

Tackling Methane Emissions: Now And In The Future

What is Methane

Methane is the second most important greenhouse gas (GHG), around 80 times more powerful than carbon-dioxide (CO₂) over a 20-year period, and is responsible for a third of the global warming experienced to date.¹ The latest Intergovernmental Panel on Climate Change (IPCC) report states that global methane emissions must be reduced by 34% below 2019 levels, by 2030, to meet the goal of the Paris Climate Agreement and prevent climate tipping points from irreversibly changing the planet's climate system.² The UN Environment Programme's Global Methane Assessment further found that methane emissions must be reduced by 45% by 2030, compared to 2020 levels.³

More than half of global methane emissions are anthropogenic, produced primarily by the agriculture sector (animal husbandry, land use), the waste sector (landfills and wastewater) and the energy sector (extraction and transport of fossil fuels). The European Union (EU) has committed to reducing GHG emissions by at least 55% by 2030 through the Green Deal. Due to its short atmospheric lifetime (12 years), cutting methane emissions across the agriculture, waste and energy sectors is one of the most critical policy levers to reach that objective.

In 2021, the EU and the United States launched the Global Methane Pledge (GMP), setting out a collective goal to reduce methane emissions by 30% by 2030. As co-creator of the Pledge, and champion of sustainability and climate action, the EU has a duty to align its legislation with the goal of the GMP, and take decisive action on methane emissions.

Methane is also a precursor of air pollution: once released, it forms ground-level ozone which causes several health and environmental issues. In 2022, 94% of the EU urban population was exposed to ozone levels above World Health Organisation (WHO) Global Air Quality Guidelines.⁴ In 2021, in the EU-27, 22,000 deaths were attributable to short-term exposure to ozone concentrations above 70µg/m³. This figure rises to 108,000 potential attributable deaths when lower concentrations (below WHO guideline levels) of ozone are considered.⁵ Communities most susceptible to these impacts are those in society that are already vulnerable, thereby compounding and reinforcing structural, social and historical inequities.⁶

Moreover, as highlighted by the European Environment Agency (EEA), ozone also damages vegetation, including agricultural crops, forests and other plants,

- 1 Intergovernmental Panel on Climate Change (2013). Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change: Anthropogenic and Natural Radiative Forcing. Page 714. Available here.
- 2 IPCC (2023): Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Page 21, 22. Available here.
- 3 UNEP (2021): Global Methane Assessment- executive summary. Page 6. Available here.
- 4 European Environment Agency (2024): Europe's air quality status 2024. Available here.
- 5 European Environment Agency (2023): Harm to human health from air pollution in Europe: burden of disease. Available here.
- 6 IPCC (2022): Climate Change: Impacts, Adaptation and Vulnerability. Available here.

as it reduces their growth rates and yields, and has negative impacts on biodiversity and ecosystem services. Some crops, including wheat, rice and beans, have been found to be particularly sensitive to ozone. In 2015, estimated wheat production losses in Europe due to ozone were 23.8 million tonnes - greater than the annual production of Ukraine (21.8 million tonnes).⁷ Recent work under the Long-Range Transboundary Air Pollution Convention shows that even with full implementation of the Gothenburg Protocol, significant production losses of wheat due to ground-level ozone will still occur, with an estimated 16.8 million tonnes lost across Europe in 2050.⁸ Low income consumers are particularly at risk from higher food prices,⁹ meaning that decreased availability and increased prices of staples such as wheat contributes to increased risk of malnutrition and food insecurity for marginalised and vulnerable communities.¹⁰

The interactions of these negative and compounding social impacts of methane emissions are however an indication of the possible reinforcing positive impacts

of environmental action. Renewable energy production can reduce methane emissions while contributing to energy security and the delivery of vital air conditioning services during increasingly hot summers. Improved waste management can reduce methane emissions, contribute to reduced food waste and sequestration of carbon in soils, reduce the risk of exposure to disease and improve mental health where it contributes to cleaner environments. While increased access to nutritious, plant-rich, and low-emission food can improve health, reduce disproportionate emissions, and increase food security.¹¹

