

Dudin, Michail; Zas'ko, Vadim Nikolaevič; Doncova, Olesja et al.

Article

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International Journal of Energy Economics and Policy

Provided in Cooperation with:

International Journal of Energy Economics and Policy (IJEEP)

Reference: Dudin, Michail/Zas'ko, Vadim Nikolaevič et. al. (2020). The energy politics of the European Union and the possibility to implement it in Post-Soviet states. In: International Journal of Energy Economics and Policy 10 (2), S. 409 - 416.

<https://www.econjournals.com/index.php/ijEEP/article/download/9077/4944>.

doi:10.32479/ijEEP.9077.

This Version is available at:

<http://hdl.handle.net/11159/8305>

Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics
Düsternbrooker Weg 120
24105 Kiel (Germany)
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)
<https://www.zbw.eu/>

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The Energy Politics of the European Union and the Possibility to Implement it in Post-soviet States

Mihail Nikolaevich Dudin^{1,2*}, Vadim Nikolaevich Zasko³, Olesya Igorevna Dontsova³,
Irina Valentinovna Osokina³

¹Market Economy Institute of RAS (MEI RAS), Moscow, Russian Federation, ²Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia, ³Financial University under the Government of the Russian Federation, Moscow, Russia.

*Email: dudinmn@mail.ru

Received: 13 September 2019

Accepted: 05 January 2020

DOI: <https://doi.org/10.32479/ijeeep.9077>

ABSTRACT

The purpose of the work is to study the evolution of the energy politics of the European Union (the EU), and the possibility to apply such experience in the post-Soviet states. The goals stated in the European energy strategy probably cannot be fully achieved by 2020. The problem is the insufficient infrastructure development and the incomplete safety of energy innovations for the environment. However, the problem can be solved in the short-term run due to the social and environmental responsibility of corporations and by promoting “clean technology entrepreneurship.” It is impossible to use the EU energy politics provisions in the post-Soviet states. This will require large investments, and the population is not ready to move to the principles of energy conservation and energy efficiency. Post-Soviet countries need to reform the state energy and socio-economic policies rather than the energy sector.

Keywords: Energy Politics, European Union, Russian Federation, Energy Intensity, Energy Efficiency, Energy Conservation

JEL Classifications: Q40, Q43, Q48

1. INTRODUCTION

The EU as a new socio-political and economic integration is generally thought to begin its formation after the Second World War, but in fact there were prerequisites for this unification at the end of the 19th century. Despite the fact that the EU has officially existed since 1993, the economic and political interests in the integration of European states became vivid in the 1950s. This was substantiated, firstly, by the political need in stability, and, secondly, by the economic need in energy resources and metallurgical products. In the post-war Europe such needs were constantly growing, but the political rivalry of some states prevented the normalization of the economic exchange.

After more than half a century, it is possible to say that the European Coal and Steel Community has achieved its goal because

nowadays the EU is the most developed political and economic integration whose energy politics are continuously improving, which is largely associated with a change of the global energy paradigm that occurred at the junction of the previous and the present century. The fuel energy dominating until the beginning of the 21st century started losing its relevance in terms of meeting the energy and social needs of the economy.

The scientific and technological progress made it possible to obtain new technologies for energy production from renewable nonfuel sources, and, in addition, centralized energy markets began to break up into fragmented or small distribution systems. Under these conditions, the energy politics of the EU underwent a series of transformational stages – from consolidation and centralization in terms of meeting the energy needs of the economic and social sectors to self-organization and decentralization of energy supply,

which, of course, was facilitated by the transition to the paradigm of renewable energy based, among other things, on processing secondary waste into energy resources.

The main objectives of the EU energy politics are supply security, competitiveness, and sustainability. The supply security is interpreted as a reliable supply of energy resources, competitiveness – as the availability of these resources at a competitive price, and constancy – as the minimum possible negative impact of the energy sector (both production and consumption) on the environment. Achieving an appropriate balance between these three goals is crucial for the economic competitiveness of the EU, its political autonomy, and intensification of the fight against the climate change.

In this article the authors are going to consider changes in the EU energy structure in terms of the political regulation and reforms, as well as the possibility of applying the best practices in obtaining, distribution, and use of energy resources in other world regions, for example, in Russia and post-Soviet states.

2. MATERIALS AND METHODS

The article is based on the interdisciplinary approach and the integration of methods of socio-economic, statistical and institutional analysis. The platform for studies was the EU Energy Strategy known as the “20/20/20” (Europe 2020 strategy), i.e., suggesting to achieve the following goals by 2020 (European Commission, 2019):

1. To reduce greenhouse gas emissions by 20%,
2. To increase the energy efficiency in the economy and social sector by 20%, and
3. To obtain 20% of energy from renewable sources.

