REGIONAL ASSOCIATION OF
OIL, GAS AND BIOFUELS SECTOR COMPANIES
IN LATIN AMERICA AND THE CARIBBEAN

ARPEL upper management report on climate change

Methane Emissions Management

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EXECUTIVE REPORTS

Introduction

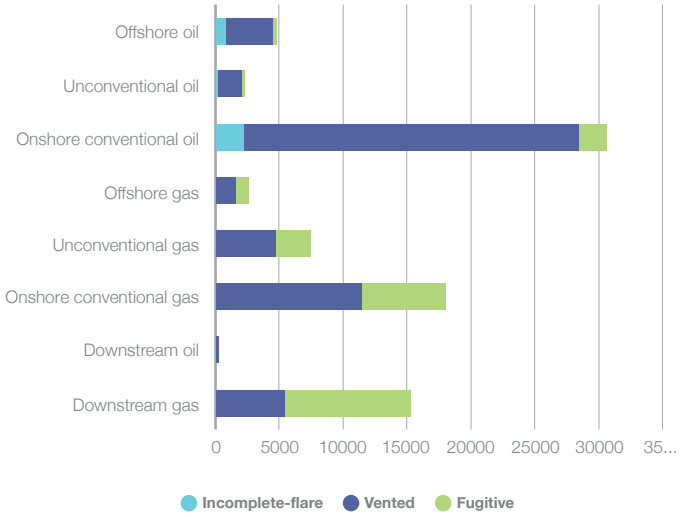
- For more than 20 years, ARPEL has helped its companies face the challenges that climate change and - more recently - energy transitions represent for the industry in the region, thanks to the wide portfolio of projects and activities developed (more than 60 technical publications and position papers, as well as international conferences and seminars).
- One of ARPEL's strategic objectives regarding energy transitions is to identify the opportunities and risks associated with climate change, among which are methane gas emissions, which are the second most important cause of global warming.
- According to the Intergovernmental Panel on Climate Change (IPCC), the global warming potential of methane is of 25[1] when considering its impact over a 100-year period (GWP100). This means that a ton of methane can be considered equivalent to 25 tons of CO_2 if you look at its impact over 100 years.
- 15% of total Greenhouse Gases (GHG) emissions from the energy sector corresponds to fugitive emissions, including flaring and venting in the oil and gas operations, and their main individual component is methane[2].
- 82 Mt[3] of methane emissions from global oil and gas operations in 2019[4], roughly divided between the two sectors.
- Detecting and measuring methane emissions in a comprehensive and cost-effective way remains a critical challenge due to the high cost of detection systems.
- Technologies that can prevent fugitive emissions and venting, on the other hand, are well known. The challenge is to encourage the reduction of these emissions through voluntary or regulatory means.
- In some cases, emissions reduction projects pay off quickly with the gas saved. Even so, when implementing them, sometimes there are other barriers related to technological availability, or to comparatively lower profitability than other projects in the business portfolio. This is where it is essential to have corporate guidelines defined at the highest level of the organization.
- In many other cases, reduced emissions do not pay for themselves. Here, government incentives are essential for companies to implement these projects.

[1] 4th IPCC Report (2007) (https://www.ipcc.ch/site/assets/uploads/2018/05/ar4-wg1-errata.pdf) https://unfccc.int/process-and-meetings/transparency-and-reporting/methods-for-climate-change-transparency/common-metrics
[2] IEA Methane Tracker (https://www.iea.org/reports/methane-tracker-2020/methane-from-oil-gas#abstract)
[3] Million tonnes
[4] IEA Methane Tracker (https://www.iea.org/reports/methane-tracker-2020/methane-from-oil-gas#abstract)

