UN environment programme

From measurement to momentum

Data is driving action — now the pace must match the promise



An Eye on Methane 2025

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Abbreviations

COP	Conference of the Parties
EDF	Environmental Defense Fund
EU	European Union
ESG	Environmental, Social and Governance assessments
GFMR	Global Flaring and Methane Reduction Partnership
IEA	International Energy Agency
IMEO	International Methane Emissions Observatory
IPCC	Intergovernmental Panel on Climate Change
LDAR	Leak Detection and Repair
LNG	Liquified Natural Gas
MARS	Methane Alert and Response System
Met coal	Metallurgical coal
MENA	Middle East and North Africa
MRV	Measurement/Monitoring, Reporting and Verification
NOJV	Non-operated joint venture
OGDC	Oil and Gas Decarbonization Charter
OGMP 2.0	Oil and Gas Methane Partnership 2.0
SMP	Steel Methane Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme

Foreword



Cutting methane emissions is our climate emergency brake, and it is long past time we pulled it. Human-caused methane emissions drive roughly one-third of current warming, and the gas is over 80 times more powerful a climate forcer than carbon dioxide. But methane remains in the atmosphere for less time than carbon dioxide, meaning that bold action today can slow the world's rate of warming within years, not decades, and buy precious time to advance the broader energy transition.

Acting on methane is not only a climate imperative, it is an economic and operational opportunity. Across sectors, solutions to reduce methane emissions are proven, often low-cost and in many cases generate savings or additional revenues.

In the fossil fuel sector especially, solutions to methane emissions are abundant and common sense. From capturing gas that can be sold to eliminating revenue-draining inefficiencies, cutting methane is among the smartest investments any operator can make. Companies that act decisively are not just reducing emissions: they are strengthening efficiency, competitiveness, energy security and public trust.

And yet, solutions and data only matter when they are put into practice. That is where UNEP's International Methane Emissions Observatory (IMEO) plays a decisive role—ensuring that credible data reaches the governments, companies and regulators with the power to act on it.

The data revolution IMEO is driving—enabled by new technologies and innovation, growing scientific research and expanded company reporting—is turning uncertainty into clarity, and clarity into action. Its mission is to deliver credible information directly to those who can turn it into real-world emission reductions.

This annual report demonstrates that credible data on methane emissions is already driving real results. Governments are using it to shape regulation, investors to assess risk and companies to find and fix leaks. Transparency, accountability and innovation are aligning to turn methane mitigation into one of the most cost-effective levers we have for climate action.

But action needs to speed up. Responses to alerts issued by UNEP on major emissions detected via satellites have increased twelve-fold in just one year. This is real progress, yet it also underscores the gap that remains: almost 90 per cent of satellite-detected emission events flagged by UNEP still go unaddressed by governments and companies.

In the oil and gas sector, nearly one-third of global production is now, or soon will be, reporting methane emissions at the highest data quality levels to UNEP through the Oil and Gas Methane Partnership 2.0. This is laudable. But the rest of the industry must now follow—moving beyond pledges to investing in credible data and real mitigation.

With less than five years to achieve the Global Methane Pledge, the moment has come to pull the emergency brake. UNEP, through IMEO, will continue to provide the science, partnerships and tools needed to seize the methane opportunity. What remains is to scale up action—with urgency, ambition and accountability—to deliver a safer, cooler and more prosperous future.



Martin Krause
Director, Climate Change Division

Executive summary

Cutting methane emissions is the fastest, most cost-effective way to slow near-term warming as broader decarbonization efforts advance. With only 52 months until 2030, achieving the Global Methane Pledge target—a 30 per cent reduction in global methane emissions by decade's end—is more urgent than ever.

The United Nations Environment Programme's International Methane Emissions Observatory (IMEO) is a core implementing partner to the Global Methane Pledge, supporting the more than 150 country signatories with data and tools to reduce emissions and meet Paris Agreement targets. IMEO combines rigorous industry reporting, satellite data and scientific research campaigns to turn transparency into action.

UNEP's Oil and Gas Methane Partnership 2.0 (OGMP 2.0) remains the world's most comprehensive framework for methane measurement and reporting in the oil and gas sector. Over the past five years, membership has more than doubled and now includes 153 companies across 90 countries, covering 42 per cent of global oil and gas production. Members are shifting to measurement-based emission inventories, uncovering previously undetected emissions and implementing cost-effective mitigation measures. In 2025, 64 companies achieved Gold Standard status (see Box 1), representing 17 per cent of global oil and gas production. A further 50 companies recognized with Gold Standard Pathway are on track to reach the highest levels of quality data, positioning the industry to mitigate emissions rapidly and effectively.

Through the Methane Alert and Response System (MARS), UNEP has sent over 3,500 alerts to 33 countries since its inception—using satellite data and artificial intelligence tools to detect large methane emissions—quickly notifying those who can act on the ground. Despite a twelve-fold increase year-over-year of "responses", almost 90 per cent of MARS alerts still lack follow-up. While MARS focused initially on the oil and gas sector, new system capabilities will target coal mines and waste sites—sectors where measurement is scarce, but targeted mitigation opportunities exist.

IMEO has launched 46 methane science studies across six continents. In 2025, five new studies began and seven were completed. Initial studies have filled critical knowledge gaps in the fossil fuel sector, where the highest potential for emission reductions exists, by testing new technologies for measuring emissions from oil and gas facilities and quantifying emissions from major coal-producing regions. The work is expanding to agriculture and waste—sectors responsible for 60 per cent of human-caused methane emissions—filling data gaps and guiding targeted action. By the end of the year, six additional studies will have started, including two baseline studies in Nigeria and Colombia, as well as an agricultural study in Colombia. IMEO is already advancing research on waste sector emissions at a major landfill in Spain alongside partners including the European Space Agency. IMEO is also developing estimates for country-level agricultural methane emissions from rice and livestock through measurement-based, multi-sector baseline studies.

The Steel Methane Programme (SMP) targets emissions from metallurgical (met) coal, which adds on average a quarter to steel's climate footprint. Mining met coal produces around 12 million metric tons of methane emissions each year—equal to nearly 990 million metric tons of CO_2—presenting a one gigaton reduction opportunity at just one per cent the cost of steel.

Despite the availability of low-cost solutions, like ventilation air methane and drainage systems, met coal methane remains largely overlooked in steel decarbonization efforts, which focus on important but slower-deploying technologies like green hydrogen transition and carbon capture. The SMP will bring new transparency to the sector through a Steel Methane Transparency Database of mine-level emissions that combines empirical studies, satellite data and industry partnerships. When operational, it will present a clear example of the data-to-action approach at the heart of IMEO.

By bringing together diverse methane data streams —through the Eye on Methane data platform—IMEO centralizes and democratizes access to validated methane data that empowers decision-makers. Since COP29, the platform has drawn over 75,000 views and thousands of downloads. This approach provides a robust foundation for accountability and targeted mitigation.

Finally, UNEP through IMEO builds the knowledge and networks needed to turn data into action through its Methane Training Series, which has trained nearly 2,000 people across almost 40 countries—including engineers, asset managers, regulators and policymakers. This includes around 300 newly trained individuals in 2025. These sessions—complemented by technical guidance, peer mentorship and targeted national engagement—ensure stakeholders can interpret data, apply best practices and overcome institutional barriers to deliver meaningful methane progress.



Introduction

Methane emissions from human activity account for roughly one-third of the global warming we experience today (United Nations Environment Programme [UNEP] and Climate and Clean Air Coalition [CCAC] 2021). Yet, there is still considerable uncertainty regarding the contribution of individual sources. Reliable measurement-based data is required not only to guide effective and efficient mitigation, but also to track changes in emissions over time and assess progress toward climate goals.

The United Nations Environment Programme's International Methane Emissions Observatory (IMEO), launched at the Group of Twenty (G20) meeting in November 2021, serves as a core implementing partner of the Global Methane Pledge. IMEO's mission is to provide open, reliable and actionable emissions data to the individuals with the agency to reduce methane emissions.

A methane data revolution driven by innovation and rapid momentum towards methane mitigation has resulted in rich and diverse streams of data, but accessing its full value requires addressing the siloed nature of data from various sources such as satellites, aircraft, ground-based measurements, industry reports and emission inventories. Data integration is fundamental for tapping the full potential of existing and emerging data sources and is a central element of IMEO's work.



Photo credit: DLR Fiehn

Theory of change

The goal of measurement is not just data collection—it is emissions reduction.

Meaningful mitigation requires clear, ambitious emissions targets supported by accurate, measurement-based data. As industries and governments set mitigation targets, accurately tracking changes in emissions over time becomes central to realizing these commitments. Assessing progress requires reliable and readily available measurement-based approaches.

IMEO's theory of change rests on three pillars: transparency, science and implementation, each designed to ensure that accurate data leads to credible, sustained methane reductions.

- **Transparency:** IMEO provides tools and frameworks for harnessing an expanding suite of methane monitoring tools, so companies, governments and others can shift from generic estimates to real-world, empirical data.
- **Science:** IMEO initiates research to supply open data and improve measurement methods to allow governments, industry and other stakeholders to prioritize effective actions to assess and reduce methane emissions.
- **Implementation:** IMEO raises awareness and increases capacity to ensure that industries and regulators understand where and how to make the most of measurement tools and the data they provide.

Core initiatives

IMEO has several core initiatives, each of which features in a chapter of this report. The Oil and Gas Methane Partnership 2.0 (OGMP 2.0) and the Steel Methane Programme (SMP), detailed in Chapters I and IV, are sector-specific transparency initiatives. They aim to establish measurement-based reporting frameworks to track changes in emissions over time and to enable methane mitigation by committing companies to evolve their data from outdated or inaccurate estimates to empirical source- and site-level data.

The Methane Alert and Response System (MARS), covered in Chapter II, serves companies and governments through its monitoring of global methane emissions, enabled by a network of over a dozen satellites. Integrating and validating emissions from multiple satellite instruments, MARS issues notification to the responsible parties so they may take action.

Chapter III presents IMEO's Methane Science Studies, which provide the scholarly foundation for all IMEO activities and are strategically initiated to improve collective understanding of where, and how much, emissions occur and to advance measurement-based methane monitoring approaches.

Finally, Chapter V discusses the Eye on Methane data platform, which provides open access to IMEO's data and insights. Along with other IMEO initiatives, including Data Integration and the Methane Training Series, it forms a suite of engagement activities that equip stakeholders with the knowledge needed to act on methane emissions.

By providing high-quality data through a network of partnerships—spanning governments, industry, academia and civil society—IMEO aims to accelerate methane reductions across the fossil fuel and steel sectors, and over time expand to the agriculture and waste sectors. This integrated model connects measurement to agency, and agency to targeted emission reductions, unlocking progress to reduce methane emissions at speed and scale.

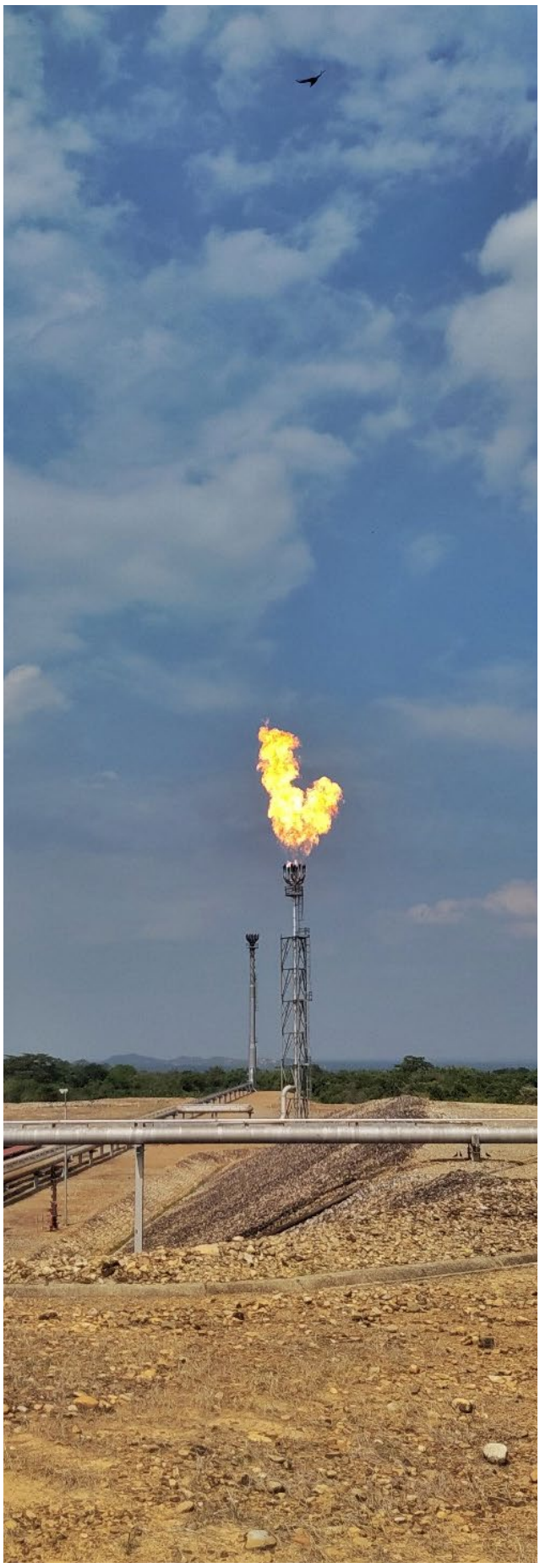


Photo credit: Energy & Emissions Research Lab (EERL), Carleton University

01

UNEP's Oil and Gas Methane Partnership 2.0

A global partnership for methane mitigation



Photo credit: Canva

Chapter highlights

- OGMP 2.0 has grown to 153 member companies in its fifth year, spanning 90 countries and covering 42 per cent of global oil and gas production.
- OGMP 2.0 now forms the basis of methane regulations in the world's largest buying market, the European Union, while shaping other key markets.
- 32 per cent of global oil and gas production is—or will soon be—recognized at Gold Standard emissions reporting based on real-world measurements.
- Progress continues to OGMP 2.0's highest data quality level with seven per cent of global production recognized at Level 5 reporting.
- Companies are accelerating progress towards the highest level of measurement-based reporting, with seven achieving it in their first and second year of membership.
- Companies across segments report mitigating emissions discovered during measurement campaigns.

UNEP's Oil and Gas Methane Partnership 2.0 (OGMP 2.0) is the only comprehensive, measurement-based international reporting framework for the oil and gas sector. In the five years since its launch, OGMP 2.0 has more than doubled its membership and fostered strong collaboration, creating a unique community of practice.

As companies advance through OGMP 2.0's reporting framework (see Box 1), the Partnership is transforming measurement and reporting practices for the industry, creating a database of high-quality measurement-based data. This empirical data allows operators to better understand their emissions profiles, design targeted mitigation strategies, allocate capital to the most impactful, cost-effective mitigation solutions and accurately track progress over time. This year's report highlights this mitigation progress and factors contributing to it.

As organizations transition to OGMP 2.0's highest data quality levels, they also shift their mindset and company culture towards mitigation. Consequently, OGMP 2.0's Gold Standard acts as both a data collection and cultural transformation tool (see Table 1 on page 12).

See all individual company factsheets here

Box 1. **Overview of OGMP 2.0**

Reporting levels

OGMP 2.0 reporting Levels 1, 2 and 3 are estimates based on generic emission factors, while Levels 4 and 5 are based on empirical measurements:

Level 1: Country, venture or asset level reporting—Emissions are reported for a venture at the asset or country level (i.e. one methane emissions figure for all operations in an asset or all assets within a region or country).

Level 2: Emissions category—Emissions are reported in consolidated, simplified source categories based on the International Association of Oil and Gas Producers' five categories for upstream emissions and on MARCOGAZ's three categories for midstream and downstream emissions. These use a variety of quantification methodologies.

Level 3: Generic emission source—Emissions are reported by detailed source type based on generic emissions factors.

Level 4: Specific emission source—Emissions are reported by detailed source type using specific emissions and activity factors derived from direct measurements or advanced engineering calculations.

Level 5: Specific emission source level + site-level measurement—Emissions are reported similarly to Level 4, but with the addition of site-level measurement reconciliation (site-level measurements characterize site-level emissions distribution for a statistically representative population).

Reporting requirements apply to all segments of the oil and gas sector where material quantities of methane can be emitted. Materiality refers to the significance of emissions for assets in terms of total emissions.

For more on OGMP 2.0's reporting journey, timelines and commitments, see the OGMP 2.0 website.

Gold Standard Pathway and Gold Standard Reporting

Gold Standard Pathway status indicates that a company has established a methane reduction target, submitted emissions data for all in-scope assets and developed a detailed implementation plan for how it will meet Level 4 and Level 5 reporting within three years for material operated assets and five years for material non-operated assets.

Gold Standard Reporting status indicates that a company has achieved Level 5 reporting within the required timeline.

