

Methane Matters:

Towards a global methane agreement



This briefing was written and researched by the Changing Markets Foundation, the Environmental Investigation Agency and the Global Alliance for Incinerator Alternatives.

www.changingmarkets.org

www.eia-international.org

www.no-burn.org



Published in November 2022

Design: Pietro Bruni - toshi.ltd

Contents

The Science of Methane	6
Background	7
Pillars of action	9
<i>Pillar 1- Monitoring and reporting</i>	<i>9</i>
<i>Pillar 2- Mitigation</i>	<i>9</i>
<i>National methane action plans</i>	<i>9</i>
<i>Energy</i>	<i>11</i>
<i>Agriculture</i>	<i>12</i>
<i>Waste</i>	<i>12</i>
<i>Pillar 3- Financial and Technical Assistance</i>	<i>12</i>
Global agreement on methane emissions - Pillars of Actions	14
Conclusions	15
References	16

Delegates at the Cop26 in Glasgow.

Credits: Wikimedia Commons



Uni
Clim



ited Nations
Climate Change

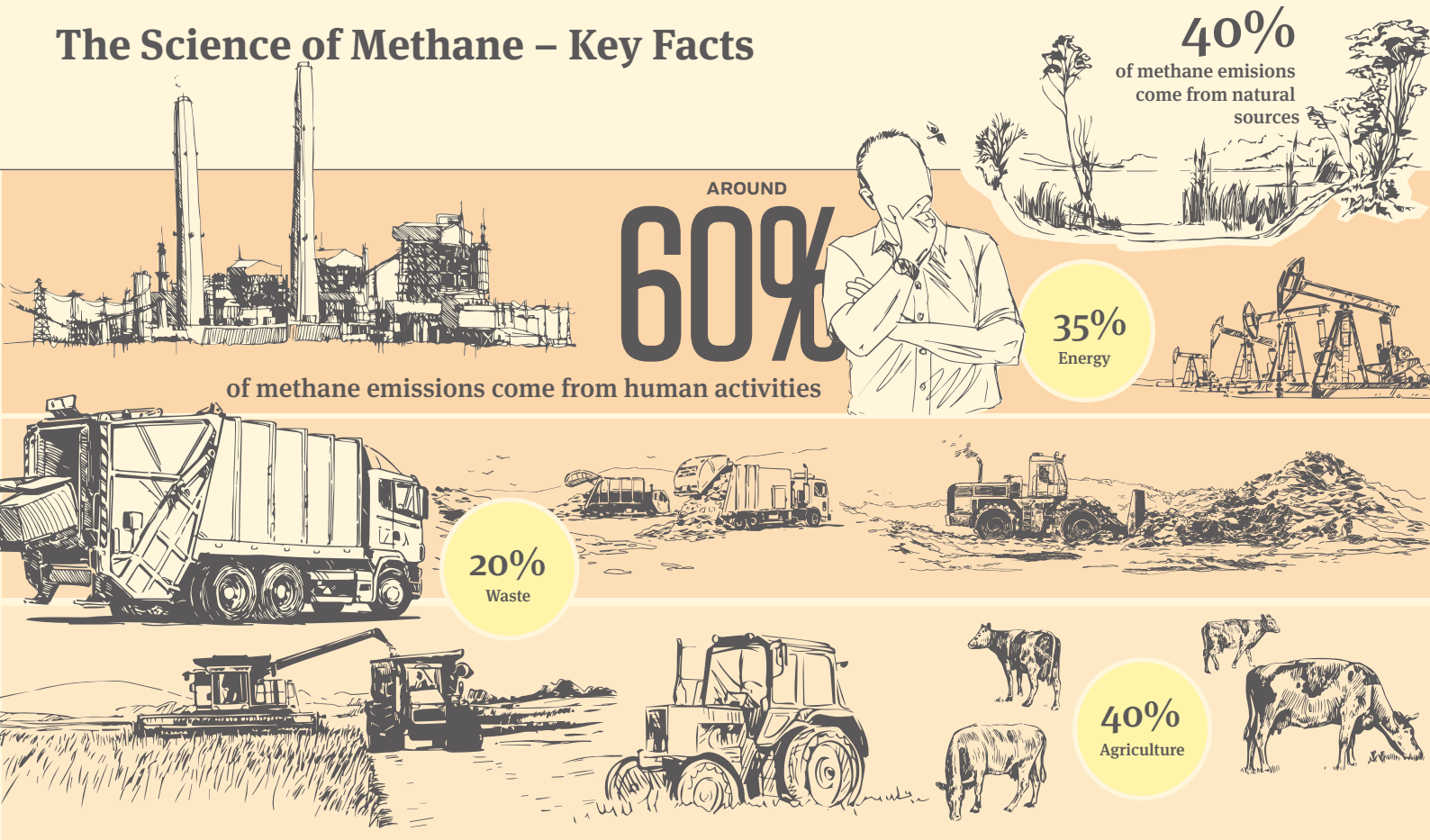