Methane emission sources in the oil and gas sector

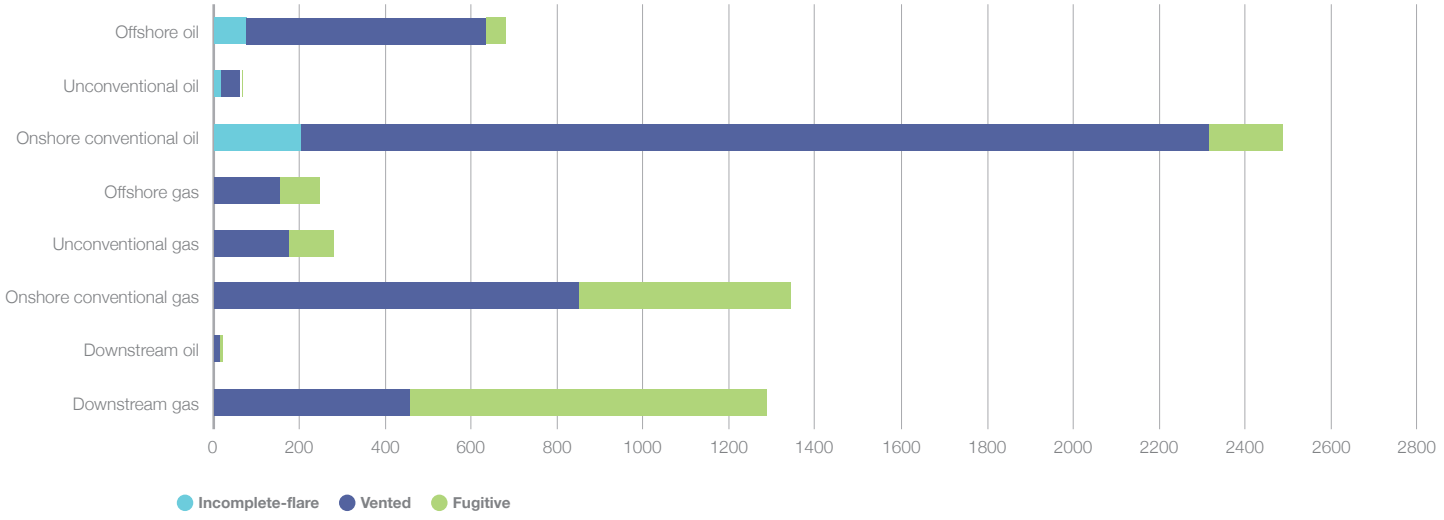
World total

World emissions sources, IEA estimate



Latin America

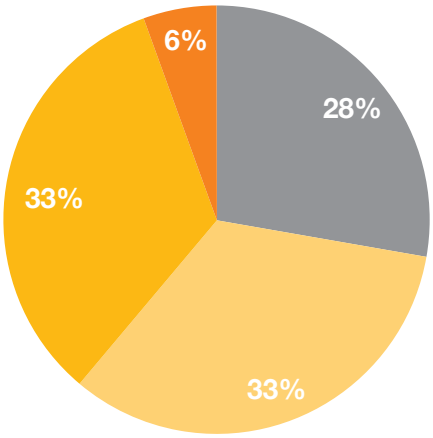
Latin America emissions sources, IEA estimate



The relative importance of the sources of methane emissions in the different segments of the oil and gas sector, according to the estimates of the International Energy Agency (IEA), are similar if we compare the region and the world. Nor are there major differences between the region and the world when comparing the origin of these emissions (incomplete burning, venting or fugitive).

Maturity level in the management of methane emissions

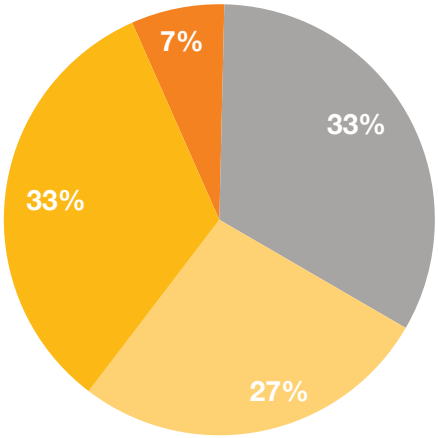
The following are the results of a survey carried out during the first quarter of 2021, among 18 operating companies in the sector in the region (16 ARPEL members, and 2 non-members), with the aim of knowing their general level of maturity regarding the management of methane emissions, and to identify the main challenges and opportunities they face.



