

## **Abstract of the doctoral dissertation “Administrative and Legal determinants of shale gas exploration and production”**

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The subject of the doctoral dissertation is the analysis of information, facts and legal regulations concerning together the possibility on the territory of the Republic of Poland of exploration, prospecting and extraction of gas from unconventional deposits in the form of shale gas.

Shale gas, gas from shale formations or gas from unconventional sources, these phrases have been accompanying Polish society for more than a decade. Shale gas, as related to the possibility of making Europe and Poland independent of external supplies of energy resources, has been and continues to be of fundamental importance for ensuring economic development and security in a broad sense.

The analysis of the presented topic will be carried out in a multifaceted manner, mainly using the formal-dogmatic method, consisting of establishing, analyzing and attempting to evaluate the effectiveness of the existing legal regulations. The structure of this dissertation, from the structural side, consists of 4 substantive chapters, supplemented by an introduction, a summary with a conclusion and a bibliography.

The first substantive chapter of the dissertation discusses the genesis of the legal, social and economic conditions related to shale gas exploration and extraction in Poland. It explains the basic concepts related to shale gas, analyzes the past decade in terms of exploration, appraisal and production of hydrocarbons from unconventional deposits in Poland. The characteristics of the extraction market in Poland are included.

The second substantive chapter of the work discusses administrative-legal aspects of the management of natural geological resources, including the right to free disposal, exploration and exploitation of natural deposits. It introduces the concepts of rationing and regulation as a function of the use of mineral deposits and the conduct of exploration and mining activities. The chapter also addresses the issues of restriction of economic activities arising from regulation and their compatibility with the constitutional principle of economic freedom. It discusses the right of entrepreneurs to conduct mining activities, which are rationed, and concessions as a form of economic activity regulated by the Entrepreneurs' Law. It presents the principles of administrative bodies in the licensing process. The chapter also addresses issues of rational management of mineral deposits, including legal protection of deposits and rationing of the use of the environment.

Finally, the chapter presents mining permissions, the legal situation of mineral deposits, including mining ownership and mining usufruct, and their role in advancing the public interest.

The third substantive chapter of the work discusses in detail the process of licensing economic activities related to the extraction of gas from unconventional deposits. At the outset, the legal nature of concessions and the specifics of activities regulated by geological and mining law are explained. It then presents the geological administration bodies responsible for issuing hydrocarbon licenses and the bodies that cooperate in the process. The chapter also examines the hydrocarbon licenses themselves, including the entities authorized to apply for them and the conditions they must meet. The entire chapter aims to show a comprehensive picture of the licensing process in the context of unconventional gas extraction, taking into account all legal, administrative and practical aspects.

The fourth substantive chapter of the work focuses on the role of shale gas in the context of the energy security of the Republic of Poland. First, the concept of energy security is explained, considering the legal aspects that regulate this issue. This is followed by a discussion of measures to ensure the diversification of the supply of energy resources, particularly natural gas, in the context of the changing geopolitical situation after 2022, when war broke out in Ukraine. The chapter also examines the European Union's energy security, pointing to common challenges and strategies to ensure stable energy supplies for state members. The final section of the chapter offers a perspective on the production possibilities of shale gas, taking into account its role as a transitional fuel in the energy transition. The chapter aims to show how shale gas can contribute to Poland's energy security, while fitting in with the broader goals of the European Union's energy and climate policy.

Excluded from the scope of this dissertation is an analysis of the general (excluding hydrocarbon concessions) regulations of the Geological and Mining Law regarding the scope of concessions. This exclusion was dictated by the author's desire to focus on solutions relating exclusively to hydrocarbon concessions as closely related to the research area, which is the subject of this thesis. At the same time, the scope of the work excludes a detailed legal and comparative analysis of the regulations on the process of exploration, prospecting and extraction of shale gas in other European countries, due to the different geopolitical structure and environmental conditions as to the very possibility of extraction of this energy resource.

The purpose of the study is to analyze the administrative-legal instruments existing in the Polish legal system, relevant to the possibility, exploration and extraction of shale gas, while ensuring safety for environmental elements, including humans.

The thesis put forward in this dissertation indicates that despite the lack of comprehensive legal regulations regarding the exploration and exploitation of already identified hydrocarbon deposits at the moment, it is able to include shale gas as one of the elements of obtaining energy resources while implementing the assumptions of the state's energy policy, increasingly covering the demand for energy resources from its own sources. In this respect, the state's actions regulating the mining sector should be perceived through the prism of implementing the broadly understood social interest as a manifestation

of the regulation of natural resources, while ensuring the state's energy security, environmental protection, and social well-being. The aim of the work is also to conduct comparative considerations, the legal status before the amendment of the geological and mining law of September 30, 2023, and to formulate an answer whether, *de lege lata*, hydrocarbon concessions will sufficiently accelerate the entire process related to the exploration, recognition and extraction of hydrocarbons. It can be clearly stated that the legal status prior to the amendment did not contribute effectively and dynamically to the development of this extraction sector.

