 people in Germany and 29,800 in France died prematurely from the effects of particulate matter on the cardiovascular system and respiratory organs.

dissolves to form ammonium; in the air, ammonia reacts with nitrogen oxides and sulphur dioxide to form ammonium salts (particulate matter PM<sub>2.5</sub>). In the soil, ammonia forms nitrate and nitrous oxide, one of the strongest greenhouse gases. Ammonia escapes from stables, and flows out of slurry tanks as well as manure stores. In areas with large numbers of livestock, ammonia emissions are 3 to 5 times higher per hectare than the European average. With better stables, tanks and improved husbandry systems, farmers could reduce ammonia emissions and contribute to air pollution control. For instance, it is crucial that urine and faeces are stored separately. In more species-appropriate forms of husbandry such as organic farming, this is done naturally by providing the animals with different areas for urinating, defecating, sleeping and eating.

A large number of stables and fattening facilities need to be transformed. We see it as a success of our public relations and campaign work in the Clean Farming project that the German government, which has been in power since 2021, wants to support German farmers financially with regard to the conversion of their stables.

### AMMONIA DRIVES NITROGEN SURPLUS

Yet ammonia is only the basic material for a whole series of nitrogen compounds. In water, ammonia

### DAMAGES COST BILLIONS OF EUROS

European farmers use a large part of slurry and manure as fertiliser. They apply slurry, manure and





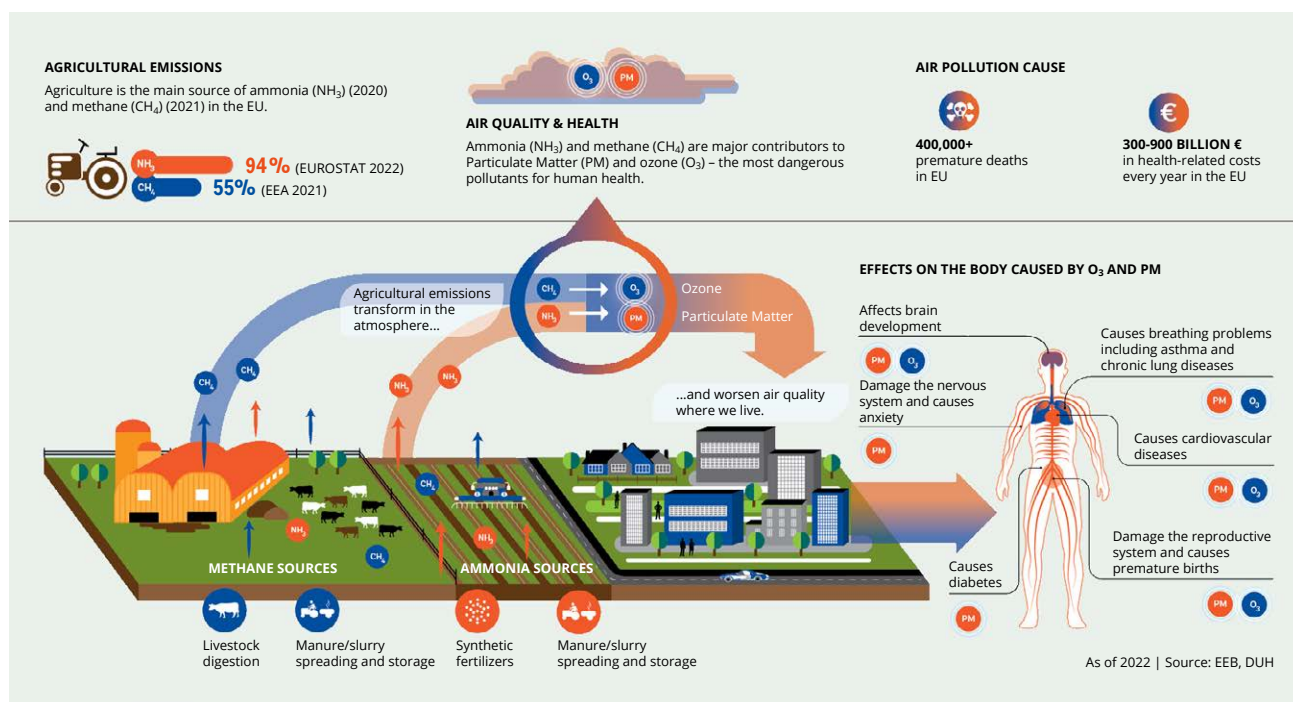


Figure 4: The agricultural sector is an important source of air pollutants, which have a major impact on our health.