Methane emissions inventories

All companies

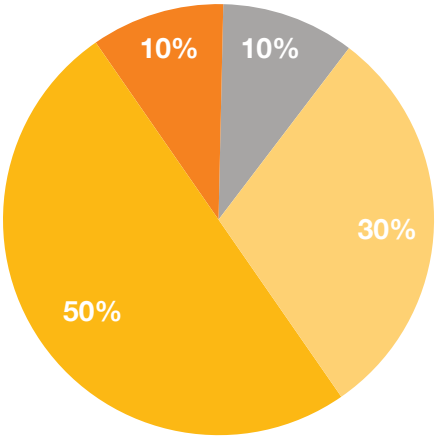
- No methane inventory
- Methane inventory - Tier 1
- Methane inventory - Tier 2
- Methane inventory - Tier 3



Methane emissions inventories

Downstream

- No methane inventory
- Methane inventory - Tier 1
- Methane inventory - Tier 2
- Methane inventory - Tier 3



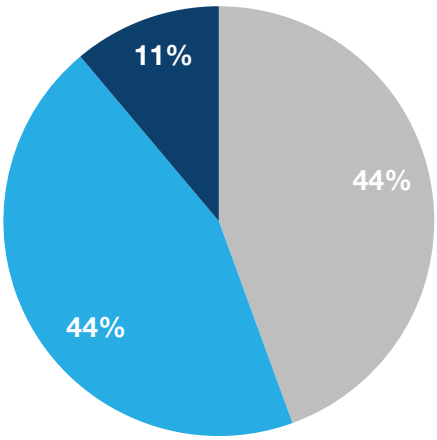
Methane emissions inventories

Upstream

- No methane inventory
- Methane inventory - Tier 1
- Methane inventory - Tier 2
- Methane inventory - Tier 3

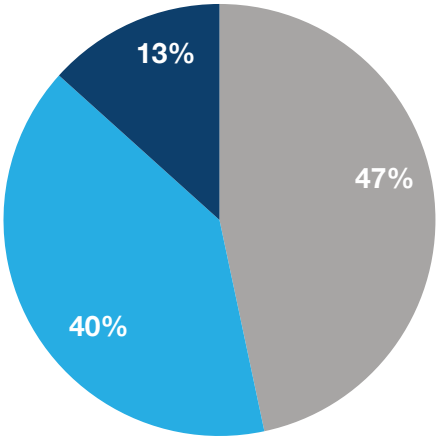
Definitions:

- Tier 1: emissions calculated with generic emission factors, by default.
- Tier 2: uses the same methodological approach as Tier 1 but applies emission factors and other parameters that are country-specific.
- Tier 3: includes models and emissions measured directly and continuously in the field.



LDAR Programs
All companies

- No LDAR Program
- LDAR Program - partially implemented
- LDAR Program - fully implemented



LDAR Programs
Downstream

- No LDAR Program
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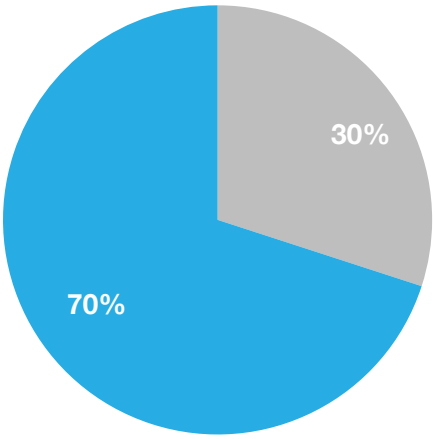
- LDAR Program - fully implemented



LDAR Programs
Upstream

- No LDAR Program
- LDAR Program - partially implemented
- LDAR Program - fully implemented

50% of companies link the results of their LDAR[5] program to methane inventories.

28% of the companies have corporate goals and direct actions to reduce methane emissions.

28% of the companies develop or provide support to research and development initiatives related to the management of methane emissions.

By segmenting downstream and upstream, the results are:

Downstream:

27% of the companies have corporate goals and direct actions to reduce methane emissions.

27% of the companies develop or support research and development initiatives related to the management of methane emissions.

Upstream:

40% of the companies have corporate goals and direct actions to reduce methane emissions.

40% of the companies develop or support research and development initiatives related to the management of methane emissions.