Due to the research goal set in the work, which was to determine the legal and administrative conditions for the exploration and extraction of shale gas, the first context was analyzed in detail, which was the popularization of shale gas extraction in the USA and the discussion started over a decade ago on the environmental, economic and, above all, legal conditions for the possibility of conducting such activity in Poland.

In this respect, the theoretical and semantic foundation was subjected to detailed research, explaining what shale gas really is, what the process of its extraction consists of in technological terms, together with a description of the extraction methods used. Significant emphasis was placed in the work on presenting the social context, which determined not only the perception by local communities of the possibility of exploring and recognizing shale gas deposits, in terms of achieving independence and energy security, but also as a threat that may cause environmental degradation, including underground water pollution. The analysis of the topic was also based on the presentation of North American experiences in the field of using the extraction potential of shale gas, including statistical data showing the extraction capabilities of Poland in the context of the USA. Based on the presented optimistic forecasts and visions, the myth of Poland as a future gas power was built. In the work, the author presents legal instruments from the broadly understood administrative law, which concerned and concern directly and indirectly the process of prospecting, recognition and extraction of gas. The formal and legal conditions in the scope of the possibility of conducting activities licensed by the Geological and Mining Law, in the scope of hydrocarbons, were subjected to a detailed analysis. Not without significance for outlining the nature of administrative and legal powers enabling the conduct of exploration, reconnaissance and extraction activities in Poland was to present in the work the competences of public administration bodies for granting concession rights.

The starting point for defining the research theses of this dissertation was to diagnose the problems related to the exploration and extraction of shale gas in Poland. Undoubtedly, these problems contributed first to the slowdown and then to the withdrawal of foreign partners who had commenced exploration and trial extraction work in Poland. On this basis, the thesis was put forward that the natural gas extraction sector should be shaped through the prism of cooperation between state entities and private entities, in order to jointly implement the assumptions of the state's energy policy and ensure the highest

possible level of state security. Then, it was derived it is the administrative bodies carrying out tasks in the scope of the extraction sector that should regulate, direct and supervise the concession rights of extraction companies, in order to ensure their greater efficiency in the scope of exploration, reconnaissance and extraction work.

The above-mentioned diagnosed problems related to shale gas exploration and extraction, which had an impact on the future of shale gas extraction activities, include those that, to some extent, remain relevant to this day. This category undoubtedly includes inadequate administrative and legal regulations, especially in the area of licensing, the task of which would be to streamline the investment process, in successive phases (exploration, recognition and extraction, especially without the need to apply to administrative bodies for the issuance of, for example, an investment decision, which significantly extends the transition to the proper extraction phase), of course, while maintaining environmental protection norms and standards. Then, we can mention: the use of appropriate and effective extraction methods, adapted to the condition of the identified gas deposit; conducting a social dialogue adequate to the subject of the activity, thus expanding the knowledge of entrepreneurs related to potential threats to the environment, in connection with the use of the appropriate extraction method. The factor that has been emphasized as having an impact on the withdrawal of foreign partners from the Polish market was and still is the estimation of the volume of hydrocarbons. To this day, the Polish state is unable to provide the value of deposit resources, and only bases its knowledge on estimates. This state of affairs is related to the lack of drilling (active exploration and recognition activities) that would allow for the analysis of the resources of the identified deposits. The fact that Poland has difficult geological conditions is also significant. Polish deposits are older than the American ones (1,000 m.b.s.l.) and located much deeper, about 3,000 m.b.s.l. Geologists emphasize that the depth of the deposits is not the only factor that differentiates them. They include to them also physicochemical features such as permeability, porosity and mechanical parameters. Such a deep location of deposits is associated with the necessity of introducing other extraction techniques and, above all, with higher costs of extracting the raw material, and then a higher price of the extracted raw material. An important element constituting the starting point for considerations on the scope and form of administrative and legal management of geological environmental resources was the author's definition of the legal nature of ownership of geological natural resources in the Republic of Poland. By demonstrating that ownership of the subject of mining property (mineral deposits) (art. 10 p.g.g.), belongs to the State Treasury. Such a solution gives expression to the implementation of the principle of sovereignty over natural resources, manifested by defining the function of the state as a regulator of the possibility of conducting mining activities by entrepreneurs. It should be emphasized that by such a definition of the role of the state, it is in principle supposed to lead to the development and achievement of social, technical and economic progress by the state. A legal principle of great importance from the point of view of mining activity is the principle of sustainable development, which in the definition proposed by G. Dobrowolski, referring to the specificity of the

