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DICHOTOMY OF LEGAL PROVISION OF ECOLOGICAL SAFETY IN EXCAVATION, EXTRACTION AND USE OF COAL MINE METHANE

Purpose. Providing general characteristics, types and concepts of legal relations in the coal mine methane industry (CMM industry), revealing specific features of coalbed methane as an object of international, European and constitutional legal relations caused by its natural dichotomy as a harmful substance – greenhouse gas, on the one hand, and material and/or energy resource – a mineral of national importance, on the other.

Methodology. During the research, general and special research methods such as dialectical, comparative legal, formal-legal, formal logical, comparative, system structural and system functional methods were used.

Findings. It is proposed to differentiate economic activity in coal mine methane industry into types corresponding to the specifics of content, object composition and the legislation field regulating it. It is established that for mining and subsoil legal relations in the CMM industry, subsoil, mining and subsoil mining objects can act as generic objects in which coal mine methane to be extracted is concentrated. The authors' understanding of the moment of transferring property to coal mine methane is reasoned, as well as its consideration as an object of law of property various forms, based on the connection of methane with subsoil. The main features of coalbed methane as a direct subject of constitutional and legal relations and as an object of international and European legal relations are determined.

Originality. The classification of types of legal relations in CMM industry of the general level, based on the natural dichotomy of coal mine methane, has been developed. Definitions of “legal relations in CMM industry”, “environmental safety of objects of legal relations in CMM industry”, as well as the features of coalbed methane as part of the property of the Ukrainian people, world climate policy and European green course.

Practical value. The practical significance of the results consists in the possibility of using them in research and educational activities by scientists and researchers in higher education, lawmaking, law enforcement and judicial practice in the process of improving national legislation, investigating and reviewing legal cases in the field of using and emitting coal mine methane.

Keywords: *coal mine methane, legal relations in CMM (coal mine methane) industry, environmental safety*

Introduction. For hundreds of years, coal methane, or as it is also called, mine methane (hereinafter – coal mine methane – CMM), has been considered exclusively as an “enemy” of miners, a source of explosions and sudden emissions of coal and rocks in mines. Significant logistical, energy and labor resources have been spent (and are being spent) on struggling it to ensure the safety of mining operations and increase the miner productivity. Methane refers to greenhouse gases (hereinafter – GHG), it is continuously released during the coal metamorphism, as well as during their extraction and processing. The intensity of absorbing Earth long-wave radiation by methane is 21 times higher than that of carbon dioxide [1].

Therefore, the problem of stabilizing the level of GHG concentration in the atmosphere at a level that would not allow dangerous anthropogenic impact on the planet's climate system is global. A significant number of scientific works in such fields as ecology, energy, economics, mining, law are devoted to its solutions, although the latter seems to influence the current set of legal relations in the coal mine methane industry most effectively. At the same time, as an object of legal relations, CMM is proposed to be considered as an intersectoral phenomenon, whose position can change dynamically in time, space and range of subjects.

Literature review. Even the Kyoto Protocol [2, Paragraph viii, Article 2], which entered into force on February 16, 2005 and was ratified by Ukraine by the relevant law on February 4, 2004 No. 1430-IV, provided that each of its parties, while fulfilling its defined obligations on quantitative limits and GHG emission reductions, on purpose to promote sustainable development, implements and/or continues to develop in accordance with its national conditions, including policies and

measures such as limiting and/or reducing methane emissions through recovery and reuse in the process of waste disposal, as well as in energy production, transportation and distribution.

Moreover, Ukraine and the EU Association Agreement [3], also ratified by the law of September 16, 2014 No. 1678-VII, provides the implementation of European energy strategies and policies. In particular, Article 339 of the Agreement states that with the aim of increasing efficiency, competitiveness and stability, the restructuring process should cover all stages of coal production, in particular from extraction through production and enrichment to the treatment and disposal of coal production waste and its incineration. This approach includes the recovery and use of methane emissions from coal mines, as well as a result of oil and gas operations and in the agricultural sector, as set out, inter alia, in the Global Methane Initiative, in which the Parties are partners.

In his work, A. F. Bulat proposed to consider the Donetsk basin, in conditions of fuel and energy resource shortage and the gradual coal reserve depletion, as a complex of promising gas fields, and to pay attention to forecasting, production and disposal of CMM [4].

Collective monographs present methodological approaches to the coal mine methane industry, basic information on methane production, present modern views on the nature of coal-bearing strata methane gas, describe the latest technologies and equipment for its production [5], and show that CMM of Ukraine is promising associated minerals whose resources in the Donetsk coal basin exceed 3.0–3.5 trillion m³ [6].

The reason is serial complexes of underground gas pumping equipment, about 50 % of them work in industrial conditions.

It should be noted that methane released into the atmosphere by ventilating and degassing of wells poses a significant

environmental risk. Only 95 % of the extracted coal is almost irreversibly lost every year, while the greenhouse effect is intensified and the environment is polluted [7].

At the same time, the existing schemes of coal mine methane capture in the development of coal seams are not effective enough and unable to fully meet the requirements of environmental protection and ensure safe working conditions [8].

Some issues of legal support of economic activity in geological study were also considered in the scientific and practical commentary to the Mining Law of Ukraine [9].