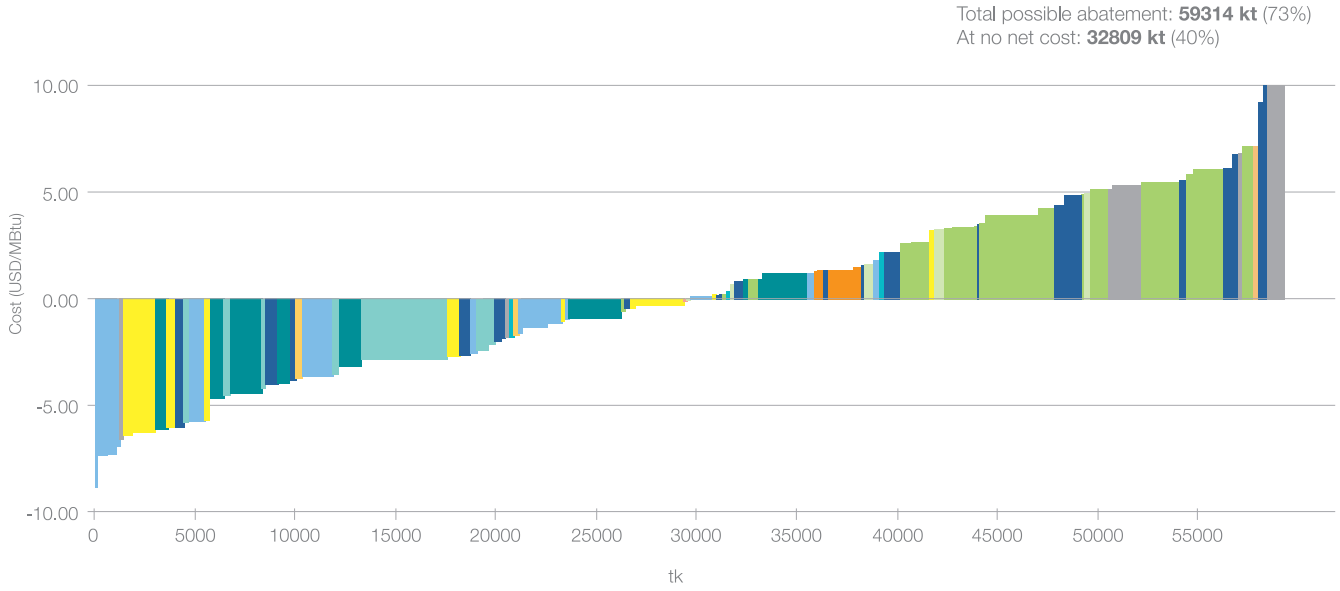
[5] Leak Detection And Repair

Alternatives to reduce methane emissions in the oil and gas sector

Although there is large variation between countries given different gas prices and capital and labor costs, the graphs below show the global and regional respective averages for different actions to reduce methane emissions in the sector.

