

INFLUENCE OF CRITICAL PHENOMENA ON THE STRUCTURE OF THE COAL INDUSTRY OF UKRAINE

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Domestic coal industry is and will continue to be the guarantor of the energy security of Ukraine. However, so far it is in a critical condition, especially its public sector, in particular, to provide the economy with deficient marks of anthracite

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energy coal, whose mining enterprises found themselves in uncontrolled territories of the Ukrainian government.

As of January 1, 2019, there were a total of 150 mines in the coal industry of Ukraine, of which 69 were not working, including 49 – due to being located in an uncontrolled area. As a whole, on the territory not controlled by Ukraine there are 85 mines of all forms of ownership, or 57% of their total Ukrainian number. Of the 90 mines formally in the management of the Ministry of Energy and Coal, 55 are located on the territory controlled by the separatists, and 35 are outside the area of combat operations. The share of 35 state mines in all-Ukrainian coal mining is only 14%. This indicates their low efficiency and uncompetitiveness.

In 2014, due to military actions in the Donbas, coal production fell by more than 22% in 2013, and the production of anthracite group fell by one third.

In 2015, the decline in extraction has gained more momentum: coal mining enterprises of Ukraine produced 40 million tons of coal, which is 25 million tons less compared with 2014. At the same time, the decline in production of both energy and coking coal at state enterprises made up even more – 62%. In 2016, 41 million tons of coal were extracted. In 2017 and 2018, as a result of blocking the supply of coal from the occupied territories, 35 and 33 million tons respectively were extracted.

According to the results of the coal industry since the beginning of 2019 it became clear that its output from a state of prolonged and deep recession is not happening, especially this applies to the public sector of the industry.

Preserving the negative tendency of falling volumes of extraction of energy coal at domestic coal mines will objectively contribute to the growth of its imports or increase the load on power units of nuclear power plants. Neither the first nor the second adds to the efficiency and safety of the functioning of the domestic fuel and energy complex.

Due to the lack of investment in modernization of the production, the active part of industrial-industrial funds of the industry is working on average by 65%, the depreciation of technological equipment at state enterprises is 80%. In the general park of active coal-mining equipment, the share of mechanized complexes of the new technical level is only one third, and new loading machines and belt conveyors – about 15%. In mines that develop steep slopes, almost 60% of coal mining is carried out by punching hammers.

In the context of the unsatisfactory technical condition of the mine stock and the complex mining and geological conditions of most state coal mining enterprises, the average cost of coal produced by them exceeds the average selling price of tons of coal by almost a third. Therefore, the state is forced to subsidize domestic coal mining. But the lack of such subsidies leads to a large loss of state mines, the inability to finance their own support measures for their own production, as well as to the constant increase of social tension in miner's teams. The latter, first of all, manifests itself in the constant formation of arrears of wages to miners.

The dynamics of the main indicators of the state sector of the coal industry shows that the crisis in the industry only intensifies. Almost 96% of mines have been operating without reconstruction for more than 20 years. Due to the slow

restructuring of the industry, a significant number of small and medium-sized lossy, unpredictable mines are in operation. The wearing out of the active part of industrial funds of the industry becomes considerable scale. Of the total volume of the main stationary equipment, two thirds of it worked out its normative term and need an immediate replacement.

The technical re-equipment of most state mines remains highly problematic. Budget expenditures for the coal industry are decreasing each year. Thus, coal industry enterprises actually received UAH 4.4 billion in 2014, and from 2015 these companies receive just over two billion UAH. annually.

In addition, starting in 2013, funding for technical re-equipment of mines from the state budget is not implemented.

Therefore, it is extremely important to clarify the main directions, principles, timing of reforms and development of the domestic coal industry in the modern conditions, with a clear definition of sources, mechanisms and amounts of funding for program activities.

The war with Russia in the Ukrainian Donbass has considerably worsened the situation in the domestic coal industry. Moreover, in the occupied areas of the Donbas, the coal industry, in fact, was in a catastrophic state.

Now the mines of the occupied Donbas produce 10-20% of pre-war coal volumes. The coal industry in the occupied part of Ukraine may even cease to exist. Problems with the sale of coal products, environmental difficulties, lack of support for miners – a complex of problems for Ukraine's non-controlling mines.

It is clear that, spending at such a rate available resources, destroying them and not providing at least a minimum level of recovery, the occupied territories can only exist for a certain period of time. According to the most optimistic estimates, in five years, the inevitable catastrophe will come.

Given the rather high degree of uncertainty about the future of the occupied territories of Donbass, it should be recognized that this uncertainty is, to a certain extent, extrapolated to the prospects of the development of the entire coal industry in Ukraine.

An analysis of the state and prospects of the development of mining enterprises of the coal industry, which are currently in the temporarily occupied territories of Donetsk and Luhansk regions, made it possible to adjust the forecast of coal production volumes in Ukraine up to 2040 [1, p. 42] upon the return of the occupied territories under the control of the Ukrainian authorities and to develop possible scenarios for the development of the coal industry taking into account the risks and critical phenomena in the structure of the production potential of the coal industry of Ukraine.

The results of the forecasting of coal production in Ukraine as a whole and in the territory controlled by the Ukrainian authorities and the occupied territories are presented separately in Table 1.

In the adjusted forecast of the development of the coal industry for the period up to 2040, account was taken of the restoration of the work of only prospective coal mining enterprises from the temporarily occupied territories of the Donbas upon returning under the control of the Ukrainian authorities.

Table 1

Projected volumes of coal production for the period up to 2040, thousand tons

Coal	2015 (fact)	2020	2025	2030	2035	2040
UKRAINE TOTAL						
Energy	32593	64875	74270	72205	76010	70530
Coke	7145	19885	24620	27525	25075	16190
Total	39738	84760	98890	99730	101085	86720
CONTROLLED BY THE UKRAINIAN AUTHORITY OF THE TERRITORY						
Energy		34065	40755	40460	44445	42480
Coke		10625	15035	18645	17240	9020
Total		44690	55790	59105	61685	51500
TEMPORALLY CLOSED TERRITORIES						
Energy		30810	33515	31745	31565	28050
Coke		9260	9585	8880	7835	7170
Total		40070	43100	40625	39400	35220

Given the likelihood of the return of the occupied territories of the Donbas under the control of the Ukrainian authorities, as well as the lack of funds for the recovery and development of the brown coal industry and the construction of new mines, consideration should be given to the critical scenario for the development of the coal industry, which takes into account the work of mines only under the control of the Ukrainian authorities (Table 2).

Table 2

Forecast volumes of coal production in the critical scenario for the period up to 2040, thousand tons

Coal	2015 (fact)	2020	2025	2030	2035	2040
Energy	32593	32830	37525	36090	34470	32475
Coke	7145	106255	10760	10855	9450	1230
Total	39738	43455	48285	46945	43920	33705

Under this scenario, maximum coal production of 48.3 million tons will be achieved in 2025, of which 37.5 million tons of coal for energy purposes. By 2040 production will gradually decrease to 33.7 million tons, including 32.5 million tons of coal energy purposes.

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