

ABSTRACT:

Methane emission to mining works, in modern mining era, has been a serious problem caused by complex geological structure and mining factors. Collieries located in the Upper Silesian Coal Basin (USCB) are characterised by diversified geological structure and emit over 700 – 800 mln m³ of methane annually and 70% of emitted gas goes directly to the atmosphere. The methane content in the rock mass is controlled by e.g. Miocene sediments sealing the coal bearing series and complicated lithology and tectonics of Carboniferous strata. These factors along with e.g. depth of mining control the methane emission into the mine workings. To analyse the causes of methane emissions, the representative collieries were chosen. The geological and mining factors were carefully investigated and conclusions were set up. Deeper parts of the rock mass, under the hermetic Miocene screen are characterised by higher methane pressure what results in greater methane emission during mining. The temperature and hydrostatic pressure increase with depth. The balance between them is called the optimum methane zone. Under the depth of 1000m, the methane emission increases as a result of almost 100% coal saturation in methane and decreasing sorption capacity at the same time. Methane is also the strong greenhouse gas and 20% of it is emitted by the USCB coal mines. Deeper coal production in complex mining and geological conditions increases the impact of natural hazards, including methane. The influence of the geological structure is extremely important to study, because it affects the methane emission in the underground coal mines.