

Committee of Permanent Representatives
Subcommittee Meeting
Thursday, 23 March 2023
14:00 – 17:00 (GMT+3)
Conference Room 1, United Nations Office at Nairobi
Hybrid meeting

Agenda item 3: Secretariat briefing on the International Methane Emissions Observatory.

This note serves as an information background document for consideration of agenda item 3, whereby the Subcommittee will be provided a presentation on the International Methane Emissions Observatory and other relevant efforts to support reduction of methane emissions by the Secretariat.

Following the presentation, Member States and Stakeholders are invited to engage in an exchange of views with the Secretariat on the International Methane Emissions Observatory and other relevant efforts to support reduction of methane emissions.

From measurement to mitigation: UNEP's efforts to reduce emissions of methane

Introduction

Reducing methane emissions represent a critical opportunity to reduce global warming in the near-term as broader decarbonization efforts gain momentum.¹ To support efforts aimed at reducing emissions of this potent greenhouse gas, UNEP engages in and provides the Secretariat of the Climate and Clean Air Coalition (CCAC) and operates the International Methane Emissions Observatory (IMEO). Each of these complementary efforts is described below within the context of recent advances in methane science and detection, and response measures available to both governments and non-state actors.

The launch in 2018 of the European Space Agency's TROPOMI instrument aboard the Sentinel-5P satellite marked the beginning of the modern era of space-based methane detection. Instruments like TROPOMI make possible the detection of methane super-emitters at an unprecedented resolution, meaning that timely information on emissions sources and magnitudes can be flagged and remedial action taken quickly. Attribution of emissions to specific facilities still requires point-source detectors that have higher spatial resolution, but such detectors are being developed, while other high-resolution land-surface mapping satellites are being repurposed for methane detection.

UNEP is harnessing the best attributes of these satellites and rapidly evolving detection technologies to create a "system-of-systems" that detects, attributes, and promotes methane mitigation at a global scale. Parallel efforts are improving understanding of methane sources and abatement options. Other efforts are strengthening the capability of national, regional, and local governments to use this emerging data; identify cost-effective mitigation actions; and develop policies, programmes, and projects that aim to reduce methane emissions.

The Methane Alert and Response System

Climate transparency is a growing priority for stakeholders around the world because open and reliable information on emissions is necessary to target mitigation actions at the speed and scale needed to achieve the goals of the Paris Agreement. UNEP is improving climate transparency through the Methane Alert and Response System (MARS), a component of IMEO.

MARS is the first global system connecting satellite methane detection to notification processes that promote on-the-ground emissions mitigation efforts. As such, it will help implementation of the Global Methane Pledge² by scaling up global efforts to detect and act on major methane emissions sources.

¹ The CCAC/UNEP Global Methane Assessment estimated that reductions in the order of 45% could be achieved with available and low-cost technologies, while the CCAC/UNEP Baseline Report 2030 indicated that with no new measures an increase in methane emissions of up to 14 percent is likely.

² The Global Methane Pledge, launched by the U.S. Government and European Commission at COP26, has gathered more than 150 countries committed to voluntary actions that aim to reduce methane emissions by at least 30% from 2020 levels by 2030.

MARS is currently in a pilot phase, results of which will be reported by UNEP at COP28. Experience from the pilot phase and additional observation capacity due to come on-line in the coming months will allow MARS to spot point sources that have even lower emissions rates and identify area sources such as agriculture and waste.

The initial focus is on very large point sources from the energy sector. In developing MARS, UNEP has collaborated with a range of institutional partners, including the International Energy Agency, the CCAC, and member companies of the [Oil and Gas Methane Partnership 2.0](#)³³, all of whom will participate in implementation of the initial phase.

