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The Methane Emissions Opportunity

Our perspective on leveraging
technology in continuous improvement
in the Oil & Gas sector

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I. Executive Summary

Reducing methane emissions and flaring in the Oil & Gas sector is an immediate action that can produce positive outcomes for businesses, the climate, and energy security. Significant progress is achievable this decade, which will help limit temperature rise, enhance the productive use of natural gas, and strengthen the industry's carbon competitiveness.

The International Energy Agency (IEA) estimates that over 75% of methane emissions in the Oil & Gas sector can be reduced with existing technologies.¹ One of the historical reasons that methane emissions have been difficult to address is a lack of reliable, real-world data. However, innovation is unlocking a growing number of emissions monitoring and measurement solutions – such as handheld devices, fixed-location monitors, sensors deployed by planes and drones, and satellite imaging.

Against this backdrop, many Oil & Gas stakeholders, including investors, policymakers, insurance providers, and non-governmental organizations, are recognizing that reducing methane emissions is a pragmatic opportunity and are beginning to take action. Many Oil & Gas companies have already taken significant actions as well. But more can be done, particularly with the application of new technologies.

JPMorgan Chase recognizes our opportunity to support efforts identified by our clients to reduce operational emissions. Consistent with that objective, we have set a net zero-aligned emissions intensity reduction target for the Oil & Gas sector's operational (Scope 1 and 2) emissions in our financing portfolio, including reducing leakage, venting, and flaring of methane as key drivers. We recognize that different technologies and solutions will make sense for different types of operators, and we aim to work with industry participants to support the deployment of effective solutions.

This document shares our perspective on continuous improvement in managing methane and highlights eight elements, with positive actions for each one, that companies in the Oil & Gas sector can consider taking to build on the progress already underway.

JPMorgan Chase is proud to support clients in their efforts to reduce methane emissions and flaring as we continue to engage with the Oil & Gas sector throughout the low carbon transition.

¹ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

II. Introduction

Recent global events – from the war in Ukraine to severe weather events and more – have highlighted the urgent need to provide energy resources securely, reliably, and affordably while scaling solutions and strategies to reduce greenhouse gas (GHG) emissions. These objectives are not mutually exclusive. The world can do both.

We view reducing methane emissions and flaring in the Oil & Gas sector as an immediate action that can produce positive outcomes for companies and stakeholders and may require more financing for industry, not less:

- **Good for energy security:** Bringing more natural gas to the global market enhances energy security. Around 260 billion cubic meters (bcm) of methane is currently lost to the atmosphere each year from Oil & Gas operations.² Approximately three-quarters of this lost gas could be retained and brought to market using proven technologies and practices.³ This captured methane, which is currently wasted, would amount to more than the European Union's total annual gas imports from Russia prior to the invasion of Ukraine in 2022.⁴
- **Good for businesses:** Capturing methane emissions is often a cost-effective decision for a company's bottom line. The International Energy Agency (IEA) has found that approximately 40% of methane emissions from Oil & Gas operations could be avoided at no net cost based on average natural gas prices from 2017-2021.⁵ This is due to the economic value companies can realize from selling the captured gas, which is mainly composed of methane.
- **Good for the climate:** Methane has a global warming potential that is around 83 times greater than carbon dioxide in a 20-year timeframe.⁶ By curbing methane emissions and routine flaring⁷ today, the Oil & Gas industry can make immediate contributions toward achieving global climate targets and, in certain cases, their own corporate-level emissions reduction targets.

As a result of these multiple, synergistic benefits, reducing methane emissions is becoming a key focus among stakeholders seeking pragmatic energy and climate solutions, including energy producers, policymakers, insurance providers, investors, and non-governmental organizations, among others.

To meet the Paris Agreement's goal of limiting global temperature rise to 1.5°C, IEA analysis suggests the need for a 79% reduction in methane emissions from Oil & Gas operations by 2030 from a 2019 baseline.⁸ However, methane abatement is underfunded when analyzed on its net emission reductions potential.⁹ Looking at 2019-2020 financial flows, methane abatement efforts across all emissions sources (Oil & Gas, agriculture, and waste) received less than 2% of total climate finance.¹⁰

² [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

³ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

⁴ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

⁵ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

⁶ [Sixth Assessment Report of the Intergovernmental Panel on Climate Change \(IPCC\), IPCC, New York](#)

⁷ According to the World Bank, routine flaring of gas is “flaring during normal oil production operations in the absence of sufficient facilities or amenable geology to re-inject the produced gas, utilize it on-site, or dispatch it to a market. Venting is not an acceptable substitute for flaring.”
[Zero Routine Flaring by 2030 \(ZRF\) Initiative, World Bank](#)

⁸ [IEA \(2023\), Net Zero Roadmap: A Global Pathway to Keep the 1.5°C Goal in Reach 2023, IEA, Paris](#)

⁹ [Barriers and Solutions to Scaling-up Methane Finance 2023, Clean Air Task Force](#)

¹⁰ [Landscape of Methane Abatement Finance 2022, Climate Policy Initiative](#)

The financial sector can play an important role in helping the Oil & Gas sector progress its methane emissions reduction efforts. JPMorgan Chase is specifically focusing on (1) financing and facilitating capital for methane monitoring and mitigation technologies and companies, (2) providing capital to clients to fund their decarbonization efforts, and (3) working with clients to improve quality and transparency in their data reporting.