UN CLIMATE
CONFERENCE

IN PARTNERSHIP WITH ITALY



The Science of Methane – Key Facts



Global Methane Pledge plans

TO CUT GLOBAL METHANE EMISSIONS

30%

by 2030

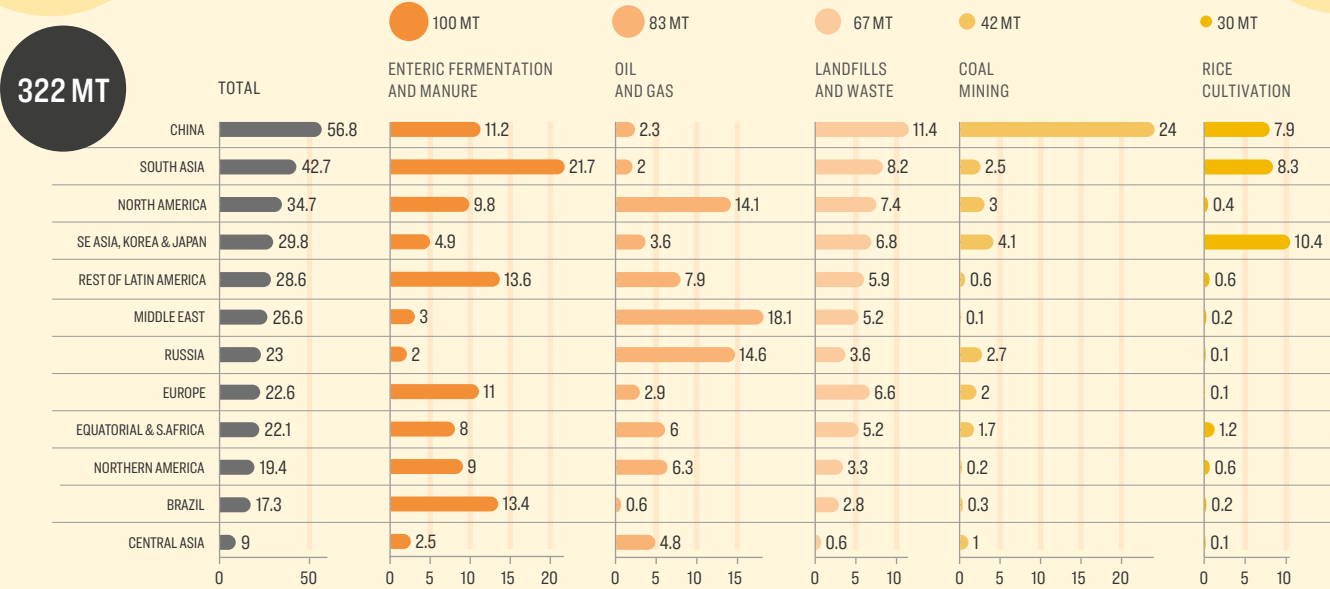


Scientists say that global methane emissions

MUST BE CUT

45%

by 2030



Background

Methane is the second most important greenhouse gas, around 80 times more powerful than carbon-dioxide (CO₂) over a 20-year period, contributing to 25% of warming experienced today.¹ The IPCC indicates that the scale of reduction of global methane emissions could decide whether global warming can be kept below 1.5°C and whether tipping points will be reached, which would accelerate irreversible changes to the climate system.²³ UN Environment's Global Methane Assessment (GMA) has found that "global methane emissions must be reduced by between 40–45% by 2030," 30% of which could be achieved by readily available measures.⁴

