EYE ON METHANE // DATA PLATFORM

METHANE PLAYBOOK

for accountable managers

November 2025

The information compiled here is featured on UNEP IMEO's Eye on Methane data platform.

CONTENTS

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ABBREVIATIONS

CapEx	Capital expenses
CLEAN	Coalition for LNG Emissions Abatement towards Net-Zero
COP	Conference of the Parties
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
EDF	Environmental Defense Fund
EEMDL	Energy Emissions Modeling and Data Lab
ESG	Environmental, social and governance
EU	European Union
GFMR	Global Flaring and Methane Reduction Partnership
GIIGNL	International Group of Liquefied Natural Gas Importers
GWP	Global warming potential
IEA	International Energy Agency
IMEO	International Methane Emissions Observatory
IOGP	International Association of Oil and Gas Producers
IPCC	Intergovernmental Panel on Climate Change
JOGMEC	Japan Organization for Metals and Energy Security
JV	Joint ventures
KPI	Key performance indicator
LNG	Liquified natural gas
MACC	Marginal abatement cost curve
MARS	Methane Alert and Response System
MENA	Middle East and North Africa
MGP	Methane Guiding Principles
MRV	Measurement, reporting and verification
NOJV	Non-operated joint venture
NPV	Net present value
OGCI	Oil and Gas Climate Initiative
OGDC	Oil and Gas Decarbonization Charter
OGMP 2.0	Oil and Gas Methane Partnership 2.0
OpEx	Operating expenses
SMART	Specific, measurable, achievable, relevant and time-bound
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

AT A GLANCE

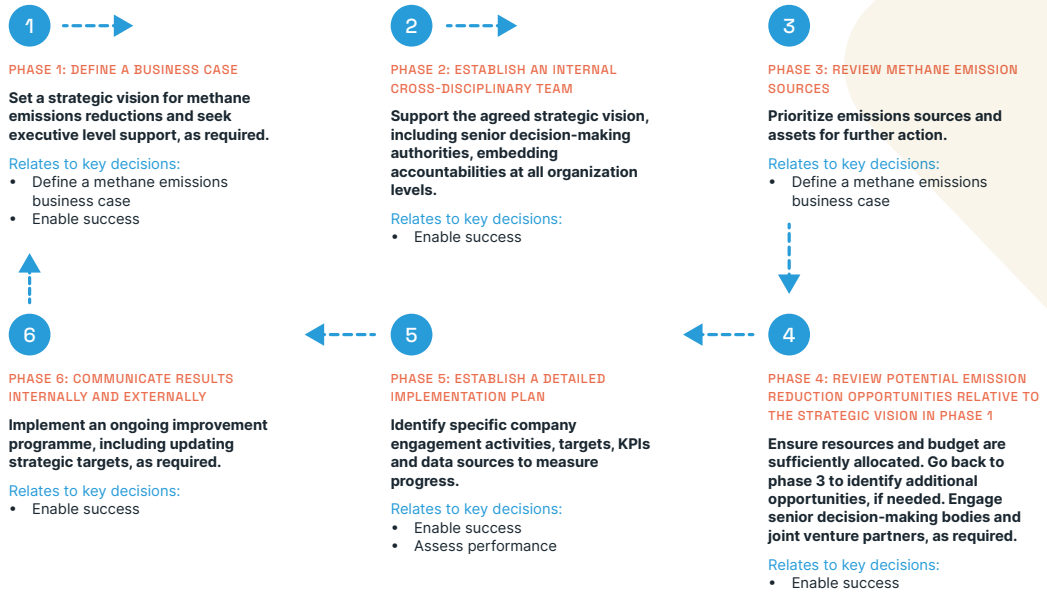
This Methane Playbook is a comprehensive reference guide on methane emissions and how to approach better management. Reducing methane is the fastest way to slow global warming in the near term.

The playbook is organized into topics according to the three questions that an accountable manager is likely to be faced with when assessing and implementing a methane emissions measurement, reporting and mitigation strategy. These are how to:

- Define a methane emissions business case
- Enable success
- Assess performance

The accountable manager roadmap (as depicted in Figure 1, below) outlines steps that an accountable manager would undertake as part of an organization's methane journey. A checklist supports accountable managers to self-assess progress and identify gaps with practical tools and resources.

Figure 1: Key phases in an accountable manager's methane roadmap



Source: IMEO

OVERVIEW

The Methane Playbook is designed to help you to tackle methane emissions in your oil and gas operations. Reducing methane is the fastest way to slow global warming in the near term.

In this section

Reducing methane emissions

The oil and gas industry is the sector with the greatest potential to reduce methane emissions. An estimated 75 per cent of oil and gas methane emissions could be mitigated by 2030 with available technology – and a significant share could be reduced at little to no net cost, economically enabled by recovering otherwise wasted natural gas.

Mitigating methane is valuable, but just as a safe asset is a better asset, an emissions-free asset represents operational excellence. Empowering staff to leverage their site-based practical operational, maintenance and engineering knowledge to reduce emissions enhances overall performance. As an accountable manager, it's essential to engage frontline staff and champion that a safe, emissions-free and rust-free asset is an operationally better asset.

It is commonly said: "If you can't measure it, you can't manage it." While historically, methane emissions have largely been estimated using generic emission factors, recent data based on measurements demonstrate that methane has been largely underreported. Having accurate measured emissions data is critical to understanding the range of emissions sources, where the largest emissions are coming from, how much is being emitted and what you need to do to cut those emissions. Although significantly large sources may be the obvious ones to prioritize, smaller sources have been shown to make up the bulk of emissions from the oil & gas sector.

Who should use the Methane Playbook?

This playbook is designed for managers and leaders with accountability for key strategic, financial, resourcing and implementation decisions relating to methane emissions. Referred to as “accountable managers” to recognize the diversity within organizations, role types can include executives, business leaders, vice presidents, corporate strategy – sustainability or safety heads, operations leaders, asset managers and production managers.

Accountable managers have a critical role to play in achieving the organizational engagement and action to reduce methane emissions. The tools are available, the targets are set. Now it is time to act.

How to use the playbook

The playbook provides a single source of information to support methane emissions business decision-making, specifically designed for accountable managers.

It outlines:

- How reducing methane emissions can cut waste or capture gas - a revenue stream.
- How to ensure that operational performance is best in class.
- How to identify and act on material emissions reduction opportunities within your own assets and in non-operated joint venture operations.

The playbook was built using the experience of people from the oil and gas sector, including members of the Oil & Gas Methane Partnership 2.0 (OGMP 2.0). Leading companies are making significant efforts to mitigate their emissions, with an even greater diversity of insights and tools that can contribute towards this collective effort.

Please take the time to send us suggestions, comments, tools or case studies by writing to georgie.passalaris@un.org.

How the playbook is structured

The playbook has been developed to help accountable managers answer three key questions they are typically faced with when tackling methane emissions:

1. How do I define a business case to reduce methane emissions?
2. How do I enable success by having an effective plan and resources in place?
3. How do I assess methane emissions performance?

For each of these three questions, we describe levers that are key to driving change in an organization: a supportive cultural environment, the right tools and good quality data. This includes data made available through the International Methane Emissions Observatory (IMEO)'s Eye on Methane Data Platform. IMEO's mission is to provide open, reliable and actionable emissions data to the individuals with the agency to reduce methane emissions.

The playbook recognizes that reducing the time burden on accountable managers, operations, engineering, site and support staff – or frontline workers – is critical to avoid initiative fatigue and to ensure that sufficient focus can be maintained on safe, reliable, cost-efficient and low-emissions operations. Guidance herein is thus designed to be integrated into existing organizational processes and systems. The playbook allows you to navigate to sections that are relevant for you, based on where your organization is in its methane journey.

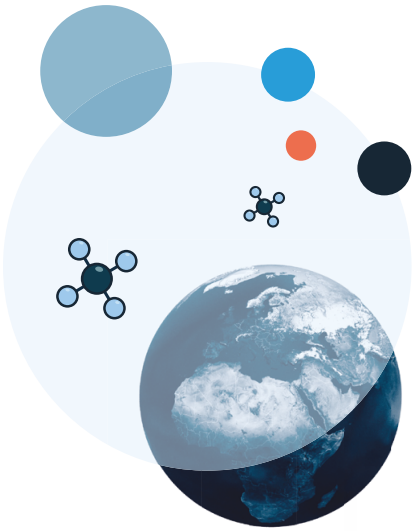
In the future, we expect to extend the playbook approach to support chief executive officers and other executives, as well as frontline workers.

More information on how the playbook was developed is available in the Appendix.

Checklist

Are you already working to understand and cut methane emissions in your organization? This checklist allows you to self-assess your progress and supports you in the next steps of your methane journey with practical tools and resources.

Lever	Checklist Topic	Checkbox
	Context	
	Why cutting methane emissions is important	
	Current industry performance	
	The basics: common sources, recommended approaches and global frameworks such as OGMP 2.0	
	Defining a methane emissions business case	
CULTURE	Why an organization should reduce methane emissions and what good performance looks like	
	The range of business benefits derived from reducing methane emissions	
TOOLS	How to structure a business case	
	How to define the business value from reducing methane emissions	
	How to prioritize methane emissions reduction opportunities using a marginal abatement cost curve	
	How to use available data to identify key methane sources and support business case development	
	Enabling success	
CULTURE	How to define roles, responsibilities and competency frameworks for your organization	
	Approaches for engaging your organization	
	How to improve outcomes using a multidisciplinary approach	
TOOLS	Setting methane commitments using common targets	
	How to allocate resources and budget, and align objectives with organizational processes	
	Approaches for engaging joint venture partners, customers and contractors	
DATA AND INSIGHTS	How to use data to understand enablement and engagement	
	Best practices in engagement approaches to support internal and external stakeholder engagement	
	Assessing performance	
CULTURE	Why and how to effectively measure performance outcomes	
TOOLS	How to assess performance using performance indicators	
DATA AND INSIGHTS	How to use data available in the Eye on Methane data platform to review and assess performance outcomes	



CONTEXT

Why is cutting methane so critical? How can the energy sector contribute to reducing methane emissions and what are the main sources of methane?

In this section

Why cutting methane emissions is important

The science

Methane is a potent short-lived greenhouse gas with a global warming potential (GWP) of over 80 times that of carbon dioxide (CO_2) over 20 years. This means that over a 20-year period, one ton of methane traps more than 80 times as much heat in the atmosphere as one ton of CO_2. In the short term, methane has a much greater warming effect on the atmosphere than CO_2.

In addition to warming the atmosphere, methane also impacts pollution and damages ecosystems and crop health. Overall, methane is responsible for around 30 per cent of the global warming we experience today. Rapid, sustained cuts in methane emissions are essential to limiting near-term warming and achieving the Paris Agreement target of keeping global temperature rise well below 1.5°C. Acting now to reduce methane is the quickest and most effective strategy to slow warming in the short term.

Human-made methane emissions originate from three main sources.