Some significant achievements of environmental law scientists in the field of researching legal support of environmental security should be noted. In particular, representatives of leading scientific schools, such as Taras Shevchenko National University of Kyiv, Yaroslav Mudryi National Law University, National University of Life and Environmental Sciences of Ukraine, V.M.Koretsky Institute of State and Law of NAS of Ukraine, V.K. Mamutov Institute of Economic and Legal Research of NAS of Ukraine, National Mining University (now – Dnipro University of Technology) published the following results: Environmental Safety Law (V.I. Andreytsev, 2002); Legal Regulation of Environmental Safety in Ukraine (edited by A. P. Hetman, 2012); Problems of Environmental Safety Law (edited by M. V. Krasnova, R. S. Kirin, 2016); Law of Environmental Safety in Ukraine (Yu. A. Krasnova, 2018); Problems of Legal Support of Environmental Safety in Special Nature Management in Ukraine (A. S. Yevstigneev, 2019), and others.

Unsolved aspects of the problem. Thus, the available publications concerning legal support of environmental safety of legal relations objects in the coal mine methane industry are few and they highlight only some narrow aspects of this problem. Sufficient and comprehensive coverage in the latest research on the issues of certain types of CMM legal regime has not been received yet.

Therefore, the **purpose of the article** is to reveal the specifics of legal support of environmental safety of legal relations objects in CMM industry, which is caused by natural dichotomy of coal mine methane coal as a harmful, dangerous substance – greenhouse gas, on the one hand, and material and/or energy resource – the mineral of national importance, on the other.

Methods. To achieve this goal the article presents the solution of the following tasks:

- providing a general description of legal relations in the CMM industry, formulating their legal definition and developing a species classification;
- disclosing features of coal mine methane as a component of the object of property rights of the Ukrainian people – the object of constitutional legal relations;
- determining the dual specificity of legal support of ecological safety of legal relations objects in CMM industry;
- reviewing the signs of coal mine methane as a component of world climate policy and the European green course – the object of international and European legal relations.

The study sequence is determined by the logic of the above mentioned tasks, the structure and content of the requirements of current international, European and national legislation, as well as the practice of its application.

Results. General characteristics of legal relations in the coal mine methane industry. Increasing the energy potential of Ukraine is associated, inter alia, with the possibility of using CMM as a fuel. The main component of explosive gases is methane, its content is 80–90 % or more. Methane, as a concomitant mineral, is found in Carboniferous coal seams in the Donetsk and Lviv-Volyn basins. Every year, Donbass coal mines emit more than 2.7 billion cubic meters of methane, and the volume of its use is only 4–5 percent. The experience of the United States shows that the extraction of CMM as a concomitant mineral can reach 70–80 percent [10].

With the aim of determining the legal, economic, environmental and organizational principles of activities in the field of

CMM geological study, including research and development, excavation and extraction during degassing and further use as a material and/or energy resource, Ukraine adopted the correspondent law [11] (hereinafter – CMM Law).

In addition to the traditional general and final provisions (Chapters I, VII), as well as the section (within one article) on international cooperation in the field of relevant activities, CMM Law currently regulates the following groups of relations:

- 1) state policy, regulation, management and incentives in the field of geological, mining and economic relations in the CMM industry;
- 2) principles of management in the field of geological, mining and economic relations in the coal mine methane industry;
- 3) liability of business entities – legal entities for legislation violations in the field of CMM extraction and use.

At the same time, the list of legislation governing geological, mining and economic relations in the field of CMM includes codified acts of subsoil legislation (Subsoil Code of Ukraine, hereinafter – SCU) and land legislation (Land Code of Ukraine), as well as basic mining (Mining Law of Ukraine, hereinafter – MLU), oil and gas (Laws of Ukraine “On Oil and Gas”, “On Alternative Types of Liquid and Gaseous Fuels”, on CMM), ecological (Law of Ukraine “On Environmental Protection”, hereinafter – the LEP) and labor legislation (Law of Ukraine “On labor protection”), other regulations.

It should be noted that the content of CMM law provides grounds for the division of economic coal mine methane activity into two types, each of which can also be differentiated into two subspecies, namely:

- 1) economic geological and mining activities in the field of CMM use: 1.1) geological activities, including research and development of coal deposits (hereinafter – CD); 1.2) mining activities, including CD industrial development;
- 2) economic energy-technological activities in the field of CMM: 2.1) energy production, where CMM is used as the main energy carrier; 2.2) production process, where CMM is used as the main technological raw material.

In more detail, CMM law reveals the concept of “CMM extraction” (Article 1), the analysis of which identifies its key features, such as: a) type of activity – economic activity, including a set of technical measures b) natural objects of CMM extraction; c) economic objects within which natural objects of CMM are concentrated; d) the purpose of using extracted CMM: material and energy resources; material resource; energy resource.

From the above mentioned definition it follows that mining and subsoil relations in the coal mine methane industry are differentiated by the following types of their objects:

- 1) generic subsoil facilities containing CMM as a subject to extract: 1.1) coal seams; 1.2) containing rocks; 1.3) underground cavities;
- 2) generic mining facilities containing CMM as a subject to extract (to excavate): 2.1) operating mines; 2.2) mines being prepared for operation; 2.3) CD, the industrial development of which was not carried out, regardless of their further use; 2.4) used CD.