Furthermore, JPMorgan Chase has set a portfolio-level 2030 emissions intensity reduction target for the Oil & Gas sector's operational (Scope 1 and 2) emissions.¹¹ Performance is measured on an intensity basis and benchmarked to targets derived from the energy pathways published as part of the International Energy Agency Net Zero Emissions by 2050 (IEA NZE) Scenario. The benchmark is calculated by applying the following framework to our portfolio baseline in 2019:

- **79%** reduction in methane emissions, as indicated by IEA's Methane Tracker 2023¹²
- **93%** reduction in CO₂ emissions from flaring, as referenced in IEA's 2023 report on emissions from Oil & Gas operations¹³
- **29%** reduction in CO₂ emissions associated with other energy use (e.g., engines used to power compressors, drilling rigs, and other equipment)

Applying this framework results in a 2030 portfolio rate of change target of 45% from a 2019 baseline. We believe that by helping our clients finance their transition objectives, we can contribute to efforts to strengthen the broader economy in response to climate change while also generating long-term returns for our shareholders. You can learn more about our approach in our [Carbon CompassSM methodology](#).

The rest of this document discusses: (1) the opportunity to reduce methane emissions and flaring in the Oil & Gas industry, (2) the various frameworks that exist to improve the data reliability and transparency of methane emissions reporting, (3) the landscape of methane monitoring and measurement technologies, and (4) the role that JPMorgan Chase plays in the methane ecosystem.

Finally, we lay out a set of positive actions, across eight elements, that companies can consider taking across their continuous improvement journeys to capitalize on the opportunity presented by addressing methane emissions and flaring.

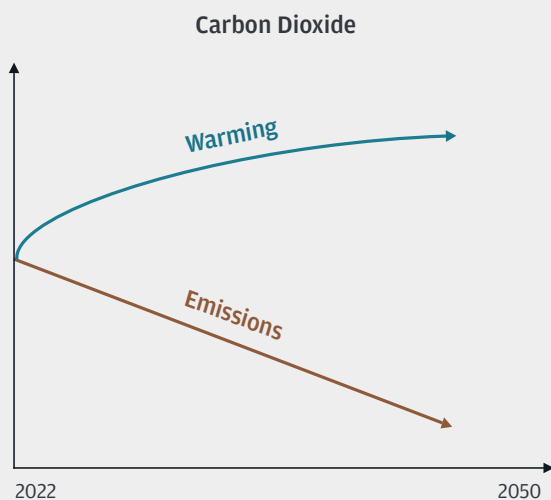
¹¹ [Carbon CompassSM Methodology, JPMorgan Chase](#)

¹² [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

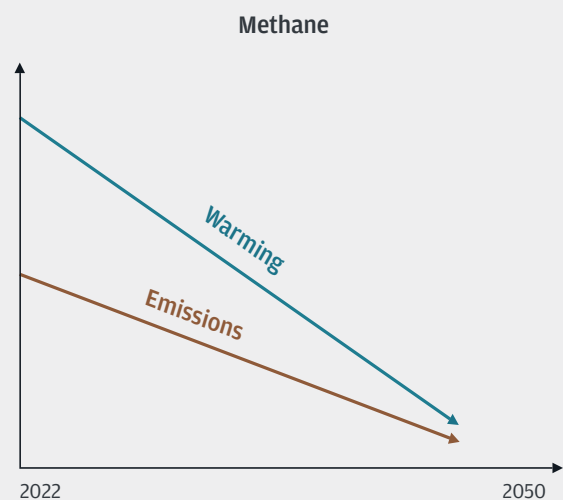
¹³ [IEA \(2023\), Emissions from Oil and Gas Operations in Net Zero Transitions 2023, IEA, Paris](#)

METHANE'S CLIMATE IMPACT

Methane's climate impact is significant, with a global warming potential approximately 83 times greater than carbon dioxide over a 20-year timeframe.¹⁴ In contrast to carbon dioxide, which lingers in the atmosphere for 300–1,000 years,¹⁵ methane has a relatively brief atmospheric lifespan, estimated at around 12 years.¹⁶ Unlike carbon dioxide, where the impact of warming accumulates over time, the warming effect of methane is linked to the rate of emissions in any given year. Thus, a reduction in methane emissions today will have an outsized short-term impact compared to reductions in carbon dioxide emissions. For example, one study estimated that if the world were able to halve the amount of methane from human sources by 2030, the world could avoid 0.25°C (0.5°F) of additional global-mean warming by midcentury, and more than 0.5°C (1°F) by 2100.¹⁷



Warming impacts can continue even as carbon dioxide (a stock gas) emissions decline as they are cumulative in nature.



Warming impacts can decline as reductions in methane (a flow gas) take place.

Note: The graphic is illustrative and not to scale.

