



Essential Readings in Environmental Law
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ALTERNATIVE ENERGY SOURCES : THEORY AND PRACTICE IN UKRAINE
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OVERVIEW OF KEY SCHOLARSHIPS

Textbooks, manuals

1. Adamenko, O., V. Vysochansky, V. Lotko, and M. Myhayliv, (Editor Lotko V.) *Alternative fuels and other alternative energy sources: textbook*. (Ivano-Frankivsk, Polumya, 2000)
2. Bavbekova, E.A., L.A. Bondar, N.S. Gavrish, I.I. Karakash (Editor Karakash, I. I.), *Natural Resource Law of Ukraine: Training guidance*. (Kyiv, Ystyna Press, 2005)
3. Plachkov, I.V., T.A. Burachok, Z. Y. Butso, G.B. Varlamov, S.I. Dubovskoy, V.A., Zhovtyansky; (Editors Klimenko, V.N., Y.O. Landau, I.O. Segal) *Energy: The History, Present and Future. V. 5: Electric power and Environment. Operation of energy in the modern world* (Kyiv, Fenix Press, 2013).
4. Dudyuk, D.L., S.S. Mazepa, J. M., Hnatyshyn, *Alternative energy: basic theory and problems: Teaching Guide for Universities* (Lviv: Magnolia 2008)
5. Winkler, I.A., and Y. V. Tevtul, *Environmental Security of energy sources, from traditional to contemporary and future: Teaching Guide for Universities* (Lviv, Novyi svyt Press, 2012)
6. Richard, T., and V. Kalinichenko, *Renewable energy sources*. – (Warsaw, Publisher House OWG, 2010)
7. Malyarenko, V.A., G.B. Varlamov, G.M. Lubchik, V.I. Kravtsov, A.N. Oleynikov, O.I. Yakovlev, P.M. Kanilo, A.I. Rovenskiy, *The complex of textbooks "Energy. Environment. Energy saving" – 7 books: Heat power installations and environmental aspects of energy production* (Kyiv, Publisher" Polytechnic, 2003); *Inexhaustible energy: Wind power generators* (Kharkyv, Polytekhnika "HAI", Sevastopol: SNTU, 2003); *Energy. Ecology. Future*. (Kharkyv, Prapor Press. – 2003); *Inexhaustible energy: Wind Energy* (Kharkyv, Polytekhnika "HAI", Sevastopol: SNTU, 2004); *Inexhaustible energy: Alternative Energy* (Kharkyv, Polytekhnika "HAI", Sevastopol: SNTU, 2006); *Inexhaustible energy: The wind and hydrogen energy* (Kharkyv, Polytekhnika "HAI", Sevastopol: SNTU, 2007); *Fundamentals of Thermal Physics of buildings and energy efficiency* (Kharkyv, Publisher SAGA, 2006).
8. Baluk, G.I., T.G. Kovalchuk, E.V. Sushyk, *Energy Law. Environmental and legal problems in energy sector // Module 1 Syllabus of the for students of specialty 6.030401 "Law", education level "Master of Law"* (Kyiv, Kyiv National University Press, 2012)

Dissertation

9. Kishko-Yerli, O.P. *Legal regulation of the use of renewable energy sources: Abstract of the Doctoral Thesis in Legal Science*, (Kyiv, Naukova dumka, 2010)

The Environmental Impact Assessment and analytical reports

10. Hertsmark, D., G. Tonhauzer, K. Muts, M. Sura, O. Kishko-Yerli, *Environmental and regulatory assessment for shale gas development in Ukraine*. - Volume 1 (Web- resource, Official website of Ministry of the environment and natural resources - Access mode: http://www.menr.gov.ua/docs/activity-international3/Final_Report_volume%20I_ukr.pdf)

11. *Annual President of Ukraine Address to the Verkhovna Rada of Ukraine, On the internal and external situation of Ukraine in 2013* (Kyiv, NISS Press, 2013).