Gold Standard status is awarded on an annual basis. For more on the reporting requirements, refer to the OGMP 2.0 Reporting Framework.

Note: Level 5 is recognised at asset level, whereas Gold Standard is awarded at the company level, meaning a company's reported assets may be at various reporting levels.



Photo credit: Canva

OGMP 2.0's approach to data assurance

The OGMP 2.0 framework requires companies to progressively improve data quality, with IMEO providing four levels of data assurance outlined in Figure 1. IMEO undertakes a rigorous approach to data assurance, as it is an integral part of the reporting process. This process continues to evolve with the integration of new technologies including Artificial Intelligence (AI) and the growing amount of independent data, such as from satellites or science studies.

In addition, regulators may require companies to obtain an additional layer of third-party verification. IMEO is working with auditors to define an OGMP 2.0 Level 5 verification protocol.

Figure 1: Levels of independent IMEO assurance

DATA QUALITY

Initial data evaluation, checking for completeness, consistency and conformity with OGMP 2.0 reporting requirements

DATA ANALYTICS

Analysis of reported data to establish patterns exploring year on year trends and evolution through OGMP 2.0 reporting levels to identify potential anomalies

DATA INTEGRATION

Integration of data from additional sources, such as IMEO science studies and satellite data, to support review of company-reported data

IMPLEMENTATION REVIEW

Thorough review of Implementation Plan, including methodologies and technologies proposed/utilised for quantification and reconciliation approach



Photo credit: Envato

What gets measured gets mitigated

There is growing evidence that companies are mitigating emissions as they are discovered during both source- and site-level measurement campaigns. Several OGMP 2.0 members have shared how their journey towards measurement-based reporting has helped them reduce emissions.

- **Abu Dhabi National Oil Company (ADNOC):** Crude oil tanker loading is the process of transferring crude oil from storage tanks or directly from offshore production facilities into tankers, and it is a material source of emissions for ADNOC. After a source-level measurement campaign in 2023 to better understand these emissions and achieve Level 4 reporting, ADNOC identified an opportunity to improve the crude oil preheating system and recover methane prior to loading.

- **Italgas:** The company conducted an extensive measurement campaign in 2024, covering its entire network with an advanced, vehicle-based mobile leak detection and quantification technology. Italgas reported that the higher frequency and coverage across its network, combined with the use of more sensitive technologies, enabled it to reduce leaks by more than 40 per cent since joining the partnership in 2020.

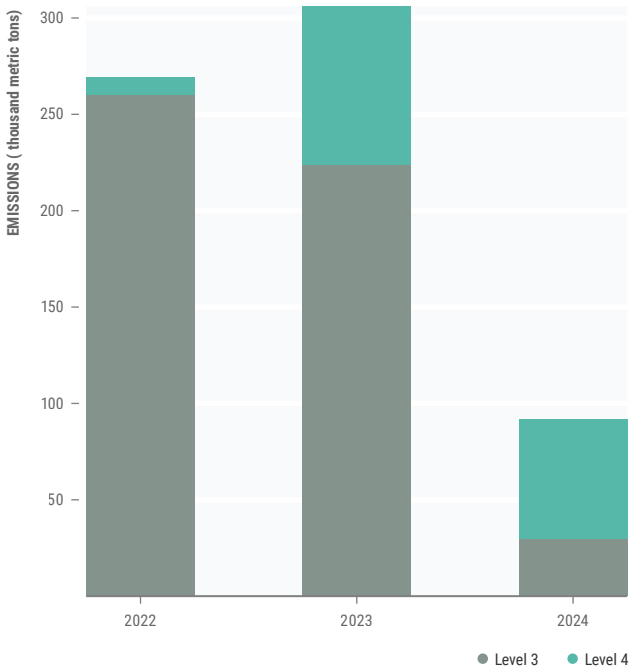
- **Jonah:** Following a Level 4 campaign to quantify emissions from enclosed combustors, units used to burn waste gas, Jonah discovered that emissions were higher than previously estimated. Upon investigation, the company identified an opportunity to reduce air flow and improve combustion efficiency to reduce emissions.

- **XP:** Despite logistical, technical and security constraints posed by the war in Ukraine, XP reported emission reductions this year. In 2023, XP reported that its main source of emissions was related to venting during manual discharging of separators and expansion chambers, vessels that separate oil, gas and water from the raw mixture coming out of the ground and manage pressure changes in pipelines and processing facilities. In 2024, XP invested to automate this activity, which led to a reported 50 per cent reduction in emissions from the previous year.

- Since joining OGMP 2.0, **midstream operators** consistently report reducing emissions through activities such as installing recovery systems and using portable compressors. These approaches minimize venting by reinjecting the gas into the system during operation and maintenance activities. Companies also report using flares to burn the gas instead of venting it when recompression is not feasible.

- There has been significant mitigation of methane emissions as operators replace pressurized natural gas-actuated **pneumatic devices** with non-emitting equipment or devices actuated by instrument air or nitrogen. Figure 2 shows the emissions reported from natural gas-actuated pneumatic devices by companies in Year 3 and beyond from 2022 to 2024. While regulations are driving the phase-out of these devices, Level 4 reporting is enabling OGMP 2.0 to track and quantify these reductions.

Figure 2: Decline in pneumatic device emissions among companies in Year 3 or later



A growing partnership and community of practice

OGMP 2.0 continues to grow (see Figures 3 and 4) and the over 150 company members[1] operate in more than 90 countries on 5 continents, with the highest coverage in Europe and the lowest in Central Asia. Members' operational footprint underscore OGMP 2.0's growing geographic reach and its ability to drive action at a global scale. This year the partnership welcomed its first companies from India—Cairn Oil and Gas and Pipeline Infrastructure Limited—as well as new members from around the world, including: Nigeria's Asharami Energy and NNPC, Romania's Depomures, Chile's Electrogas and Engie Stream Solutions, Brazil's TAG and Colombia's TGI. As of 2025, nearly 50 per cent of the United States of America production is in scope.

The partnership fosters knowledge and experience-sharing as well as better decision-making to address the collective challenge of methane emissions. This is facilitated in several ways including through OGMP 2.0's annual implementation conference. In 2025, Petrobras hosted a conference in Rio de Janeiro, Brazil, designed to enhance members' understanding of the latest developments in methane science, regulation and technology, and strengthen their capacity to implement OGMP 2.0 reporting.

In 2025, OGMP 2.0 hosted six webinars between companies and experts on a range of technical subjects such as methane emissions from LNG carriers and approaches to reconciliation between source- and site-level measurements.

The partnership's mentoring programme has grown, with 37 member companies joining since its launch in 2024. A network of 36 operational asset managers across 19 companies also helps participants overcome barriers to mitigation and navigate shared organizational challenges to secure buy-in and resources for methane management.

Figure 3: **OGMP 2.0 membership growth by year**

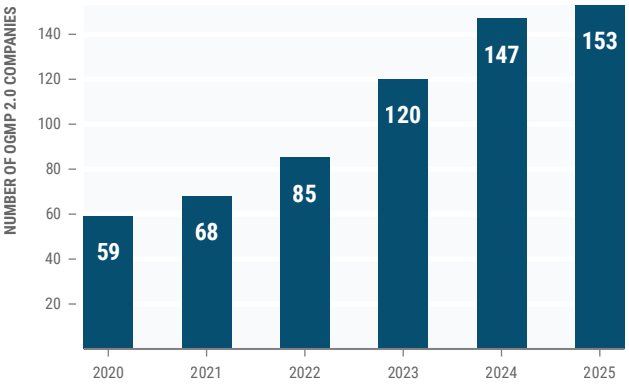
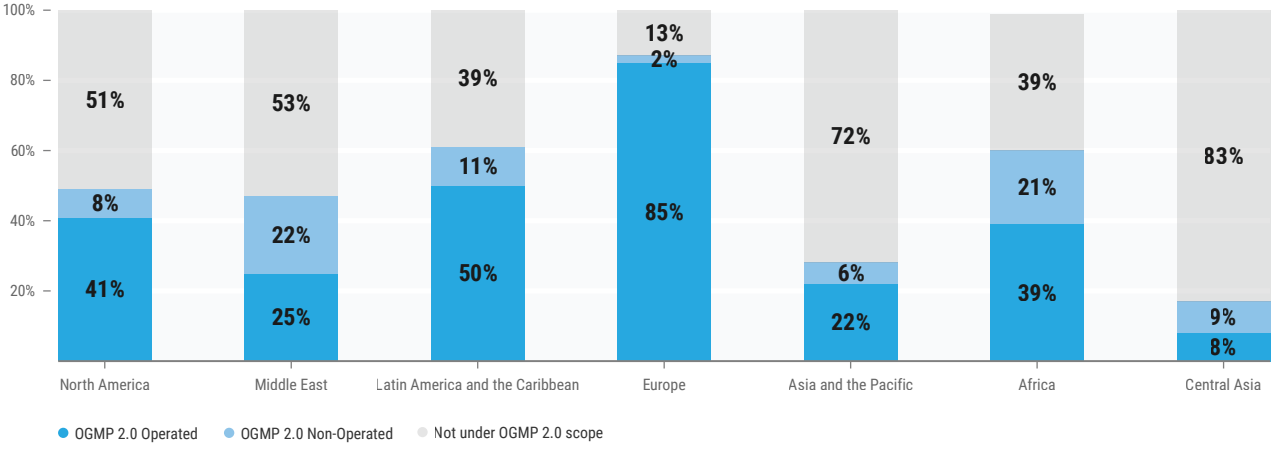


Figure 4: **OGMP 2.0 members share of production by region**



1 A full list of company members is available at https://www.ogmpartnership.org/our-member-companies

What the data tells us

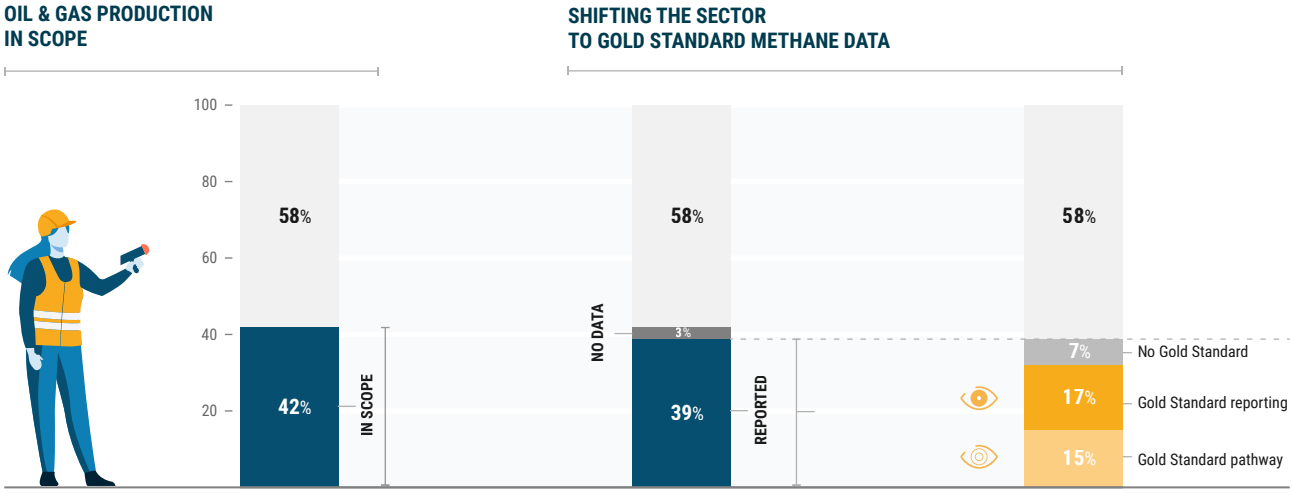
OGMP 2.0's consolidated performance

In 2025, members reported total emissions of 2.5 million metric tons of methane, up from 2 million metric tons reported the previous year. Of the 144 member companies eligible to report, 137 submitted reports, while seven did not.

Of the companies that reported emissions data in 2025, 64 companies representing 17 per cent of global oil and gas production achieved Gold Standard Reporting and 50 companies representing a further 15 per cent achieved Gold Standard Pathway (see Figure 5). Another 23 companies (representing 7 per cent) reported emissions data but did not meet Gold Standard requirements.

In total, 32 per cent of global oil and gas production is now at Gold Standard or on track to be Gold Standard in the next one or two years, positioning close to a third of the global industry to effectively measure—and thus mitigate—emissions.

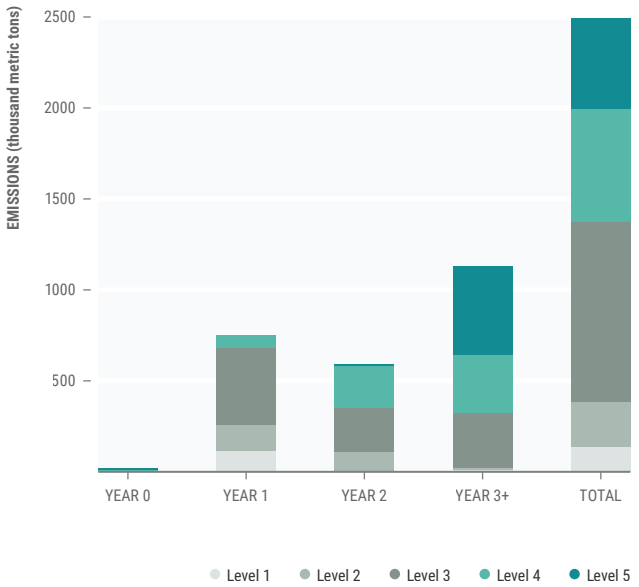
Figure 5: Oil and gas industry shifting to Gold Standard data



Improving data quality builds confidence in mitigation opportunities

As expected, companies reporting early in their membership—Year 0 or Year 1—have a higher share of reported emissions data at lower reporting levels, Levels 1–3. Of companies reporting in Year 3 and beyond, roughly two-thirds of their reported emissions are at Levels 4 and 5. Figure 6 shows the total reported emissions by reporting levels and indicates the contribution from members across the partnership by reporting year.

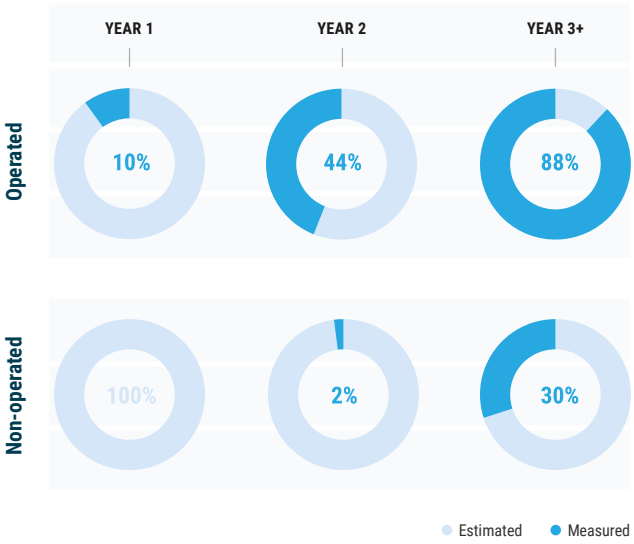
Figure 6: Reported emissions by reporting levels by reporting year



Data quality improves as companies measure their emissions across their operations. This year, companies in Year 3 and beyond reported measurement-based emissions data for around 90 per cent of their operated emissions, compared to companies in Year 1 who measured only 10 per cent of their operated emissions, as shown in Figure 7 below.

Similarly, for non-operated joint ventures (NOJV), the most mature members report measurement-based emissions data for over 30 per cent of their NOJVs, compared to zero for companies in Year 1. The higher the share of measurement-based emissions data, the greater the confidence stakeholders can have that companies understand their methane emissions and, consequently, the opportunities to mitigate those emissions.

Figure 7: OGMP 2.0 companies evolving to measured data



Companies accelerate journey to Level 5

Companies' efforts have brought approximately 7 per cent of global oil and gas production to OGMP 2.0 Level 5 reporting, equivalent to more than double the European Union's net gas imports.

