

# PERSPECTIVES AND PROBLEMS OF HARMONIZING ENERGY LEGISLATION OF UKRAINE WITH THE EUROPEAN UNION STANDARDS

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## SUMMARY

Essence, features and components of the energy market was investigated in the article. Regulatory support of energy efficiency and energy saving in the European Union and Ukraine was analyzed. Ukraine obligations due to the harmonization of the energy legislation with the EU standards were defined. Problems in the housing and communal services (HCS) as one of the largest consumers of energy resources were revealed.

**Keywords:** market of energy resources, energy policy, housing and communal services (HCS), adaptation of the laws, harmonization, implementation, European Union.

## INTRODUCTION

The systemic influence of external and internal political, organizational, economic, and social factors of Ukraine's development in conditions of its energy security has caused significant changes in the priorities in the formation and use of energy resources of the country. In modern conditions, the energy factor in the development of the national economy of Ukraine has a decisive influence on the level of its competitiveness, social stability, the trajectory of economic development. Undoubtedly important tasks for the formation of an energy efficient national economy model are optimization of the structure of primary supply and final energy consumption, proper investment provision of energy-efficient measures taking into account the specifics of energy consumption in different sectors of the national economy and households, which will enable to meet the energy needs of consumers in the conditions of minimization of total energy consumption (maximization of benefits to all participants of the energy market). It actualizes the task of increasing energy independence of Ukraine and the formation of a new state policy in the energy sector based on the experience of the European Union.

For Ukraine to deepen cooperation with the EU must be realized through the coordination of key directions of energy policy of Ukraine and the EU in the field of energy security, including the following tasks: ensuring consumer rights, preventing the dominance of one supplier in the market, increasing transparency of energy industry activity, expanding sources of energy supply, liberalization of the gas market and increase, the level of energy efficiency.

The above problems were addressed in many works of foreign and Ukrainian scholars:

M. Radovanovic (Golusin), S. Popov, S. Dodic [1], G. Smith, K. Parmenter [2], F. Sioshanci [3,4], G. Kayakutu, E. Mercier-Laurent [5], N. Hnydiuk [6], I. Hrytsiak [7], M. Makarenko, L. Khomutenko [8], I. Yakoviuk [9], I. Kosse [10], O. Shatylo [11], O. Pashechko [12].

At the same time, the resolution of the problems of harmonization of the energy legislation of Ukraine with the standards of the European Union and the definition of the basis on which basis the formation of an energy-efficient model of economic development of the country requires an analysis of the existing regulatory framework and its effectiveness in further introducing market relations in this area.

#### 1. The main problems of formation and development of the energy market in Ukraine

A modern energy market in Ukraine is under formation, but at the same time, the existing system of economic relations in this area is extremely politicized. So it has become a defining way of organization and functioning of the national economy and ensure its economic independence and competitiveness. The specificity of functioning of the national energy market is determined by: high level of monopolization that violates the balance of interests of energy market agents regarding the purchase and sale of energy resources with the conditions of territorial, temporal, situational constraints. The mechanisms of the state and supranational regulation of prices, supply and demand of energy are imperfect, high tariffs reduce the availability of energy resources, constrain economic development of business entities, is accompanied by an increase in the burden on the state budget of the country, since almost ten million households (more than 40% of their total number) receive subsidies from the State Budget.

Therefore, the main principles of functioning of the energy market are not complied, the characteristics of which are: the autonomy of participants in the economic process; the commercial nature of their interaction; rivalry (competition) of economic entities; formation of economic proportions influenced the dynamics of prices and competition; the prices are based on supply and demand [13].