Slightly differently, these objects are defined at the secondary level in the Guidelines of the State Commission of Ukraine for Mineral Resources (hereinafter – SCR) (approved by the decree of 30.12.2013 No. 569), where with reference to the CMM law, the following types of coal and gas subsoil area (hereinafter – CGSA) are defined:

- coal deposits (basins) areas, the industrial development of which was not carried out, regardless of their further use;
- mine areas that are being prepared for operation;
- areas of existing mines;
- areas of used CD.

The CGSA standardization adopted by the CMM Law, within which geological studies and CMM extraction are performed, is determined primarily by their position on the coal

mining front, as well as the type of subsoil use for which they were provided or are being provided. This CGSA typing generally corresponds to modern technologies of complex industrial development of coal mine methane deposits, which provide the CMM extraction consistently at all stages of geological study and industrial development of coal seams. That is, in this case the generic subsoil objects are determined.

In the legal aspect, in our opinion, the determining criterion in the legal relations division in CMM industry, in addition to the type is the stage of subsoil use, i.e. the stay of the ancestral coal and gas facility at a certain stage of use (operation) of the subsoil facility. before, during and after the CD development.

Important meaning for the differentiation of legal relations in CMM industry is the CMM law requirement, according to which, first, these relations are regulated by regulations, which are mandatory for all subjects of these relations. Secondly, the subjective composition of legal relations in CMM industry can be represented by certain groups depending on the type and nature of activities in relation to the objects of CMM extraction and use: design activities; construction activities; reconstruction activities; repair activities; operation activities; liquidation activities; activities for further use. Thirdly, the norms and rules apply not only to these activities, but also to the CMM compliance with the conditions of access and transportation by gas transmission networks, including the gas transmission system of Ukraine.

Thus, economic activity in the CMM field should be considered in two aspects in terms of the legislation area governing it:

1) subsoil economic activity: 1.1) geological (geological study of activities where CMM is a mineral raw material); 1.2) mining activities (extraction activities where CMM is a marketable product of mining), the implementation of which is regulated mainly by subsoil legislation and mining legislation;

2) production economic activity: 2.1) energy (activity where CMM is the main energy carrier); 2.2) technological (CMM is the main technological raw material) activity, the implementation of which is regulated mainly by energy and/or industrial and economic legislation.

It is significant that stimulating these types of economic activities at the legislative level is recognized as one of the leading areas of state policy in the field of industrial and energy security and is based on creating favorable conditions for such activities.

This should be ensured through a number of measures aimed at establishing certain guarantees, benefits, incentives in the following sectors of coal mine methane industry: 1) investment – creating attractive conditions, providing state guarantees for investment protection; 2) mineral resources – taking into account the CMM peculiarities as a mineral; 3) mining and geological – an individual approach to project development at separately identified sites; 4) customs and tax – the provision of customs and tax benefits to the subjects of extraction and production of CMM products; 5) economic – the introduction of a system of state support for mining and energy businesses.

The following basic principles of management must be observed:

1) safety of CD operation – the necessity to bring CMM concentration to the established standards;

2) safety of development of new CD – the necessity of preliminary degassing;

3) accounting the reserves (resources) and the volume of CMM extraction;

4) dispositiveness in economic activity – the possibility of concluding agreements on joint investment activities for selling extracted CMM and other actions not prohibited by law.

Separately, we note the peculiarities of economic activity for CMM extraction under the terms of the agreement on the so-called Joint Implementation (joint implementation projects

involving cooperation between two industrialized countries, hereinafter – JI-project). Article 14 of the CMM Law obliges one of the parties of this agreement to have a permit to emit pollutants into the air in accordance with the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) [2]. In this case, the profits from JI-projects, in accordance with the requirements of this protocol, will be distributed among the participants on contractual terms.

Finally, we should pay attention to the SCR separation of such types of coal mine methane economic activity (technological and economic schemes of CCM extraction) as:

- concomitant CMM extraction by surface and underground installations of mines during degassing the coal massif to ensure industrial and environmental safety of coal mining, regardless of its use as a material and/or energy resource;

- independent industrial CMM, carried out for the purpose of using CMM as a material or energy resource, economically independent of ensuring industrial and environmental safety of coal mining.

Considering in the general set of legal relations in the coal mine methane industry a separate type relating to the environmental safety of their facilities, the provision features established by the CMM Law should be noted. The latter are caused by objective conditions that currently exist or may exist in the areas of CMM extraction and use:

1) geological and mineralogical – the lack of guaranteed CMM availability and its guaranteed quality composition;

2) mining and technological – the complexity of CMM industrial extraction and use, caused by uncertainty of its distribution and quality;

3) security – the necessity to ensure the reliability and safety of operating the facilities in the coal mine methane sector, caused by the increased explosion and fire hazard of CMM and its products.

In addition, it is necessary to take into account another condition, according to which the set of basic requirements for deposits development is transformed in an appropriate system of responsibilities of subsoil use entities at each component of “use – supervision – responsibility”, and their correspondence obviously has the potential to balance [12].

The above group of relations is associated primarily with the useful CMM properties. However, the latter, by its natural origin, has extremely harmful features which are dangerous to humans and the environment.

