United Nations Secretary-General's

Call to action on methane

Three sectors, nine actions by 2030

United Nations

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The Secretary-General's call to action on methane:

Three sectors, nine actions by 2030

Executive summary

The world is set to overshoot the 1.5°C limit of the Paris Agreement. This overshoot will only be temporary if the world acts now. Every fraction of a degree above this threshold increases the risks of further ecosystem collapse, food insecurity, economic disruption and displacement. **Cutting carbon dioxide (CO_2) emissions remains essential to stabilizing the climate. But slowing warming in the near term will also require urgent action to reduce emissions of methane – a powerful greenhouse gas responsible for roughly one-third of today's warming.**

Methane emissions come primarily from three sectors: fossil fuels, agriculture and waste. In 2024, agriculture accounted for roughly 42 per cent of global anthropogenic methane emissions, fossil fuels approximately 38 per cent and waste 20 per cent. Rapid reductions across these three sectors represent one of the fastest and most effective opportunities to limit the scale and duration of overshoot.

According to the World Meteorological Organization's (WMO) 2025 State of the Global Climate report, atmospheric methane concentrations reached about 1,942 parts per billion in 2024 – roughly 266 per cent above pre-industrial levels and the highest in at least 800,000 years. Methane levels continued to rise in 2025, underscoring the urgent need for rapid action on one of the fastest and most effective levers available to slow near-term warming.

Methane is around 80 times more powerful than CO_2 over a 20 year period, yet it remains in the atmosphere for only about a decade. This means that cutting methane can rapidly slow the pace of warming. Methane is also a precursor to ground-level ozone, a harmful air pollutant that damages human health and agricultural productivity. Therefore, **rapid methane mitigation would deliver multiple benefits across a range of sectors, bringing cleaner air, improved public health, stronger crop yields and major economic gains.**

The latest assessment of the Intergovernmental Panel on Climate Change (IPCC) makes clear that limiting warming to 1.5°C by the end of the century requires deep cuts in methane emissions. Global methane emissions would have to fall around 34 per cent by 2030 and 51 per cent by 2050 relative to 2019 levels to remain consistent with 1.5°C pathways. The Global Methane Pledge (GMP), supported by 159 countries and the European Union, reflects growing international recognition of the need to rapidly reduce methane emissions. Delivering this pledge would avoid 0.1-0.2°C warming by 2050.

The opportunities and available tools for methane mitigation differ across the three emitting sectors. In agriculture and waste, solutions are advancing, but vary in cost, maturity and scalability. However, **in the fossil fuel sector, mitigation technologies are mature, widely available and often inexpensive.** In this sector, the barriers are not technological, but regulatory, financial and political. **This makes methane mitigation in fossil fuels one of the most immediate opportunities available to governments, industry and investors to slow warming this decade, while accelerating the broader energy transition.**

In the International Energy Agency (IEA) net-zero scenario, methane emissions from fossil fuels fall by around 75 per cent by 2030 through direct methane mitigation measures and by reducing fossil fuel production and consumption – the latter of which would reduce both direct CO_2 emissions and methane emissions associated with oil, gas and coal production. **Around 75 per cent of oil and gas methane emissions can be avoided with existing technologies, frequently at low or even negative cost.** The scale of the opportunity is enormous. In 2024 alone, approximately 150 billion cubic meters of gas was flared globally, according to the World Bank's Global Gas Flaring Tracker. Methane is the main component of natural gas and flaring is a major source of methane emissions from oil and gas operations. This flared methane is roughly equivalent to the annual gas consumption of the African continent being wasted each year instead of being used to power and heat homes and industries.

Coal mining also represents a significant source of methane emissions. Action is urgently required to reduce them. Mining metallurgical coal, which is used during steel making, produces around 12 million tonnes of methane emissions each year, or around 324 million tonnes of CO_2 equivalent (over a 100-year time horizon). Yet readily available and low-cost mitigation options – including mine closure management, pre-mining degasification and oxidation of ventilation air methane – can deliver significant emission reductions. Reducing methane from coal mining represents an important and often overlooked opportunity to deliver significant emission reductions in the near term.

At the same time, a methane data revolution is transforming transparency and accountability. Advances in satellite monitoring, remote sensing and company reporting now make it possible to detect methane emissions in near real time, given available technologies and capabilities. Point-source imagers in satellites are designed to look at relatively small areas in high detail, with some satellites able to attribute emissions to a specific source within a 50-metre radius. By February 2026, the UNEP International Methane Emissions Observatory (IMEO) Methane Alert and Response System (MARS) had sent over 5,000 alerts across 33 countries identifying major emissions events. Yet responses remain extremely low. In 2025, the global response rate reached only 12 per cent, leaving the vast majority of detected emission events unresolved. **The world can now see methane emissions as they happen. Continued inaction is no longer a matter of uncertainty or lack of information – it is a deliberate choice.**

There are some examples of effective action. Norway banned routine flaring in 1971, imposed a tax on CO_2 and methane emissions from petroleum production and transport in 1991, and increased the tax on flaring and methane emissions in 2017. The country now has one of the lowest methane emissions intensities of upstream oil and gas production in the world. **If all countries matched Norway's methane emission intensity standards, global methane emissions from oil and gas operations could fall by roughly 90 per cent.**

The financial case for action is equally clear. The fossil fuel industry has earned trillions of dollars in recent years. The efforts needed to eliminate methane emissions would only cost a fraction of these profits. **According to UNEP's Global Methane Status Report 2025, the total annual cost for mitigation measures in the industry would be USD 98 billion, when accounting for the value of recovered gas. This is two to four per cent of the sector's USD 2.4 trillion net income in 2023. The IEA estimates even lower costs – around USD 52 billion per year to reach a 75 per cent reduction by 2030.** Both estimates are far below the USD 330 billion in annual global economic benefits that methane mitigation across all three sectors could deliver by 2030. **The resources exist. The responsibility is clear.**

Because mitigation technologies in the fossil fuel sector are mature, rapidly deployable and cost-effective, and contribute to the efficiency of operations and energy security, this sector must deliver the majority of near-term methane reductions. But action must also accelerate across agriculture and waste.

Agriculture is the largest source of anthropogenic methane emissions. Livestock contributes about one-third of all anthropogenic methane, while rice cultivation is another major source. As global demand for food continues to rise, methane emissions from food systems will increase without mitigation. **Reducing agricultural methane is not about producing less food – it is about producing food efficiently, more sustainably and with lower emissions.**

Improved livestock nutrition and breeding, better animal health, enhanced manure management, reduced use of water and pesticides in rice-growing practices, and cutting food loss and waste can lower emissions, while increasing productivity and farmers' incomes. These measures strengthen food security, reduce water depletion and improve rural livelihoods. With targeted finance and agricultural extension services (activities that provide information, guidance and services to develop the knowledge, skills and practices of farmers) to increase capacity and international support – particularly for smallholder farmers – methane reductions can support rural development and economic growth.

Redirecting a small share of harmful agricultural subsidies and improving monitoring, reporting and verification (MRV) systems could unlock progress in methane mitigation and result in development co-benefits. Modelling shows that low-cost measures could be implemented at a total annual cost of USD 2.5 billion, while reducing annual methane emissions by 17 million tonnes by 2030 – equivalent to five per cent of global methane emissions from human activities in 2025. This investment amounts to less than three per cent of the subsidies governments allocate to the sector every year.

The waste sector accounts for roughly a fifth of global anthropogenic methane emissions, primarily from landfills and wastewater. Once organic waste is buried, it can emit methane for decades. Diverting organic waste from landfills must be prioritized in every city, region and country. As urbanization accelerates and global waste volumes rise, unmanaged dumpsites and undermanaged landfills risk locking in future emissions while creating serious environmental and public health hazards.

But **methane reduction in the waste sector can turn a cost for cities into an economic opportunity. Captured landfill gas and anaerobic digestion can generate electricity, heat and renewable fuels for cooking or transport.** Composting programmes create soil amendments and local jobs. Modern waste systems reduce air pollution, prevent fires and improve sanitation. **With the right policy frameworks and concessional finance, cities can transform waste into an engine of climate action, economic opportunity and improved public health.**

Efforts across all three sectors must be supported by adequate finance. While methane abatement finance has risen in recent years, it remains far below the estimated USD 127 billion net annual cost needed by 2030 to implement technical abatement measures in all three sectors. Delivering on the GMP requires a nine-fold rise in methane abatement finance over 2022 levels. The necessary costs represent six per cent of global climate finance flows in 2023.

Closing the gap requires action from bilateral and philanthropic donors, the private sector, financial institutions, Multilateral Development Banks (MDBs), Multilateral Climate Funds, industry and investors. Priorities include investing in enabling conditions, supporting project preparation, unlocking capital-intensive projects, covering ongoing project costs and supporting innovation – as well as mainstreaming methane mitigation across existing lending portfolios rather than treating it as a standalone initiative.

There are existing financing pathways. For example, The World Bank's Methane Reduction Blueprint focuses on scaling methane abatement across all sectors. Through its implementation hubs – the Global Flaring and Methane Reduction Partnership and the Global Methane Reduction Platform for Development – the World Bank provides developing countries with catalytic financing, grants and advisory technical support. The Global Methane Hub supports mitigation efforts in all three sectors through grant-making and partnerships. Private sector actors, including corporations, philanthropies, investors and financial institutions, are emerging as critical drivers of methane finance. **Developing countries – particularly those with limited fiscal space, rapidly growing cities and smallholder-based food systems – require strong financial and technical support to deliver methane reductions across all three sectors.**

The second half of this decade must focus on implementation and acceleration: enforceable standards, measurable performance, clear market signals and incentives, stronger market accountability and scaled-up support for developing countries. Coordinated efforts are required across all sectors to deliver on the 2030 potential and create the conditions for far bigger gains by 2040 and beyond.

This report sets out nine priority actions across three sectors to be delivered by 2030.