MARS has four components:

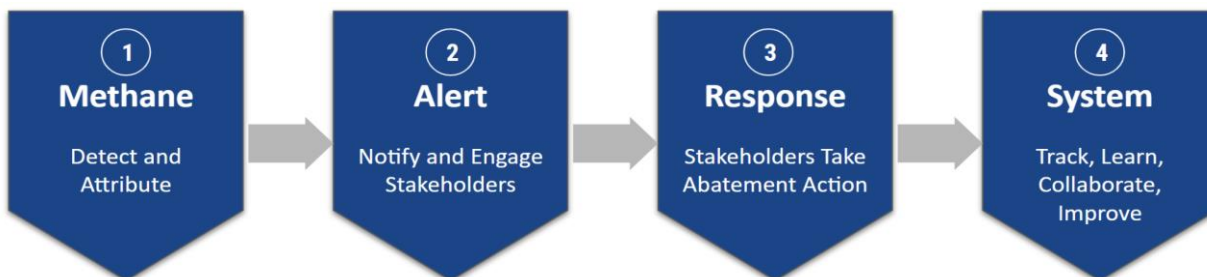


Figure 1. Overview of MARS Components

- Component 1: Detect & Attribute:** UNEP is working with existing global mapping satellites such as the EU/ESA Copernicus Sentinel 5P/TROPOMI to identify very large methane plumes and methane hot spots. Other satellites such as ASI PRISMA; EU/ESA Copernicus Sentinel-2; ESA Sentinel-2; NASA Landsat; DLR EnMAP and datasets allow for further analysis and enable attribution of the event to a specific source.

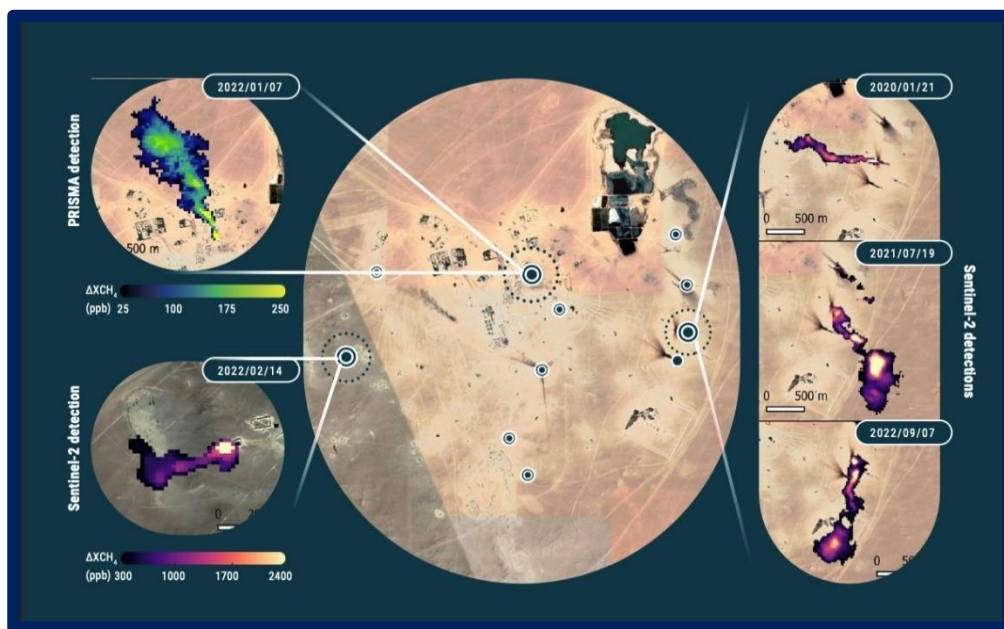


Figure 2. Example of Methane Plume Detection Compared to Visual Imagery

³³ The Oil and Gas Methane Partnership was launched by UNEP and the CCAC at the UN Secretary-General’s Climate Summit in 2014. It provides a comprehensive, measurement-based reporting framework for the oil and gas industry that improves the accuracy and transparency of methane emissions reporting in the oil and gas sector. Over 100 companies participate in OGMP2.0.