Thus, CMM located in the mine can create explosive and flammable methane-air mixtures. In CD development areas, methane can enter residential areas during barometric pressure drops, causing suffocation conditioned by a decrease in oxygen concentration in a methane-saturated atmosphere.

In addition, the CMM presence in the Earth's atmosphere leads to the greenhouse effect, through its ability to absorb thermal radiation from the planet's surface and clouds (infrared radiation) and reflect it back, further warming the planet's atmosphere.

Legal and organizational principles of monitoring, reporting and verification (hereinafter – MRV) of GHG emissions and aimed at fulfilling Ukraine's obligations under international agreements approved by the Verkhovna Rada of Ukraine, in particular, the Association Agreement between Ukraine and the EU [3], as well as in compliance with the requirements of the UNFCCC and the Paris Agreement [13] (ratified by the law of July 14, 2016 No. 1469-VIII) determines the MRV Law [14].

Therefore, the legal relations in the CMM industry are diverse in their content, but interconnected and unique. Their unity is caused by the connection of natural CMM properties. Therefore, the unity of legal relations in the coal mine methane industry does not prevent the existence of their varieties, caused by the priority of resource or security factors.

The analysis of the current coal mine methane legislation allowed us to present the classification of legal relations types

in the CMM industry of the general level, which is based on the natural CMM dichotomy:

1) relations arising in connection with the useful CMM properties – methane-resource legal relations: 1.1) methane-subsoil (relations of geological studying and extracting CMM); 1.2) methane-economic (relations of using CMM);

2) relations arising from the harmful CMM properties – methane-safe legal relations: 2.1) relations of methane-coal safety (relations ensuring industrial safety at coal mining facilities); 2.2) relations of methane-ecological safety (relations ensuring ecological safety of man, environment, the planet).

Thus, legal relations in the CMM industry are proposed to be understood as public relations regulated by legal norms appearing between the subjects of environmental and industrial safety, CMM geological study, production and extraction during degassing and further using as material and/or energy resource, protection of man, the environment from its harmful effects as a greenhouse gas to prevent, eliminate negative consequences and meet environmental, economic and other interests.

CMM as a component of the object of property rights of the Ukrainian people is the object of constitutional legal relations. Based on the provisions of the Constitution of Ukraine of June 28, 1996 Article 13), subsoil located within the territory of Ukraine, its continental shelf, exclusive (marine) economic zone are objects of property of the Ukrainian people. At the same time, the rights of the owner are exercised by state authorities and local governments within the limits set by the Constitution of Ukraine.

Analysis of the latter allows us to identify the following constitutional requirements aimed at ensuring sustainable use of nature, and hence subsoil use, and environmental safety:

- the state duty is to ensure environmental safety and maintain ecological balance in Ukraine (Article 16);

- the duty of the property use subjects is to preserve the ecological situation and natural qualities of the land (Article 41);

- the right of everyone is the right to a safe environment for life and health, compensation for damage caused by this right violation (Article 50);

- everyone's duty is not to cause harm to nature, to compensate for damages (Article 66);

- the principles of using natural resources and the basics of environmental safety are determined exclusively by the laws of Ukraine (Article 92);

- the Cabinet of Ministers of Ukraine (hereinafter – the CMU) ensures the implementation of the policy in the spheres of nature protection, ecological safety and using natural resources (Article 116).

In this case, in accordance with Article 50 of the Law of Environmental Protection, the concept of “environmental safety” is considered as a state of environment, which provides: a) prevention of environmental situation deterioration; b) the emergence of a danger to human health. Environmental security is guaranteed to the citizens of Ukraine by implementing a wide range of interrelated political, economic, technical, organizational, state and legal, other measures. The latter, in relation to the objects of legal relations in the CMM industry, are proposed to be considered as a general environmental safety measures.

The generic level of legal support for environmental safety of these relations, i. e. their regulation by the state through law and a set of legal means, as well as legal consolidation, protection and development, is disclosed in the prescriptions of subsoil and mining legislation, such as – Articles 17, 24, 48, 50, 54, 56, 63 and 65 of the Criminal Procedure Code, Articles 4, 7, 18, 26, 34–36, 38, 49 MLU.

Instead, the direct legal provision of environmental security of legal relations in the CMM industry is carried out through the provisions of Article 16 of the CMM. Based on the content of the latter, with the aim to comply with environmental safety during the extracting and using CMM, for business

entities responsibilities in the following areas related to methane coal activity are established, they are:

1) insurance – compulsory insurance of property risks during the extracting and using CMM in the manner prescribed by insurance legislation;

2) mining – compliance with the rules, norms of mining;

3) environmental – compliance with the rules, norms of environmental protection;

4) environmental safety – compliance with the ban (prevention) of incinerating the seized CMM without using special devices provided with the relevant operational documentation; establishment of protection and sanitary protection zones to ensure the safety of the population living in the area of coal mine methane facilities;

5) industrial safety – implementation of technical and organizational measures to prevent accidents and catastrophes at all stages of the existence of coal mine methane facilities; ensuring the possibility of their permanent and mandatory rescue services.

Therefore, the following should be recognized as generic environmental safety measures in the field of legal relations in the CMM industry: insurance; mining; ecological; technological; emergency; rescue; sanitary, and protective.

Immediate measures to ensure environmental safety in the conduct of coal mine methane activities are provided by the projects of relevant facilities.