Background

Concerns over the depletion and exhaustion of natural resources underpin the global policy priorities of reducing energy consumption and increasing energy efficiency. These priorities are especially important for Ukraine because it is one of the biggest energy consumers in the world. Challenges to achieving the efficient use of traditional energy sources in Ukraine include outdated technology, resource depletion and the use of fixed assets with low fuel efficiency and high emission rates. Other challenges include resource losses during gas transportation and the distribution of electricity and heat, and constraints on local energy markets caused by increased dependency on energy imports. These factors make the development of alternative energy sources an urgent matter for Ukraine policy makers.

It is no secret that the Russian Federation is a major player in the Ukraine energy market. The Russian Federation uses this position to charge a high rate for its gas and impose onerous supply agreements on local energy retailers. The recent encroachment by Russia on the territorial independence of Ukraine makes further cooperation with Russia untenable. This situation lends further support to calls for tough Ukrainian policies that encourage energy efficiency and conservation, and the production and use of alternative energy sources.

Alternative Energy and Ukraine Law. The production of energy from non-traditional sources may help mitigate some of the problems with traditional energy sources, such as pollution and resource depletion. Ukraine has several potential alternative energy sources. However, one barrier to the exploitation of these sources is the lack of a unified definition of ‘alternative energy’ in Ukrainian law. Different laws contain different definitions. For example, the law *On alternative energy sources* defines alternative energy sources as renewable energy sources. Listed sources include solar, wind, geothermal, wave, tidal, hydro, biomass, organic waste gas, gas from sewage treatment plants and biogas. Listed secondary sources include blast-furnace and coke gas plant, methane gas from coal deposits and the transformation of industry waste into energy. The law *On alternative types of fuel* defines alternative energy sources as non-conventional energy sources, such as stock materials of plant origin, waste, hard combustibles and other natural and artificial sources. It also lists types of energy feedstocks, including oil, gas, oil and gas condensate, non-industrial deposits, heavy oil grades, original asphalt, gassaturated waters and gas-hydrates. *The Ukraine Tax Code* defines renewable energy sources as solar, wind, geothermal, wave, tidal, hydro, biomass, organic waste gas, sewage treatment plant gas and biogas.

The law *On alternative types of fuel* aims to establish the legal, social, economic, ecological and organisational conditions necessary for expanding production and consumption of alternative types of liquid and gas fuel. It sets out key principles to help achieve this aim, including:

- supporting the development of a scientific and technical base for alternative fuel

production;

- promoting scientific and technical achievements in alternative fuel production;
- developing international scientific and technical collaboration;
- using world science and technology to expand alternative fuel production; and
- supporting entrepreneurship and protecting business interests in alternative fuel production.

The implementation of the Ukrainian legal framework for alternative energy sources has been constrained by political and economic crises. These have limited the governments' capacity to invest in alternative energy sources, with most new alternative energy plants constructed by private companies.

The development of alternative energy sources comes with both advantages and disadvantages. On the positive side, renewable energy resources can help minimise pollution, conserve non-renewable resources, and promote the growth of energy infrastructure and the development of new technologies. On the negative side, the technologies involved are expensive, as is the construction of alternative energy plants. Constraints on the development of new technology include network remoteness and legal obstacles. Other hurdles to the development of alternative energy sources include the high cost of producing alternative energy in comparison to traditional energy, and the immaturity of domestic markets. In this regard, certain alternative energy products are produced solely for export because they might not sell on the domestic market. These factors may partially explain the relatively low use of renewables in Ukraine.

Overall, the development of alternative energy industry in Ukraine is in its early stages. Constraints upon industry development include the inadequacy of financial incentives, inconsistency in legal requirements, bureaucratic red-tape, corrupt practices, poor funding for research and development, insufficient consumer information and inefficient and outdated technology. An independent and systematic review of the current legal framework may assist industry development. The review may also help highlight more efficient and effective practices for stimulating the production of alternative energy. The review can take into account current financial and political constraints, and ensure recommendations are practical, well-targeted, strategic and cost-effective. Recommendations may include streamlined regulatory procedures, transparent tax preferences, preferential loans, direct consumer subsidies and the collation of information on the best available technologies. Information gathering may help facilitate the cheaper and quicker implementation of alternative energy productions. Consumer education programs may help increase the use of renewable energy in Ukraine. One thing is certain : the energy crisis in Ukraine makes inaction not an option.

