Environmental Defense Fund

Regional methane emissions assessment for Romania

Establishing a national, measurement-based methane baseline to support mitigation policy and industry action

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Supported by:

Federal Ministry
for the Environment, Climate Action,
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European
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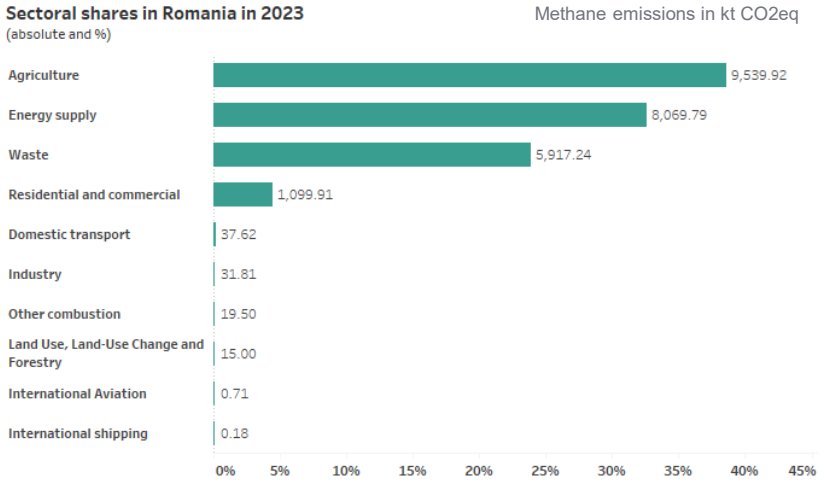
Romania's Methane Emissions Profile

- Romania is one of the **EU's largest oil and gas** (O&G) producers
- The energy sector is one of the **main sources of anthropogenic methane emissions:**
  - **high mitigation potential**, with many cost-effective, proven mitigation options
  - **a true low-hanging fruit**
- UNFCCC reporting still relies on **default emission factors — high uncertainty and underestimation**



- The EU Methane Emissions Regulation (EU-MER) is **a key opportunity** to move toward **accurate, measurement-based methane data**
- This independent assessment provides a **baseline for Romania's methane footprint** covering the oil, gas and coal sectors, supporting informed policymaking and **effective mitigation planning**

Figure Source: Environmental Environment Agency based on the country reporting to UNFCCC

Data Sources

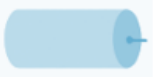
- Romanian Methane Emissions from Oil and Gas (**ROMEO**) **Multi-Scale Science Studies:**
  - 2019: **First empirical methane study** in Romania
  - Objective: **Multi-scale measurement** survey of **major onshore O&G regions**
  - 2021: Two follow-up campaigns **expanded spatial coverage**
  - This analysis: **Integrated results** from all three campaigns for a **comprehensive, measurement-based assessment**

Quantification approaches

Airbone top-down measurements

Stationary and mobile vehicles
-Gaussian Plume Model (GPM)
-Tracer Dispersion Method (TDM)
-Other Test Method 33A (OTM 33A)

UAV-based
-Mass Balance Approach (MBA)

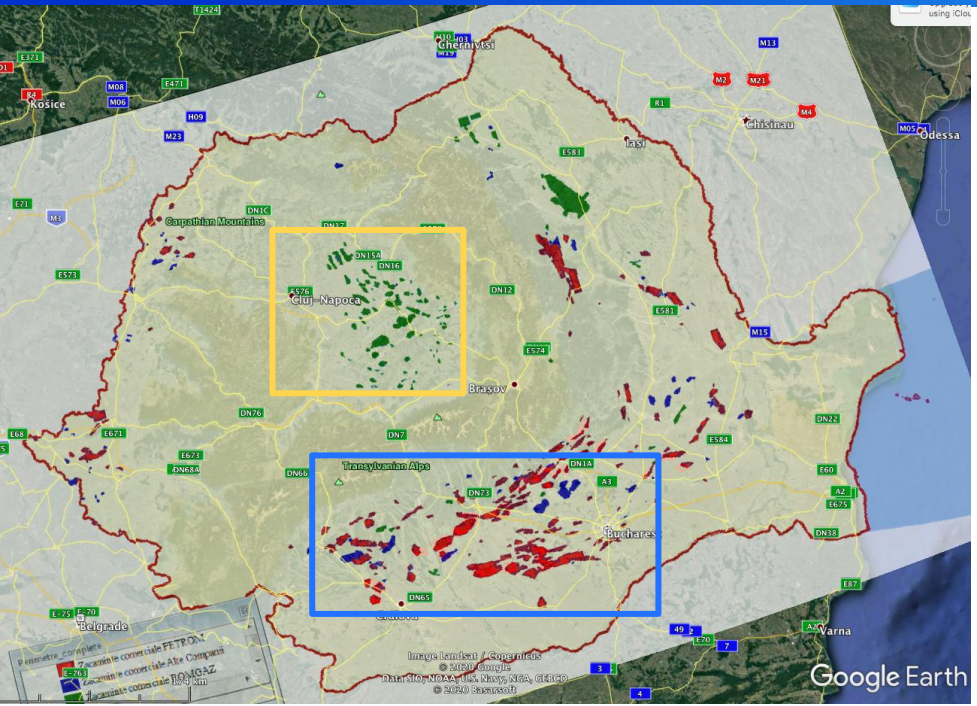


Large-Scale Flow Chamber (LSFC)

