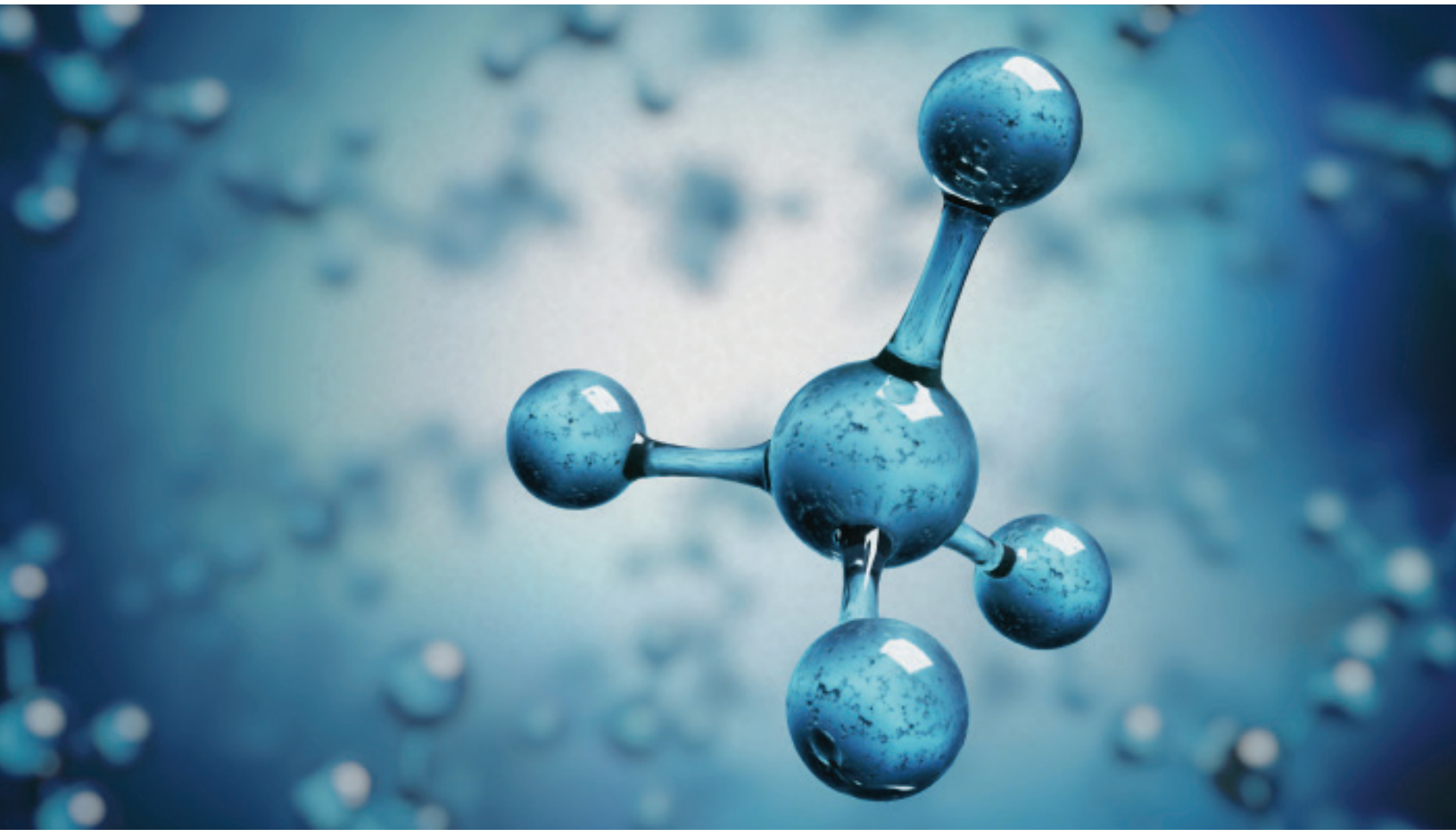
Highwood Emissions Management

December 2024

The Methane Data Problem: A Looming Risk with Major Potential Consequences for Banks



Summary

As society moves to demand lower carbon intensity energy, financial institutions play a critical role in shaping the path forward for the oil and gas sector. This report explores the growing need for accurate methane data, the role of measurement-informed inventories, and how existing frameworks including OGMP 2.0 and EU regulations can facilitate meaningful collaboration between banks and industry.

