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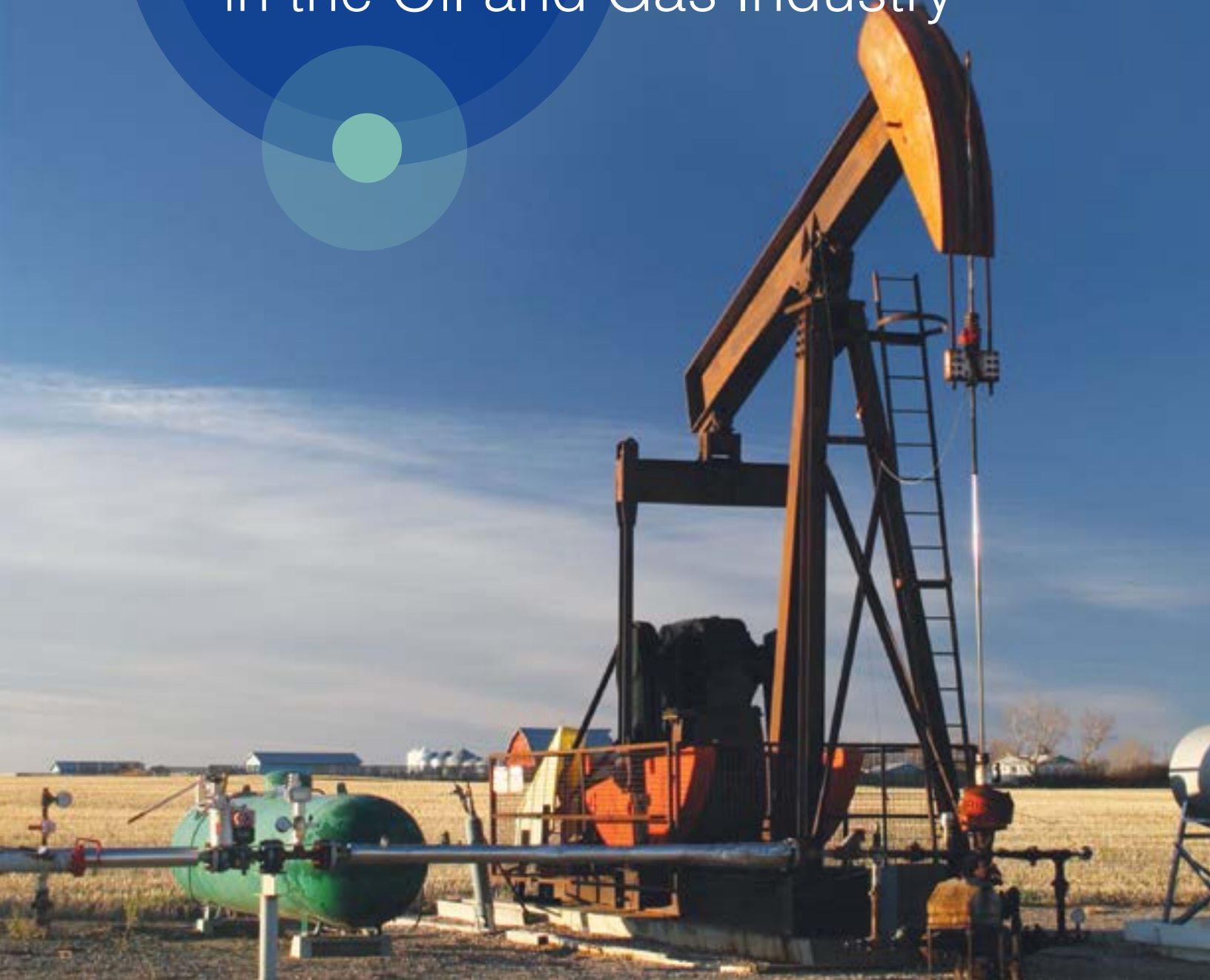
RISING RISK:

Improving Methane Disclosure in the Oil and Gas Industry



Foreword

JANUARY 11, 2016

As the nation's largest educator-only public pension fund managing over $185 billion in assets, the California State Teachers' Retirement System (CalSTRS) is well aware of the substantial risk that climate change poses to the economy, corporate bottom lines and investor portfolios. As a matter of fiduciary duty, we are escalating our attention on this pivotal issue, while working to ensure that the many companies we own are doing the same.

