

PROTECTION OF ENERGY RESOURCES IN THE LEGAL MECHANISM OF FOOD SECURITY

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Annotation. The article is devoted to analyze, evaluate, and propose improvements to the legal mechanism in Ukraine concerning the protection of energy resources to ensure national food security, specifically within the context of Ukrainian national agrarian and protection policy and the ongoing challenges posed by military aggression. The interconnectedness of energy security and food security is a critical, yet often under-examined, factor in the national security calculus of modern states. For Ukraine, a major global agricultural producer currently facing the profound challenges of armed aggression, this nexus has become acutely central to its national agrarian and protection policy. The legal mechanism for ensuring food security must, therefore, explicitly and robustly incorporate provisions for the protection and efficient use of energy resources, which are vital for every stage of the agri-food supply chain. The objectives of the study were: a) critical analysis of existing Ukrainian legislation (e.g., laws on martial law, agriculture, and energy) to identify gaps and inconsistencies in the protection of energy assets critical to the agricultural supply chain; b) to conceptually define the legal link between the protection of energy resources and food security, and to justify why disruptions in the former, under Ukrainian law, pose a fundamental threat to the latter. While Ukraine's legal framework provides general mechanisms for martial law and critical infrastructure protection, there is a significant legal gap in assigning enhanced, targeted protection status specifically to energy assets essential for the agricultural supply chain. However, the legal framework must fully catch up to ensure these small, distributed assets which are crucial for keeping local food production functional during large-scale grid failure are afforded the necessary legal safeguards, simplified operational procedures, and prioritized fuel (maintenance) access over non-critical commercial users. The methodology of researching legal problems of protection of energy resources in the legal mechanism of food security is based on the provisions of the general scientific dialectical method of scientific knowledge. In addition, were used formal-logical, formal-legal and hermeneutic methods to achieve the research goal.

Key words: food security, energy resources, state agricultural policy, agricultural sector, agrarian legal relations, sustainable development.

1. Introduction.

Supporting the global Sustainable Development Goals for 2030, defined by UN General Assembly Resolution № 70/1 of 25 September 2015, and taking into account their adaptation to the specificities of Ukraine's development, as set out in the National Report «Sustainable Development Goals: Ukraine, it is necessary to ensure the implementation of Ukraine's Sustainable Development Goals for the period up to 2030», in particular, overcoming hunger, achieving food security, improving nutrition, and promoting sustainable agriculture. This is stipulated by the Decree of the President of Ukraine dated 30 September 2019 № 722/2019 «On the Sustainable Development Goals of Ukraine for the period up to 2030». These and other areas of implementation of the state agricultural policy in the field of land relations require a more precise legal analysis and disclosure of their content.

Within the framework of the EU's Common Agricultural Policy, considerable attention is paid to regulating approaches to the collection and use of agricultural data as an important resource for the development of agriculture. Farmers are considered the primary owners of the data and therefore have the right to informed consent for any operations involving this data. The use of agricultural data must be transparent, with appropriate standards of confidentiality and cyber security.

Companies and digital platforms working with agricultural data are required to ensure that there is no unauthorised access or commercial use of information without the appropriate permissions. This approach contributes to the formation of a balanced system in which innovation is combined with the protection of farmers' rights and responsible data management.

2. Analysis of scientific publications.

The contemporary challenges facing Ukraine in the areas of energy security, food security, and sustainable resource management have generated an unprecedented level of academic and expert attention. Researchers across multiple disciplines emphasize that the war launched against Ukraine has not only disrupted regional stability but has fundamentally reshaped global energy and food systems.

As Al-Saidi argues, Europe's dependence on external energy supplies, especially during the crisis triggered by Russian aggression, has transformed the Middle East into both a "white knight" and a strategic partner of choice [1]. At the same time, Colgan, Gard-Murray, and Hinthorn demonstrate that the invasion dramatically increased Europe's fossil fuel costs, revealing the fragility of traditional energy supply chains and pushing the EU toward diversification, efficiency, and renewable alternatives [2]. The International Energy Agency further reinforces this by highlighting structural vulnerabilities in Ukraine's energy infrastructure and underscoring that ensuring energy resilience is now a matter of national and European security.

