CLEAN AIR TASK FORCE CARBON LIMITS

Methane Abatement in Ghana’s Oil and Gas Sector

This fact sheet presents findings for Ghana from a broader study assessing the costs and financial implications of methane abatement measures across nine countries in Africa and Latin America. The study aims to support regulators in designing appropriate incentives and policies to guide and prioritize the deployment of abatement technologies.

Estimates of abatement potential and mitigation costs are developed at the country level, accounting for real-world constraints including existing policy frameworks, ease of deployment, and prevailing industry practices. Four key abatement measures were analyzed: leak detection and repair (LDAR) programs, installation of vapor recovery units (VRU) for storage tanks, replacement of natural gas-driven pneumatic equipment with electric or air-driven alternatives, and improved flaring practices. Additional technologies, operational practices, and regulatory approaches can further drive methane reductions but are beyond the scope of this study. The full report, published in June 2026, is available via the QR code.

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Key figures

Estimated annual emissions[1]

96 kt methane

(2.9 Mt CO_2e)

Emissions analyzed[2]

48 kt methane

(50% of estimated emissions)

Technical abatement possible from analyzed technologies

29%

of estimated emissions

Low-cost abatement potential from analyzed technologies[3]

29%

of estimated emissions

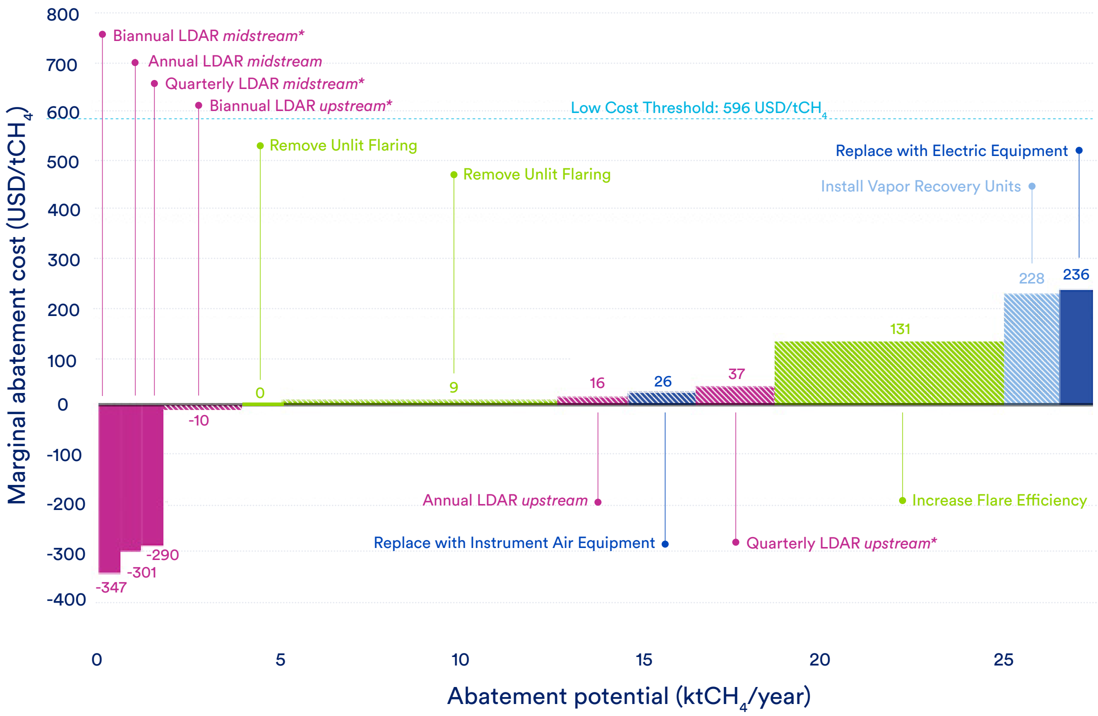
Current policies and practices

Until recently, Ghana had only limited methane-specific regulatory requirements[4], and most mitigation efforts depended on operators’ own standards. Existing requirements were limited to restrictions on flaring and venting, enforced through facility limits and penalties for unapproved flaring. **The new Environmental Protection (Petroleum) Regulations (2025)**[5] **mark a shift toward a dedicated methane framework**, introducing clearer expectations for inspection, monitoring, and emissions control. Supporting technical guidelines[6] will translate these regulations into practical, enforceable procedures for inspections, repairs, and emissions reporting to the Environmental Protection Authority (EPA), with an implementation roadmap to guide effective rollout.