What is more, reducing methane emissions goes beyond solving the climate emergency and has been associated with tremendous co-benefits. This is in part because methane contributes to ozone formation, which is a potent local air pollutant that causes serious health problems, contributing to illnesses and premature deaths, as well as losses in agricultural harvests, not only locally but on a much wider geographical scope.⁵ Cutting methane by 45% by 2030 would have the potential to prevent 255,000 premature deaths and 775,000 asthma-related hospital visits each year, as well as increase global crop yields by 26 million tonnes per year.⁶ In the energy sector, venting, flaring and methane leaks represent a waste of fossil gas. Mitigating those emissions could therefore save energy. In the context of the global energy crisis, this is particularly crucial. For example, the International Energy Agency has found that if exporters to the European Union (EU) were to put in place measures to limit flaring, they could increase gas exports by more than 45 billion cubic meters using existing infrastructures. This is equivalent to almost one third of Russian gas exports to the EU in 2021.⁷

However, global anthropogenic methane emissions are projected to increase by nearly 9% over anticipated 2020 levels to 10,220 million metric tons of CO₂e by 2030.⁸ Concerted efforts between countries are therefore critical to see a drastic reduction of methane emissions at the global level and across high methane-emitting sectors.

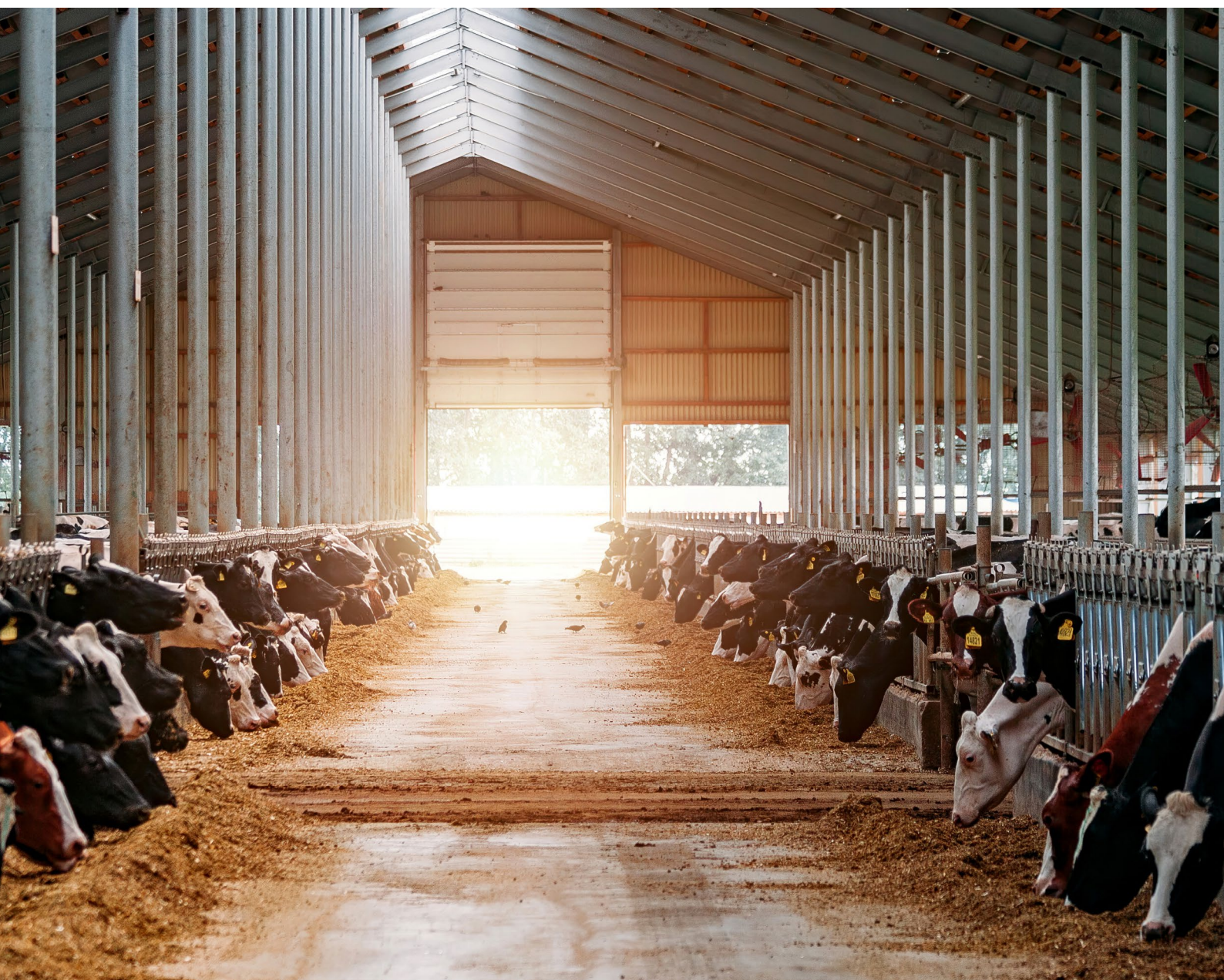
In light of these findings, more than 125 countries have committed to the Global Methane Pledge – an initiative launched at the 2021 UN Climate Conference (COP26) in Glasgow. The Pledge has the goal of "reducing global methane emissions by at least 30% from 2020 levels by 2030 and moving towards using best available inventory methodologies to quantify methane emissions."⁹ This Pledge represents an important milestone, but the initiative falls 10-15% short of the cuts needed to firmly ensure consistency with the 1.5°C target. Moreover, the Pledge does not include the key components to deliver on our objectives, including monitoring and reporting, national action plans and technical and financial assistance.