subject of this activity, highlights its ideas referring to "the process of transformations aimed at improving previous states, and this process must take into account the need for balance" ... and "that it is to be an ordering principle, and the solutions proposed in it should be considered the most important interpretative criterion - for the entire legal system". The author also presents the thesis, developed later in the chapter devoted to the regulation of the use of mineral deposits and the licensing of mining activities (regulation of geological and mining activities, in the scope of covering mining activities with the obligation to obtain an authorization in the form of a concession for the prospecting, recognition and extraction of hydrocarbons from deposits), that the scope of administrative and legal regulations enabling the conduct of shale gas extraction activities is based on the scope of hydrocarbon licensing indicated in the Geological and Mining Law. The chronological course of the legislative process, covering the licensing of hydrocarbons, was also analyzed, along with a presentation of the individual phases of the licensing procedure. At the same time, at the beginning, an attempt was made to provide a definition of the license, and then the subject of the hydrocarbon license was characterized. Pointing out that, in accordance with the content of art. 6 sec. 1 item 16 p.g.g., hydrocarbons are: "crude oil, natural gas and their natural derivatives, as well as methane occurring in hard coal deposits, with the exception of methane occurring as an accompanying mineral". In the scope of the hydrocarbon licenses, the author provides an analysis of: a license for the prospecting, exploration and extraction of hydrocarbons - the so-called combined license, and a license for the extraction of hydrocarbons.

At the same time, the work emphasizes that the geological and mining activities of individual EU Member States have a certain degree of freedom in decision-making, resulting from the sovereignty of the Member States and the same scope of rights to hydrocarbon deposits on their territory. The guarantor of such rights is the so-called Hydrocarbon Directive - Directive 94/22/EC of the European Parliament and of the Council of 30 May 1994 on the conditions for granting and using authorisations for the prospecting, exploration and production of hydrocarbons. The aim of the analysis conducted by the author was to demonstrate that the market for energy resources, including those originating from unconventional deposits, cannot function in isolation from the development of this sector on the European and global markets. It was precisely the extraction of shale gas in the international space that was important for initiating changes on the European market, through the search for new unconventional sources of energy resources. Since 2020, the provisions of Regulation (EU) 2020/852 of the European Parliament and of the Council, as well as subsequent delegated acts, have played a significant role in the European arena, in terms of setting "new standards for categorizing economic activities as environmentally sustainable", which also apply to activities in the gas sector, in which entrepreneurs are required to demonstrate the implementation of the environmental objectives imposed. The author also presents an analysis of the geopolitical situation in Poland and Europe, which occurred after Russia's armed invasion of Ukraine, in the context of the country's energy security, and the necessary diversification of energy resources and sources of their acquisition. She also points out that ensuring

security, including energy security, has become one of the key pillars of the energy policy of Europe and Poland, which, according to the assumptions, will undergo transformation over the following years. Energy transformation is a key element of Poland's energy policy, which should be understood as the next step towards achieving stability and increasing Poland's energy self-sufficiency. The author also emphasizes that in the process of energy transformation, reducing the amount of coal in the Polish energy mix, i.e. gradually introducing decarbonization, is becoming important. From this perspective, the role of natural gas, the role of which is to stabilize the Polish energy market, in order to increase the share of renewable energy sources in the country's energy balance, becomes even more important. For this reason, gas is called a transition fuel in wide literature.

In the work, the author also puts forward the thesis that the diversification of gas sources should also focus on the possibility of using domestic resources of this raw material. Therefore, already recorded gas deposits, including those from unconventional deposits such as shale gas, are becoming important. Extraction of this gas would significantly contribute to the stabilization of the energy situation, including reducing the need to obtain this raw material from other sources.

The author also states that despite passing time, the majority scope of issues concerning the possibility of commercial gas extraction from shale formations, remains relevant. However, in the face of the geopolitical situation and the need for the state to ensure energy security (by ensuring supplies of energy resources), as well as striving to achieve energy independence to the greatest extent possible, should lead to reconsideration of including shale gas in the energy resources balance. In the context of the future, gas fuel, and in particular low-emission (such as shale gas), will continue to be a pillar of the Polish energy structure.