Recent years are characterized by an increasing number of studies on the use of alternative sources of energy - alternative fuels, wind, solar, sea waves, hydrothermal, biogas. It should be noted however that the field of environmental law in Ukraine has yet to produce a complex study of legal and theoretical regulation of alternative energy sources. The only comprehensive work is a dissertation of **Oksana B. Kishko -Yerli** (see below). This is why we include in this list some books that address only incidentally legal issues and are mostly on environmental science and other relevant disciplines.

1. The book *Alternative fuels and other alternative energy sources*, by **O. Adamenko, V. Vysochansky, V. Lotko** and **M. Myhayliv** is an environmental science research book, meant first and foremost for environmental engineers, that provides the context for alternative energy in Ukraine. It examines the means to introduce clean sustainable energy to combat climate change. It discusses a host of topics such as the nuclear heritage of Europe, the extraction of fossil fuels, the environmental and energy problems linked to transport, environmental and energy challenges in Central and Eastern Europe, the environmental and energy agenda of the European Union, and energy issues in different parts of Europe.

2. **Bavbekova, E.A., L.A. Bondar, N.S. Gavrish, I.I. Karakash** have written the first legal textbook in Ukraine one of which chapters was aimed at non-material natural resources (air, energy, biomass, geysers, earth heat) as a subject of legal regulation. Titled *Natural Resource Law of Ukraine: Training guidance* it, among other things, outlines the nature and use of alternative energy sources. It also analyzes the main existing legislation in the field of alternative energy sources, in particular, the laws of Ukraine "On Energy Conservation" (1994), "On alternative types of fuels"(2000), and on "On alternative energy sources" (2003). The latter sets the rules for alternative energy sources use in Ukraine, in particular the necessity for a special permission (license) from the authorized state bodies to use these sources for production of electrical, mechanical or thermal energy. The only exception is when citizens use these resources for energy production for their own needs. In that case a license is not required. The authors also identify the main features for the use of alternative energy sources: dependence on weather and other environmental conditions; the availability of water resources from small rivers, required for hydropower equipment; availability of biomass, the amount of which depends on the annual harvests; availability of geothermal wells that are suitable for the needs of geothermal energy and others. In addition, they describe the legal requirements for the operation of alternative energy sources: the securing of work; state supervision of the modes of consumption; sufficient energy supply that addresses the periodic, current and future needs of energy consumers; adherence to uniform standards, rules and regulations in construction and exploitation of alternative energy objects; observance of rules of exploitation of alternative energy objects that are governed by regulations, mandatory for all economic activities.

To provide these functions and to develop the national, regional and local management programs in the industry of alternative energy and the tax incentives for the production of energy from alternative sources there are specially authorized bodies, including, on the State level, the Ministry of Fuel and Energy of Ukraine and the State Agency of Ukraine for Energy Conservation, as well as at the local and regional levels. Regional and local authorities are allowed only to control the activity in compliance with the requirements set by the central executive authorities, and can make decisions about possibility to use the local natural resources in alternative energy production (e.g. to allow or ban the construction of hydro plants on the small rivers) but are not allowed to change the requirements.