thus a large proportion of the ammonia directly to fields and meadows to fertilise field crops and soil-age. In this way they actively feed the nitrogen cycle and the excess nitrogen costs society a lot of money. The damage to nature and human health averages 17.50 euros per kilogram of ammonia. In Germany, Belgium and the Netherlands, the external costs amount to 30 euros/kg of ammonia.

Ammonia emissions could cost European countries up to 60 billion euros in 2030. This corresponds to half the income of farmers in the EU. In other words, the present agricultural system is too expensive for society as a whole. To avoid these external costs to the environment, climate and health, agriculture should only release half as much ammonia into the environment. That means fewer animals on the same area. This would mean that the remaining farm animals would have more space in the stables or would live outdoors. The animals' living conditions would be improved, which is what a large part of the citizens in the EU countries are demanding.

Reducing the number of farm animals would also solve a range of other environmental problems: Less forest could be cleared in the global south to grow soya for animal feed in Europe. In addition, farmers

would require fewer antibiotics during the fattening process since the animals don't need to be herded together so closely. The price of beef and pork would increase due to animal welfare and environmental protection. The meat would be 25 to 35 per cent more expensive.

#### AMMONIA DAMAGES BIODIVERSITY ON LAND AND IN WATER

Ammonia also has a lethal effect in nature. Plants, lichens, insects and other invertebrates in particular suffer directly from ammonia or from the nitrogen compounds it produces. If grasses, herbs and flowering plants disappear, bees, bumblebees and butterflies also perish and with them the basis of life for most species of songbirds, frogs and other animals vanishes. Ammonia damages biodiversity in ecosystems on land and in water. Ammonia emissions also contribute significantly to the eutrophication of lakes, rivers and the Baltic Sea, worsening the living conditions for fish, mussels, snails, crabs and other animals. In the increasingly hot, low-rainfall summers of the climate crisis, ammonia thus also promotes the mass spread of toxic blue-green algae in various bodies of water.

## Methane drives the climate crisis

Methane is the most important greenhouse gas after CO<sub>2</sub>. Methane released into the atmosphere by humans has already caused the global temperature to rise by 0.5 degrees Celsius since the beginning of the industrial age (source: IPCC). Most of the climate-damaging methane comes from agricultural livestock farming. In the EU, 80 percent of methane in agriculture escapes from the digestive processes of cattle for meat and milk production. Other ruminants such as sheep also contribute to methane emissions. Fewer cattle and dairy cows, less meat and dairy products make the difference in climate protection. The global community must nearly halve methane emissions by 2030 to meet the 1.5 degree target of the Paris Climate Agreement.

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And reducing methane emissions has a timely effect, because methane degrades after only 12 years in the atmosphere. Other gases take several hundred years to decay. So producing less methane immediately helps to slow down the global temperature rise.

However, methane emissions from livestock farming also damage nature, the environment and human health. Ground-level ozone is formed from methane, which attacks human health and was responsible for 16,800 preliminary deaths across the EU in 2019. Ground-level ozone also damages biodiversity and reduces agricultural yields on arable land.

## Agriculture is part of the problem - and also part of the solution

In numerous workshops, conferences and background discussions, we discussed with agricultural and economic scientists, members of parliament and experts from the agricultural and food industries. We have organised the exchange of ideas very broadly, because we wanted to gather as much scientific knowledge as possible about animal husbandry, livestock breeds, stable construction, feed and fertilisation with manure and slurry.

