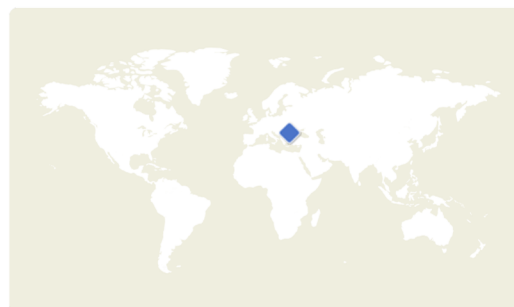


# ROMANIAN METHANE EMISSIONS FROM OIL & GAS (ROMEIO PROJECT)



Romania, EU's 2nd largest oil and gas producing country, found to emit roughly 120,000 metric tons of methane – equivalent to €90 million worth of wasted gas, enough to power 1 million homes for a year.



**DONOR:**  
Oil and Gas Climate Initiative (OGCI)



**BENEFITTING COUNTRIES OR REGIONS:**  
Romania



**SECTOR:**  
Oil & Gas



Subsector, if applicable:  
Onshore

**STATUS:** Published

**TIMELINE:** Measurements collected 2019-2021, Most Recent Publication 2023



**IMEIO SCIENCE OBJECTIVE:**

→ **Advance reconciliation and data integration approaches for multi-scale emissions data.**



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## KEY FINDINGS

Measurements using a range of ground-based and aerial measurements suggest that Romania's oil and gas sector emissions are significantly underreported. For oil production sites, total methane emission in the surveyed region alone (120 kt CH<sub>4</sub> yr<sup>-1</sup> with a range of 79–180 kt yr<sup>-1</sup>) are a factor of about 2.5 larger than reported values for entire Romania in 2020. Measured oil production sites emit on average 5.4 kg CH<sub>4</sub> h<sup>-1</sup> per site (3.6 per cent–8.4 per cent, 95 per cent confidence interval), the third highest emission factor in comparison with US production regions for this type of infrastructure. 10 per cent of sites are responsible for more than 70 per cent of emissions, also a relatively high skewness compared to US regions, which represents an important mitigation priority.

## RATIONALE

Romania is a key oil and gas (O&G) producer in the EU and may be poised to increase production due to recent discoveries of significant natural gas reserves in the Black Sea.

As a country that reports to the IPCC using simple emissions factors, Romania's current emissions estimates lack measurement-based data. Inventory uncertainties pose challenges to prioritizing and implementing methane mitigation strategies to achieve country-level reductions.



### RELATED PUBLICATIONS

- ▶ [Using isotopic signatures \(Menoud et al., 2022\).](#)
- ▶ [Using tracer gas dispersion method \(Delre et al., 2022\).](#)
- ▶ [Using ground-based measurement techniques \(Korbeň et al., 2022\).](#)
- ▶ [Integrated results \(Stavropoulou et al., 2023\).](#)

*Additional papers are in progress.*



### SIGNIFICANCE FOR DECISIONMAKERS

#### For O&G Operators and Executives:

Introducing frequent measurement, reporting and verification practices identifying all emission sources, including vents in addition to leaks, is key for effective mitigation. In particular, changing management practices to collect gas from open-ended lines can reduce half of all oil production site emissions. Comparison of sites with and without co-production of the highly toxic hydrogen sulfide (H<sub>2</sub>S) shows that already implemented mitigation activities for health reasons are effective and need to be expanded to non-H<sub>2</sub>S sites.

#### For Policymakers:

The study highlights the importance of collecting empirical data for prioritizing effective mitigation action. Identifying super-emitting sites via frequent monitoring is key to substantial emission reductions. Effective mitigation options are low tech (collecting gas at open-ended lines) and implementation needs to be expanded from some sites to all others.



### STUDY APPROACH/ACTIVITIES

The ROMEIO team conducted a large-scale measurement campaign in Romania to characterize oil and gas methane emissions using a variety of measurement platforms (vehicles, drones and aircraft). Data were collected on leaks and venting components, facilities and whole production basins, primarily from oil production and some gas production sites, oil parks and compressor stations. Four different quantification methods (Gaussian plume method (GPM), mass balance approach (MBA), tracer dispersion method (TDM) and Other Test Method 33A (OTM- 33-A), were utilized to increase robustness of the results. Quantifications were aggregated and compared to regional emissions inventories, with a focus on the oil production sites (178 sites, from a screened pool of 887 total sites).



### CATALYZING ACTION

Multiple stakeholders were involved from the project's early phases to allow rapid use of the data for mitigation action. Two main oil and gas operators in Romania as well as the Romanian Ministry of Energy and Ministry of Environment were invited for a study briefing at the close of the first measurement campaign in 2019. Among others, this resulted in a mitigation project by the major oil producer in Romania. In ROMEIO's follow-up measurements in 2021, the mitigation magnitude of the project was tested and results are currently in peer-review.

### OTHER SUPPORTERS/STAKEHOLDERS

Principal Investigator: **Utrecht University**  
Revision History: **20 June 2024**



The UN Environment Programme's International Methane Emissions Observatory (IMEO) exists to provide open, reliable, and actionable data to the individuals with the agency to reduce methane emissions. IMEO does this by integrating and reconciling data across sources, including its global methane science studies. IMEO supports measurement and research studies around the world to close the knowledge gap on methane emissions and provide policy-relevant insights to decisionmakers.