3. The book by **Plachkov, I.V., T.A. Burachok, Z. Y. Butso, G.B. Varlamov, S.I. Dubovskoy, V.A. Zhovtyansky, Energy: The History,, Present and Future. V. 5: Electric power and Environment. Operation of energy in the modern world** is a partly legal, technical and economic textbook aimed at specialists in the energy sector, including the energy law sector. The structure of the book is very detailed and includes: renewable alternative energy definition; general information about non-traditional renewable energy sources; characterization of renewable sources of alternative energy: solar power, solar thermal power, state and prospects of solar energy, wind energy, wind energy installation, state and prospects of development of wind power, bioenergy, biomass energy resources, bioenergy technologies, small hydro, tidal power, using hydraulic power flows, wave power, geothermal energy, energy for environmental use. It also deals with the organizational and economic aspects of energy: energy security; legislation that regulates relations in the energy sector; the current system of Ukraine's energy legislation and basic directions for its improvement; legal regulation of environmental problems in nuclear power; legal regulation of relations in the field of energy in the EU; environmental requirements for environmental protection during the construction of hydropower facilities; environmental requirements for environmental protection in the operation of hydroelectric facilities; environmental monitoring; renewable alternative energy and environmental protection; environmental aspects of electric fields of power lines of super high voltage on the environment; prospects for development of renewable nontraditional power engineering.

A very interesting chapter is titled "Power and Environment» describing the history of environmental protection, the effect of heat power engineering on the environment, major environmental contaminants, burning of fuels and the greenhouse effect, methods to reduce

emissions of toxic substances into the atmosphere. The authors also analyze the positive experience of EU countries. The experience has shown that among the various factors that affect the level and prospects of development of renewables state economic incentives play a key role.

4. In *Alternative energy: basic theory and problems: Teaching Guide for Universities* by **D.L. Dudyuk, S.S. Mazepa, and J.M. Hnatyshyn** include in each chapter practical examples and possible solutions. This guide is partially legal and designed for university students and engineers who are involved in the study and research of alternative energy sources.

5. The book by **I.A. Winkler, and Y.V. Tevtul**, *Environmental Security of energy sources, from traditional to contemporary and future: Teaching Guide for Universities*, highlights issues related to the technology of using traditional energy sources, as well as the environmental aspects of current and future energy sources. It focuses on the nature of renewable energy sources, their use in economic activities and the reduction of their negative impact.

6. The Manual by **T. Richard and V. Kalinichenko**, *Renewable energy sources* describes the perspectives and development of renewable energy sources in Ukraine. The authors note that the experience of Poland, with 7.5% of its energy from renewable sources, can provide valuable lessons for the implementation of renewable energy in Ukraine. The manual examines the main definitions of energy science and the relevant legal regulations for renewable energy sources, discusses the energy potential of Ukraine, describes the general and territorial distribution of resources, and its current state of development. The review of existing technologies for using solar, wind, geothermal, biomass and small hydroplants is another feature of the book. Useful examples from Poland aim to facilitate implementation in Ukraine. The review of Polish and Ukrainian legislation and the Ukrainian projects for each type of renewable energy are also addressed. It also includes technological and economic analysis of implementing projects of renewable energy sources. The quality of diagrams and pictures helps to understand the material. This is a partially legal, technological and economic manual which is intended for energy industry experts, energy lawyers and students.

7. In this impressive set of volumes on the themes *Energy. Environment. Energy saving*, by **V.A. Malyarenko, G.B. Varlamov, G.M. Lubchik, V.I. Kravtsov, A.N. Oleynikov, O.I. Yakovlev, P.M. Kanilo and A.I. Rovenskiy** the authors cover in detail the processes currently taking place for improving energy technologies, energy production (traditional and alternative) and supply. They summarize the experience of leading countries in the field of economical use of energy, environmental restoration, application of modern energy-saving materials and technologies. It describes, among other topics, the intercommunication of energy technologies and energy production. This series of volume is unique given that it covers a wide range of basic and specialized disciplines on energy and environmental sciences.

8. The comprehensive volume by **G.I. Baluk, T.G. Kovalchuk, and E.V. Sushyk**, *Energy Law. Environmental and legal problems in energy sector* is the first and still main legal guidance on Energy Law in Ukraine. Energy Law is considered more as a commercial activity than an environmental subject in Ukraine. As such it is often seen as belonging more to Commercial Law. This volume helps to see energy as part of both of these areas of law. It includes educational and thematic plans of lectures, seminars, tests for examination of the literature and recommended sources for the following issues:

1. Concept and types of energy. The legal definition of "energy".
2. The energy resources as an object of legal regulation.
3. Legal regulation of relations in the sphere of fuel and energy complex of Ukraine.
4. Legal regulation of the energy policy of Ukraine.
5. Legal regulation of the energy security of Ukraine.
6. Energy Law of Ukraine – the complex area of law.
7. Principles of Energy Law of Ukraine.