Potent methane emissions from the oil and gas industry pose a burden on the climate and a risk to the industry's reputation, while also representing waste of a valuable product. Therefore, enhanced methane management is both a risk-mitigation imperative and a financial opportunity. Improving methane emission disclosure is a key step toward securing investor confidence, managing risk and unlocking returns.

As a shareholder with a global portfolio, CalSTRS has a financial stake in the long-term performance of the natural gas industry. However, for the gas industry to be part of the solution in the needed transition to a low-carbon global economy, methane emissions — which literally leak away the potential climate benefits of natural gas over other fossil fuels — must be actively managed. Improved methane emission disclosure is one important piece of the climate change risk management puzzle.

Rising Risk: Improving Methane Disclosure in the Oil and Gas Industry is a valuable contribution to the dialogue about climate solutions, offering fresh insights for investors along with a valuable roadmap for improved disclosure. The data-driven analysis in *Rising Risk* underscores the need for improvement in methane emissions disclosure to address reputational risk, regulatory risk and economic waste. CalSTRS believes that the use of a core set of streamlined methane metrics to improve transparency will contribute to improved risk management for the industry. Improving methane management and related disclosure will also help companies maximize operational efficiencies, get ahead of upcoming regulations and do their part to address climate change.

Managing methane emissions is a critical part of the urgent challenge of addressing climate change. In keeping with our fiduciary duty, CalSTRS will encourage oil and gas operators to embrace improved methane emissions disclosure as a win-win opportunity to mitigate risk, build trust and create long-term shareholder value.

Jack Ehnes
Chief Executive Officer
California State Teachers' Retirement System

Executive Summary

Voluntary reporting on methane emissions by the oil and gas industry is poor — less than a third of reviewed companies report emissions and zero companies disclose emissions reduction targets **making it challenging for investors to effectively gauge materiality, assess performance and manage risk.**

Methane, the primary component of natural gas, is a climate pollutant 84 times more powerful than carbon dioxide over a 20 year period, and it is responsible for a quarter of the warming we are experiencing today.[1]

Emissions from the oil and natural gas industry represent the largest industrial source of methane emissions, both in the United States and globally.[2] Methane emissions undermine the value proposition of natural gas for delivering cleaner, low-cost energy, and have drawn increasing scrutiny from the public, environmental and health groups, and state and federal policymakers. Additionally, emissions of methane represent wasted saleable product, with implications for operational efficiency and the bottom line. Unfortunately, reporting of methane emissions by the industry is lacking, making it challenging for investors to effectively understand the materiality of the problem, assess performance and manage risk.

Benefits of Methane Emissions Data

Improved transparency is required to enable investor management of three key risks:

- **Economic:** Emissions of methane, the main component of natural gas, represent a loss of resources that directly impact topline revenue. Estimates suggest that as much as $30 billion of natural gas is emitted into the atmosphere each year globally, with $2 billion lost annually in the U.S. alone.[3] Low-cost solutions exist to reduce these emissions, many of which come with a positive payback.[4] Understanding company methane management practices and results can serve as a proxy for operational efficiency.[5]
- **Regulatory:** Regulators at the state and federal level are beginning to institute standards to limit methane emissions. Methane emissions information can help investors understand a company's exposure and how easily it can comply with regulations as they are implemented.
- **Reputational:** Methane emissions are a long-term reputational risk for the industry. Methane reduces the climate benefits of natural gas and thus undermines its ability to hasten the transition towards a lower-carbon economy. Better data can help investors understand how industry is addressing this issue.

This report has three purposes: (1) to educate oil and gas investors on the importance of methane emissions, (2) examine and document the current state of reporting on methane in the U.S. oil and gas sector and (3) provide recommendations to improve the amount, quality, and accuracy of methane emissions data.