Ghana’s gas market and infrastructure shape methane outcomes in important ways. Most of the gas used for domestic electricity generation is produced locally, with smaller volumes supplemented through regional pipeline imports[7]. Yet, **infrastructure constraints limit the ability to bring all produced gas to the market:** in 2024, 44% of gas production was reinjected and 10% was flared[8]. These figures highlight **ongoing limits in processing capacity and transmission bottlenecks** that hinder Ghana’s ability to capture and use its gas. To address these limitations, the country is advancing **major infrastructure projects** to strengthen energy security, increase domestic gas use, and reduce routine flaring.

Key barriers to methane mitigation in Ghana include **high upfront capital costs of mitigation technologies, limited commercial incentives** when gas volumes are small, **offshore logistical challenges**, as well as ongoing **gas infrastructure gaps**. Looking ahead, Ghana’s emerging carbon-market framework[9] may create new incentives for methane abatement projects that deliver verified reductions beyond regulatory baselines.

Ghana Marginal Abatement Cost Curve for Selected Mitigation Options



Abatement technologies

Leak detection and repair (LDAR) | Replace natural gas driven equipment | Offshore
Improve flaring practices | Install vapor recovery units (VRU) for storage tanks

**Biannual costs reflect costs of increasing from annual to biannual. Quarterly costs reflect costs of increasing from biannual to quarterly*
Based on emissions data from International Energy Agency (2025) Methane Tracker Database - IEA; as modified by Carbon Limits/CATF

Analysis

Mitigation economics largely depends on whether recovered methane can be monetized: when gas can be sold, marginal abatement costs fall, and when it is flared or reinjected, costs rise. This dynamic explains why some measures, such as the implementation of LDAR programs in the midstream segment, show negative abatement costs, as recovered gas generates net savings. These savings depend on assumptions regarding gas marketability and prices. In this analysis, 41 % of recovered gas in upstream operations is assumed to be currently brought to market at a price of 5 USD/MMBtu, while 100 % of recovered gas in the midstream segment is assumed to be currently brought to market at 10 USD/MMBtu. Under these assumptions, all mitigation measures assessed fall below the low-cost threshold of 596 USD/t CH_4 (20 USD/t CO_2e).

Within this cost range, the elimination of unlit flaring delivers the largest single abatement potential, with approximately 8 kt of methane emissions reductions per year at a low marginal abatement cost of around 9 USD/t CH_4. LDAR programs in the upstream segment and the replacement of pneumatic equipment with instrument air systems also remain well below the low-cost threshold. Higher marginal abatement costs are associated with infrastructure upgrades, including improved flaring systems, installation of vapor recovery units, and replacement of pneumatic equipment with electric systems, but these are still below the low-cost threshold.

Overall, deploying the full portfolio of considered abatement measures could result in 27 kt of methane emissions reductions per year at a net cost of around USD 1 million/year. *If all recovered upstream gas were assumed to be saleable at 5 USD/MMBtu, the aggregate cost of the abatement portfolio becomes negative, implying net cost savings of around USD 0.3 million/year.*

Summary of analyzed mitigation technologies in Ghana

For further details, please refer to the mitigation technology fact sheets for each abatement technology.