With the Zero Pollution Action Plan, the EU has committed to cut premature deaths due to air pollution by at least 55%, compared to 2005 levels. The Commission also more specifically recognised, in the NEC Directive, that there is a “strong air quality case” for cutting methane emissions and that “it will consider measures for reducing those emissions, and where appropriate, submit a legislative proposal to that purpose.”¹²

Current state

To date, methane emissions have largely escaped scrutiny from EU policymakers but the tide is turning. As part of its commitment to the GMP, the Commission released its EU Methane Action Plan in November 2022, outlining existing policies as well as further activities to reduce methane emissions until 2030 and beyond.¹³ This was followed by the development of the EU Methane Regulation in the energy sector, recently adopted by both the European Parliament and the Council of the European Union. However, large gaps remain in the EU’s approach to methane emissions reduction.

First, the EU Methane Action Plan relies heavily on existing policies and regulations that have little relevance to methane, with the exception of the energy sector. The Plan states that under EU climate policy, “three different pieces of legislation cover different sectors and GHG and set specific GHG reduction targets for each”. Methane emissions are drastically overlooked in the referenced legislation: The Emissions Trading System (ETS) does not currently cover methane; the Land Use, Land Use Change and Forestry (LULUCF) Regulation “is expected to have a limited impact on absolute CH₄ emissions in the EU”; and the

upcoming revision of the Effort Sharing Regulation does not have a methane reduction target, despite this legislation covering “almost all CH₄ emissions in the EU”. Despite claims that this allows flexibility to Member States in reducing their non-CO₂ emissions, in reality it constitutes an avoidance of responsibility and a lack of leadership by EU policymakers. Under the Methane Action Plan, the 2020 Reference Projection predicts an emission reduction of around 12% by 2030 compared to 2020. When the newly proposed policies of the Fit-for-55 package are considered, an emission reduction of an estimated 23% is predicted by 2030 compared to 2020. Existing policies are not sufficient to deliver the 30% ambition level of the GMP.

Second, there is no methane target. The GMP represents an important milestone, but the initiative falls short of the cuts needed to keep warming within 1.5°C. Aside from the overarching goal of the Pledge, binding EU and national methane reduction targets are still missing. These are a key element to both trigger and maintain progressive action by Member States in cutting methane emissions from all sources and to also secure coherence in all relevant EU policies and legislation touching on the key responsible sectors. Targets are key to send signals to markets, unlock financing, and provide a direction of travel. Methane mitigation targets are needed to align with the goal of reducing net GHG emissions by at least 55% by 2030 and to achieve WHO recommendations on ground-level ozone maximum concentration levels. In April 2024, Ministers of the G7 countries committed to accelerate methane measures with the aim of reducing global methane emissions by at least 35% by 2035.¹⁴ Countries outside of the EU are taking bolder action. At national level, Vietnam has set a 2030 target under its methane action plan to reduce overall emissions by at least 30% below 2020 levels (13.34% by 2025), with specific emission ceilings for each sector.¹⁵ While Canada has outlined reduction measures and supporting programmes to reduce domestic methane emissions by more than 35% by 2030, compared to 2020.¹⁶ Without clearly defined targets, the EU will

quickly move from a leader to a laggard on methane mitigation.

Third, existing regulatory frameworks in the agriculture, waste and energy sectors are insufficient to cut methane emissions at the scale required:

In the agriculture sector, despite the Commission recognising in its methane action plan that more must be done to achieve the goal of the GMP, insufficient action has been taken up to now. Given the significant health implications of the continued overconsumption of meat and dairy, along with the health and environmental impacts of ground-level ozone, addressing methane emissions in the agriculture sector is a win-win and a must.

Comprehensive and coherent legislative change and political commitments are needed to achieve the necessary reductions for the Paris Agreement. Agriculture is responsible for 54% of the EU’s methane emissions, yet there are currently no binding objectives and no mandatory measures to reduce methane, as the focus has been on measurement of emissions only.