¹⁴ [Sixth Assessment Report of the Intergovernmental Panel on Climate Change \(IPCC\), IPCC, New York](#)

¹⁵ [The Atmosphere: Getting a Handle on Carbon Dioxide 2019, NASA](#)

¹⁶ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

¹⁷ [“Acting rapidly to deploy readily available methane mitigation measures by sector can immediately slow global warming” 2021, Environmental Research](#)

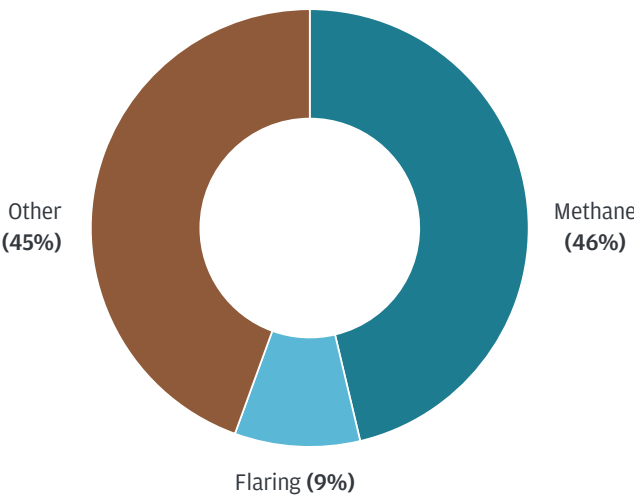
III. The Methane Opportunity for the Oil & Gas Sector

The Oil & Gas industry has a significant role to play in both delivering energy today and in enabling the energy transition for tomorrow. Although there is no one-size-fits-all solution for Oil & Gas companies navigating this transition, there are both immediate and long-term steps that operators can take to make contributions to achieving global climate targets. Significantly reducing methane emissions and routine flaring are two of these immediately actionable steps.

The energy sector is responsible for around 40% of global methane emissions attributable to human activity (second only to agriculture).¹⁸ Methane abatement in the Oil & Gas sector is one of the most cost-effective emission reduction options.¹⁹

There are three main sources of methane emissions from that result from the Oil & Gas sector: venting, flaring, and unintentional leaks (aka fugitive emissions). Together these methane emissions sources account for around 55% of operational emissions (Scope 1 and 2) from the Oil & Gas sector.²⁰

Sources of global greenhouse gas emission (Scope 1 and 2) from Oil and Gas operations, 2019²¹



Note: “Other” includes Scope 2 (indirect) emissions as well as Scope 1 (direct) emissions not due to flaring or methane emissions, such as emissions from operating Oil & Gas production facilities, powering drilling rigs, and ships used to transport oil or gas.

In 2022, global methane emissions from the Oil & Gas sector were around 82.3 million tons (MT).²² Of this total, venting, fugitive emissions, and flaring accounted for approximately 63%, 21%, and 9% respectively.²³

¹⁸ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

¹⁹ [IEA \(2023\), Financing Reductions in Oil and Gas Methane Emissions 2023, IEA, Paris](#)

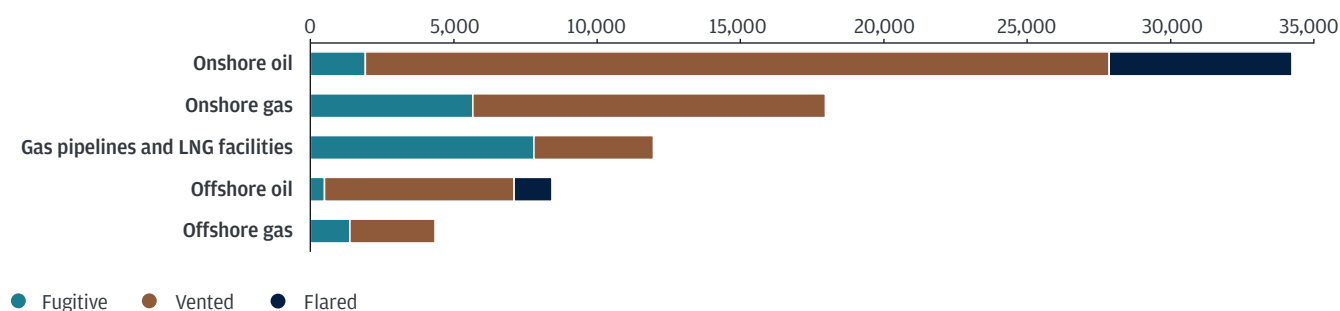
²⁰ [Financing Solutions to Reduce Natural Gas Flaring and Methane Emissions 2022, World Bank](#)

²¹ [Financing Solutions to Reduce Natural Gas Flaring and Methane Emissions 2022, World Bank](#)

²² [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

²³ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#) Note: The remaining 7% came from "satellite-detected large oil and gas emissions" and "other" sources.

