

ANALYSIS OF ASPECTS OF POLLUTION OF ENVIRONMENTAL COMPONENTS FROM HEAT-AND-ELECTRIC POWER PLANT

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Relevance of the study topic is due to the following components.

Compliance with the Order of the State Emergency Service of Ukraine № 618 dated 09/20/2013 «On approval of the Regulations on the organization of environmental support of the State Emergency Service of Ukraine» [1], the Decree of the President of Ukraine № 722/2019 dated 09/30/2019 «On the Sustainable Development Goals of Ukraine for the period until 2030» [2], the Resolution of the Cabinet of Ministers of Ukraine № 476 dated 04/30/2024 «On approval of the list of priority thematic areas of scientific research and scientific and technical developments for the period until December 31 of the year following the termination or abolition of martial law in Ukraine» [3], the Specialty Passport of 21.06.01 «Ecological Safety», approved by Resolution of the Presidium of the Higher Attestation Commission of Ukraine № 33-07/7 dated 04.07.2001 [4], the Law of Ukraine № 3769-IX dated 04.06.2024 «On Amendments to Some Laws of Ukraine Regarding the Mandatory Use of Liquid Biofuels (Biocomponents) in the Transport Sector» [5], the Standard of Higher Education in Specialty 183 «Environmental Protection Technologies» of the Third (Educational and Scientific) Level in the Field of Knowledge 18 «Production and Technologies», approved by Order of the Ministry of Education and Science of Ukraine № 1427 dated 23.12.2021 [6], the Topics of Scientific Research and Scientific and Technical (Experimental) Developments for 2025-2029, approved by Order of the Ministry of Internal Affairs of Ukraine № 326 dated 21.05.2024 [7], the Civil Protection Code of Ukraine in its current version dated 12.09.2025, Article 108 [8].

Purpose of the study. To analyze aspects of pollution of environmental components from a heat-and-electric power plant.

Object of the study. Negative technogenic impact on environmental components from a heat-and-electric power plant.

Subject of the study. Qualitative and quantitative indicators characterizing the object of the study.

Results of the study. Kharkiv region, as a region with developed industry and heat and power industry, faces significant environmental challenges associated with pollution of all components of the environment. The largest sources of pollution are enterprises of the heat and power industry, oil and gas and mining sectors. It has been established that H&E PP emit sulfur oxides, nitrogen oxides, carbon monoxide, heavy metals, as well as products of incomplete combustion, including soot and benzopyrene, into the air, which have a negative impact on

human health, cause respiratory diseases, destroy infrastructure, cause acid rain and reduce the transparency of the atmosphere. In addition, the introduction of modern technologies, such as reheating of steam, regenerative heating, the use of scrubbers to capture sulfur oxides and reduce the formation of nitrogen oxides through optimization of the combustion process, allows to significantly reduce the negative impact on the environment. Particular attention should be paid to the situation that has developed as a result of a full-scale war. The destruction of industrial facilities, a decrease in production volumes and the relocation of enterprises led to a temporary decrease in the level of industrial pollution. However, explosions, fires and shelling caused new environmental threats, including air pollution by combustion products and the destruction of infrastructure. Under martial law, assessing the real level of pollution is complicated by the limited ability to monitor and provide official reporting.

Conclusions. Thus, this study analyzed qualitative and quantitative indicators characterizing the negative technogenic impact on environmental components from a heat-and-electric power plant.

References

1. Order of the State Emergency Service of Ukraine No. 618 (with amendments) dated September 20, 2013 «On approval of the Regulations on the organization of environmental support of the State Emergency Service of Ukraine». URL: <https://zakon.rada.gov.ua/rada/show/v0618388-13#Text>.
2. Decree of the President of Ukraine № 722/2019 dated 30/09/2019 «On the Sustainable Development Goals of Ukraine for the period until 2030». URL: <https://zakon.rada.gov.ua/laws/show/722/2019#Text>.
3. Resolution of the Cabinet of Ministers of Ukraine № 476 of 04/30/2024 «On approval of the list of priority thematic areas of scientific research and scientific and technical developments for the period until December 31 of the year following the termination or abolition of martial law in Ukraine». URL: <https://zakon.rada.gov.ua/laws/show/476-2024-%D0%BF#Text>.
4. Specialty passport 21.06.01 «Ecological safety», approved by the Resolution of the Presidium of the Higher Attestation Commission of Ukraine № 33-07/7 dated 04.07.2001. URL: https://zakon.rada.gov.ua/rada/show/va7_7330-01#Text.
5. Law of Ukraine № 3769-IX dated 04.06.2024 «On Amendments to Certain Laws of Ukraine Regarding the Mandatory Use of Liquid Biofuels (Biocomponents) in the Transport Sector». URL: <https://zakon.rada.gov.ua/laws/show/3769-20#Text>.
6. Standard of higher education in specialty 183 «Environmental Protection Technologies» of the third (educational and scientific) level in the field of knowledge 18 «Production and Technologies», approved by Order of the Ministry of Education and Science of Ukraine № 1427 dated 12/23/2021. URL: <https://mon.gov.ua/static-objects/mon/sites/1/vishcha-osvita/zatverdzeni%20standarty/2021/12/24/183-Tekhn.zakh.navk.seredovysycha-dokt.filos.pdf>.
7. Topics of Scientific Research and Scientific and Technical (Experimental) Developments for 2025-2029, approved by Order of the MIA of Ukraine № 326 dated 21.05.2024. URL: <https://mvs.gov.ua/normativno-pravovi-akti/nakaz-mvs-vid-21052024-326-pro-zatverdzeniia-tematiki-naukovix-doslidzen-i-naukovo-texnicnix-eksperimentalnix-rozrobok-na-2025-2029-roki>.
8. Civil Defense Service Oath (Civil Defense Code of Ukraine in the current version of September 12, 2025, Article 108. URL: <https://zakon.rada.gov.ua/laws/show/5403-17#Text>.