The contents and features of formation of market energy resources of Ukraine determines its structure, namely: nuclear fuel market and nuclear technology; energy market; natural gas market; the oil market; the coal market and the market for alternative energy sources. In Ukraine, the markets of electric energy, thermal energy, natural gas are the key in terms of impact on the development of the national economy. It is legally determined that: Law: electricity market is a system of relations arising between subjects of the market in the implementation of the purchase and sale of electric energy and/or ancillary services transmission and distribution of electrical energy power networks, the supply of electricity to consumers; thermal power market is a sphere of circulation of thermal energy as a commodity for which there is demand and offer; the natural gas market is an aggregate of legal relations arising in the process of purchase and sale of natural gas and services on its transportation, distribution, storage (loading, selection), services installation LNG [14]. The established legal framework to a certain extent provides the formation of competition in the energy sector of Ukraine, but does not solve all problems of the functioning of energy resource markets.

The problem of reliable and secure supply of energy resources, diversification of the countries of receipt, the formation of energy-efficient consumer behavior, aimed at optimization of energy resources consumption, reduction of energy intensity of GDP of the country as a whole is not less important for Ukraine as an importer of energy resources. The complexity of solving such problem like this is that the structure of formation and consumption of energy resources has significant disproportions (Tab. 1 - 2) and practically determines its level of energy independence and energy security.

**Table 1** The distribution of energy sources in the total primary energy supply in Ukraine in 2013-2015

Energy sources	Structure, % to the total		
	2013	2014	2015
Coal and peat	35,7	33,7	30,4
Crude oil and petroleum products	8,5	10,1	11,7
Natural gas	34,0	31,6	28,9
Atomic energy	18,8	21,9	25,5
Renewable energy	2,7	2,6	3,0
Total	100,0	100,0	100,0

Source: consolidated on the basis [15].

Despite the fact that Ukraine is sufficiently provided with energy resources, it largely depends on the import of certain energy sources. So, in Ukraine, in 2016 the share of imported inputs in the consumption was as follows: oil and condensate is 19% of the total consumption of that resource, coal is 27%, gas is 33%, petroleum products is 77%, nuclear fuel is 100% [16]. In the structure of final consumption of fuels and energy in 2015 remains consistently high share of natural gas (31,5%) (Tab. 2).

**Table 2** The structure of final consumption of fuels and energy in Ukraine in 2013-2015

Types of fuel and energy	Structure, % to final consumption			
	2012	2013	2014	2015
Natural gas	36,4	35,8	34,1	31,5
Coal and peat	13,1	12,5	14,9	12,4
Crude oil and petroleum products	16,6	16,2	16,5	18,6
Electricity	16,2	17,0	18,0	20,1
Heat energy	16,2	16,8	14,5	14,8
Biofuels	1,4	1,6	2,0	2,5
Total	100,0	100,0	100,0	100,0

Source: consolidated on the basis [15].

The main consumers of fuel and energy in Ukraine in 2015 are households (32,6 %), industry (32,3 %) and transport (17,2 %) [15].

Therefore, the important priority of the state energy policy should be the creation of preconditions for the transition to an energy-efficient model of the economy, where the key remains the task of introducing mechanisms for stimulating the economy-friendly behavior of the population (households), as well as modernizing the economy by increasing the innovation activity of enterprises and introducing energy-efficient technologies. It is here that significant potential for increasing energy conservation in the country is concentrated.

## THE BASIS OF THE STAGES OF HARMONIZATION OF THE ENERGY LEGISLATION OF UKRAINE TO EU STANDARDS

Regulatory support of energy efficiency and energy saving in the EU is based on adaptation of a number of strategic policy documents, such as "Green Books", corresponding Roadmaps and Directives that form a single, reliable, modern European policy on rational and economical use of

energy resources.

Energy legislation on the regulation and functioning of the energy market of Ukraine was formed in several stages. The signing of the Agreement on partnership and cooperation between Ukraine and European Communities and their member States in 1994 and the adoption of other documents that defined the legal basis for the organization of cooperation with our government, created appropriate preconditions for the harmonization of Ukrainian legislation with the EU law, but the main disadvantage of this process was the lack of control by the competent Ukrainian institutions and the European Union over its implementation. In addition, there is harmonization of Ukrainian legislation in the energy sphere was not associated with the process of implementing internal economic reforms.