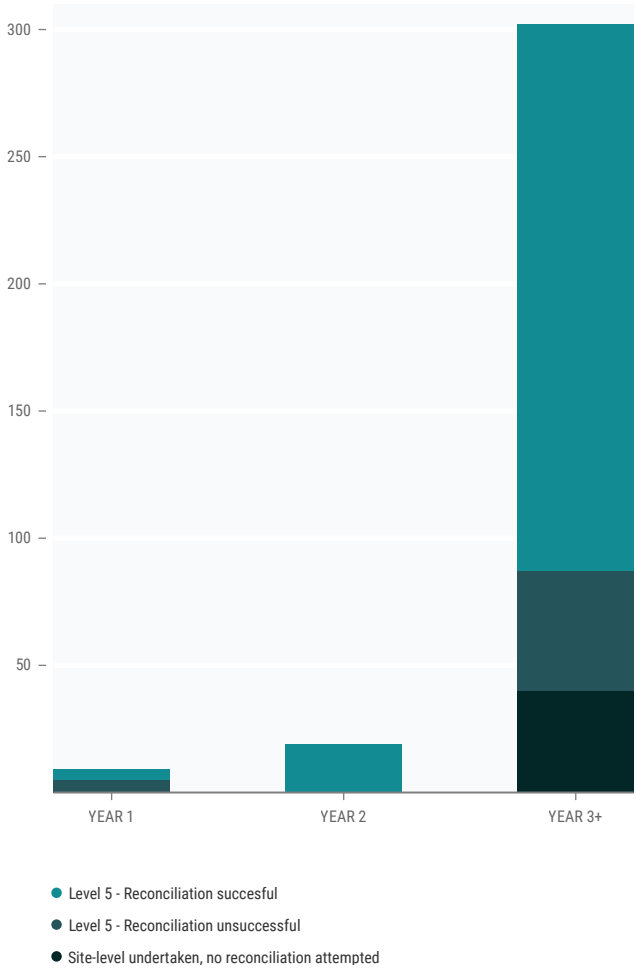
Significantly more assets were reported at Level 5 this year than last year. Overall, companies reported over 289 assets at Level 5, up from 187 last year. Of these, OGMP 2.0 recognized 82 per cent—or 238 assets—as successful, up from last year's 35 per cent success rate. Two factors drove this growth: companies successfully achieving Level 5 for assets previously recognized at lower levels and an expansion in first-time Level 5 reporting from members.

Notably, in 2024, GateLNG, Ithaca, Var Energi and Harbour Energy reported assets at Level 5 in their first year of OGMP 2.0 membership, while Triple Crown Resources, SierraCol and Kiwetinohk reported assets at Level 5 in their second year of membership.

Attaining the highest levels of reporting quality is challenging for some companies due to differences in access to technologies and services used for measurement and reconciliation, as well as factors such as a company's level of expertise and knowledge implementing methane measurement practices.

Figure 8 below shows the number of assets reported at Level 5 by reporting year, and the share of those for which reconciliation was successful, enabling them to achieve Level 5. This increase reflects growing understanding among members of how to conduct reconciliation and develop a strong Level 5 estimate.

Figure 8: Number of assets for which members performed reconciliation



With two years of Level 5 reporting now complete, analysis of the progression of upstream asset emissions data from estimated to measured data illustrates two different scenarios, both demonstrating the value of Level 5 measurement. In some cases, members have high confidence in their Level 4 inventory, and site-level surveys conducted at Level 5 confirm their emissions estimates (see Figure 9).

However, in other cases, site-level surveys reveal additional emission sources or significant discrepancies in the Level 4 inventory, providing operators with valuable insights into mitigation opportunities. Analysis suggests this is more common in onshore production assets and gathering and boosting facilities. OGMP 2.0 is working with members to understand and learn from these discrepancies.

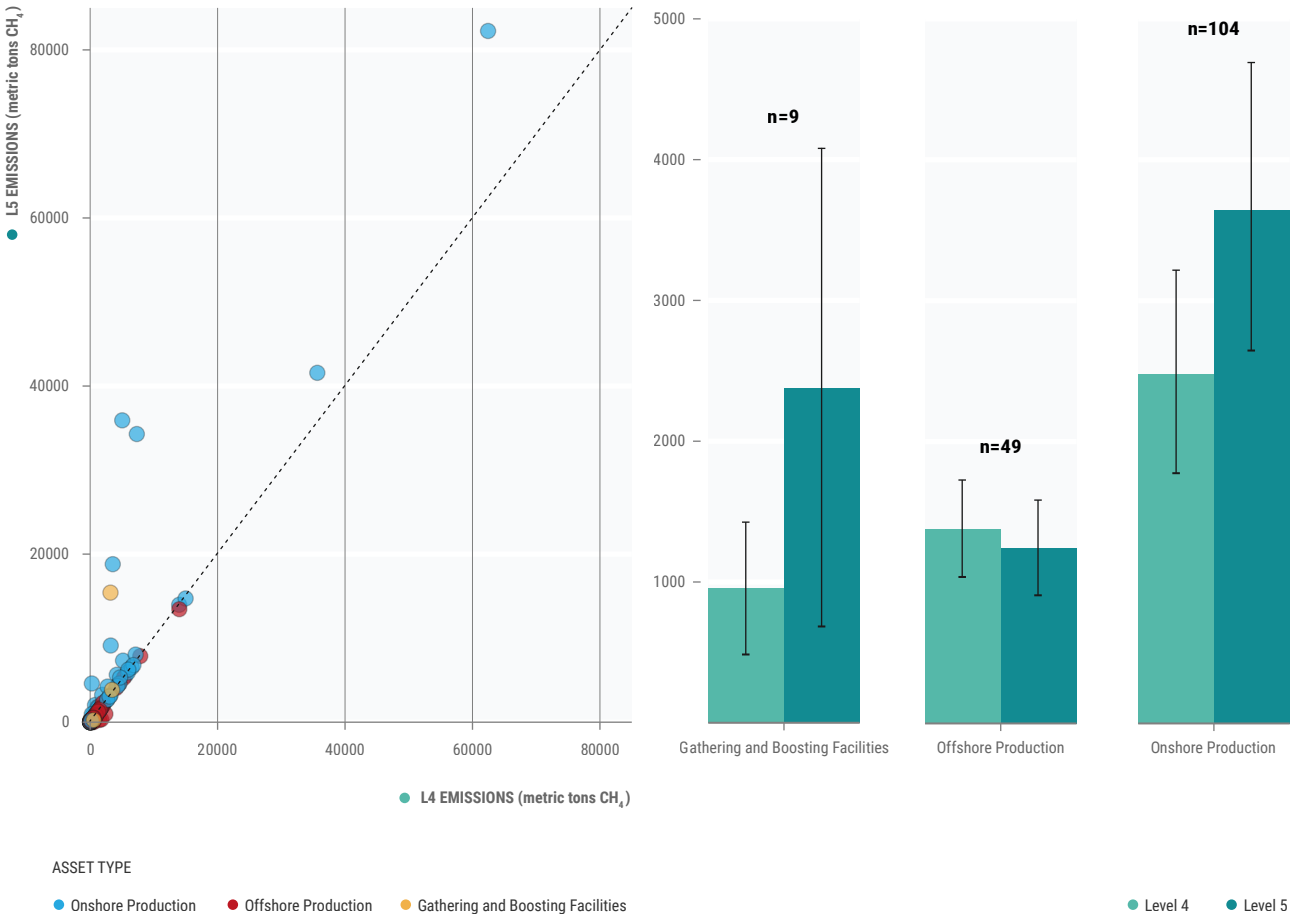
Box 2. **The disparity between OGMP 2.0 reporting and scientific estimates**

As described in last year's An Eye on Methane report, there continues to be a substantial gap between emissions reported by OGMP 2.0 companies and those observed in scientific studies.

While OGMP 2.0 member companies work to improve data quality across their portfolios, it is expected that reported emissions will increase in some cases. However, the gap serves to highlight the importance of increasing membership to include production in oil and gas-producing nations that are not currently covered by existing membership.

In addition, the portfolios of companies inside and outside the partnership are different in one notable respect: OGMP 2.0 companies have a much higher proportion of offshore assets, which have materially lower emissions than the onshore segment.

Figure 9: Comparison of Level 4 and Level 5 results for selected upstream assets between 2023 and 2024



Key emission sources and drivers confirmed

OGMP 2.0's broad coverage and increasingly robust emissions data offer a powerful view of where reported emissions occur in the oil and gas industry and the key drivers behind them (Figure 10).

Upstream: The largest share of reported emissions—over 80 per cent—continues to occur in the upstream segment (all activities related to extracting oil and gas before it is transported for further processing), with production assets accounting for nearly 85 per cent of reported upstream emissions. Onshore assets account for the dominant source of emissions when compared to offshore assets.

Midstream: The largest sources of midstream emissions—over 48 per cent—come from natural gas liquefaction (LNG), shipping and regasification plants. Transmission systems represent over 37 per cent of this segment's emissions, while underground storage systems represent the remaining balance of approximately 14 per cent of emissions.

Downstream: Leaks derived from systematic surveys, emergency warnings and third-party damages account for over 50 per cent of emissions from distribution systems.

Figure 10: Emissions reported by segment



Progress continues on non-operated joint ventures

As OGMP 2.0 membership continues to grow, a notable trend has emerged regarding NOJV assets. These assets are those in which a member company has a financial share or contractual partnership with another company operating the asset.

With large companies such as Chevron and Exxon joining the partnership, assets previously classified as "non-operated" are being reported as "operated". This increase in membership has resulted in the share of reported emissions from NOJVs dropping from 40 per cent in 2023 to 20 per cent in 2025.

Since OGMP 2.0 requires members to report on operated assets within a shorter timeframe than non-operated assets, this shift is likely to result in earlier and higher-quality emissions data for those assets.

The quality of reported data for NOJV assets is improving year on year. Companies in the Year 4 cohort improved their emissions-weighted reporting data quality average from Level 2.9 to Level 3.3 from 2023 to 2024 for their NOJV assets. Four companies reported Level 5 data for some NOJV assets earlier than required, including Eni, NaTran and Snam.

While this progress is noteworthy, greater collaboration is needed among member companies and non-members to overcome persistent barriers, such as contractual, technological, financial, legal, policy or reporting constraints.

Company stories of progress

Companies at various stages of implementation of the OGMP 2.0 reporting framework are demonstrating progress.

Shell has achieved Level 5 reporting at 14 operated assets, covering 88 per cent of its total operated emissions. During 2024, Shell conducted over 650 site-level measurements and performed reconciliation at over 100 individual sites spanning eight countries. Shell also made progress with its NOJV assets, for example, by securing permission to report methane emissions from its operations in Iraq and supporting the operator to investigate and act on key projects to reduce methane and greenhouse gas emissions from flaring.

Karachaganak Petroleum Operating (KPO), operator of the Karachaganak field in Kazakhstan, successfully conducted source-level measurements at all sources in its first year of joining OGMP 2.0. As a result, KPO achieved Level 4 reporting in Year 1 and is on track to achieve Level 5 next year, a year ahead of the Gold Standard timeline.

Petroliam Nasional Berhad (PETRONAS) achieved successful reconciliation and Level 5 reporting for approximately 30 per cent of its operated emissions and continues to influence improved data reporting and mitigation across its NOJV assets. In 2024, methane emissions from a single NOJV asset in Malaysia, which is also its most material NOJV asset, were reduced by 50 per cent through investment in advanced membrane technology, with plans to fully eliminate the source via acid gas reinjection. PETRONAS also strengthened collaboration with its partners to reduce flare emissions following satellite-detected methane emissions.

Eni has acted to improve its NOJV data quality, facilitating site-level measurements across six NOJV assets in Egypt and Libya, and successfully attaining Level 5 reporting for several of them. Additionally, Eni has supported Level 3 and Level 4 reporting at multiple NOJVs by sharing its proprietary model for quantifying stationary combustion emissions, delivering LDAR training to local operational staff and conducting desktop reviews of fugitive and venting emissions inventories.

Cheniere Energy presented a robust implementation plan with all material operated assets reported at Level 5. The company has made results of its research and development programme available in peer-reviewed journals. These findings detail efforts to assess the capabilities of methane emissions measurement technologies and improve the analysis and characterization of methane emissions.

Snam has successfully engaged its NOJV partners with seven (out of 11) now under membership of OGMP 2.0 directly. Snam is actively supporting all its NOJV partners to achieve the objectives of the OGMP 2.0 framework. One of the NOJV partners (non-member of OGMP 2.0) has reported at Level 5 a year earlier than the reporting requirements.

Gaz Réseau Distribution France (GRDF) is conducting a significant research and development effort in collaboration with the Climate and Environment Sciences Laboratory (LSCE) to develop an "Internet of Things" framework to build a strong emission monitoring system that covers all sources of methane emissions from the distribution network, as well as the other sources present in the area.

Increasing transparency at asset level

Through OGMP 2.0, UNEP aims to dramatically increase understanding of emissions at the asset level, where mitigation takes place—while simultaneously providing transparency to investors, regulators and civil society. To do this, companies must allow disclosure of emissions at the asset level. Under the current OGMP 2.0 membership agreement, companies submit detailed, confidential asset-level company data and only aggregated data is disclosed.

Last year, a total of 11 companies led the way to greater transparency and trust by choosing to disclose on an asset basis, resulting in 28,600 metric tons of disclosed methane emissions. This year, 22 companies have increased transparency by approving asset-level disclosure, including emissions from NOJV assets, with a resulting 18,700 metric tons. Further disclosures are anticipated.



Photo credit: Fluxys Belgium - David Samyn

The value of OGMP 2.0 for global buyers and investors

OGMP 2.0 provides a valuable basis for informing purchasing decisions and assessing emissions data across companies and the LNG value chain.

Notably, the OGMP 2.0 framework is a foundational element of the European Union's Regulation on the Reduction of Methane Emissions in the Energy Sector (Regulation (EU) 2024/1787)[2], which requires increased emissions transparency for oil and gas produced in and shipped to the EU.

Markets in Asia, particularly the Republic of Korea and Japan, are also leveraging the emissions transparency provided by OGMP 2.0. Data from OGMP 2.0 is provided to the Coalition for LNG Emission Abatement toward Net-zero (CLEAN) initiative, a regional buyer-driven effort to reduce LNG emissions footprint through public-private cooperation, for its annual report.

Investors can apply the OGMP 2.0 Gold Standard Reporting as a simple yet effective indicator of companies' methane performance and engage with companies to shepherd their continued progress.

Box 3. **Driving accountability among non-OGMP 2.0 members**

In 2023, the International Energy Agency (IEA), UNEP and Environmental Defense Fund (EDF) launched a joint initiative to track how the world's largest oil and gas companies are meeting the emissions reduction goals set by the Oil and Gas Decarbonization Charter (OGDC).

Last year, the three organizations released a report (IEA, UNEP and EDF 2024) detailing a framework to evaluate companies, including OGDC signatories, using 25 predefined metrics. These metrics aim to capture companies' alignment on climate goals, gaps between ambition and action, and progress towards greater transparency.

A subsequent report is planned for release in 2025, which will score 116 major oil and gas companies along this framework to understand their progress towards the goals they have set and uncover opportunities to accelerate progress.

2 Regulation (EU) 2024/1787

Table 1: OGMP 2.0 member companies reporting status and history

NO	Company	Segment	Country	Year of joining	2021	2022	2023	2024	2025
1	**2i Rete Gas S.p.A.**	Downstream	Italy	2022			GSP	GSP	GSP
2	**ADNOC**	Upstream	United Arab Emirates	2020		GSP	GSP	GSP	GSP
3	**Adriatic LNG**	Midstream	Italy	2023				NGS	NGS
4	**Adrigas SpA**	Downstream	Italy	2020	GSP	GSP	GSP	GSP	GSP
5	**akerbp**	Upstream	Norway	2023				GSP	GSP
6	**APA Corporation**	Upstream	United States of America	2023				GSP	GSP
7	**AS Gaso**	Downstream	Latvia	2024					GSP
8	**Asharami Energy**	Upstream	Nigeria	2025					
9	**Atlantic LNG**	Midstream	Trinidad and Tobago	2023				GSP	GSP
10	**Azule Energy**	Upstream	Angola	2023				GSP	GSP
11	**BAHÍA DE BIZKAIA GAS, S.L.**	Midstream	Spain	2020	GSP	GSP	GSP	GSP	GSP
12	**Bapco Energies**	Upstream	Bahrain	2023				DNR	NGS
13	**bp**	Upstream	United Kingdom of Great Britain & Northern Ireland	2020	GSP	GSP	GSP	GSP	GSP
14	**Cairn Oil & Gas, Vedanta Limited**	Upstream	India	2024					GSP
15	**Cheniere**	Midstream	United States of America	2022			NGS	GSP	GSP
16	**Chevron**	Upstream	United States of America	2024					NGS
17	**China Gas Holdings LTD.**	Downstream	China	2021		NGS	GSP	GSP	GSP
18	**Civitas Resources**	Upstream	United States of America	2022			GSP	GSP	GSP
19	**ConocoPhillips**	Upstream	United States of America	2022			GSP	GSP	GSP
20	**Coteq Netbeheer**	Downstream	Netherlands	2020	NGS	NGS	GSP	GSP	GSP
21	**Coterra Energy**	Upstream	United States of America	2023				GSP	GSP
22	**Crescent Energy**	Upstream	United States of America	2022		GSP	GSP	GSP	GSP
23	**Depomures**	Midstream	Romania	2025					
24	**DESFA SA (Hellenic Gas Transmission System Operator)**	Midstream	Greece	2020	GSP	GSP	GSP	GSP	GSP
25	**Devon Energy**	Upstream	United States of America	2022			GSP	GSP	GSP
26	**Diamondback Energy**	Upstream	United States of America	2023				GSP	NGS
27	**Distrigaz Sud Retele**	Downstream	Romania	2023			GSP	GSP	GSP
28	**Diversified Energy Company, PLC**	Upstream	United States of America	2022		GSP	GSP	GSP	GSP
29	**Dugan Production Corporation**	Upstream	United States of America	2024					DNR
30	**ECOPETROL**	Upstream	Colombia	2020	NGS	NGS	GSP	GSP	GSP

A company is expected to report the year after they join. In some cases, a company elects to report in the year of joining.