As for the other side of such activities, i. e. activities whose GHG emissions are subject to monitoring, reporting and verification, Article 13 of the Law on MFA obliges the operator (business entity) to implement the following environmental safety measures: registration; planning; reporting; procedural; improving; monitoring; verifying; documentaries, and others.

Therefore, the term “environmental safety of objects of legal relations in the CMM industry” is proposed to mean the state of the environment, in which, with a set of measures provided by law and projects of these objects, provide space and time guarantees of environmental protection, vital rights and the interests of man and citizen from the possible negative impact of coal mine methane and other activities, the threat of deterioration of the ecological situation, the emergence of natural and man-made nature.

Based on the understanding “subsoil” concept used in Article 1 of the Subsoil Code of Ukraine of July 27, 1994 No. 132/94-VR (hereinafter – SC), subsoil, in the geosphere aspect, is a part of the earth's crust characterized by two spatial indicators:

a) location below the land surface and the reservoirs bottom;

b) extension to the depths available for geological study and development.

Being the object of exclusive property of the Ukrainian people, subsoil is provided only for use, and agreements or actions that directly or implicitly violate this property right, according to Article 4 SC, are invalid.

In their turn, in accordance with Article 5 of the SC, the used subsoil areas as well as not used ones, including the continental shelf and the exclusive (marine) economic zone, are included into the state subsoil fund (hereinafter – SSF). As part of the latter is the State Fund of Mineral Deposits (hereinafter – SFMD), which includes all mineral deposits including man-made ones, with reserves estimated as industrial, and all previously estimated mineral deposits – the reserve of this fund.

The SFMD and the reserve of this fund are formed by the CEB (Central Executive Bodies, which implements the state policy in the field of geological study and rational use of subsoil. Currently, this body is the State Service of Geology and Subsoil of Ukraine (hereinafter – SSGSU) – CEB, whose activities, according to the Decree of CMU of December 30, 2015 No. 1174, are directed and coordinated by the Cabinet of Ministers through the Minister of Environment and Natural

Resources. It should be noted that the Ministry of Environmental Protection and Natural Resources of Ukraine (hereinafter – the Ministry of Environment) is the main body in the CEB system, whose activities are directed and coordinated by the CMU, and which, unlike the SSGSU, No. 614, ensures the formation of public policy, including in this area.

SSF forms the SSGSU together with CEB, which implements state policy in the field of labor protection – the State Labor Service of Ukraine (hereinafter – SLSU) – CEB, whose activities, based on the Decree of CMU of February 11, 2015 No. 96 are directed and coordinated via the Minister of Economy, who also implements state policy, inter alia, in the field of state mining supervision.

Therefore, the subjective composition of state regulation in the field of coal mine methane, which on behalf of the Ukrainian people exercises the rights of ownership of the relevant subsoil facilities, consists of the following CEB:

1) Ministry of Energy of Ukraine (hereinafter – MEU) – within the provided mining allotments;

2) Ministry of Environment, SSGSU, National Commission for State Regulation of Energy and Utilities (hereinafter – NCSREU), State Agency for Energy Efficiency and Energy Saving of Ukraine (hereinafter – SAEE), other CEOs authorized by the President of Ukraine in relevant areas, established by law – on vacant areas.

This division is based on the provisions of Article 8 of the CMM Law; however, the analysis of the provisions of some of these CEBs does not provide such grounds, and therefore requires appropriate changes that would harmonize laws and regulations in this area.

In addition, some powers of local governments in the field of legal relations in the coal mine methane industry, defined in Article 9 of the CMM Law are disputable, among them there is granting consent in accordance with the legislation for the location of coal mine methane facilities on the relevant territory, the sphere of environmental impact of which in accordance with current regulations includes the relevant territory. A similar provision of the Law of Ukraine “On Amendments to Certain Legislative Acts of Ukraine to Reduce the Number of Permitting Documents” of April 9, 2014 No. 1193-VII is excluded from Article 11 MLU, as well as Article 49 of SC “Approval of locations of mining facilities and underground structures not related to mining”.

As for the object composition of the property rights of the Ukrainian people to the subsoil, the very concept of “minerals” as one of the types of subsoil resources, the most complete, in our opinion, is disclosed in Article 14.1.91 of the Tax Code of Ukraine of December 2, 2010 No. 2755-VI (hereinafter – TC), the analysis of which gives rise to the separation and differentiation of their generic features: 1) creation type: natural mineral; man-made mineral; 2) origin type: organic origin in the subsoil; inorganic origin in the subsoil; groundwater; formed in places of production waste disposal; formed in places of loss of products of mineral processing; 3) use type: directly in the field of material production and consumption; in the field of material production and consumption after primary processing.

National Classifier SC 008:2007 “Classifier of Minerals” classifies CMM (type – Gas (methane) of coal deposits and coal-bearing strata) to the class “Combustible minerals”, group “Gaseous combustible minerals”, subgroup “Combustible natural gas”.

It is obvious that the domestic legislation considers minerals in two main types in relation to their connection with the subsoil:

1) minerals that are directly in the array of rocks in the natural deposit (minerals in the natural state – in situ);

2) minerals that are separated from the mass of rocks (minerals in the extracted state).