- **Component 2: Notify and Engage:** UNEP will work with partners to notify governments and companies about large methane emissions events occurring in their jurisdictions or operations.
- **Component 3: Stakeholders Take Abatement Action:** Notified stakeholders will determine how best to respond to the notified emissions and share their actions with UNEP. MARS partners will be available to provide support services at this stage, for example helping assess mitigation opportunities and/or supporting abatement actions.
- **Component 4: Track, Learn, Collaborate, Improve:** UNEP will monitor the event location for emissions as mitigation efforts proceed. Once MARS is fully operational, UNEP and partners will make data and analysis publicly available between 45- and 75-days post detection. UNEP will foster collaboration across the MARS ecosystem to draw lessons that can be applied to improve MARS and strengthen methane action in general.

Engaging Stakeholders

UNEP is engaging governments and companies on MARS to ensure that the right stakeholders are contacted and connected. The notification process, detailed below, aims to get information on emissions events to those who can act quickly.

The first planned step is an initial notification as soon as possible after detection. If MARS connects the emissions to an OGMP 2.0 asset location that has been provided to UNEP, the company will be notified directly with a preliminary estimate of the location. The government contact or contacts provided to UNEP will at the same time be notified about the event. If there is no OGMP 2.0 member company involved, the government will be notified first, and companies subsequently.

After two weeks, UNEP will provide governments and operators with a detailed report of the satellite data, and request that within 45-75 days of the notification operators provide both

feedback on the cause of the emission and share any mitigation plans completed or in process. This information will be documented by UNEP. P

UNEP will work with partners throughout this process, connecting stakeholders with entities that can provide mitigation support where possible.