FOSSIL FUELS: THE IMMEDIATE PRIORITY

Addressing methane emissions from fossil fuels offers the potential for the largest, fastest and most cost-effective methane reductions this decade. The industry has the means and the responsibility to deliver them. Lasting progress also requires accelerating the global transition away from fossil fuels, which will reduce methane emissions alongside CO_2. **By 2030, governments, industry and investors must implement the following actions:**

ACTION 1: Fix leaks and eliminate routine flaring and cold venting

- Adopt and enforce regulations that ban routine flaring and cold venting and require early leak detection and repair across the entire oil and gas value chain.
- Replace and upgrade high-emitting equipment.
- Adopt a zero-tolerance approach to super-emitter events using satellite monitoring and other detection systems to ensure a rapid response.
- Commit to improving the response rate to methane alerts issued through the UNEP Methane Alert and Response System to at least 80 per cent as a first step towards full response and compliance.
- Make methane mitigation a standard industry practice in coal mining.

ACTION 2: Make methane measurable, reportable and verifiable

- Adopt and enforce regulations that require direct asset-level measurement of methane emissions across oil and gas operations (aligned with the Oil and Gas Methane Partnership 2.0).
- Make verifiable data publicly available and subject it to independent assurance so regulators, investors and markets can distinguish high-performing operators from those failing to control methane emissions.
- Support reporting of domestic methane emissions in national greenhouse gas inventory reports and include it in the Nationally Determined Contributions.

ACTION 3: Adopt a science-based global methane standard that establishes a marketplace for near-zero-methane fossil fuels

- Establish a common, internationally recognized methane intensity benchmark. Make compliance a condition for financing, procurement and long-term market access through a process involving producers and consumers.

Establishing a shared methane intensity benchmark is essential. This would define what qualifies as near-zero methane emissions, ensure comparability across producers, protect against greenwashing and enable buyers, financiers and regulators to link performance to capital and contracts. MDBs and international partners must support low-income developing producer countries in meeting this benchmark through technical assistance, regulatory strengthening and targeted finance.

AGRICULTURE: CUT EMISSIONS WHILE STRENGTHENING FOOD SECURITY AND PROTECTING LIVELIHOODS

Addressing methane emissions in agriculture can be cost-effective and could deliver substantial medium- to long-term benefits by strengthening productivity, food security and improving livelihoods. **By 2030, governments and producers must implement the following actions:**

ACTION 4: Produce food more efficiently with less methane

- Scale up proven methane-reducing practices in livestock and rice production with dedicated support for smallholder farmers. These include improved livestock nutrition and breeding, better animal health, improved manure management systems and climate-resilient rice cultivation.

ACTION 5: Halve per-capita food waste and reduce food loss

- Implement strategies aligned with SDG 12.3 to halve per-capita global food waste at retail and consumer levels, and reduce food losses across production and supply chains, including scaling investments in cold chain infrastructure, improved storage and more efficient supply chains.

ACTION 6: Reform incentives and redirect finance and subsidies

- Embed methane reduction in agricultural strategies and align subsidies and finance with methane-reducing production systems and consumption.
- Expand extension services to ensure farmers – particularly in developing countries – can adopt methane-reducing practices while safeguarding livelihoods.
- MDBs, climate funds, bilateral partners and other providers of finance must scale blended finance and de-risk innovation.

WASTE: AVOID METHANE GENERATION AND CAPTURE METHANE BEFORE IT ESCAPES

Addressing methane in the waste and wastewater sector can deliver multiple economic and public health benefits. **By 2030, local and national governments and the private sector must implement the following actions:**

ACTION 7: Phase out open dumping and uncontrolled landfills

- Establish clear timelines to phase out open dumping and uncontrolled landfills, particularly in rapidly urbanizing regions, recognizing differing national circumstances and levels of development.
- Plan waste management infrastructure investments and sanitary landfills, with full potential to avoid, divert and valorize organics.

ACTION 8: Capture methane from waste and wastewater

- Deploy and scale technologies that capture methane from organic waste streams, including anaerobic digestion and landfill gas utilization, and wastewater treatment plants.

ACTION 9: Build circular, low-methane urban waste systems

- Divert organic materials away from landfills through adopting and enforcing regulations to implement mandatory source separation of organic waste and expanding community-driven composting centres.
- Invest in modern and integrated waste management systems that prioritize waste prevention, recycling, composting and energy recovery.
- MDBs and other finance providers must prioritize waste management transformation in urban development portfolios, recognizing methane mitigation as both a climate and public health imperative, including by providing concessional finance to rapidly urbanizing regions.

1. The role of methane in climate change

Methane, a powerful climate-warming gas, is a historic and continuing contributor to global warming, second only to CO_2. However, methane's shorter atmospheric lifetime means that reducing its emissions can slow the rate of global warming within decades.

Science estimates a 2.3-2.5°C rise above pre-industrial levels over the course of this century, even if current Nationally Determined Contributions (NDCs) are fully implemented and similar efforts continue thereafter.[1] Massive cuts to emissions of greenhouse gases (GHGs) – of 40 per cent by 2030 and 60 per cent by 2035 over 2019 levels – are needed to stay in line with the 1.5°C goal of the Paris Agreement. Even with deep emissions cuts, it is now highly likely that long-term averages of global warming will exceed 1.5°C – known as overshoot – within a decade. It is possible to return to 1.5°C by the end of the century, but urgent action is needed now to ensure that overshoot is as short and small as possible – as climate impacts and risks of triggering tipping points grow substantially with the extent of overshoot.[2]

Methane has played a major role in bringing the world to this point. Over a 20-year time horizon, methane has a global warming potential of around 80 times that of CO_2.[3] Methane emissions are estimated to have contributed 0.6°C of global warming since pre-industrial times, making methane the second-largest contributor to observed warming after CO_2.[4]

The concentration of methane in the atmosphere is rising rapidly. Annual global methane emissions from 2010-2019 sat at around 575 million tonnes per year, approximately 65 per cent of which was from human activity – primarily from the fossil fuel, agriculture and waste sectors. In 2020, this figure rose to 610 million tonnes per year, an increase partly driven by increased emissions from wetlands in a wetter and warmer climate.[5] Atmospheric methane concentrations reached about 1,942 parts per billion in 2024 – roughly 266 per cent above pre-industrial levels and the highest in at least 800,000 years – and continued to rise in 2025.[6]

Atmospheric measurements indicate that emissions are significantly greater than reported in most national inventories. A recent study found that methane emissions overall are 15 per cent higher than reporting to the UN Framework Convention on Climate Change and 32 per cent higher for oil and gas in particular.[7] These emissions will grow faster without decisive action: a forecasted increase of about five per cent by 2030 and 21 per cent by 2050, over 2020 levels, driving up temperatures.[8]

There are also concerns about rising temperatures leading to higher methane emissions from wetlands and accelerating thawing of the permafrost, which could release tens of billions of tonnes of carbon and methane into the atmosphere by the end of the century.[9] While methane would be a fraction of the total additional GHGs from permafrost, its higher warming potential would make it more potent, raising temperatures faster in the near-term than an equivalent amount of CO_2.[10]

1 *UNEP Emissions Gap Report 2025*
2 *UNEP Emissions Gap Report 2025*
3 *IPCC AR6 WG I 2021*
4 *IPCC AR6 WG I 2021*; Shindell et al., 2019
5 *Global Methane Budget 2000-2020*
6 *WMO's State of the Global Climate report 2025*
7 *Nature Communications, 2025*
8 *UNEP Global Methane Status Report 2025*
9 *Environmental Research Letters 2024*
10 *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*

METHANE AND OVERSHOOT OF 1.5°C

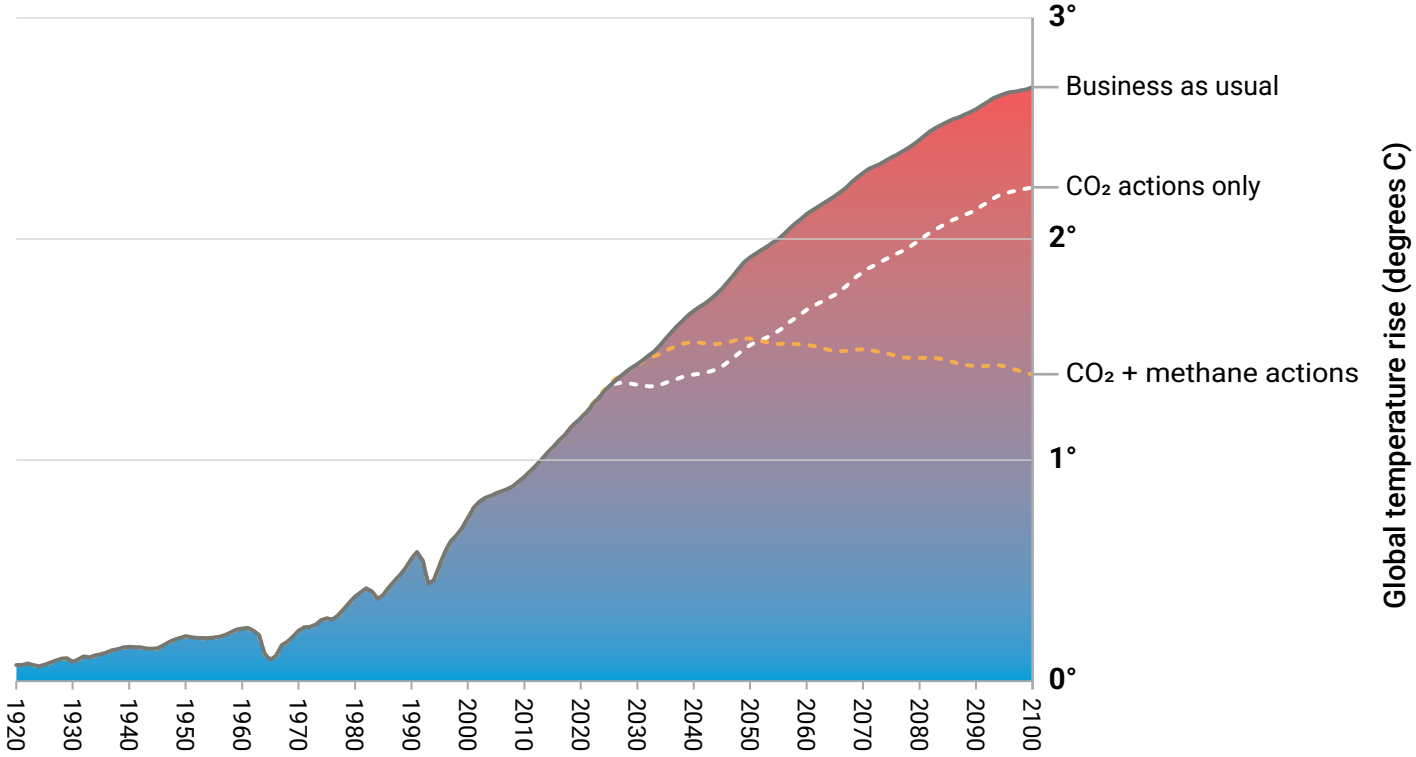
As overshoot is now expected to occur in the early 2030s, the question is how far temperatures rise above 1.5°C and how long they remain there.[11] Both dimensions strongly influence climate risks, impacts on ecosystems and societies, and the likelihood of triggering irreversible changes. Every fraction of a degree avoided matters in terms of lives saved, livelihoods protected and economic damage avoided.