All partnership members are listed inlcuding those not yet eligible to report - a total of 153

Where a company was not required to / eligible to report, the year is greyed out.

GSP GOLD STANDARD REPORTING
GSP GOLD STANDARD PATHWAY
NGS NO GOLD STANDARD
DNR DID NOT REPORT

NO	Company	Segment	Country	Year of joining	2021	2022	2023	2024	2025
31	**Electrogas S.A.**	Midstream	Chile	2025					
32	**Empresa Nacional del Petroleo (ENAP)**	Upstream	Chile	2025					
33	**Enagas**	Midstream	Spain	2020	◎	◎	◎	◎	◎
34	**Enaon**	Downstream	Greece	2023				◎	◎
35	**Encino Energy**	Upstream	United States of America	2024					◎
36	**Energienetze Bayern GmbH & Co. KG**	Downstream	Germany	2020	◎	◎	◎	◎	◎
37	**Enexis**	Downstream	Netherlands	2020	◎	◎	◎	◎	◎
38	**Engie Mexico**	Downstream	Mexico	2024					◎
39	**Engie Stream Solutions Chile**	Downstream	Chile	2025					✕
40	**Eni**	Upstream	Italy	2020	◎	✕	◎	◎	◎
41	**EOG Resources**	Upstream	United States of America	2023				◎	◎
42	**EQT Corporation**	Upstream	United States of America	2021		◎	◎	◎	◎
43	**Equinor**	Upstream	Norway	2020	◎	◎	◎	◎	◎
44	**eustream, a.s.**	Midstream	Slovakia	2020	✕	◎	◎	◎	◎
45	**EWE GASSPEICHER GmbH**	Midstream	Germany	2020	✕	✕	◎	◎	◎
46	**EWE NETZ GmbH**	Downstream	Germany	2020	◎	◎	◎	◎	◎
47	**Expand Energy**	Upstream	United States of America	2025					◎
48	**ExxonMobil**	Upstream	United States of America	2024					◎
49	**FGSZ Zrt.**	Midstream	Hungary	2021		◎	✕	✕	◎
50	**Floene Energias S.A**	Downstream	Portugal	2024					⊘
51	**Fluvius**	Downstream	Belgium	2020	◎	◎	◎	◎	◎
52	**Fluxys Belgium**	Midstream	Belgium	2021	✕	◎	◎	◎	◎
53	**G.E.I. GESTIONE ENERGETICA IMPIANTI SpA**	Downstream	Italy	2020	◎	◎	◎	◎	◎
54	**Gas Connect Austria GmbH**	Midstream	Austria	2020	◎	◎	◎	◎	◎
55	**Gas Transmission Operator GAZ-SYSTEM S.A.**	Midstream	Poland	2021		◎	◎	✕	✕
56	**GASCADE Gastransport GmbH**	Midstream	Germany	2020	◎	◎	◎	◎	◎
57	**GasNet, s.r.o.**	Downstream	Czech Republic	2024					◎
58	**Gasunie Deutschland Transport Services GmbH**	Midstream	Germany	2020	◎	◎	◎	◎	✕
59	**Gate terminal**	Midstream	Netherlands	2024					◎
60	**Gaz Réseau Distribution France (GRDF)**	Downstream	France	2020	◎	◎	◎	◎	◎
61	**GNL Quintero**	Midstream	Chile	2024					◎
62	**Harbour Energy**	Upstream	United Kingdom of Great Britain & Northern Ireland	2024					◎

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◎ GOLD STANDARD REPORTING
◎ GOLD STANDARD PATHWAY
✕ NO GOLD STANDARD
⊘ DID NOT REPORT

NO	Company	Segment	Country	Year of joining	2021	2022	2023	2024	2025
63	**Heritage Petroleum**	Upstream	Trinidad and Tobago	2024					
64	**INPEX**	Upstream	Japan	2023					
65	**Italgas S.p.A.**	Downstream	Italy	2020					
66	**Ithaca Energy**	Upstream	United Kingdom of Great Britain & Northern Ireland	2024					
67	**Jonah Energy LLC**	Upstream	United States of America	2020					
68	**JS Amber Grid**	Midstream	Lithuania	2023					
69	**Karachaganak Petroleum Operating (KPO)**	Upstream	Kazakhstan	2024					
70	**KazMunayGas**	Upstream	Kazakhstan	2023				✕	✕
71	**Kiwetinohk Energy**	Upstream	Canada	2023					
72	**LD Reti**	Downstream	Italy	2020	✕	⊘	⊘	⊘	⊘
73	**Lereti**	Downstream	Italy	2025					
74	**Liander**	Downstream	Netherlands	2020	✕				
75	**Madrileña Red de Gas, SAU**	Downstream	Spain	2023					
76	**MEDGAZ**	Midstream	Spain	2020					
77	**Metrogas**	Downstream	Chile	2024					✕
78	**Moldovagaz**	Downstream	Moldova	2020	✕	✕	✕	✕	✕
79	**N.V. Nederlandse Gasunie**	Midstream	Netherlands	2020					
80	**Nafta**	Midstream	Slovakia	2025					
81	**Naftogaz**	Upstream	Ukraine	2020	✕	✕	✕	✕	✕
82	**NaTran**	Midstream	France	2020					
83	**NaTran Deutschland GmbH**	Midstream	Germany	2020					
84	**NEDGIA**	Downstream	Spain	2020					
85	**NEL Gastransport GmbH**	Midstream	Germany	2020					
86	**Neptune Energy Holding Germany GmbH**	Upstream	Germany	2024					
87	**Netze-Gesellschaft Südwest mbH**	Downstream	Germany	2021					
88	**Nigeria LNG**	Midstream	Nigeria	2022					
89	**NNPC**	Upstream	Nigeria	2024					✕
90	**North Caspian Operating Company N.V.**	Upstream	Kazakhstan	2023					
91	**Nowega GmbH**	Midstream	Germany	2020				✕	✕
92	**NTS Brazil**	Midstream	Brazil	2023				✕	
93	**Oman LNG**	Midstream	Oman	2023					
94	**OMV**	Upstream	Austria	2024					
95	**ONE-Dyas B.V.**	Upstream	Netherlands	2023					
96	**Open Grid Europe GmbH**	Midstream	Germany	2020					⊘

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GOLD STANDARD REPORTING
GOLD STANDARD PATHWAY
✕ NO GOLD STANDARD
⊘ DID NOT REPORT

NO	Company	Segment	Country	Year of joining	2021	2022	2023	2024	2025
97	**Oxy**	Upstream	United States of America	2022					
98	**Pertamina**	Upstream	Indonesia	2024					
99	**Petrobras**	Upstream	Brazil	2023					
100	**Petroecuador**	Upstream	Ecuador	2023					
101	**Petroleum Development Oman (PDO)**	Upstream	Oman	2021					
102	**PETRONAS**	Upstream	Malaysia	2022					
103	**Pipeline Infrastructure Limited (PIL)**	Midstream	India	2025					
104	**Planta de Regasificación de Sagunto, S.A. (Saggas)**	Midstream	Spain	2020					
105	**Presidio Petroleum LLC**	Upstream	United States of America	2023					
106	**PT Medco E & P Indonesia**	Upstream	Indonesia	2025					
107	**PTTEP**	Upstream	Thailand	2023					
108	**PureWest Energy**	Upstream	United States of America	2022					
109	**QatarEnergy**	Upstream	Qatar	2021					
110	**QB Energy Operating, LLC**	Upstream	United States of America	2024					
111	**REN**	Midstream	Portugal	2020					
112	**REN Portgás**	Downstream	Portugal	2023					
113	**RENDO Netwerken**	Downstream	Netherlands	2020					
114	**Repsol**	Upstream	Spain	2020					
115	**RetiPiu**	Downstream	Italy	2025					
116	**Retragas srl**	Midstream	Italy	2020					
117	**RheinNetz GmbH**	Downstream	Germany	2023					
118	**Seapeak**	Midstream	United Kingdom of Great Britain & Northern Ireland	2024					
119	**Serica Energy**	Upstream	United Kingdom of Great Britain & Northern Ireland	2023					
120	**Shell**	Upstream	Netherlands	2020					
121	**Sierracol Energy**	Upstream	Colombia	2023					
122	**Snam S.p.A.**	Midstream	Italy	2020					
123	**SNGN ROMGAZ SA**	Upstream	Romania	2023					
124	**SOCAR**	Upstream	Azerbaijan	2024					
125	**Sociedad GNL Mejillones**	Midstream	Chile	2024					
126	**SPP-distribucia,a.s.**	Downstream	Slovakia	2025					
127	**Stedin**	Downstream	Netherlands	2020					

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GOLD STANDARD REPORTING
GOLD STANDARD PATHWAY
NO GOLD STANDARD
DID NOT REPORT

NO	Company	Segment	Country	Year of joining	2021	2022	2023	2024	2025
128	**Storengy Deutschland GmbH**	Midstream	Germany	2020					
129	**Storengy France**	Midstream	France	2020					
130	**Storengy UK**	Midstream	United Kingdom of Great Britain & Northern Ireland	2020					
131	**TAG Brazil**	Midstream	Brazil	2024					
132	**TAG GmbH**	Midstream	Austria	2020					
133	**TAP**	Midstream	Switzerland	2023					
134	**TEREGA**	Midstream	France	2020				✕	✕
135	**TERMINAL DE LNG DE ALTAMIRA, S. DE R.L. DE C.V.**	Midstream	Mexico	2023				✕	✕
136	**terranets bw**	Midstream	Germany	2023					
137	**The National Gas Company of Trinidad and Tobago**	Midstream	Trinidad and Tobago	2021				✕	✕
138	**Thüga Energienetze GmbH**	Downstream	Germany	2020					
139	**Thyssengas GmbH**	Midstream	Germany	2020				⊘	⊘
140	**TotalEnergies**	Upstream	France	2020					
141	**Transportadora de Gas Internacional (TGI)**	Midstream	Colombia	2025					
142	**Triple Crown Resources**	Upstream	United States of America	2023					
143	**TRP Energy**	Upstream	United States of America	2022				✕	⊘
144	**UNARETI S.p.A.**	Downstream	Italy	2020					
145	**Uniper Energy Storage GmbH**	Midstream	Germany	2020					
146	**Vår Energi**	Upstream	Norway	2024					
147	**Vital Energy**	Upstream	United States of America	2024					
148	**VNG Gasspeicher GmbH**	Midstream	Germany	2020	✕	✕	✕	✕	✕
149	**Wapiti Energy**	Upstream	United States of America	2023					
150	**Westland Infra Netbeheer**	Downstream	Netherlands	2020	✕				
151	**Williams**	Midstream	United States of America	2023					
152	**Woodside Energy**	Upstream	Australia	2024					
153	**XP**	Upstream	Romania	2022				✕	✕

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GOLD STANDARD REPORTING
GOLD STANDARD PATHWAY
✕ NO GOLD STANDARD
⊘ DID NOT REPORT

02

Methane Alert and Response System

Satellite data driving action



Photo credit: Canva

Chapter highlights

- IMEO has documented mitigation actions in ten countries since MARS was launched, including six new countries over the past year.
- Despite a more than tenfold increase in response to MARS alerts, almost 90 per cent of alerts still go unanswered.
- IMEO expands artificial intelligence models to analyse vast amounts of data from ten methane-detecting satellites.
- New MARS products will increase emission visibility in the coal and waste sector.

Satellites are a crucial source of methane emissions data, offering global coverage and near-real-time monitoring. Three years ago, UNEP launched the Methane Alert and Response System (MARS) to connect satellite data with efforts to reduce methane emissions. Managed by IMEO, MARS is the first global system to provide free satellite-based alerts on major emission events to governments and companies so they can take action. IMEO publishes these alerts on the Eye on Methane data platform, along with information on whether UNEP received responses to a MARS notification and whether operators mitigated emissions. While satellites detect only a fraction of total emissions—and more granular measurements from field studies (Chapter III) and OGMP 2.0 (Chapter I) remain critical—these satellite observations still provide some of the most actionable data currently available.

Integration of a dozen satellite missions

Among satellite-enabled initiatives to track methane emissions, MARS integrates the greatest number of instruments from the evolving methane satellite landscape (see Figure 11): 17 satellites from 11 different missions for direct MARS notifications and another 18 satellites from 6 missions for historical records. This near-real-time data facilitates early mitigation actions and allows IMEO to regularly update the status of detected emissions sources.

MARS has expanded its capabilities to detect point-source methane emissions in 67 different countries, 37 of which include emissions from the oil and gas sector. In addition, MARS accesses data from the archives of another six missions, including MethaneSAT, Carbon Mapper and GHGSat. Archival data, sometimes dating back as far as 1982, provides information on the duration of emissions, previously active sources and the behaviour of specific facilities over time.

In mid-2025, MARS integrated a new source of methane plumes from the TROPOMI sensor aboard the Sentinel-5P satellite. The Space Research Organisation Netherlands (SRON) analysed the data and provided it to UNEP through the Copernicus Atmosphere Monitoring Service (CAMS). The rapid detection of TROPOMI plumes makes it possible to target follow-up observation with higher-resolution satellites and use their data to identify the source of emissions.

MARS also incorporated observations from the SLSTR sensor aboard the Sentinel-3 A and B satellites and the VIIRS sensor aboard the Suomi-NPP, NOAA-20 and NOAA-21 satellites. The combination of their different daily revisit times allows high-frequency monitoring and source identification for TROPOMI plumes (de Jong *et al.* 2025). In many cases, it even allows MARS to pinpoint the beginning and end of an emission event, making it possible to estimate the total amount of methane emitted.

IMEO has designed modular, flexible processes that can easily be adapted to integrate observations from new missions. This approach makes MARS resilient; if there is a problem with a single satellite, the system continues to operate.

Table 2: **MARS Data in 2025**

	Total in Platform	New in 2025
Methane plumes detected	14,638	4,163
Oil and gas	10,847	3,022
Coal	1,960	611
Waste	1,809	525
Other	22	5
Methane plumes notified (oil and gas sector only)	4,058	2,203

Harnessing artificial intelligence to accelerate processing

As the ecosystem of methane-detecting satellites continues to grow, so too does the volume of observations that require analysis. IMEO has deployed artificial intelligence (AI) to allow timely analysis of this vast amount of data. To date, this has allowed MARS to process over 200,000 satellite images[3] in 2025—a task that would've taken far longer if performed without the use of specially trained AI algorithms backed by human validation.

IMEO has developed AI models to facilitate rapid alerts for most satellites used by MARS, including Sentinel-2, Landsat series, EMIT, PRISMA and EnMAP. Analysts manually labelled thousands of plumes for the purposes of model development during MARS's early stages.

AI models trained with actual, satellite-observed plumes now allow for automatic internal alerts of potential plumes, optimizing analytical work and accelerating the notification process. IMEO has also developed an AI model for MethaneSAT, which will facilitate the analysis of MethaneSAT data archives. All AI models and methods used by IMEO are peer-reviewed in scientific journals, with datasets and code to be made publicly available when the review process is complete (Vaughan *et al.* 2024).

3 From January to August 2025 the team has processed: 137,786 Sentinel-2 and 78,431 Landsat images; 785 PRISMA, 4,885 EMIT and 2,253 EnMAP images.

Figure 11: The methane satellite ecosystem



	POINT SOURCE IMAGERS	
PAST	1	LANDSAT 4 & 5
PAST	2	LANDSAT 7
PRESENT	3	SENTINEL-2
PRESENT	4	GHGSAT
PRESENT	5	LANDSAT 8 & 9
PRESENT	6	CARBON MAPPER
PRESENT	7	GOFEN-5 02 and 01A
PRESENT	8	ZIYUAN-1 02D and 02E
PRESENT	9	ENMAP
PRESENT	10	PRISMA
PRESENT	11	EMIT
PRESENT	12	VIIRS
PRESENT	13	SENTINEL-3
PRESENT	14	GOES
PRESENT	15	MTG
FUTURE	16	TANGO
FUTURE	17	CO2IMAGE
FUTURE	18	SBG
FUTURE	19	CHIME

	AREA FLUX MAPPERS	
PAST	20	SCIAMACHY
PAST	21	METHANESAT[4]
PRESENT	22	GOSAT
PRESENT	23	SENTINEL-5P
FUTURE	24	GOSAT-GW
FUTURE	25	SENTINEL-5
FUTURE	26	CO2M
FUTURE	27	MERLIN

- **PAST:** Missions that are completed.
- **PRESENT:** Missions that are currently operating.
- **FUTURE:** Missions that are in commissioning phase or planned to launch in the future.