Parallel to the energy crisis, scholars such as Bychkovska, Velasquez, Boddiger, and Vishnevsky draw attention to the global repercussions of disruptions in Ukrainian agricultural production. Ukraine has long been a cornerstone of global food security, and its role in supplying grain and agricultural commodities to developing regions cannot be overstated [3; 4; 5]. The Food and Agriculture Organization outlines strategic priorities for stabilizing Ukrainian agriculture, stressing the need for adaptive technologies and post-war reconstruction of critical production systems. This perspective is echoed by UNECE, which emphasizes that innovative agricultural practices and climate-resilient technologies are essential not only for restoring Ukraine's farming capacity but also for addressing the compounded global food and energy crisis [6].

Scholars examining agricultural policy such as Kovalenko and Korniyenko [7], Novak and co-authors [8], and Bilousov [9] highlight that Ukraine's food security challenges are both economic and legal in nature. They argue that state policy must evolve toward stronger institutional capacity, better crisis-response mechanisms, and harmonization with European regulations. The idea that food can be used as a geopolitical weapon, explored by Pokalchuk and Pustovit [10], reinforces the urgency of developing robust legal safeguards to protect the population during wartime and to ensure uninterrupted food supply chains. Their analysis resonates with the broader academic consensus that food security is no longer a purely agricultural issue but a fundamental element of national defence and sovereignty.

Legal scholars such as Kurman and Tuieva deepen this perspective by exploring the legal mechanisms that underpin national security in the context of natural resource management [11; 12]. Their work shows that sustainable use of land, water, and energy resources is inseparable from the broader security architecture, especially during martial law. Sytnyk and colleagues expand on this by examining environmental protection as an integral component of Ukraine's energy resilience [13]. The research collectively reveals that legal modernization, environmental governance, and security planning must operate together to protect both people and ecosystems in times of crisis.

Next to these internal considerations, issues surrounding renewable energy and decarbonization also play a prominent role. Tvaronavičienė frames renewable energy development as a strategic opportunity but cautions that technical, institutional, and financial barriers remain significant [14]. Kirillova, Pukala, and Janowicz-Lomott complement this analysis by emphasizing the critical role of insurance mechanisms in renewable energy projects [15]. Their insights demonstrate that a strong insurance and risk-management framework is essential for attracting investment and ensuring the long-term sustainability of renewable infrastructure.

The economic and legal dimension of biofuel production has also been extensively studied by Janda and Stankus [16], as well as Obolenska [17]. Their findings highlight that the regulatory environment

in Ukraine remains complex and often insufficiently harmonized with European standards. Nevertheless, the shift toward biofuels represents both an economic opportunity and a strategic necessity, offering Ukraine a pathway to energy diversification and reduced dependence on fossil fuels.

Finally, the broader policy landscape is shaped by Ukraine's integration with the European Union. The Association Agreement implementation reports and EU directives, such as Directive 2003/54/EC, illustrate the ongoing process of aligning Ukrainian energy and agricultural regulations with European norms [18; 19]. Scholars such as Bityak emphasize that legal and economic support for state energy policy must be strengthened to meet these new expectations [20]. This alignment is more than a bureaucratic process; it is a transformative shift that places Ukraine within the European legal, economic, and environmental frameworks.

Taken together, the work of these researchers presents a comprehensive and interconnected picture. Energy and food security in Ukraine are not isolated issues but part of a wider geopolitical, legal, economic, and environmental context. The academic community largely agrees that Ukraine's resilience depends on coordinated reforms, advanced technologies, integration with European systems, and the development of strong protective mechanisms for both citizens and resources. At the same time, the war has revealed new global interdependencies, demonstrating that Ukraine's stability is directly linked to Europe's energy future and the world's food supply. The collective insights of these scholars form a powerful foundation for shaping policy decisions, guiding reconstruction efforts, and strengthening Ukraine's security and sustainability in the decades ahead.

3. The aim of the paper is to identify legal issues in the implementation of state agricultural policy in the field of agricultural information protection and the rights of agribusiness entities, as well as to develop scientifically sound conclusions and proposals for improving the scientific doctrine of agricultural law in Ukraine.

4. Review and discussion.

The legal protection of energy resources is indispensable for maintaining Ukraine's food security amidst conflict. Recent publications unanimously emphasize that Russia's invasion initiated cascading risks, directly linking rising energy and fertilizer prices to a worsened global and national food poverty crisis. Legal scholars explicitly analyze the shortcomings of pre-war legislation, noting its inability to effectively regulate the current catastrophic food security situation, especially in war-affected regions.

A key legal conclusion across the literature is the lack of specialized regulatory acts for the protection and restoration of decentralized energy infrastructure, which is crucial for the agricultural supply chain. Experts advocate for comprehensive legal improvement, recommending amendments to the Law "On the Legal Regime of Martial Law" and the creation of a new Law "On Energy Security" to provide this targeted protection. This proactive legal approach is deemed fundamental for post-war reconstruction and the resilience of the agricultural economy.