As the member of the Energy Community (2011), Ukraine received the opportunity of active use of the best practices of the EU, which is important for the modernization of oil and gas, electricity, coal and nuclear power sectors. From members of the Energy Community is required to harmonize the legal framework with the EU, implementation of the Second and Third Energy Package. Ukraine signed the Protocol of Accession to the Energy Community which contains a clear list of regulations that need to be considered in Ukrainian legislation and timeframe to appropriate these changes. Changes are related to the areas of production and transportation of gas, electricity, environment and renewable energy.

The next stage of harmonization of energy legislation concerning regulation and functioning of the market of energy resources of Ukraine should be recognized by the Law of Ukraine "On the National Program of Adaptation of Ukrainian Legislation to the Law of the European Union" (March 18, 2004). [14]. This law for the first time in Ukrainian national legal system without translation introduced term "acquis communautaire". Acquis communautaire (acquis) is means the legal system of the European Union, which includes (but is not limited to) acts of EU legislation, which adopted by European Community, the common foreign and security policy and cooperation in justice and home affairs, ie, *acquis communautaire* is a set of common legal heritage of the European Union.

Adaptation of Ukraine's legislation to the EU is a set of interrelated organizational, legal, socio-economic, scientific, and technical processes and measures, that aimed to the approximation of the Ukraine laws to modern European legal system by designing a new and making changes in current Ukraine's legislation in view of the common European standards, which are reflected in the current legislation of the European Union and the EU. In the broadest sense the legal approximation is not limited by the direct amendments to the legislation or the creation of new acts, because the main components of the adaptation process are implementation and enforcement of legislation approximated [17].

The obligation of the Ukrainian side about the approximation of the domestic energy sector to European standards enshrined in a number of documents (Tab. 3).

**Table 3.** Legal basis of cooperation between Ukraine and the EU in the energy sector

Date	Document	Energy component
signed 14. 06.1994 entered into force on 01.03.1998	Agreement on Partnership and Cooperation between Ukraine and the European Communities and their Member States (APC)	Cooperation in the following areas: the impact of energy production and consumption on the environment in order to prevent or minimize the harmful consequences of the results of these activities on the environment (environmental aspect); improve economically feasible and nature safe way the quality and security of energy supply, including diversification of suppliers (energy security); formulation of energy policy; improve the management and regulation of the energy sector according to market requirements; introduction of a number of institutional, legal, financial and other conditions which are necessary to promote the growth of energy trade and investment (institutional aspect); promotion of energy saving and its efficient use; modernization, development and diversification of energy infrastructure; improving energy supply technologies and end-use of all forms of energy; management and technical training in the energy sector (innovative aspect).
1.12.2005	Memorandum of Understanding of the collaboration in power industry	Strengthening cooperation in areas: nuclear safety; integration of electricity and gas markets; increasing security of energy supply and transit of hydrocarbons; structural reform, enhancing standards of safety and environmental protection in the coal industry (integration aspect)..
24.09.10	Protocol on Ukraine's accession to the Treaty of establish of the Energy Community	The integration of the Ukrainian energy sector with the EU markets, strengthening its energy security, ability to attract international loans and technical assistance (integration aspect).
27.06.2014	Association Agreement between Ukraine, on one hand, and European Union, European Atomic Energy Community and their Member States, on the other hand	Increasing energy security, competitiveness and stability for economic growth and progress in the direction market integration, including through a gradual convergence in the energy sector through participation in the regional initiatives on energy cooperation (sectoral and regional aspect). Cooperation in the legal sphere will take into account the need to provide the corresponding obligation to provide public services, in particular measures to inform and protect consumers from unfair pricing practices and access to affordable energy for consumers, particularly the most vulnerable (informational aspect).

Source: consolidated on the basis [14].

The biggest obstacle to the timely adaptation of EU norms in Ukraine is the delay by the Parliament of considering and adopting relevant bills, a slow and bureaucratized procedure for approving draft laws and regulations at the level of the Cabinet of Ministers, as well as insufficient staffing capacity of state authorities to develop quality projects for such acts.