In a climate system already warmed by cumulative CO_2 and methane emissions, additional atmospheric methane will have an outsized effect on short-term temperature trends.[12] Models show that methane emissions strongly influence the level of peak warming, the rate at which temperatures rise and the rate at which temperatures decline once emissions are reduced. Because methane contributes disproportionately to warming over short timescales compared to CO_2, delays in its mitigation can have stronger impacts on the scale and pace of near-term temperature increases and exacerbate overshoot.[13]

METHANE MITIGATION: A FAST-ACTING, LOW-COST CLIMATE SOLUTION

Unlike CO_2, which takes centuries to leave the atmosphere, methane has an average atmospheric lifetime of around a decade.[14] As a result, lower methane emissions translate rapidly into reductions in atmospheric concentrations and radiative forcing, slowing global temperature rise much faster. Therefore, action on methane emissions reduces cumulative exposure to extreme heat, accelerated sea-level rise and ecosystem stress, which would have major impacts on food systems and health.[15] In addition, cutting methane emissions by 30 per cent can contribute to long-term temperature decline.

Figure 1: Avoided warming from simultaneous mitigation of CO_2 PLUS methane compared to a CO_2-only pathway



(Source: Rocky Mountain Institute)[16]

Reaching net-zero CO_2 emissions via rapid, deep and sustained CO_2 reductions is essential for long-term climate stabilization. And reaching net negative CO_2 emissions will be necessary to bring temperatures back down to below 1.5°C before 2100. But without methane mitigation, peak temperatures will be higher, more CO_2 removal will be needed later in this century and it will take longer to return to 1.5°C.[17]

11 UNEP Emissions Gap Report 2025, IPCC AR6 WG I, 2021; IPCC AR6 WG III, 2022

12 Shindell et al., 2012; IPCC AR6 WG I, 2021.

13 Rogelj et al., 2018; Shindell et al., 2019

14 IPCC AR6 WG I 2021

15 Shindell et al., 2012; Allen et al., 2018

16 Rocky Mountain Institute, 2024

17 IPCC AR6 WG III 2022; Shindell et al., 2019

2. The huge potential for rapid methane mitigation

Mitigation measures, particularly in the fossil fuel sector, can be implemented quickly with proven technologies, often at low or negative cost – creating a huge opportunity for action on near-term warming.

Humans are responsible for around 65 per cent of global methane emissions, with natural sources responsible for the rest. Around 38 per cent of anthropogenic methane emissions originate from the fossil fuel sector. Agriculture, at 42 per cent, and waste, at 20 per cent, account for the remainder.[18]

Box 1 Methane emissions in the fossil fuel sector

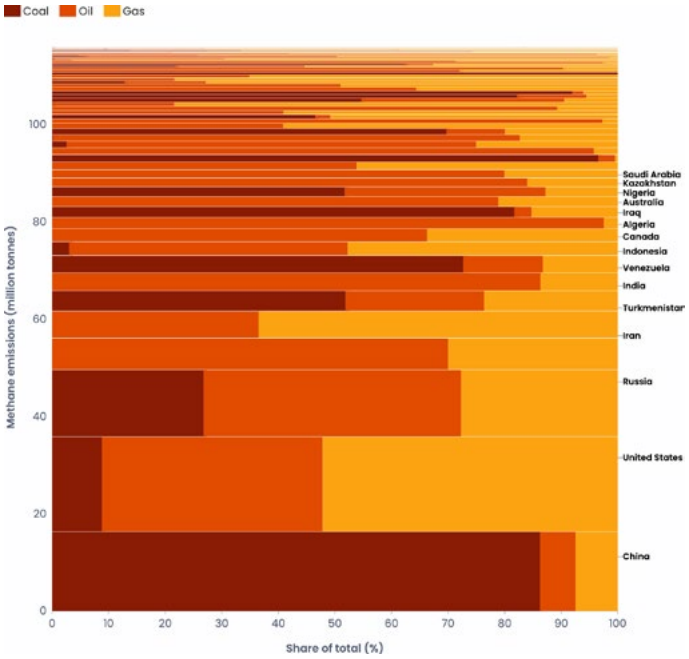
Record global production and insufficient mitigation efforts kept methane emissions from oil, gas and coal above 124 million tonnes in 2025. Oil and gas operations contributed 80 million tonnes, largely from flaring, leaks and equipment venting. Coal mining accounted for more than 40 million tonnes.[19]

The full implementation of all technical measures currently available in these three sectors could cut annual methane emissions by 32 per cent by 2030, compared to 2020 levels.[20] Over 80 per cent of the 2030 emissions reduction potential across all sectors can be achieved at low cost, which is defined as an average of below USD 1,000 per tonne of methane, or USD 36 per tonne of CO_2 equivalent.[21]

The fossil fuel sector offers one of the fastest and most cost-effective opportunities to cut methane emissions, accounting for the lion's share of mitigation potential by 2030. **If all technically feasible measures were implemented, 72 per cent of the total 2030 mitigation potential lies in the fossil fuel sector, 18 per cent in the agriculture sector and 10 per cent in the waste sector. Some 72 per cent of the global methane mitigation potential by 2030 lies with the G20+.**[22]

18 *UNEP Global Methane Status Report 2025*
19 *IEA Global Methane Tracker 2026*
20 *UNEP Global Methane Status Report 2025*
21 *UNEP Global Methane Status Report 2025*
22 *UNEP Global Methane Status Report 2025*. G20+ includes Argentina, Australia, Brazil, Canada, China, France, Germany, Italy, India, Indonesia, Japan, Mexico, the Russian Federation, Saudi Arabia, South Africa, the Republic of Korea, Türkiye, the United Kingdom of Great Britain and Northern Ireland, and the United States of America, plus the remaining 24 European Union countries, Norway, Switzerland, Iceland and New Zealand.

Figure 2 Top country contributors to methane emissions in the fossil fuel sector



(Source: Ember) *Excluding emission estimates from abandoned oil, gas and coal facilities.

In the fossil fuel sector, many of the available measures – such as leak detection and repair (LDAR) programmes – are relatively inexpensive. According to the Global Methane Status Report 2025, the combined total annual cost for mitigation measures in the fossil fuel sector would be USD 98 billion, when accounting for the value of recovered gas offsetting some of the investment costs.[23] This is equivalent to 2-4 per cent of the sector's USD 2.4 trillion net income in 2023 and far below the overall annual economic benefits that methane mitigation would deliver (see below). The International Energy Agency (IEA) calculates a spend of about USD 52 billion per year to reach a 75 per cent reduction in methane emissions, around two per cent of the sector's net income.[24]

Given the massive potential of the fossil fuel sector to deliver rapid mitigation, this report looks in more detail at near-term action in this sector – particularly oil and gas, which has mature technologies and support systems in place. However, the Global Methane Pledge (GMP) and broader aspirations to limit near-term warming will not be met without parallel immediate action in the agriculture and waste sectors, which together account for almost 30 per cent of the 2030 mitigation potential.

The agriculture and waste sectors are projected to have the largest emissions increases in the future, given expanding populations and economic growth. In the agriculture sector, for example, emissions are expected to rise by 8 per cent by 2030 and 17 per cent by 2050, compared to 2020 levels, if no mitigation action is taken.[25] Coordinated mitigation efforts are crucial for these growing sectors to deliver on the 2030 potential and create the conditions for far bigger gains by 2050 and beyond.

Photo: @CANVA Premium

23 UNEP Global Methane Status Report 2025
24 IEA Global Methane Tracker 2025
25 UNEP Global Methane Status Report 2025

3. The many benefits of methane mitigation

Cutting methane emissions would slow the rate of global warming, lessen climate impacts, reduce energy waste and save companies money. As methane also contributes to air pollution, action on methane emissions would have additional and rapid benefits on everything from human health to crop harvests.

Cutting methane emissions by 32 per cent by 2030 would avoid 0.1-0.2°C of warming by 2050, with many positive knock-on effects.[26,27] However, the full set of benefits can only be understood by considering that methane also contributes to air pollution. Methane is the main precursor to tropospheric ozone, a common air pollutant and GHG, so its contribution to surface ozone concentrations has impacts on human health and agriculture.[28]

Air pollution leads to poor respiratory health and impacts on vegetation, while warming temperatures put stress on energy sources through increased demand and infrastructure disruption. In addition to avoiding warming, cutting methane emissions by 32 per cent would avoid an annual 180,000 premature deaths, nearly 19 million tonnes of crop losses and billions of hours of labour productivity losses by 2030. The value of these benefits is estimated to exceed USD 330 billion annually by 2030. If efforts are sustained to 2050, the benefits would rise to 0.31°C avoided warming, averaged over 2060-2090, more than 290,000 avoided premature deaths per year, nearly 30 billion tonnes of avoided crop losses and over 80 billion hours of avoided lost labour for outdoor workers. The associated economic benefit would exceed USD 500 billion annually.[29]

Improving monitoring and leak detection and stopping routine flaring and venting would benefit everyone. Stopping most of the 80 million tonnes of methane emitted annually by the oil and gas sector would avoid GHG emissions roughly equivalent to the entire emissions of the United States in 2024, when measured on a 20-year-timescale.[30] Methane is also commonly co-emitted with deadly contaminants like hydrogen sulfide and other air toxins like the carcinogen benzene. In addition, it would safeguard workers and surrounding communities, protect public health, lower operational costs, increase efficiency, strengthen market performance and generate jobs across the value chain – from field technicians conducting inspections and repairs to software engineers developing monitoring, analytics and verification platforms.

