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MINING AND METALLURGICAL COMPLEX OF UKRAINE: CURRENT STATE AND DEVELOPMENT PROSPECTS

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The article is devoted to the analysis of the state of the second most important industry for the Ukrainian economy – the mining and metallurgical complex. The purpose of the article was analytical substantiation of the causes and consequences of problematic functioning of enterprises of the mining and metallurgical complex of Ukraine. Iron ore raw materials are one of the few types of mass export products in Ukraine. The analyzed indicators of individual companies in the industry show that the decline in MMC has not been overcome, despite some improvement in recent months. The dynamics of the number of personnel at individual mining enterprises in the period from January 2022 to June 2023 were studied, that is, a comparison of current with pre-war indicators. In addition, the dynamics of wages for the specified period at mining, metallurgical and pipe enterprises were analyzed. The most significant negative impact caused by the war was ground by the loss of large metallurgical plants in Mariupol and the blockade of Black Sea ports through which the products of metallurgical enterprises were exported. At the same time, one of the most significant internal negative factors is the lack of proper modernization of production and, as a consequence, the loss of competitive advantages. The conducted analysis indicates an unstable situation in metallurgy. Possible force majeure circumstances can radically change expectations, therefore protection of one of the most important industries in Ukraine's economy should become one of the main tasks of the state during martial law.

Keywords: mining and metallurgical complex, employment, development prospects, steel production, pig iron production.

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Introduction and statement of the problem

The mining and metallurgical complex of Ukraine is the second most important branch of the economy. The last few years have been difficult for enterprises in the metallurgical and mining industry, and two years of martial law have significantly worsened the situation. Compared to 2013, Ukraine lost about 80% of its steel production volume. And the largest share of this fall occurred precisely in 2022. The study of the state of the industry, which provided up to 42% of all foreign currency inflows to the country, provided jobs for 13% of all working Ukrainians, the share of which in the foreign trade balance reached 40%, always remains a relevant scientific task and makes it possible to analyze the factors that led to the crisis situation, and to see the prospects of getting out of it.

Analysis of research and publications

Economic problems of the development of the mining and metallurgical complex of Ukraine are the subject of research by many domestic scientists. In particular, V. V. Wenger in the article "Trends and development vectors of the metallurgical industry of Ukraine" [1] explains the main stages of market transformation of the industry. In the work of Z. P. Dvulit [2] singled out the necessary post-war trends as vectors for the construction and development of the metallurgical industry. An analysis of the state of the industry in wartime conditions and promising directions for further development are thoroughly described in the article by N. Smolinska [3]. However, constant economic and political changes in the country require systematic research and analysis of the state of the metallurgical industry in order to find and create ways of perspectives development, especially in today's difficult conditions.

The purpose of the article and presentation of the main material

The purpose of the article is an analytical substantiation of the causes and consequences of problematic functioning of enterprises of the mining and metallurgical complex (MMC) of Ukraine. Due to the rapid deterioration of the operating conditions of the MMC of Ukraine since the beginning of the war, even with today's improvement in the business activity of enterprises, the industry is working with great tension. According to Association of enterprises "Ukrmetalurgprom" [4], in January-July 2023, Ukraine produced:

– 3.37 million tons of cast iron (70.1% relative to January-July 2022);

– steel 3.43 million tons (71.2%);

– pipe rolling 2.90 million tons (68.5%).

According to the results of 2007, Ukraine took 8th place among 65 countries that are part of the international association of steel producers World steel. Loss of part of the territory of Donetsk and Luhansk regions in 2014-2015, as a result of the Russian occupation, it affected the production statistics later – after the Ukrainian management companies lost operational control over the Makiivka, Donetsk, Yenakiivo and Alchevsk steel plants.

A full-scale Russian military invasion worsened the situation. According to the results of January-June 2023, Ukraine fell to 17th place, reducing steel production by 2.4 times compared to the same period of the pre-war year 2021. The main reason was the destruction of the Mariupol plant "Azovstal" and the plant named after Ilyich, which in 2021 ensured 40% of steel production in the country, as well as blocking the operation of Ukrainian ports by the Russian Black Sea Fleet. The world ranking of iron and steel producers for 6 months of 2023 is shown in Tables 1-2.

