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Environmental Influence of Fan Unit Emissions on the Example of Western Donbass Mines

Studying environmental influence of harmful substances emitted by mining fan units is quite topical nowadays as the number of people suffering from different diseases has been increasing dramatically over the last decades in mining regions of our country. Mining industry, coal mining in particular, influences the environment specifically. Coal mining enterprises use clean air for coursing that is why any mine draws used air saturated with gases, dust, and mineral substances in addition to coal output. As for the volumes of contaminating substances and the degree of environmental influence mining industry occupies fourth position after chemical and metallurgical industries and agriculture.

PAO “DTEK Pavlogradugol” combines ten mines located in Western Donbass which deal with mining seams with high methane abundance (the thickness is 0.8-1.15 m).

Here are the following harmful substances emitted into atmosphere: carbon dioxides CO_x , nitrogen dioxides NO_x , sulfur dioxide SO_2 , hydrocarbons C_mH_n , and hydrogen sulfide H_2S . Methane is the most dangerous gas. Mine air is one of the sources of methane (this air contains just 0.3-1% of methane but air consumption is quite high – it is about 10,000 m^3/min (i.e. 17 t per day) per one air shaft. It means that annual methane emissions are 5.6 bln m^3 that is 92% of valuable mineral being lost irretrievably along with boosting greenhouse effect and contaminating environment. It should be noted that different discomfort evidences due to air contamination (bad smell, bad illumination etc.) influence negatively upon people psychologically as well as worsen overall condition: headaches, nausea, creep appear, there can be work decrement or even loss of labour capacity and stamina decrease.

Here are the following priority areas for protecting atmosphere against contamination: implementing coal mining processes without surface drawing; maximum use of methane being emitted from coal seams; recovery of system of spontaneous firing prevention and extinguishing burning piles. According to the data presented by PAO “DTEK Pavlogradugol” about 115 mln UAH are planned to be channeled for implementing strategic initiatives of the enterprise for environmental protection (the term is up to 2016) – 56.2 mln UAH are for reasonable water management, 18.2 mln UAH are for atmosphere protection, and 400,000 UAH more are for maintaining and work of the system of environmental management.