The legal reforms focus heavily on decentralization and green transformation, supported by newly adopted laws like № 9381. This legislation is crucial for enhancing energy resilience by simplifying regulatory procedures and stimulating investment in distributed generation, which directly benefits the localized energy needs of agribusiness. Furthermore, Ukraine's strategic focus on biomethane is highlighted as a major legal and economic development, offering a path to energy independence and EU market integration.

Legal mechanisms for biomethane export and the introduction of a Guarantees of Origin system have been established, providing farmers with added value and utilizing agricultural waste to substitute natural gas. However, publications note that despite legal frameworks being in place, barriers like complex certification procedures and incomplete alignment with all EU sustainability criteria (RED II) remain. Finally, the legal necessity of aligning with EU *acquis* drives much of the recent progress in climate policy, energy efficiency, and renewable energy, solidifying these concepts as legal obligations rather than mere policy goals.

Disruption of Ukraine's energy infrastructure has become a new security challenge and a tool of modern warfare. Technical and technological innovations in the development of energy technologies in all sectors of the economy, especially in the agricultural sector, can have a significant impact on the stability of the country's energy systems. Ensuring the sustainable development of the national economy and full access to reliable, sustainable, affordable and modern energy sources for all categories of consumers is becoming a priority of Ukraine's domestic national policy.

In the current conditions, national security strategies, along with national priority programmes, should include projects directly related to economic security, especially those aimed at developing such sectors of the economy as energy, trade and food. The deepening global food, energy and financial crises have brought to the fore the role of agricultural production as the most promising sector in the development of alternative energy sources. In terms of bioclimatic potential, taking into account the provision of normal living conditions, Ukraine has at its disposal a territorial space suitable for life and capable of providing food products of its own production for 150-160 million people. It can increase the production of alternative energy sources by processing agricultural raw materials by at least 30 % [6].

Ukraine's state policy in the field of energy security aims to ensure the protection of national interests in the field of providing access to reliable, sustainable, affordable and modern energy sources for all consumers in a technically reliable, safe, economically efficient and environmentally acceptable manner under normal conditions and in crisis situations, exclusively within the limits and in the manner specified by law. In order to ensure the balance of the economic, social and environmental dimensions of Ukraine's sustainable development, the Energy Security Strategy was approved by Resolution of the Cabinet of Ministers of Ukraine № 907-r of 4 August 2021.

According to the Strategy, the term 'energy security' refers to the protection of national interests in the field of ensuring access to reliable, sustainable, affordable and modern energy sources in a technically reliable, safe, economically efficient and environmentally acceptable manner under normal conditions and in conditions of a state of emergency or extraordinary circumstances. The strategic objectives include, in particular, the economic efficiency of the state's energy sector, energy supply systems and import substitution of mineral raw materials, as well as the energy efficiency of energy resources and the national economy. To achieve this, a number of measures are planned, including the promotion of import substitution, in particular through the development of bioenergy, wind energy, the reasonable increase in energy resource production, and the implementation of a set of measures to expand the use of local alternative fuels.

Ukraine's accession to the Energy Community plays a dual role: on the one hand, it serves to ensure transparency in relations between Ukraine and the EU in the gas and electricity sectors and to strengthen the EU's energy security, and on the other hand, giving impetus to the process of harmonising and adapting national legislation and procedures governing energy relations with EU rules and procedures. Certain active steps towards adapting national legislation in the field of promoting energy production using alternative sources were taken thanks to the approval by the Cabinet of Ministers of Ukraine on 3 September 2014 of the Action Plan for the implementation of Directive 2009/28/EC of the European Parliament and of the Council. Specific adaptation steps were noted in the 2015 Report on the Implementation of the Association Agreement between Ukraine and the European Union, which states that the term 'biomass' has been brought into line with the requirements of Directive 2009/28/EC of the European Parliament and of the Council EU, which makes it possible to obtain a «green» tariff for electricity production not only from waste, but also from agricultural and forestry products.