Table 1

TOP-18 world producers of cast iron for 6 months of 2023

Place	Country	2022	2023	%=/-
1	China	439690	66204	2.7%
2	India	60620	66204	9.21%
3	Japan	33030	31587	–4.37%
4	Russia	30336	31202	2.85%
5	Republic of Korea	21115	21831	3.39%
6	North American Free Trade Agreement (NAFTA)	18529	17903	–3.38%
7	IRAN	17507	16559	–5.41%
8	Brasil	13599	12846	–5.54%
9	Germany	12242	12164	–0.64%
10	Taiwan	7111	6194	–12.90%
11	Another EU	6508	5649	–13.20%
12	Turkey	4693	3936	–16.13%
13	Saudi Arabia	3342	3375	0.99%
14	Egypt	3031	3374	11.32%
15	Austria	3047	2919	–4.20%
16	France	4384	2880	–34.31%
17	Ukraine	4537	2836	–37.49%
18	Great Britain	2480	2422	–2.34%

Source: built according to [4]

Table 2

TOP-26 world steel producers for 6 months 2023

Place	Country	2022	2023	%=/-
1	China	528770	535640	1.30%
2	India	63254	67918	7.37%
3	Japan	45997	43833	–4.70%
4	USA	41034	39855	–2.87%
5	Russia	37074	37463	1.05%
6	South Korea	33832	33675	–0.46%
7	Germany	19561	18527	–5.29%
8	Iran	15382	16125	4.83%
9	Brazil	17524	15972	–8.86%
10	Turkey	19024	15916	–16.34%
11	Italy	12253	11436	–6.67%
12	Taiwan	11033	9876	–10.49%
13	Vietnam	11306	9239	18.28%
14	Mexico	9340	8264	–11.52%
15	Canada	6183	6484	4.87%
16	Spain	6369	5729	–10.05%
17	France	6804	4862	–28.54%
18	Saudi Arabia	4834	4839	0.10%
19	Egypt	4805	4779	–0.54%
20	Another EU	4763	4152	–12.83%
21	Austria	3941	3785	–3.96%
22	Poland	4173	3397	–18.60%
23	Belgium	3609	3241	–10.20%
24	Great Britain	3125	2982	–4.58%
25	Ukraine	4539	282	–37.67%
26	Australia	2839	2802	–1.30%

Source: built according to [4]

In terms of cast iron production for the first half of 2023 (2.84 million tons or 62.51% compared to January-June 2022), Ukraine fell to 17th position among 40 pig iron producing countries. As for steel production, in 6 months of this year, Ukraine (2.83 million tons or 62.33% relative to January-June 2022) took 25th place among 64 steel-producing countries.

Iron ore raw materials are one of the few types of mass export products in Ukraine. Indicators of individual companies indicate that the downturn in the industry has not been overcome, despite some improvement in recent months. Before the start of the war, the main consumer of Ukrainian iron ore was China, but due to the blockade of Ukrainian seaports, the supply of raw materials to the People's Republic of China became economically impractical, and the key export markets for ore became the EU countries, which need it in much smaller quantities.

According to the GMK Center [5], in the first half of 2023, Ukraine exported 8.3 million tons of iron ore (51% less, compared to the same period in 2022. Export income amounted to 896.1 million dollars (-58.5% in compared with last year's indicator). The general reason is blocked Black Sea ports. In June, ore exports decreased by 2.9% compared to May 2023 – to 1.48 million tons and by 15.8% compared to June 2022. as a result of 2022, Ukrainian iron ore exports fell by 45.9% compared to last year – to 24 million tons. Practically 30 million tons of ore or 60% of all exports of iron ore raw materials in 2021 were exported through the Black Sea ports blocked today.