These include:

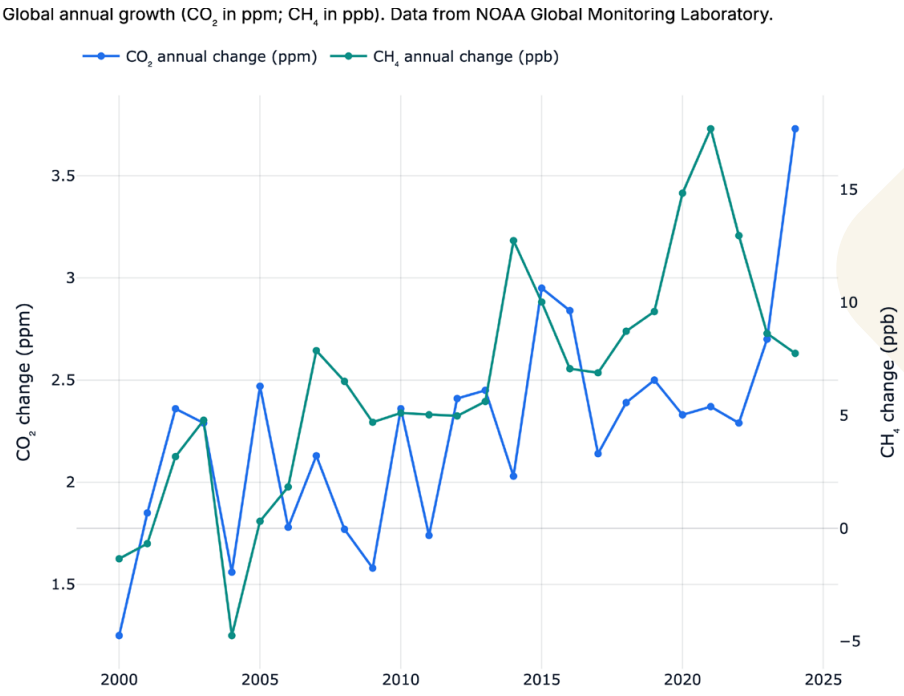
- Agriculture – livestock and rice cultivation
- Energy – oil, gas and coal mining
- Waste – landfills and wastewater

Fossil fuels – including oil, natural gas and coal – account for more than a third of methane emissions from human activity and offer some of the best opportunities to cut these emissions.

Methane emissions are a collective problem, requiring collective action from all stakeholders. In recognition of this collective responsibility, the Global Methane Pledge was announced in 2021 at the UN Climate Change Conference (COP 26). The Global Methane Pledge is a voluntary commitment with 159 signatories, including the United States, United Kingdom and the European Union, working to reduce global methane emissions across all sectors by at least 30 per cent below 2020 levels by 2030. For oil and gas emissions specifically, this target implies a reduction of around 75 per cent of emissions in this sector, compared to 2020.

Despite this and other such pledges, analysis by the International Energy Agency shows that methane emissions continue to rise year on year (see Figure 2).

Figure 2: Changes in atmospheric CO_2 and methane concentrations 2000–2025



Sources: NOAA Global Monitoring Laboratory — CO_2 global annual growth rates (methods & table) and CH_4 annual increase (trends). Units differ (ppm vs ppb); two y-axes are used. Recent data may be revised.

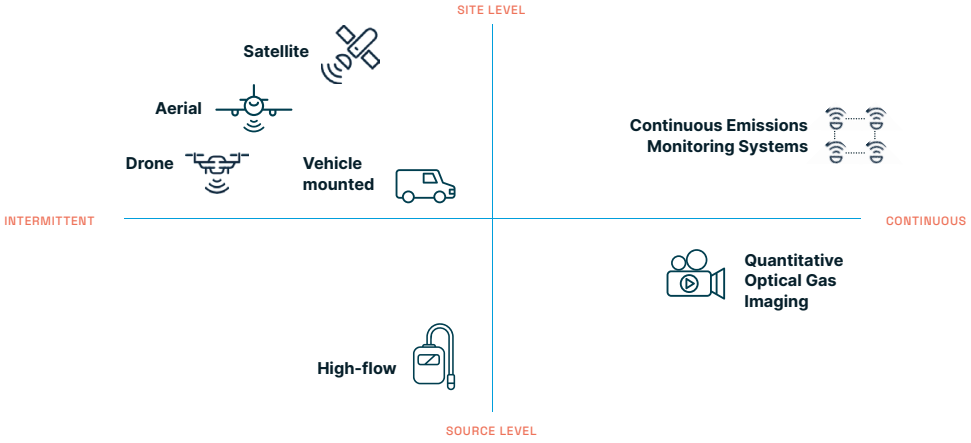
Source: NOAA Global Monitoring Laboratory

How is methane detected?

Methane emissions in the oil and gas sector are best detected, monitored and measured using a range of different technologies that address different emission detection thresholds and can be applied in different settings or contexts. Such technologies can include infrared cameras, drones, satellites and ground-based sensors, as illustrated in Figure 3. Insights can guide mitigation, as well as support companies to comply with reporting and regulatory commitments.

Figure 3: Technologies and thresholds for measuring methane

Mapping



Source: IMEO

IMEO combines state-of-the art technologies including satellites, science studies and reporting frameworks (such as OGMP 2.0) and integrates these to provide validated and trusted methane emissions data, made publicly available on the IMEO Eye on Methane data platform.

Learn more:

- TED Talk: The fastest way to slow global warming today
- GMP: 2024 Global Methane Pledge Ministerial, Global Methane Pledge
- Global Methane Hub: Countries Most Impacted by Climate Change Exhibit the Strongest Support for Climate and Methane Action

The responsibility of the energy sector

The need for action

Every molecule of gas escaping into the atmosphere represents a lost opportunity for oil and gas companies to commercialize a valuable natural resource and provide much needed energy to support economic growth and development. Companies also have a social and environmental responsibility to reduce emissions, especially through low-cost and easy mitigation measures.

The need for action is evident, yet action is lagging. While over 40 per cent of global oil and gas producers are measuring and reporting methane emissions in their operations through OGMP 2.0 with the intent to mitigate, the others – representing more than half of global production – are yet to demonstrate credible progress. The low response rates from governments, and in some cases the private sector, to notifications of large emissions events issued by IMEO's Methane Alert and Response System (MARS) is also indicative of lagging action.

MARS is the first public global satellite detection and notification system providing actionable data on very large methane emissions around the world. Using data from more than a dozen satellite instruments, coupled with scientific expertise and advanced AI, governments and companies are notified of methane emissions to enable swift mitigation action. However, in 2024, just over 10 per cent of the 1,200 MARS notifications issued to governments and operators had received responses, let alone been mitigated. There is a clear opportunity for operators and governments to engage and increase mitigation action.

Performance

Global oil and gas methane emissions are estimated at 80-140 MT per year. This is enough to meet twice the entire annual gas needs of major industrialized countries like Japan or Germany.

The opportunity to cut methane emissions from the oil and gas sector is significant. Such reductions are possible today. Many abatement options can pay for themselves within a year. In the oil and gas sector, the IEA estimates that around 30 per cent of the industry's emissions today could be avoided with measures offering rates of return of more than 25 per cent – well above the usual returns sought by oil and gas companies when considering new capital investment. Additionally, methane emissions present safety and explosion risks and mitigating methane losses could make significant additional volumes of natural gas available as a supply source as well as benefit the climate.

Given the diversity of types of operations, operational practices, facility designs and age of equipment, methane emissions performance varies widely across operators, with the worst performers being 100-fold worse than the best.

Technologies to detect and repair methane emissions exist and are effective. Strong leadership is key to enabling systemic implementation. Data-driven tools for cutting methane emissions already exist, however, stakeholders must increase their engagement and follow through. Accountable managers play a critical role in achieving the required level of organizational engagement and action to mitigate these emissions sources.

Learn more:

- IEA: Global Methane Tracker 2025 – Key findings
- IMEO: An Eye on Methane 2025
- IMEO: Methane Alert and Response System (MARS)

Oil and gas methane sources

What are the sources of oil and gas methane emissions?

Historically, little or no measurement-based data has been used to report methane emissions in most parts of the world. This is a major issue because measured emissions tend to be higher than reported emissions. For accountable managers and frontline workers to effectively reduce emissions, it is essential to measure emissions across operations, to understand where methane emissions come from.

The Oil and Gas Methane Partnership 2.0 (OGMP 2.0) is the world's global standard for measuring and mitigating methane emissions. Representing more than 40 per cent of global oil and gas production, OGMP 2.0 members are increasingly measuring emissions to produce high-quality data that informs effective mitigation strategies.

Common methane sources

Although quantifying methane emissions can be challenging, the most common methane emissions sources are well understood. Over 80 per cent of methane emissions in the sector come from the upstream segment, with onshore assets accounting for the dominant source of emissions (higher emissions intensity) when compared to offshore assets.

Measured and publicly available data from IMEO – collected through OGMP 2.0, satellite observations and global methane science studies – clearly identifies the top three most common sources of methane emissions for the oil and gas industry:

- Fugitive emissions: unintentional releases due to equipment leaks, often due to improper installation and wear and tear.
- Routine emissions: intentional and expected methane emissions releases that occur during standard operating practices. This includes large maintenance events, small but frequent process venting, and methane slip from incomplete combustion and poor-quality flaring.
- Non-routine emissions: unexpected, unplanned or abnormal releases of methane emissions due to operational upsets, malfunctions or emergency situations. These events are typically large and episodic in nature.

Oil production

Oil companies emit methane when the gas is produced as a by-product that is not economical to sell. Leaking methane into the atmosphere is not the only option, however. Ideally, this gas could be used as fuel or feed a gas distribution system. When this is not possible, the gas should be flared – a process that is known to achieve a destruction efficiency of more than 99 per cent. The high destruction efficiency of flaring is important because any unburnt, or non-combusted, gas is otherwise released directly into the atmosphere as methane, rather than as CO_2. In all cases, flaring should be minimized, and as per the World Bank's initiative Zero Routine Flaring by 2030, routine flaring should be eliminated immediately for new facilities and for existing facilities by 2030.

Gas and liquified natural gas production

In the gas and liquefied natural gas (LNG) supply chain, emissions primarily come from gas production, processing and transmission. Half of midstream emissions come from transmission systems and close to half come from LNG liquefaction, shipping and regasification plants. Emissions derived from systematic survey emergency warnings and third-party damages account for half of all emissions from distribution systems.