The Current State of Methane Reporting is Inadequate

To understand the current state of reporting, EDF conducted an analysis of 40 of the largest U.S. oil and gas producers, as well as 25 large midstream companies. We reviewed primary sources of information for investors and other stakeholders, including SEC filings, CDP questionnaires, sustainability reports and company websites. The primary findings include:

- **Zero companies disclose reduction targets, and few report methane-related data.** Of the 65 companies, only 18 reported their methane emissions. Even fewer companies provided detailed information on how they are managing their emissions. Zero companies provided quantitative reduction targets, and one company provided comprehensive information regarding their leak detection and repair (LDAR) programs. A positive correlation between size of companies and quality of disclosure suggests the state of disclosure among the smaller companies not within the scope of this report may be even worse.
- **The quality of disclosure is low, limiting usefulness for decision-making.** Among companies that disclose emissions, reports contain vague, qualitative information that is not actionable. The qualitative and highly variable nature of corporate disclosures limits meaningful assessments of, and comparisons between, individual companies. Furthermore, companies measure their emissions in a variety of ways, primarily using estimates, which diminishes the accuracy of data.
- **The lack of rigorous and standardized metrics hampers disclosure quality.** Across the various disclosure platforms, each has a different methodology for how companies should report their methane information. This inconsistency limits the comparability of data.

Recommendations: A New Approach to Reporting Can Improve Transparency

Based on the challenges with current reporting, three areas must be addressed to improve methane disclosure:

METRICS

Investors need rigorous, accurate and comparable information to assess company performance. Unlike in financial reporting, no standardized metrics currently exist for methane emissions. EDF, with input from investors and operators, has developed a set of methane metrics. These metrics will make data more actionable and aid in the assessment of methane performance. We recommend that operators utilize the metrics as performance indicators to drive operational improvements, investors use metrics to assess performance and manage risk, and disclosure platforms incorporate the metrics in their questionnaires and methodologies.

- **Emission Rate —** Emission rate refers to the percentage of total methane volume which is being lost as a function of production or throughput — a single methane intensity figure. By reporting emissions as a percentage, the resulting data becomes comparable between companies, regardless of size, and over time, as a given company's operations evolve.
- **Reduction Targets —** Goal setting is the most basic and effective management device for improving performance. Emission reduction goals and timelines provide actionable information about management commitment to reduce emissions.
- **LDAR Protocol —** Operators should report the frequency, methodology and scope of their leak detection and repair (LDAR) programs. LDAR is one of the most important ways for a company to reduce emissions, so understanding how a company approaches LDAR can help investors gauge how effectively a company is reducing emissions.
- **Economic Value of Methane Emissions —** Expressing methane emissions as a dollar value allows investors to easily understand the potential financial impact of wasted natural gas.