With the signing in 2014 the Association Agreement between Ukraine, on one hand, and the European Union, the European Atomic Energy Community and their Member States, on the other hand, began a new phase of international cooperation of Ukraine with the European Union in the field of safety of nuclear energy. Implementation of this Agreement requires from Ukraine achievements in ensuring respect for shared values and progress in approximation with the EU in political, economic and legal areas. Among the key objectives of the Agreement provides a high level of nuclear safety, enhance energy security, regulatory adaptations to the key elements of the EU acquis. Ukraine confirms its obligations to make closer its energy legislation to EU standards in the field of energy, at the same time promoting energy efficiency and renewable energy.

Integration of the Ukrainian energy sector with the markets of the EU countries is a common priority, but the practical implementation of these tasks is rather complex and contradictory from the standpoint of ensuring economic security (low level of diversification of sources of basic energy resources and high cost of their transportation along the new transport corridors bypassing Russia), technological safety (the need for technological modernization of power generating enterprises as a result of diversification of energy resources of resources and their qualitative parameters, use of existing transport energy infrastructure), environmental safety (limitation of greenhouse gas emissions into the atmosphere), social security (the need to ensure social stability of the country in terms of increasing the cost of energy for households and poverty), investment security (very

limited investment resources for ensuring the modernization of the energy sector of the economy and the transition to an energy-efficient development model of Ukraine).

Therefore, the process of harmonization of the energy legislation of Ukraine with European Union standards requires investigation of its impact on other aspects of the development of the national economy (environmental, safe (energy security), institutional, innovation, integration, sectoral, regional (regional initiatives), information). One can foresee that the formation of a new energy legislation in Ukraine will lead to a revision of the system of priorities and mechanisms for reforming the economy as a whole, and therefore it is appropriate to study the implications of such systemic changes and the establishment of risk prevention mechanisms.

## FEATURES OF THE IMPLEMENTATION OF LEGISLATIVE ENSURING DEVELOPMENT OF KEY SEGMENTS OF THE ENERGY MARKET OF UKRAINE TAKING INTO ACCOUNT REQUIREMENTS OF THE EU

Summarizing the full range of measures which taken by the EU to improve energy efficiency, we can choose three main areas: the use of alternative energy sources, modernization of housing and equipment, regulatory and operational regulation of energy consumption. The main direction of energy supply in HCS is an alternative energy. Tab. 4 shows the main EU Directives and Ukraine laws (integrated with the relevant provisions of European directives) that regulate the functioning of the energy markets and market of HCS as one of the largest consumers of the energy.

**Table 4.** Comparative table of legislative development energy and energy efficiency in the EU and Ukraine

The EU acquis	Ukrainian legislation
Market of nuclear fuel and nuclear technology	
<p>Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel.</p> <p>Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom.</p> <p>Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations.</p>	<p>The Law of Ukraine "About regulation of issues which related to Nuclear Safety" on June 24, 2004 №1868-IV.</p> <p>The Law of Ukraine "About licensing activity in the field of nuclear energy use" from February 11, 2010 №1874-VI.</p> <p>The Law of Ukraine "About Amendments to the Law of Ukraine "About Nuclear Energy Use and Radiation Safety" about regarding supplementing nuclear installations on December 20, 2011 №4175-VI.</p> <p>The Law of Ukraine "About handling of spent nuclear fuel on location, design and construction of centralized storage facility for spent nuclear fuel on domestic nuclear power" on February 9, 2015 №4384-VI.</p>
Natural gas market	
<p>Directive 98/30/EC of the European Parliament and of the Council on common rules for the internal market in natural gas.</p> <p>Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC.</p> <p>Council Directive 2004/67/EC of 26 April 2004 concerning measures to safeguard security of natural gas supply.</p> <p>Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.</p>	<p>The Law of Ukraine "About Oil and Gas" of July 12, 2001 № 2665-III.</p> <p>The Law of Ukraine "About natural gas market" on July 8, 2010 №2467-VI.</p> <p>The Law of Ukraine "About natural gas market" on April 9, 2015 №329-VIII.</p>