Shipping

Another important methane source includes shipping of LNG – around 10 per cent of the methane emissions footprint of LNG comes from shipping. Shipping emissions can vary significantly for individual assets, impacted by factors such as equipment type and age, and shipping transportation distances. For example, when shipping LNG, the

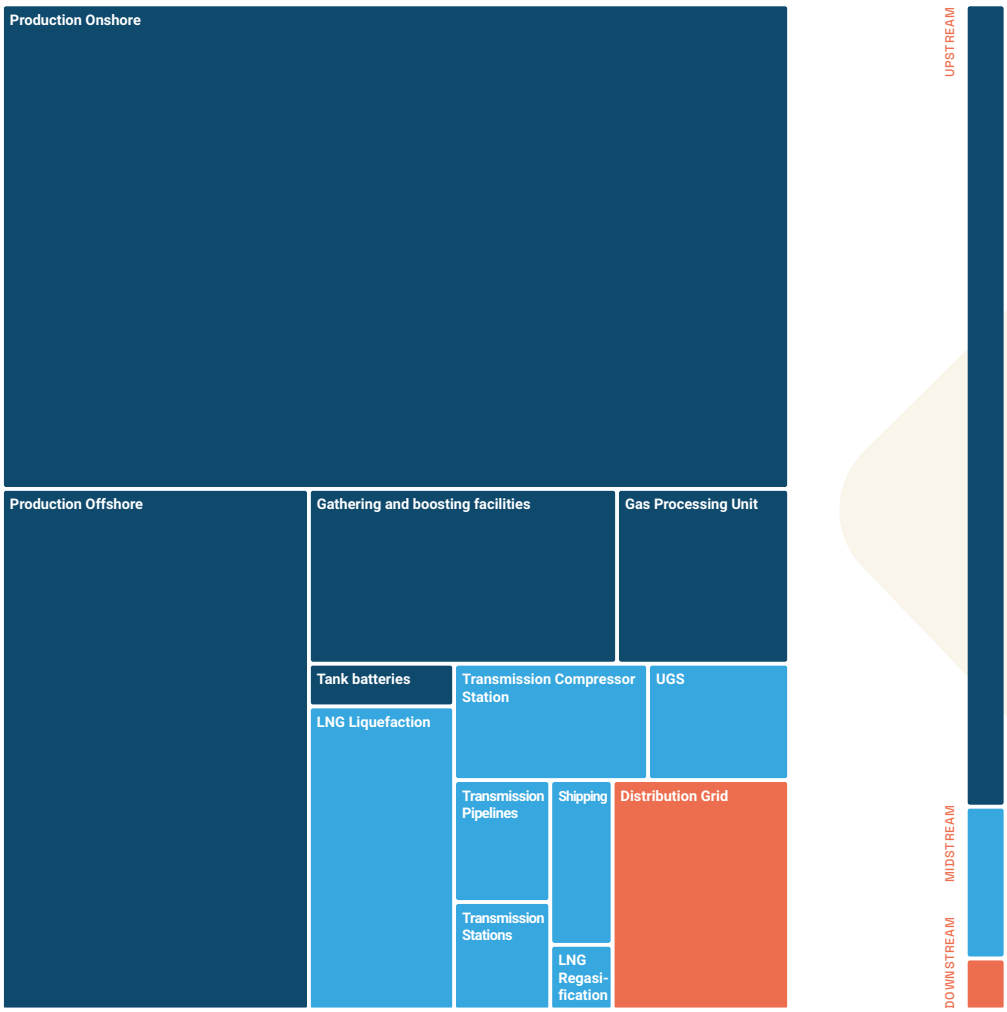
highest emitting 10 per cent of journeys resulted in ten times more emissions than the lowest emitting 10 per cent. Figure 4 below illustrates the top emission sources by segment.

Accountable manager tip

Picking the low-hanging fruit

Sometimes leaders delay methane emissions remediations because they assume that detection and remediation are costly and complicated. While it is true that quantifying the volume of methane emissions from specific sources can take time, common material emissions sources are well understood. Address these first before tackling more complex mitigation actions.

Figure 4: Top emission sources by segment based on OGMP 2.0 reporting 2025



Source: IMEO

Data deep dive

As an OGMP 2.0 member, you can review your key company methane emissions sources right here, in Eye on Methane INSIGHTS.

Learn more:

- IEA: Assessing emissions from LNG supply and abatement options

Getting started

The basics

There are three key steps to understand and act on methane emissions: measurement, which includes detection and quantification, reporting and verification – commonly referred to as MRV.

The importance of measurement

For accountable managers and operators to effectively reduce emissions, it is essential to measure emissions across operations.

There are four methods used to quantify emissions:

1. Generic emission factors
2. Measurement-based emission factors
3. Engineering calculations
4. Measurements

Accurate quantification of methane emissions is necessary to target and track action and to inform a focused and prioritized mitigation plan. While existing data and estimates can serve as a basis for immediate action to cut methane emissions, the actual distribution of methane emissions sources can vary greatly. This can be influenced by spatial variability and intermittency. Thus, measurements are critical for identifying and prioritizing material emissions sources and optimal mitigation pathways.

Safety

Safety is the highest priority. Prior to undertaking any source or site level measurements there should be vigilance around:

- **Following all site safety procedures,** permits, gas monitoring and emergency response protocols.
- **Personal protective equipment**.
- **Assessments at a safe distance:** undertake remote measurements or use technology with a suitable long range and resolution to confirm the presence of emissions levels before entering the location of a detection.
- **Awareness of gas concentration limits**, explosion hazards, ignition sources, and emergency evacuation procedures.

Selecting the right detection and measurement technology

Methane emissions can be detected with technologies such as infrared cameras, drones, satellites and ground sensors. Once detected, emissions can be quickly fixed with existing solutions.

Different technologies are required for source-level and site-level measurements. Measurement accuracy can be improved via repeated measurements, which can especially address temporal variability.

Sources that tend to lead to large emissions but are not always captured by source level inventories include:

- Unlit or malfunctioning flare, or other issues with flare ignition
- Operational issues with storage tanks
- Maintenance, or equipment being stopped, started, and/or purged
- Equipment upsets or malfunctions

For site-level measurements, in situ monitoring is commonly conducted using airborne options and advanced mobile leak detection technologies. Typically, aircraft (fixed wing/rotary) and/or drones are flown around or downwind of the facility and emissions are inferred using a mass balance approach.

Technologies should be selected with a minimum detection threshold that will capture the majority (such as 90 per cent) of expected emissions. This increases the likelihood of obtaining accurate measurements. An approach some companies use is to define a threshold based on prior site-level observations to determine when to use different measurement techniques.

Source-level measurements include optical gas imaging and high-flow samplers. Typically, high-flow samplers can provide one of the most accurate source-level measurements. However high-flow samples may not be suitable for use in inaccessible locations or for diffuse sources.

Differences in measurement results are common. For example, site-level measurements may be higher than source-level measurements. This may indicate that emission sources have been overlooked during source-level quantification. Conversely, source-level measurements may be higher than site-level measurements. This may indicate that the site-level measurement has not detected all emissions sources, potentially due to unsuitable technology resolution, environmental conditions (such as wind), and/or emissions variability over time. It may also indicate that some source-level measurements have been overestimated (particularly for diffuse methane emissions sources).

Technology selection

The IOGP/OGCI 2025 Best Practice Guide provides the following guidance when selecting technologies for site-level quantification:

Table 1: Technology considerations

Validation

Documented, transparent validation of emissions (third-party testing, public availability of information, controlled release testing in representative conditions).

Safety

Technologies that respect company and local safety requirements, e.g. ATEX certification, civil aviation requirements, International Association of Oil and Gas Producers (IOGP)/company aviation requirements.

Source localization

Selection of technologies that can attribute emissions to desired level (e.g. site or equipment level) and that are appropriate with respect to the facility characteristics (e.g. small/large, congested/geographically dispersed assets).

Availability

Import/export, commercial availability in-country and other restrictions and logistical constraints for technologies.

Operational data

Ensure field data collection at the time of monitoring (operational mode, events, ...) to improve the understanding of operational factors and correlate them to measured levels of emissions.

Environment

Technologies may be impacted by environmental conditions (e.g. cloud cover, snow, precipitation) that undermine their ability to monitor emissions at desired frequency. Location offshore may also make some technologies not applicable.

The choice of technology will depend on the objective of site-level quantification. The various options are presented in Table 2, below.

Table 2: Site-level quantification objectives and technology choices

	Inform inventory / validation / reconciliation (equivalent to OGMP level 5)	**Monitor and address potential super emitters / unexpected sources**	**Build understanding of temporal variability – continuous**
Threshold	Select a technology with a threshold well below expected emission rate determined by source-level inventory – within reasonable costs, logistical and labor efforts with regards to the absolute level of emissions. Very high probability of detection required for the threshold target.	Select a technology with a threshold higher than the total of continuous source, and in line with either super emitter definition for your site or proportionately large emission sources. Very high probability of detection required for the threshold target.	Select technology with quantification threshold (or alarm threshold) that does not generate alarm fatigue (i.e. quality degradation due to repetition). Detection threshold can be slightly higher than the total of the continuous sources.
Uncertainty	Technologies with documented uncertainties that consider uncertainty of the sensor and of the method depending on environment conditions.	Requirement on the uncertainty of the quantification depends on whether the quantification will directly be used for inventory or whether the measurement will be combined with other estimation methods.	N/A – Currently high to very high uncertainty for all technologies assessed.

Learn more:

- Carbon Limits: Overview of methane detection and quantification technologies for offshore applications
- Energy Emissions Modeling and Data Lab (EEMDL): Technology Selection Tool
- IOGP: Methane detection and quantification technology filtering tool
- IOGP: Recommended practices for methane emissions detection and quantification technologies – upstream
- Oil and Gas Decarbonization Charter (OGDC): Methane and Flaring Framework

Global frameworks

The Oil and Gas Methane Partnership (OGMP 2.0)

The Oil and Gas Methane Partnership 2.0 (OGMP 2.0) is the flagship oil and gas reporting and mitigation programme of the United Nations Environment Programme (UNEP). It is the only comprehensive, measurement and mitigation framework for Scope 1 methane emissions for the oil and gas sector. Understanding and measuring methane emissions is key to prioritising mitigation actions; if you can't measure it, you can't manage it.

Representing 153 companies (in July 2025), OGMP 2.0 covers more than 42 per cent of global oil and gas production, over 80 per cent of LNG flows, and over 20 per cent of global gas storage capacity. OGMP 2.0 is the leading measurement, reporting and verification (MRV) framework globally.

The OGMP 2.0 framework applies to all segments of the oil and gas sector (both operated and non-operated assets). For more information, see the OGMP 2.0 website.

The partnership requires companies to increasingly improve the quality of methane data by conducting measurements at both source and site level (using the OGMP 2.0 reporting levels, as defined below) and report emissions using the highest quality data to inform mitigation.

OGMP 2.0's measurement-based framework forms the basis for the EU Regulation on Methane Emissions Reduction in the Energy Sector. This regulation requires domestic companies to measure, monitor, report and verify their methane emissions in line with OGMP 2.0 reporting standards and technical guidance documents and requires importers to demonstrate the methane intensity of the gas imported into Europe.

OGMP 2.0 reporting levels

Level 1 – Country, venture or asset level reporting – Emissions 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 reported in consolidated, simplified source categories (based on the International Association of Oil and Gas Producers' (IOGP) five categories for upstream emissions and on MARCOGAZ's three categories for midstream and downstream emissions), using a variety of quantification methodologies.

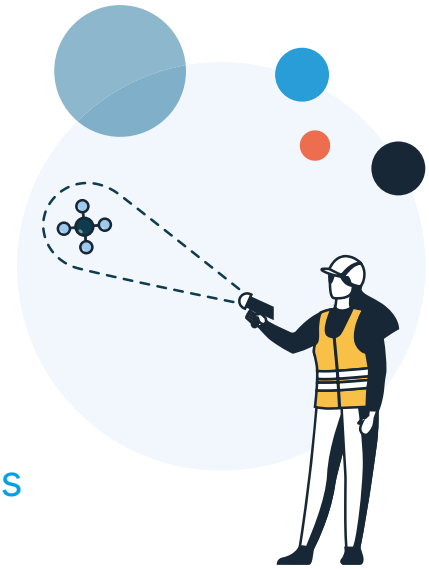
Level 3 – Generic emission source – Emissions are reported by detailed source type, based on generic emissions factors.

Level 4 – Specific emission source – Emissions 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 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).