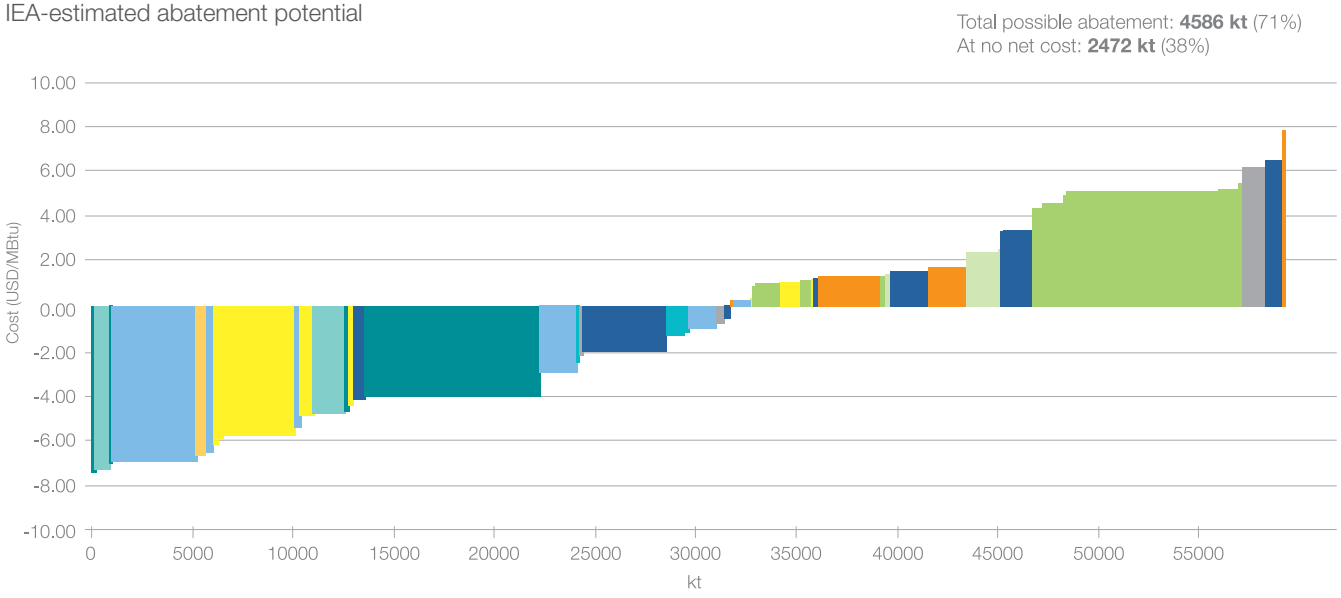
World total

IEA-estimated abatement potential



Latin America

IEA-estimated abatement potential



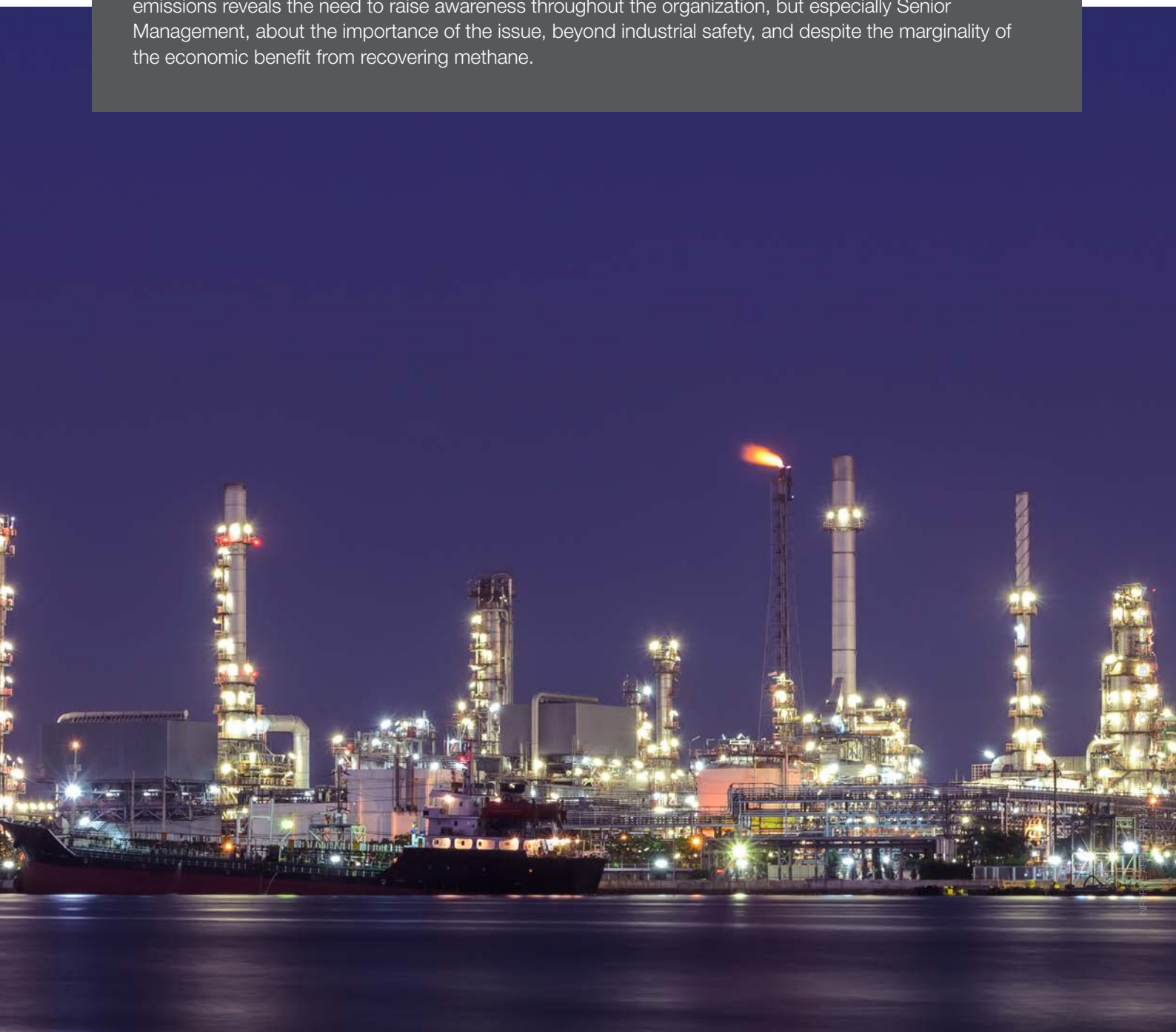
Abatement technologies				
Replace existing devices	Early replacement of devices	Replace pumps	Replace compressor seal or rod	
	Replace with instrument air systems	Replace with electric motor		
Install new devices	Vapour recovery units	Blowndown capture	Install flares	Install plunger
Leak detection & repair	Upstream LDAR	Downstream LDAR		
Other	Other			

