



Bottom – up methane budget estimation from the sources over Upper Silesian Coal Basin

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Methane is a long-lived greenhouse gas, the second of most important anthropogenic greenhouse gases after carbon dioxide. Global warming is effect of greenhouse gases on the environment. Impact in climate changes of greenhouse gases has been stabilized during 1990s, but situation has been changed nowadays. Since preindustrial times atmospheric CH₄ concentrations have more than doubled. Measurement, modeling, estimation of methane concentration has been done using new techniques and technology. As Upper Silesian Coal Basin (USCB)– Southern Poland, is responsible for between 430 - 1350 Gg CH₄, it makes USCB one of the most important source of this gas in Europe (50% of CH₄ from Poland). Here we present the performance of methane budget estimation from the anthropogenic sources over USCB, including coal pits, waste disposal, agriculture, city gas network over Basin. Methane is estimated in USCB by bottom up method and technology - used Picarro 2201 – i. During measurement campaign we have used in-situ measurement of methane and their stable isotopic composition near its sources. Values of concentration were obtained from direct measurement of samples taken from ventilation shafts, coal underground mine pits (concentration 0.15% to 0.4% of CH₄, subsequently diluted to 2ppm with zero air and measured by Picarro CRDS analyzer) and in-suit measurement near landfills and city gas network– reached 15ppm and 5ppm, respectively. All data from CH₄ measurement are compared with well-known databased EDGAR, E-PRTR, US EPA, miner’s reports. The purpose of utilization bottom-up method in USCB is to figure out methane budget over USCB and differences between databases in case of Poland.

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