Learn more:

- OGMP 2.0: Resources
- IOGP: Recommended practices for methane emissions detection and quantification technologies – upstream
- The Oxford Institute for Energy Studies: Measurement Reporting and Verification of Methane Emissions from the Gas and Oil Sector and Consequences for LNG Trade: a three year progress report



DEFINING A METHANE EMISSIONS BUSINESS CASE

Why should an organization reduce methane emissions? What are the benefits and how to define a methane emissions reduction business case?

In this section:

- Business benefits
- Defining the value of methane reductions
- Assessing and prioritizing methane reduction projects
- Understanding your data

Why is methane important?

Methane emissions are the single largest contributor to climate change since the start of the industrial revolution. Methane emissions are a collective problem, requiring collective action – cutting methane emissions is not just one company or sector's responsibility. Rather, it requires governments, industries, civil society and individuals to collaborate and act.

Given the opportunities, agency and cost effectiveness of mitigating methane emission in the oil and gas sector, industry performance (and individual company performance) will continue to be of interest to external stakeholders including governments, hydrocarbon buyers, investors, financial institutions, activists and civil society.

What does good methane emissions performance look like?

Methane emissions should be reduced to levels that are near zero, or as low as practical. It is globally accepted that individual assets' methane emissions intensity should be well below 0.2 per cent, with the best companies in the world aiming for 0.05 per cent or less. Global methane targets are discussed further in the section Setting a methane target.

A word on methane emissions intensity

Methane emissions intensity should be calculated based on the volume of methane emitted divided by volume of production, in comparable units. There is not a single metric that suits all reporting scenarios. The methane loss rate (methane lost per methane produced) better ranks gas producers, while energy intensity (methane lost per energy produced) more favourably ranks oil producers. Since neither metric alone provides a complete picture, the calculation basis should be transparently reported alongside the intensity metric.

Why should I set a methane emissions objective?

Establishing a corporate methane objective helps integrate emissions reduction into an organization's culture and operational practices and signals methane emissions reductions are a core leadership priority. This could include both a clear ambition and a corresponding goal to reduce methane emissions. For example:

- The CEO or Board may set an ambition of striving for near-zero methane emissions.
- An accountable manager can implement a goal of no leaks alongside a culture of doing what is right and we care.
- Other mechanisms may include key performance indicators and targets.

Accountable manager tip

Consider the following questions

- What are your emissions targets with regards to methane emissions reductions? What obstacles stand in the way of deeper cuts to methane emissions?
- How do your targets compare to global benchmarks?
- What national, state and/or international policies or initiatives do you promote or support to improve methane management?

Learn more:

- Environmental Defense Fund (EDF): Plugging the leaks: An investor guide to oil and gas methane risk
- Research Square: Methane emission intensity metrics: unmasking the trade-offs

Business benefits

How to build a business case

Businesses have many priorities to manage. These include safety, reliable operations, emissions mitigation, and cost minimization. Developing a robust methane emissions detection and mitigation business case is critical to ensure resources and funds are allocated to mitigation activities.

In many cases, the cost of mitigation is more than offset by the value obtained from capturing the gas and selling it as a product. In other cases, a comprehensive business case is required to demonstrate the full value (financial and non-financial benefits) of methane mitigation. Business case templates and tools are provided in Table 3, in the next section. Here, we describe considerations for an accountable manager when developing a business case.

Value-based decision-making

Methane emissions mitigation assessments must be based upon critical thinking with a key focus on maximizing value (rather than cost minimization). Benefits, including operational, organizational, financial and reputational aspects should be considered. This will avoid methane mitigation activities being prematurely screened out during initial assessment phases. Benefits that should be considered by an accountable manager are outlined below.

Benefits of methane reduction

Operational benefits

Low methane emissions are directly linked to operational excellence and improved safety, reliability and performance outcomes. For example:

- **Safety:** Methane is a hazardous gas that, when emitted, can lead to high-impact process safety incidents. A frontline worker commitment to reducing methane emissions directly reinforces safety objectives to keep gas in the pipe.
- **Reliability:** Methane emissions are often associated with upset or non-routine asset conditions. A focus on maximizing reliability and avoiding upset events can increase revenue while concurrently reducing methane emissions.
- **Operational excellence:** A culture of pride in reducing methane emissions can inspire broader asset ownership and operational excellence.

Financial benefits

Methane is the primary component of natural gas. This means that any avoided gas emissions can be recovered, used as fuel and/or sold. As a result, many methane emissions reduction activities save more money than the cost of mitigation. For example:

- **Simple solutions to avoid methane emission that can be otherwise sold** include tightening equipment, optimizing operating conditions, optimizing maintenance and minimizing recovery times (and flaring) following unintended events.
- **Capital investments to avoid methane emissions that can be otherwise sold** include using vapour recovery units to recover low-pressure methane and replacing wet compressor seals with dry seals.
- **Avoided fines** such as methane and/or carbon costs imposed by regulations, importers or oil and gas buyers. Further examples of these are described in the Deep dive box below.
- **Reduced operating costs** from ongoing maintenance requirements.

Data deep dive

New regulations and initiatives are shaping the future of methane management.

The European Union (EU) is developing mandatory performance standards for importing natural gas with low methane emissions, aiming to create transparent reporting systems for supply chains. Penalties will be imposed for non-compliance. These regulations are based on OGMP 2.0.

The Japanese government is building on prior announcements of the Coalition for LNG Emissions Abatement towards Net-Zero (CLEAN) to catalyse the entire LNG supply chain towards low emissions. A further announcement was made for a collaboration between Japan, Canada, MiQ methane certification, the United Nations International Methane Emissions Observatory (IMEO), the Environmental Defense Fund, the International Energy Agency (IEA) and the International Group of Liquefied Natural Gas Importers (GIIGNL) to collaborate in the development of a verification mechanism for emissions reduction from the LNG supply chain that leverages existing global standards and protocols.
As a part of countries and companies assessing the emissions intensity of their imported gas via certification systems and standards, there is increasing recognition that the best verification and certification solutions balance accuracy and environmental integrity with practicality, cost minimization, minimal disruption to existing markets, with built in pathways for future improvement. This includes ensuring that accuracy of certification methods is commensurate with implementation costs and complexity.

Energy security

- Energy security and affordable and accessible energy are synonymous. Cleaner low-emissions gas can help to safeguard future gas access and sales.
- A low-emission, secure and reliable gas system can complement stable and orderly transitions to other energy sources.

Financial instruments

- Investors and financial institutions are taking a growing interest in methane performance as evidence that a company's capital allocation and investment decisions are aligned with climate-related goals.
- Investors primarily seek metrics aligned with financial performance (like production volume, costs and reserves), operational efficiency (safety and environmental compliance), and market dynamics (supply, demand and prices), while also considering long-term climate alignment and geopolitical risks. Given the low cost and ease of many methane emissions reduction projects, investors are increasingly interested in methane management.

Market differentiation

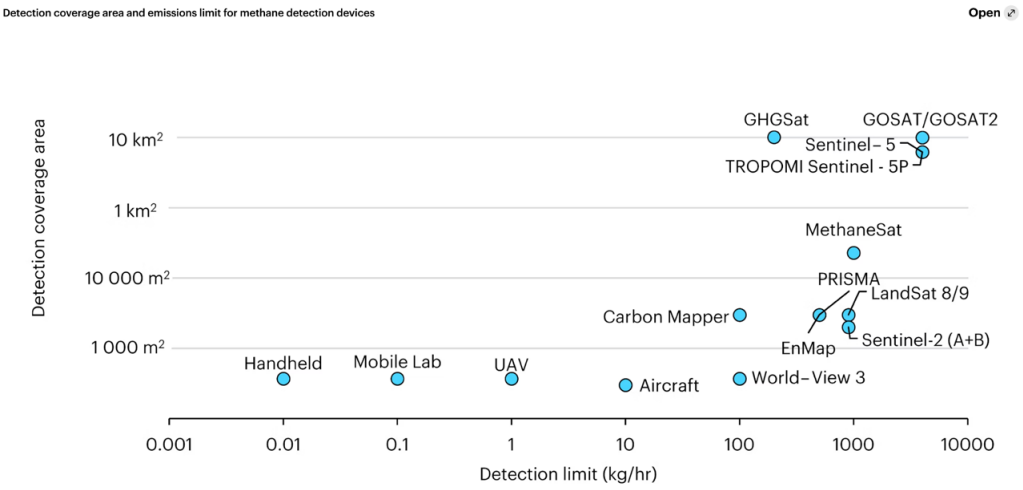
Low methane emissions assets can provide reputational benefits and differentiate oil and gas supply to buyers. For example:

- **Reputation:** Many governments and buyers are targeting gas supply with demonstrated low-methane emissions intensity. Methane emissions performance is also of interest to financiers and shareholders.
- **Publicly accessible data:** There is an increasing prevalence of satellites which can identify emissions on a periodic basis as they circle the globe. Satellite measurements are increasing in quantity, accuracy and geographical coverage, with the most recent launch of Carbon Mapper's Tanager-1 in 2024, and the GOSAT-GW in 2025. As satellite measurements do not need site access or company approval to collect data, the best way to prevent emissions detection from satellites is to proactively understand and mitigate methane emissions sources.

Satellite resolution can range from below 1000 m2 to up to 10 km2, as shown in Figure 5, making them suitable for the detection of large-scale emission events. Methane emissions detection by satellites can be further supplemented by other methods including handheld devices, aircraft and drones.

Gas supply differentiation: With energy security being of increasing global importance, several buyers are using methane emissions intensity as a metric to demonstrate strong environmental performance and safeguard the future use of gas for their economy.

Figure 5: Detection coverage area and emissions limit for methane detection devices



Source: IEA

Learn more:

- Global Methane Initiative: Oil and Gas Systems Methane: Reducing Emissions, Advancing Recovery and Use (examples from India, Argentina and Mexico)
- Transmission: Best practices to reduce methane emissions at gas transmission networks. A literature review and case studies
- Critical thinking frameworks:
  - TED Talk: Bill Peterson – Lean applied to us
  - TED Talk: Achieving Excellence: One Choice & Three Practices
- Examples of global results and approaches:
  - Japan: Japan Organization for Metals and Energy Security (JOGMEC) – CLEAN Annual Report 2024
  - European Union: Methane emissions – Strategy, rules, partners and initiatives

TOOLS

Defining the value of methane reductions

Clear capital allocation criteria, backed by a strong business case, equip accountable managers with what they need to justify methane reduction initiatives and secure broader company support.

Allocating capital and resources

Accountable manager tip

Integrating considerations into capital allocation frameworks

Once methane emissions sources are detected, it can be relatively straightforward to remediate sources using existing technologies. However, for larger cost mitigation activities such as equipment replacement or infrastructure changes, clearly integrating climate considerations into capital allocation frameworks can help methane mitigation activities to compete effectively for capital. Both capital allocation frameworks and business case templates are essential to enable implementation of methane emissions reduction projects.

There is a significant investment gap between ambition and action. Although many companies have announced climate targets, few have allocated sufficient capital or operational expenditure to achieve these commitments. While many methane emissions reduction initiatives can be implemented at no, or low cost, some require capital investment.

Business case outline

A business case can take many forms. Below are key criteria an accountable manager should consider when supporting a methane emissions business case. This builds on the considerations previously described in the section Business benefits.