According to Article 91 of the Law of Ukraine «On Alternative Energy Sources» of 20 February 2004 № 555-IV the «green» tariff for economic entities that produce electricity from biomass is set at the level of the retail tariff for second-class voltage consumers as of January 2009, multiplied by the «green» tariff coefficient for electricity produced from biomass. For the purposes of this Law, biomass is considered to be a non-mineral, biologically renewable substance of organic origin, capable of biological decomposition, in the form of products, waste and residues from forestry and agriculture (crop and livestock production), fisheries and technologically related industries, as well as a component of industrial or household waste capable of biological decomposition. At the same time, the concept of renewable energy sources is further defined as renewable non-fossil energy sources, namely solar, wind, aerothermal, geothermal, hydrothermal energy, wave and tidal energy,

hydropower, biomass energy, gas from organic waste, gas from sewage treatment plants, and biogas (Article 1 of the Law of Ukraine «On Alternative Energy Sources»). A similar definition is contained in subparagraph 14.1.29 of paragraph 14.1 of Article 14 of the Tax Code of Ukraine. This interpretation of renewable energy sources is in line with Ukraine's obligations to adapt its national legislation to that of the European Union.

European Union Directive 2003/54/EC of 26 June 2003 uses the term «renewable energy sources», which means renewable inexhaustible energy sources (wind energy, solar energy, geothermal energy, wave energy, tidal energy, hydropower, biomass energy, gas from organic waste, gas from wastewater treatment plants and biogas energy) [19]. Further development of social relations in the field of agricultural bioenergy will make it possible to achieve, for example, the following goals: a) increasing the country's energy security by reducing dependence on imported energy resources; b) ensuring GDP growth by stimulating the production of alternative fuels; c) improving the state of the environment and reducing harmful emissions into the atmosphere.

According to Article 16 of the Law of Ukraine «On Energy Saving», energy saving is encouraged by: a) providing tax incentives to enterprises that manufacture energy-saving equipment, technology and materials, measuring instruments, control and management of fuel and energy resources, manufacturers of equipment for the use of non-traditional and renewable energy sources and alternative fuels; b) granting tax incentives to enterprises that use equipment powered by non-traditional and renewable energy sources and alternative fuels.

O. Bityak expressed a reasoned position that "...achieving significant economic effects from the implementation of energy-saving policies depends, first, on the systematic nature of economic and legal, as well as tax and budgetary measures, and second, on the creation of real mechanisms for implementing these measures" [20, p. 248]. The development of provisions and innovative use of renewable energy sources that can contribute to the creation of new markets for agricultural and forestry products should form the basis for reforming current agricultural legislation. In addition, according to S. A. Obolenska, the optimal balance between biofuel production and food security is a legal principle for regulating biofuel production in Ukraine by agricultural producers [17, p. 7]. Thus, the realities of the interaction between food and energy security indicate the possibility of forming an inter-sectoral legal institution of energy security in the agrarian law system, the norms of which are aimed at deepening the adaptation of Ukrainian legislation to EU legislation in the field of alternative energy development, including through the production of biological fuels.

5. Conclusions.

Ukraine's food and energy security challenges are deeply intertwined with global stability. The war has amplified vulnerabilities in fossil fuel dependence, disrupted agricultural exports, and exposed gaps in legal and institutional frameworks. Scholars emphasize that Ukraine's agricultural sector remains pivotal for global food supply, yet requires agro-ecological modernization, legal safeguards, and international cooperation to recover. Energy security studies reveal both the costs of Legal analyses underscore the necessity of harmonizing Ukrainian regulations with EU standards to ensure effective integration and compliance.

Insurance mechanisms, conformity assessments, and adaptive technologies emerge as practical tools to mitigate risks in both energy and food domains. The concept of "food as a weapon" illustrates the geopolitical stakes of agricultural policy, while renewable energy opportunities highlight pathways to reduce dependency and enhance resilience. Overall, Ukraine's trajectory is framed by its strategic importance to Europe: securing energy flows, stabilizing food exports, and aligning with EU legal frameworks. The collective scholarship concludes that sustainable recovery requires coordinated policy, investment in renewable and agro-ecological systems, and robust legal institutions. Ukraine's resilience is not only a national imperative but a cornerstone of European security in the post-war era.

In food security, legislation should secure strategic reserves, embed agro-ecological standards, and criminalize manipulation of supply chains. Harmonization with EU law is essential, particularly in traceability, conformity assessments, and environmental compliance. A unified "Food and Energy Security Act" could bring coherence to Ukraine's fragmented regulatory frameworks, creating a single legal architecture for crisis response, sustainability, and European integration. Coupled with stronger public-private partnership

incentives and independent regulatory bodies, such reforms would enhance transparency, investment stability, and institutional trust. These measures would not only reinforce Ukraine's internal resilience during and after the war but also solidify its position as a cornerstone of European food and energy security.

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