4 MethaneSAT ceased operations in July 2025. MARS has integrated the mission's data and continues to use it as a historical record.

Box 4. **The evolving methane satellite landscape**

There is a large and growing number of methane-detecting satellites with different sensitivities, accuracy, revisit frequency, coverage, spatial resolution and historical archives.

MARS uses the advantages of each to create an effective and resilient monitoring system:

- **Area flux mappers** identify critical areas with high emissions (e.g. TROPOMI)
- **Hyperspectral satellites** with targeted high spatial resolution and high methane sensitivity cover complex areas and readily identify emission point sources (e.g. EnMAP or Carbon Mapper)
- **Multispectral satellites** with lower sensitivity to methane but high revisit frequency and spatial resolution constantly monitor identified emission sources (e.g. Sentinel-2 or Landsat)
- **Band imagers** with low sensitivity but daily or near-constant extensive global coverage reveal and track the sources of large plumes first detected by area flux mappers (e.g. VIIRS sensors, or GOES or MTG geostationary satellites)
- **Archival data** reveals targets to keep monitoring, as well as the historical record of currently emitting sources (e.g. MethaneSAT, GHGSat, or Landsat 4, 5 or 7)
- **New and upcoming future missions** will improve MARS's capabilities (e.g. GOSAT-GW, Sentinel-5 or Tango)

The integration of many satellites avoids dependence and ensures MARS is resilient to the loss of any one satellite. For example, communication with MethaneSAT was lost in mid-2025. The MARS notification process continues uninterrupted. IMEO will be able to use historic MethaneSAT data in its broader data integration efforts.

Despite the growth of the system, there are still several gaps. Satellites can only see the largest emissions (greater than 100 kilograms methane per hour). There is also a lack of broader spatial coverage, as well as more frequent and temporally diverse observations, particularly outside the typical time at which most satellites overpass (i.e. noon). Launching new satellites with unique sensitivities enhances the diversity of measurements, addressing some of these limitations. In this context, the Ministry of the Environment of Japan, the National Institute for Environmental Studies and IMEO have announced collaborative efforts on the use of data from GOSAT-GW. IMEO will integrate GOSAT-GW data into its MARS system, as announced at the LNG Producer-Consumer Conference 2025 in June. However, satellite launches impact the environment through emissions and space debris, so sustainability measures must be considered.

More research is needed to improve the detection and quantification of non-point source emissions such as certain landfills, open coal mines or agricultural emissions, as well as emissions in complex environments such as cities, heavily vegetated regions or areas with changing topographies.

Direct notification to enable action

For any oil and gas plume detected by MARS, IMEO rapidly shares a notification with nominated focal point(s) in the government and any relevant OGMP 2.0-member company. Focal points then coordinate with other stakeholders to investigate the cause of the emissions, address the emissions where possible and provide feedback to IMEO on the status of this action.

At the Conference of the Parties (COP29) in 2024, UNEP published a stark statistic: Only one per cent of MARS notifications received a response. IMEO considers a response received if focal points reply with detailed information on the emission event that triggered the alert and, if applicable, any actions taken to mitigate it.

In less than a year, this rate has increased to more than 12 per cent. This shift has been driven in part by increased engagement from IMEO and partners. IMEO's network of focal points is growing, with 25 countries having nominated individuals to receive MARS notifications and another six focal points nominated at the subnational level. Table 3 lists jurisdictions that have nominated MARS focal points. Focal points are regularly in touch with the IMEO team to review and respond to notifications. Where possible, these engagements are linked with efforts by partner organizations to bring together MARS response and other priority initiatives, such as venting and flaring reduction, or regulatory development.

Table 3: Jurisdictions that have nominated MARS focal points

• Algeria	• Azerbaijan	• Libya	• Turkmenistan
• Angola	• Bahrain	• Malaysia	• Ukraine
• Argentina	• Bosnia and Herzegovina	• Mexico	• United States of America
• Argentina – Province of Chubut	• Brazil	• Mozambique	• United States of America – New Mexico
• Argentina – Province of Neuquén	• Colombia	• Nigeria	• United States of America – Colorado
• Argentina – Province of Río Negro	• Iraq	• Oman	• Uzbekistan
• Argentina – Province of Santa Cruz	• Kazakhstan	• Pakistan	• Yemen
• Australia	• Kuwait	• South Africa	

IMEO has further supported response by making the MARS notification more digestible and actionable. Initially, UNEP issued MARS notifications for individual plumes—that is, isolated observations of methane emissions. In 2025, UNEP transitioned to notifying at a source-level, meaning plumes are now linked to a specific source, pointing to the origin of the emissions (see Figure 12).

This move clarifies where emissions come from and how frequently emissions occur at a given source. By providing a clear and comprehensive view of satellite-detectable methane emissions, IMEO helps focal points identify the highest priority for action and better track developments over time.

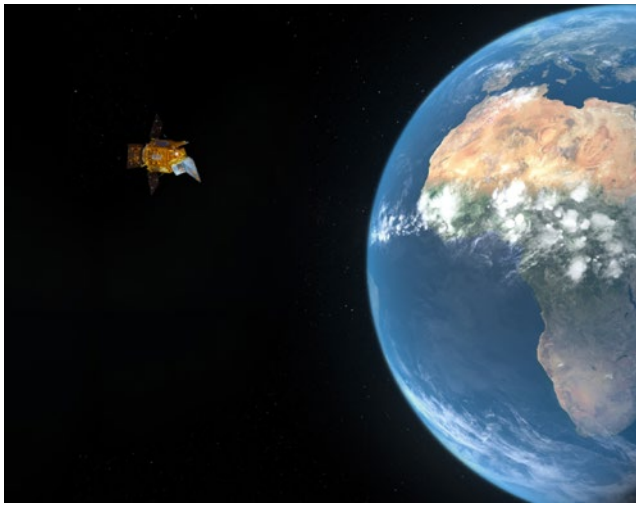
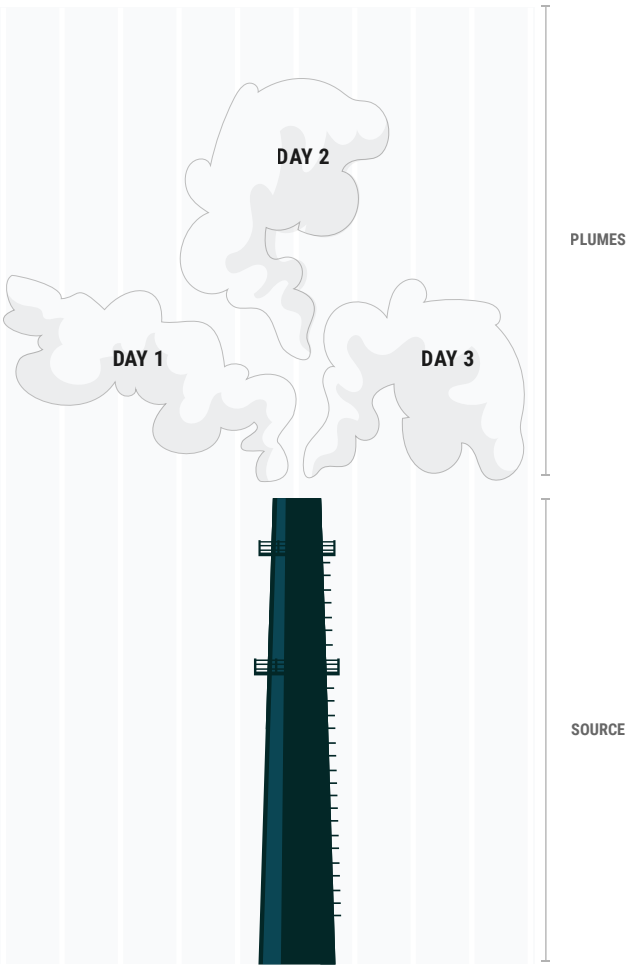


Photo credit: Canva

Figure 12: The transition from plume- to source-level notifications



Growing action from notifications

To date, IMEO has documented 25 instances of emissions reduction that MARS facilitated or verified. Nineteen of these cases were documented since the last edition of this report was published in November 2024. The growing body of confirmed mitigation action underscores the concrete progress possible when governments and companies engage with MARS. In July, IMEO highlighted seven such mitigation cases in Kazakhstan (Middle Caspian Basin and Uzen Field), Oman (Jahlah North and Northwest Oman), Yemen (Al-Shura and Kamil Field) and Argentina.

Since this July update, IMEO has verified 12 more mitigation actions in response to MARS notifications:

Argentina, Meseta Espinosa Field, Santa Cruz. Four emission events have been addressed and verified:

- One event, detected on 21 March 2025, resulted from a burner failure in a battery flare pit, due to the high carbon dioxide content in the associated gas. The operator confirmed that the burner design was modified in mid-April, and the pilot supplied with fresh water.

- Two other events were detected on 4 April 2025. The operator confirmed the first issue resulted from a failure in diverting gas to the acid gas plant, which instead routed gas to the battery flare pit. The excess CO_2 prevented the flare burner from staying lit. The burner design was modified, and the pilot was supplied with fresh water. Additional adjustments were made to minimize future diversion failures. In the second case, the cause was a burner failure in the battery flare pit due to excessive CO_2 in the gas. The lack of combustion was linked to the high CO_2 content. The burner was modified and the pilot supplied with fresh water.

- A fourth case was detected on 7 June 2025, which the operator confirmed was the result of operational failure in a separatory that diverted gas to a tank. This issue resulted from low temperatures and was resolved on 9 June by repairing the pneumatic liquid discharge equipment.

Iraq, Mesopotamian Foredeep Basin. IMEO had detected a persistent emissions source in Iraq since late 2023; however, by September 2024 it was no longer detected. Following communication with the focal point and the operator, the operator confirmed that the emissions resulted from a leak at a dry gas pipeline caused by malfunctioning equipment. The operator had isolated and excavated the pipeline to repair the leak, reinject the gas and resume operations.

Iraq, Al-Akkas. Initially detected by IMEO on 17 April 2025, the operator reported the emissions originated from a malfunctioning dry gas pipeline, which persisted due to logistical and operational challenges. The operator confirmed they had excavated and repaired the pipeline at the end of May 2025 before restoring operations.

Libya, Faregh-Argub. On 29 May 2025, MARS detected emissions in an onshore upstream production site in the Faregh-Argub oil and gas basin. According to company information shared through an OGMP 2.0 member, the emissions came from mud tanks storing oil-based mud, a mixture of diesel and drilling materials. Methane was released during routine storage when the mud was not being used. To stop the emissions, the company used the stored oil-based mud in operations, eliminating the source.

Turkmenistan, Northern Balguyy and 10 yyl Abadanchylyk. Three emission events were detected and notified in the Abadanchylyk field. Each of these emissions were caused by gas leaks on pipelines connecting wells to gas connection points.

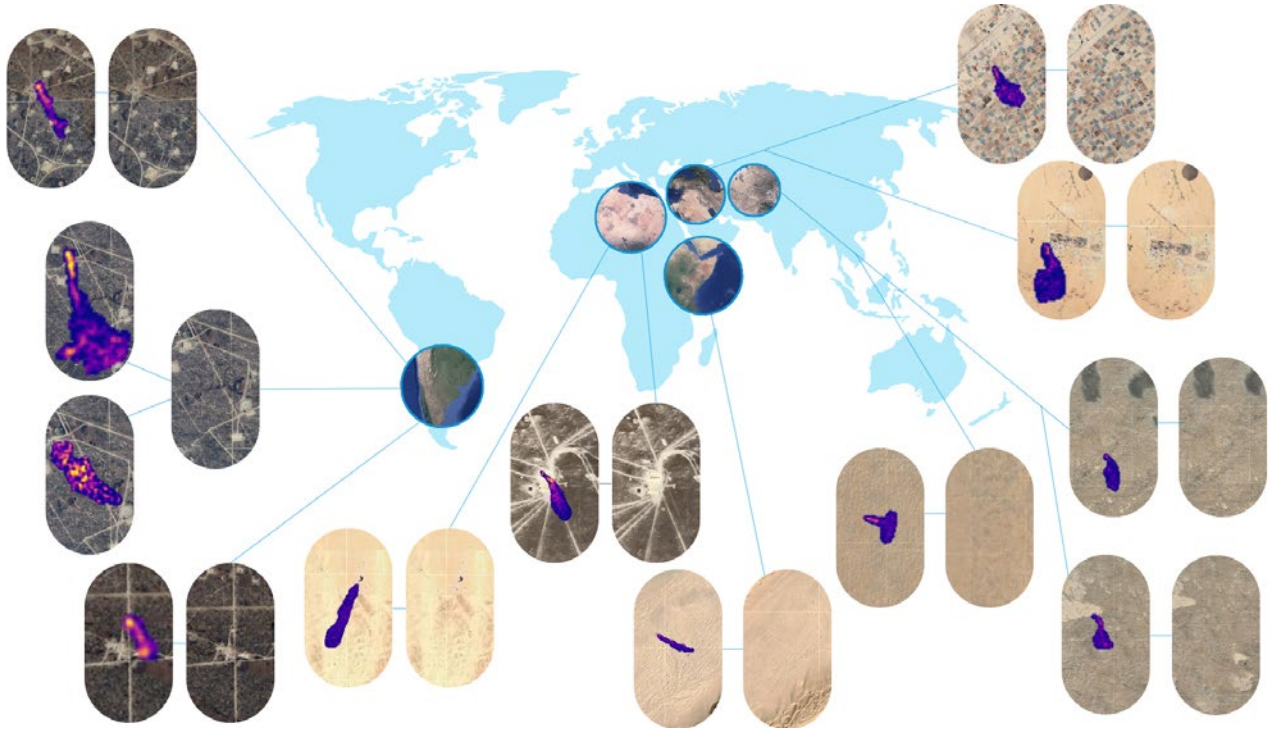
- The first source was detected several times between July 2024 and June 2025. After the last notification on 3 June 2025, Turkmengaz discovered the leak was due to the high wear and tear rate of the pipeline and completed maintenance and repair work—Northern Balguyy.

- Two additional sources were detected on 22 June 2025, one of which was previously detected and notified in October 2024. Turkmengaz conducted maintenance and repair work on both locations on 24 June 2025—10 yyl Abadanchylyk.

Libya, Zaggut. On 6 June 2025, MARS detected emissions in the Zaggut oil and gas basin. According to company feedback provided through an OGMP 2.0 member, the release occurred during a period of low gas production, when gas was sent to a flare to burn off for safety purposes. On the day of the emission event, strong winds extinguished the flare, allowing methane to escape into the air. After securing the required safety clearance, the operator relit the flare, stopping the emissions. The event lasted about four hours.

Yemen, Mawza. Methane emissions were detected in early July 2025 and notified to SEPOC at an upstream offshore production facility. The operator investigated and confirmed that emissions were caused during an attempt to recover a low-pressure well using a portable test separator, which resulted in flaring at the pit. The well was shut two days later, ending the emission event.

Figure 13: Map of MARS mitigation cases



Collectively, the 19 emission events mitigated thanks to IMEO over the past year had an estimated combined emissions rate of 52 metric tons of methane per hour (see Figure 13). This means that for every day these leaks persisted, they had the same near-term climate impact as over 24,000 passenger vehicles being driven for an entire year.

Beyond direct mitigation action, IMEO is seeing increasing examples of other ways in which MARS notifications serve stakeholders:

1. Identifying illegal or unauthorized activity
In Argentina, provincial focal points have achieved a 100 per cent response rate to emissions notified through MARS. The country's constitution made the province-level engagement possible, which grants provinces ownership of natural resources. Provincial focal points have used MARS notifications to identify non-compliance with regulations. A MARS alert in Neuquén led to on-site inspections and the discovery that venting had occurred without combustion, contradicting initial operator reports. Urged by the authorities, the operator provided feedback to IMEO and committed to corrective and preventative maintenance. Since 2024, flare activity is visible in satellite imagery, with no further plumes detected from the source.

In Nigeria, MARS alerts have helped the government identify third-party interference with oil and gas production that led to emissions. After receiving a MARS notification on two emission events, operators immediately launched an investigation that led to the discovery that vandalism and third-party interference had caused a leaking wellhead. They repaired the leak.

2. Facilitating temporary fixes for long-term issues
IMEO has documented multiple instances of unlit flares causing significant emissions of methane. Notifications have alerted officials in several countries, notably Libya and Iraq, of extinguished flares, facilitating quick remediation while they pursue longer-term solutions. In Libya, one company is redesigning a flare tip with automated ignition and wind protection. In Iraq, a structural integrity issue with a flare stack is repeatedly extinguishing the flare. MARS notifications alert the operator to quickly relight the flare while it makes efforts to rehabilitate the flare stack and replace the damaged equipment.