Leak detection and repair (LDAR)
Implementation of Leak detection and repair programs at quarterly inspection frequency

Ease of deployment	Current practices	Abatement potential	Marginal abatement cost
Intermediate	Medium adoption	8 kt CH_4 abatable	-58 USD/tCH_4

- LDAR is one of the most cost-effective mitigation options for both offshore production facilities and onshore midstream facilities in Ghana. The recent regulations[10] require operators to conduct regular inspections using technologies such as optical gas imaging (OGI) cameras, with inspection frequency increasing progressively over the first three years, and mandate prompt repair of all detected leaks.
- Current LDAR practices are largely operator-driven, with some companies using fixed gas detectors and OGI cameras to identify fugitive emissions. Leading operators, including Eni Ghana[11], are also taking steps toward more advanced, quantitative LDAR approaches aligned with international reporting frameworks.

Improve flaring practices
Improvement of flaring practices through increased flare efficiency and elimination of unlit flaring

Ease of deployment	Current practices	Abatement potential	Marginal abatement cost
Intermediate	Low adoption	15 kt CH_4 abatable	79 USD/tCH_4

- The recent regulations[12] prohibit routine venting and limit flaring to clearly defined exceptional circumstances, such as emergency or safety-related events. Flares must achieve a minimum destruction efficiency of 98% and be supported by technology to minimize periods when flare is unlit. Any flare that becomes unlit or operates below performance standards must be repaired or replaced within strict timelines.
- Operationally, several offshore facilities rely on flare monitoring and alarm systems to detect flame outages, and some operators report upgrades (e.g., flare tip replacements) that can materially reduce methane emissions.

Install vapor recovery units for storage tanks
Installation of vapor recovery units (VRUs) on storage tanks

Ease of deployment	Current practices	Abatement potential	Marginal abatement cost
Difficult	Low adoption	2 kt CH_4 abatable	228 USD/tCH_4

- The recent regulations[12] require operators to minimize venting from tanks by capturing vapors (e.g., through vapor recovery units) or applying appropriate combustion controls. The regulations discourage the use of "vent-by-design" equipment in new facilities, while requiring operators to plan the phased replacement of higher-emitting equipment in existing installations.
- VRUs are used selectively in Ghana, but wider adoption is limited due to integration challenges with existing offshore systems and high installation costs, which require recovered gas to generate sufficient value to ensure a reasonable payback period.

Replace natural gas driven equipment
Replacement of natural gas-driven pumps and controllers with electric or air-driven alternatives

Ease of deployment	Current practices	Abatement potential	Marginal abatement cost
Intermediate	Medium adoption	3 kt CH_4 abatable	96 USD/tCH_4

- In practice, gas-driven pneumatic controllers and pumps are reportedly common across Ghana's oil and gas sector, while electrified and instrument air alternatives are not widely used.
- The recent regulations[10] require minimization of venting from equipment, discourage venting designs in new builds, and promote replacement of gas-driven pneumatic devices with zero-emission alternatives where feasible.

Legend
Ease of deployment: indicator of how easily an abatement measure can be deployed at scale, considering regulatory, logistical, and infrastructure constraints.
Current practices: indicator of the level of existing deployment of an abatement measure in the country.

Policy recommendations

Ghana has recently taken important steps toward establishing a dedicated methane regulatory framework through the adoption of the Environmental Protection (Petroleum) Regulations, which introduce clearer requirements for inspection, monitoring, and emissions control. With the regulatory foundations now in place, **near-term priorities can focus on effective implementation and enforcement** to translate these requirements into emissions reductions on the ground. Several mitigation options show low or negative marginal abatement costs, notably LDAR and elimination of unlit flaring, particularly where recovered gas can be monetized. For these low-cost measures, consistent enforcement of existing standards could support rapid uptake.

Over the medium term, targeted financial instruments, such as concessional loans or fiscal incentives, could **help address remaining deployment barriers, particularly for more capital-intensive technologies**, such as vapor recovery units or electrified equipment. Such instruments may be especially important where infrastructure constraints or market conditions limit commercial returns.