World methane emissions from Oil & Gas sources (kilotons)²⁴

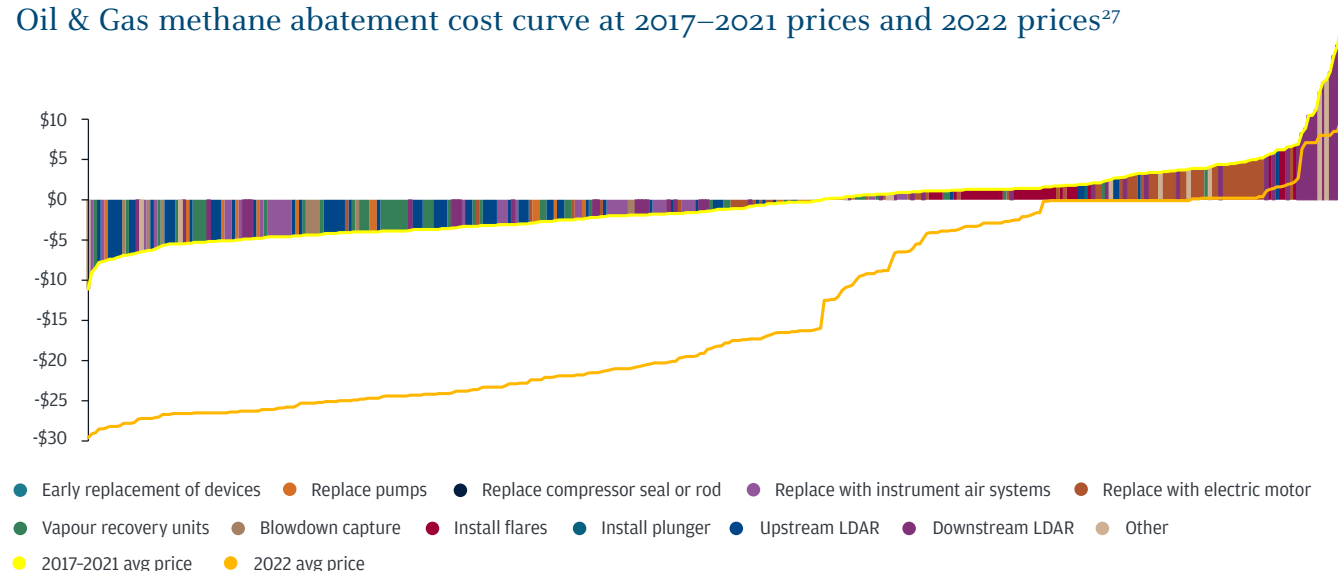


CAPTURING METHANE EMISSIONS IS OFTEN A COST-EFFECTIVE DECISION FOR A COMPANY'S BOTTOM LINE

The IEA estimates that, in the Oil & Gas sector, over 75% of methane emissions can be reduced by implementing well-known measures such as leak detection and repair (LDAR) programs, installing vapor recovery units, replacing pumps and compressor seals, and replacing existing devices with instrument air or electric motor systems.²⁵ Many of these methane abatement efforts are cost-effective. The IEA found that, at average natural gas prices from 2017–2021, around 50% of the actions to reduce methane emissions from Oil & Gas could be implemented at no net cost, resulting in around a 40% reduction in global Oil & Gas methane emissions. Based on record natural gas prices seen in 2022, the IEA found that those numbers increase to around 80% of the actions and 60% of the emissions.²⁶ This is because the outlays for abatement are less than the market value of the additional gas that is captured.

There are also actionable opportunities that have a limited financial net cost to Oil & Gas companies. As companies consider potential future carbon price scenarios (e.g., internal pricing or compliance mechanisms) and their implications for allocating capital to carbon abatement projects, the high potency of methane on a CO₂-equivalent basis combined with the low cost of abatement creates favorable economics to prioritize methane.

Oil & Gas methane abatement cost curve at 2017–2021 prices and 2022 prices²⁷



²⁴ IEA (2023), Global Methane Tracker 2023, IEA, Paris

²⁵ IEA (2023), Global Methane Tracker 2023, IEA, Paris

²⁶ IEA (2023), Global Methane Tracker 2023, IEA, Paris

²⁷ IEA (2023), Global Methane Tracker 2023, IEA, Paris

In total, an estimated \$100 billion in investment is required by 2030 to deploy all methane abatement measures in the Oil & Gas sector.²⁸ Despite the positive economics of abatement in many instances, barriers to action may include a lack of awareness of the problem, low-quality emissions data, capability gaps, infrastructure constraints, and relative profitability compared to other uses of capital.

LARGE SINGLE LEAK EVENTS ARE AN IMPORTANT EMISSIONS SOURCE, BUT CUMULATIVE METHANE EMISSIONS FROM NORMAL OIL & GAS OPERATIONS ARE MORE SIGNIFICANT

Avoiding very large leaks, and quickly addressing those that do occur, is a key opportunity to reduce methane emissions. But such events are only one piece of the puzzle. Normal Oil & Gas operations around the world, on average, emit the equivalent amount of emissions every day as the largest single leak event ever recorded.²⁹ Efforts to prevent very large leaks must be paired with steps that reduce emissions from daily operations (e.g., installing emissions control devices or replacing leaky equipment).

While Oil & Gas players across the value chain (upstream, midstream, and downstream) have an opportunity to benefit from focusing on methane, we recognize that different technologies and solutions will make sense for different types of operators and in different geographies. We aim to work with industry participants to find solutions to support their work to reduce methane emissions and flaring in their circumstances.

INDUSTRY STAKEHOLDERS INCLUDING INVESTORS, INSURANCE PROVIDERS, AND POLICYMAKERS RECOGNIZE THE IMPORTANCE OF THE METHANE RISK AND OPPORTUNITY FOR THE OIL & GAS SECTOR AND ARE TAKING ACTION³⁰

Investors: Large asset managers are actively engaging with companies in the Oil & Gas sector on the topic of methane. PIMCO, for example, has stated that its rationale to engage on the topic is due to a variety of factors, including:³¹

- *“If not curtailed, methane emissions could limit American companies’ access to global gas export markets and jeopardize the role of natural gas in a decarbonizing economy”; and*
- *“[Methane emissions] from Oil & Gas operations is an example of a material concern that puts both invested capital as well as the climate at risk, making it a priority topic when engaging with energy sector issuers”*