3. Tracking progress on ongoing mitigation efforts
IMEO has received feedback regarding a major, long-term emission event in the Malaysia-Thailand Joint Development Area in the Gulf of Thailand. These emissions are located at an offshore platform operated by a joint subsidiary of two OGMP 2.0 member companies and seem to result from a poorly functioning flare.

Since IMEO started notifying focal points of the source, the OGMP 2.0 member companies have proactively engaged the operator, confirmed that drone surveys of the source took place and shared that a long-term mitigation plan is underway. Completion is expected in 2026. MARS continues to monitor the location and track progress.

In Mexico, MARS notifications have prompted authorities to investigate a persistent methane source in the Gulf of Mexico. Despite initial efforts to address the source, emissions persisted. Now, officials at Pemex are conducting a pre-feasibility analysis on the infrastructure upgrade required to fully eliminate emissions. They continue to communicate with IMEO on progress.

4. Boosting capacity for methane reductions

Despite a lack of methane detection equipment, Yemen's focal point—within its national oil company SEPOC—has achieved a 100 per cent response rate and investigates every MARS-detected emission event. After UNEP provided coordinates to conduct on-the-ground inspections, Yemen has enacted several mitigation actions, even choosing to temporarily shut down fields when repair efforts were unsuccessful. Furthermore, at a particularly persistent source in Yemen, SEPOC has started to undertake repairs by replacing over 50 leaking valves, though many valves still remain and additional support may be needed.

Similarly, MARS notifications to a subsidiary of an OGMP 2.0-member company in Kazakhstan led to on-site inspections using Audio-Visual-Olfactory (AVO) methods and soap foam testing to locate the source of methane emissions. The team swiftly identified and replaced a leaking valve, fully stopping the emission. This example highlights the diverse nature of mitigation action; while some cases require advanced detection and long-term solutions, others can be addressed rather quickly. In the Kazakhstan case, a lack of specialized equipment did not prevent the operator from taking effective action.

The opportunity remains

The progress noted in the above mitigation cases is important, but there remains a significant opportunity—and a critical need—for further action. While a 12 per cent response rate demonstrates rapid growth, the reality is that 88 per cent of methane-emitting sources detected via MARS have not received any response—amounting to over 900 individual sources around the world. These emissions sources provide a picture of where near-term action could eliminate emissions while longer-term efforts to address other, smaller methane sources continue.

Around the world, direct action by governments and companies spurred by MARS notifications demonstrates an important proof point of data to action—in many cases, regardless of circumstance and geography. Argentina, Yemen and Oman have all achieved a near-100 per cent response rate. Kazakhstan, Turkmenistan and others are increasingly responding despite challenges in the availability of detection equipment and outdated infrastructure.

Through MARS, IMEO helps enable the efforts these stakeholders can take with the resources already available to them, while also identifying barriers to eliminating these emissions. This information can point to areas where additional support from the global methane community is needed.

Creating new products to catalyze action beyond oil and gas

Rapid alerts for coal and waste sectors

MARS exists to deliver alerts of methane emissions that are unknown or under-prioritized, but which can be mitigated. To date, MARS has focused on oil and gas emissions given the sector's near-term mitigation potential. Recognizing that important emission reduction opportunities exist in other sectors, MARS is evolving to issue alerts on unintentional emissions with mitigation potential in the:

- **Coal sector:** unlit flares, draining stations and gas to electric stations, among other facilities or components of mines that shouldn't vent methane by design
- **Waste sector:** unlit flares and other components of gas capture and processing systems

Continuous source alerts

For sources known to continuously emit methane by design—for example, landfills or ventilation shafts from met coal mines—satellite data can be used to estimate emissions and support the monitoring of emissions over time. This information will improve the understanding of a source's behaviour and increase sector-level transparency on emissions within a country.

Starting in 2026, UNEP will deliver MARS quarterly updates on such sources. The alerts will include the specific origin of emissions, MARS detections over time for each source and estimated emission rates. With this information, IMEO expects to increase awareness of ongoing emissions, which, despite mitigation challenges, are important to address.

IMEO expects that such continuous sources will predominantly be in the met coal and waste sectors. However, some cases in the oil and gas sector could be similarly characterized, such as facilities with complex repairs that require months or years of planning and repair, or sites originally designed for venting whose cessation would require a regulatory change prohibiting venting and promoting mitigation.

Country-level estimates

While MARS mainly uses high-resolution satellites to identify emission sources, low-resolution satellites—also known as area flux mappers or global mappers (see Box 4)—can estimate total emissions at regional or country levels. Rigorous statistical analysis of methane data from global mappers like TROPOMI enables these country-level estimates.

Countries increasingly demand this up-to-date, empirical and comprehensive data on methane emissions over a specific period of time, typically annually, both for total methane emissions and emissions by sector. Supported by partners, UNEP has provided such estimates for Member States advancing large-scale projects or as part of specific scientific studies. To meet growing demand, IMEO plans to develop in-house capability to provide regular estimates using an open-source, cloud-based model developed by Harvard University (Estrada *et al*. 2025).

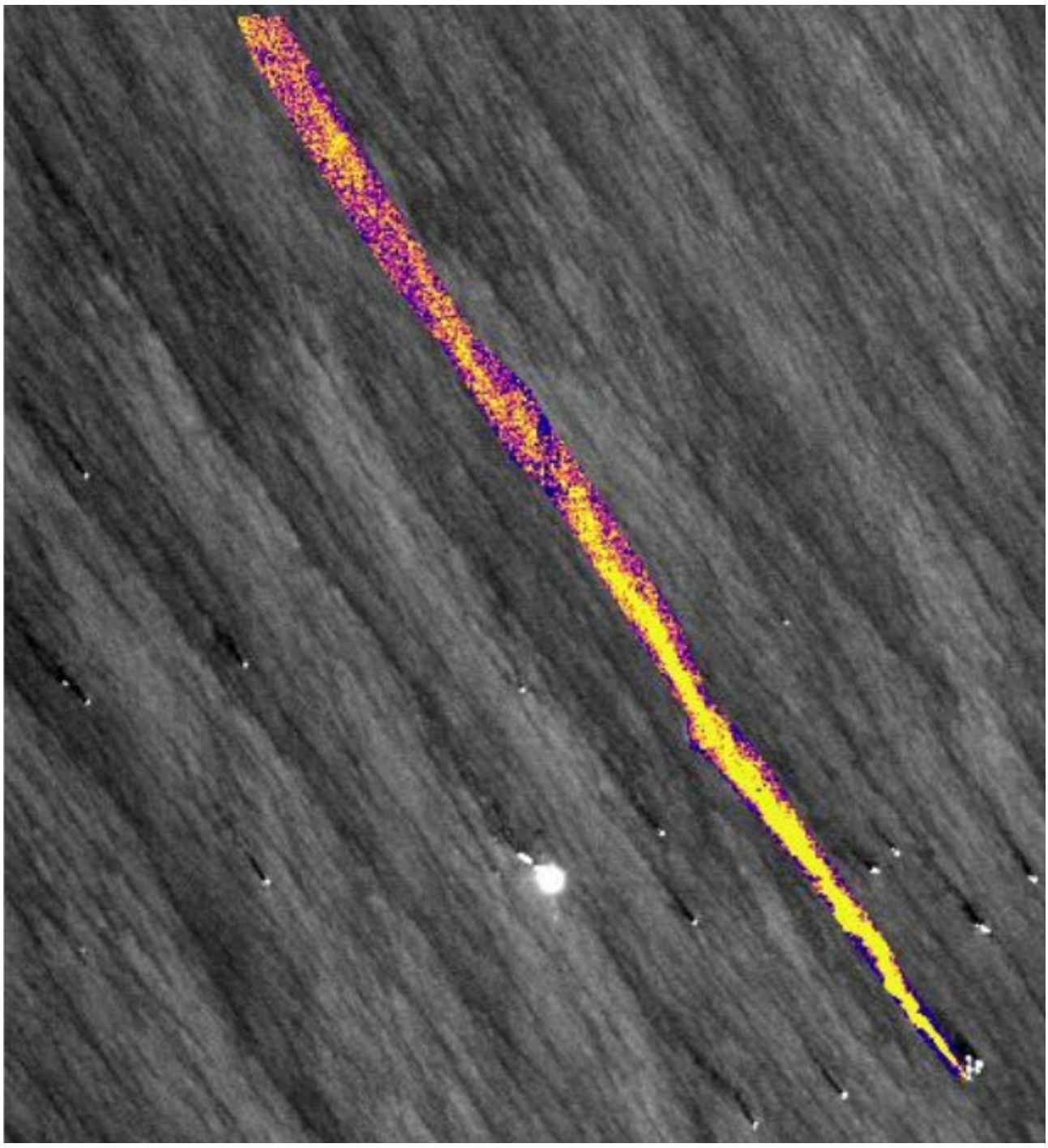


Photo credit: Universitat Politècnica de València

03

Methane Science Studies

Improving the world's understanding of methane emissions



Photo credit: UNEP

Chapter highlights

- Forty-six methane science studies initiated globally, with 17 completed and 35 peer-reviewed publications resulting.
- IMEO science tests and validates the technology and methods needed to quantify and report emissions—vital to support regulators and voluntary reporting through OGMP 2.0.
- This work is enabling the adoption of accurate, measurement-based inventories, moving past outdated or inaccurate emission factor-based methods.
- Studies are leveraging the use of satellite data along with in-situ data to assess whole country methane emissions by sector.
- IMEO science expands into the waste and agricultural sectors.

IMEO designs, funds and leads Methane Science Studies to provide empirical data to improve understanding of where, and how much, methane is emitted. By investigating the major emission sources across sectors and advancing methane monitoring, IMEO equips stakeholders with tools to identify mitigation opportunities and track emission changes over time.

The studies are sector-specific. The oil and gas sector's efforts have benefited from advanced measurement-based insights, while other sectors such as coal, agriculture and waste have different knowledge gaps and specific needs in terms of policy-relevant data.

The studies continue to follow the core principles of IMEO science:

1. Studies are led by academic/research scientists.
2. Studies employ multiple measurement and emission quantification methodologies whenever possible.
3. The full scientific process—from scoping of the study to publication—is reviewed and overseen by an independent panel of scientific experts in IMEO's Scientific Oversight Committee, including UNEP's Chief Scientist.
4. All emission measurement data are released publicly.
5. Results are published in peer-reviewed scientific journals.

As of September 2025, IMEO has made significant progress in methane research and mitigation efforts. Figure 14 shows where IMEO studies have been initiated around the world. Key achievements include:

- 17 methane science studies completed worldwide
- 29 studies under way, covering major emissions sectors: oil, gas, coal and waste
- 35 papers from IMEO-funded studies published in leading scientific journals
- 9 additional papers have been submitted to journals and are expected to be published in 2025

Figure 14: IMEO-initiated scientific research around the world



IMEO Methane Science Studies objectives

The studies prioritize four key objectives:

1. **Develop data integration approaches for multi-scale emissions data**
   As the volume of methane data increases, IMEO coordinates studies that bring together data from different monitoring technologies to build a comprehensive picture of emissions.

2. **Validate measurement-based approaches**
   Assessing the accuracy and precision of different measurement-based approaches used to quantify and report emissions is critical. IMEO validates and develops guidelines for the use of methane monitoring technologies—critical for quality assurance as regulators and industry implement data-driven mitigation policies.

3. **Characterize regions, sectors and sources with large discrepancies in emission estimates**
   There are still many sources of methane that remain poorly understood. Field research on such sources helps identify potential mitigation targets.

4. **Develop country-level studies to provide baseline for countries targeting methane mitigation**
   IMEO develops studies to assist countries pursuing methane reductions, especially where national methane inventories rely on generic emission factors and direct measurement data is limited. These baseline studies aim to foster the development of national methane mitigation strategies by improving countries' ability to locate, quantify and understand emissions.

2025 study highlights

Four recently completed science studies are described below.

Measuring methane emissions from Australia's leading coal region

In 2022, Australia produced over 450 million metric tons of coal, accounting for approximately seven per cent of global production (Geoscience Australia 2024). Fugitive methane emissions from Australian surface and underground coal mines are estimated and reported under the National Greenhouse and Energy Reporting (NGER) scheme. The NGER framework uses higher-tier methods for estimating coal mine methane emissions, including direct measurement methods for underground mines. Emissions from surface mines have not been independently verified through atmospheric measurements.

Given the high uncertainty of satellite-based quantifications and lack of suitable ground-based methods, IMEO initiated a study deploying two different aircraft-based techniques to more accurately measure emission rates (Figure 15, source: Borchardt *et al.* 2025)). The study took place in Australia's Bowen Basin, home to much of the country's met coal, and evaluated 30 underground and surface, or open-cut, mines.

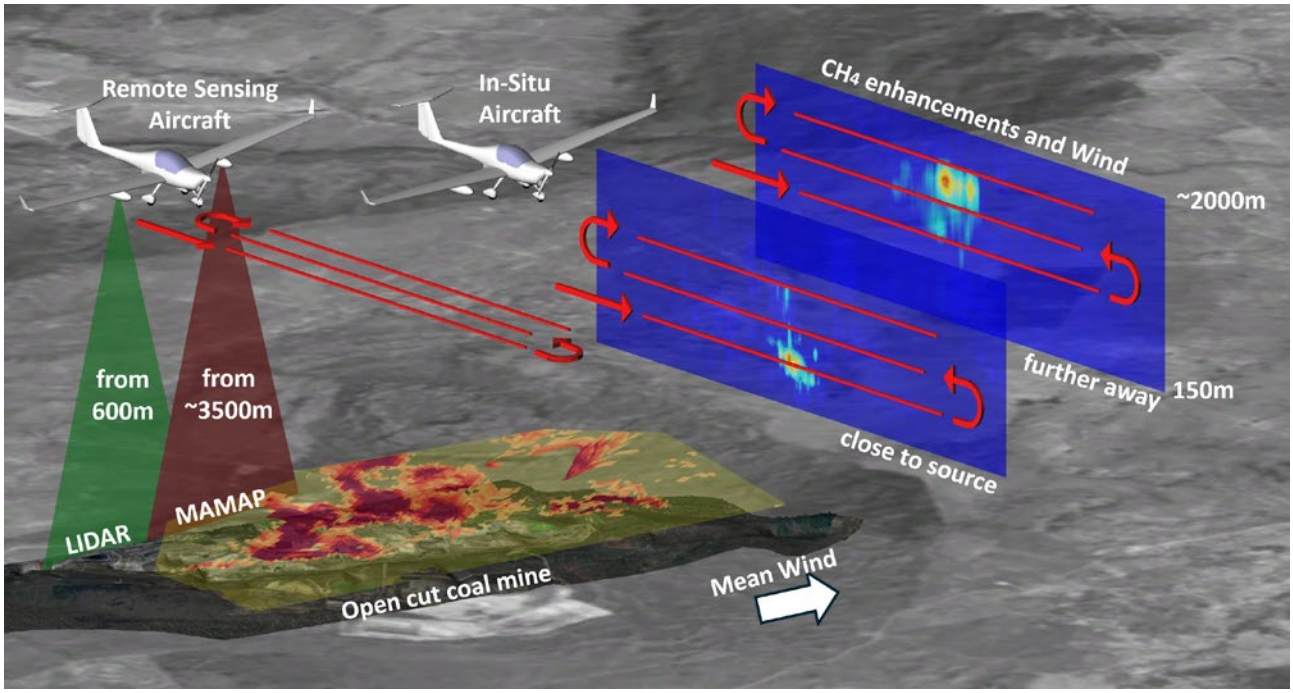
The first analysis of this study focused on a high-emitting, isolated mine called Hail Creek (Borchardt *et al.* 2025). The analysis found emissions three to eight times higher than what the operator reported based on state-wide emission factors.

This finding was based on annualised data collected over five days across 2022 and 2023, with the assumption that these measurements represent average operational conditions over 2023. It was supported by the 2025 upward revision of operator-reported methane emission rates at Hail Creek (Glencore 2025). On-going analysis will determine the applicability of Hail Creek findings to the rest of the Bowen Basin.

The study validates the Australian Government's decision to phase out the simplest NGER reporting method, which relies on a state-wide emission factor. The Government has also committed to a review of the existing alternative reporting method. In addition, it has tasked an independent panel to advise on the use of atmospheric measurements and the role they could play in Australia's reporting scheme. Results from this study will inform both processes.

These findings also have global significance as half of global coal production is from surface mining (Global Energy Monitor [GEM] 2025). Some countries, for example India, are dominated by surface mining (Ministry of Coal 2025). The study underscores the need for improved data to understand the sector's emissions and how they can best be mitigated.