Conclusions

The results of the survey show a higher level of maturity in carrying out inventories of methane emissions in the upstream segment, compared to the downstream segment. It is also important to consider that the main opportunities for reducing methane emissions (and their recovery) are presented in the upstream segment, due to gas flaring and venting practices.

On the other hand, companies in the downstream segment have a higher level of maturity in implementing methane leak detection and repair programs, or LDAR (for its acronym in English). Here it should be noted that fugitive emissions represent the main opportunities for reducing methane emissions in this segment.

The low percentage of companies with corporate goals associated with the management of methane emissions reveals the need to raise awareness throughout the organization, but especially Senior Management, about the importance of the issue, beyond industrial safety, and despite the marginality of the economic benefit from recovering methane.



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This report was developed by
the **ARPEL Climate Change Working Group:**

Rosario Martino, ANCAP | Arthur Lee, CHEVRON | Tania Pérez, CUPET | Isis Dávila, CUPET | Cristian Nuñez, ENAP | Fabián Guerrero, ENAP | Henry Ojeda, EP PETROECUADOR | Lorena Bracho, EP PETROECUADOR | Cecilia Meza, EP PETROECUADOR | Fernando San Martín, HONEYWELL | Fernando Halperin, IAPG | Celeste Moscetta, OLDELVAL | Iván Eberle, OLDELVAL | Fernando Guzmán, PAN AMERICAN ENERGY | Rafael Neria, PEMEX | Regis Mereles, PETROPAR | Juan Gallarday, PETROPERU | Stephen Wharton, TECPETROL | Rafaela Pestana, TEMA | Gemma Martínez, TEMA | Oscar Alvarez, TGN | Claudio Moreno, TGN | Eric Tolcach, YPF

Irene Alfaro
ARPEL Downstream Director
E-mail: ialfaro@arpel.org.uy

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ARPEL is a non-profit association gathering oil, gas and biofuels sector companies and institutions in Latin America and the Caribbean. Founded in 1965 as a vehicle of cooperation and reciprocal assistance among sector companies, its main purpose is to actively contribute to industry integration and competitive growth, and to sustainable energy development in the region. Its membership currently represents a high percentage of the upstream and downstream activities in Latin America and the Caribbean and includes national and international operating companies, providers of technology, goods and services for the value chain, and national and international sector institutions.

Regional Headquarters:
Av. Luis A. de Herrera 1248. WTC. Tower 2. Floor 7. Of. 717.
11300 Montevideo, Uruguay
Ph: (+598) 2623-6993 • info@arpel.org.uy

www.arpel.org