CLEAN AIR TASK FORCE CARBON LIMITS

Methane Abatement in Mexico's Oil and Gas Sector

This fact sheet presents findings for Mexico 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]

1,169 kt methane

(34.8 Mt CO_2e)

Emissions analyzed[2]

616 kt methane

(53% of estimated emissions)

Technical abatement possible from analyzed technologies

34%

of estimated emissions

Low-cost abatement potential from analyzed technologies[3]

34%

of estimated emissions

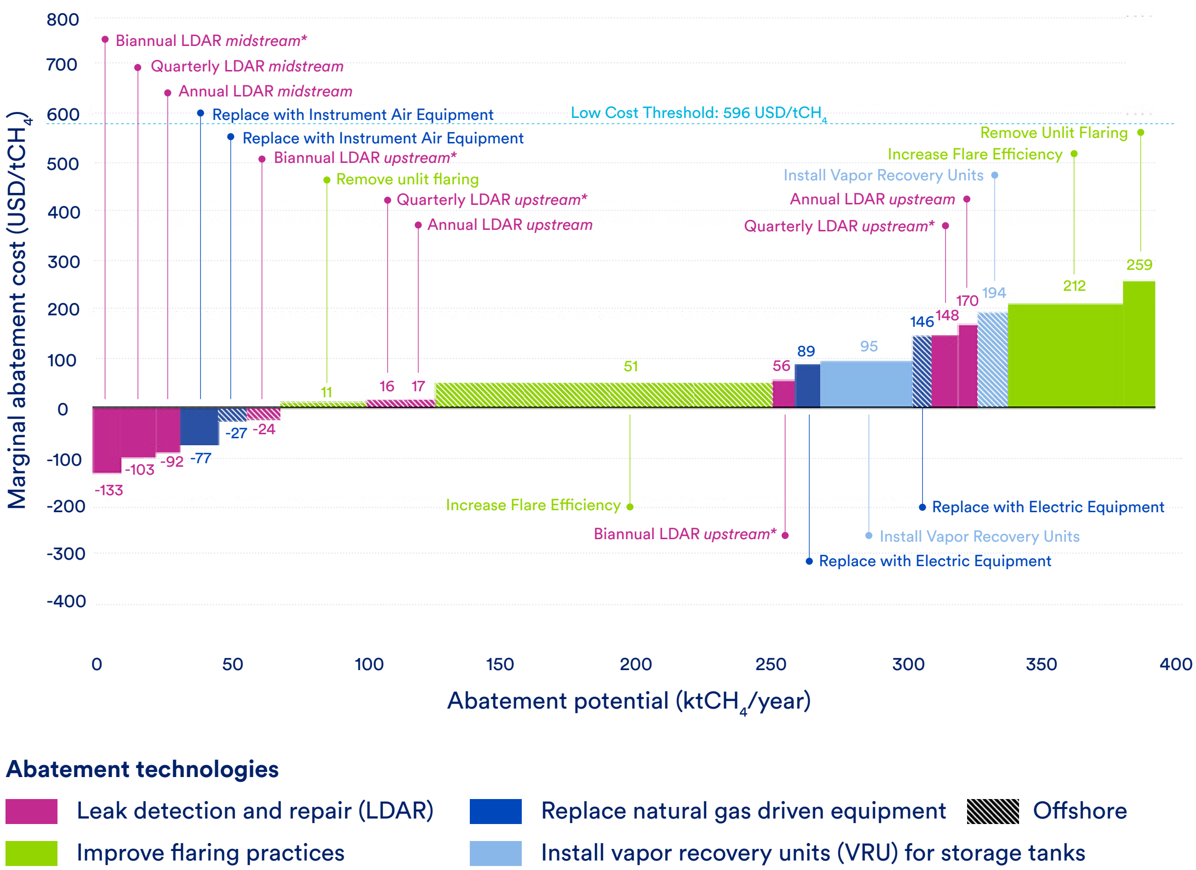
Current policies and practices

Mexico has established a **comprehensive legal and regulatory framework**[4,5] **to control methane emissions across the oil and gas value chain**, including prescriptive requirements on equipment and operational practices (such as LDAR), restrictions on venting and flaring, high associated-gas utilization targets, and detailed obligations for monitoring, reporting, and verification. The regulation requires facilities to establish a methane emissions prevention and control plan, with defined and self-imposed reduction objectives, as well as an implementation schedule, supported by annual reporting to the regulator and third-party review. While the framework is robust, **remaining challenges** relate primarily to **enforcement capacity and effective implementation.**

Domestic natural gas production in Mexico is central to the energy system, supplying around 45% of total primary energy demand and over 60% of electricity generation[6]. However, **domestic production meets only 37% of demand**, resulting in a strong reliance on imports, particularly from the United States of America. Mexico has an **established and expanding gas processing and transmission network**, but **regional infrastructure gaps persist**, limiting the full monetization of domestic gas resources in some areas. At the same time, national production is largely composed of associated gas from oil fields, including sour gas that requires significant investment to meet market specifications. Where processing capacity is insufficient, these constraints result in some gas being flared or reinjected.

Methane mitigation deployment in Mexico is constrained by economic and technical challenges, including **limited financial resources and technical expertise**, affecting both smaller and larger operators, and **insufficient gas gathering and processing infrastructure**, which limit reductions in venting and flaring.