The gap in regulation is evident in the lack of sustained reductions of methane emissions in the agriculture sector since 2005, non-CO₂ GHG emissions have declined by only 2%. National policies and measures currently in place across the EU are expected to deliver further reductions of only 1.5% by 2040. Notably, progress in practices and technology have been offset by increased demand for meat and dairy.¹⁷ Despite the harmful effect of overconsumption of meat and dairy in public health across the EU, funding through the Common Agricultural Policy (CAP) continues to disproportionately support industrial livestock farming. Without change, reductions in methane emissions in the agriculture sector will continue to stagnate, resulting in adverse effects on productivity, human health, food security and environmental health.

7 UNECE (2023): New evidence shows impact of ozone, heavy metals and microplastics on natural vegetation and crops. Available Here.
 8 Economic Commission for Europe (2022): Report on the review of the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone. Available here
 9 The Global Climate and Health Alliance (2023): Tackling climate change could be the greatest global health opportunity of the 21st century. Available here.
 10 The Global Climate and Health Alliance (2023): Mitigating Methane from Food and Agriculture a Global Health Strategy. Available here.
 11 Changing Markets Foundation (2024): The New Merchants of Doubt: The corporate playbook by Big Meat and Dairy to distract, delay and derail climate action. Available here.
 12 European Commission (2016): National Emission Ceilings Directive. Available here.
 13 European Commission (2023): European Union Methane Action Plan. Available here.

14 G7 Italia (2024): Climate, Energy and Environment Ministers' Meeting Communiqué. Available here.
 15 IEA (2023): Viet Nam Action Plan for Methane Emissions Reduction by 2030. Available here.
 16 Government of Canada (2022) Faster and Further: Canada’s Methane Strategy. Available here.
 17 European Environment Agency (2022): Progress and prospects for decarbonisation in the agriculture sector and beyond. Available here.

Significant potential for methane reduction exists and can be easily addressed with existing reduction measures. While technological solutions will not be enough to cut methane emissions from agriculture to the level needed to achieve the objectives of the Paris Agreement, a suitable combination of measures that address both the production and consumption of meat and dairy products would help achieve the methane reduction commitment and support the EU's claim to be a frontrunner on methane emissions reduction.

In the waste sector, the EU methane strategy emphasises the importance of stricter compliance with existing laws, particularly maximising the diversion of biodegradable waste from landfills through separate collection and composting, and phasing out the landfilling of untreated residual waste (with stricter enforcement of related obligations to pretreat, as stipulated by Directive 99/31). A multi-faceted approach is essential to significantly reduce methane emissions from landfills, focusing on both preventing methane generation and enhancing mitigation efforts.

The strategy begins with developing food waste prevention programmes, therefore stopping potential methane emissions before the threat even emerges. Second, in this strategy is the enhancement of waste separation and the effective treatment of bio-waste, which is primarily through composting or anaerobic digestion. Increasingly nowadays in Europe, bio-waste treatment also includes biogas production and subsequent use as a renewable energy source. Biological stabilisation of residual waste may then avoid any further possibility of generating methane from landfills, while at the same time avoiding the release of CO₂ from incineration.

In the energy sector, the EU Methane Regulation fails to sufficiently address emissions associated with fossil fuel imports. The EU is the world's largest importer of fossil fuels. Nearly all of the methane emissions from coal operations occur upstream. The same can be

said for 3/4 of the methane emissions linked to oil and gas operations.¹⁸ As a result, about 75-90% of methane emissions associated with EU fossil fuel consumption occur outside EU borders.¹⁹ Domestic measures are vital, but the EU is liable for the upstream emissions emitted outside its border.