26 *UNEP Global Methane Status Report 2025*
27 *Advancing Earth and Space Sciences*
28 *CCAC*
29 *UNEP Global Methane Status Report 2025*
30 *EDGAR*

4. Global pledges and national action on methane mitigation

Despite growing attention and action on methane, efforts to meet current pledges to cut emissions are falling short.

Under the overarching goal of the GMP, 159 countries and the European Union have voluntarily pledged to cut methane emissions by at least 30 per cent globally by 2030, from 2020 levels. However, current NDCs and MAPs would deliver only an eight per cent reduction by 2030, indicating that global ambition and action – from both GMP signatories and non-signatories – needs to increase significantly to meet the target.[31]

Nearly 100 countries have completed or are developing national Methane Action Plans (MAPs), including 37 countries that are being supported by the UNEP-hosted Climate and Clean Air Coalition (CCAC) and over 75 that participate in its Methane Roadmap Action Programme.[32]

As of June 2025, 127 countries had included policies and measures targeting major methane sources in their latest NDCs, a 38 per cent increase compared with pre-2020 NDCs. Some 115 countries include measures addressing waste, 85 include agricultural methane measures and 35 include measures targeting emissions from fossil fuels.

There are already many technologies and policies dealing with methane. Much is being learned from these experiences and integration across policies within national, subnational and global contexts will be valuable.[33] However, current NDCs and MAPs lack detail. While nearly 70 per cent of NDCs include methane mitigation measures, only a few include quantified reduction targets. For example, only four per cent of NDCs include agricultural methane reduction targets. Current plans achieve just half of the sector's full cost-effective mitigation potential. Coverage remains limited and uneven, with only 2-18 per cent of GMP-participating countries having policies directly targeting key sources such as enteric fermentation, rice cultivation or manure management.[34]

A recent study found that only about 13 per cent of methane emissions are currently covered by methane mitigation policies.[35] As mentioned above, current NDCs and MAPs would only reduce methane emissions by up to eight per cent by 2030.[36] While these levels would bring significant benefits – estimated at an annual 60,000 premature deaths and 6.1 million tonnes of crop losses avoided by 2030, and global warming reduced by 0.06°C by 2050 – these results fall far short of what is both possible and necessary.[37]

Meeting mitigation opportunities requires policymakers to adopt consistent approaches for accurate quantification of methane emission sources alongside stronger policy.[38] Only quantified goals and concrete national action plans send the signal that methane reductions are urgent. Equally, without regulations in place, many measures are not being taken up at scale, even if they pay for themselves.

31 UNEP Global Methane Status Report 2025
32 IEA Global Methane Tracker 2025
33 CGS Global Methane Abatement Solutions Tracker
34 UNEP Global Methane Status Report 2025
35 Science Direct, Volume 6, Issue 5, 2023
36 UNEP Global Methane Status Report 2025
37 CCAC
38 Science Direct, Volume 6, Issue 5, 2023

5. Three sectors, nine actions by 2030

Given the significance of methane emissions to global warming, the contribution cutting these emissions can make to reducing or slowing overshoot and its impacts, and the many co-benefits of cleaner air, better crop yields and economic gains, the Secretary-General is endorsing nine priority actions across the fossil fuel, agriculture and waste sectors. If fully implemented, these can deliver a reduction in methane emissions of at least 30 per cent by 2030, compared to 2020 levels.[39]

5.1 METHANE MITIGATION ACTIONS IN THE FOSSIL FUEL SECTOR

In the IEA net-zero scenario, methane emissions from fossil fuels fall by around 75 per cent by 2030 and around 85 per cent by 2035 compared with current levels. This can be achieved through direct methane mitigation measures and by reducing fossil fuel production and consumption, the latter of which would reduce both direct CO_2 and methane emissions associated with oil, gas and coal production.[40] Methane emissions from fossil fuels can be reduced rapidly at a cost of only a few per cent of the sector's net annual income using existing technologies and practices – backed by measurement, monitoring and detection of emissions; policies and regulations; transparency; an increase in finance; and international cooperation. Full implementation of the Maximum Technically Feasible Reduction (MTFR) scenario, aligned with the GMP target, could reduce emissions by 78 per cent in 2030 compared to 2030 projected emissions under current legislation.[41]

ACTION 1: Fix leaks and eliminate routine venting and flaring

Deploy and respond to measurement, monitoring and detection technologies

With ever-improving data collection and availability, it is increasingly possible to detect super emitters – point sources that emit at very high rates – through satellites. As the largest hotspots in the world, mostly from major extraction operations, emit as much methane in a year as entire countries, governments and industry must adopt a zero-tolerance approach to these super emitters.

There are multiple established and emerging initiatives. For example, the Methane Alert and Response System (MARS), part of UNEP's International Methane Emissions Observatory (IMEO), integrates data from 35 satellite instruments to provide rapid alerts on major methane emission events directly to governments and operators.[42] By February 2026, MARS had sent over 5,000 alerts about major events. While the global response rate rose from one per cent in 2024 to 12 per cent in 2025, overall engagement remains low.[43] Only 11 countries have a response rate from operators and governments of over 70 per cent. At the same time, around 60 per cent of alerts without a response occur in just four countries: Algeria, Iran, the United States and Turkmenistan.

39 UNEP Global Methane Status Report 2025
40 IEA Global Methane Tracker 2025
41 UNEP Global Methane Status Report 2025
42 IMEO
43 An Eye on Methane 2025: From Measurement to Momentum, UNEP 2025

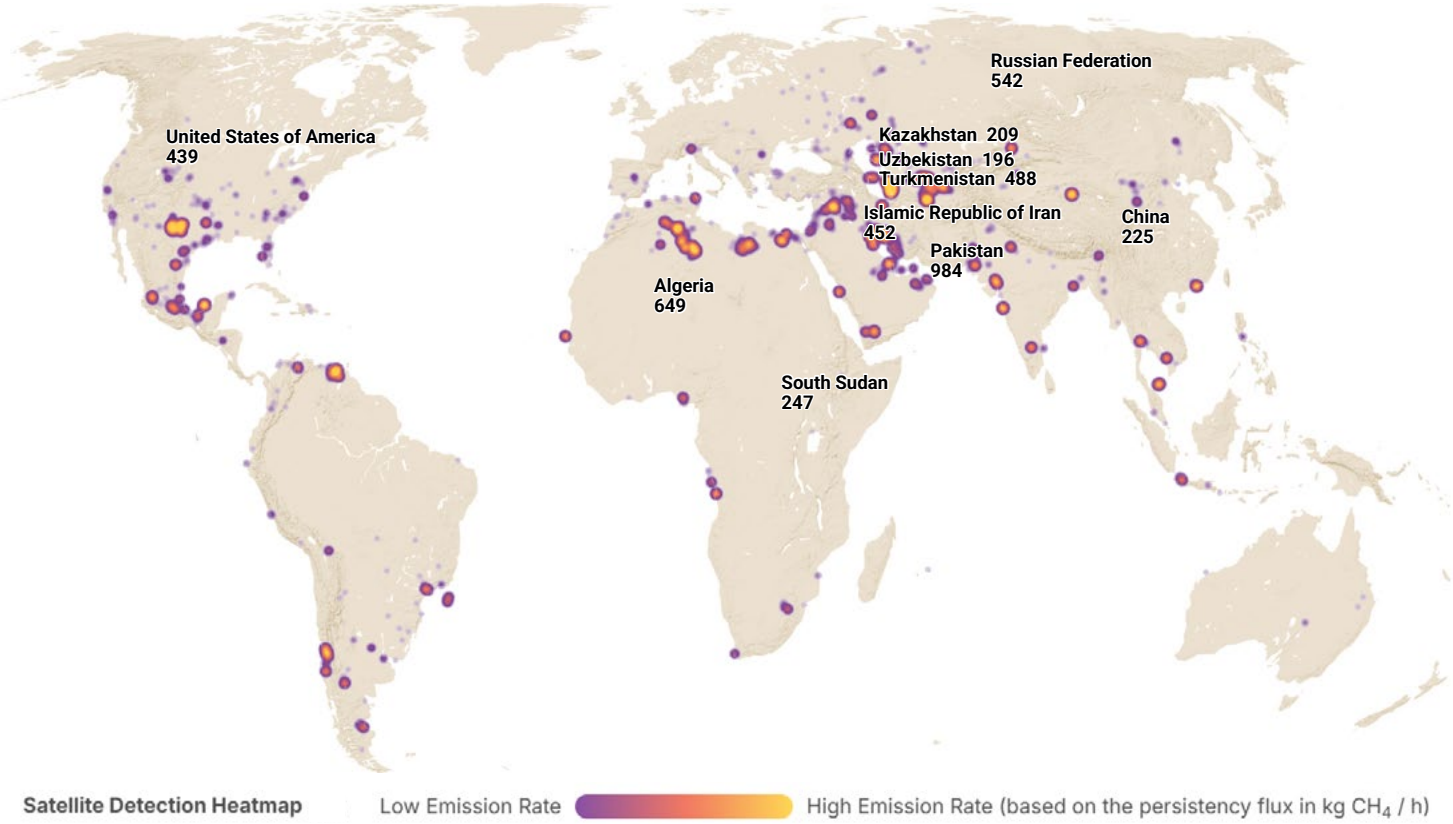
Box 2 Positive impacts of responding to MARS

In Algeria and Nigeria, MARS notifications and engagement led to direct action from governments and oil and gas companies. In Algeria, the annual avoided emissions are equivalent to 500,000 cars being taken off the road. In Nigeria, a six-month leak emitted methane equivalent to 400,000 cars being driven for a year. This leak was fixed in under two weeks simply by replacing faulty equipment.[44]

There is also a growing constellation of point-source satellites that detect, measure and mitigate methane. Over half the super emitters detected in 2025 were from the oil and gas sector. Waste and other energy sources (coal mines and electricity generation) constituted in equal shares most of the remaining sources.