Figure 15: Coal mine aerial observations



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Testing methane measurement tools in real-world conditions

Accurately assessing methane emissions at the facility level is vital for regulators and industry alike. Controlled release experiments, in which known quantities of methane are released and measured, evaluate the capabilities and effectiveness of different measurement technologies.

In 2024, IMEO instigated such a "challenge" experiment, in which 15 commercial and academic groups quantified emissions without knowing the release rates and reported their results to an independent team for assessment.

Methodologies included aircraft, drones and satellites, as well as vehicles and fixed, ground-based sensors. Conducted at the TotalEnergies Anomalies Detection Initiatives (TADI) site in Pau, France, the study was the first public blind, controlled release test of this scale for methane technologies in Europe.

The results of the experiment were mixed (McManemin *et al.* 2025). While most participants reliably detected emissions, the accuracy varied greatly, with low wind speeds and shifting winds posing difficulties for many mobile and remote-sensing tools. Several teams identified challenges measuring wind speed and direction, suggesting that better meteorological data is needed to produce more accurate estimates.

The location of the experiment—an active industrial site—also made measurements challenging. More public challenge experiments are needed to capture the real-world variability of oil and gas infrastructure and to understand how the performance of different technologies changes under variable conditions.

Understanding the limitations and uncertainties in the methodologies used for OGMP 2.0 reporting is critical for tracking mitigation and understanding how to reconcile Level 4 and Level 5 reporting.

A new method for quantifying liquified natural gas processing emissions

Liquefied natural gas (LNG) accounted for around 15 per cent of global gas demand in 2023 (Energy Institute 2024). There has been relatively little research to understand methane emissions associated with the energy-intensive liquefaction process, in which gas is converted to a liquid so it can be transported to markets.

IMEO initiated a study to determine emissions from the LNG industry in Australia, which exports around 20 per cent of global LNG (Institute for Energy Economics and Financial Analysis 2024). LNG liquefaction facilities emit significant amounts of carbon dioxide (CO_2) as a result of gas combustion. In this study, researchers investigated whether they could use the CO_2 emissions to better estimate methane emissions, through a technique known as tracer correlation (see Figure 16).

In this method, the concentration of methane is measured relative to a reference tracer gas. This typically involves the artificial release of a tracer gas at a known rate. In this case, researchers used existing CO_2 emissions as the tracer, the first time this has been done for a specific facility within the oil and gas industry.

The study demonstrates that the unique tracer correlation method results in very similar estimates to a more conventional method, but with less uncertainty (Lunt *et al*. 2025). In addition, estimates can be achieved more efficiently, with fewer measurements, and are more reliable in suboptimal wind conditions.

Made possible by collaboration with local LNG plant operators, the study provides results that can be applied widely by the industry, not just in Australia, particularly in the context of OGMP 2.0 Level 5 reporting. The development of new methodologies for assessing emission rates will ideally lead to more frequent measurements, better understanding of a site's emissions and, ultimately, reduce emissions.

Figure 16: The Airbourne Research Australia team view data collected during a flight using the onboard visualisation



Photo credit: Airborne Research Australia / ARA

Establishing a baseline in Colombia

IMEO's baseline science studies combine measurements and inventory assessments with the overall aim of helping countries estimate annual methane emissions, by sector. This effort supports countries that may face challenges in setting methane reduction goals and identifying mitigation targets due to a lack of measurement-based emissions data. To date, baseline studies have been initiated in Colombia and Nigeria, with the work in Colombia being the most advanced of the two.

Many methane sources contribute to Colombia's overall emissions. According to its national greenhouse gas emissions inventory, estimated total anthropogenic methane emissions in 2018 were 2,629 kilotons, with livestock being the main source of emissions (Institute of Hydrology, Meteorology and Environmental Studies [IDEAM] 2021). Most of the inventory calculations, however, are performed using generic emission factors (Tier 1). IMEO aims to address this gap by conducting a multi-scale study to produce the first measurement-based estimate of the country's total and sectoral methane emissions.

In the first part of the project, researchers characterized the country's emission sources by analysing national and international inventories and conducting an extensive literature review. Four sources were identified as responsible for 85 per cent of methane emissions: cattle enteric fermentation (53 per cent), disposal of solid waste (13 per cent) and wastewater (11 per cent), and fugitive emissions from fossil fuel production (8 per cent) (Jimenez *et al.* 2024). Researchers then created an emissions inventory, combining it with satellite measurements to produce sector-specific emissions estimates for Colombia (Hancock *et al.* 2025).

In the second phase of the project, measurement campaigns will be carried out in the poorly understood sectors. The goal is a better estimate of each sector's contribution to the national emission inventory and a map of total and sectoral emissions in Colombia. Participants at a workshop involving representatives from government, operators and the scientific community will then make recommendations on specific mitigation actions.

Methane science studies expand to the waste sector

In May 2025, IMEO's science activities for the waste sector began with a campaign at a landfill in Madrid, Spain. Emission measurements were concurrently collected by aircraft, satellites and tracers. Additional campaigns are planned for Autumn 2025, with results expected in 2026.

Methane detection technologies, particularly those relying on remote sensing, are typically built on assumptions about how methane behaves in the atmosphere. These assumptions are largely drawn from oil and gas contexts, where most emissions are released under pressure from elevated infrastructure, forming narrow, high-velocity plumes that rise quickly and disperse downwind. However, landfill methane emissions may behave differently, since they are diffuse and occur at the surface, under moist conditions.

Controlled releases and multi-scale intercomparison studies will improve the understanding of the nature of landfill emissions. As satellites increasingly observe methane from landfills around the world, IMEO will build on these studies to develop or update landfill-specific algorithms that estimate emission rates from satellite detections.

As part of its baseline studies, IMEO will also perform ground-based and drone-based methane emission quantification measurements at several landfills in Colombia and Nigeria, covering a range of operating conditions and landfill types.

Box 5. **IMEO's agricultural science**

IMEO is extending its scientific focus to the agricultural sector through multi-sectoral baseline studies of methane emissions.

For example, in Colombia, IMEO will generate a comprehensive, measurement-based baseline of methane emissions from rice and livestock systems. Key expected outcomes include an integrated methane data inventory; updated Tier 2 emission factors (Intergovernmental Panel on Climate Change 2006) for livestock systems, derived from direct measurements; and high-resolution, regionally disaggregated emission estimates.

IMEO aims to produce gridded inventories of methane emissions from rice and livestock in Colombia, which can be incorporated into national reporting frameworks and models.

In 2025, IMEO established an Agriculture Subcommittee to the Scientific Oversight Committee (SOC). Composed of experts from various scientific fields, the Agriculture Subcommittee provides oversight of IMEO's work on agricultural methane emissions, evaluating proposed research strategies and technical approaches.



Photo credit: unsplash / Filip Bunkens

Gender equality in IMEO's science work

UNEP's strong commitment to gender diversity is reflected in IMEO's scientific work, with women playing key roles across its science studies. Currently, 30 per cent of ongoing IMEO science studies are led by female scientists, while 40 per cent of IMEO's Scientific Oversight Committee members are women.

In terms of IMEO's research output, 30 per cent of published and submitted papers in 2025 have female first authors. Within IMEO, half of in-house scientists are women, including the lead of IMEO's Methane Science Studies. Additionally, two female scientists head critical areas—satellite remote-sensing science and baseline studies—highlighting their leadership in advancing methane research. To further strengthen gender equity, women should be actively engaged in IMEO activities on the ground (including projects and grants), ensuring their expertise and perspectives drive methane mitigation efforts across all levels.

Next steps for IMEO's science

As regional studies consistently find underreported methane emissions in the fossil fuel sector, work to understand the magnitude of this underreporting across geographies is needed. Through IMEO, UNEP will continue to develop studies that improve the scientific basis for regulatory reporting that currently relies on generic emission factors. Announced in July 2025, one of these studies will develop a testing facility for verifying atmospheric methane measurement methods at open-cut coal mines. Undertaken with the Australian Government, the controlled release study will evaluate the capabilities of different methods for detecting and quantifying methane emissions from a simulated open-pit coal mine.

The expansion of IMEO science into the agricultural and waste sectors will continue. IMEO's first agricultural study will begin in 2025 in Colombia to enhance the accuracy and resolution of rice and livestock methane emissions data through field measurement campaigns.

04

Steel Methane Programme

A gigaton opportunity at one per cent of the cost of steel



Photo credit: Canva

Chapter highlights

- Methane mitigation in steel is a gigaton-scale opportunity that can be tackled at low cost, but requires urgent improvements in data, accountability and integration into decarbonization planning.
- IMEO's Steel Methane Programme combines science, credible data and industry engagement to make methane emissions in steel more visible and actionable.
- Global scientific studies backed by IMEO are revealing that met coal methane emissions are underreported, demonstrating the need for mine-specific, top-down measurement—not estimates based on emission factors.
- Through IMEO, UNEP is building the first public database of mine-level methane emissions that combines satellite, aerial and inventory data to drive transparency across the steel supply chain.

Strengthening the Steel Methane Programme

Building on its launch last year, UNEP's Steel Methane Programme (SMP) is evolving into a comprehensive system to tackle methane emissions in the steel supply chain. Over the last year, SMP has advanced scientific studies, formed new partnerships and continued developing coal methane training and a public mine-level methane emissions database.

Developed with industry and scientific partners, SMP's Measurement/Monitoring, Reporting and Verification (MRV) framework is under development and gaining momentum. The framework sets methane measurement standards and a five-level reporting system, aligned with the approach used in OGMP 2.0. It increasingly considers the roles of investors and steel companies alongside met coal producers, reflecting the growing recognition of methane as a material issue across the full steel value chain. To support implementation, IMEO has prepared technical guidance documents to help mine operators achieve "Gold Standard" reporting and adopt effective mitigation practices.

Engagement remains key. IMEO works with groups like the World Steel Association, ResponsibleSteel, the Steel Breakthrough Initiative, Global Energy Monitor, Ember and the United Nations Economic Commission for Europe (UNECE), while expanding dialogue with investors and industry coalitions to embed methane in Environmental, Social and Governance (ESG) assessments.

Box 6. **The steel sector mitigation opportunity**

Methane emissions from metallurgical coal, also known as met coal, are a significant but underrecognized contributor to the climate footprint of steel. Today, more than 70 per cent of the world's steel is produced using blast furnaces, which rely on met coal both as a fuel and as a chemical reductant (World Steel Association 2025). Methane is released from coal seams during mining and processing and adds about a quarter to steel's climate footprint (Kasprzak 2025), which makes it a major source of industrial greenhouse gases attributed to industrial activity.

Overall, met coal is estimated to account for one-tenth of all methane emissions from the energy sector and one-third of total emissions from coal (International Energy Agency [IEA] 2024). Emissions are estimated at roughly 12 million metric tons of methane, which carries the same near-term climate impact as approximately 990 million metric tons of CO_2—making mitigation across the sector a roughly one gigaton opportunity (IEA 2022).

Low-carbon alternatives such as hydrogen-based reduction and carbon capture are emerging but remain costly (Benavides *et al.* 2023). While steel recycling helps reduce demand for iron, scrap supply falls short of current demand (Wenban-Smith 2025).

As a result, met coal-based blast furnaces are expected to remain central to steel production for the foreseeable future (Fan and Friedmann 2021), making methane mitigation a critical part of any credible strategy to decarbonize steel.

Proven, cost-effective technologies exist to reduce these emissions. While these emissions fall under scope 3 (category 1) for steel companies, meaning indirect emissions from their supply chains, their scale and potential for reduction make them too significant to ignore.

A major barrier to progress is the lack of robust methane measurement. Empirical, site-specific measurements are necessary to drive effective engagement and mitigation. While the oil and gas sector has made rapid advances in this arena, the steel and met coal value chains are lagging. The coal sector's long history of safety-driven methane monitoring offers a starting point for climate-focused methane measurement.

Despite its significant potential, this opportunity has yet to gain widespread recognition. UNEP is working to change this through its Steel Methane Programme (SMP).



Photo credit: Canva

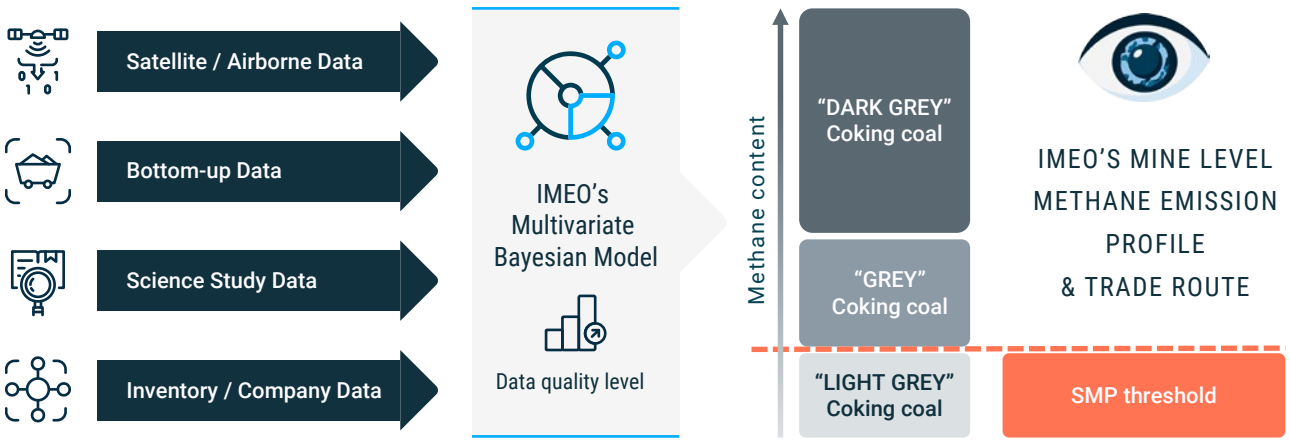
Delivering transparency in the steel supply chain

IMEO is building the world's first public database of mine-level methane emissions that integrates multiple source of information. The Steel Methane Transparency Database will create the most comprehensive view of methane emissions in the steel supply chain (see Figure 19). The database will cover both surface and underground mines across diverse geographies and geologies. It aims to promote MRV and mitigation, as well as climate-conscious met coal procurement decisions and policy development.

The database will integrate top-down observations, such as satellite and airborne measurements, with bottom-up reporting from companies and a diverse set of inventories. For satellite measurements, MARS has expanded its capabilities to harness satellite data for methane reduction in the coal sector (see Chapter II). For each mine assessed, the database will use rigorous statistical methods to generate best-estimate emissions, along with confidence ratings and methodological transparency, enabling users to understand both the precision and limitations of the data.

Hosted on IMEO's Eye on Methane data platform, the database will be a public resource for a diverse user base, including steel producers, investors, policymakers, researchers and civil society.

Figure 17: The Steel Methane Transparency Database



Advancing met coal science through field studies and academic partnerships

Through its Methane Science Studies, IMEO is building understanding of met coal methane emissions and improving measurement practices. Its comprehensive approach—combining aerial surveys, satellite observations, onsite measurements and academic collaboration—reflects a robust and evolving scientific toolkit aimed at accelerating methane mitigation across the coal sector.

As outlined in chapter three, regional field campaigns are expanding, with new studies shedding light on poorly understood methane sources. For example, a recent study focusing on the Hail Creek coal mine in the Bowen Basin in Queensland, Australia, found methane emission rates during airborne sampling campaigns much higher than official inventories—highlighting the limitations of generic emission factors and the need for mine-specific data and top-down validation.

IMEO has forged strategic academic partnerships around the world to expand knowledge of met coal emissions. Studies that aim to improve understanding of emissions from surface and underground mining have been completed or initiated in the United States of America, Poland, Australia, China, India and Colombia. Together, these countries account for nearly three-quarters of the world's coal production.

05

Enabling action through data

Providing insights, training and tools to agents of change



Photo credit: UNEP

Chapter highlights

- Data integration efforts are informing new products to increase transparency across the oil and gas and steel sectors.
- IMEO's Eye on Methane data platform has reached over 75,000 users and is launching new tools to deliver customized data to governments and companies.
- More than 2,000 individuals have participated in IMEO's Methane Training Series to build capacity on methane emissions in the oil and gas sector, as engagement enhances mitigation capacity in high-opportunity countries.

By bringing together different data streams, IMEO provides agents of change with a comprehensive, science-based view of emissions. IMEO couples this effort with digital tools and capacity-building to ensure individuals have the access and ability to translate data into decisions that drive down emissions.

Making sense of diverse data through data integration

As this report highlights, the ecosystem of methane data sources is growing quickly. However, viewing data in isolation can result in fragmentation, which can lead to misinformed strategies such as focusing on super-emitters while smaller, diffuse sources contribute the most emissions. IMEO's data integration work provides more accurate, transparent and policy-relevant methane emissions estimates.

