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Methane Abatement in Angola's Oil and Gas Sector

This fact sheet presents findings for Angola 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]

796 kt methane

(23.7 Mt CO_2e)

Emissions analyzed[2]

336 kt methane

(42% of estimated emissions)

Technical abatement possible from analyzed technologies

25%

of estimated emissions

Low-cost abatement potential from analyzed technologies[3]

25%

of estimated emissions

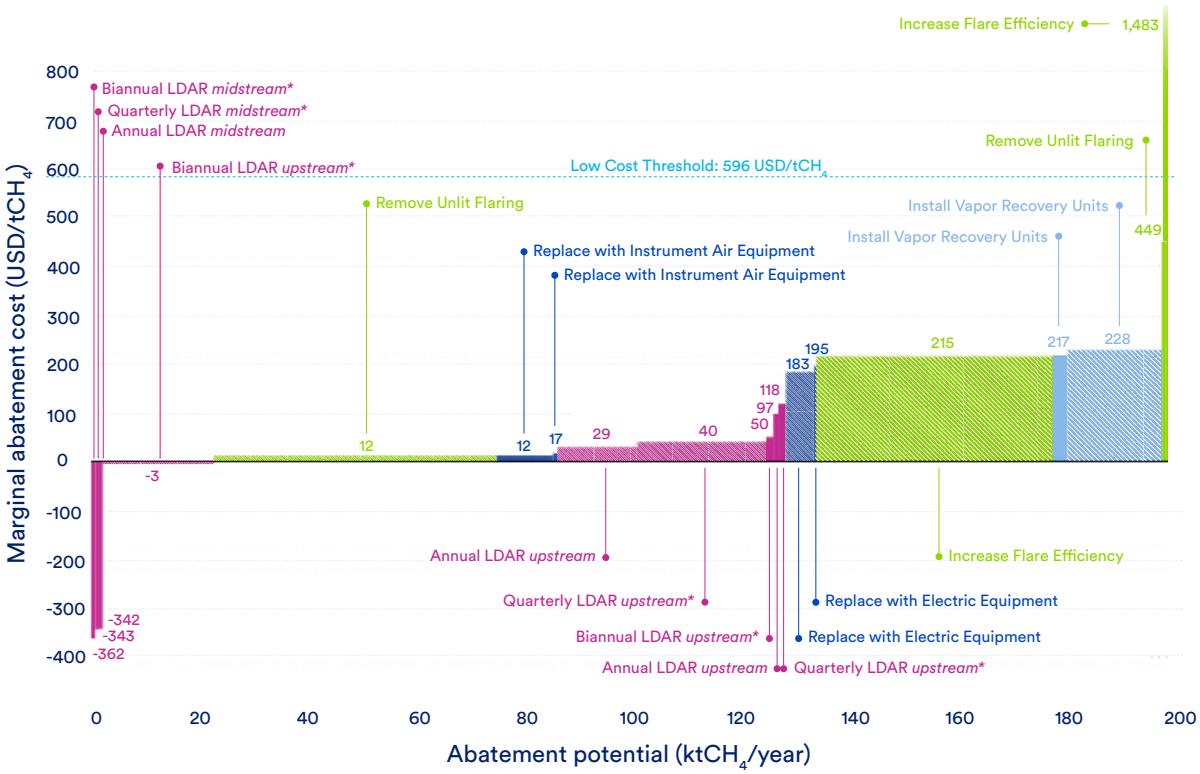
Current policies and practices

Angola does not have a dedicated methane regulatory framework, with existing provisions largely limited to restrictions on gas flaring under the Petroleum Activities Law[4,5]. Flaring is generally prohibited, although exemptions may be granted, and authorized flaring may be subject to fees. However, there is limited publicly available evidence on enforcement, compliance rates, and effectiveness, making it difficult to assess real-world impact. In parallel, **discussions are ongoing within the government to develop a national methane mitigation plan**, which could lead to future measures in the oil and gas sector. As of May 2026, a draft of this methane mitigation plan has been developed and is awaiting formal review and approval, indicating progress toward a structured policy approach.

Angola's gas market is largely export-oriented, with nearly 80% of volumes exported[6], while domestic gas use remains limited. Most natural gas production is associated with oil, and **infrastructure constraints combined with limited economic incentives[7] prevent all produced gas from reaching the market.** In 2024, 53% of gas was reinjected and 6% was flared[8]. These patterns reflect ongoing challenges in gas monetization and utilization, including the Angola liquefied natural gas (LNG) plant's historical operation below capacity. In response, **Angola has adopted the National Gas Master Plan[9]**, outlining measures to address these constraints through expanded gas infrastructure and improved gas monetization over the period to 2050.

Angola faces several methane mitigation technical and operational barriers, including offshore space and operational constraints, limited methane-specific technical expertise among domestic operators, few local service providers, some ageing facilities with legacy equipment that is not fully compatible with modern mitigation technologies, and insufficient infrastructure to reinject or commercialize captured gas.