The world can now see methane emissions and mitigation as they happen. Governments and companies can and should achieve a response rate to alerts from MARS of at least 80 per cent before 2030. Multilateral Development Banks (MDBs) and international partners must support developing countries with capacity limitations to increase response rates and enable mitigation through technical assistance and targeted finance.

Figure 3 Geographic distribution of methane super emitters detected by satellites, with examples of rates of the largest measurements in 2025



Largest Estimated Emissions Rate (tonnes CH_4 per hour). (Source: UNEP)[45]
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

44 UNEP 2024

45 UNEP Sources and Plumes Data 2025

Expand leak detection and repair programmes and change operational practices

LDAR programmes can avoid significant releases of methane each year, often with simple fixes such as replacing worn valves, tightening seals and fixing component leaks through operator-led, on-site detection programmes using infra-red cameras and other sensors, or through MARS notifications for more significant leaks.[46]

Energy operations, especially oil and gas extraction and processing, use an abundance of equipment with numerous points of connection that are prone to unintentional leakage. Companies also conduct maintenance and other operations that routinely vent methane when repairing their equipment. Both unintentional leakage and intentional equipment venting must be stopped.

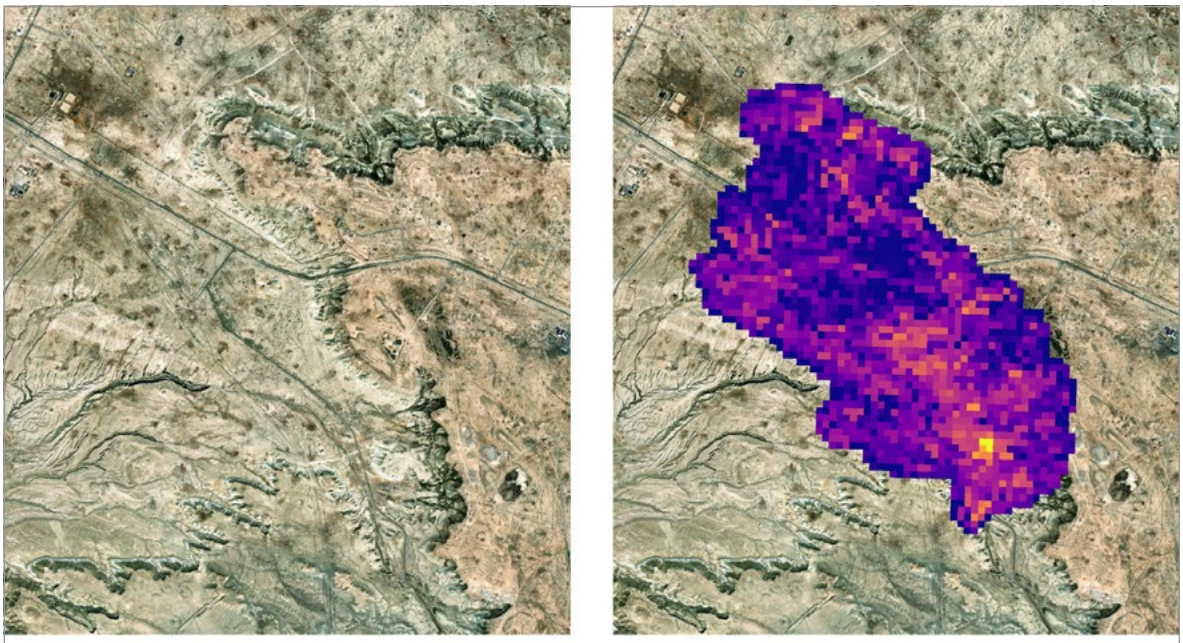
Evidence from jurisdictions with mandatory LDAR requirements shows that inspection frequency and rapid repair timelines are critical determinants of emission reductions.[47] High-frequency LDAR is especially effective in addressing super-emitter events, which account for a disproportionate share of total methane emissions.

Fossil fuel companies must adopt streamlined LDAR frameworks that use risk-based approaches, concentrating resources on potentially high-emitting targets such as compressors, storage tanks and processing facilities. Governments must mandate leak detection and repair across the entire oil and gas value chain.

Stop routine flaring and cold venting

Routine flaring, methane releases from inefficient flares and venting usually occur when operators burn or release the gas that accompanies oil production, rather than building equipment and pipelines to capture it. Around 150 billion cubic metres of natural gas was flared in 2024, emitting 389 million tonnes of CO_2 equivalent. This wasted gas is roughly equivalent to the total annual gas consumption of the African continent.[48]

Companies must deploy readily available or emerging technologies and techniques to avoid or reduce such emissions. Options include capturing gas and directing it to other uses – including through portable facilities that compress gas from wellheads and pipelines – or using it to produce electricity for the grid. Gas can be reinjected for disposal, storage or maintaining well pressure. Technologies and maintenance practices that improve the efficiency of flaring could reduce the amount of methane emitted due to poor combustion. However, flaring still emits CO_2, black carbon and other volatile organic compounds.[49]



Attributions: Google Earth / NASA's EMIT

The image shows a plume detected by NASA's EMIT in Kazakhstan, on 7 April 2025. No further emissions have been detected at the location since 4 June 2025.

Photo: @IMEO

46 Calyx Global 2025
47 Environmental Research Letters, 2021
48 2025 Global Gas Flaring Tracker Report, World Bank
49 IEA

Replace and upgrade methane-intensive equipment

Methane emissions often arise from outdated or poorly performing equipment. Many other techniques can and must be adopted, such as upgrading compressor seals, installing dry-seal compressors and improving tank venting systems. A study in British Columbia found that methane in Canada could be reduced by 75 per cent by 2030 using technology standards, at a cost of just 0.0089 per cent of its GDP in 2030.[50] Moreover, governments can impose equipment standards immediately without waiting for enhanced methane emissions data.

Infrastructure modernization is important in regions with ageing pipeline networks. Advanced materials, improved welding standards and enhanced pressure management reduce chronic leakage and the risk of large releases. Electrification of pumps and compressors, where feasible, eliminates methane emissions entirely while supporting broader decarbonization objectives, if powered by renewables. However, many nations lack the resources to replace or upgrade ageing equipment, meaning that international financial and technical support will be required to accelerate action.

Address methane from coal mining

Global coal demand is slowing, partly due to the expansion of renewable energy.[51] While nations must exit coal as soon as possible, they also have a responsibility to reduce methane emissions from coal mining using proven technologies.

Despite the existence of readily available low-cost mitigation options in the coal sector – such as Regenerative Thermal Oxidizers and pre-mine degasification – methane policy development and mitigation projects in coal lag oil and gas. Capturing and utilizing, or destroying, methane offers clear abatement pathways, whether from gas drainage systems and ventilation shafts in active mines or pre-mine drainage. Setting clear utilization targets could complement broader mitigation efforts.[52] As methane emissions from abandoned mines can continue for decades after mining ceases, mines must be properly closed, with proper sealing or drainage techniques, and then monitored.[53]

Governments should treat coal mine methane as a near-term "fix-it-first" opportunity by mandating mine-level measurement and public reporting, time-bound mitigation plans for high-emitting sites, and enforceable post-closure methane management requirements as part of responsible mine closure frameworks. In addition, governments and mining companies should pursue credible methane data, transparent reporting and time-bound mitigation plans for coal production, alongside sectoral decarbonization efforts.

Mining metallurgical coal, which is used in blast furnaces during the steel-making process, produces around 12 million metric tonnes of methane emissions each year. These emissions can be mitigated at just one per cent of the cost of steel.[54] Yet metallurgical coal methane remains largely overlooked in steel decarbonization efforts, even though this coal will be needed for several decades, even in rapid global decarbonization scenarios. IMEO's Steel Methane Programme (SMP) is bringing transparency to the sector through a Coal Methane Database of mine-level emissions that combines empirical studies, satellite data and inventory data.

50 *Economic impacts of reducing methane emissions in British Columbia's oil and natural gas sectors: Taxes vs technology standards, 2024*

51 *IEA Global Energy Review 2026*

52 *UNEP Global Methane Status Report 2025*

53 *IEA Driving Down Coal Mine Methane Emissions, A regulatory roadmap and toolkit, 2023*

54 *An Eye on Methane 2025: From Measurement to Momentum | UN Environment Programme*

ACTION 2: Make methane measurable, reportable and verifiable

Transparency and empirical data are crucial for methane reporting, mitigation opportunities and accountability. Despite some advances in recent years, the industry has not done anywhere near enough. All companies, including Oil and Gas Decarbonization Charter (OGDC) signatories, must move to direct, asset-level measurement across operations – aligned with the UNEP IMEO Oil and Gas Methane Partnership 2.0 (OGMP 2.0) – and make data publicly available and independently verifiable.

Membership of OGMP 2.0 has more than doubled to over 150 companies, covering around 45 per cent of global oil and gas production.[55] In total, companies accounting for one-third of global oil and gas production report, or will soon report, emissions at OGMP 2.0's Gold Standard Reporting – meaning emissions are tracked with best-practice measurements. However, this increase in transparency must spread further and translate into widespread concrete mitigation action.[56] Such mitigation is crucial, as oil and gas producers are opening dozens of new, potentially high-emitting, fields for development across the globe.

Nations should also commit to reporting methane emissions through the Biennial Transparency Reports of the Enhanced Transparency Framework, which specifies that methane actions should be one of the well-designed reporting approaches in each sector.[57] National-level methane emissions inventories must also be enhanced. IMEO and the IEA should maintain their partnership to continuously refine annual average methane emissions data estimates for every country, including annual average emission intensity estimates for oil, natural gas and coal production. This is essential to guard against adverse sorting, where cleaner fossil fuels are exported to countries with import standards while methane-intensive product is consumed domestically and/or by other importers. IMEO should also assess gaps in remote sensing capabilities and encourage Member States to finance satellite, aviation-based or other new data sources.