Key insights include:

- Financial institutions face mounting pressure to align with and support oil and gas companies that will thrive in a low-carbon future.
- Financial institutions require accurate, company-specific methane data for their own corporate carbon accounting and meaningful engagement with the oil and gas sector.
- Of the four data categories defined in this report, measurement-informed inventories are best positioned to meet the needs identified by banks during New York Climate Week.
- The data and protocols for measurement-informed inventories, established through OGMP 2.0 and EU regulations, should form the foundation for future engagement between banks and oil and gas companies.

Thank you for reading this report, and please do not hesitate to reach out with any feedback or reflections.

Thomas Fox

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At New York Climate Week, I had conversations with a broad range of financial institutions on an emerging topic of concern – methane emissions from the oil and gas (O&G) sector. Sustainability leaders representing banks voiced a growing awareness toward methane-related risks and a perceived lack of high-quality methane data.

In their view, methane data should be:

Company-specific. Methane emissions performance varies significantly from one company to another, so data must enable differentiation and be attributable to those responsible.

Measurement-based. Direct measurements of methane emissions are increasingly preferred over generic assumptions.

Independently assured. Independent auditing and assurance of emissions data can improve accountability and ensure adherence to complex standards and protocols.

Consistent in methodology. Countless methodologies exist for calculating methane emissions. Consistency is needed to enable comparisons among companies and over time.

Forthright on limitations. Given the novelty of methane accounting, most technologies and methods have limitations that could impact accuracy and that should be disclosed.

Complete in global coverage. Measurement technologies and methane accounting standards are not always available, which can prevent meaningful comparisons of companies and regions.

A few years ago, achieving these requirements was not possible. Today, such data are emerging or already exist, but are not yet widely used by banks.

The energy transition will reshape the O&G sector, separating winners from losers. Banks are under pressure to align with and enable the winners – companies that will not just survive but thrive in a low-carbon future. The difficulty lies in identifying which companies are adapting effectively.

Methane is a major component of O&G direct emissions, often exceeding carbon dioxide for the production segment, and costing an estimated $10bn per year in lost natural gas revenues and damages in the US alone.[1] According to the International Energy Agency's (IEA) net-zero scenario, limiting global warming to 1.5°C by the end of this century requires a 75% reduction in methane emissions from O&G by 2030 – at an estimated net cost of $100bn (the IEA considers

Exhibit 1

Example of extreme variability in methane estimation methods

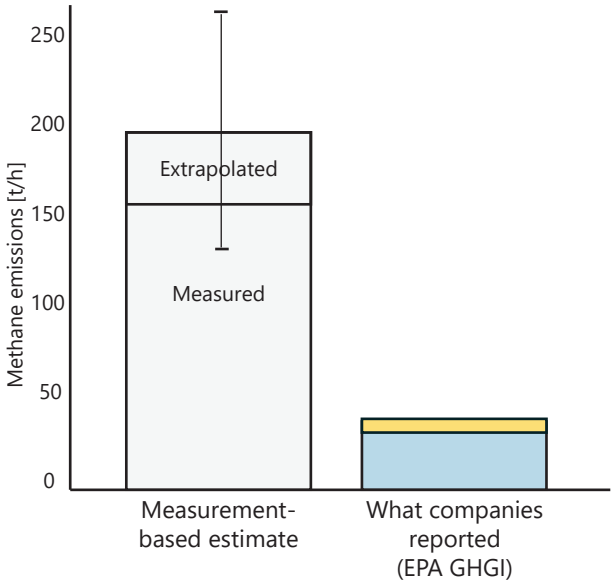

Exhibit 1. Methane emissions in the Permian Basin comparing aerial measurements with estimates derived using EPA's reporting requirements (which have since been changed). Discrepancies can go either way and differ by region and operator. Source: Chen et al., 2022.

many emissions reduction projects to be "profitable" as conserved gas can be sold).[2] Stringent and effective methane regulations are emerging in some jurisdictions – but most countries have been slow to act. At a global scale, existing regulations (if effective) and all corporate targets (if met) are expected to achieve only a 50% reduction by 2050.[2] However, financial institutions are stepping in, recognizing both risks and opportunities associated with methane.