As another example, Legal & General Investment Management (LGIM) published net zero sector guides addressed to directors of companies that issue securities on public markets, including specific guidelines for the Oil & Gas sector around methane leaks, venting and flaring.³² According to LGIM, no-net-cost methane reduction efforts are easier to achieve in the short term for corporates and are part of the net zero pathway, along with commitments to achieve zero routine flaring and significantly limit methane intensity.³³ In 2023, LGIM also included more stringent climate expectations for corporates, such as time-bound methane reduction and zero flaring targets, backed by voting and investment sanctions.³⁴

²⁸ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

²⁹ [Impact of the Nord Stream gas leak on methane emissions 2023, UNEP](#) Note: In September 2022, a series of blasts at two subsea natural gas pipelines caused a methane leak of 75-230kt according to the UN International Methane Emissions Observatory.

³⁰ In pursuing the global goal of a transition to a low-carbon economy, JPMorgan Chase always operates independently and uses its own judgment based on the best interest of the firm and serving our clients and will continue to do so.

³¹ [Engaging With Stakeholders to Reduce Methane Emissions From Oil & Gas Production 2022, PIMCO](#)

³² [Net zero: Oil & Gas 2021, LGIM](#)

³³ [Net zero: Oil & Gas 2021, LGIM](#)

³⁴ [Climate Impact Pledge Report 2023, LGIM](#)

Policymakers: Policymakers at the international, national, and state levels have put new measures in place in recent years to require or incentivize industry efforts to reduce methane emissions and flaring and improve the quality of emissions quantification and reporting. In the United States, the Inflation Reduction Act (IRA) includes grant funding for methane monitoring and abatement, a methane fee starting at \$900 per ton in 2024, and a directive to improve the Greenhouse Gas Reporting Program. The U.S. Environmental Protection Agency (EPA) regulates methane emissions and states such as Pennsylvania, New Mexico, and Colorado also have state-specific regulations in place. Internationally, the European Union is pursuing efforts to address emissions and data quality from both domestic and imported natural gas. Canada³⁵, China³⁶, and other nations are also actively engaged on this issue. At COP26, in 2021, nations signed the Global Methane Pledge (GMP).³⁷ The GMP now includes around 150 countries agreeing to take voluntary actions to contribute to a global effort to reduce global methane emissions by at least 30% from 2020 levels by 2030.³⁸

Insurance Providers: Insurance companies are a key stakeholder of the energy companies they underwrite. In 2023, Chubb announced new underwriting criteria for Oil & Gas extraction projects that will require clients to reduce methane and flaring emissions.³⁹ According to Chubb, it will continue to provide coverage to its clients that *“implement evidence-based plans to manage methane emissions including, at a minimum, having in place programs for leak detection and repair and the elimination of non-emergency venting.”*⁴⁰ Chubb has stated that its clients must also implement at least one measure that has been demonstrated to reduce emissions from flaring.⁴¹ To support its clients in these efforts, Chubb created a customer resource center that helps in identifying and adopting methane emissions reduction technologies.⁴²

³⁵ [Faster and Further: Canada’s Methane Strategy 2022, Government of Canada](#)

³⁶ [IEA \(2023\), People’s Republic of China, National Methane Action Plan 2023, IEA, Paris](#)

³⁷ [COP26 Global Methane Pledge](#)

³⁸ [IEA \(2023\), Global Methane Tracker 2023, IEA, Paris](#)

³⁹ [Chubb Announces New Climate and Conservation-Focused Underwriting Standards for Oil & Gas Extraction 2023, Chubb](#)

⁴⁰ [Chubb Announces New Climate and Conservation-Focused Underwriting Standards for Oil & Gas Extraction 2023, Chubb](#)

⁴¹ [Chubb Announces New Climate and Conservation-Focused Underwriting Standards for Oil & Gas Extraction 2023, Chubb](#)

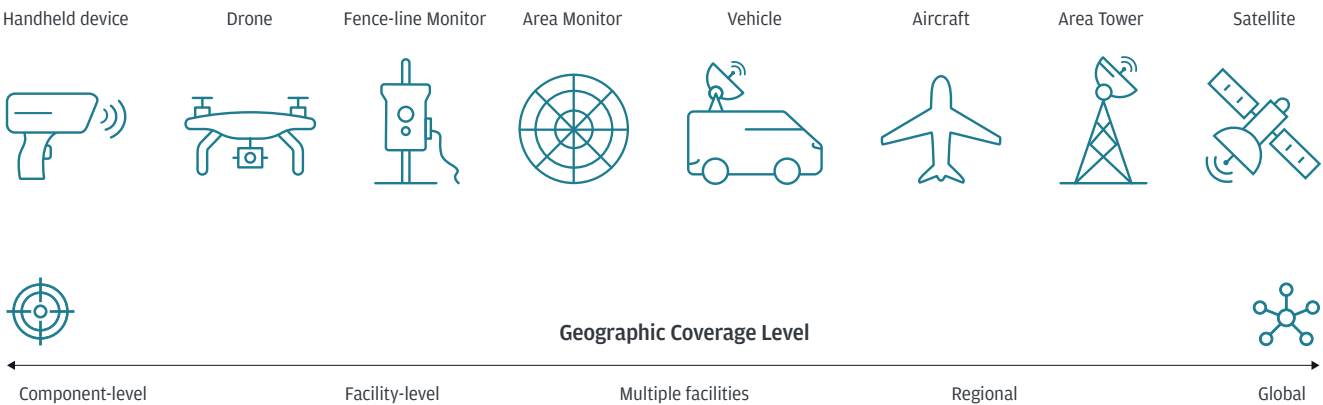
⁴² [Methane Resource Hub, Chubb](#)