Anthropogenic methane emissions come from three major sectors: energy (35%), agriculture (40%) and waste (20%).¹⁰ New initiatives focusing on the energy sector alone, through the creation of a “buyers club” for fossil fuel importers, are insufficient to enable the necessary reduction of 45% of global methane emissions by 2030 nor will they achieve the additional reductions required in subsequent years. Therefore, to ensure a comprehensive approach, this new agreement should cover all three emitting sectors.

In other words, to deliver enduring methane emissions reductions at the scale required, countries should work toward quickly adopting a global methane agreement, one that provides an overarching framework to measure progress towards necessary reductions in 2030 and beyond, while ensuring international cooperation and financial assistance, enabling domestic actions and promoting implementation.

This ‘thought starter’ sets out a framework for collective international coordination and collaboration on methane emissions in the three emitting sectors, identifying the pillars of action for a global methane agreement to implement and strengthen the Pledge.

Credit: Shutterstock



Pillars of action

Pillar 1- Monitoring and reporting

An accurate monitoring, reporting and verification (MRV) framework is the foundation of any effective global agreement on methane. To date, actual methane emissions from energy, agriculture and waste have largely escaped scrutiny from policymakers, with many countries relying on methodologies based on outdated and generic emission factors or simplistic models, leading to chronic underreporting in these sectors. The MRV framework therefore requires substantial update and uptake, with a prompt progression to the use of higher-tier methodologies and incorporation of new technologies such as satellite, aerial and ground based monitoring. Developing well-functioning and accurate MRV frameworks will require early investment and support to institutionalise MRV into the industrial and bureaucratic landscape and make it regular and systematic, while ensuring its utility as a performance and planning tool.

To assist countries with verification, the IMEO can play a role by providing satellite surveillance and verification services as well as an early warning system for super-emitters. The emergence of satellite surveillance is dramatically increasing the amount of methane emissions data available with greater accuracy, spatial detail, quantification and timelines. National reporting in standardised formats by countries to a central clearing house, such as a secretariat, would also make the data accessible to scientists, economists, policymakers and civil society and improve implementation, compliance and enforcement.

Pillar 2- Mitigation

At the heart of the new global methane instrument is national action to reduce methane emissions in the energy, agriculture and waste sectors.