Electricity market	
<p>Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC - Statements made with regard to decommissioning and waste management activities.</p> <p>Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.</p> <p>Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council.</p> <p>Directive 2005/89/EC of the European Parliament and of the Council of 18 January 2006 concerning measures to safeguard security of electricity supply and infrastructure investment</p> <p>Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC</p> <p>Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products.</p>	<p>The Law of Ukraine "About Electric Power Industry" on October 16, 1997 № 575/97-VR.</p> <p>The Law of Ukraine "About Amendments to the Law of Ukraine "About Electric Power Industry" on June 22, 2000 №1821-III.</p> <p>The Law of Ukraine "About principles of functioning Ukraine electricity market" dated October 24, 2013 №663-VII.</p>
Market of heat energy	
<p>Directive 2004/8/EC of the European Parliament and of the Council of 11 February 2004 on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC.</p>	<p>The Law of Ukraine "About combined heat and power (cogeneration) and Waste of Energy Potential" on April 5, 2005 №2509- IV.</p> <p>The Law of Ukraine "About Heat Supply" on June 2, 2005 №2633-IV.</p>
Market of alternative energy sources	
<p>Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market.</p> <p>Directive 2003/30/EC of the European Parliament and of the Council of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport.</p> <p>Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.</p>	<p>The Law of Ukraine "About alternative energy sources" from 20.02.2003 №555-IV.</p> <p>The Law of Ukraine "About Amendments to Some Laws of Ukraine on the establishment of "green tariff" of 25 September 2008 №601- VI.</p> <p>The Law of Ukraine "About amending some laws of Ukraine to promote the production and use of bio-fuels": from May 21, 2009 №1391-VI.</p> <p>The Law of Ukraine "About Amendments to the Law of Ukraine "About Electric Power Industry to stimulate the production of electricity from alternative energy sources" from December 20, 2012 №5485-VI.</p> <p>The Law of Ukraine "About amending some laws of Ukraine to ensure competitive conditions of electricity from alternative energy sources" from June 04, 2015 №514-VIII.</p>

Market of HCS	
Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings.	The Law of Ukraine “About state regulation of utilities” on July 9, 2010 № 2479-VI.
Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC.	The Law of Ukraine “About providing commercial metering of natural gas” from June 16, 2011 №3533-VI.
Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.	The Law of Ukraine “About the introduction of new investment opportunities, guaranteeing the rights and interests of businesses for major energy modernization” from April 9, 2015 №327-VIII.
Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.	The Law of Ukraine “About peculiarities of ownership of an apartment building” from May 14, 2015 №327-VIII.
	The Law of Ukraine “About peculiarities of access to information in the supply of electricity, natural gas, centralized hot water, centralized drinking water supply and sanitation” of December 10, 2015 №887-VIII.

Source: consolidated on the basis [14,18].

The problems of implementing the provisions of the energy package of the EU Directives and Regulations in the relevant legislation of Ukraine are: significant technological gap in the energy sector of Ukraine and the EU (different architecture of networks and structure of generating capacities, shortage of maneuvering power in Ukraine, relatively low level of reliability and quality of power supply, etc.); the impossibility of the implementation of the EU legislation which regulates the institutional framework of markets, through the mechanism of a simple copy (translation) directives and regulations, as it is in the sphere of technical regulation; the rate of adoption of acts and the realism of their performance; the lack of accountability and sanctions for non-compliance with regulations and directives, implementierung in national legislation, as it applies to countries-EU members; low level of transparency, accuracy and matching (comparison) of data of energy statistics and the like.

Delay implementation of European rules or their inadequate implementation of the normative law of the country may lead to the isolation of the Ukrainian energy market from the energy space of the EU with serious negative long-term consequences. The implementation of European energy standards in national legislation will contribute significantly to improving the energy security of the country, and the entry into the European market will reduce the opacity of domestic energy markets.