In the first case, minerals, including CMM, should be considered as a component of the subsoil, natural mineral for-

mations – the object of property rights of the Ukrainian people. In the second case – minerals are mineral raw materials, i.e., within the meaning of Article 14.1.112 TC, marketable products of the mining enterprise, which is the result of its economic activities for the extraction of minerals, including through the implementation of economic contracts for services with toll raw materials, and qualitative characteristics meet the requirements of statutory standards or contract requirements. Therefore, legally extracted minerals should be considered as the object of ownership of the subsoil user who extracted them, unless otherwise is provided by law, special permit or contract (agreement). That is a change of ownership, and hence the legal regime of minerals.

In this regard, the issue of transferring minerals ownership from the Ukrainian people (authorized public authority) to the subsoil user is extremely actual. For example, according to Article 20 of the Law of Ukraine “On Production Sharing Agreements” of September 14, 1999 No. 1039-XIV (hereinafter – the PSA Law), prior to distributing products at the point of measurement, the property right to all products produced under the agreement belongs to the state. Starting from the moment of distributing products at the point of measurement, the investor acquires the property right to compensatory products and part of the profitable products determined by the agreement; the rest of the products remain the property of the state.

It should be noted, first, that the parties to the PSA are the investor (investors) and the state represented by the Cabinet of Ministers. Secondly, the point of measurement in the PSA Law is the point at which, in accordance with the PSA, the measurement of manufactured products is carried out as well as their division into compensatory and profitable ones. Thirdly, according to the PSA Law (Article 1), CMM refers to non-traditional hydrocarbons, during the development of which PSA may provide special stages, rules and procedures for subsoil use and works.

Therefore, it is proposed to consider that for CMM the transferring property right from the Ukrainian people (authorized body of state power) to the subsoil user corresponds to the moment of delivering CMM to the designated point (mining mouth, well), where it is possible to assess the compliance of quantitative and qualitative characteristics of the extracted CMM to the requirements of marketable products of the mining enterprise.

Thus, based on defining such concepts as: “subsoil”, “mineral deposits” (Article 5 of Criminal Procedure Code), “minerals” (article 14.1.91 of the Tax Code, “coal deposit”, “gas (methane) of coal deposits” [13], it can be argued, on the topic of research, the general object of constitutional and legal relations, is the economic sphere of social and state order, generic – the sphere of natural objects, direct – the sphere of subsoil ownership. At the same time, the general subject of constitutional and legal relations in the latter sphere should be considered subsoil, generic – methane-bearing subsoil of CB, direct – CMM.

At the same time, as a subject of constitutional and legal relations, it is proposed to consider CMM as a component of the methane-bearing subsoil of CD – the property of the Ukrainian people included into SFMD or its reserve and also SSF limited by the body of state power that realizes the owner rights with the relevant area, depth, a special permit and established rights and responsibilities concerning them.

CMM as a component of world climate policy and the European green course is an object of international and European legal relations. The Paris Climate Agreement [13], in contrast to the Kyoto Protocol [2], stipulates that all states, regardless of their level of economic development, are obliged to reduce harmful GHG emissions. This Agreement strengthens the implementation of the UNFCCC, including its objectives, aims to strengthen the global response to the threat of climate change in the context of sustainable development and poverty eradication efforts, including through [13]:

a) restricting global average temperatures below 2 °C above pre-industrial levels and working to limit temperatures to 1.5 °C above pre-industrial levels, recognizing that this will significantly reduce the risks and consequences of climate change;

b) enhancing the capacity to adapt to the adverse effects of climate change, as well as promoting resilience to climate change and low-carbon development so as not to jeopardize food production;

c) ensuring that financial flows are consistent with low-carbon and climate-resilient developments.

The implementation of new tasks caused by Ukraine's ratification of the Paris Agreement and further implementation of its provisions requires the formation of a coherent and consistent state policy in the field of climate change in accordance with international organizations, taking into account leading world technologies and practices. The formation and further implementation of an integrated state policy in the field of climate change, harmonized with international law, is a difficult task due to the multidisciplinary nature of the problem [15].

Reducing anthropogenic methane emissions by 45 % by 2030 will pave the way for the Paris Agreement to keep warming to 1.5 degrees Celsius this century. It is estimated that methane pollutes LEP 84 times more than CO₂ over a 20-year period. This is stated in a new report by the United Nations Environment Program (UNEP) and the Climate and Clean Air Coalition (CCAC) [16].

In addition, it should be noted that most of these emissions are from the fossil fuel sector (33 %), including gas distribution, leaks and exhaust, which are relatively easy to detect, eliminate and thus reduce air pollution [17].

In Ukraine, the Low-Carbon Development Strategy of Ukraine until 2050 (hereinafter – LCDS), developed to meet Ukraine's international obligations under paragraph 19 of Article 4 of the Paris Agreement, paragraph 35 of Decision 1/CP.21 of the Conference of the Parties to the UNFCCC, and approved by the decision of the Interdepartmental Commission for Enforcement of the UNFCCC (Protocol of 16 February 2018 No. 1) [18]. The fifth section of the LCDS, "Reducing Greenhouse Gases Emissions Other than CO₂," describes policies and measures in three areas to reduce methane and nitrous oxide emissions, which include, but are not limited to, a number of measures to minimize the environmental impact of methane coal activities: reduction of CMM leaks during extracting, processing, transporting and storing fossil fuels; ensuring the CMM removal, use and disposal.

