ADVANCING METHANE MEASUREMENT IN THE HYDROPOWER SECTOR

Exploring the use of different airborne measurement technologies and quantification methods to estimate methane emissions from hydropower dams and reservoirs.



DONOR:
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BENEFITTING COUNTRIES OR REGIONS:
Brazil

SECTOR:
Other

STATUS: **Study ongoing**

TIMELINE: **Measurements in Q3 2026**

IMEO SCIENCE OBJECTIVE:

→ **Define appropriate methodologies for monitoring emissions across distinct monitoring goals, by sector**



KEY FINDINGS

In progress

RATIONALE

Hydropower reservoirs are a potentially significant source of methane emissions in countries such as Brazil, but emissions are highly uncertain. Traditional quantification relies on upscaling of small-scale measurements, but there has been no work to verify these estimates via top-down quantification of whole reservoir emissions. The study will explore the use of different methods to quantify emissions. This will provide an evidence base enabling future studies to deliver more certainty on the location and magnitude of methane emissions within reservoir systems. Ultimately, improved understanding will help guide strategies to mitigate any emissions.

UN environment programme | International Methane Emissions Observatory

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RELATED PUBLICATIONS

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SIGNIFICANCE FOR DECISIONMAKERS

For policymakers: Enhanced data collection on emissions from hydropower reservoirs and dams can better inform national inventories and guide policies to achieve emission reduction targets.

For industry: Improved understanding of the extent of methane emissions can guide strategic decisions to alter dam operations to lower emissions or to invest in specialized degassing technologies.

STUDY APPROACH/ACTIVITIES

This pilot project aims to determine the detectability of hydropower methane emissions using in-situ and remote-sensing airborne measurements and different quantification methods, including mass balance and eddy covariance. Additional ground-based measurements will be conducted simultaneously, to allow comparison of emission estimates derived from different methods. The pilot project will focus on measurements from a single reservoir and dam system in Brazil. Results will provide the first dedicated airborne measurements of hydropower methane in South America.

CATALYZING ACTION

In progress

OTHER SUPPORTERS/STAKEHOLDERS

Principal Investigator: **German Aerospace Centre, DLR, Germany**

Other: **National Institute of Amazonian Research, INPA, Brazil; Max Planck Institute for Biogeochemistry, Germany**

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.