## PROSPECTS FOR HARMONIZATION OF ENERGY LEGISLATION

Despite the fact that energy efficiency is undoubtedly one of the priorities of Ukraine’s energy policy, energy consuming is excessive, and effectiveness of energy efficiency measures, by international standards, remains low. The amount of energy that used to produce a unit of goods and services (per unit of GDP) in Ukraine exceeds level: Great Britain in 4.8 times; Turkey in 3.8 times; Poland in 3 times; Belarus in 1.8 times; the average of the European Union in 3.8 times; for the world in general in 2 times [19].

There are great hopes that the implementation of European experience of energy sector development and the implementation of European energy standards will improve energy efficiency of Ukraine’s



economy; reduce the high level of politicization of intergovernmental relations in the energy sector will allow to liberalise and de-monopolise the domestic energy markets to make them more transparent and competitive, and create conditions for their integration into the European market. However, the practical implementation in the energy sector of the package of laws is facing in reality is accompanied by a complex and somewhat contradictory processes, as each country has specific national features, the existing system of economic relations in the energy sector, which in Ukraine is first of all characterized by a high level of monopolization of markets.

The procedure of the implementation of Ukraine's commitments as a member of the Energy Community, due to make the necessary changes in the legislation of Ukraine, defined by the Cabinet of Ministers of Ukraine (CMU) №733-r of 03.08.2011 about Action Plan on implementation of Ukraine's commitments under the Energy Community Treaty [14]. One of the primary steps in this direction was adoption the Law of Ukraine "About principles of functioning of gas market" and "About the basis of functioning of electricity market" and the CMU Decree "About urgent measures to reform the management system of united gas transportation system of Ukraine".

European model natural gas market, including for domestic consumers provides free access to gas infrastructure; stable regulatory environment; the absence of monopolies among the owners of the resource; free pricing of natural gas; lack of economic incentives for suppliers; the presence of paying customers; a sufficient number of suppliers.

The liberalisation of the natural gas market and implementation of the relevant EU standards in this area is the Law of Ukraine "On natural gas market"[14], adopted April 9, 2015. Creating a complete and competitive natural gas market in Ukraine will increase the efficiency of decision-making in the energy sector, depoliticize the market; increase the attractiveness of economic activities in the market for its subjects, create the conditions for long-term investment in this sector, reduce risks and dependence on external suppliers monopoly natural gas, strengthening energy security of Ukraine and the prospects for a qualitatively new integration of the Ukrainian gas market to the EU market.

Unfortunately, in Ukraine the modern natural gas market maintains a significant drawbacks: the lack of a stable regulatory environments conducive to attracting new players; the state company of national joint-stock company "Naftogaz of Ukraine" controls 80% of the natural gas resource; free pricing of gas exists only in the category "industry"; the presence of National joint stock company "Naftogaz of Ukraine" benefits 20% value added tax, more than 40% of households in Ukraine is beneficiaries; there are a limited number of suppliers of natural gas [20]. Access to the infrastructure of the gas transmission system can be considered conditionally free. Thus, the implementation of the Law of Ukraine "On the Natural Gas Market" requires the consistent introduction of market and regulatory mechanisms on the basis of balancing their impact and overcoming the monopolisation of the natural gas market, which will help to establish a complete market relations in this area and reduce its level of shadowing.

An important step for the transition to the European model of energy market is the Law of Ukraine "On electricity market" [14], adopted on 8 June 2017 In particular, this concerns the question of separation companies in the areas of distribution and transmission of electricity. The law provides de-monopolisation and free competition for all market participants, opens up opportunities for consumers to choose their electricity supplier.

However, the modern development of electricity market of Ukraine entails a number of problems: we still have a large amount of cross-subsidization of households by industry, that is, the tariffs for industrial consumers are significantly higher than the market price, and the tariffs for households do not cover even half the costs (for 2016, the amount of subsidies amounted to about 45 billion UAH); the lack of competition in the generation and supply of electricity; the existence of significant debt on the entire chain of "customers – suppliers – State-owned enterprise "Energorynok" – the producers" (as of February 1, 2017. the debt of consumers for electricity has reached 27,6 billion UAH. debt providers is 30,1 billion UAH. the duty of the State enterprise "Energorynok" and 29,9

bln.). In addition, the market is “closed” for household consumers, they can’t change the main supplier of energy (State-owned enterprise “national energy company “Ukrenergo”) to other providers of electricity [21].