The only measure provided by the LCDS in this direction is to stimulate the activities of geological studying, extracting and using CMM, degassing and its utilization, in particular the installation of cogeneration units. It should be noted that in 2015 methane emissions in Ukraine amounted to 62.7 million tons of CO₂-eq., which is 67.1 % less than in 1990, and one of the largest sources of CH₄ emissions (61 %) are coal mines [18].

However, since the adoption of the LCDS, global progress in tackling climate change has accelerated significantly – the EU has launched an ambitious European Green Deal (EGD), which has been declared a priority in Ukraine. The main steps in climate and environmental policy are identified as follows [19]:

- decarbonization of the national economy, achieving carbon neutrality;
- change in the approach to GHG emissions taxation and targeted use of these funds;
- introduction of the emissions trading system from 2025;
- development of a strategy for environmental safety and adaptation to climate change until 2030.

At the same time, it should be noted that on March 11, 2020, the European Commission (EC) adopted the Circular Economy Action Plan, which is an important part of EGD strategy agenda and aims to reduce consumption in EU and doubling resource reuse in the coming decades, while contrib-

uting to economic growth [20]. And on October 14, 2020, the EC presented the EU Strategy for Reducing Methane Emissions, which states that methane is the second factor influencing climate change after carbon dioxide. In Europe, it accounts for 10 % of total GHG emissions. It is also a powerful local air pollutant that causes serious health problems. Therefore, combating methane emissions is important for achieving the EU's 2030 climate targets and the 2050 targets.

Finally, on February 24, 2021, the EC adopted the EU's Climate Change Adaptation Strategy, which sets out ways to prepare for the inevitable effects of climate change. Although the EU is doing its utmost to mitigate climate change, both domestically and internationally, there is a need to be prepared to deal with the inevitable effects of climate change, such as deadly heat waves, devastating droughts, deforestation and coastal degradation, blurred due to rising sea levels. Basing on the 2013 Climate Change Adaptation Strategy, the new Strategy aims to shift the focus from understanding the problem to decision making and moving from planning to implementation.

Ukraine participates in international cooperation in the field of extracting and using CMM in accordance with international treaties of Ukraine and the legislation of Ukraine [11, Article 18].

Thus, methane in general and CMM in particular, as an object of international and European legal relations, have the following features: recognized by the Kyoto Protocol as one of the main GHGs – has a greenhouse activity 28 times stronger than that of carbon dioxide, and in the 20-year perspective – 84 times; is a powerful local air pollutant that causes serious health problems; GHG, which accounts for 10 % of total emissions in Europe, most of which are in the fossil fuel sector; reducing its harmful emissions into the atmosphere is an obligation under the Paris Agreement for all states, regardless of their level of economic development.

Conclusions. A study on specific features of CMM as an object of international, European and constitutional relations, due to its natural dichotomy as a harmful, dangerous substance – greenhouse gas, on the one hand, and material and/or energy resource – minerals of national importance, on the other, gave rise to the following generalizations.

1. It is proposed to differentiate economic coal mine methane activity into types corresponding to the specifics of content, object composition and the field of legislation governing it:

1) economic activity on geological study, CMM gas production: 1.1) geological study, including research and development; 1.2) industrial development of CD in order to remove CMM from it for further use;

2) economic activity on CMM use: 2.1) production of electric, thermal and/or other types of energy if CMM is the main energy source; 2.2) when using CMM as the main technological raw material;

3) subsoil economic activity: 3.1) geological (geological study on activities where CMM is a mineral raw material); 3.2) mining (mining activities where CMM is a marketable product of mining) activities, the implementation of which is regulated mainly by subsoil legislation and mining legislation;

4) production economic activity: 4.1) energy (activity where CMM is the main energy carrier); 4.2) technological activity (activity where CMM is the main technological raw material), the implementation of which is regulated mainly by energy and/or industrial and economic legislation.

2. It is established that for mining and subsoil legal relations in the coal mine methane industry, as generic objects in which CMM is a subject, which is to be extracted (extraction), may be:

1) generic subsoil objects: 1.1) coal seams; 1.2) containing rocks; 1.3) underground cavities;

2) tribal mining facilities: 2.1) operating mines; 2.2) mines being prepared for operation; 2.3) CD, the industrial development of which was not carried out; 2.4) spent CD;

3) tribal subsoil-mining objects: 3.1) subsoil areas of CD (basins), the industrial development of which was not carried

out; 3.2) subsoil areas of mines that are being prepared for operation; 3.3) subsoil areas of existing mines; 3.4) areas of subsoil spent CD.

3. Provisions on the defining criteria for the division of legal relations in the methane coal industry, which should be considered the type and stage of subsoil use, i.e. the location of the ancestral coal and gas facility at a certain time stage of use (operation) of the subsoil facility, namely – before, during and after the development of BP.

4. The classification of types of legal relations in the methane-coal industry of the general level based on the natural dichotomy of CMM is developed:

1) relations arising in connection with the useful properties of CMM – methane-resource legal relations: 1.1) methane-subsoil (relations of geological studying and extracting CMM); 1.2) methane-economic (relations of using CMM);

2) relations arising from the harmful properties of CMM – methane-safety legal relations: 2.1) relations of methane-coal safety (relations to ensure industrial safety at coal mining facilities); 2.2) relations of methane-ecological safety (relations on ensuring ecological safety of man, environment, planet).