IV. Landscape of Methane Monitoring and Measurement Technologies

One historical reason that methane emissions have been difficult to address is a lack of reliable, real-world data. Most Oil & Gas companies today use factor-based computer modeling to generate estimates of their methane emissions. Studies have found that such desktop-based estimates often substantially underestimate real-world methane emissions, at times by up to 60%, which further emphasizes the need to accelerate the deployment of methane monitoring technologies.⁴³

Depending on the size, type, and location of operations, Oil & Gas companies have a breadth of methane monitoring and measurement solutions they can chose from. These solutions vary by technology, geographic coverage, cost, measurement sensitivity, and many other factors.⁴⁴ One estimate forecasts the market for methane detection technologies to exceed \$900 million by 2025 and puts the total addressable market (TAM) at \$14.9 billion.⁴⁵ North America is projected to account for a majority (58%) of the advanced methane detection market by mid-century, largely driven by the goals of corporates operating in the region, the number of upstream assets in the region, and the presence of a supportive regulatory environment.⁴⁶

Advanced emission detection and quantification platforms⁴⁷



Note: Coverage capabilities vary across technologies and platforms

One solution in isolation may not provide a complete view of a company’s methane footprint. Oil & Gas companies across the value chain can the optimal mix of technology tools that can provide a decision-useful view of the company’s methane footprint, helping to prioritize opportunities to invest in emissions reduction.

⁴³ [Major studies reveal 60% more methane emissions, EDF](#)
⁴⁴ [Benchmarking Methane and Other GHG Emissions 2023, Ceres and Clean Air Task Force](#)
⁴⁵ [BloombergNEF](#)
⁴⁶ [BloombergNEF](#)
⁴⁷ [Benchmarking Methane and Other GHG Emissions 2023, Ceres and Clean Air Task Force](#)

INDUSTRY IN PRACTICE: BRIDGER PHOTONICS

One example of a company performing direct methane measurement in the Oil & Gas sector is Bridger Photonics (Bridger).^{48, 49} The Montana-based start-up uses proprietary, aircraft-mounted Gas Mapping LiDAR (GML) to scan Oil & Gas infrastructure to pinpoint leaks and quantify emission rates. According to Bridger, this laser-based technology can be used throughout the Oil & Gas value chain, from production sites to transmission pipelines to end-user distribution.

According to Bridger, energy clients can choose the frequency of asset scans and what sites are monitored based on their goals and needs. After a scan occurs, Bridger identifies large emissions and sends alerts, followed by a safety report and a final emissions data report. The final assessment includes data covering leak location, emissions rates, plume imagery, and aerial site photography. Aerial scans can increase the efficiency of methane detection, and actionable data can allow for the identification and mitigation of emission sources.

The main benefits of direct methane management can include:

- 1. Reduced Emissions:** GML technology can produce a GPS pinpoint of the emitter source along with visual plume imagery. Actionable data is delivered to clients to enable leak detection and repair, and to support preventative measures.
- 2. Increased Efficiency:** Emission detection and localization at the component level are achieved without site access, allowing for an efficient deployment of ground crews for repairs.
- 3. Accurate Emissions Mapping:** Emissions can be accurately quantified for energy clients and used towards abatement prioritization, improved reporting, and optional certifications.

INDUSTRY IN PRACTICE: DEVON ENERGY

Oklahoma based Oil & Gas producer Devon Energy (Devon)⁵⁰ has announced it is focusing on the monitoring, measurement and reporting of methane emissions, including its commitment to cut its methane emissions intensity 65% by 2030.⁵¹ Devon also committed to reduce its flaring intensity to 0.5% or lower by 2025 and to eliminate routine flaring by 2030.⁵² Devon sees advanced methane detection technologies and measurement-informed reporting methodologies as key to informing its mitigation strategy and to credibly and transparently disclosing progress on its emissions reduction goals.⁵³

According to Devon, the company currently surveys its entire portfolio of production facilities with fixed-wing aircraft flyovers at least twice annually and is investigating and deploying continuous- and near-continuous monitoring technologies. The company indicates that its emissions monitoring test facility near its corporate headquarters in Oklahoma City plays an important role in identifying which technologies are viable candidates to incorporate more broadly across its various operating areas.

⁴⁸ [Gas Mapping LiDAR for Unparalleled Methane Emissions Detection, Bridger Photonics](#)

⁴⁹ A member of the JPMorgan Chase Board of Directors maintains a minority investment in Bridger Photonics through a multi-investor syndicate.

⁵⁰ Devon Energy is a client of J.P. Morgan Securities Inc.