European scientists have shown that methane production in cattle stomachs can be slowed down by

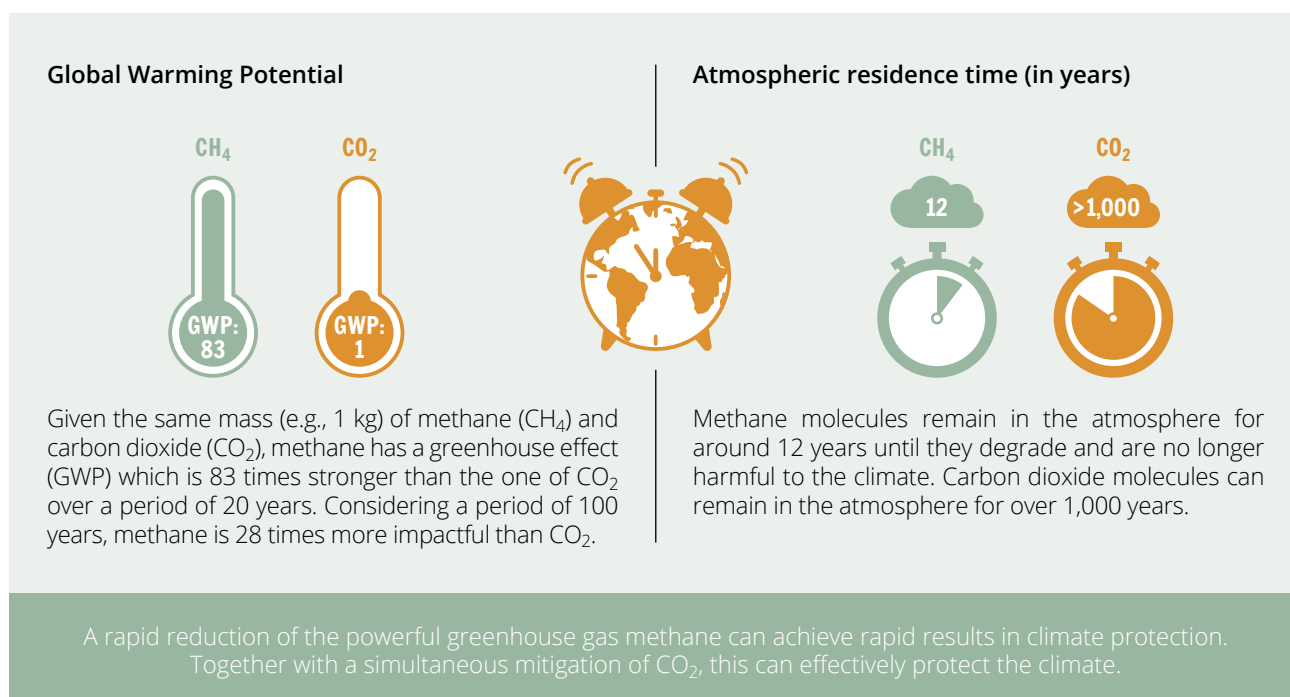


Figure 5: Methane must be mitigated as quickly as possible so as to avoid climate shock.