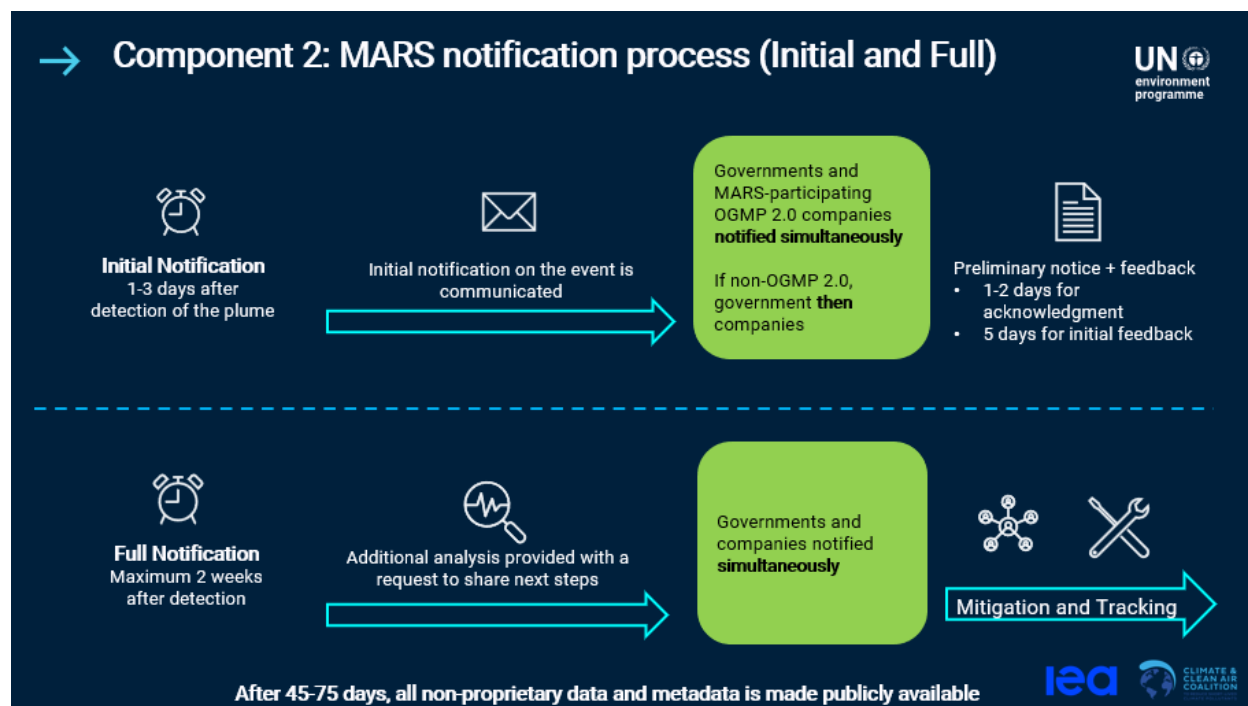


Figure 3. Proposed MARS Notification Process

Other Elements of UNEP's Work on Methane Emissions

UNEP is at the forefront of methane emissions reduction, supporting the [Paris Agreement](#) goal of keeping global temperature rise well below 2°C. UNEP's work has two pillars: data and policy. Companies and governments use IMEO's global database of empirically verified methane emissions data to target mitigation actions and support science-based policy options. Through the UNEP-convened CCAC, UNEP advocates high-level commitments and supports countries with institutional strengthening, policy support and national planning. Both initiatives are core implementers of the [Global Methane Pledge](#). The CCAC Secretariat also provides certain secretariat functions under its Methane Flagship.

IMEO

IMEO catalyzes the collection, reconciliation and integration of empirically-based, near-real time methane emissions data to provide unprecedented climate transparency and the information required for reducing this powerful greenhouse gas. IMEO exists to provide open reliable

actionable data to the individuals who act to reduce 150 Mt of methane emissions by 2030. It serves the rapidly growing ecosystem of governments, companies, investors, researchers, NGOs and other entities engaging in this crucial climate challenge.

IMEO's core functions are:

- 1. Integrate methane data** from different sources into a coherent and policy-relevant platform that accounts for the confidence of each data element and improves the characterization of global methane emissions.
- 2. Collate proprietary asset emissions data** through OGMP 2.0, report aggregated company data, and verify progress towards announced targets.
- 3. Hold companies accountable for their emission performance and encourage companies** to increase their performance targets, making rigorous methane emissions management integral to their operational practices.
- 4. Fund scientific measurement studies** that improve the characterization of methane emissions from human activities.
- 5. Evaluate measurement methodologies and technologies** to encourage the adoption of the best solutions on the broadest scale.
- 6. Engage countries** through capacity building that develop policy-relevant science, strengthen the science-policy interface, and deepen understanding of the importance of methane mitigation.
- 7. Provide early warning** services for extraordinary anthropogenic methane emissions.

A critical component of IMEO is the Oil and Gas Methane Partnership 2.0, which aims to improve methane transparency by providing accurate, unbiased and up-to-date information on methane emissions from fossil fuel operations. Originally launched by the CCAC in 2014, OGMP was ratcheted up in scope and ambition in November 2020 to become the Oil and Gas Methane Partnership 2.0.

The Partnership provides a systematic way for companies to manage methane emissions and demonstrate reductions in a credible way. Companies across the oil and gas value chain report methane emissions from all sources at both operated- and non-operated ventures at an unprecedented level of accuracy and granularity. UNEP receives companies' asset emissions data and ensures its completeness and integrity.

Methane Alert and Response System

As noted above, MARS contributes to IMEO's mission of providing open, reliable, and actionable data to stakeholders who have the agency to reduce emissions. MARS uses state-of-the-art satellite data to quickly identify major emissions events, notify and engage countries and operators, provide support for mitigation, and track progress.

Science

Through another component of IMEO, UNEP aims to improve knowledge regarding the location and magnitude of methane emissions by funding peer-reviewed studies and the reconciliation

of empirical data. The Methane Science Studies generate robust, publicly available data and improve measurement methods. This data enables stakeholders to prioritize policies and actions that reduce methane emissions. Measurements have occurred in Africa (Angola and Gabon), the Middle East (Oman), and across North America, Europe, and Australia, as well as through several global satellite studies. Upcoming efforts will focus on Europe, South America, Asia, and Australia. Although the focus was initially on oil and gas infrastructure, it is being expanded to cover metallurgical coal mines, landfills, and agricultural sources.

