

Section 01. Innovations in Engineering

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Integrated Processing of Coal Mining Waste as Optimum Problem Solving for Donbas

Intensive development of Ukrainian coal mining industry during preceding period has resulted, on the one hand, in repletion of raw material base of operating mines and degradation of mined coal. On the other hand, it has resulted in its serious price increase. The negative tendencies not only continue but even are strengthened. It is quite evident that the way to reverse the trend is not only the improvement of equipment and technology as each technology has its own limits.

In the two past decades stable increase in ash content of coal being mined (0.4% per annum) and the product being delivered to consumers (almost 0.12% per annum). Following reasons for increase in ash content are the key ones: enlarged level of mechanization that is change-over to narrow-web continuous mining; total degradation of mining and geological conditions; high-ash seams which were put into operation; coal dilution as a result of wrong dimensions of winning machines; and coal seam thickness.

At the same time, increase in upper limit of ash content is one of the ways for extra involvement of coal reserves to be mined. Calculations confirm that involvement of reserves which are substandard in terms of ash content and thickness in mining process will make it possible to prolongate mine life (for 20 years at an average) and improve structure of coal Donbas reserves in large.

Effective use of off-specification reserves (in terms of ash content) is only possible at the expense of increase in preparation rate and capacity of coal-preparation plants. In turn, increase in preparation rate and capacity of coal-preparation plants in the context of ash-content growth will result in wastes explosion. The wastes explosion is of catastrophic nature; it factors into escalation of expenditures connected with their storage in dumps and tailing ponds.

A way out of the situation is in integrated and rational use of the whole rock mass mined by colliers. The way makes it possible to solve cardinaly complicated environmental and social as well as economic problems of one of the most developed Ukrainian regions.