National methane action plans

To achieve the necessary reductions in 2030 and beyond, countries should adopt and update national methane action plans, setting out country-specific sectoral policies and measures and transposing international commitments. Tailored to the national context, and supported by an MRV framework, the submission of national



methane action plans would constitute the main pathway for reducing methane emissions over time. Because the mitigation potential in different sectors and countries varies considerably – depending on the presence of livestock, landfills and fossil fuels – countries should be expected to make their fair contribution based on a common metric. For methane reductions beyond 2030, the GMA further found that the mitigation potential from all sectors is expected to increase, which could form the basis for periodic review and update – a ratcheting mechanism to secure methane reductions over the longer term. On a practical level, national methane action plans can be developed independently, with each country setting out to adopt currently available measures, before being integrated into NDCs as a stand-alone section. This would mirror the approach taken for hydrofluorocarbons (HFCs) under the Kigali Amendment, whereby HFCs are controlled under the Montreal Protocol on Substances That Deplete the Ozone Layer and subject to Kigali HFC Implementation Plans (KIPs) but have also been integrated into several NDCs as stand-alone sections.¹¹ The first round of NDCs were delivered in 2020 and are subject to periodic review and update every five years, allowing for easy incorporation.

Energy

In the energy sector, national methane actions plans should contain sectoral phase-out strategies, linked to alternatives deployment and infrastructure investments in the main methane-emitting sectors – e.g. energy, heating, transport and industry – with national targets and measures to mitigate methane emissions in the interim, accompanied with a ban on expansion, exploration and new infrastructures. Such mitigation measures should include: (i) leak detection and repair (LDAR) subject to minimum requirements on frequency of checks, repair timelines and resurveying obligations, eventually moving to continuous monitoring; (ii) limits on routine venting and flaring with clearly defined exceptions and criteria and updated flaring-efficiency standards; (iv) decommissioning of unused and abandoned wells, in particular obligations to cap and seal or capture and use leaking methane to eliminate legacy methane emissions; (v) technology standards to reduce emissions associated with the normal operation of certain equipment; and (vi) measures on inactive coal mine methane, limits on venting and flaring in ventilation shafts, drainage and degasification stations.

Mitigating methane emissions from the energy sector does not necessarily mean price increases. The International Energy Agency (IEA) has found that “it is possible to avoid more than 70% of current emissions with existing technology, and around 45% could be avoided at no net cost”.¹² The GMA further found that more than 80% of the mitigation in the energy sector could be implemented at negative or low cost, with further reductions appropriate for 2040 and 2050 in line with climate-neutrality objectives, making the energy sector very appealing for policymakers.¹³

Agriculture

In the agricultural sector, livestock is by far the largest contributor of methane emissions (32% of all anthropogenic emissions), caused by the digestive systems of ruminants (enteric fermentation) and manure management. National methane action plans should adopt a holistic approach to food systems and encompass mitigation measures tackling both the ways we produce and consume food. The GMA concluded that targeted technical measures at production level, such as feed additives and manure management, could reduce methane emissions in the ruminal livestock sector by around 30 million tons per year by 2030, but that these technical measures will not suffice on their own. It is crucial that governments adopt policy measures to promote healthier human diets with less and better meat and dairy and more sustainable food production systems that will ultimately reduce the number of animals used for food. Countries in the Global North, where people over-consume meat and dairy products and where a large share of overall methane emissions comes from animal agriculture, should prioritise this transition. A shift towards healthier diets with less animal products will also have significant co-benefits in terms of public health and food security, especially given the ongoing food crisis due to Russian invasion of Ukraine. For example, scientists estimated that reducing the use of grains to feed livestock by about one-third in the European Union could compensate for the collapse of Ukrainian exports of grains and oilseed.¹⁴

Waste

Methane emissions in the waste sector arise primarily from the anaerobic decomposition of organic waste in landfills, making the solution rather simple: stop landfilling organic waste. National methane action plans should therefore prioritise the reduction of food waste throughout the value chain. In addition to reducing organic waste, added advantages include increasing food supplies and reducing pressure on farmland. National methane action plans should include support to local governments to implement composting at scale, which is an effective, inexpensive and universally applicable treatment for organic waste that avoids methane emissions and improves soil quality, making it more resilient to climate stressors like droughts and floods. Alternative treatments include anaerobic digestion and use of organic waste to produce animal feed. Additional methane mitigation measures, such as biostabilization and the use of biologically active landfill cover, function well in tandem with composting. In combination, this approach can reduce landfill methane emissions by 95%.¹⁵

Ultimately, organic waste prevention, source separation and separate treatment of organic waste all synergise with larger zero-waste goals and generate many co-benefits, such as increased employment and better air quality, as part of a transition to a new, circular economy and sustainable food system.