In the longer term, where marginal abatement costs remain higher due to limited gas market access, Ghana could prioritize further **development of gas processing and transmission infrastructure to expand gas monetization opportunities and progressively improve the economics of methane recovery.**

In parallel, **promoting the use of Ghana's carbon market framework** (particularly the eligibility of flaring reduction activities under the national carbon whitelist[12]) could help operators integrate potential carbon revenues into project economics. Developing projects to utilize previously flared gas and monetize it could indirectly reduce the abatement cost of other mitigation measures.

Methodology

This study estimates methane abatement potential and costs using a bottom-up marginal abatement cost curve (MACC) approach. The analysis covers four emission sources in the oil and gas sector (flaring, fugitive equipment leaks, tanks, and natural gas-driven pneumatic equipment) and evaluates a set of abatement measures for each source.

Abatement potential and costs were refined through fourteen interviews with stakeholders operating in Ghana, including oil and gas companies and technology and service providers. These interviews were complemented by a comprehensive literature review and informed assumptions on technology deployment, applicability, performance, implementation costs, and operational practices, ensuring the analysis reflects local conditions. Where recovered gas can be sold, revenues are deducted using local gas prices where available, or international benchmark prices adjusted to netback values. Country-specific MACCs were then developed using local discount rates to reflect national investment conditions and financial risks.

While this study focuses primarily on abatement costs, methane mitigation is driven by a broader set of benefits, including improved operational safety and asset integrity, enhanced local air quality, immediate climate gains due to methane's high short-term warming potential, reduced social costs of methane emissions, improved operational excellence or international regulatory compliance.

Scan the QR code at the start of this document for a full description of the methodology and key assumptions. Disclaimer: The figures presented in this fact sheet are based on national-level estimated data and analytical assumptions from 2025. Actual emissions, abatement potential, and costs may vary due to data limitations, site specific conditions, operational constraints, and cost structures. This document is intended for informational purposes only and should not be relied upon as the sole basis for investment, operational, or policy decisions. Regulators are invited to reach out to CATF for further discussions on understanding the assumptions underlying the cost curves and for guidance on the adoption and implementation of methane regulation.

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1 Based on data from International Energy Agency (2025) *Methane Tracker Database - IEA*; as modified by Carbon Limits and CATF. For further details, please refer to the methodology report.
2 Emissions analyzed refer to the share of total methane emissions impacted by the abatement measures studied.
3 Low cost refers to a cost less than 596 USD/tCH_4 (20 USD/tCO_2e using GWP 100)
4 Previous framework encompassed the Petroleum (Exploration and Production) Act, 2016 (Act 919) and the Petroleum (Exploration and Production) (Health, Safety and Environment) Regulations, 2017.
5 Republic of Ghana. (2025). *The Environmental Protection (Petroleum) Regulations.* To be released in 2026.
6 Environmental Protection Authority (EPA). (2026). *Guidelines for Inspection, Monitoring and Reporting of Fugitives Methane Emissions from Oil and Gas Operations in Ghana*. Approved by the EPA and awaiting official unveiling.
7 Energy Commission, Ghana. (2025). *2025 National Energy Statistical Bulletin*. Available at: https://energycom.gov.gh/planning/energy-statistics
8 The Petroleum Commission, Ghana. (2025). *2024 Fields Production Data* [Database]. Available at: https://petrocom.gov.gh/production-volume/
9 Republic of Ghana. (2025). *Environmental Protection Act, 2025*. Available at: https://epa.gov.gh/new/wp-content/uploads/2025/01/Environmental-Protection-Act-2025-Act-1124-2.pdf
10 Republic of Ghana. (2025). The Environmental Protection (Petroleum) Regulations. *Detailed technical guidelines to operationalize these regulations have been approved by the EPA and are expected to be released in 2026.*
11 CATF. (2025). *Building partnerships and expertise to tackle methane emissions in Ghana.* Available at: https://www.catf.us/2024/12/building-partnerships-and-expertise-to-tackle-methane-emissions-in-ghana/
12 Ghana Carbon Market Office. (2023). *Pre-selected MO Activities*. Available at: https://gcr.epa.gov.gh/wp-content/uploads/2023/12/Whitelist_Preselected_.pdf