Analysis of the activities of the main producers of iron ore raw materials in Ukraine showed the following. One of the Ukrainian mining and processing plants (Zaporizhsky Iron Ore Plant (PJSC ZZRK) is not controlled by Ukraine today, and the others are operating at partial capacity. For example, mining and processing plants of "Metinvest" – by 35-40% of pre-war indicators; mining department "ArcelorMittal Kryvyi Rih" – by 40%; Kryvyi Rih iron ore plant (KZRK) – by 40-50% of the capacities in the pre-war period; GZK Ferrexpo – by approximately 50%.

Overcoming the systemic crisis with the volumes of production and exports is possible only if the Black Sea ports are unblocked and safe for shipping. While they are blocked, additional problems with logistics arise – against the background of the cancellation of the "grain agreement", the agricultural export flow puts even more pressure on the cargo flow through the Danube ports and western railway border crossings, which reduces the opportunities and volumes of exports of MMC products.

Indicators of the average registered number of employees for the first half of 2023 are not available for a significant number of enterprises, therefore the analysis of changes in the number of employees was performed by comparing the average registered number of employees in June 2023 with its values in June 2022 and with the pre-war period.

At mining enterprises for which there are data, the reduction in the number of employees in June 2023 compared to June 2022 is up to 67%.

The largest decrease in numbers occurred: in LLC "Glukhiv Quarry of Quartzites" (−67.6%); in PJSC "Sukha Balka" (−21.7%); at KRYVBASVIBUHPROM PVP (−18.5%); in JSC "Marganets Mining and Processing Plant" (−16.9%); in the branch "Irshansky Mining and Processing Plant" JSC "United Mining and Chemical Company" (−14.8%) (Fig.1).

In June 2023, workers at some enterprises were laid off. 46.8% of the workers of Irshansky MPP, 37.14% of workers of Marganetsky MPP, 35.3% of Glukhiv quartzite quarry, 17.5% – Pokrovsky MPP.

At coke-chemical enterprises, the number of employees in June 2023 compared to June 2022 changed insignificantly, decreased by 3.6% at ZAPORIZHKOKS PJSC. Compared to the pre-war level, the number of personnel at ZAPORIZHKOKS PJSC decreased by 13.9%, and at YUSHKOKS PJSC – by 3.7%.

At ferrous metallurgy enterprises, the number reduction is noted at almost all enterprises for which data are available. In some cases, it reached 33.8% in June 2023 (at DMZ PJSC). Compared to the pre-war level, the largest decrease occurred in DMZ PJSC – by 39.8%, DNIPROSPETSSTAL PJSC – by 30.2%, and ARSELORMITTAL KRYVIY RIH PJSC – by 17.1%.

In June 2023, 2% of employees of PJSC "ZAPORIZHSTAL", 8.36% of employees of PJSC "DMZ" and 61% of employees of LLC MZ "DNIPROSTAL" were on layoff with payment of 2/3 of the tariff rate (set salary).

In June 2023, the number of pipe companies decreased in the range from 8.8% (in INTERPIPE NIKO TUBE LLC) to 81.6% (in INTERPIPE NMTZ JSC). There was a certain increase in the number of employees at PJSC CENTRAVIS PRODUCTION UKRAINE (+8.4%). When compared with the pre-war level, i.e. January 2022, a similar trend is noted.

As of June 2023, 44.87% of the employees of INTERPIPE NIKO TUBE LLC and 6.73% of the employees of DMZ COMINMET LLC were laid off.