While negotiations on the EU Methane Regulation progressed from the Commission's initial proposal lacking measures on imports, to an intensity standard to be applied within 6 years of adoption, the measures remain undefined and untested. This final text falls short of the comprehensive and practical mitigation measures that many stakeholders supported: the implementation of leak detection and repair (LDAR) and limits to venting and flaring (LVF) to the full supply chain. Intensity standards focus on reducing methane emissions per unit of output but do not directly limit total aggregate emissions. Therefore, if production increases, total emissions can still rise even with a lower methane intensity standard. The methodology for the intensity standard is yet to be defined.

Many relevant stakeholders support a 0.2% intensity standard, expressed as cubic meters (m³) of methane emitted per m³ of gas produced. The European Parliament, through its adopted amendments, called on the Commission to assess the impact of setting a methane intensity standard at or below 0.2%.²⁰ Similarly, the Oil and Gas Climate Initiative, representing 12 leading energy companies worldwide, aims for a 2025 target intensity well below 0.2%. A recent study by Kayrros found that EU gas suppliers' methane intensity in 2022, expressed in thousand cubic feet (MCF), ranged from 0.5g/MCF to a high of 0.87 kg/MCF. Translated into m³ of methane emitted per m³, this represents an intensity range between 0.00246% and 4.29%.²¹ The upper end of this range significantly exceeds the proposed 0.2% intensity standard, highlighting the need for concrete mitigation measures to ensure compliance.

18 International Energy Agency. Methane emissions from oil and gas operations. Available here.

19 European Commission (2020). Inception Impact Assessment: Proposal for a Legislative Act to Reduce Emissions in the Oil, Gas and Coal Sectors. Page 4. Available here

20 European Parliament (May 2023). Amendments adopted by the European Parliament on 9 May 2023 on the proposal for a regulation of the European Parliament and of the Council on methane emissions reduction in the energy sector and amending Regulation (EU) 2019/942, Amendment 121. Available here.

21 To convert methane intensity from grams per MCF to cubic meters of methane emitted per cubic meter of gas produced: First convert intensity from grams per MCF to grams per cubic meter using the conversion factor of 1 MCF ≈ 28.3168 m³. Second divide these values by the density of methane at standard conditions methane density (716 g/m³) to obtain intensity expressed in cubic meters of methane emitted per cubic meter of gas produced. Resulting range: Approximately 0.000246 m³/m³ to 0.0429 m³/m³.

Finally, the envisioned time frame is too protracted to align methane emissions reductions with the 1.5°C Paris target.

Addressing shortcomings

The EU has a unique opportunity to deliver deep methane emissions reductions by 2030 and beyond. It is crucial that the new Commission integrate concrete measures to address methane emissions when revising relevant legislation in the coming years. Now is the time for ambitious and decisive action from policymakers. To ensure the EU meets its climate targets, the following steps can be taken on methane emissions:

1. Set a target

The EU must develop a binding methane mitigation target. A binding target sets the baseline for any mitigation action plan, providing a clear objective to guide the measures adopted, and a reference point to track progress.

In February 2024, the Commission presented its assessment for a 2040 EU climate target, recommending a 90% net reduction of GHG emissions, relative to 1990.²² It is clear that concrete measures leading to deep methane emissions reductions will be needed to achieve this target. It falls to the new Commission to integrate the 2040 target into the European Climate Law. The EU is also due to submit a 2035 revision of its Nationally Determined Contribution (NDC) to the Paris Agreement by February 2025, ahead of COP30. The GMP time horizon extends only to 2030. A dedicated target to reduce methane emissions towards zero will ensure that the post-2030 policy framework is fit to reduce methane emissions from all sectors with the urgency required to deliver climate neutrality and limit warming to 1.5°C.

The ongoing review of the National Emission reduction Commitments Directive (NECD), expected to be finalised by the end of 2025 at the latest, offers a key opportunity for the European Commission to cut

22 European Commission (2024). 2040 climate target. Available Here.

23 European Environment Bureau (2023) Views and expectations on a revised Gothenburg Protocol. Available here.

methane emissions and reduce ground-level ozone concentrations in all Member States. National Emission Reduction Commitments for methane should be included in a revised NECD, setting binding targets for the years 2030, 2035 and 2040, with an obligation to maintain a linear trajectory. Member States will then be in the position to identify, select and implement the measures that will allow them to comply with these binding objectives (as part of their National Air Pollution Control Programmes).

