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# CARBON LIMITS

## Methane Abatement in Egypt's Oil and Gas Sector



This fact sheet presents findings for Egypt 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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FULL REPORT

### Key figures

Estimated annual emissions<sup>1</sup>

**596 kt methane**

(17.8 Mt CO<sub>2</sub>e)

Emissions analyzed<sup>2</sup>

**308 kt methane**

(52% of estimated emissions)

Technical abatement possible from analyzed technologies

**35%**

of estimated emissions

Low-cost abatement potential from analyzed technologies<sup>3</sup>

**35%**

of estimated emissions

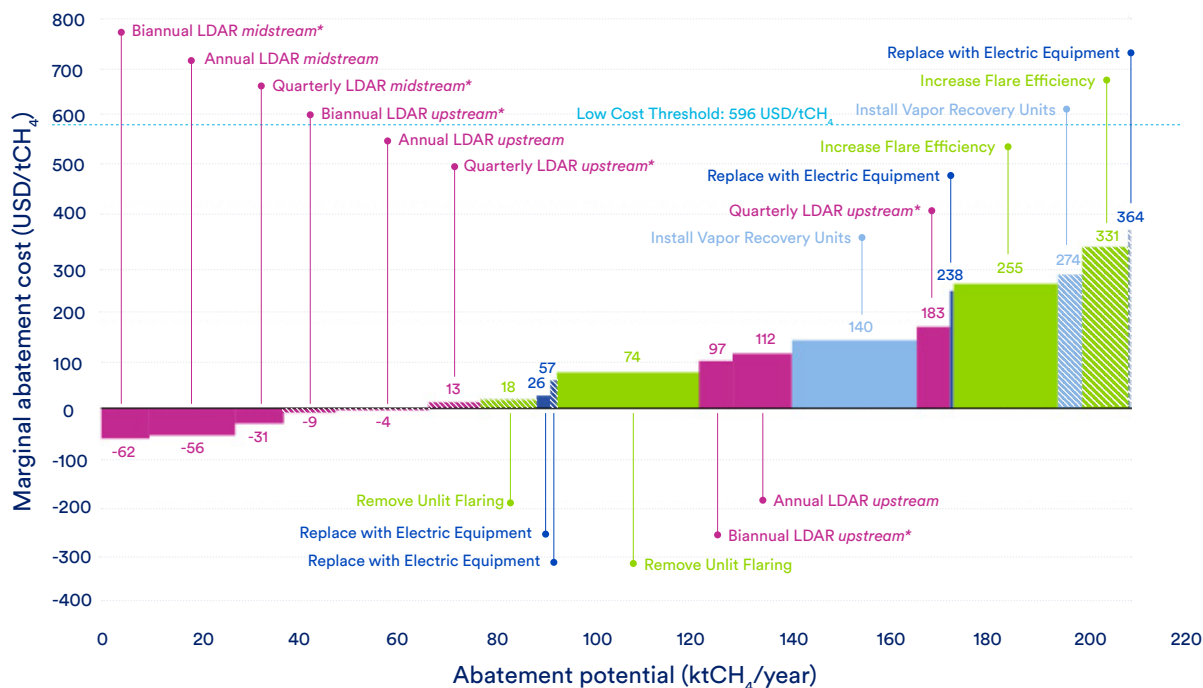
### Current policies and practices

**Egypt does not have a dedicated methane regulatory framework for the oil and gas sector.** Methane control is addressed indirectly through petroleum and environmental regulation<sup>4</sup>, including requirements for flaring and separation systems, vapor ventilation on storage tanks, and the safe disposal of associated gas that cannot be utilized. Recent developments point to a potential shift, as Egypt has approved an agreement to develop a methane reduction roadmap<sup>5</sup>, including possible regulatory measures.

**Egypt's gas sector is central to its energy system, supplying most electricity demand<sup>6</sup>** and supported by vast production, processing, and export infrastructure. However, declining output and rising demand have tightened supply, leading to periodic LNG imports. At the same time, **infrastructure gaps** (particularly in older or remote oil fields) continue to result in flaring. In addition, **partially regulated gas prices** (remaining below international prices) and **restricted market access** weaken economic incentives for methane mitigation investments, although recent reforms<sup>7</sup> aim to liberalize the sector.

Methane mitigation in Egypt are constrained by several technical and operational barriers, including **high upfront capital costs, infrastructure gaps, restricted market access, and low domestic gas prices** that weaken investment incentives. However, several low-cost abatement opportunities exist, and some operators have begun to take up the issue of methane emissions and have started to implement solutions.

## Egypt 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 rely on assumed marketable gas shares. In this analysis, 50% of recovered gas in upstream operations is assumed to be currently brought to market at a price of 2.8 USD/MMBtu, while 100% of recovered gas in the midstream segment is assumed to be currently brought to market at a price of 3.3 USD/MMBtu. Under these assumptions, all mitigation measures assessed fall below the low-cost threshold of 596 USD/t CH<sub>4</sub> (20 USD/tCO<sub>2</sub>e).