5. The definition of “ecological safety of objects of legal relations in CMM industry” is formulated, it is the environment state, in which vital rights and interests of man and citizen from the possible negative impact of methane coal and other activities, threats of deterioration of the ecological situation, the appearance of emergencies of natural and man-made nature.

6. The definition of “legal relations in the coal mine methane industry” is formulated, they are public relations regulated by law, arising between the subjects of environmental and industrial safety, geological study on CMM, production and extraction during degassing and further use as a material and/or energy resource, protection of man, the environment from its harmful effects as a greenhouse gas in order to warn, prevent, eliminate negative consequences and meet environmental, economic and other interests.

7. It is substantiated that CM should be considered as an object of law of various forms of ownership, based on its connection with the subsoil:

1) CMM located directly in the massif of rocks in the natural deposit (in situ) is a component of the subsoil, a natural mineral formation – the object of property rights of the Ukrainian people;

2) CMM separated from the massif of rocks (CMM in the extracted state) is a mineral raw material extracted on a legal basis – the object of ownership of the subsoil user, who extracted it, unless otherwise provided by law, special permit or contract agreement).

8. It is proposed to consider that for CMM the transfer of ownership from the Ukrainian people (authorized body of state power) to the subsoil user corresponds to the moment of CMM delivery to the point (mouth, well), where it is possible to assess the compliance of quantitative and qualitative characteristics of the extracted CMM to the requirements of marketable products of the mining enterprise.

9. It is established that the direct object of constitutional and legal relations, in terms of research, is the sphere of subsoil ownership, while their common subject should be considered subsoil, generic – methane-bearing CD subsoil, direct – CMM. The latter should be considered as a component of the methane-bearing subsoil of CD – the object of property of the Ukrainian people, included in the SFMD or its reserve, as well as in the SSF, limited by the state authority special permission and established rights and obligations in relation to them.

10. The main features of CMM as an object of international and European legal relations are defined, in particular: belonging to internationally recognized types of GHG that have the greatest impact on climate change; possession of greenhouse activity is ten times stronger than that of carbon

dioxide; belonging to powerful local air pollutants, which causes serious health problems; ownership of 10 % of total GHG emissions in Europe, most of which are in the fossil fuel sector; the need to reduce its harmful emissions into the atmosphere is an international obligation for all states, regardless of the degree of economic development.

Further research in the direction of the study is proposed to focus on clarifying the intersectoral nature of CMM in other types of legal relations in which this gas is involved as a direct or indirect object, namely: subsoil; geological; mining; environmental; land; gas; gas transportation; civilians; economic; contractual; administrative; criminal; tax; instrument.

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Дихотомія правового забезпечення екологічної безпеки при видобуванні, вилученні та використанні метану вугільних родовищ

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Мета. Надати загальну характеристику, види й поняття правовідносин у метановугільній галузі, розкрити специфічні ознаки метану вугільних родовищ як об'єкту міжнародних, європейських і конституційних правовідносин, обумовлені його природною дихотомією як шкідливої небезпечної речовини – парникового газу, з одного боку, і матеріального і/або енергетичного ресурсу – корисної копалини загальнодержавного значення, з іншого.

Методика. Під час дослідження використовувались загальнонаукові та спеціальні методи дослідження: діалектичний, порівняльно-правовий, формально-юридич-

ний, формально-логічний, компаративістичний, системно-структурний і системно-функціональний.

Результати. Запропоновано диференціювати господарську діяльність у метановугільній галузі на види, що відповідають специфіці змісту, об'єктного складу й галузі законодавства, яке її регулює. Установлено, що для гірничих і надрових правовідносин у метановугільній галузі в якості родових об'єктів, в яких зосереджений метан вугільних родовищ, що підлягає видобуванню, можуть виступати надрові, гірничі й надро-гірничі об'єкти. Обґрунтоване авторське розуміння моменту переходу права власності на метан вугільних родовищ, а також його розгляд як об'єкту права різних форм власності, виходячи зі зв'язку метану із надрами. Визначені основні ознаки метану вугільних родовищ як безпосереднього предмету конституційно-правових відносин і як об'єкту міжнародних і європейських правовідносин.

Наукова новизна. Розроблена класифікація видів правовідносин у метановугільній галузі загального рівня, заснована на природній дихотомії метану вугільних родовищ. Сформульовані дефініції «правовідносини у метановугільній галузі», «екологічна безпека об'єктів правовідносин у метановугільній галузі», а також розкриті особливості метану вугільних родовищ як складової об'єкту права власності Українського народу, світової кліматичної політики та європейського зеленого курсу.

Практична значимість. Практичне значення отриманих результатів полягає в тому, що вони можуть бути використані в науково-дослідній та навчальній діяльності вченими й пошукувачами вищої освіти, у правотворчій, правозастосовчій діяльності й судовій практиці у процесі вдосконалення національного законодавства, розслідування й розгляду юридичних справ у сфері використання та викидів метану вугільних родовищ.

Ключові слова: метан вугільних родовищ, правовідносини в метановугільній галузі, екологічна безпека

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