Table 3: **Business case template**

Section	Content/Details
1. Executive summary	• Describe key objectives and outcomes. For example, key objectives may include a combination of delivering (i) operational improvements, (ii) the most material methane emissions reductions, (iii) the quickest methane emissions reductions, (iv) the most cost-effective methane emissions reductions, (v) strategic benefits, or (vi) methane targets. • Key recommendation, cost and benefit (including financial and non-financial factors).
2. Background and context	• Present an organizational wide (and/or asset-level) methane emissions overview graph displaying the key sources of methane emissions. • Describe financial and non-financial benefits of methane mitigation, including operational improvements, recovery of gas for use as fuel and/or sale, safety improvements, reliability increases, operational efficiency improvements, OpEx reductions, reputational benefits, reduced regulatory costs, market supply differentiation, gas security of supply and social benefits. • Present a marginal abatement cost curve (MACC) as a chart. Include methane emissions reduction targets (tons or intensity reduction) or internal cost of methane criteria ($/t) on the MACC chart to inform prioritization of methane mitigation projects. • Summarize industry standards and peer benchmarking.
3. Proposal	• Prioritize methane emissions reduction projects using the MACC according to key objectives identified. • Outline overall benefit (financial and non-financial of undertaking the mitigation project). Include a discussion of risks and opportunities, including any impacts on corporate risk assessments. Ensure that a focus on short-term outcomes does not increase long-term risks.
4. Implement the plan	• Recommend additional measurement, data gathering or analysis. • Define an implementation plan, timeline and milestones. • Allocate budget. • Allocate resources, including defining roles and accountabilities. • Define non-operated joint venture engagements. • Define performance tracking frequency and approach.

Defining business value

There is both financial and non-financial value that results from reducing methane emissions. Methane emissions can be strategically important for asset and organizational risks and opportunities.

Operational excellence

- It is commonly known that safer operations emit less methane. A focus on reducing methane emissions can reinforce safety outcomes.

- Assets with lower methane emissions tend to have improved reliability and higher operational performance. An imperative to act to reduce methane emissions can be used to inspire and engage the workforce, improving operational outcomes.

Cost effective mitigation with positive returns

- Methane is the primary component of natural gas, so methane emissions represent a wasted product that could otherwise be utilized, reinjected and conserved for future production or commercialized. As a result, many actions to reduce emissions save more money than the cost of mitigation. In other words, methane mitigation provides a net cost saving.
- Operational improvements from mitigating methane emissions may reduce ongoing operational expenditure (OpEx).

Regulations

- An increasing number of governments are recognizing the importance of transparent methane emissions measurement, reporting and verification via regulations.
- Regulatory costs due to methane emissions exceeding expected or regulated levels may result in fines that increase operating costs.

Energy security and political positioning

- Energy security is closely linked to economic security. Low methane emissions gas safeguards its use as a future energy product and can be an important aspect to support engagement with regulators and customers.

Reputational risk reduction

- Reputational risks from methane emissions detected and reported by external data sources and satellites can be minimized by proactively identifying and addressing methane emissions.
- If the world is to limit global warming to 1.5°C (or to 2°C) above pre-industrial levels and avoid the worst climate impacts, dramatic reductions in methane emissions (around 75 per cent) must be achieved in the oil and gas sector.
- A poll by the Global Methane Hub found that most people interviewed across the 17 countries surveyed support actions to minimize methane pollution.

Market differentiation

- As governments seek to decarbonize, several global customers are using methane emissions performance as one criterion when selecting energy suppliers. Understanding and acting on methane emissions can help prepare companies for these developments.
- Lower demonstrated methane emissions may improve access to capital via investors, financial or other lending institutions.

Attributing value to methane emissions using global warming potential

Attributing financial metrics to methane emissions is an important element for business decision-making.

Methane emissions should be reported as a carbon dioxide equivalent (CO_2e) cost, using the global warming potential (GWP) of methane to reflect that methane lasts longer in the atmosphere than carbon dioxide.

The GWP value attributed to methane in the literature is typically defined as one of two key values:

- 20 years: GWP of 82.5 times CO_2
- 100 years: GWP of 30 times CO_2

Most international climate targets, such as the Paris Agreement and the Global Methane Pledge, define an aim for a significant reduction in emissions within the next 20 to 30 years. Thus, the 20-year GWP of methane is the most representative when assessing methane emissions mitigation projects. While the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement, and many global governments historically assume a 100-year GWP, societal and investor expectations are increasingly shifting towards a 20-year GWP.

Practically, this means that financial assessments of the emissions benefit of methane emissions projects should be based on the volume of methane (t) x 82.5 (i.e. the 20-year GWP of methane) x cost of carbon ($/t).

Accountable manager tip

Calculate the financial assessment of emissions benefit

Example of a project requiring financial assessment of emissions benefit – volume of methane (t) x 82.5 (i.e. the 20-year GWP of methane) x cost of carbon ($/t).

Learn more:

- OGMP 2.0: Frequently asked questions

Assessing and prioritizing methane reduction projects

Marginal methane abatement cost curve assessment

Screening of methane emissions, even without measurement-based methane emissions quantification (i.e. at OGMP 2.0 Level 3), can be an important source of information to identify material emissions sources, to undertake initial mitigation. Emissions sources can be further understood and prioritized as more detailed information, including site-level and source-level quantification measurements, are obtained.

Typically, methane emissions projects are assessed and prioritized using a marginal abatement cost curve (MACC). A MACC presents costs or savings, expressed as a net present value (NPV), expected from individual emissions mitigation opportunities, alongside the potential volume of emissions reduction. They use the metric of dollars per ton of carbon dioxide equivalent – usually represented as $/tCO$_2$e.

Typical steps when undertaking a MACC assessment are outlined below.

Define objectives and scope

- Clarify the primary goals of the assessment, such as emission reduction, cost savings, etc.
- Define baseline emission sources (types and emissions amount) using measured data and/or empirical factors (where data is not available).

Accountable manager tip

Wider assessment equals greater mitigation opportunities

Ensure the assessment is undertaken at a divisional or country level (or where total budget and personnel resourcing are allocated), rather than restricting the assessment to a smaller scope. As capital expenditures is often validated at a company level, a MACC assessment can ensure that methane mitigation opportunities are compared and prioritized against other business opportunities.

Identify potential mitigation opportunities

- List all feasible leak repairs including simple quick fixes and operational modifications.
- Consider new technologies or equipment, including capital modifications.

Accountable manager tip

Put together a dedicated assessment team

Ensure the right range of personnel and skillsets are involved in MACC ranking opportunity identification and assessment. This should include maintenance, operations, engineering, business strategy, environment, safety and asset management expertise. Assessments could be undertaken by existing teams, or a dedicated task force/project team (with a nominated leader).

Quantify cost and benefit

- Estimate emission reductions using emission factors, modelling or (ideally) measurements and validate with benchmarking. OGMP 2.0 and IOGP best practices guides outline methods and approaches to estimate methane emissions quantities.
- Estimate capital costs (CapEx) for each opportunity and ongoing operational and maintenance costs (OpEx).
- Defining business value, attribute a financial value to additional benefits of each individual opportunity as well as any broader site-wide benefits including:

  - Energy and fuel savings
  - Enhanced gas supply security
  - Market differentiation
  - Process simplification and operational excellence resulting in resourcing, time or operational efficiency improvements
  - Reduced regulatory costs
  - Reliability improvements
  - Reputational benefits
  - Safety improvements
  - Sale of the recovered methane gas
  - Sustainable operating performance

- Calculate the overall net $/ton emissions reduction cost or benefit in ton of CO_2e. The calculation should be a multi-year assessment so that projects with capital costs can be compared against the multi-year benefit provided. Attributing value to methane emissions using a GWP, for the purposes of illustration, if the GWP of a 20-year time horizon is used, then the $/ton would be calculated as:

$$\$/\text{ton } Co_2e = \frac{\text{annualized [financial value + non-financial value – CapEx – OpEx*]}}{\text{annualized methane reduction x GWP of 82.5}}$$

*The time value of money (i.e. net present value) should be considered when calculating the annualized cost and benefit.

Accountable manager tip

Don’t overwork the cost-benefit analysis

There can be a tendency for detailed engineering calculations, emissions estimates and cost analysis to be undertaken that can take many months. A best estimate of methane emissions reduction and cost (class 5 cost estimate), informed by engineering judgement can be an effective approach. The intention at this stage is to create an opportunity list so that the group of highest value $/ton opportunities can be identified. This analysis can be later refined and improved.

Use a MACC curve to prioritize opportunities

- Develop a MACC curve (see example provided below) to identify opportunities that maximize cost-effectiveness and impact. For example, a MACC curve can illustrate which opportunities:
  - Generate revenue.
  - Provide the highest value for cost.
  - Provide the highest value across both carbon dioxide and methane mitigation projects.

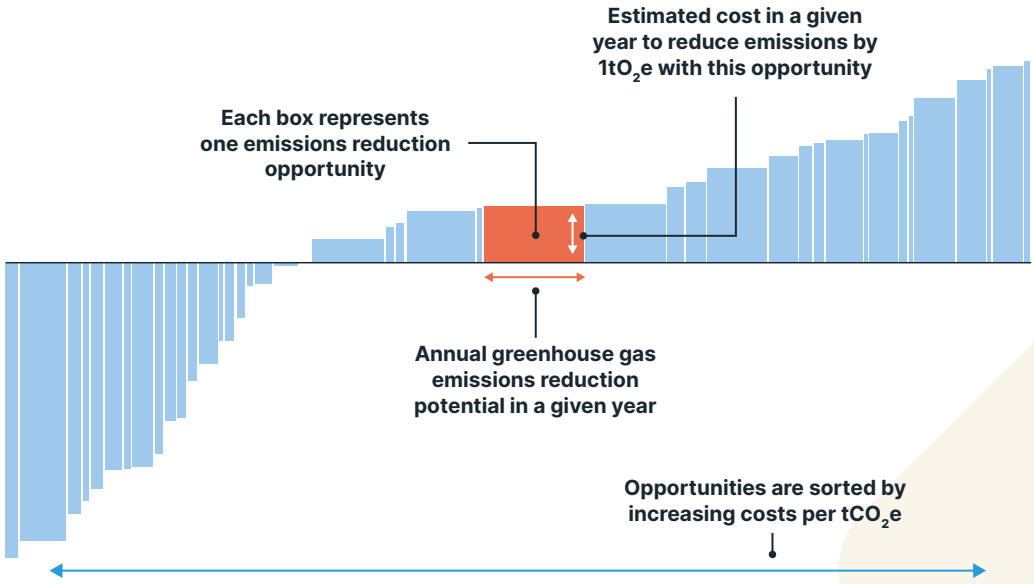
- Identify the opportunities that provide both lowest cost and largest strategic benefit.
- Other considerations that may also influence opportunity prioritization include:
  - Emissions reduction materiality
  - Opportunity implementation feasibility
  - Individual opportunity CapEx

Accountable manager tip

During prioritization, consider the broader business strategy

Will the selected methane mitigation opportunities demonstrate both short-term methane emissions abatement and material emissions reductions? Can the business implement many smaller opportunities or do organizational processes lend themselves to a smaller number of larger opportunities, or a mix? And importantly, have sufficient emissions mitigation projects been identified to achieve company targets and goals?