Pillar 3- Financial and Technical Assistance

Collective action on methane emissions will require technical assistance to policymakers and financial assistance to developing countries.

Policy-making should be based on the best available technical and science. This can be achieved through a technical body that focuses on the range of issues associated with methane emission reduction, one that brings together the relevant scientific and technical expertise to inform the decisions of policymakers. This body would be expected to undertake periodic comprehensive assessments on progress towards common objectives and produce *ad hoc* reports on specific issues, as requested. Technical assistance can be further enhanced by coordinating with existing institutions and international organizations, such as the Climate and Clean Air Coalition (CCAC) and the Food and Agricultural Organization (FAO), among many others.



Credit: Shutterstock

Financial assistance to developing countries will also be required to support implementation. Following the collective experience of various multilateral environmental agreements, stable and predictable funding is a critical component of any effective global governance framework. Financial assistance can be divided into two main categories: (i) enabling activities, i.e. those activities necessary to pave the way for or enable compliance such as capacity-building and training, policy development, monitoring and reporting, institutional strengthening and pilot and demonstration projects; and (ii) other agreed costs, i.e. costs related to complying with the new commitments, such as infrastructure investments.

Global agreement on methane emissions - Pillars of Actions

Pillar 1 Monitoring and reporting	Pillar 2 Mitigation	Pillar 3 Financial and technical assistance
Monitoring and reporting on methane emissions and implementation	National methane action plans	Technical support to policymakers and financial support to developing countries
<p>Harmonisation</p> <p>definitions and methodologies formats and templates standards</p> <p>Measurement and verification</p> <ul style="list-style-type: none"> energy <ul style="list-style-type: none"> oil and gas coal heavy industrial end users agriculture <ul style="list-style-type: none"> animal husbandry and manure management rice paddies waste <ul style="list-style-type: none"> landfills and dumpsites organic waste management <p>International Methane Emissions Observatory (IMEO)</p> <p>satellite surveillance and verification super-emitter detection and alert</p> <p>National reporting</p> <p>inventories and emissions national methane action plans</p>	<p>Energy</p> <ul style="list-style-type: none"> oil and gas <ul style="list-style-type: none"> leak detection and repair limits on venting and flaring technology standards inactive wells coal <ul style="list-style-type: none"> ventilation shafts limits on venting and flaring drainage and degasification stations inactive coals mines <p>Agriculture</p> <ul style="list-style-type: none"> livestock <ul style="list-style-type: none"> animal husbandry animal feed and health improvements manure management herd-size reductions meat and dairy regulations promotion of plant-based foods and other meat analogues rice paddies <ul style="list-style-type: none"> technical measures <p>Waste</p> <ul style="list-style-type: none"> landfills and dumpsites <ul style="list-style-type: none"> biologically active cover landfill gas capture diversion organic waste management <ul style="list-style-type: none"> waste prevention source separation high-impact treatments (composting, anaerobic digestion) animal feed production bio-stabilisation incineration bans <p>Super-emitters</p> <p>satellite surveillance early detection and response protocols</p>	<p>Technical assessment bodies</p> <p>periodic comprehensive assessments ad hoc reports</p> <p>Financial assistance</p> <ul style="list-style-type: none"> Enabling activities <ul style="list-style-type: none"> institutional strengthening capacity-building and training monitoring and reporting policy development and implementation pilot and demonstration projects Other agreed costs <p>Implementing and bilateral agencies</p> <ul style="list-style-type: none"> Technical assistance <ul style="list-style-type: none"> capacity-building and training monitoring and reporting policy development and implementation pilot and demonstration projects Best practices and knowledge exchanges <p>Coordination</p> <p>Climate and Clean Air Coalition (CCAC) Scientific Advisory Panel (SAP) Intergovernmental Panel on Climate Change (IPCC) International Energy Agency (IEA) Food and Agricultural Organization (FAO) World Bank Other public and private initiatives</p>

Conclusion

Time is of the essence. Readily available and often low-cost interventions are available to reduce methane emissions. But to deliver enduring methane emissions reductions at the scale required, it is time to initiate negotiations to develop a global methane agreement.