The adoption of the Law of Ukraine “On electricity market” are the first steps in reforming the domestic energy market, then you need to ensure the technical feasibility of free trade with electricity to provide infrastructure. The more investors, the better will be the situation in the economy as a whole. Technical opportunity to sell Ukrainian electricity abroad makes our country a more attractive investment.

In European countries, alternative energy is actively developed for a long time. Some countries (Germany, Italy) even exceeded its state program for the replacement of traditional energy sources renewable. Ukraine is only at the beginning of this journey. In Ukraine there is a certain revival of the market development of alternative sources of energy. It is planned that in Ukraine by 2030 in the structure of energy resources 11% will be alternative sources of energy (renewable resources); were introduced green tariff. The state is obliged to buy electricity produced from renewable sources subject to the green tariff, which, as it turned out, was one of the highest in the world. Recently, changes were made to the Law “On electric power industry”, since the previous version created a ground for corruption. Today, tariffs on manufactured renewable electricity in Ukraine is more or less balanced and balanced [22].

To accelerate renewable energy development in Ukraine should be: increased domestic and foreign investment in new capacity due to the simplification of the procedure of qualification for getting green tariff, the adoption of incentives for small investors and the establishment of funding available loan banking products such as loan guarantees.

The main problems in the oil market of Ukraine – the decline in domestic production of oil and increase the economy’s dependence on import of petroleum products; lack of significant investment in geological exploration; technically worn out and obsolete material and technical base of oil refineries, high cost of production and the unresolved questions of ownership. As a result, Ukraine has a significant dependence on imports of petroleum products, whose share in 2016 reached 80% of its total consumption [21].

Positive changes in the oil market of Ukraine is the conformity of production of petroleum products of Ukrainian producers to the standards of quality of imported counterparts; adoption of legislative changes regarding the ease of administration of an excise tax on the sale of the fuel, which will reduce the share of the shadow market; introduction of a decline in rental rates will help to increase oil production, to increase investment in exploration; the use of new production technologies will enable to increase the attractiveness of the industry, thereby improving the load factor of the Ukrainian refineries, as well as reduce the import of petroleum products.

The main problem of the nuclear fuel market and nuclear technology of Ukraine is a problems of technogenic safety. In 2016, the number of accidents at nuclear power plants has increased five times compared to 2015. Reasons: outdated equipment; reduction in training of personnel; the transition to new fuels (Ukraine replaces Russian nuclear fuel to fuel the American company Westinghouse Electric). The second component of the problem is extending the life of nuclear reactors; lack of funding, withdrawal of the units from operation and handling of nuclear waste [23].

Ukraine considers the nuclear energy as one of the most cost-effective low-carbon energy sources. The further development of nuclear energy sector for the period up to 2035 is projected on the assumption that the share of nuclear generation in total electricity production will grow.

The coal market of Ukraine is characterized by a shortage and the need for coal imports (due to the loss of control over part of the Donetsk and Luhansk regions); the imperfection of price and tariff policy depending on the energy value of coal products and the opacity of the market; the lack of funds for the purchase and introduction of modern high-performance cleaning and trampoline technology, vehicles, as well as the latest technological decisions for coal mining; the loss of the personnel potential of the coal industry due to the fall in the prestige of mining work, the lack of a

training base and the lack of compliance with the level of professional training of workers for the needs of innovative development of coal production [21].

Ways of overcoming the shortage of coal: the reform of the coal industry and thermal generation; admission to the internal coal market of importers; the implementation of the gradual elimination of loss-making mines; creation of favorable investment conditions for the privatization of mines; the introduction of an electronic exchange form of trade in coal products.