Implementation

Recognizing the importance of the science-policy interface, UNEP focusses on ensuring that governments have accurate scientific data and information to support effective methane mitigation strategies and policies. IMEO shares with partner organizations and government bodies information and best practices in a non-prescriptive manner, ensuring objectivity.

As part of the IMEO effort, UNEP offers a series of virtual methane trainings developed for policymakers and companies in the oil and gas sector. Trainings are available in the six official UN languages and have been provided to over 300 participants from 20 governments.

The Climate and Clean Air Coalition

The UNEP-convened Climate and Clean Air Coalition is a voluntary partnership of governments, intergovernmental organizations, businesses, scientific institutions and civil society organizations committed to reducing short-lived climate pollutants, thereby integrating climate and clean air solutions to slow the rate of global warming and achieve benefits for public health, food and economic security. Since its inception in 2012, the CCAC has focused on short lived climate pollutants , including include methane, hydrofluorocarbons, black carbon and tropospheric ozone. The CCAC has grown from six countries and UNEP as founding partners to 78 countries and 78 non-state actors including numerous UN sister agencies. It has implemented projects worth 100 million USD in its first phase. The CCAC's science products have strengthened political commitment, the Global Methane Assessment having informed the Global Methane Pledge being one example.

In 2021, the CCAC's partners adopted the 2030 Strategy which has, at its core, a commitment to support national, regional, and local governments to leverage emerging data, identify cost-effective mitigation actions, and develop policies, programmes, and projects.

Furthermore, the CCAC convenes a Planning Hub and sector Hubs across key sectors, including the three main methane emitting sectors: agriculture, fossil fuels, and waste. These provide a common vision, foster peer-to-peer exchange, and allow for matchmaking.

More information about the CCAC can be found on its [website](#) and in its latest online CCAC Annual Report.

CCAC services, available to its developing state partners and Global Methane Pledge participants include:

- **Expert technical assistance:** to provide guidance on technological options, mitigation measures, funding opportunities, application of measurement tools, and policy development.

- **National planning support:** to develop national plans that integrate climate and clean air objectives through actions to reduce methane and other short-lived climate pollutants. This covers all stages of the national planning process, including emissions inventories, policy and mitigation measure assessments, action plan design, and Monitoring, Reporting & Verification (MRV).
- **Policy and regulatory support:** through targeted activities such as regulatory analysis, cost-benefit analysis, and peer-to-peer exchanges.

Specifically related to methane, the CCAC has a [Methane Technical Assistance Portal](#) and is:

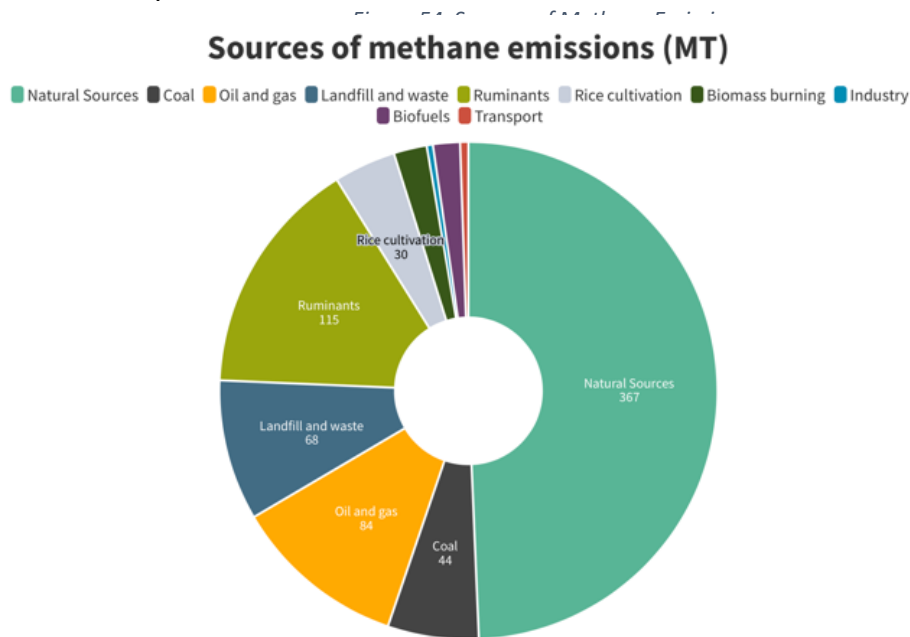
- Providing countries with **methane projections**, using international data from the CCAC/UNEP Global Methane Assessment, the CCAC generates country specific profiles summarizing the mitigation potential across the sectors, the cost of action, and the benefits achieved. These profiles are intended to provide initial insight into the priority areas for action in the main source sectors – agriculture, fossil fuels, waste – and offer a consistent point of comparison between countries, regions and global assessments.
- Offering training and peer-to-peer exchange through its **Methane Roadmap Action Programme** (“M-RAP”) to support the development and implementation of transparent and consistent National Methane Action Plans.
- Providing targeted support and national consultants to build capacity in national governments for inter-ministerial coordination and engagement especially on planning, to support National Methane Action Plan development, and to facilitate access to resources and financing for implementation.
- Engaging the media, with Masterclasses to support public understanding and to maintain momentum for the political/diplomatic efforts of the Global Methane Pledge.

Annex I

Why Reducing Methane Emissions is Important

Methane is a short-lived but potent climate pollutant. Despite an atmospheric lifetime of only approximately a decade, the average impact of one tonne of methane on climate warming is roughly 80 times that of one tonne of carbon dioxide (using a 20-year Global Warming Potential). Overall, methane emissions are responsible for almost one-third of the current rise in global temperature and the atmospheric concentration of this gas is increasing faster now than at any time since the 1980s. Moreover, methane contributes to the formation of tropospheric ozone, a potent air pollutant associated with respiratory diseases and decreased crop yield. The social cost of methane emissions is currently estimated at more than \$1000 per tonne, under any scenario.⁴

More than half of global methane emissions come from anthropogenic activities in three sectors: fossil fuels (35%), waste (20%), and agriculture (40%). The CCAC Global Methane Assessment is clear: reducing methane emissions is imperative to act on climate change as the Paris Agreement's target cannot be achieved at a reasonable cost without 40-45 per cent methane emissions reduction by the end of this decade. This target could be met with currently available mitigation options. Furthermore, methane's short atmospheric lifetime presents an opportunity for a rapid reduction in climate forcing that would allow limiting dangerous climate feedback loops.



Source: Global Methane Assessment 2021
<https://www.ccacoalition.org/en/resources/global-methane-assessment-full-report>

The increased understanding of the urgency to reduce methane emissions has been reflected by Global Methane Pledge, an initiative launched at COP26 to accelerate action on methane. Countries who join the Pledge agree to contribute to a collective effort to reduce global

⁴ Shindell, D. T., J. S. Fuglestvedt, and W. J. Collins. "The social cost of methane: theory and applications." *Faraday Discussions* 200 (2017): 429-451.

methane emissions at least 30 percent from 2020 levels by 2030, aiming to eliminate over 0.2°C warming by 2050. The pledge has now 150 countries on board and these countries represent collectively over a half of global anthropogenic methane emissions. UNEP supports countries achieve the objectives of the Global Methane Pledge through the International Methane Emissions Observatory (IMEO) and the Climate and Clean Air Coalition (CCAC) both of which have been identified as implementing partners of the Global Methane Pledge.