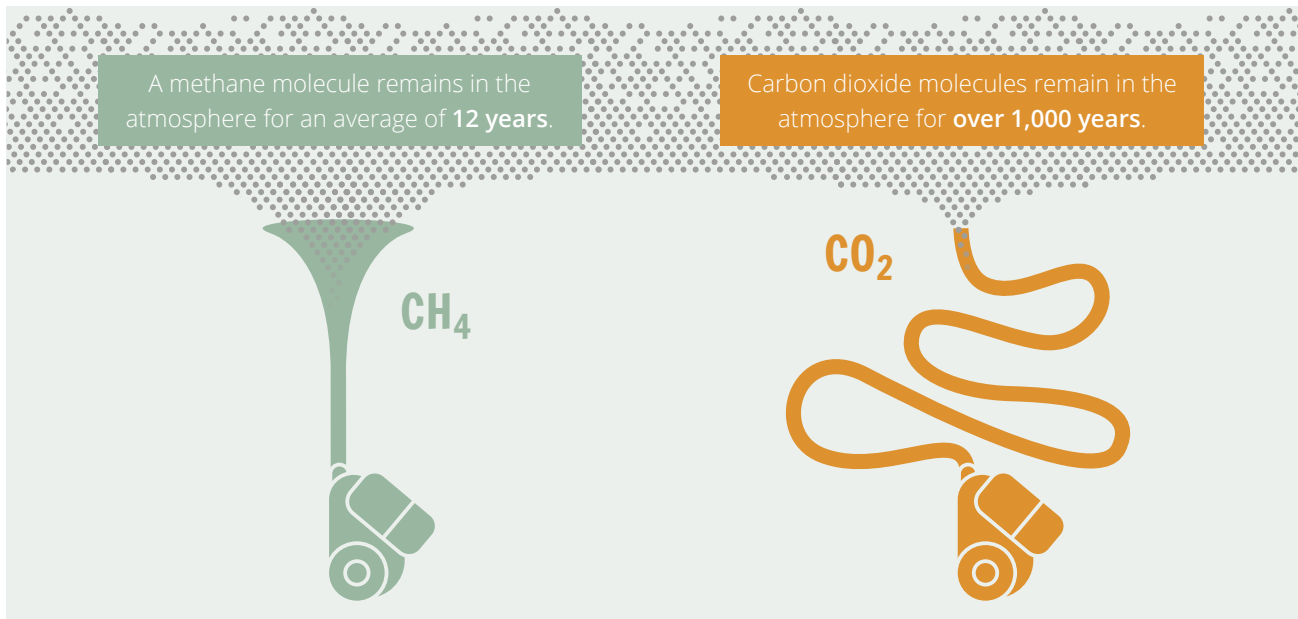


Figure 6: Methane is a short-lived greenhouse gas – its reduction yields swift successes.

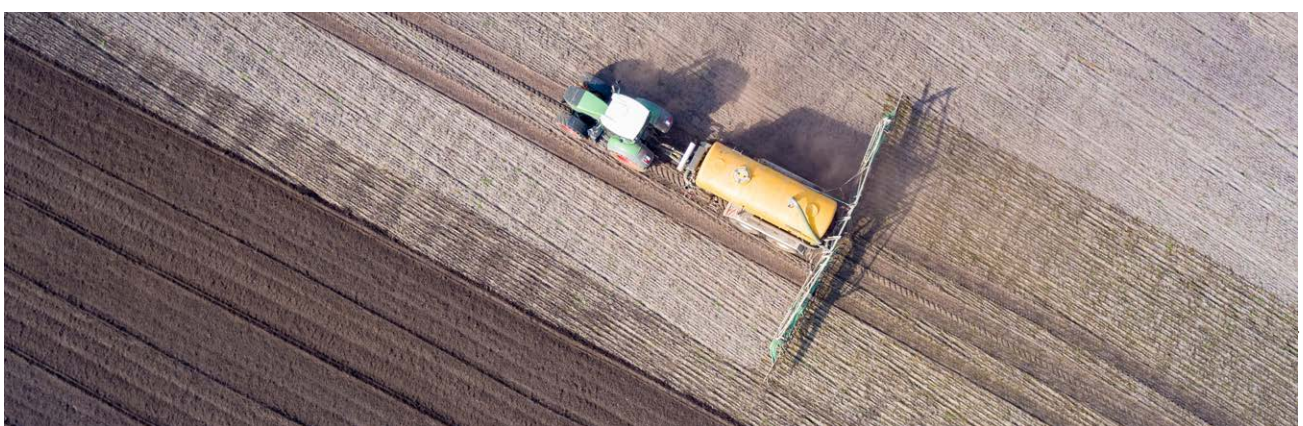
changing the composition of feed, for instance via other types of grass and feed additives. Farmers can also rebuild their stables, store manure and slurry in closed barns and inject it directly into the soil instead of spreading manure and slurry over a wide area of meadows and fields. But the technical solutions are not enough to reduce methane and ammonia emissions significantly.

Only one thing really helps: substantially fewer animals in agricultural production. Fewer cattle, pigs, chicken and other species in stables, fewer farm animals per hectare of land. Experts have a whole range of suggestions as to how to determine a maximum number of cattle or pigs per agricultural area.