On thermal power market of Ukraine there are the following problems: the lack of preconditions for competition in the heating sector; lack of incentives to improve the efficiency of heat production; the existence of barriers to access to heating systems of independent heat producers; the lack / failure of investment as a consequence of the imperfection of the existing mechanisms for tariff setting. The reasons for this situation are the monopoly position of the enterprises of municipal power system in the district heating sector and the imperfect legislation in the field of power system.

The urgent question for housing and communal services is the replacement of fossil fuels with alternative energy sources for production of thermal energy, since the consumption volume of natural gas companies Teplokommunenergo amounted to about 8,6 billion m<sup>3</sup> in 2014 and 6,9 billion m<sup>3</sup> in 2015 [24]. An important role in this process can play a bioenergy, but significant barriers to the entrance of bioenergy technologies in the sphere of municipal power system is the lack of a competitive market of thermal energy.

The developed European countries such as Sweden, Finland, Germany, Austria, Belgium, France and UK have created a competitive market of the heat, the rest of the EU countries are moving in this direction right now. Almost all EU countries more or less conducted unbundling (legal division of existing heating companies, at least for two independent companies, one of which produce thermal energy, and the second made its transportation and delivery) in the sector of the heat and ensured conditions of access the independent producers to the heating networks [24].

The introduction of competitive energy market in Ukraine, provides the opportunity to: create competition in the district heating sector; improving the efficiency of thermal energy production for operators and independent producers; the application of the concept of “open heating” on the basis of non-discriminatory conditions for connection of independent producers; the growth of private investment in the district heating sector; increased demand for biofuels and other alternative energy sources in the district heating sector.

In the context of the implementation of the Association Agreement between the EU and Ukraine we should pay attention to the existing experience in the field of housing and communal services (HCS). European approach is provided by current building standards, which define mandatory installation of the metering devices of house heat and instalation to every apartment metering devices of electricity, hot and cold water. Reserve of increasing energy efficiency of the apartment, especially in the current fund, is to create conditions for every apartment metering of thermal resources that can significantly increase the motivation of residents to careful attitude to the operation of heating systems.

Of course, reforming HCS in EU was due to the economy development, and with the financial and standartpmy help of EU; and made such great progress as a result of the transformation of HCS (restructuring, de-monopolization, market liberalization, privatization) and because of the introduction of effective management control (regulation) and market pricing methods.

In 2015 in Ukraine there was a significant raising of tariffs for housing and communal services, within the framework of the memorandum with the key creditor of country - the International Monetary Fund, namely the minimum fare for households was increase by 3.3 times up to 3600 UAH per thousand cubic meters of fuel consumption below 200 cubic c. m. of gas; heat tariffs for the population by 72%, to UAH 537.2 UAH G.cal.; electricity tariffs for households rose for the year twice: first to 19%, then from 24.6% to 0,456 UAH per kW / h [25].

Thus, given the existing tariffs for housing and communal services, and a tendency to their increase in the near future, comparing the rates of wages and pensions of ordinary citizen, realizing that the

revision of existing tariffs and use of Ukrainian gas production for the needs of population issue more political than economic and solving it requires knowledge of changes in the energy policy of the country, so improvement is now possible only on the base of economic motivation of energy saving consumer behaviour and improving energy efficiency in HCS in Ukraine [26].

## CONCLUSIONS

Today Ukraine is moving toward increasing energy efficiency, in particular to fulfillment of its targets adopted under the Energy Community Treaty. In terms of energy consumption per unit of GDP Ukraine exceeds the average level of the EU countries is more than twice, so its potential for energy efficiency is really enormous. Its potential is still unused at national and local levels, that leads to significant economic losses and negatively influence on the economy of the state.

One of the main barriers to energy efficiency in Ukraine is a significant number of the not adopted necessary primary and secondary legislations. Also it is very important to develop a legal and regulatory framework of the energy efficiency of the buildings. In addition, improving coordination between the executive authorities, expert organizations and investors is a prerequisite for further progress in implementation programs and energy efficiency measures.

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