Box 3 Industry and data

Due to the voluntary nature of global agreements, fossil fuel operators and private data providers retain close control over many of the inputs necessary for methane accounting at the facility scale where mitigation efforts occur. This leaves the world's leading scientists tracking corporate accountability to rely upon the goodwill of operators, who may themselves be responsible for emissions. In addition to the scientific community, a coalition of experts from NGOs and academia involved in ClimateTRACE is quantifying methane from every emitting sector.

Public satellite data offers a way to independently verify estimates. However, these instruments are limited in terms of how often they pass over different locations and their detection capabilities. Clouds, rough terrain and open water also pose challenges to capturing often intermittent emissions. Having more transparent, bottom-up data – collected at the asset site and reported through OGMP 2.0 – will help fill gaps in data collection. Together, these can help connect plume observations to specific asset operators and support credible, independent, country-level methane emission estimates.

55 *OGMP 2.0*

56 *An Eye on Methane 2025: From Measurement to Momentum | UN Environment Programme*

57 *CCAC Guidance on Including Methane in NDCs*

ACTION 3: Adopt a science-based global methane standard that establishes a marketplace for near-zero-methane fossil fuels

Effective methane and energy transition strategies depend on clear returns on investment and monetization opportunities, in addition to regulatory mechanisms. Essentially, fossil fuel producers require well-designed signals and incentives to act. Creating a marketplace for low-methane-intensity products would be one such incentive. A pre-condition for such a marketplace would be a common, internationally recognized methane intensity benchmark. A shared methane intensity benchmark would define what qualifies as near-zero methane production, ensure comparability across producers, prevent greenwashing and enable buyers, financiers and regulators to link performance to capital and contracts.

With such a benchmark in place, importing countries could require fossil fuel products to fall below the intensity threshold. The EU Methane Regulation, with a target for 2030, is an example of this approach. Importing countries could prioritize suppliers that demonstrate low methane intensity across their operations and commit to purchasing gas that would have been vented or flared.[58]

Other countries and regions are taking different approaches. Notable examples are Japan and the Republic of Korea's CLEAN initiative, which assesses liquefied natural gas (LNG) suppliers' efforts in monitoring and reducing methane leaks, and efforts under the auspices of OLADE for Latin America, which shares knowledge and promotes technical cooperation on methane reductions.

Drastically Reducing Methane Emissions in Global Fossil Fuel Sector, a statement signed by 11 countries at COP30, calls for the use of market levers via the development and adoption of performance standards that reflect local needs and contexts.[59] Market mechanisms also include access to capital. In a capital-intensive sector such as oil and gas, this can be a powerful lever. Investors, insurers and capital providers should require companies to measure, manage and reduce methane emissions as a condition for contracts, investment, insurability, financing and long-term market access.

The principle of shared responsibility should be adopted to promote a partnership approach, setting import standards and helping countries to meet them, including with domestic regulation and capacity support. Governments and National Oil Companies need to work together to roll out methane abatement technologies and set a level playing field for all operators. Support for technical assistance, regulatory strengthening and targeted finance should be provided to developing countries, especially those facing gaps in data, capacity and finance.

Transparency would also be crucial. Developing common monitoring, reporting and verification (MRV) standards based on measurement-based data for all countries, building on the OGMP 2.0 framework, would help create a level playing field.

SUPPORTING REGULATIONS AND POLICIES FOR FOSSIL FUEL ACTIONS

Appropriate regulations and policies have already made a difference in some countries and jurisdictions, but they can do even more if adopted widely. Nations must look at the many examples of good regulations and policies and adopt their own as a matter of urgency. There are many examples of existing legislation that can be replicated. Norway banned routine flaring in 1971, imposed a tax on CO_2 and methane emissions from petroleum production and transport in 1991, and increased the tax on flaring and methane emissions in 2017. The country now has the lowest methane emissions intensity of upstream oil and gas production in the world. If all countries matched this level, global methane emissions from oil and gas operations would fall by over 90 per cent.[60]

58 *IEA Global Methane Tracker 2025*

59 *Drastically Reducing Methane Emissions in Global Fossil Fuel Sector*

60 *IEA Global Methane Tracker 2025*

Other recent examples of legislation include:

- The European Union's 2024 Methane Regulation, which spells out mandatory monitoring, reporting and verification (built on the OGMP 2.0 framework); mandatory leak detection and repair (LDAR); a ban on routine flaring and venting; and more, including methane intensity standards on imports starting in 2030.[61]
- Brazil's guidelines, issued through the National Energy Policy Council, which promote the decarbonization of oil and gas activities, including minimizing flaring and a call for measures to reduce methane leaks from oil and gas operations.[62]
- Canada's 2025 Enhanced Methane Regulations, which apply to onshore oil and gas production, processing and transmission sectors. They build on 2018 methane regulations by establishing stronger requirements to reduce methane emissions, including strengthening LDAR and controlling venting. Key compliance dates come into force on January 1, 2028.[63]
- China's new standard for coalbed methane, which requires coal mine operators to capture gas that has a methane concentration of eight per cent or higher and a flow rate of at least 10 m^3/min.[64]

Such legislation is already delivering results. Data from ClimateTRACE suggest that China, Canada, UAE and Qatar reduced or held steady their oil and gas production methane emissions from 2023 to 2024, even as volumes increased. This indicates a reduction in the methane emissions intensity of their oil and gas operations, stressing the opportunity for further gains ahead.

If every country implemented tried-and-tested policies, global methane emissions from oil and gas operations would halve. If, in addition, emissions pricing, financing instruments and performance standards were adopted globally, oil and gas emissions could drop by 75 per cent.[65] However, capacity support is required to assist nations as they devise and enforce regulations.

Policies and regulations to address methane from coal operations are lagging, although several jurisdictions, including major coal producers and users such as China and Australia, have recently taken steps to regulate methane emissions in the coal sector. For example, Australia's Safeguard Mechanism will impact 59 of the largest mines and require emissions either to decrease slowly by 2030, or be offset with carbon credits. There is a need for a major uptick in regulation on coal.[66]

5.2 METHANE MITIGATION ACTIONS IN THE AGRICULTURE SECTOR

The agriculture sector is the biggest single contributor to anthropogenic methane emissions, accounting for 42 per cent of the global total.[67] And global food demand continues to rise. Agricultural and fish production is projected to expand by 14 per cent over the next decade.[68] Methane emissions from food systems will increase unless production becomes more efficient. However, the sector has the potential to cut 2030 emissions by eight per cent with simple, low-cost measures.[69]

Reducing agricultural methane is not about producing less food, it is about producing food efficiently and more sustainably with less organic landfill waste. With targeted finance, extension services (activities that provide information, guidance and services to develop the knowledge, skills and practices of farmers) and international support – particularly for smallholder farmers – agricultural methane reductions can drive rural development. A phased approach prioritizing productivity and optimization until 2030 – particularly in developing countries where reduction potential is highest – can unlock near-term gains while building the trust and evidence base for deeper structural shifts.

61 European Union, Methane Emissions
62 IEA Global Methane Tracker 2025
63 Canada's 2025 Enhanced Methane Regulations
64 IEA Global Methane Tracker 2025
65 IEA Global Methane Tracker 2025
66 Global Energy Monitor, Still Digging 2025: Tracking Global Coal Mine Proposals
67 UNEP Global Methane Status Report 2025
68 FAO Food Outlook 2025
69 UNEP Global Methane Status Report 2025

ACTION 4: Produce food more efficiently with less methane

Governments and the private sector must reduce methane through measures such as improved livestock management, feed innovation, manure management, direct dry seeding rice, and alternate wetting and drying, which would lower near-term warming and strengthen the resilience of farming systems. Healthier soils, more efficient production and water-sparing practices help farmers adapt to droughts, floods and shifting weather patterns. At the same time, cutting methane supports food security by protecting yields, stabilizing supply chains and ensuring agriculture can feed a growing global population while operating within planetary boundaries.

Key opportunities for 2030 include improved rice cultivation, in which more-effective water management and sulphate use could reduce emissions by 9.8 million tonnes per year at negative cost, and banning the open burning of agricultural waste, which could lower emissions by 4.7 million tonnes per year at zero cost.[70] In the livestock sector, cost-effective strategies such as reducing enteric fermentation and improved manure management must be prioritized, while dealing with the constraints of higher costs and social factors. In low-income regions, co-benefits – such as improved animal health and climate resilience through veterinary care feed storage and gender-inclusive programmes – make mitigation more attractive.

Box 4 Country action to reduce methane emissions in food production

In India, the National Dairy Support Project piloted animal breed improvement and animal nutrition for value-added dairy products that enhance food quality and safety. The project benefited more than three million smallholders who averaged a 20 per cent increase in milk production and a 14 per cent reduction in methane emissions.

In Tanzania, the Livestock Resilience and Competitiveness Project is building upon an assessment of the sector that showed a potential reduction of 0.5 million tonnes of methane in seven years with enhanced productivity in only one per cent of the cattle population.

In Viet Nam, the Sustainable Agriculture Transformation Project helped more than a million farmers in the Mekong Delta area by introducing climate-smart rice farming practices, including the use of certified seeds, reductions in fertilizers and pesticides, and alternate drying of rice fields. These practices abated methane emissions and reduced production costs by about 22 per cent, increased profits by approximately 40 per cent, reduced the use of pesticides by 30 per cent and reduced water pumping by 40 per cent.

Brazil was one of the first countries to address methane emissions from the agricultural sector. The Low-Carbon Agriculture Plan, the Low-Carbon Agriculture Program and the Plan for Adaptation and Low Carbon Emission in Agriculture were launched in 2010, 2012 and 2020 respectively, aiming to reduce GHG emissions and finance low-carbon technologies in both livestock and cultivation activities.