Figure 6: Marginal abatement cost curve (MACC)



Source: IMEO

Each emissions reduction opportunity is presented as a box above or below the horizontal axis, demonstrating the net present value of the opportunity. Boxes seen above the axis indicate there is a net cost to that action – the higher the box, the higher the cost. Boxes seen below the horizontal axis indicate a net saving from that action – the lower the box, the greater the saving. The width of the box indicates the action's potential volume of reduction per year, expressed as tCO_2e. The curve shape is created by ordering the actions from lowest cost to the left, to highest cost on the right.

Implementation planning

- Confirm that the scope is in line with internal and external targets. If not, additional MACC assessment iterations will be needed to identify more methane mitigation opportunities.
- Develop timelines and milestones as an emissions reduction programme of work that monitors performance monitored and celebrate successes.
- Assign responsibilities for implementation, performance monitoring and performance verification.
- Allocate resources and budget.

Accountable manager tip

Allocation of resources and budget is key

Allocation of resources and budget is one of the critical steps to ensure successful delivery of methane emissions reduction projects. This can be overlooked, assuming that staff will be able to prioritize budget and resources against other core priorities such as safety, reliability and efficiency, using existing processes. It is recommended that a discrete budget and resources are allocated to methane emissions reduction opportunities to support the case for change and to ensure that it is a priority for the organization. Use the MACC approach to rank all emissions reduction opportunities at an organization-wide level, determine budget and resource allocation at a CEO or head of organization-level and then distribute this budget to asset-level mitigation projects.

There are many industry tools available to calculate methane emissions abatement potential, cost and support prioritization of methane reduction opportunities. One such example is the free MIST tool. There are various charts and data views that can demonstrate abatement potential at both an individual asset and organizational level.

Continuous improvement

- Continuous improvement is an important element of the MACC process to ensure frontline workers' insights and methane mitigation learnings are implemented into methane emissions identification, mitigation planning and implementation.
- Engagement and feedback from frontline workers can deepen the understanding of how work gets done and the most appropriate and effective actions in the context of existing systems and processes. This also creates a learning dialogue across levels that reinforces collaboration and psychological safety.

Accountable manager tip

Focus on value and excellence

The key focus should be on maximizing value and operational excellence, rather than cost minimization or attributing blame. Helpful diagnostic approaches include Root Cause Analysis, the Lean Six Sigman DMAIC Framework, and/or Bowtie Analysis.

Data Deep Dive

You can explore your methane emissions data compared to peers via the Eye on Methane data platform. Common emission sources can be investigated to be considered as a part of the MACC analysis, as well as outlier sources compared to peers – outliers may suggest an opportunity for operational adjustments to implement quicker methane emissions reductions and remediation.

Learn more:

- Carbon Limits: Mist by Carbon Limits
- IOGP: Recommended practices for methane emissions detection and quantification technologies – upstream
- OGDC: Methane and Flaring Framework
- EDF: Fuelling a digital methane future

Understanding your data

Data to support informed decision-making and action are available to accountable managers on Eye on Methane INSIGHTS – a new, secure space designed exclusively for OGMP 2.0 companies. Key features of Eye on Methane INSIGHTS include:

- MARS notifications for satellite detected emissions and status of these detections. This data can be particularly helpful to understand very large emissions sources and performance of non-operated joint venture (NOJV) partners.
- Total methane emissions (in tons).
- Emissions performance trends over time, including the largest emitting assets and the largest emitting sources in your organization.
- The lowest emitting assets in your organization, to assist sharing of effective action and approaches.
- Emissions performance across different assets. This data can be helpful to assess if some assets are overperforming or underperforming compared to others.
- Peer benchmarking comparisons. This data can be helpful to understand company and asset methane emissions performance compared to peers, and OGMP 2.0 status compared to peers.
- OGMP 2.0 factsheets.

Accountable manager tip

Satellites only tell part of the story

Satellites typically identify large methane emissions sources that require immediate action. It is important to note that the detection limit of satellites means that many smaller sources will not necessarily be detected. In fact, most emissions are invisible to satellites, so measurement is key.

For companies with multiple assets, an internal benchmark such as a methane absolute emissions level or methane intensity can identify good and bad actors to help deliver company targets.

ENABLING SUCCESS

What is the role of the accountable manager in engaging, planning and enabling teams to reduce methane emissions?

In this section:

- Defining responsibilities, competency and training
- Engaging your organization
- Improving outcomes using a multidisciplinary approach
- Setting methane targets
- Allocating budgets and resources
- Approaches for engaging joint venture partners, customers and contractors
- Understanding your enablement and engagement data

Defining responsibilities, competency and training

Roles and responsibilities

Every single employee needs to understand the company's ambition to reduce methane. Setting up a dedicated, cross-functional team of competent people who coordinate the effort across the organization and implementing strong training for blue collars and technicians are key.

Clearly defined roles and responsibilities establish expectations, promote accountability and ensure that team members understand their specific contribution towards achieving organizational methane objectives.

The role of accountable managers is to ensure the organization is familiar with company targets and objectives, and that these objectives are communicated, understood and endorsed by all employees from frontline

workers to mid-level managers. Methane detection, measurement and mitigation responsibilities and decision authorities must be allocated for roles across all organizational levels. These should link to the organization's internal and external commitments and ambition level. Clarity can help to build alignment among internal groups such as senior management and frontline workers.

Without clarity, even the best intentions may not translate into action, as individuals may be unsure of what they are responsible for or may assume others will take the lead. This lack of clarity can lead to delays and duplication of efforts, hindering an organization's ability to deliver methane emissions reductions.

Example roles and responsibilities that can be defined by an accountable manager are listed in the section on tools, below.

Competency levels

Knowledge of methane emissions detection and mitigation approaches is a foundational step in ensuring staff and contractors are empowered to understand and act on methane emissions. An accountable manager plays an important role in establishing competency levels that link to an organization's strategy and methane vision, and in defining how methane reductions create value.

For example, competency frameworks should consider:

- **Business-wide knowledge requirements:** This is mandatory and applicable to the entire workforce. Content may include explanation of why to address methane emissions, as well as common sources and mitigation approaches. It should also include corporate ambitions and commitments, including internal and external targets so that methane initiatives can be appropriately prioritized compared to other organizational activities.
- **Targeted knowledge for specific roles:** Specific technical knowledge will vary depending on an individual's roles and responsibilities. For example, frontline workers, engineers, subject matter experts, functional teams, mid-level managers and accountable managers should have specific knowledge and skills based on their role and responsibilities.
- **Embedment in business processes:** Methane emissions reduction knowledge should be reflected and embedded in strategic and operational decision-making processes. Competency frameworks should equip people with the necessary skills to act in their roles.

Training

A wealth of training programmes and educational materials exist that can be deployed at relatively low cost and at speed across an organization.

This can be supplemented by presentations and discussions through existing forums such as townhalls and regular operations meetings.

Technical guidance and resources

There is a range of tools, technical guidance documents and training materials available. Many are freely accessible.

Learn more:

- Methane Guiding Principles (MGP) – Methane Reduction Management Best Practice Guides
- IOGP – Recommended practices for methane emissions detection and quantification technologies – upstream
- OGDC – Methane and Flaring Framework
- IMEO – Capacity-building and training

Engaging your organization

Engagement approaches

As an accountable manager, you have a responsibility to foster a culture that prioritizes methane emission reductions. This includes the feeling of agency, responsibility and interest among those with the necessary skills to catalyse further action to reduce methane emissions. It goes beyond training and compliance and shares many similarities with safety culture.

Business benefits to cultivating this mindset and embedding and aligning methane emissions reduction processes into daily operational practices include increased employee productivity, engagement, satisfaction, greater innovation and ideation, and improved overall business performance.

The most effective approach will vary depending on your organization's values and level of psychological safety. The examples below should be assessed for suitability within existing cultural practices.

Psychological safety

Psychological safety in oil and gas operations is the shared belief among all personnel (from frontline workers to management) that they can raise concerns, report emissions sources, admit mistakes and suggest improvements without fear of blame.

Establishing or strengthening communication channels that surface possible methane emissions and potential operational improvements are more successful when employees feel comfortable reporting methane emission sources. Existing industry frameworks on human performance can be adopted. The focus should be on understanding the root causes of any reported methane emissions occurrences – whether systemic, organizational or process-related – so that the root cause can be resolved, the source of the methane emission acted upon and future impacts avoided. This inquisitive approach is often associated with a causal or no-blame culture in a safety context and promotes continuous improvement, transparency and trust.

Accountable manager tip

Fear not

Are emissions sources reported with fear and blame, or celebrated as part of a continuous improvement culture?

Commitment

Leadership commitment is one of the biggest enablers defining an organization's methane performance. Companies with visible leadership commitment to methane emissions reductions typically report improved business outcomes, higher operational performance and greater employee and contractor trust. The narrative should connect to social, environmental and business objectives, such as health, climate, and safer, more profitable and efficient operations.

Accountable manager tip

Demonstrate leadership and commitment

Setting goals or expectations to reduce methane emissions without providing the means to act on them (such as budget and resources) can erode trust and have a negative impact on methane emissions reduction projects. Is leadership visibly and consistently committed to methane reduction? Do employees genuinely believe in this goal, or is it just a checkbox? What could be done differently to increase leadership visibility, consistency and commitment?

Visibility

Emissions performance should be reported and visible at an asset level and fuel a sense of inquiry if levels go above a certain threshold.

Accountable manager tip

Report on emissions reduction performance

Do daily and monthly operational reports include methane emissions performance, and explanatory notes?

Inclusive and tailored communication

Communicating the risks and opportunities of methane emissions requires tailoring language and context to different audiences. For example, messages of reputation, industry leadership or regulatory risks may resonate with top management, while operational efficiencies, safety and performance is more suitable for frontline workers.

Accountable manager tip

Check in with your audience

Has feedback been obtained on key messages from different organizational levels? Does messaging resonate?

Enabling processes

Embedding methane reduction actions into an organization's processes and procedures is crucial to ensure methane measurement and reduction efforts are not seen as one-off initiatives but as a core component of an organization's ethos. Accountable managers should be aware of the risk of initiative fatigue, with methane emissions being viewed as yet another task among a long list of priorities.

Company processes should also complement requirements to identify and prioritize methane reduction opportunities. For example:

- An annual methane workshop comprising of a multidisciplinary team (including operations, engineering and maintenance to brainstorm mitigation opportunities) to create a rolling list of ideas to reduce methane emissions that are actively implemented with support of senior leadership.
- A regular internal forum to facilitate lessons learned and internal collaboration and share learnings across the organization.
- Regular discussions on methane emissions at site-level to allow the workforce to discuss the emissions profile, actions being taken and the importance of mitigation, and to identify improvement opportunities.

Accountable manager tip

Set up emissions-focused systems and processes

Are systems and processes in place (such as budget and resources) to support delivery and achievement of methane emissions reduction objectives? Do regular company processes reinforce and support methane emissions objectives?

Recognition and reward

Recognition and reward can enhance employee and contractor engagement. In a safety context, many workplaces that implemented recognition programmes experienced better safety outcomes.

Accountable manager tip

Employee recognition

Are employees and contractors recognized for reporting hazards, completing training and reducing methane emissions?