Within this cost range, the elimination of unlit flaring in the onshore upstream segment delivers the largest single abatement potential, with approximately 29 kt of methane emissions reductions per year at a marginal abatement cost of around 74 USD/t CH<sub>4</sub>. LDAR programs in the upstream operations and the replacement of natural gas-driven pneumatic equipment with instrument air systems also remain well below the low-cost threshold. Higher marginal abatement costs are associated with infrastructure upgrades, including installation of VRUs, replacement of pneumatic equipment with electric systems, and improvement of flaring destruction efficiency. Despite these factors, these measures remain within the low-cost abatement range.

Overall, deploying the full portfolio of considered abatement measures could result in 209 kt of methane emissions reductions per year at a net cost of around USD 17 million/year. If all recovered upstream gas were assumed to be marketable at 2.8 USD/MMBtu, net abatement costs could decline to around USD 12 million/year.

## Summary of analyzed mitigation technologies in Egypt

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	Low adoption	103 kt CH <sub>4</sub> abatable	12 USD/tCH <sub>4</sub>

- Egypt does not have regulatory requirements mandating LDAR programs, and current practices vary across operators. Some operators have begun implementing LDAR using OGI cameras, with campaigns carried out in-house, by contractors, or through partnerships between international and domestic companies. In some cases, these efforts are driven primarily by safety considerations rather than emissions reduction objectives. Wider deployment is constrained by the absence of regulatory incentives and the prioritization of capital toward other investments.

### 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	71 kt CH <sub>4</sub> abatable	191 USD/tCH <sub>4</sub>

- Egypt does not impose detailed performance, monitoring, or maintenance requirements for flaring systems. Instead, the current regulation<sup>8</sup> provides a general provision that associated gas which cannot be safely used or exploited must be disposed of in accordance with relevant international standards.
- In practice, operators prioritize reducing flared volumes rather than optimizing flare performance, investing instead in gas utilization or monetization solutions. Several flare-capture projects have been commissioned in recent years. Flare gas recovery supports reduction of methane emissions and GHGs more broadly, however, this analysis focuses on the opportunity to mitigate methane emissions through better efficiency and reduction of unlit flares at existing flare systems.

### 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	30 kt CH <sub>4</sub> abatable	161 USD/tCH <sub>4</sub>

- The current regulation<sup>8</sup> does not mandate the use of VRUs. Instead, it takes a performance-based approach, requiring storage tanks to be tightly sealed and any release of excess vapors to be managed in accordance with international standards.
- In practice, some operators have started implementing vapor recovery systems. However, wider deployment is constrained by high installation costs and uncertain economic returns, as infrastructure gaps and complex gas market conditions can limit the commercialization of recovered gas.

### 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	High adoption	5 kt CH <sub>4</sub> abatable	84 USD/tCH <sub>4</sub>

- The current regulation<sup>8</sup> requires operators to prioritize the use of compressed air instead of compressed natural gas for measuring and control equipment wherever technically feasible. In practice, natural gas-driven equipment is not widely used in the Egyptian oil and gas sector, with most assets already relying on electric or instrument-air alternatives.

#### 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

**Egypt has not yet established a dedicated methane regulatory framework**, with existing provisions primarily embedded in broader environmental and petroleum regulations. However, recent steps toward developing a methane reduction roadmap signal growing policy momentum. **Priorities could focus on establishing a regulatory framework that targets the most cost-effective mitigation opportunities in the near term and phases in a broader set of mitigation measures in the medium term.** Near term measures can include LDAR programs and the elimination of unlit flaring, which show substantial abatement potential at low or negative cost. Introducing minimum LDAR requirements, alongside basic flaring monitoring obligations, would provide a high-impact entry point. **Measures that can be phased in can include performance standards for flaring systems and the deployment of vapor recovery units on storage tanks.**

**Further liberalization of gas market access and pricing** could help improve monetization opportunities and strengthen the economic case for methane mitigation. In parallel, **targeted financial instruments**, including concessional financing or fiscal incentives, could help address capital constraints and support the uptake of more capital-intensive technologies. **Strengthening technical capacity and awareness** among operators would also further support implementation.

In addition, **continued development of gas gathering, processing, and transport infrastructure** would further improve gas monetization prospects.

## 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 thirteen interviews with stakeholders operating in Egypt, including government representatives 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<sub>4</sub> (20 USD/tCO<sub>2</sub>e using GWP 100)
  - 4 Arab Republic of Egypt. (1995). *Prime Minister's Decree No. 338 of 1995 Issuing the Executive Regulations of the Environment Law 4/1994*. Available at: <https://faolex.fao.org/docs/pdf/egy4986E.pdf>
  - 5 Egypt Today. (2025). *President Sisi approves agreement for roadmap to reduce methane emissions in Egypt*. Available at: <https://www.egypttoday.com/Article/1/141050/President-Sisi-approves-agreement-for-roadmap-to-reduce-methane-emissions>
  - 6 International Energy Agency (IEA). (2023). *Egypt – Natural gas*. <https://www.iea.org/countries/egypt/natural-gas>
  - 7 Arab Republic of Egypt. (2017). *Law for Gas Market Activities Regulation*. Available at: <https://www.gasreg.org.eg/law-for-gas-market-activities-regulation/>
  - 8 Arab Republic of Egypt. (1995). *Prime Minister's Decree No. 338 of 1995 Issuing the Executive Regulations of the Environment Law 4/1994*. Available at: <https://faolex.fao.org/docs/pdf/egy4986E.pdf>