

Vessel-based methane emission quantification of oil and gas platforms at the Dutch North Sea

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In the oil and gas sector, the identification and quantification of methane (CH₄) sources are essential for prioritizing and validating mitigation strategies, as well as for developing accurate methane inventories. The Dutch offshore oil and gas sector has already achieved significant methane reductions in recent years as shown in the report “Offshore methane reduction covenant 2019-2020”. In the meanwhile, Regulation (EU) 2024/1787 of the European Parliament and of the Council of June 13, 2024 on the reduction of methane emissions in the energy sector and amending Regulation (EU) 2019/9424 entered into force on August 4, 2024.

Due to these developments, Element NL asked TNO to investigate whether methane emissions can be quantified using supply vessels. We demonstrated the feasibility of this approach by measuring methane concentrations downwind of the platforms. Subsequently, we used the Mobile Dispersion Method (MDM) to evaluate emissions. The emission of offshore sources was estimated using dispersion parameters determined in earlier experimental work and a Gaussian Plume model

A Picarro G2401 was employed to measure the concentrations of methane (CH₄), carbon dioxide (CO₂), and carbon monoxide (CO). Consequently, position, wind speed and wind direction were determined using a GPS-corrected 2D sonic anemometer.

The measurement campaign ran from November 14, 2023 to June 7, 2024. During this period, the supply vessel visited over 100 platforms and passed nearly 70 platforms downwind. Emission from 26 platforms could be quantified. Lessons learned from this campaign and recommendations for applicability within the EU methane regulation or the OGMP2.0 level 5 site level emissions will be addressed.

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