The revision of the Gothenburg Protocol (to the UNECE Long-Range Transboundary Air Pollution Convention) started in December 2023. This is an important opportunity to secure commitment by UNECE countries, as well as the US and Canada, to cut methane emissions across the Northern Hemisphere. During negotiations, the EU - guided by the Commission - should push for the inclusion of methane emissions reduction targets in the revised Protocol, for the same set of years relevant for the NECD (2030, 2035, 2040). Civil society's detailed position on this is available.²³

An overall binding target could be made up of indicative targets for the three sectors, allowing some flexibility to Member States in developing their future National Energy and Climate Plans (NECPs) under the Governance Regulation.

2. Strengthen measures for each sector

To maintain its leadership role and demonstrate unwavering commitment to the GMP, the EU must strengthen the Methane Regulation, and take action to mitigate methane emissions from the agriculture and waste sectors.

In the agriculture sector, technical reduction measures must be accompanied by dietary shift and a reduction in meat and dairy production, implemented as quickly as possible. Such measures will future-proof agriculture policy, ensure a just transition for farmers and support vulnerable citizens impacted by food insecurity. Shifting diets would also ensure fairer and more sustainable land use, improved health, and re-

duction of other emissions associated with meat production, including CO₂ and nitrous oxide. Reduction of food waste must also be seen as a benefit for action on climate, air quality and animal health, due to the reduction of unnecessary production. All measures should be undertaken in a way that takes into account the safeguarding of other crucial dimensions such as biodiversity and animal welfare so as to not create unintended adverse effects by focusing only on emissions.

The following actions are needed to require and support the industry to transition:

1. Revision of the NEC Directive to include binding methane reduction targets to ensure that action is taken at Member State level, resulting in reduced ground-level ozone concentrations and protecting people's health and the environment.
2. Integration of methane reduction objectives in the revised Gothenburg Protocol to ensure action by the international community.
3. Revision of the CAP to mandate the adoption and effective implementation of methane emissions reduction measures, with clear indicators and assessment and reporting mechanisms to monitor results, securing coherence with the polluter pays and pollution prevention principles.
4. Linking of subsidies to the agricultural sector with support for dietary shift, diversification of protein production and transition away from industrial agriculture to mixed production agroecological practices.

In the waste sector, robust waste separation at the source allows communities to effectively separate organic waste from other types of waste, increasing recycling rates and promoting composting. This approach significantly reduces the amount of biodegradable waste in landfills, thereby minimising methane generation. To encourage source segregation, the EU needs to establish mandatory collection targets. Currently, the requirement to separately collect bio-waste

is weakly enforced and does little to incentivise high performance. For instance, the existing EU requirement can be met by simply placing a large, unlocked bin on a street for hundreds of apartments, which is far less effective than door-to-door collection models.

Additionally, setting goals for EU Member States to reduce residual waste generation per capita and/or to limit the amount of biowaste in residual waste (measured in kilograms per person per year) would incentivise municipalities to implement systems that maximise bio-waste composting at home and in community composting systems, or ensure separate collection. This would prevent bio-waste from ending up in residual waste, and consequently in landfills and incinerators.

Adopting biostabilisation techniques is another crucial step. Treating biodegradable waste through aerobic processes before it reaches the landfill converts it into more stable forms, minimising methane production. Material Recovery and Biological Treatment (MRBT) systems support this effort by mechanically separating recyclables and biologically stabilising organic fractions, thereby reducing methane emissions from the remaining waste. The EU should replace the 10% landfilling target with a target of reducing the landfilling of untreated waste to zero.