Stories

Stories are an effective way to communicate benefits of low-emissions assets. Stories should be engaging and specific, and outline what, how and why action was undertaken, as well as human elements including motivation, personal pride and recognition of outcomes achieved.

Learn more:

- IMEO: MARS mitigation case studies

Improving outcomes using a multidisciplinary approach

Multidisciplinary input

Although methane attribution to specific sources can be simple to resolve, outcomes can be significantly improved using a multidisciplinary approach. A range of roles and skills should be engaged, including:

- Frontline workers
- Operations
- Maintenance
- Engineering
- Specialists
- Contactors
- Service providers
- Safety and environmental specialists

Joint design, analysis of methane detection and measurement outcomes, site-based measurement and reconciliation approaches, and refinement of roles and accountabilities allows teams benefit from:

- Realistic and practical focus areas.
- Incorporation of operational, day-to-day knowledge and experience.
- High employee engagement, commitment and ownership.
- A trust-based and collaborative culture.

Accountable manager tip

Listen to those in the field

The value of field insights cannot be underestimated. An intimate understanding of operational performance and equipment can identify operating conditions that contribute to methane emissions sources. Outsourcing detection and mitigation to external parties may overlook simple mitigation options and limit learnings that could otherwise be embedded within operating practices.

Continuous improvement

Continuous improvement via regular feedback helps maintain methane measurement and mitigation approaches that are relevant, effective and cohesive. It also ensures that the plan is continually improved in response to changing operating conditions and events.

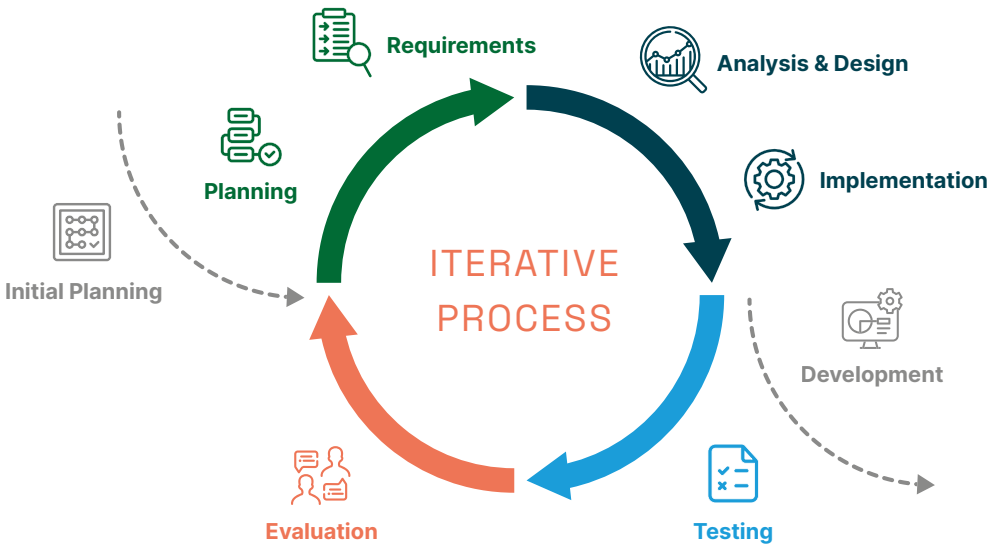
Accountable manager tip

Organization-wide engagement

Are employees and contractors involved in development and ongoing review and update of the methane emissions reduction plan? Are employee engagement, commitment and ownership evident?

Figure 7: **Iterative process for process improvements**

Critical Thinking Tools: Iterate, Plan, Design and Test



Learn more:

- OGDC: Methane and Flaring Framework

TOOLS

Setting methane targets

Commitments and targets are important elements to empower and align all levels of an organization to reduce methane emissions. Targets should be realistic and achievable within a predetermined timeframe. They can be based on industry benchmarks. Interim or intermediate targets may be needed to ensure regular progress and early identification of issues.

Accountable managers should play an active role in shaping their organization's public methane emissions reduction commitments and participate in key initiatives.

Global initiatives and industry benchmarks

There are a range of global targets an accountable manager can use to demonstrate internal and external commitment to reducing methane emissions.

Oil & Gas Methane Partnership 2.0 members, representing over 42 per cent of global oil and gas production, recognize the importance of rapid action to reduce methane emissions across the industry. All members are required to establish an organization-wide methane emission reduction target no more than five years into the future that reflects ambitious goals that are ratcheted over time. Additional targets, including for non-operated assets / joint ventures, are encouraged but not required. UNEP promotes the following goals relating to the oil and gas sector: a 45 per cent reduction in methane emissions over estimated 2015 levels by 2025, leading to a 60 to 75 per cent reduction by 2030.

The Aiming for Zero Methane Emissions Initiative, signed by over 100 oil and gas organizations, focuses on reducing methane emissions to near-zero for upstream operated assets by 2030. Near-zero is defined as well below 0.2 per cent methane intensity.

The Oil and Gas Decarbonization Charter (OGDC) by the Oil and Gas Climate Initiative (OGCI), is an initiative to reduce emissions across the oil and gas sector. The initiative has 54 signatories.

The World Bank Zero Routing Flaring by 2030 Pledge aims to eliminate routine flaring on existing oil and gas companies' assets by 2030 and on new assets immediately.

The World Bank Global Flaring and Methane Reduction (GFMR) is a multi-donor trust fund that provides grant funding, technical assistance and policy and regulatory reform advisory services to help developing countries rapidly cut flaring and methane emissions.

Setting a methane target

Methane targets should be timebound, with ambition increasing over time. When setting a methane target as an accountable manager, it is important to recognize there are two common types:

- Absolute reduction target (tons of methane)
- Methane intensity target (emissions per unit of output)

Absolute methane targets

Absolute targets provide greater certainty of achieved environmental outcomes but require a robust baseline against which to measure progress. Absolute reduction targets should thus be reported alongside the baseline year and methane volume.

Methane intensity targets

Intensity targets enable comparisons across operators but do not guarantee that environmental benefits are achieved – intensity can increase or decrease without any changes to emissions if production increases or decreases.

Intensity targets should thus specify key calculation elements as definitions can vary across operators. For example, organizations with an upstream methane intensity target may report the sum of all gas marketed over the period, however other organizations may report methane losses as a fraction of all energy produced (oil and gas).

Learn more:

EDF: Plugging the leaks: An investor guide to oil and gas methane risk
GIE, IOGP and Marcogaz: Guidelines for methane emissions target setting
OGMP 2.0: Starters Guide
EDF: Guidance for Including Methane Abatement in Oil and Gas Debt Structuring

Allocating budgets and resources

A critical but often overlooked element of success is ensuring that budget is pre-allocated for methane mitigative activities. Although many methane mitigation activities are value-positive, expenditure in most organizations is tracked separately to profits. This can result in workers struggling to find funds to implement even modest methane mitigation activities. This issue is often exacerbated for larger expenditure amounts that are required for facility equipment modifications and brownfield or greenfield design changes.

Allocating budget using practical approaches

Practical approaches that can be used by accountable managers to allocate budget for methane measurement and mitigation include:

- Set aside a specific budget at an organization or country level (endorsed by the CEO or the Board) for methane mitigation activities. This should be based upon a multi-year methane mitigation plan with activities informed by an organization-wide MACC analysis. This approach has the benefit of methane activities being endorsed by the most senior organizational levels and enables the highest value opportunities to be implemented across an entire organization.
- Set aside a specific monetary amount at an asset level for methane mitigation activities. This should be based upon a multi-year methane mitigation plan with activities informed by a portfolio-level MACC analysis.

In both cases, the budget allocated should be confirmed to be sufficient to meet internal and external methane emissions targets. If the allocated budget is not sufficient, an iterative process should be used to review and refine the list of mitigation projects and increase the budget allocation over time.

Accountable manager tip

High-level cost estimates and the use of pool of funds

Often a difficulty in allocating budget is the lack of detailed cost estimates for mitigative activities. One approach is to use high-level cost estimates to create a pool of funds. Funds should have some flexibility for reallocation, as the nature of methane emissions is such that emissions sources (and thus cost estimates) will likely change as more data is acquired through MRV and continuous improvement feedback processes.

Defining resourcing and accountabilities

Accountable managers must ensure key accountabilities for methane MRV and mitigation are defined. This includes assigning strategic, tactical and operational decisions and implementation roles and accountabilities, such as:

- Detecting methane emissions and selecting appropriate technologies.
- Measuring methane emissions and selecting appropriate technologies.
- Monitoring methane emissions performance and undertaking corrective actions.
- Undertaking a MACC analysis and prioritizing methane emissions mitigation opportunities in a multi-year plan.
- Embedding detection, measurement and monitoring within existing operational processes, including a structured continuous improvement approach.
- Reviewing implementation of methane mitigation activities.
- Tracking and reporting on leading and lagging key performance indicators (KPIs).
- Securing budget for methane detection, measurement and mitigation activities via a business case.
- Engaging NOJVs and suppliers.
- Responding to and acting on notifications and external detections, including escalation pathways.
- Reporting and compliance obligations.
- Leading organizational cultural engagement.

Accountable manager tip

Clear allocation of accountability

It is important that allocation of accountability to specific roles is visible and clearly documented.

Approaches to engaging non-operated joint venture partners and contractors

Why engage non-operated joint venture partners

Working with joint ventures (JVs) to reduce methane emissions – a responsibility of the accountable manager – is a critical part of an organization's efforts to address climate change. Reducing methane emissions is a multi-stakeholder partnership with representatives from governments, international organizations, non-government organizations and the oil and gas industry.

JVs account for approximately 77 per cent of total production by large international oil companies. Methane emissions are like safety; there is no intellectual property in methane emissions measurement, monitoring, reporting or mitigation, and thus organizations should openly and transparently share insights and learnings.

Non-operated joint venture outcomes

When working with operated or non-operated JVs, accountable managers can aim for a range of outcomes, such as:

- Adding methane emissions reduction clauses within contractual agreements or joint operating agreements.
- Agreeing methane emissions targets and methane emissions costs ($/t CO_2e) and including statements of intent in board or operating committee terms of reference and scopes.
- Committing to joining OGMP 2.0.
- Committing to eliminating venting and routine flaring and minimizing non-routine flaring.
- Specifically allocating budgets and resources for methane emissions reduction activities, supported by a MACC analysis.
- Committing to transparent methane emissions reporting.
- Instituting a greenhouse gas emissions committee to oversee implementation of best practice emissions monitoring, reporting and reduction strategies.

Non-operated joint venture engagement

There may be potential barriers to securing full or partial disclosure of methane emissions data with ventures, which may relate to contractual, import, technological,

financial, legal, policy or reporting barriers. Engagement is important to identify and resolve such barriers.

The following approaches can be adapted and applied to ensure successful collaboration with joint ventures:

- Hold senior leader discussions to agree on methane emissions strategic intent.
- Provide introductions to supportive science, industry and advocacy organizations, including OGMP 2.0.
- Ensure methane performance is considered alongside profit, production, operational excellence and safety on meeting governance agendas.
- Lead accountability definition across organizations.
- Share or collaborate on measurement technology surveys in similar geographical areas.
- Conduct materiality assessments to inform a methane strategy and implementation roadmap.
- Engage in bilateral and multilateral discussions with joint venture partners on the importance of greenhouse gas management and transparent data reporting.
- Implement training and capacity-building, as well as offer technical support, and sharing of best practices and learnings.
- The engagement plan and approach should reflect the methane journey of the operator and the joint venture partner and should include all levels, from senior management to decision committees, working level discussions, technical subcommittee and audits.

