



## CASE STUDY

### Measurement efforts uncover mitigation priorities: discrepancies in onshore & offshore emissions in Mexico

This case study presents recent measurement studies conducted in Mexico and highlights how they can inform targeted mitigation action. In aggregate, these studies indicate total oil and gas emissions in Mexico are larger by a factor of two relative to the official national emissions inventory. One particular onshore production basin - the Sureste basin - accounts for more than half of total oil and gas methane emissions in the country. The large emissions discrepancy between measurements and inventory is likely a combination of high emissions at midstream facilities that process offshore gas as well as venting and super-emitters from onshore oil production wells.

## Context

Mexico is major oil and gas producing country with both onshore and offshore operations. Its official emissions inventories are based in standard emission factors (i.e. IPCC Tier 1) and changes in related methods have resulted in significant variations in emission estimates over the past decade, making it challenging to track emissions and mitigation progress.

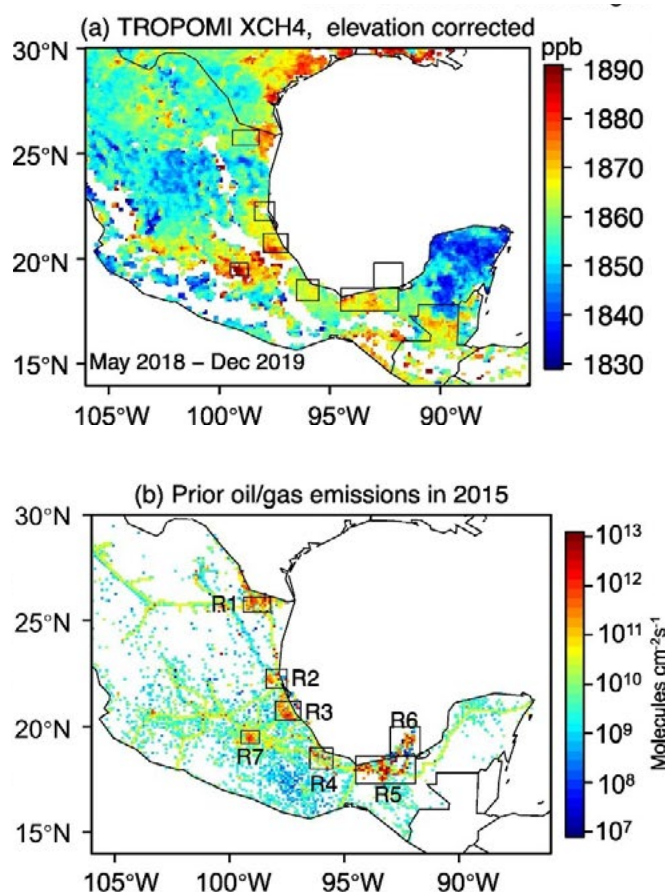
In 2018, Mexico published federal regulations targeting methane emission reductions across its entire oil and gas supply chain. These regulations require that each operator produces facility-specific estimates of current emissions and develops an emissions reduction plan (for each operated facility). Compliance must be reviewed by a certified third party and submitted to the regulating agency on an annual basis. Emissions reduction plans need to be supported by specific requirements (e.g. use of zero bleed equipment, leak detection and repair program). These regulations became the basis for Mexico's inclusion of methane emissions mitigation as part of its Nationally Determined Contribution to the Paris Agreement as well as the Mexico-Canada-US trilateral agreement to reduce oil and gas methane emissions by 40-45%.

Last year, Mexico joined the Global Methane Pledge, committing to move towards using the highest tier IPCC good practice inventory methodologies. While abatement measures can be implemented in the short term without further information, measurement efforts can help improve emissions estimates, identify key sources and regions for mitigation efforts, and track progress.

## Measurement studies reveal mitigation priorities

A [recent study](#) quantified methane emissions from Mexico's most important onshore and offshore oil and gas production regions using aircraft-based measurements and satellite data (TROPOMI and VIIRS night-time flare data). The majority of the country's oil and gas production happens offshore, thus, current inventories allocate the majority of methane emissions to the offshore production segment. However, the study showed a significant overestimation in offshore emissions and a significant underestimation from onshore emissions, indicating onshore operations as the production segment with the highest mitigation potential. The study also showed the value of incorporating multiple measurement-based technologies: airborne-based measurements can provide granular data at the regional and facility level; and satellite data allows an independent assessment of the representativeness of the temporally discrete airborne sampling to enable estimates of annual emission rates.

### TROPOMI XCH<sub>4</sub> and Oil/gas emissions in eastern Mexico



Source: [Shen et al. 2021](#)

A [follow-up study](#) integrated roughly two years of satellite data from the TROPOMI instrument to characterize and quantify methane emissions by sector for the majority of the country. In aggregate, it showed total oil and gas emissions in Mexico are larger by a factor of two relative to the official national emissions inventory. One particular onshore production basin, the Sureste basin, accounts for more than half of the total oil and gas methane emissions in the country. This region is key in terms of prioritizing mitigation. The large emissions discrepancy between measurements and inventory is likely a combination of high emissions at midstream facilities that process offshore gas as well as venting and super-emitters from onshore oil production wells.

While technically feasible mitigation options are readily available across sectors and jurisdictions, and their implementation need not wait for perfect data, the set of measurements in Mexico illustrate how empirical data can enable a more efficient implementation of mitigation strategies. To learn more about measurement efforts, see the [International Methane Emissions Observatory](#), the [Environmental Defense Fund](#) and the [Oil and Gas Methane Partnership 2.0](#).

## Find out more

Monitoring and managing methane emissions



EDF in-depth resources



METHANE  
GUIDING  
PRINCIPLES

This case study was prepared and submitted by the Environmental Defense Fund and does not necessarily reflect the views or positions of all of the Signatories and Supporting Organisations of the Methane Guiding Principles.