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The extent of methane emission associated with the natural gas industry in southeastern Poland.

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Goal of the CCAC project is to observe urban emission of natural gas over Canada and different countries in Europe. Our team was responsible for the Silesia and Sub-Carpathia regions in southern Poland. In this presentation we will focus on the methane emission measurements from gas pipelines, storages, gas wells as well as gathering and processing facilities, which was realized by our team in years 2018-2020.

South eastern Poland is rather rural part of the country with rich history of oil and gas industry going back to the XVI-th century. Currently Carpathians and Carpathian Foredeep regions gas industry produces 1.35 BILLIONS of m^3 [1]

The measurements have been carried out since summer 2016 mainly with Micro-Portable Greenhouse Gas Analyzer 'Los Gatos Research, MGGA-918' mounted on board of a car. We also had capability to deploy analyser in difficult terrain with its own power supply. During our measurements our team visited over 300 gas wells. We found that over half of these sites show elevated methane concentrations which can be attributed to either gas well itself or soil fractures around site. Transects paths were designed to follow pipelines. This allowed us to monitor possible leaks from the natural gas infrastructure. However there are numerous possible sources in close proximity of pipelines. We will discuss detection methods and variability study for dozens of transects. As of the 2017 only 9 gathering and processing facilities report release which states the emission of $1.8*10^6$ m^3 CH_4 per year. One of the focus points of our project was to estimate how uncertain were methane emission from O&G in Poland which at current phase concludes methane emission of 7.5-40 kt CH4/year

During the presentation we will outline challenges in carrying out measurements with GPM, OTM 33a methods that were performed alongside large-area screening. We are developing oversized flow chamber method. Mobile structure is built in the shape of a dome. It has the radius of 3 meters which gives the chamber volume of 49 m^3.

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Methane Science Studies.

[1]PSG, „Bilans zasobów złóż kopalin w Polsce wg stanu na 31 XII 2019 r,” PIG-PIB, Warsaw, 2020.