(Source: World Bank Group)[71]

70 *UNEP Global Methane Status Report 2025*

71 *Bending the Curve, World Bank Group*

While many GMP-participating countries express political commitment and some have created improved inventories, policies and plans, more work is needed to create widespread and actionable national policies. Stronger integration into regulatory, financial and voluntary frameworks is needed to leverage co-benefits for, and avoid trade-offs with, food security, rural development and the conservation of ecosystems.

ACTION 5: Halve per-capita food waste and reduce food loss

While up to 720 million people go hungry[72], around one billion tonnes of food is wasted (at retail and consumer level) each year – 19 per cent of all food available to consumers.[73] An additional 13 per cent is lost post-harvest and before retail.[74] Food waste alone is responsible for 8-10 per cent of GHG emissions – including through methane produced when organic waste rots in dumps and landfills, linking the issue closely to the waste sector – and costs at close to USD 1 trillion per year.[75] Avoiding food loss and waste eliminates emissions from production, transport, refrigeration and disposal, positioning food loss and waste as one of the most cost-effective and achievable climate solutions.

Governments, farmers, cities, retailers and others must implement strategies aligned with the SDG 12.3 target to halve food waste and reduce food loss by 2030, including investments in cold-chain infrastructure and logistics in developing countries, public-private partnerships, incentives and educational campaigns.[76] Embracing innovation and fostering circular economy approaches in agrifood systems to prevent, reduce, reuse and repurpose food waste also creates new job opportunities, improves livelihoods and generates financial benefits for a range of stakeholders. Food banks are another option to feed people in need while avoiding sending organic waste to landfill.

ACTION 6: Reform incentives and redirect finance and subsidies

Governments must redirect harmful agricultural subsidies and improve MRV systems that could unlock progress in mitigation and result in development co-benefits. Low-cost measures in the agriculture sector could be implemented at a total annual cost of USD 2.5 billion, while reducing annual methane emissions by 17 million tonnes by 2030.[77] This investment amounts to less than three per cent of the subsidies governments currently allocate to the sector every year. Repurposing even a small share of these subsidies could significantly help finance methane mitigation.[78]

Governments must embed methane reduction in agricultural strategies and align subsidies and finance with climate-resilient production. MDBs, climate funds, bilateral partners and other providers of finance must scale blended finance, de-risk innovation and expand extension services to ensure farmers, particularly in developing countries, can adopt climate resilient methane reduction practices without compromising livelihoods. Investing in extension services is particularly important, as complementing existing schemes and using AI and digital extension can be a cost-effective way to ensure more farmers benefit.[79]

Holistic, equity-based policies are needed to avoid unintended consequences, such as shifting emissions to unregulated sources, or increasing food insecurity and rural poverty. Scaling up targeted incentives and financial support, particularly for smallholder farmers, is essential to unlock broader adoption. Key lessons for any country are to respect the sector's sensitivities, engage farmers as partners and use revenues to support, not punish, the transition.[80]

72 *The State of Food Security and Nutrition in the World 2025*
73 *UNEP Food Waste Index Report 2024*
74 *Tracking progress on food and agriculture-related SDG indicators 2022, FAO*
75 *UNEP Food Waste Index Report 2024*
76 *FAO 2025*
77 *UNEP Global Methane Status Report 2025*
78 *UNEP Global Methane Status Report 2025*
79 *CCAC 2024*
80 *Grassroots Journal of Natural Resources 2025*

5.3 METHANE MITIGATION ACTIONS IN THE WASTE SECTOR

While the solid waste subsector's methane reduction potential of eight million tonnes per year by 2030 is more modest, 49 million tonnes per year could be achieved by 2050 with near-term investment in landfill upgrades and large-scale diversion of organic waste from landfill.[81] Simple interventions can yield immediate results with minimal investment.

Currently available measures in the waste sector that would deliver on the 2030 mitigation potential would come at a net saving of USD 9 billion per year, requiring USD 18 billion per year in investment and operational costs and delivering USD 27 billion in savings per year from the valorization of recovered biogas from landfill gas capture and anaerobic digestion of food waste and wastewater.[82]

Essentially, methane reduction in the waste sector can turn a cost for municipal budgets into an economic opportunity. Captured landfill gas and anaerobic digestion can generate electricity, heat and renewable fuels. Composting programmes create soil amendments and local jobs. Nature-based Solutions such as Black Soldier Fly farming can turn organic waste into protein and a scalable business opportunity.[83] Modern waste systems reduce air pollution, prevent fires and improve sanitation. With the right policy frameworks and concessional finance, cities can transform waste from a liability into an engine of climate action, economic opportunity and public health improvement.

ACTION 7: Phase out open dumping and uncontrolled landfills

As urbanization accelerates and global waste volumes rise, unmanaged dumpsites risk locking in future emissions and compounding public health hazards. Today, more than half of the world's population lives in cities. The urban population is expected to more than double by 2050, with nearly 7 in 10 people living in cities.[84] The world produces over two billion tonnes of municipal waste annually, a figure expected to rise to nearly four billion tonnes by 2050. Today, 23 per cent of waste goes uncollected, while 33 per cent is openly dumped. In low-income countries, the problem is worse – 60 per cent of solid waste goes uncollected and 93 per cent is improperly managed.[85] Pre-2030 action is critical given that organic waste in landfills and dumpsites emits methane for decades.[86]

Key actions that must be taken include mandating the separate collection of organic waste and establishing facilities to treat it, closure of dumpsites, including with biocovers, enforcing standards for engineered landfills with methane collection, and increasingly diverting untreated biodegradable waste from landfills.

Box 5 Examples of country action

Cameroon: All major cities should have landfills with at least 70 per cent methane capture by 2035.

UAE: Target of 80 per cent landfill diversion by 2031.

Chile: 66 per cent organic waste diversion from landfills by 2040.

(Source: UNEP)[87]

81 UNEP Global Methane Status Report 2025
82 UNEP Global Methane Status Report 2025
83 Transforming Organic Waste with Black Soldier Flies, CCAC TEAP 2025
84 Urban Development Overview, World Bank Group
85 World Bank
86 UNEP Global Methane Status Report 2025
87 UNEP Global Methane Status Report 2025

Bans on organics going into landfill, within a realistic timeline, have been a game changer in several countries and must be adopted more widely. To yield results, such bans need to be accompanied by enabling policy frameworks and financing mechanisms to drive investments in alternatives – upstream, midstream and downstream. Consistent treatment infrastructure for organic waste and improved landfill engineering is also needed to ensure the sector contributes to meeting global methane abatement goals.

Local governments should reclaim land while cutting methane via the use of, for example, biocovers to close dumpsites and landfills. Where gas recovery is not viable, engineered biocovers/biofilters can reduce emissions by promoting methane oxidation. Sub-national governments can play a pivotal role in implementation and should be supported with adequate institutional capacity and enforcement tools.

ACTION 8: Capture methane from waste and wastewater

Although landfill-gas capture and other mitigation technologies are well established, collection efficiencies are often influenced by landfill design, operational practices and ageing infrastructure. Countries and cities must adopt policy measures that encourage landfill operators to capture and mitigate methane by favouring landfill mitigation and gas as a fuel source, offering incentives for landfill gas utilization projects and providing tax advantages for technologies that use biogas from landfills or anaerobic digestion.[88]

For the wastewater subsector, estimates suggest that the maximum annual mitigation potential is around five million tonnes of methane per year by 2030.[89] As more wastewater is being collected for sanitation reasons, it is critical to plan for appropriate treatment to ensure one problem does not replace another. Key measures to avoid methane releases from wastewater that must be taken include improving unsustainable wastewater management practices to prevent the formation of anaerobic conditions when possible, capturing methane and recovering biogas in facilities using anaerobic processes, flaring captured methane when recovery is not feasible, and minimizing leaks from the systems. National regulations should also provide the basis for scaling up composting and anaerobic digestion infrastructure, especially in urban and peri-urban settings.

ACTION 9: Build circular, low-methane urban waste systems

Implementation of technical measures must align with long-term decarbonization and circular-economy objectives, prioritizing upstream measures such as mechanisms and incentives to prevent food loss and waste, together with mandatory source separation. Clear mandates and consistent enforcement are needed to ensure the mitigation opportunities are fully used.

For many developing countries, methane reductions in waste depend on infrastructure investment. Local governments need access to financial resources for both capital and operating expenditure. MDBs and other finance providers must prioritize waste management transformation in urban development portfolios, recognizing methane mitigation as both a climate and public health imperative.

Governments should prioritize the mobilization of sustainable and scalable financing and enabling policies, and expand economic incentives through fiscal policies, carbon pricing, methane credits and concessional financing for biogas and organic-waste processing infrastructure.

Expanding public-private partnerships (PPPs) is also critical to accelerating innovation, expanding infrastructure and scaling methane mitigation solutions across the waste sector. Financing and PPPs should be structured to prioritize waste prevention and organics diversion and avoid lock-in to mixed-waste disposal. To be effective, these partnerships require enabling regulatory environments, clear risk-sharing mechanisms, transparent procurement processes and predictable revenue streams that make waste sector investments bankable. Integrating methane-reduction targets into PPP contracts, concession agreements and tenders for infrastructure can help align private capital with public climate goals, while promoting innovation and accountability throughout the value chain.

88 CCAC

89 UNEP Global Methane Status Report 2025

6. Increasing finance

Tracked methane abatement finance has risen in recent years, with a Climate Policy Initiative analysis showing an 18 per cent increase to an annual average of USD 13.7 billion in both 2021 and 2022.[90] However, this amount falls far below the estimated USD 127 billion net annual cost needed to 2030 to implement technical abatement measures in all three sectors. Delivering on the GMP requires a nine-fold rise in methane finance over 2022 levels.[91]

While significant, the costs represent only six per cent of global climate finance flows in 2023 and just over half of the year-on-year increase in climate finance from 2022 to 2023. The fossil fuel and agricultural sector mitigation costs also represent a small fraction of sectoral revenues or harmful subsidies. Closing the gap requires action from bilateral and philanthropic donors, private sector financial institutions, development finance institutions (DFIs), investors and more.[92] Priorities include investing in enabling conditions, supporting project preparation, incentivizing cost-effective projects, unlocking capital-intensive projects, covering ongoing project costs and supporting innovation.