As agriculture is part of the problem, it is also part of the solution. But all consumers, the food industry and politicians must participate. Society as a whole is called upon to reduce the high animal populations.

## A task for society as a whole

One way to improve this is via the change of eating and living habits. We have therefore informed the public and the federal government in Germany with a broad-based campaign on food waste. Under the slogan "Ackern für die Tonne" (Farming for the Barrel), we convinced more than 200,000 people to sign a petition against food waste. With a legal study we informed politicians in government and parliament about the juridical obstacles to food distribution or the use of crooked, non-standard vegetables. Notably, it is not only at home or in restaurants that Europeans waste food. A large part of the vegetables and fruits grown, but also hundreds of thousands of farm animals, end up in the rubbish straight from the field and the stables. Every year, 89 billion kilograms of food end up directly in European dustbins. If food waste were a country, it would be the third largest emitter of climate-damaging greenhouse gases.



## Inform, negotiate, educate - we talk to everyone about clean air in agriculture

The campaign against food waste was one way in which we advanced the goals of the Clean Air Farming project. Since the transformation of agriculture and the reduction of livestock is a task for society as a whole, we addressed all stakeholders from the beginning. We wanted to involve representatives of agriculture and politics, the food industry and the public. It also seemed crucial to us to address young farmers. We therefore sought exchange with vocational and technical colleges in agriculture in order to discuss opportunities for reducing ammonia and methane emissions from agriculture and to bring climate protection and nature conservation more into education. We have initiated the political discussion with a study on the economic means for the conversion of livestock farming. On behalf of the Clean Air Farming Project, scientists have calculated how financial incentives can support environmentally and climate friendly and species-appro-

priate animal husbandry. We discussed the results of the study with representatives from politics and agriculture and introduced them into the political processes.

## Demonstrate, post, take action - engage the public

In addition to the workshops and conferences, we disseminated our issues in high-profile actions and campaigns. For this purpose, we used social media such as Facebook and Instagram, but also carried out media-effective campaigns. Publicly, we handed over the petition for the "Ackern für die Tonne" campaign to the State Secretary in the Federal Ministry of Food and Agriculture, Dr. Manuela Rottmann.

At the rally "We're fed up!" (WHES) we reached a large public with actions against agricultural policies and practices. Every year in January, shortly before



*Figure 7: Clean Air Farming sets an indication against food waste with the start of the petition "Farming for the Barrel/Ackern für die Tonne" in front of the German Ministry of Agriculture with State Secretary Dr. Manuela Rottmann.*





Figure 8: WHES 2020 protest action "Slurry King" (© Stefan Wieland)

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Figure 9: WHES 2021 protest action „Fleisch-Soli“

the Green Week in Berlin, around 100,000 people demonstrate under the motto "We're fed up!" for more animal welfare and an environmentally and climate-friendly agriculture, for a food transition and sustainable agriculture.

## Active and targeted press relations

Thanks to the intensive exchange with experts in the events and the data gained there, we managed to do very well-founded press work. For media professionals in the project countries and at the EU level in Brussels we were sought-after contacts. The journalists knew how to use our expertise for their reporting on the complex issues. Through targeted press work, we also brought the topics of agriculture, ammonia and methane emissions, air pollution control, climate protection and health into the media promptly. This was done in particular on selected occasions, such as the publication of the National Clean Air Programmes and the analysis reports on their implementation by the EU Commission.





Figure 10: Social media campaign week of action “agriculture” for the federal election Germany 2021.

We explained the project’s demands and positions in direct exchanges with political decision-makers. Our arguments were bolstered by solidly prepared, factual information with which we raised awareness of the issue of methane and ammonia emissions from agriculture. In the discussions, we called on politicians to introduce reductions in the ongoing negotiations, e.g. on the Gothenburg Protocol or the EU methane strategy. Our broad-based campaign during the German election campaign for the 2021 Bundestag elections was also well received in the media and on social media channels.

## Aims of the project

- To make the associations of the meat and milk producing industry as well as the food industry aware of the necessary reduction of methane and ammonia emissions and to enter into an exchange with them about a goal-oriented common position. The “Interessensgemeinschaft gesunde Gülle” has supported this, others were not yet able to join during the project period, but have been informed about the discussion and the position paper.