References

- 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 [ONLINE] <https://www.ipcc.ch/report/ar5/wg1/anthropogenic-and-natural-radiative-forcing/>
- 2 UNEP (2021). *Global Methane Assessment: Summary for decision makers*. Page 6. Available [ONLINE] https://wedocs.unep.org/bitstream/handle/20.500.11822/35917/GMA_ES.pdf
- 3 UNEP and Climate and Clean Air Coalition (2021). *Assessment of environmental and societal benefits of methane reductions*. Available [ONLINE] <https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions>
- 4 UN Environment and Climate and Clean Air Coalition (May 2021). *Global Methane Assessment: Benefits and Cost of Mitigating Methane Emissions*. Pages 9-10 and 13. Available [ONLINE] <https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions>
- 5 Van Dingenen, R., Crippa, M., Janssens-Maenhout, G., Guizzardi, D. and Dentener, F. (2018). *Global trends of methane emissions and their impacts on ozone concentrations*, EUR 29394 EN. Luxembourg: Publications Office of the European Union.
- 6 UNEP (2021). *Global Methane Assessment: Summary for decision makers*. Page 8. Available [ONLINE] https://wedocs.unep.org/bitstream/handle/20.500.11822/35917/GMA_ES.pdf
- 7 IEA (2022). *The energy security case for tackling gas flaring and methane leaks*. Available [ONLINE] <https://iea.blob.core.windows.net/assets/9414ec9a-bbba-4592-b005-4af05c894bdc/Theenergysecuritycasefortacklinggasflaringandmethaneleaks.pdf>
- 8 Global Methane Initiative. *Global methane emissions and mitigation opportunities*. Available [ONLINE] <https://www.globalmethane.org/documents/gmi-mitigation-factsheet.pdf>
- 9 UNEP (2021). *New global methane pledge aims to tackle climate change*. Available [ONLINE] <https://www.unep.org/news-and-stories/story/new-global-methane-pledge-aims-tackle-climate-change>
- 10 UNEP (2021). *New global methane pledge aims to tackle climate change*. Available [ONLINE] <https://www.unep.org/news-and-stories/story/new-global-methane-pledge-aims-tackle-climate-change>
- 11 UNFCCC Secretariat (2021) *NDC synthesis report*. Available [ONLINE] <https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/ndc-synthesis-report/ndc-synthesis-report>

- 12 International Energy Agency (October 2021). *Curtailling Methane Emissions from Fossil Fuel Operations: Pathways to a 75% Cut by 2030* (Page 7). Available [ONLINE] <https://iea.blob.core.windows.net/assets/585b901a-e7d2-4bca-b477-e1baa14dde5c/CurtaillingMethaneEmissionsfromFossilFuelOperations.pdf>
- 13 *Climate and clean air coalition, United Nations Environment Programme (2021). Global Methane Assessment. (Page 97, paragraph 2 and 6). Available [ONLINE] https://www.ccacoalition.org/en/resources/global-methane-assessment-full-report*
- 14 Pörtner, Lisa M. et al. (2022) *We need a food system transformation - in the face of the Ukraine war, now more than ever. Available [ONLINE] https://zenodo.org/record/6366132#.Y1v8PuzMLOr*
- 15 Changing markets Foundation, Environmental Investigation Agency, GAIA (2022), *Methane Matters: A comprehensive approach to methane mitigation. Available [ONLINE], http://changingmarkets.org/wp-content/uploads/2022/03/CM-WEB-FINAL-REPORT-METHANE-MATTERS-1-1.pdf*