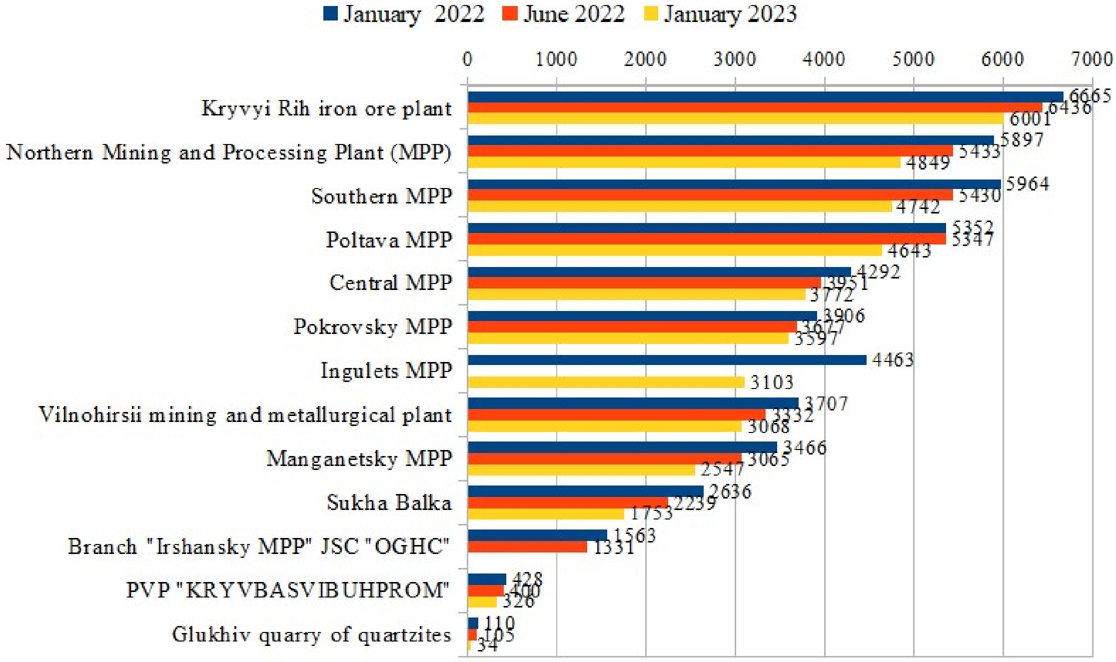

Fig. 1. Number of personnel at individual mining enterprises in January, June 2022 and June 2023, persons

Source: built according to [5]

At the enterprises of the mining and metallurgical complex of Ukraine, the trend of decreasing wages, which has developed since the beginning of the war, was maintained at many enterprises in the first half of the current year.

Thus, wages at mining enterprises in the first half of 2023 compared to the first half of 2022 mostly decreased. The same dynamics can be seen when comparing wages in June 2023 with their pre-war level, i.e. January 2022 (Fig. 2).

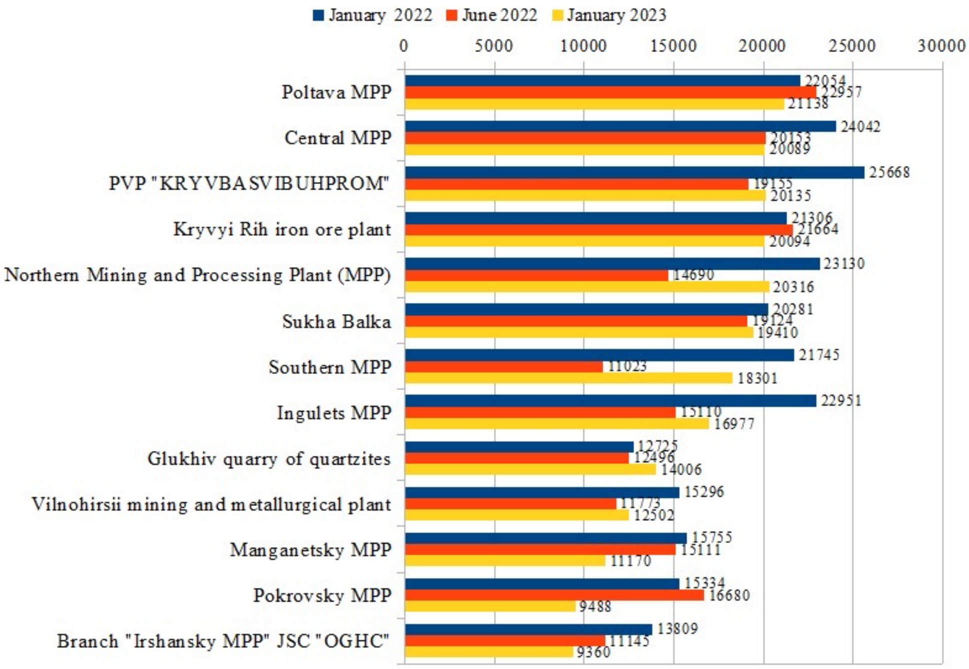

Fig. 2. Average wages at individual mining enterprises in January, June 2022 and January 2023