This work combines data across multiple dimensions: different scales (source, site and regional), technologies (in-situ or remote sensing) and reporting frameworks (such as OGMP 2.0 or the Steel Methane Programme). IMEO integrates diverse datasets, from satellite instruments through MARS, field measurements through the Methane Science Studies and oil and gas company reporting through OGMP 2.0, alongside fossil fuel infrastructure and production data for context. This integration effort now supports the Steel Methane Programme (see Chapter IV), for which IMEO is integrating met coal emissions data from satellite measurements, scientific studies, process models and inventories.

Emerging data integration products to empower actors

IMEO has conceived several dedicated data integration products that will enhance transparency, improve accountability and accelerate mitigation in the oil and gas and other methane-emitting sectors.

The Methane Emissions Index (MEI) is a science-based tool underpinning the European Commission's Methane Supply Index[5]. It will map methane emissions across oil and gas supply chains from different gas-producing regions to the markets they are imported to. The index will represent an emission intensity based on measured total methane emissions and oil and gas production volumes. The emission intensity will be tracked globally over time using a consistent methodology, indicating emission levels and mitigation progress for groups such as regulators, oil and gas buyers, importers and policymakers. The MEI will guide stakeholders in setting performance standards and creating market incentives for mitigation. Regional test cases in Algeria, Libya and Romania will use satellite data as well as data from scientific measurements, laying the foundation for additional datasets, such as OGMP 2.0, to be included in the future.

The OGMP 2.0 assurance pilot will integrate company-reported data with empirical emission data sources, such as satellites and aerial surveys, to strengthen data quality, enhance transparency and support continuous reconciliation, all of which make for more robust emissions estimates.

The Emission Data Repository will form a publicly accessible database of geo-located and time-stamped methane emission rates obtained from peer-reviewed scientific studies. The repository will make it possible for users to base decisions, reporting and interventions on high-quality, comparable methane emissions data. Anticipated users include scientists validating models and conducting comparative studies, regulators evaluating national inventories, companies benchmarking their emissions and civil society groups concerned with bringing down methane emissions.

IMEO's Eye on Methane data platform drives integration, transparency and accountability

The Eye on Methane data platform delivers open, reliable and actionable global methane emissions data through a user-friendly interface. It empowers companies and governments to drive impactful methane mitigation action, while providing transparent, reliable data to civil society and media.

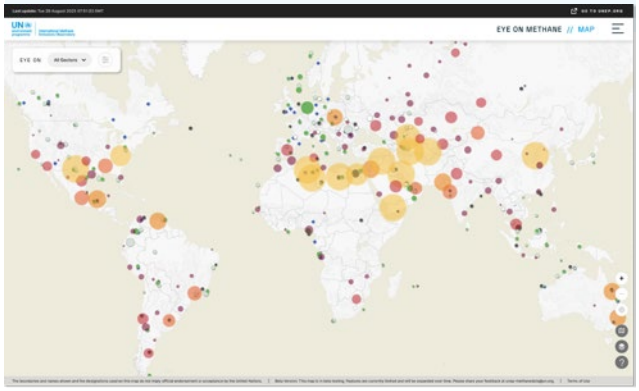
Co-designed with governments, companies, civil society, academia and media stakeholders, the platform launched at COP29 after a beta release the previous year. Key features include OGMP 2.0 company factsheets with validated emissions data, MARS satellite data with notification status, country factsheets aggregating emissions, and open data sets and API access.

Box 7. **What makes the Eye on Methane data platform unique**

- **Integrated Data Streams:** Combines satellite observations (MARS), company-reported data (OGMP 2.0), scientific studies (Methane Science Studies) and government inventories into a unified global emissions picture.
- **Measured:** Provides real-world, measurement-based data for actionable, policy-relevant insights.
- **Validated:** All methane data is confirmed and validated through expert analysis before it is displayed on the map.
- **Open Access:** Covers diverse regions and sectors, providing free access to promote transparency and collective action.

The Eye on Methane data platform now boasts:

- 13,000+ satellite-detected methane plumes
- 5,800+ operated and non-operated assets reported through OGMP 2.0, across all segments
- 50+ science papers with key takeaways for policymakers and operators



5 The European Commission published the EU Methane Strategy in 2020 in which it tasked IMEO to develop a methane-supply index (MSI) at EU and international level.

Since its launch, the platform has garnered more than 75,000 views, with thousands of data downloads and API requests from a wide range of stakeholders. Average visit durations of four minutes underscore its value as a trusted data source, and feedback from partners such as the European Commission highlights its role informing methane policy and action.

> ***"You've made us look at our bread and butter really differently through the power of data visualization."***
> European Commission representative on the Eye on Methane data platform

In July 2025, the data platform launched a monthly data update to inform users on the latest available data. Subscriptions doubled in the newsletter's second month, with open rates at 112 per cent and click-through rates at almost 30 per cent, proving its value to subscribers, who come from government, the private sector, civil society, research firms and academia.

As the data platform evolves, it will expand the suite of tools into structured tiers to serve distinct user groups. The public tier provides access to integrated methane data streams, interactive views, company and country dashboards, MARS data and mitigation success stories. This information empowers change-makers to act in their domains to advance transparency and drive down methane emissions. The evolving public tier will include OGMP 2.0 companies' asset-level disclosures, expanded country-level data for importers and exporters, a beta release of methane data from the steel and coal sectors, new MARS-based metrics and case studies showcasing real-world impact.

In late 2025, a secure tier for decisionmakers, the Eye on Methane Insights tool, will provide specific tools for companies and governments. OGMP 2.0 companies will receive access to comparative benchmarks, performance insights and notifications to support robust methane business cases and manage performance towards mitigation goals. Complementing this, a new Methane Playbook will offer industry actors a framework for embedding methane emissions action in their company practices. The Playbook provides tools, resources and approaches to driving change in organizational culture and processes. For governments, the Insights tool will provide access to a secure online interface, where they can track MARS notification status, updates and history to support responses to methane emission events.

Building capacity and empowering agents of change

Gaps remain in government and industry individuals' capacities to translate data into effective action and decision-making.

IMEO's Methane Training Series for governments and national oil companies addresses this through:

- Four core modules on methane fundamentals and emissions management.
- Four optional modules on specific emissions sources.
- New modules added in the past year, including a *Net Zero* module and a Financing module developed with support from the Oil and Gas Decarbonization Charter (OGDC), enabling wider engagement with industry and financial stakeholders.

While methane mitigation activities are undertaken by actors in companies or governments, IMEO actively seeks out diverse voices and experiences, including women in leadership, to participate in problem-solving, collaboration-building and storytelling—with the goal of ensuring that capacity-building efforts reach the individuals best positioned to act.

Since launching three years ago, IMEO's training programme has reached about 2,000 people through over 50 sessions conducted in nearly 40 countries, with women making up around 30 per cent of participants. Training is delivered in person and virtually. In 2025, nearly 300 people in Libya, Angola, Argentina and Mexico were trained. Funded by UNEP and supported by OGDC, Environmental Defense Fund (EDF) and local partners, training is conducted by technical and implementation partner Carbon Limits in countries where emissions from oil and gas are most significant. In June 2025, IMEO launched the Methane Alumni Group to provide a platform for continued learning and knowledge exchange among training participants.

IMEO is expanding its curriculum to include satellite data modules to increase the capacity of stakeholders to analyse, interpret and respond to satellite data and a met coal module for coal and steel sector stakeholders.

Targeted engagement to support data to action

IMEO develops targeted initiatives to help governments use methane data. They are often made possible with dedicated donor funding and coordinated with partner organizations. Key regional and country-specific engagements in 2025 included:

Latin America: Through UNEP's Regional Office for Latin America and the Caribbean and in partnership with the Latin American Energy Agency (OLADE), IMEO is supporting national responses to MARS notifications and advising governments on alignment of MRV regulations with OGMP 2.0.

Iraq: With UNEP and the IEA, the Government of Iraq is developing protocols for responding to emissions detected by satellites and notified via MARS. This guidance will outline procedures for responding to an emission event, including the best means of engaging operators to facilitate investigation and action. This guidance could establish a template for other countries to standardize responses to MARS notifications.

Libya: In collaboration with the United Nations Development Programme (UNDP), UNEP delivered an EU-funded project through which IMEO prepared Libya's national oil company (NOC) to report its emissions at OGMP 2.0 Level 5 data quality and to meet upcoming EU regulations. This included delivery of IMEO's Methane Training Series, followed by a three-day Leak Detection and Repair (LDAR) training, hosted by OGMP 2.0-member ENI. The training strengthened the NOC's capacity to identify and mitigate emissions, improved transparency and advanced Libya's commitment to methane reduction. The effort is a good example of collaboration between IMEO, an OGMP 2.0-member company and the company's non-operated joint venture.

Nigeria: Under the framework of an EU-funded project, IMEO organised multiple trainings for stakeholders in Nigeria. The first workshop focused on building research capacities of young scientists in the country. The second workshop focused on aligning Nigeria's MRV regulations with OGMP 2.0 and highlighted opportunities for the measurement data from IMEO's planned science campaign to contribute to these policymaking efforts.

Turkmenistan: IMEO, in collaboration with UNOPS and UNECE, has continued efforts on a UN Joint Programme for Methane Emissions Reduction in Turkmenistan, which would focus on swift mitigation of major sources of methane emissions identified by MARS. Once formally approved, it would mark the first UN Joint Programme on methane emissions reduction and an important commitment by a government to advance the global methane agenda.

Supporting MRV regulatory alignment with OGMP 2.0

As governments strengthen Measurement/Monitoring, Reporting and Verification (MRV) approaches through regulation, OGMP 2.0's voluntary industry reporting and mitigation framework serves as a reference model for key principles that can inform regulatory design.

This year, in response to requests from governments to support regulatory alignment with OGMP 2.0 and the EU methane regulation, IMEO will publish a working paper that provides practical guidance for regulators interested in aligning MRV systems with OGMP 2.0 reporting requirements. The implementation of the blueprint in specific countries will be closely coordinated with the CCAC's Fossil Fuel Regulatory Programme and the World Bank's Global Flaring and Methane Reduction Partnership (GFMR).

Delivering on the promise of credible data

This year has demonstrated that credible, transparent methane data is already driving action and results. Advances in measurement and reporting now make it possible to target reductions at speed and scale, delivering immediate gains for the climate while also strengthening public health, energy security and livelihoods. IMEO will continue to expand access to this data, foster partnerships and support practical solutions. The transparency this data enables holds the promise of lasting progress. Investors and civil society continue to encourage ambition, and now the foundation is laid for governments and companies to act decisively and seize the methane opportunity.



Photo credit: UNEP

References

- Benavides, K., Gurgel, A., Morris, J., Mignone, B., Chapman, B., Kheshgi, H. *et al.* 2024. Mitigating emissions in the global steel industry: Representing CCS and hydrogen technologies in integrated assessment modelling. *International Journal of Greenhouse Gas Control*, 131, 103963. https://doi.org/10.1016/j.ijggc.2023.103963

- Borchardt, J., Harris, S.J., Hacker, J.M., Lunt, M., Krautwurst, S., Bai, M. *et al.* 2025. Insights into elevated methane emissions from an Australian open-cut coal mine using two independent airborne techniques. *Environmental Science & Technology Letters*, 12(4), 397–404. https://doi.org/10.1021/acs.estlett.4c01063

- de Jong, T.A., Maasakkers, J.D., Irakulis-Loitxate, I., Randles, C.A., Tol, P., and Aben, I. 2025. *Annual Report 2024: Energising today, advancing tomorrow. Geophysical Research Letters*, 52(8). https://doi.org/10.1029/2024gl111824

- Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Government of Australia. 2025. National Greenhouse and Energy Reporting scheme. https://www.dcceew.gov.au/climate-change/emissions-reporting/national-greenhouse-energy-reporting-scheme

- Energy Institute. 2025. *Statistical Review of World Energy, 73rd ed.*, London. https://www.energyinst.org/statistical-review

- Estrada, L.A., Varon, D.J., Sulprizio, M., Nesser, H., Chen, Z., Balasus, N. *et al.* 2025. Integrated Methane Inversion (IMI) 2.0: an improved research and stakeholder tool for monitoring total methane emissions with high resolution worldwide using TROPOMI satellite observations. *Geoscientific Model Development*, 18, 3311–3330. https://doi.org/10.5194/gmd-18-3311-2025

- Fan, Z. and Friedmann, S.J. 2021. Low-carbon production of iron and steel: Technology options, economic assessment, and policy. *Joule*, 5(4), 829–862. https://doi.org/10.1016/j.joule.2021.02.018

- Global Energy Monitor (GEM). 2025. Summary tables, Global Coal Mine Tracker. Global Energy Monitor. https://globalenergymonitor.org/projects/global-coal-mine-tracker/summary-tables/

- Geoscience Australia. 2024. Australia's Energy Commodity Resources 2024 Edition: Coal. [online] Geoscience Australia, Canberra. https://www.ga.gov.au/aecr2024/coal

- Glencore PLC. 2025. *Annual Report 2024: Energising today, advancing tomorrow*. Glencore. https://www.glencore.com/.rest/api/v1/documents/static/7a4295e4-3674-45e9-94c4-7d7fb285faff/GLEN-2024-Annual-Report.pdf

- Hancock, S.E., Jacob, D.J., Chen, Z., Nesser, H., Davitt, A., Varon, D. J. *et al.* 2025. Satellite quantification of methane emissions from South American countries: a high-resolution inversion of TROPOMI and GOSAT observations, *Atmospheric Chemistry and Physics*, 25, 797–817. https://doi.org/10.5194/acp-25-797-2025

- Institute for Energy Economics and Financial Analysis. 2024. *Global LNG Outlook 2024-2028*. https://ieefa.org/resources/global-lng-outlook-2024-2028

- Intergovernmental Panel on Climate Change (IPCC). 2006. *Guidelines for National Greenhouse Gas Inventories.* https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html

- International Energy Agency (IEA). 2022. *Global Methane Tracker* 2022, IEA, Paris https://www.iea.org/reports/global-methane-tracker-2022, Licence: CC BY 4.0

- International Energy Agency (IEA). 2024. *Global Methane Tracker 2024*, IEA, Paris https://www.iea.org/reports/global-methane-tracker-2024. Licence: CC BY 4.0

- Instituto de Hidrología, Meteorología y Estudios Ambientales – IDEAM. (2021). *Tercer Informe Bienal de Actualización de Cambio Climático de Colombia* (BUR3).

- Jimenez, R., Ardila A.V., Vargas-Burbano A.C. and Morales-Rincon L.A. 2024. A critical review of Colombia's anthropogenic methane emission inventory—missing and underestimated sources. (Poster A21K-1913), *Fall Meeting 2024, American Geophysical Union (AGU)*, Washington, D.C.

- Kasprzak, M., Hamburg, S., Kupers, R. and Schwietzke, S. 2025. *Climate Opportunity for the Steel Industry: Coal Mine Methane. In review.* https://doi.org/10.2139/ssrn.5220042

- Li, Z., Åhman, M., Algers, J. and Nilsson, L.J. 2025. Decarbonizing the Asian steel industries through green Hot Briquetted Iron trade. *Resources, Conservation and Recycling*, 219, 108275. https://doi.org/10.1016/j.resconrec.2025.108275

- Lunt, M.F., Harris, S.J., Hacker, J., Joynes, I., Robertson, T., Thompson, S. *et al.* 2025. An evaluation of airborne mass balance and tracer correlation approaches to estimate site-level CH_4 emissions from LNG facilities using CO_2 as a tracer of opportunity. *EGUsphere [preprint].* https://doi.org/10.5194/egusphere-2025-1926

- McManemin, A., Juéry, C., Blandin, V., France, J.L., Burdeau, P. and Brandt, A.R. 2025. Controlled release testing of commercially available methane emission measurement technologies at the TADI facility. *EGUsphere [preprint].* https://doi.org/10.5194/egusphere-2025-3793

- Ministry of Coal, Government of India. 2025. Production of Raw Coal from Underground and Open Cast Mines from last ten years, Production and Supplies, Major Statistics. https://coal.gov.in/sites/default/files/2021-01/Production-Opencast-and-Under-ground-mines-durin-last-ten-years.pdf

- United Nations Environment Programme and Climate and Clean Air Coalition. 2021. *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions.* Nairobi: United Nations Environment Programme. https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions

- Vaughan, A., Mateo-Garcia, G., Irakulis-Loitxate, I., Watine, M., Fernandez-Poblaciones, P., Turner, R.E. *et al.* 2024. AI for operational methane emitter monitoring from space. *arXiv [preprint].* https://doi.org/10.48550/arXiv.2408.04745

- Wenban-Smith, M. 2025. Global Recycling Day: Analysing the role of scrap in steelmaking through the years. Responsible Steel. https://www.responsiblesteel.org/news/global-recycling-day-analysing-the-role-of-scrap-in-steelmaking Accessed 12 August 2025

- World Steel Association. 2025. *World Steel in Figures 2025.* World Steel Association. https://worldsteel.org/data/world-steel-in-figures/world-steel-in-figures-2025/

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