⁵¹ [Devon Energy Establishes New Environmental Performance Targets Including Net Zero GHG Emissions 2021, Devon Energy](#)

⁵² [Devon Energy Establishes New Environmental Performance Targets Including Net Zero GHG Emissions 2021, Devon Energy](#)

⁵³ [Devon Energy Establishes New Environmental Performance Targets Including Net Zero GHG Emissions 2021, Devon Energy](#)

Devon indicates that deployment of these technologies generates new data that the company is working to better understand, analyze, and integrate into its leak detection and repair program, change management processes, facility designs, and reporting methodologies. Devon reports that it undergoes independent, third-party verification of its emissions data under current reporting methodologies and works closely with peers and other stakeholders to develop new methodologies that incorporate data from innovative technologies. Devon joined the Oil and Gas Methane Partnership 2.0 in 2022 and is a foundational sponsor of Veritas, by GTI Energy.

According to Devon, deployment of innovative technologies like advanced methane detection will take time given asset distribution and variability, and should be incentivized by policymakers and the financial sector. Devon suggests that as policymakers develop more stringent regulations for controlling, reducing, and reporting methane emissions, they should take particular care in evaluating the unintended consequences of overly prescriptive or punitive regulations. According to Devon, the financial sector should recognize the climate and environmental benefits of constructively engaging and partnering with the industry, including supporting operators who share the same goals of meaningfully improving their emissions performance.

V. Methane Reporting in the Oil & Gas Industry

In addition to accurate measurement, robust and transparent reporting is needed. One way to improve transparency is to report unconverted methane emissions separately from carbon dioxide emissions.⁵⁴ Separate reporting can allow for meaningful comparison between companies and tracking of progress over time.

Various private-sector consortiums and joint public-private efforts have been launched to improve the measurement and reporting of methane emissions from the Oil & Gas sector. These include, among others, the Oil & Gas Methane Partnership 2.0 (OGMP 2.0), the Energy Emissions Modeling and Data Lab (EEMDL), Methane Guiding Principles (MGP), Veritas, and the Oil & Gas Climate Initiative (OGCI). JPMorgan Chase applauds efforts to improve the accuracy of methane monitoring and enable robust disclosure, and aims to work with industry partners and NGOs to help make direct measurement technologies a preferred method of tracking methane emissions and informing emissions reporting.⁵⁵

We also recognize that direct measurement may result in companies disclosing higher operational emissions in the short- to medium-term when compared to prior data that relied only on desktop-based emission factors. We commend companies who take forward-leaning action on direct measurement and reporting based on the view that accurate measurement is necessary for effective management. We believe that reporting higher-quality data is an important way to build investor and stakeholder confidence over time.

Efforts to improve the measurement and reporting of methane emissions from the Oil & Gas sector

	ORGANIZATION	DESCRIPTION
1	OGMP 2.0 ⁵⁶	See <i>Industry In Practice</i> section on page 13
2	EEMDL ⁵⁷	An industry-sponsored initiative of the University of Texas at Austin, Colorado State University, and the Colorado School of Mines. EEMDL provides science-based greenhouse gas assessments of global Oil & Gas supply chains through models and tools, publicly available datasets, and education and training materials
3	MGP ⁵⁸	A public-private partnership with 50 members that develops and shares guides, tools, playbooks, reports, and case studies designed to help the industry reduce methane emissions
4	Veritas ⁵⁹	A GTI Energy-led collaborative effort across industry, research, and environmental stakeholders to develop technical protocols to calculate methane emissions for natural gas systems by six segments and offer a consistent approach to demonstrate emissions reductions in a credible and transparent way
5	OGCI ⁶⁰	An industry CEO-led initiative of 12 companies focused on capacity building and innovations in technologies and areas that can reduce emissions (e.g., carbon capture, utilization, and storage, methane emissions, and transport emissions)

⁵⁴ [Curbing methane emissions: How five industries can counter a major climate threat 2021, McKinsey](#)

⁵⁵ [Carbon CompassSM methodology, JPMorgan Chase](#)

⁵⁶ [The Oil & Gas Methane Partnership 2.0](#)

⁵⁷ [Energy Emissions Modeling and Data Lab](#)

⁵⁸ [Enabling Action to Reduce Methane Emissions Globally, Methane Guiding Principles](#)

⁵⁹ [GTI Energy's Methane Emissions Measurement and Verification Initiative](#)

⁶⁰ [Oil & Gas Climate Initiative](#)

INDUSTRY IN PRACTICE: THE OIL & GAS METHANE PARTNERSHIP 2.0

OGMP 2.0 is a measurement-based, international methane reporting framework for the Oil & Gas sector. This multi-stakeholder initiative is led by the United Nations Environment Programme (UNEP). Currently, OGMP 2.0 has over 115 signatories with operations in more than 60 countries.

Member companies report methane emissions annually across operated and non-operated assets and adopt a methane reduction target (either intensity or absolute). OGMP 2.0 establishes five reporting levels, with the highest-level including reconciliation of source-level emission inventories with measurements at the site level. Member companies submit an implementation plan and update the implementation plan annually, if needed.

According to UNEP, detailed technical guidance is available to member companies, including reporting templates, scorecards, and target setting guidelines. According to UNEP, OGMP 2.0 data informs the global database of methane emissions that the International Methane Emissions Observatory (IMEO) is establishing, which also includes data from scientific measurement studies, satellites, and national inventories. The data reported by participating companies also feeds into the IMEO annual report, which includes a section on the state of methane emissions and the evolution of reporting trends based on the analysis of companies' reporting.

VI. Looking Ahead

With an increasing global focus on meeting both energy and climate needs in a balanced way, tackling methane emissions and flaring is a tangible opportunity for near-term progress.