- Involve civil society organisations such as DUH, European Environmental Bureau and France Nature Environment in the legislative processes and work on the implementation of national clean air programmes.
- Expand agricultural vocational training curriculum to inform future farmers about the impact of their own actions and provide practical tools to avoid emissions.
- Reduce food waste. Resource efficiency in food production is to be increased and emissions of methane and ammonia reduced.

## What we have achieved

We all need much more of a long breath and staying power than we thought at the beginning of the project. The changes in animal husbandry and agricultural meat and milk production are extensive. They concern animal husbandry, stable construction, feed as well as eating habits, purchasing behaviour and the training of farmers. During the course

of the project, we realised that even factually correct arguments are not necessarily convincing or even persuade those involved to change. We therefore see the four years of the project as an accelerator of a social debate on the future direction of agriculture.

We therefore see the following four developments at the different levels of our work as the most important successes of our information and publicity campaign to reduce ammonia and methane emissions:

1. The EU recognises the relevance of agricultural emissions and includes the agricultural sector in the EU methane strategy after we, together with other European environmental organisations, wrote letters to MEPs, submitted petitions and did extensive press work, including our own studies.
2. The international Gothenburg Protocol on Long-Range Transboundary Air Pollution control sets stricter reduction targets for ammonia and is working on the inclusion of methane in the ongoing improvement rounds (review process). Synergies from the areas of health, climate protection and air pollution control serve as drivers here.
3. The three parties of the new German government – elected in September 2021 – included commitments to a reduction of methane and ammonia emissions with respect to the agricultural sector in their coalition agreement.
4. France adopts a national plan for less emitting application equipment in agriculture (slurry directly incorporated into soil, abolition of spraying) as part of the clean air programme. With this, France implements the European directive on air pollution control NEC.



Figure 11: Campaign to launch the "Farming for the Barrel/Ackern für die Tonne" petition.

## What still needs to be done

With the Clean Air Farming project, we have brought movement into the political discussion on methane and ammonia. With this momentum, we continue to work on ensuring that national governments and the EU rapidly reduce emissions. In the Global Methane Pledge, the EU and a total of 110 countries have committed to reducing global methane emissions by at least 30 percent by 2030. As the EU has launched this global methane wake-up call together with the US, they must lead the way and cut methane emissions quickly and sharply.

We also keep ammonia on the agenda. In talks and with high-profile campaigns, we constantly remind the political decision-makers to add stricter ammonia reduction targets to the clean air plans and the EU NEC Directive. And we continue to promote more vegetables, less meat, less manure and more crooked things from the field.

With all these efforts, we can make a significant contribution to achieving the United Nations Sustainable Development Goals.



Figure 12: "Clean Air Farming" contributes to these „Sustainable Development Goals“.





*Photos: DUH; stock.adobe.com (Stephen Butler, HQUALITY, Frank Seifert, agrarmotive, Jürgen Nickel, Countrypixel, Christian Schwier. Graphics: Lütgebüter/DUH*

## You can find more information under the following links

[www.clean-air-farming.eu](http://www.clean-air-farming.eu)

[Global Methane Assessment](#)

[IPCC Sixth Assessment Report](#)

[Position paper Methane emissions from agricultural sector](#)

[Empfehlungen zur Luftreinhaltung für die Lebensmittelbranche](#)

[Farmer's experiences of air quality in dairy farming](#)

[Food waste Reduce in the retail sector](#)



# clean air farming

## ABOUT CLEAN AIR FARMING

With the EU-funded project „Clean Air Farming“ (LIFE17 GIE/DE/610), Deutsche Umwelthilfe and its partners are working to reduce ammonia and methane emissions caused by agriculture. To protect climate, biodiversity and health, we are strengthening competencies within the agriculture and food sectors and advancing technical, legal and political solutions. The project started in August 2018 and ended in July 2022. The project started in summer 2018 and ended in July 2022.



Deutsche Umwelthilfe



Further information on the project can be found at:  
[www.clean-air-farming.eu](http://www.clean-air-farming.eu)

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