For many financial institutions, O&G sector emissions represent a material component of their overall portfolio emissions. Accurate estimates are therefore needed to track progress toward targets and distinguish the O&G companies that will likely outcompete their peers in the energy transition from those that could fall behind.

Unfortunately, methane accounting has long been plagued by data problems. Discrepancies between reported estimates and independent measurements have been shown to approach 10x for some companies and regions, leading to the emergence of international standards that require use of company-specific data and independent verification.[3] To illustrate, Exhibit 1 compares aerial methane measurements in the Permian Basin to amounts reported to the EPA.

Why does methane matter for financial institutions?

Banks are paying close attention to methane due to stakeholder pressure and emerging global alignment that it should be prioritized among climate actions (Exhibit 2). First, scrutiny is growing from clients and stakeholders to curate and manage cleaner portfolios – including tracking and reporting of Scope 3 emissions. As a result, commitments to decarbonize portfolios have emerged.

Second, inaccurate methane data may mislead financial institutions and obscure financial risks in their portfolios. Poor-quality data could one day impact underwriting decisions and increase loss ratios. Banks must have clarity on whether O&G companies will falter under new regulations, face compliance fines from environmental regulators, or be required to purchase excessive offsets and pay carbon taxes.

Emerging methane regulations could pose an existential threat for some O&G companies. New methane rules have been approved by the European Commission that will mandate methane controls, rigorous accounting standards, and emissions intensity thresholds for importers of oil, natural gas, and coal. Depending on how these rules are further developed and applied, individual

Exhibit 2

Financial exposure risks for financial institutions and the oil and gas sector

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The EU will soon mandate rigorous methane standards for importers of oil and natural gas, creating hurdles for market access.

producers could face hurdles in accessing a major market. In the US, new rules by the Environmental Protection Agency (EPA) will – for the first time – apply to decades-old marginal production facilities. Compliance will require expensive retrofits that may be uneconomical for hundreds of O&G companies across the United States.

How can banks help to reduce methane emissions?

Financial institutions can leverage different strategies to encourage methane emissions reductions in their portfolios. One simple yet effective strategy is direct engagement between banks and O&G companies. Regular conversations about methane and targeted requests for the right data can effectively foster alignment and progress toward tracking and enabling emissions reduction efforts.

Another lever is sustainable debt, which includes a broad range of financial instruments, but the jury is out on which ones can be effective for methane.[4] For instance, sustainability-linked loans may tie variable interest rates to emissions targets. Such instruments are likely to be more effective where O&G companies are capital constrained, such as for national oil companies, whose finances are often linked to national budgets. Despite growing interest in sustainable debt, its potential for reducing methane emissions is not yet proven, and it has been met with skepticism and distrust among some environmental groups.

Increasingly, banks are advocating for a "yes-and" approach to methane reductions, which considers diverse strategies—used individually or in combination—based on context. Regardless of whether banks leverage direct engagement, use-of-proceeds instruments, or sustainability-linked instruments, each relies on a foundation of accurate and trusted methane data.

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Four considerations for getting the data right

Accurate, company-specific methane data is essential for financial institutions, both for their own carbon accounting and to engage meaningfully with the O&G sector. However, diverse and inconsistent measurement technologies, algorithms, and methods to estimate emissions exist.

Broadly, methane data can be grouped into four categories:

1. Non-quantitative. Criteria-based reporting, such as determining whether an O&G company has an active Leak Detection and Repair (LDAR) program or participates in the United Nations Oil and Gas Methane Partnership (OGMP) 2.0.[5]

2. Generic bottom-up estimates. Quantitative estimates derived from industry-average emissions and activity factors, increasingly seen as unreliable for precise assessments.