On site inspections

OGI camera – detect

High Flow Sampler (HFS) - quantify



ROMEO-A (2019) & ROMEO-C (2021): South Romania

ROMEO-B (2021): Transylvania

Other Data Sources

- UNFCCC National Inventory
- IEA Global Methane Tracker
- OGMP 2.0 Reported Emissions
- Company Sustainability Reports:
  - Infrastructure data (e.g., number of facilities)
  - Production data
  - Reported emissions & reductions

Methodology and Assumptions

- National methane emissions estimated by **scaling ROMEO emission factors** with **national activity data from company sustainability reports**
- Romania has **11,600 registered active onshore wells**; analysis covers **~9,000 wells**, representing the majority of activity
- Conservative approach: 25% of sites assumed to have **no emissions**

Detailed methodology and results will be published early 2026

Results

- **Baseline 2019:**
  - Estimated methane emissions for 2019: **≈320 kt** [220 – 460], covering part of the onshore national O&G sector

Emissions estimate (kt)		
2019	**2021**	**2023**
≈320 kt [220 – 460]	170 – 300 kt	160 – 270 kt

- **Changes in 2021:**
  - ROMEO data indicate **20 – 60% emission reductions** in southern Romania between 2019 – 2021
  - Applying these reductions to the national baseline and incorporating emissions data for the Transylvanian region yields **2021 emissions of 170 – 300 kt**
  - Resulting **methane intensity** for 2021 estimated at **3 – 5%**
- **Trend to 2023:**
  - No new measurement campaigns after 2021; UNFCCC inventory suggests **~10% decline** (2021 – 2023) based on production trends
  - Applying the 10% reduction assumption gives **2023 emissions of 160 – 270 kt**
  - Methane intensity remains roughly **unchanged**, since production declines offset reductions in emissions

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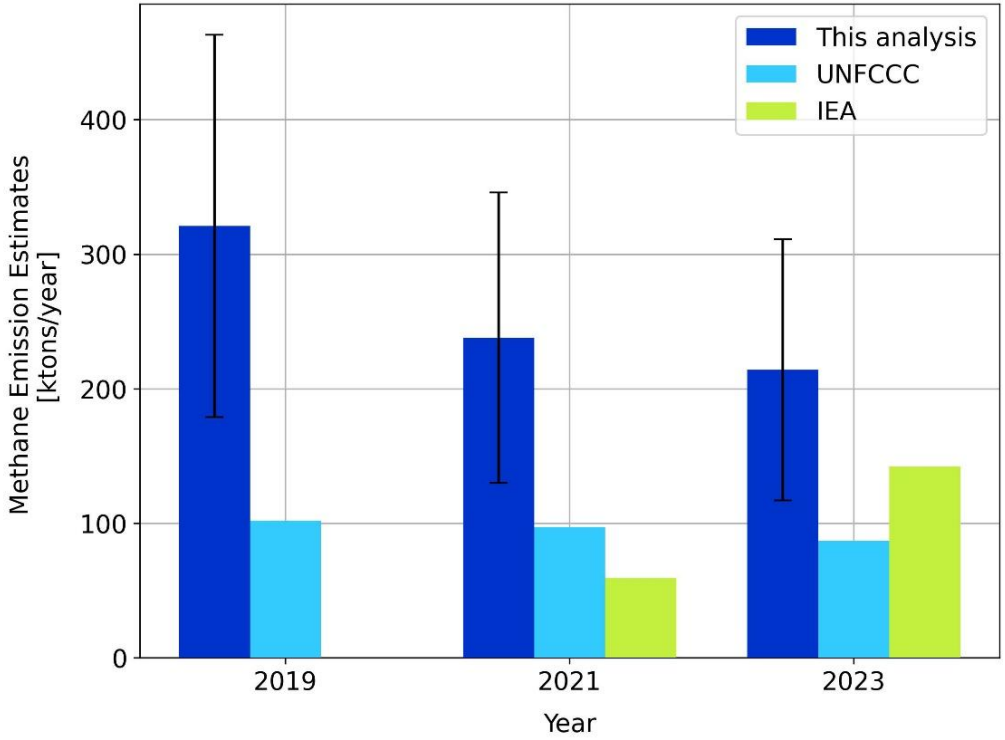
Results – O&G Sector

- UNFCCC-reported emissions are **2–3 times lower**:
  - Underestimation driven by **generic, non-country-specific** emission factors
- **Similar discrepancies** with IEA estimates:
  - **Increasing emissions trend** from 2021 to 2023
- Industry self-reported emissions are also **substantially lower:**
  - **Emission reductions have taken place**, but the baseline and overall **magnitude of emissions** remain underestimated



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Data Gaps and Uncertainties

- Infrastructure data are often **scarce or incomplete** across years
- **No empirical data for key components**: small operators, other O&G regions, offshore sector, downstream segment, and inactive/abandoned wells

Opportunities and Next Steps

- **This report** will be published in early 2026, with an **updated version** planned for Q3 2026 – **potential new data sources**:
  - Satellite observations
  - Preliminary results from ongoing and planned research initiatives such as the IM4CA measurement campaign (aerial and ground-based observations), SMART-CH4 from ESA (satellite observations), UNEP-funded project on methane emissions from abandoned oil and gas wells (ground-based observations), etc.
  - Operator reporting under OGMP 2.0 and **EU-MER MMRV**
- **Global knowledge exchange and collaboration:** Sharing expertise, best practices, and solutions among operators, competent authorities, and research institutions

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