It is important to positively recognize JVs that support a shared methane vision. This will help to develop mutual respect and support future collaboration.

Non-operated joint venture facilitation support

JV facilitation is critical to create a common aim, priorities and approach around methane emissions reductions. This is especially important when organizations are at different points in their methane emissions MRV and mitigation journey, if trust has not yet been established, or if there is a vast difference in the level of knowledge.

As a part of facilitation, listening is an often underestimated and seldom practiced skill. One of a facilitator's primary jobs is to break the cycle of communication failure.

Active listening can:

- Create rapport
- Build trust, influence and understanding
- Encourage flows of information and reduce misunderstandings
- Help people to accept responsibility
- Show respect to alternate attitudes and values
- Create an atmosphere of openness and trust

Engaging contractors

Given the large contractual spend and reach of oil and gas contracts, organizations should consider including working with independent contractors to limit and mitigate greenhouse gas emissions resulting from operations, products and services. Outcomes and approaches may be similar to those discussed above for JVs.

Learn more:

- MGP: Joint Venture Playbook
- MGP: Model greenhouse gases board resolution to manage and reduce emissions in joint ventures
- MGP: Model greenhouse gases emissions committee charter for oil and gas joint ventures

Understanding your data

Eye on Methane INSIGHTS– a dedicated, secure space on the data platform for OGMP 2.0 companies – provides accountable managers the data needed to understand and act on methane emissions.

Relevant data include:

- Changes in OGMP 2.0 reporting level compared to the prior year.
- Changes in emissions levels over time.

Accountable manager tip

Follow the progression of OGMP 2.0 reporting levels

The OGMP 2.0 process is designed for reporting levels for assets to increase year on year. Stagnation or reduction in reporting level may indicate poor engagement or enablement for staff.

Stakeholder engagement best practices

There are many examples of engagement across organizations. Approaches can vary widely depending on company size, geographical location, culture and how mature the organizational thinking is.

Several examples of data sources that can be used to assess engagement effectiveness include:

- Organizational culture surveys with questions on methane science (understanding the why and the how), company objectives, effectiveness of implementation and achievement of goals.
- Comparing the budget spent to the proportion allocated in a fiscal year and identifying the cause of the underspend.
- Data available via the Eye on Methane Data Platform's member portal for accountable managers, such as:

- Asset/regional performance compared to other assets or regions within the organization.
- Change in methane emissions performance over time (trends) following external commitments and/or targets.
- Change in methane emissions performance over time (trends) following joint venture engagement.

Accountable manager tip

The hidden risk of underspent budgets

Underachieving an assets budget is often celebrated as a positive outcome. However, unspent budget allocated for methane emissions activities may signal a delay in methane emissions measurement and mitigation, insufficient resources to undertake planned activities, or a need to improve organizational engagement to increase the visibility and priority of methane-related activities.

ASSESSING PERFORMANCE

How can an accountable manager monitor and assess methane emissions reductions against corporate objectives? How can they identify and implement performance improvements?

In this section:

- An accountable manager's approach to measuring outcomes
- Assessing performance using performance indicators
- Reviewing your data

An accountable manager's approach to measuring outcomes

The importance of measuring outcomes

Performance assessment is an important element to determine effectiveness of an organization's methane targets and implementation strategy.

At the simplest level, performance insights can inform MRV and mitigation improvements. Without a defined process for reviewing and updating the methane MRV and mitigation plan, there is a risk that it becomes outdated and/ or misaligned with evolving risks and opportunities.

Measuring outcomes

Guidelines for accountable managers in assessing performance, includes the distinction between results, outcomes and impact.

Focus on the outcomes not the activities

It's often easier to measure the immediate results of your activities – for example, the number of methane leaks repaired. What happens because of those activities – the outcome – is what counts. When those repairs reduce methane emissions, that becomes the outcome, which contributes to your organization's wider impact on global emissions reduction. A practical way to distinguish between outcomes and results is to identify the desired outcome (for example, the amount, in tons, of emissions reduction) and work backwards. Define the outcome, determine how it will be measured and identify the specific results from your activities that lead to it.

Focus on material, measured outcomes

Outcome assessments should be based on measured data, as estimates derived solely from empirical data or emission factors may be misleading.

Take a wide-lens view

Assessments should consider the programme or organization as a whole. A broad perspective can help identify the critical emissions reduction activities that will make the biggest contribution to the intended outcomes. Narrow assessments may not pick up on the activities with a large potential outcome.

Focus on the data that drives action

With so much data available, it is important to focus on what informs decisions and improves performance. The Eye on Methane data platform can help identify the data most relevant to key outcomes. This playbook supports the link between data that matters and the ability to act.

Integrate impact measures into decision-making

Make impact metrics a tool to simplify, not burden, business processes. As you gain insights, embed them into existing operational processes, to inform the actions of those who are ultimately accountable for the outcome. For example, an integrated approach could include:

- Measuring methane emissions on site.
- Acting on small emissions sources immediately.
- Reporting larger sources through a monitoring system or tool to allow for prioritization and action.
- Following up and closing out activities through a regular site-based monitoring programme.

Accountable manager tip

Establish a clear process for tracking progress

Is there is a clear process for tracking progress against the methane MRV and mitigation plan? Is it easy to assess performance and hold the organization accountable? If not, what would help you to do this more effectively?

TOOLS

Assessing performance using performance indicators

Assessing performance

Performance indicators can provide information on how well an organization is performing compared to internal and external objectives and targets. There are two key types of key performance indicators:

- Lagging KPIs
- Leading KPIs

While lagging KPIs provide insight into successful project delivery, leading KPIs are important for accountable managers (and their teams) to predict if action and activities are on track to achieve desired performance outcomes.

Both leading and lagging KPIs have their place in methane management and mitigation. Using both types of KPIs offers a comprehensive view of performance, allowing organizations to make informed and timely decisions. Examples below can be used by both organizations and joint venture participants.

Leading key performance indicators

Leading KPIs are indicators that predict future performance and provide early signals whether goals are on track. Key elements include proactive behaviours and frequent measurements to identify early issues so that alternate or additional action can be undertaken. Examples of leading KPIs include:

- OGMP 2.0 membership and reporting level.
- Budget allocated for methane emissions detection, measurement and mitigative activities in the fiscal year.
- Number of methane measurement or abatement projects sanctioned vs initially planned or budgeted in a year.
- A cost per ton of methane is allocated to all methane emissions decisions.
- The resource (fulltime equivalent) allocation to support methane emissions detection, measurement and mitigative activities in the year, and percentage of roles with methane emissions detection, measurement and mitigation responsibilities that are filled.

- Workforce engagement measured through culture surveys to determine the percentage of staff who understand the importance of methane emissions mitigation and who have been trained in methane detection/mitigation practices relevant to their role.
- Number or percentage of facilities with MRV programs.
- Non-operated joint venture targets.

Lagging key performance indicators

Lagging KPIs are indicators that reflect past performance. Key elements of lagging KPIs includes retroactive measurement. Examples include:

- Methane emissions intensity and the change in intensity since the last reporting period.
- Methane emissions intensity compared to benchmarks and changes compared to similar assets since the last reporting period.
- Total annual methane emissions and changes since the last reporting period.
- Number of methane emission sources abated or the tons of methane emissions abatement achieved since the last reporting period.
- Percentage of allocated budget spent on MRV and mitigation in the past year.
- Routine/non-routine flaring volumes, as well as any period of flares malfunctioning/unlit or low-combustion efficiency.
- Non-operated joint venture performance compared to targets.

Learn more:

- MGP: Best Practice Guide: Continual Improvement

Reviewing your data

Data available to accountable managers on Eye on Methane INSIGHTS – companies' dedicated space on the data platform – include:

- MARS notifications for satellite-detected emissions and status of these detections including response rate, mitigation rate and the time taken to act. These data can be particularly helpful to understand performance of NOJVs where NOJVs are not members of OGMP 2.0 and/or do not measure and report methane emissions performance.
- Emissions performance trends over time, compared to KPIs. These data can be helpful to assess how and if performance is improving over time.
- Emissions performance across different assets, and the difference in improvement in performance across assets over time. These data can be helpful to assess if some assets are overperforming or underperforming compared to others, which assets have superior performance and to identify lessons that can be applied and shared across the organization.
- Data benchmarking comparisons. These data are useful to understand company and asset methane emissions performance compared to peers. They can also serve to assess whether internal and external targets and commitments are sufficient or if they should be increased over time to remain in step with peers.
- OGMP factsheets and achievement of OGMP 2.0 commitments.

APPENDIX – ARCHITECTURE FRAMEWORK

The purpose of the Methane Playbook is to provide information to support action on methane emissions reductions and mitigation. The playbook aims to foster agency and responsibility to support action to reduce methane emissions, where individuals are empowered and enabled to enact change.

It is designed around practical elements (data, tools and culture) to maximize and enhance existing organizational processes. It also helps users to identify and prioritize additional activities that could be beneficial.

Key roles and drivers

Two primary agents of change identified in the oil and gas sector are the frontline worker and the accountable manager. The needs of these two groups are diverse, with a multitude of factors influencing their agency and ability to act to reduce methane emissions.

In addition to these two agents of change, the executive or CEO plays a key role. This senior leader sets the organizational vision and ambition to act on methane emissions sources.

Leadership characteristics and dimensions

There are numerous organizational change and leadership models available. The model was selected that is applicable to oil and gas organisations of different types, sizes, ownership structures and geographical boundaries; the 5 P's of Leadership framework, designed by Jim Kouzes and Barry Posner, was modified to suit this context.

Based on experience and engagement with oil and gas organizations, there are five core leadership characteristics that influence organizational change:

Power: Direction and sponsorship is visible, clear and authentic. There is clarity on the level of organizational ambition and business case requirements. Power creates organizational agency for change.

Plan: Specific, measurable, achievable, relevant and time-bound (SMART) objectives are cascaded. Time-bound, realistic targets with clear accountability lines are set. Leading and lagging KPIs are built into governance processes.

Policies: Strong policies and processes are in place to assist people while limiting administrative burden. Employees, service providers and contractors are supported to thrive.

Purpose: Company management believes in the end goal of reducing emissions. Language and storytelling support the narrative and helps showcase role models.

Proof: Data tracks everything. Companies celebrate wins and learn from failures to accelerate future action. Managers and top executives drive continuous improvement and demonstrate commitment through action.

Implementation in an oil and gas setting

User journey stories guided the practical application of the 5 P's in an oil and gas context, integrating design thinking principles. This user-centered approach identified three key decisions or activities commonly undertaken by both frontline workers and accountable managers to support the 5 P's of organizational change.

Three key activities are tailored for accountable managers in this Playbook. These are:

- **Setting a goal, frame or business case** to act on methane emissions reductions. This activity relates to power and purpose.
- **Implementing methane emissions reductions**. This activity relates to plan and policies.
- **Tracking performance**. This activity relates to proof.

Organizational change requires three cross-cutting elements within each key activity to support users. These are:

- **Culture** to drive purpose.
- **Tools** to support power, plan and policies.
- **Data** to provide proof and guide planning.

Explore the Eye on Methane data platform

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