There are existing financing pathways. For example, The World Bank's Global Flaring and Methane Reduction Partnership focuses on catalytic financing and grants to help governments and state-owned operators reduce emissions, while the Global Methane Hub supports methane reduction efforts in all three sectors through grant-making and partnerships. The ClimateWorks Foundation,[93] Pisces Foundation[94] and Sequoia Climate Foundation[95] all provide grants for methane-reduction work. Private sector actors, including corporations, investors and financial institutions, are emerging as critical drivers of finance.

Sources of grants and highly concessional donor funding, including governments and philanthropy, should scale available funding, cooperate to limit fragmentation of resources and coordinate to fill critical gaps. Financial incentives such as tax credits and concessional finance are important in developing economies, where upfront costs and capacity constraints can delay adoption of the technologies in the fossil fuel sector.

DFIs provide about USD 3 billion annually for methane mitigation – small compared with their USD 2.5 trillion in total yearly investments. Yet methane abatement delivers co-benefits aligned with development mandates. DFIs have an opportunity to scale up support.[96] Fossil fuel companies should also step up their investment, including increasing donations to the Global Flaring and Methane Reduction Partnership.

Ensuring funding reaches the local level is important, particularly in the waste sector, where local governments need adequate and sustained financing to cover both capital investment and operational costs, where the valorization of methane does not cover all costs. Many lack the necessary creditworthiness and direct access to funding. Climate finance must, therefore, be structured to reach the local level, supported by robust policy frameworks, clear regulations and sustained capacity building to ensure long-term impact.[97]

Joint funding can support the development and commercialization of new and innovative technologies. In 2023, for example, a group of governments, philanthropies and a private corporation jointly launched the Enteric Fermentation Research and Development Accelerator with more than USD 200 million in funding to support innovation in the livestock sector.[98]

Funding for capacity building is also crucial, and the COP 30 Action Agenda identified three key initiatives that can increase technical capacity to reduce methane emissions and mobilize investment: the World Bank Global Methane Reduction Platform (CH4D), the CCAC Technology & Economic Assessment Panel and the Super Pollutant Country Action Accelerator.[99]

90 UNEP Global Methane Status Report 2025
91 UNEP Global Methane Status Report 2025
92 UNEP Global Methane Status Report 2025
93 ClimateWorks Foundation
94 Pisces Foundation
95 Sequoia Climate Foundation
96 UNEP Global Methane Status Report 2025
97 CCAC Low-Methane Finance Toolkit
98 Global Methane Hub 2023
99 COP30 Action Agenda

7. Available international cooperation and support

International cooperation to deliver policy and regulatory support, technology transfer and capacity building is essential to accelerate the deployment of the practices outlined above. Many developing nations – among them major emitters in all three sectors – require support to include methane actions in their NDCs, develop Methane Action Plans, improve MRV systems and regulations, develop, maintain and repair infrastructure, and more. The following table is a non-exhaustive list of existing international support efforts that developing countries can draw on that extends beyond the financing efforts in the previous section.

Table 1: International initiatives, organizations and support mechanisms

INITIATIVES	ACTIVITIES
International Methane Emissions Observatory (IMEO)	Oil and Gas Methane Partnership (OGMP 2.0) – the only comprehensive, measurement-based international reporting framework for the sector. Methane Alert and Response System (MARS) – the first public global satellite integration system providing actionable data on very large methane emissions directly to stakeholders. Steel Methane Programme – an evolving initiative to tackle methane emissions in the steel supply chain. Methane Training Series – capacity building and support for regulators and stakeholders in the oil and gas sector.
Climate and Clean Air Coalition (CCAC)	Drives action on super pollutants and provides policy-relevant science, political advocacy and direct country support via a dedicated Trust Fund. Fossil Fuel Regulatory Programme (FFRP) – tailored support to 20 developing country governments for capacity development, regulatory frameworks and compliance. CCAC/IEA Regulator to Regulator Network Platform to help fuel regulators share experience, develop best practice and strengthen methane regulation through trusted collaboration. CCAC Methane Roadmap Action Programme – support to countries in developing national methane roadmaps and action plans and direct support in the waste and agricultural sectors, including on methane mitigation tools, practices and technologies. CCAC Superpollutant Country Action Accelerator – provision of a team and programmatic funding in countries.
The Global Methane Initiative	Cost-free technical, policy and programmatic methane mitigation support to countries.
UNECE Group of Experts on Coal Mine Methane and Just Transition	Promotes and develops the environmentally sustainable transition of industries along the coal value chain.
Global Methane Hub	Funds and convenes partners at international, national and local level to work towards curbing methane pollution in the most efficient way possible.
IEA	Global Methane Tracker, data and transparency, policy databases, abatement technologies.
World Bank	Global Flaring & Methane Reduction Partnership, Methane Reduction Blueprint, country support.
Super Pollutant Action Alliance	Advancing philanthropic learning and collaboration, building capacity, addressing barriers to action.
Oil & Gas Decarbonization Charter	Fosters collaboration by sharing knowledge, best practices and real-world experiences tailored to different stakeholders and national contexts.

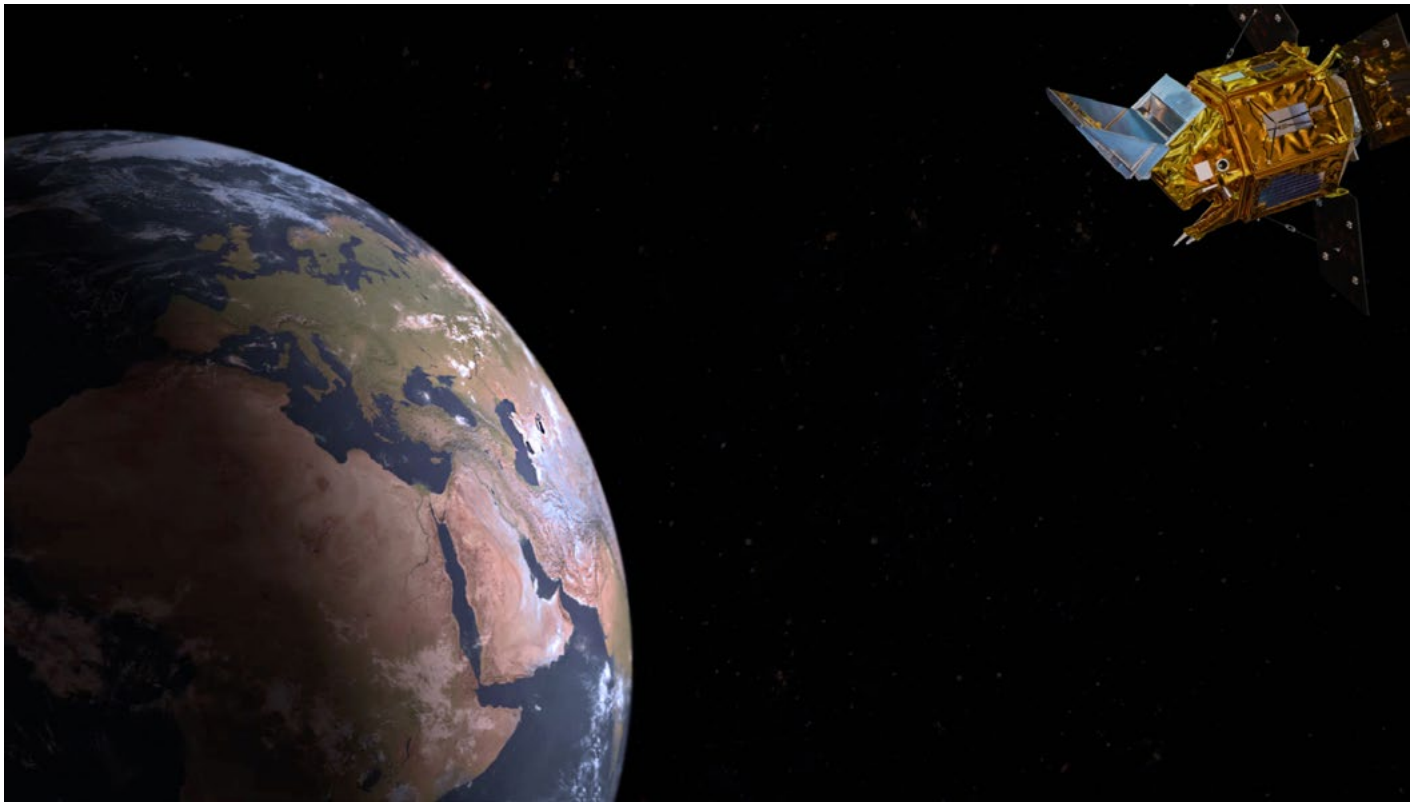
8. Conclusion

Methane mitigation, particularly in the fossil fuel sector, offers a huge opportunity to rapidly minimize overshoot of 1.5°C – which would decrease the risks of ecosystem collapse, food insecurity, displacement, instability and loss, and increase the chances of meeting long-term climate goals.

So far, this opportunity is being missed. The world is currently off track to meet the GMP goal of reducing global methane emissions by at least 30 per cent by 2030 relative to 2020 levels, which would avoid about 0.1-0.2°C of warming by mid-century. But following the nine actions across the fossil fuel, agriculture and waste sectors outlined in this report – all of which technically available and can often be delivered at low or no net cost – and rapidly transitioning away from fossil fuels would allow the world to quickly catch up. This would allow action on methane to play its part in a global transition that reduces near-term warming rates, helps to control peak temperatures and gets warming back below 1.5°C as quickly as possible before 2100.

Methane mitigation initiatives work most effectively when they combine technology, policy and sector-specific practices tailored to local economic and social contexts. Technologies, regulations and incentives should be applied in combination with robust monitoring and stakeholder engagement across the three sectors. This means that cooperation will be key.

Governments, cities, the private sector, the UN system, international organizations, insurers and financiers – from MDBs to philanthropies – must work together now to implement these nine actions by 2030 to lower near-term warming and deliver a host of co-benefits, from cleaner air and stronger crop yields to more jobs and major economic benefits. These actions will help to deliver a more secure, prosperous, resilient and clean future for all.



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