JPMorgan Chase supports clients across the steps of their continuous improvement journey to detect and reduce methane emissions and flaring, while recognizing that clients of varying sizes have different access to resources and some practices that are attainable for the largest companies may not be attainable for others.

HOW JPMORGAN CHASE WORKS TO ENHANCE METHANE MEASUREMENT AND MITIGATION

We work across multiple segments of our business to actively identify and engage with companies that are developing promising technologies and bringing low carbon solutions to market – including those focused on methane and flaring.

Deploying Capital to Help Methane Solutions Scale

Our Commercial Banking (CB) Green Economy and Climate Tech teams lead our green economy-focused client franchise and are called upon to provide banking and leveraged finance solutions for companies focused on sustainable solutions, including methane monitoring, measurement, and abatement. We believe, over time, that providing funding to growth stage methane innovation companies can help them scale and drive down the cost curve to make services accessible for broader segments of industry. We recognize that these business models are capex and manufacturing intensive and have created solutions tailored to these unique needs.

Delivering Financing to Meet the Needs of a Variety of Market Participants

Our CB and Corporate & Investment Bank (CIB) businesses provide strategic advice, raise capital, and extend credit to a wide variety of energy producers. Dedicated advisory and product teams engage clients on their operational footprint to understand capital needs and offer tailored solutions, which may include support for measures that reduce operational emissions. As appropriate, we engage clients on incorporating methane considerations in financial products to support them in their emissions reduction efforts.

Engaging with Stakeholders

Through our Corporate Sustainability team, we engage NGOs, thinktanks, technology innovators, methane coalitions, and select clients on methane and flaring mitigation technology and practice. We welcome stakeholder engagement to share action-oriented perspectives from diverse efforts and learnings.

Evaluating Environmental and Social (E&S) Risk

As part of the firm's due diligence process of E&S risks of Oil & Gas companies (both existing clients and prospects), E&S risk teams assess companies' greenhouse gas emission risk profile, which includes their methane emissions and intensity. This review incorporates companies' public disclosures, along with their ambition for, and progress towards, their independently set reduction commitments. This information is evaluated in the context of the companies regional and global peers, and E&S risk teams can use this to discuss with companies ways to help them reach their commitments.

Moving forward, we plan to continue supporting transparent reporting efforts, which we expect to help attract more capital for methane reduction and flaring mitigation projects. We also intend to continue learning from and working with others who share the goals of advancing technology and positive actions, including supporting smaller companies with realistic steps they can implement.

Below, we identify eight interrelated elements for Oil & Gas companies to consider implementing in their methane and flaring management plans.

	ELEMENT	LEADING MARKET PRACTICES	POSITIVE ACTION
1	Target setting	Publicly set a 2025 methane emission intensity target at or below 0.20%	Set a methane-specific emissions reduction target
2	Monitoring	Conduct quarterly methane monitoring for all operated assets	Conduct routine methane monitoring for largest operated assets
3	Reduction plans	Develop and disclose plans and timelines for emission reduction, including priority assets	Develop and disclose methane abatement initiatives
4	Flaring	Commit to eliminating routine flaring by 2025 with credible plans to significantly reduce all (routine and non-routine) flaring by 2030 or sooner	Develop plans to reduce routine flaring by 2025
5	Measurement and Reporting	Demonstrate a commitment to methane measurement and reporting by participating in the Oil & Gas Methane Partnership 2.0 or equivalent standard	Report methane emissions separately from CO ₂ emissions
6	Culture	Regularly drive methane management as a priority from senior management to operators and contractors in the field	Educate and engage workforce on importance of methane emission management as good operational practice
7	Third-party engagement	Consider undertaking independent, third-party audits to validate measurements and support continuous improvement	Learn from no-cost, best management practices disseminated by leading industry groups
8	Mergers and Acquisitions (M&A)	Improve operational emission footprint of acquired assets and pursue responsible disposition of assets	Include consideration of operational emission consequences as one factor during M&A activity

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The information provided in this document reflects its authors’ understanding and approach to methane emissions in the Oil & Gas sector as at the date of this document and is subject to change without notice. We do not undertake to update any of such information in this document. This document contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements relate to, among other things, our goals, commitments, targets, aspirations, and objectives, and are based on the current beliefs and expectations of JPMorgan Chase’s management and are subject to significant risks and uncertainties, many of which are beyond JPMorgan Chase’s control. Expected results or actions may differ from the anticipated goals and targets set forth in the forward-looking statements. In addition, our ability to measure many of our goals, commitments, and targets is dependent on data that, in some instances, is measured, tracked, and provided by our clients, other stakeholders, and third-party data providers; our ability to measure progress toward our goals, commitments, and targets is subject to the quality and availability of such data. Factors that could cause JPMorgan Chase’s actual results to differ materially from those described in the forward-looking statements include the necessity of technological advancements, the evolution of consumer behavior, the need for thoughtful climate policies, the potential impact of legal and regulatory obligations, and the challenge of balancing our commitment to short-term targets with the need to facilitate an orderly and just transition and energy security. Additional factors that could cause JPMorgan Chase’s actual results to differ materially from those described in the forward-looking statements can be found in JPMorgan Chase’s Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K filed with the SEC. Those reports are available on [JPMorgan Chase’s website](#) and on the [Securities and Exchange Commission’s website](#). JPMorgan Chase does not undertake to update any forward-looking statements.

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