8. System of Energy Law of Ukraine as a branch of law.
9. The subject and methods of Energy Law in Ukraine.
10. Value of Energy Law and interaction with other branches of the legal system of Ukraine.
11. Concept and types of sources of energy law in Ukraine.
12. Laws of Ukraine as a source of energy law in Ukraine.
13. Subordinate acts as a source of energy law in Ukraine.
14. Features of sectoral energy legislation.
15. Technical regulations are already the sources of energy law in Ukraine.
16. Typical, reference and methodical regulations in the energy sector.
17. Ways to improve Ukraine's energy legislation.
18. Prospects for the development and adoption of the Energy Code of Ukraine: concept, content, structure.
19. Ukraine's energy legislation and international law in the energy sector.
20. The international, interstate and intergovernmental agreements in the field of energy as a source of energy law and their role in regulating the energy sector in Ukraine and in the world.
21. The concept and composition of land power. Content of the legal regime of land energy as land for special purposes of use.
22. Specific requirements for land use in protected areas and sanitary protection zones of energy facilities.
23. Grounds, implementation, modification and termination of the right land use for energy.
24. Legal regulation of land use in power industry.
25. Features of the legal regime of the land provided for placement of linear objects.
26. Legal regulation of land use for forestry purposes for energy.
27. The legal regime of lands provided for operation of pipelines.
28. Subsoil as the objects of legal protection and use of energy.
29. The right of subsoil use and its place in the energy law.
30. The procedure for granting subsoil in use for energy production.
31. The content of the right to use subsoil for energy production.
32. Grounds and procedure for termination of subsoil use for energy production.
33. Legal protection of natural resources in energy production.
34. Management Features in the use and protection of natural resources for energy production.
35. Legal forms of payments for subsoil use for energy production.
36. Water as an object of legal regulation, use and protection of energy production.
37. The right to water and its place in the Energy Law.
38. The procedure for granting water bodies for the use for the purposes of hydropower.
39. The content of the right to use water for hydropower needs.
40. Legal protection of waters in the area of hydropower production.
41. Grounds and procedure for termination of the right to use water in hydropower production.
42. Management Features in the use and protection of water for hydropower needs.
43. Legal forms of payment for the use of water for hydropower needs.
44. Ecological legal requirements for the location, design, construction, reconstruction, commissioning and operation, the conservation and the elimination of fuel and energy complex.
45. Ecological legal requirements for disposal of waste and hazardous substances in the fuel and energy complex.
46. Features of the functions of environmental management in respect of fuel and energy complex.
47. Activities of environmental regulation in the field of environmental protection from the negative impact of the fuel and energy complex.
48. Legal liability for environmental offenses in the energy sector. Environmental risks and damages.

49. Features of Legal Environment in nuclear power.
50. The legal environmental safety in oil and gas producing fields.
51. Concept and types of renewable energy under the laws of Ukraine.
52. Ukraine's legislation on renewable energy and its place in the national legislation of Ukraine.

9. **O.P. Kishko-Yerli's** thesis, *Legal regulation of the use of renewable energy sources*: makes an important contribution to the topic. Among the conclusions of particular interest are the following:

- When developing normative acts aimed at implementation of licensing and permitting of alternative energy sources, the government should take into account the main features for the use of alternative energy sources: dependence on weather and other environmental conditions; the availability of water resources from small rivers, required for hydropower equipment; availability of biomass, the amount of which depends on the annual harvests; availability of geothermal wells that are suitable for the needs of geothermal energy and others.
- Economic activities such as the production of electricity and thermal energy from alternative energy sources and its transmission and distribution require licensing procedure.
- It is necessary to reconcile the provisions of the Laws of Ukraine "*On Alternative Energy Sources*" and "*About the permitting system in economic activity*" regarding the terms to set up the equipment for solar radiation, wind, waves of the sea, and to establish the legal regime for the use of objects for alternative energy, for the construction or rehabilitation of hydropower at small rivers and for network needed for the transportation of renewable energy to consumers.
- A unified fund to finance activities in the field of alternative energy sources, energy conservation and energy efficiency should be established. One of the sources of replenishment of the fund could be amounts received by taxing energy consumption. The consumers of electricity and thermal energy produced from renewable energy sources and biofuels should be exempted from taxation.
- A system of public information should be set up. In order to improve awareness of renewable energy and conservation it is necessary to create a network of information centers in the area of renewable energy, energy conservation and energy efficiency.

10. A multidisciplinary team of specialists from the oil and gas industry and regulatory and environmental experts - **D. Hertsmark, G. Tonhauzer, K. Muts, M. Sura** and **O. Kishko-Yerli** - have prepared a report titled *Environmental and regulatory assessment for shale gas development in Ukraine*. The work of the team under the leadership of the International Resources Group (the IRG is an incorporated not-for-profit membership-based organization providing informational and educational resources) covers the major areas of environmental issues on exploration, development and use of shale gas. The Ministry of Environment and Natural Resources took part in every stage of the project and this report reflects its cooperation and contribution. This environmental impact assessment aims at training government officials and significantly increases their capacity to regulate and support activities in shale gas development. Ultimately, measures from this environmental impact assessment, and potential further work (see. Section 5), will help to achieve the following results:

- Assistance to the Government of Ukraine in the development of environmentally friendly measures for shale gas development.
- Preparation of improved environmental reviews of shale gas development.
- Development of improved legal approaches to regulation.
- Providing the assistance in the development of a more transparent and efficient procedures for competitive bidding in the sphere of shale gas exploration.

This work is considered as a first step towards establishing key rules on environmental information, analysis and evaluation of legal/ regulatory issues, identifying the main measures to mitigate the environmental impacts and possible scenarios for future development of shale gas exploration.

While this report is intended for distribution throughout the country, the analysis of local governments focusses mainly on Western Ukraine. Analysis of the environmental impacts and the drilling technologies focus on two of the three regions of the country with potential for exploitation of shale deposits, the Carpathians and the Dnieper-Donets.

11. In its 2013 message to the Verkhovna Rada of Ukraine, *On the internal and external situation of Ukraine in 2013*, the **President of Ukraine** defined the priorities for future development in the energy sector: increasing the share of renewable energy use in the industrial sector, meeting the needs of the internal market and the development of new energy sources. In the Message the President supports initiatives for production activities at the regional level, the need to attract investment for modernization, the renewal of fixed assets. He also refers to the need to further develop mechanisms for state-private partnerships. Particular attention is paid to the potential of agriculture and the energy sectors. The most important problems are energy conservation, energy efficiency and, as a whole, searching alternative ways for additional energy supply for industrial and consumers needs to ensure a stable energy supply and energy security of the state in general. As summarized in this Message, economic incentives for the production of energy from alternative and unconventional sources were approved for 2009-2012. Regulations and implementation of incentive "green" tariffs have brought positive results. Expanding the use of alternative and non-traditional sources of energy proved to be an effective measure to implement the state energy policy. In order to consolidate the gains made the government should:

- Consider the development of a National Strategy for renewable energy, which would contain evidence-based renewable energy objectives and define legal, economic, organizational, managerial and other measures to increase the share of renewables in the energy balance of Ukraine;
- Ensure proper implementation of the objectives and activities of the State Target Economic energy efficiency programs and the development of energy production from renewable energy sources and alternative fuels for 2010-2015;
- Develop a new approach to the production and consumption of biofuels in Ukraine in conformity with the latest decisions of the governing bodies of the European Union on this issue;
- Develop a National action plan on renewable energy sector until 2020 in accordance with the commitments of Ukraine to the Energy Community of the EU.

FURTHER READINGS

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