3. Independent data solutions. Independent data from remote sensing technologies, (e.g., MethaneSAT and Carbon Mapper) and intelligence providers, (e.g., S&P Global, Enverus, Rystad, and WoodMac).

4. Measurement-informed inventories (MIIs). Robust company-specific estimates that compare and combine measurements from diverse

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technologies – typically to derive a company-wide annualized estimate – and require reporting of statistical uncertainties. MIIs are increasingly required by regulators, gas certification programs, and international reporting standards.

While Categories 1 and 2 can provide useful indicators, they fail to meet the criteria for company-specific measurements deemed critical by financial institutions during discussions at New York Climate Week.

Independent data solutions (Category 3), such as satellites are poised to transform global accountability in methane emissions. They were designed to (1) quickly identify and resolve major problems, (2) reveal "bad actor" sites and O&G companies with recurring issues, and (3) reveal broad spatial and temporal patterns.

Unfortunately, Category 3 data were not designed to derive accurate and consistent annual methane estimates for individual companies. These solutions lack the coverage and resolution needed to deliver high-quality, company-specific methane estimates. The most sophisticated satellite systems remain orders of magnitude less sensitive than typical methane sources for most companies – especially those that are leading the charge on eliminating methane. Satellites also face challenges in specific conditions, such as over water (offshore) or in cloudy producing regions. For instance, the Marcellus Basin, Colombia, and Papua New Guinea experience 200–300 cloudy days per year, which can significantly impact data coverage.

For precise, company-specific methane accounting, financial institutions may need to leverage measurement-informed inventories, which are already required by the new European methane regulations and voluntary initiatives like OGMP 2.0 – a United Nations methane reporting program that consists of 140+ O&G companies. Concerns about the trustworthiness of self-reported data from O&G companies can be mitigated through independent verification and robust audit and assurance practices. Such practices are already well-established for MiQ gas certification and Veritas protocols and will be required for EU imports. Audit and assurance methods, routine for financial data and O&G reserves, can similarly be applied to self-reported methane emissions.

Conclusion

In summary, each of the four data categories offer valuable insights and should be part of a "yes and" approach. However, measurement-informed inventories are required to get robust company-specific annual estimates and to track emissions reduction progress. The data and protocols for measurement-informed inventories already exist and should be a foundation for future engagement between banks and O&G companies.

Thomas Fox is President of Highwood Emissions Management. His expertise is in methane detection and quantification technology, voluntary initiatives, measurement-informed inventories, and forecasting emissions management strategies through simulation. At Highwood, Thomas works with industry, regulators, and innovators to evaluate and deploy cutting-edge emissions management solutions. He holds a PhD from University of Calgary and an MSc from McGill University.

Endnotes

[1] Stanford Report, " Methane emissions from U.S. oil and gas operations cost the nation $10 billion per year", March 2024. https://news.stanford.edu/stories/2024/03/methane-emissions-major-u-s-oil-gas-operations-higher-government-predictions

[2] International Energy Agency (IEA), Global Methane Tracker 2024: Key Findings, February 2024. https://www.iea.org/reports/global-methane-tracker-2024/key-findings

[3] Research Square, "Quantifying oil and natural gas system emissions using one million aerial site measurements", preprint, March 2024. https://doi.org/10.21203/rs.3.rs-2406848/v1

[4] Sustainable debt instruments, including green bonds and sustainability-linked loans, are gaining traction for funding environmental projects, but their effectiveness in addressing methane emissions specifically remains uncertain due to varying standards and transparency in reporting. Environmental Defense Fund (EDF), Report on Sustainable Finance Instruments, 2024. https://business.edf.org/wp-content/blogs.dir/90/files//Report-on-Sustainable-Finance-Instruments.pdf

[5] The Oil & Gas Methane Partnership 2.0 (OGMP 2.0) is the United Nations Environment Programme's flagship oil and gas reporting and mitigation programme. OGMP 2.0 is the only comprehensive, measurement-based reporting framework for the oil and gas industry that improves the accuracy and transparency of methane emissions reporting. https://ogmpartnership.com/