

Distribution of methane release rates accompanying upstream sector of O&G in Romania and Poland detected with mobile, ground based, indirect measurements.

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Indirect analyses of methane release rate from point sources and area sources are possible with different remote techniques: inverted gaussian plume models, controlled tracer release method, stationary plume cross section (EPA OTM33A), installation tenting, mobile FTIR mass balance, UAV air-core collection, UAV plume sampling and TDLAS remote plume cross section. All these techniques were applied to verify the methane emissions from O&G upstream installations in Poland and in Romania under three projects funded by the UNEP (United Nations Environment Programme).

In all of these techniques the modern methane analysers (CRDS – cavity ring down spectroscopy, OA-ICOS – off axis integrated cavity output spectroscopy, OF-CEAS – optical feedback cavity enhanced absorption spectroscopy) is placed on ground level, frequently on board of a car. The construction of the available analysers are slightly different and their positive and negative solutions for mobile application will be thoroughly discussed. Some modern SWIR (short wave infrared) MIR (mid infrared) methane analysers available on the market will also be compared in the same context of methane “plume hunting”.

The presentation will also focus on validation of each of indirect techniques in assessment of methane emission estimations, their advantage in comparison to the other methods, also weakness and limitations. The log-normal distributions of methane release rates obtained with available experimental activities during the campaigns were compared and the emission on basin scale will be presented.

Additionally fast screening technique basing on simplified dispersion model will be presented. It was applied for verification of methane release rate distribution including the low efficiency sources, not detected by earlier mentioned techniques.