Angola 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, 100% of recovered gas midstream is assumed to be currently brought to market at a price of 10 USD/MMBtu, while only 40% of recovered gas in upstream operations is assumed to be currently brought to market at a price of 5 USD/MMBtu. Under these assumptions, most mitigation measures assessed fall well below the low-cost threshold of 596 USD/t CH_4 (20 USD/t CO_2e).

Within this MACC, the elimination of unlit flaring offshore delivers the largest single abatement potential, with approximately 52 kt of methane emissions reductions per year at a marginal cost of around 12 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 costs are associated with infrastructure upgrades, including improved flaring systems, installation of vapor recovery units, and replacement of pneumatic equipment with electric systems.

Overall, deploying the full portfolio of considered abatement measures could result in 198 kt of methane emissions reductions per year at a net cost of around USD 18 million/year. *If all recovered upstream gas were assumed to be saleable at 5 USD/MMBtu, net abatement costs could decline to around USD 6 million/year.*

Summary of analyzed mitigation technologies in Angola

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	65 kt CH_4 abatable	14 USD/tCH_4

- Angola does not have regulatory requirements mandating leak detection and repair (LDAR) programs, and current practices vary across operators. International oil companies typically conduct LDAR campaigns as part of their global methane management strategies. Local operators are only beginning to implement LDAR, generally through limited pilot campaigns at selected facilities.
- Wider deployment is constrained by the absence of regulatory incentives and by limited local technical capacity, which often requires reliance on foreign service providers.

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	97 kt CH_4 abatable	151 USD/tCH_4

- Angola does not impose strict performance, monitoring, or repair requirements for flaring systems. Regulation is largely limited to restricting routine flaring under petroleum legislation, with flaring permitted mainly for testing or operational safety.
- The main policy instrument is mainly focused on gas monetization[9]. This orientation is also mirrored in operator strategies, which prioritize reducing routine flaring volumes over improving flaring performance standards.

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	20 kt CH_4 abatable	226 USD/tCH_4

- There are no regulatory requirements mandating the deployment of VRUs in Angola, and their uptake currently relies on voluntary operator initiatives.
- Adoption remains limited, reflecting high installation costs and the need for recovered gas to have on-site or market value for investments to be viable. Offshore space, weight, and safety constraints (particularly on older facilities) further complicate retrofitting. Wider deployment of VRUs depends on improved access to gas utilization routes, which could increase their attractiveness over time.

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	17 kt CH_4 abatable	70 USD/tCH_4

- Angola does not impose regulatory restrictions on natural gas-driven pneumatic equipment, leaving decisions on the use of pneumatic or electric pumps and controllers to operators.
- In practice, natural gas-driven equipment continues to be used on older offshore platforms, while newer installations increasingly rely on electric or instrument-air systems.

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

Angola has not established a dedicated methane regulatory framework, with existing provisions largely limited to restrictions on routine flaring under petroleum legislation. Current policy efforts instead address methane emissions indirectly through broader gas utilization and monetization objectives. **In the near term, introducing an initial regulatory framework could support cost-effective emissions reductions.** Several mitigation options, notably LDAR, replacement of natural-gas-driven pneumatic equipment, and elimination of unlit flaring, exhibit low or negative marginal abatement costs. Establishing minimum regulatory requirements, such as periodic LDAR surveys or restrictions on gas-driven equipment, could help scale deployment beyond voluntary operator initiatives. However, the effectiveness of such measures will depend on institutional capacity for monitoring, reporting and enforcement, as well as coordination between regulatory bodies, which may require targeted capacity-building support alongside regulatory development.

Over the medium term, targeted fiscal incentives or concessional financing could help address capital and capacity constraints, particularly for more capital-intensive technologies such as vapor recovery units. Such measures could complement regulatory requirements and improve uptake where commercial returns remain uncertain. At the same time, **continued development of gas infrastructure** would further support commercialization and progressively lower abatement costs by expanding monetization opportunities. In parallel, **improving the commercial terms for recovered gas**, for example delivered to the Angola LNG plant, could materially strengthen project economics and incentivize broader uptake of methane mitigation measures.

In the longer term, Angola could **focus on implementing higher-cost mitigation options, supported by international climate or carbon finance** where appropriate.

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 Angola, 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.

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 Republic of Angola. (2004). *Petroleum Activities Law, Law No. 10/04*. Available at: https://faolex.fao.org/docs/pdf/ang81903e.pdf
5 Republic of Angola. (2019). *Law No. 5/19 amending Law No. 10/04 on Petroleum Activities*. Available at: https://faolex.fao.org/docs/pdf/ang185279.pdf
6 International Energy Agency (IEA). (2023). *Angola – Natural gas*. Available at: https://www.iea.org/countries/angola/natural-gas
7 Surplus associated gas that is not utilized or commercialized by operators must be transferred free of charge to the Angola LNG plant.
8 National Oil, Gas and Biofuels Agency (ANPG). (2025). *Relatório de gestão 2024*. Available at: https://anpg.co.ao/wp-content/uploads/2025/06/Relatorio_de_Gestao_2024.pdf
9 Republic of Angola. (2025). *Presidential Decree No. 72/25 approving the Natural Gas Master Plan*. Available at: https://faolex.fao.org/docs/pdf/ang234158.pdf