Mexico Marginal Abatement Cost Curve for Selected Mitigation Options



**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 and the replacement of pneumatics equipment with instrument air systems, show negative abatement costs, as recovered gas generates net savings. These savings rely on assumed marketable gas shares. In this analysis, it is assumed that 100% of recovered gas in the midstream segment, 80% of onshore upstream recovered gas, and 55% of offshore upstream recovered gas can currently be brought to market at a price of 3 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 improvement of flaring systems in the offshore upstream segment delivers the largest single abatement potential, with approximately 124 kt of methane emissions reductions per year at a low marginal abatement cost of around 51 USD/t CH_4. This reflects the large volumes of gas currently flared due to limited infrastructure to monetize associated gas. In addition, flaring efficiency is assumed to remain below optimized levels[7], together creating substantial potential for emissions reduction at a low cost, even while capital investment and ongoing operational effort are required. LDAR programs in the offshore upstream segment also remain well below the low-cost threshold. Higher marginal abatement costs are associated with infrastructure upgrades, including installation of vapor recovery units, replacement of pneumatic equipment with electric systems, and improvement of flaring practices in the onshore upstream segment. LDAR implementation in the onshore upstream segment similarly shows higher costs, reflecting an assumed lower number of emission sources per site and relatively low gas prices. Despite these factors, these measures remain well within the low-cost abatement range.

Overall, deploying the full portfolio of considered abatement measures could result in 392 kt of methane emissions reductions per year at a net cost of around USD 24 million/year. *If all recovered upstream gas were assumed to be saleable at 3 USD/MMBtu, total abatement costs could decline to around USD 14 million/year.*

Summary of analyzed mitigation technologies in Mexico

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
Easy	Medium adoption	96 kt CH_4 abatable	-3 USD/tCH_4

- The current regulations[8] mandate quarterly LDAR inspections using Optical Gas Imaging (OGI) cameras or equivalent methane-calibrated technologies, with prescriptive repair timelines depending on leak size.
- Many companies have started to implement LDAR programs to meet regulatory requirements, either through external service providers or by training in-house teams. However, deployment remains uneven across operators, and, in many cases, inspection frequency falls short of regulatory requirements.
- Scaling quarterly LDAR implementation is constrained by limited financial and human resources, affecting both smaller operators and large companies, while offshore deployment is further hindered by logistical complexity.

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	210 kt CH_4 abatable	90 USD/tCH_4

- The current regulations[8] set minimum flare combustion efficiency requirements of 90% for exploration and extraction activities and 98% across the rest of the value chain, alongside mandatory continuous ignition systems.
- In practice, flare combustion efficiency is assumed to be below regulatory thresholds in some companies. However, the deployment of high-efficiency enclosed flares, achieving methane destruction efficiencies above 98%, is being evaluated through pilot projects in selected fields.

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
Intermediate	Low adoption	45 kt CH_4 abatable	120 USD/tCH_4

- The current regulations[8] require both new and existing facilities with storage tanks to control methane emissions using vapor recovery systems (VRUs) when annual emissions are estimated to be 10 tonnes of methane or more per facility.
- Some operators have already installed VRUs on stabilization and storage systems and reinject the recovered gas into process pipelines. However, wider deployment is constrained by economic and capital limitations, space and feasibility challenges for offshore assets, and insufficient associated-gas gathering and processing infrastructure that limits gas monetization.

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
Easy	Medium adoption	41 kt CH_4 abatable	11 USD/tCH_4

- The current regulations[4] mandate zero-bleed or gas-capture solutions for new facilities and progressive replacement options for existing assets, including electrification, instrument air, or routing gas to vapor recovery units or combustion systems. In practice, some operators have begun replacing gas-driven pneumatics with instrument air or electric 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

Mexico has developed a regulatory framework covering all the methane mitigation technologies assessed and has now **transitioned from policy design to implementation.** While challenges remain, particularly in achieving consistent compliance with quarterly LDAR requirements, the marginal abatement cost curve (MACC) indicates that effective implementation and enforcement of existing regulations could deliver net economic benefits while addressing remaining adoption barriers.

In the near term, priorities could focus on **strengthening implementation and enforcement of low-cost mitigation measures.** All options assessed show low or negative marginal abatement costs, because, where gas can be captured and sold, the value of recovered gas is assumed to outweigh deployment costs. Regulatory action, including stricter enforcement of existing bans, equipment standards, and emissions limits, combined with targeted capacity-building programs for operators, could support rapid uptake of measures such as LDAR, pneumatic equipment replacement, and vapor recovery.

Over the medium term, targeted policy instruments such as concessional loans, tax incentives, or fiscal transfers could help address remaining financial barriers. **Continued development of gas processing and transport infrastructure** would further improve commercialization prospects and lower abatement costs.

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 sixteen interviews with stakeholders operating in Mexico, including government representatives, 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 Government of Mexico. (2018). *Guidelines for the Prevention and Comprehensive Control of Methane Emissions from the Hydrocarbons Sector.* Available at: http://www.dof.gob.mx/nota_detalle.php?codigo=5543033&fecha=06/11/2018
5 Government of Mexico. (2016). *Technical guidelines for the use of associated natural gas in exploration and production of hydrocarbons.* Available at: https://www.dof.gob.mx/nota_detalle.php?codigo=5422286&fecha=07/01/2016#gsc.tab=0
6 International Energy Agency (IEA). (2024). *Mexico – Natural gas*. Available at: https://www.iea.org/countries/mexico/natural-gas
7 The average destruction efficiency is assumed to be 84%, based on information reported by PEMEX (Mexican National Oil Company) in its sustainability report. PEMEX. (2024). *Sustainability Report 2024*. Available at: https://www.pemex.com/etica_y_transparencia/transparencia/informes/Documents/sustainability_report_2024_eng.pdf