Source: built according to [5]

Thus, the drop in the level of wages in the first half of 2023 compared to the first half of 2022, according to the primary organizations of PMSU, amounts to minus 45.7% in mining enterprises (at Pokrovsky MPP). Average salaries at Irshansky MPP (–32.7%), Marganetsky MPP (–31.8%) and Sukha Balka (–22.8%) also showed a significant drop.

When compared to the pre-war level, wages decreased the most at Pokrovsky MPP (–38.1%), Irshansky MPP (–32.2%), Inguletsky MPP (–26%), at KRYVBASVIBUHPROM PVP (–22.5%).

When comparing average wages in June of the current year and last year, even their increase is noted at some enterprises – at the Southern MPP (+66%), the Northern MPP (+38.2%), the Inguletsky MPP (+12.4%), the Glukhiv quarry on quartzites (+12.1%) and on some others – to a lesser extent (from 1.5 to 6.2%).

The highest level of average wages in the first half of 2023 was at:

– Poltava MPP – UAH 23,501;

– Central MPP – UAH 21,085;

– KRYVBASVIBUHPROM PVP – UAH 19,843;

– Kryvyi Rih iron ore plant – UAH 18,747;

– Northern MPP – UAH 18,266.

At ferrous metallurgy enterprises, in the first half of 2023, compared to the first half of 2022, there is an ambiguous trend of changes in wages. According to the available data, growth was demonstrated by PJSC “DNIPROSPETSTAL” (+19.8%), LLC MZ “DNIPROSTAL” (+11.7%), PJSC “KAMET-STEEL” (+3.4%). The fall occurred in PJSC “ARCELORMITTAL KRYVY RIH” (–19.2%) and somewhat in PJSC “ZAPORIZHSTAL” (–0.5%).

When compared with the pre-war level, wages in June 2023 at most metallurgical enterprises decreased to –24.3% (at PrJSC “DNIPROSPETSSTAL”). Growth is noted only at DMZ PJSC (+38.3%). In the first half of 2023, the highest salary was at DNIPROSTAL LLC – UAH 27,799 (increased by 11.7% compared to the first half of 2022) , the lowest, according to the available data, is UAH 11,075 in PrJSC “DNIPROSPETSSTAL” (Fig.3).