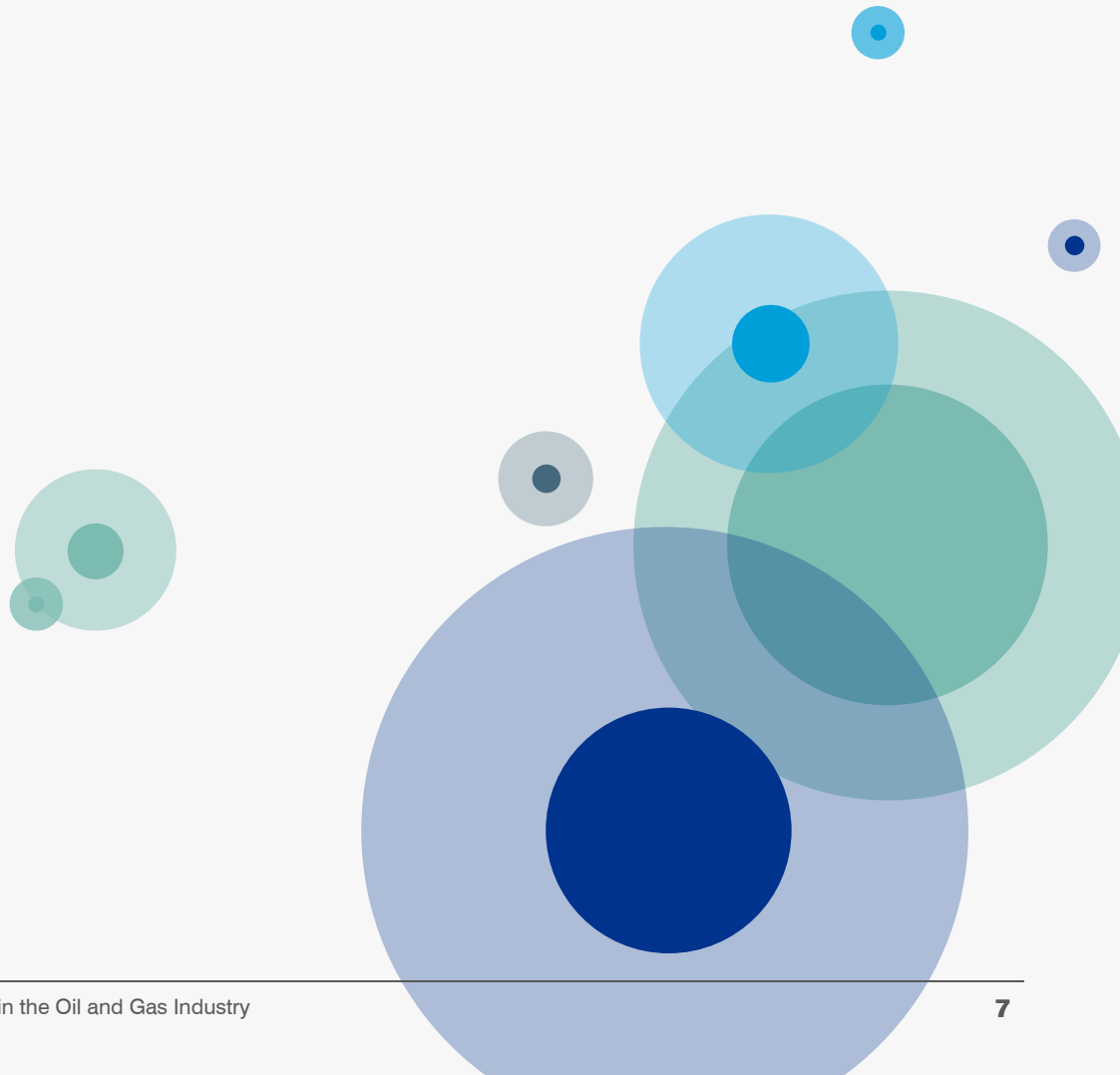
ACCURACY

The accuracy of reported methane data can be improved. Companies often use emission estimates that may be based on outdated information and thus not reflective of actual emissions. Companies should strive to utilize direct measurement of emissions, particularly for fugitive emissions.[6] In general, companies should ensure that their measurement is comprehensive, based on frequent observation and employs rigorous quantification.

PLATFORMS

While the Environmental Protection Agency's (EPA) Greenhouse Gas Reporting Program (GHGRP), a compliance reporting program, has substantial information on methane emissions for U.S. facilities, it could be further strengthened to improve its usefulness for investors. Organizations like CDP, Sustainability Accounting Standards Board (SASB), and Global Reporting Initiative (GRI) have developed to fulfill investors' growing desire to incorporate environmental, social and governance (ESG) data, such as methane, into their decision-making processes. Operators should utilize these platforms. In turn, the organizations must elevate the methane component of their reporting platforms, and improve it by using key methane metrics to harmonize standards, improve comparability and reduce reporting burden on operators.

While better methane reporting is critical for investors, such improvement should also help operators. The process of measuring and reporting methane emissions will drive increased management attention to this issue, leading to waste reduction, higher revenues and improved positioning to comply with regulations. Furthermore, given the continued public concerns about the environmental impacts of fossil fuel development, improved transparency on methane management can foster constructive dialogue across multiple stakeholders and ultimately build trust for long-term operations.



About the Authors

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Carlos Villacis contributes to Environmental Defense Fund's Corporate Partnerships Program, focusing on natural gas and methane mitigation. Carlos is a Master's degree candidate at George Washington University, specializing in environmental policy. Prior to EDF, Carlos worked for the Environmental and Energy Study Institute and Kiva.org, and was an analyst for Stockman's Water & Energy.

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