Moreover, advanced landfill cover materials can significantly enhance methane oxidation, converting methane into biogenic carbon dioxide as it passes through the cover layers, which reduces the methane released into the atmosphere. Collectively, these measures could reduce methane emissions from landfills by 95%.

In the energy sector, significant strengthening of the Methane Regulation is needed via its implementing and delegated acts. Mitigation measures are required to tackle emissions associated with fossil fuel imports. The European Commission must extend limits to venting and flaring (LVF) and leak detection and repair programme (LDAR) measures to the entire supply chain. The EU has frequently adopted mandatory measures on imports accompanied by enforcement and verification frameworks. For example, the EU Timber Regulation prohibits the sale of illegally harvested timber and products derived from such timber on the

EU market.²⁴ Another example is the EU F-Gas Regulation, which places obligations on the destruction of HFC-23, a highly potent GHG, in the production of F-gases that are imported into the EU.²⁵ When establishing the methodology for the methane intensity standard in Article 27b of the regulation, the European Commission should integrate obligations, coupled with penalties for non-compliance, to subscribe to LVF and LDAR measures, similar to the ones established in Article 14 and 15.

3. Increase global leadership

The Global Methane Pledge, as it currently stands, remains just that – a Pledge – without the necessary commitments, institutions, mechanisms and financial support to drive substantial change. The EU, as co-creator, is in a position to take the lead in strengthening the governance framework around the Pledge.

Following the collective experience of various multilateral environmental agreements, stable and predictable financial assistance for enabling activities (institutional strengthening, capacity-building and training, policy development and implementation) is a critical component of any effective global governance framework. However, the current approach to funding for the GMP faces three major issues that undermine its effectiveness. First, it's inadequate. Of the 158 GMP signatories, 113 are recipients of official development assistance (ODA), yet the Climate and Clean Air Coalition (CCAC) only supports 40 of these, indicating a need for increased financial assistance to reach all developing countries. Second, it's project based. Funding is limited to specific projects, lacking comprehensive support across all enabling activities, leading to gaps in methane mitigation efforts. Third, it's unpredictable, which hampers countries' ability to invest in human resources and infrastructure, and to establish a coordinated approach to methane monitoring and mitigation, as consistent funding streams are absent.

For these reasons, as a priority, the EU should take the lead in instituting a dedicated fund for methane monitoring and mitigation for developing countries, with

well-defined timelines extending through 2030, supported by philanthropies and multilateral development banks. Financial assistance for enabling activities should be provided to all signatories in need, on a grant basis.

The EU should also leverage its diplomatic outreach to encourage other countries to either join the GMP, particularly countries with strong ties to the European market, such as Algeria or South Africa, or if already signatories, to technically support them to develop their methane action plans and regulations through best practices and knowledge exchange.

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Official Journal of the European Union (2010). Regulation Laying Down the Obligations of Operators Who Place Timber and Timber Products on the Market. Available here.

25

Official Journal of the European Union (2014). Regulation on Fluorinated Greenhouse Gases. Available here.

Conclusion

Methane is the second most important GHG and responsible for a third of the warming that has occurred to date. Reducing methane emissions is essential in the fight to limit temperature increase to 1.5°C in line with the Paris Agreement, while such action will also have important benefits for natural ecosystems, agricultural yields and human health (cutting ground-level ozone concentrations).

Methane's short lifespan makes it an attractive target for reducing climate warming quickly. As co-creator of the GMP, and in line with commitments made under the Green Deal, the EU has a duty to rapidly reduce its methane emissions, while supporting ODA countries to do the same. While positive steps have been taken, in the form of the EU Methane Action Plan and the EU Methane Regulation in the energy sector, large gaps remain in the EU's approach to methane emissions reduction overall and especially in the agricultural sector.

To ensure the EU meets its climate, environmental protection and air quality objectives, stronger measures on methane are needed. The EU and its Member States must develop binding methane reduction targets, built upon concrete technical and behavioural measures across all sectors. The incoming European Commission has the opportunity to take action on methane emissions in the coming years, delivering significant reductions as we approach 2030.