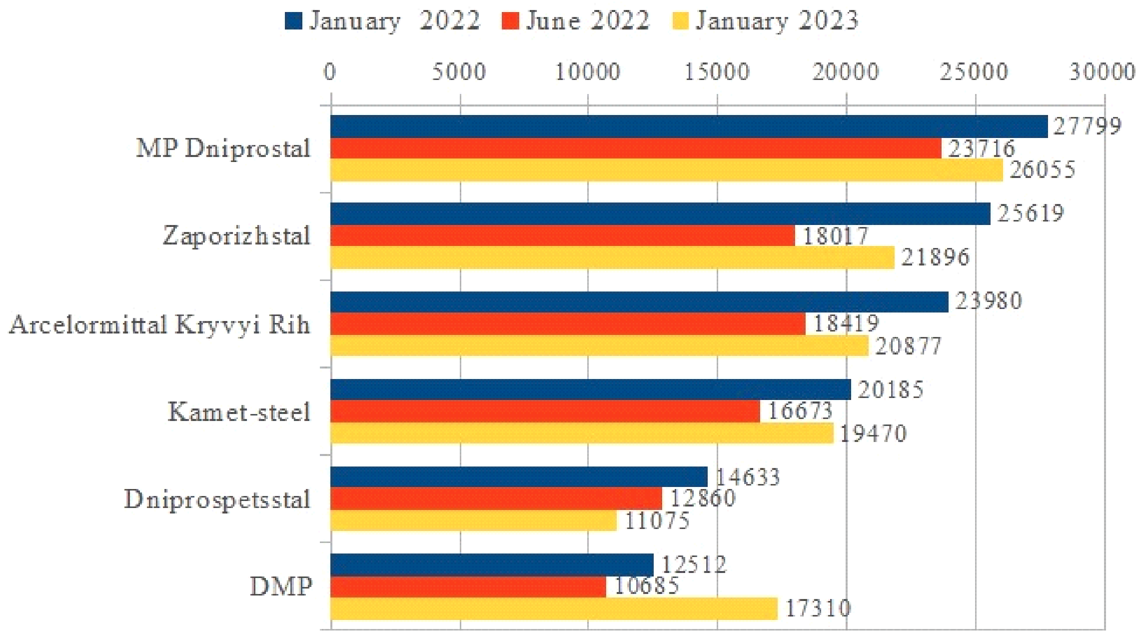

Fig. 3. Average wages at Ukrainian ferrous metallurgy enterprises in January, June 2022 and January 2023

Source: built according to [5]

According to available data, there was a significant increase in wages at pipe enterprises in the first half of 2023, at some of them it reached +51.1% (Ltd “INTERPIPE NIKO TUBE”) compared to the first half of 2022 (Fig. 4).

Thus, in the first half of 2023, the trend of changes in wages at the enterprises of the mining and metallurgical complex of Ukraine cannot be characterized unambiguously. At some enterprises, wages were increased, in particular at pipe companies, at other enterprises, on the contrary, they were decreased.

Unfortunately, these processes took place together with a significant decrease, with some exceptions, in the number of personnel at MMC enterprises. That is, as of the end of the first half of 2023, the situation continued to be difficult and tense, and such that, in the conditions of a significant increase in prices for goods and services and, accordingly, a drop in the standard of living of the population, urgent actions are needed.

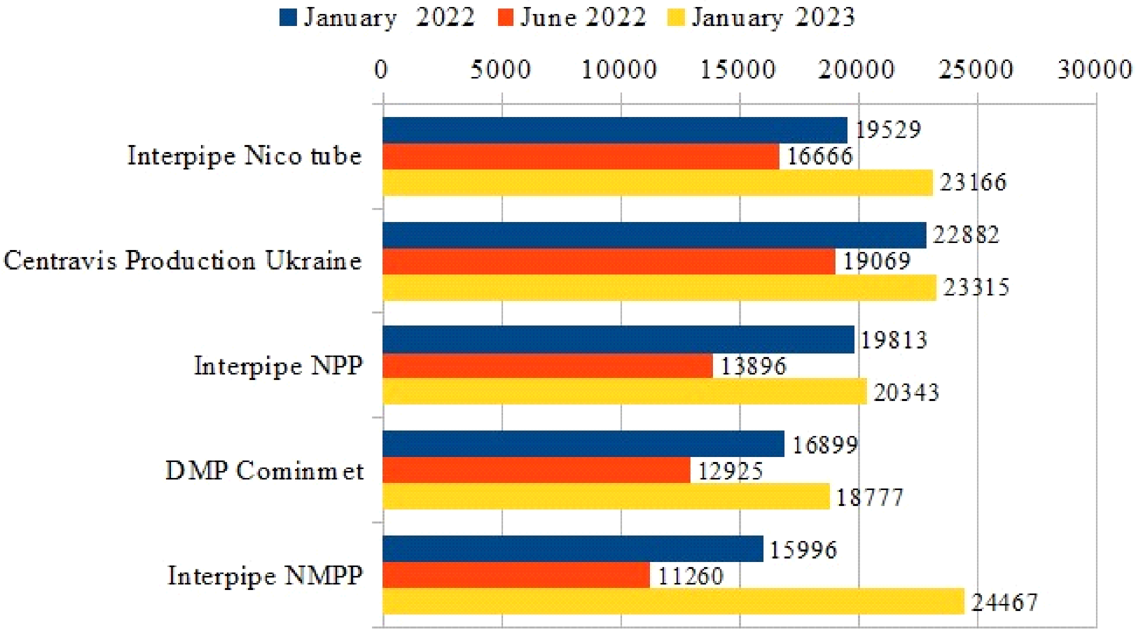

Fig. 4. Average wages at pipe enterprises of Ukraine in January, June 2022 and January 2023
Source: built according to [5]

Conclusions

The second most important branch of the Ukrainian economy is in a difficult situation. The loss of large metallurgical plants in Mariupol and the blockade of the Black Sea ports through which the products of metallurgical enterprises were exported are two of the most tangible and painful blows to the Ukrainian mining and metallurgical complex inflicted by the war.

However, not only external factors have a detrimental effect on the state of the metallurgical industry in Ukraine. One of the most significant negative factors is the lack of proper modernization of production and, as a consequence, the loss of competitive advantages.

According to forecasts, with steady work of metallurgical enterprises, the volume of steel production in 2023 will amount to 5.5-5.6 million tons. Maintaining production volumes at this level can be considered a positive development of the situation for the industry.

Representatives of the industry emphasize that the expansion of the grain agreement to metallurgical products is not the most important condition for the recovery of the sector [7]. At the same time, experts doubt that the ports will be able to open before the end of the war, given the difficulties in the process of negotiations even regarding the supply of grain. Thus, the export of Ukrainian ferrous metals will continue to depend on the logistics capabilities and conditions of foreign markets. At the same time, the share of exports of raw materials - cast iron, ferroalloys and scrap - will grow.

No significant changes should be expected in the geographical structure of exports: the EU and other European countries will remain the main sales market. By the end of 2023, the export of ferrous metals may amount to 4.8-5.2 million tons worth 2.8-3 billion dollars.

The most realistic support scenario so far is the prolongation of the effect of reduced rates of customs duties on Ukrainian products, which is what partners in the EU and Great Britain are talking about.

The conducted analysis indicates an unstable situation in metallurgy. Possible force majeure circumstances can radically change expectations, therefore protection of one of the most important industries in Ukraine’s economy should become one of the main tasks of the state during martial law.

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ГІРНИЧО-МЕТАЛУРГІЙНИЙ КОМПЛЕКС УКРАЇНИ: СУЧАСНИЙ СТАН І ПЕРСПЕКТИВИ РОЗВИТКУ

Рябцева О.Є.

Статтю присвячено аналізу стану другої за важливістю для української економіки галузі – гірничо-металургійного комплексу. Метою статті було аналітичне обґрунтування причин і наслідків проблемного функціонування підприємств гірничо-металургійного комплексу України. Залізорудна сировина – один із небагатьох видів масової експортної продукції в Україні. Проаналізовані показники окремих компаній галузі свідчать: спад у ГМК не подолано, незважаючи на деяке покращення останніх місяців. Досліджено динаміку чисельності персоналу на окремих гірничо-видобувних підприємствах у період з січня 2022 по червень 2023 року, тобто порівняння сучасних із довоєнними показниками. Крім того, проаналізовано динаміку заробітних плат за вказаний період на гірничо-видобувних, металургійних і трубних підприємствах. Найбільш суттєвий негативний вплив, завданий війною, спричинили втрата великих металургійних комбінатів у Маріуполі та блокада чорноморських портів, через які продукція металургійних підприємств йшла на експорт. У цей же час одним з найбільш суттєвих внутрішніх негативних факторів є відсутність належної модернізації виробництва і, як наслідок, втрата конкурентних переваг. Виконаний аналіз свідчить про нестабільну ситуацію в металургії. Можливі форс-мажорні обставини здатні кардинально змінити очікування, тому захист однієї з найважливіших в економіці України галузі має стати одним з головних завдань держави під час воєнного стану.

Ключові слова: гірничо-металургійний комплекс, зайнятість, перспективи розвитку, виробництво сталі, виробництво чавуну.

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Keywords: mining and metallurgical complex, employment, development prospects, steel production, pig iron production.

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