This strategy is focused on ensuring the energy security in the domestic European market, i.e., it determines the areas and guidelines for pursuing the EU energy politics. In its turn, in order to ground the efficiency of the EU energy politics, the comparative approach will be used. It is based on the econometric fuzzy logic algorithm. The object of comparison is the EU and Russian energy politics, and the subject of comparison is the efficiency of the politics under consideration based on fuzzy set variables:

1. The stability of energy supplies to end consumers,
2. Economic satisfaction of customers,
3. The competitiveness of the domestic energy market, and
4. Diversification of the domestic market by sources of energy resources.

Table 1: Methodology for calculating variables included in the “energy politics efficiency” fuzzy set [compiled by the authors]

Variable	Calculation method	Abbreviations and notation
Stability of energy supplies (x_1)	$x_1 = 1 - \Delta_{id}$	Δ_{id} – the share of the days in a year when energy supplies were delayed (irregular)
Economic satisfaction of consumers (x_2)	$x_2 = 1 - \Delta_{ec}$	Δ_{ec} – the share of end customers’ expenses for purchasing energy
Competitiveness of the domestic energy market (x_3)	$x_3 = 1 - cr$	cr – the market concentration coefficient if $cr \leq 0.75$, if $cr > 0.75$, then $x_3 = 1$
Diversification of the domestic market (x_4)	$x_4 = \frac{\Delta_{re}}{\Delta_{fe}}$	Δ_{re} , Δ_{fe} – respectively, the share of renewable and the share of fuel energy in the end consumption

These variables are selected as key ones for the “energy politics efficiency” fuzzy set based on the fact that:

- Firstly, the data for calculating variables can be obtained from public sources,
- Secondly, the interpretation of these variables is always invariant – the higher the value of the variable, the greater its contribution to ensuring the energy security of a state (a group of states).

Table 1 shows the methodology for calculating the above variables included in the above fuzzy set.

For this fuzzy set, several hierarchical subsets are singled out. A variable can be assigned to these sets in accordance with its membership function. Table 2 shows the hierarchy of subsets and membership functions of variables in the “energy politics efficiency” fuzzy set.

Based on distributing the variables in subsets, the value of the intermediate coefficient (ir) is calculated. It will make up the basis for defining the “energy politics efficiency” indicator (i.e., the value of the fuzzy set FS). For these two operations, formulas (1) and (2) are used [suggested by the authors]:

$$ir = \frac{\sum SS}{n} \quad (1)$$

$$FS = \sum ir_i * g_i \quad (2)$$

Where: n is the number of variables in a fuzzy set; g_i is the weight of the intermediate coefficient.

It is important not only to calculate the value of the fuzzy set that can vary in the range $[0; 1]$, but also to estimate the certainty that the fuzzy set relevantly determines the efficiency of the energy politics, and, therefore, the energy security. It is offered to use Table 3 for this.

Table 4 contains the initial data that show the values of the variables included in the “energy politics efficiency” fuzzy set.

The data in Table 4 were obtained from public sources (Eurostat, International Energy Agency, International Renewable Energy Agency, Statistical Yearbook of World Energy).

3. RESULTS

The global consumption of energy synthesized from primary fossil energy resources has grown more than 10 times over

Table 2: Subsets and membership functions of variables in the “energy politics efficiency” fuzzy set [compiled by the authors]

Variable (x_i)	Subset (SS)	Membership function (f_i)
$x_i = 0.05 \pm 0.05$ $0.05 > x_i < 0.15$	Subset of low-level variables	$f(SS_1)=1$
$x_i = 0.15 \pm 0.05$		$f(SS_1)=(0.15-x_i)*10$
$x_i = 0.2 \pm 0.05$		$f(SS_2)=1-f(SS_1)$
$0.2 > x_i < 0.3$		$f(SS_2)=1$
$x_i = 0.3 \pm 0.05$ $x_i = 0.35 \pm 0.05$ $0.35 > x_i < 0.45$	Subset of pre-medium variables	$f(SS_3)=(0.3-x_i)*10$
$x_i = 0.45 \pm 0.05$		$f(SS_3)=1-f(SS_2)$
$x_i = 0.5 \pm 0.05$		$f(SS_4)=1$
$0.5 > x_i < 0.6$		$f(SS_4)=(0.45-x_i)*10$
$x_i = 0.55 \pm 0.05$ $x_i = 0.6 \pm 0.05$ $0.65 > x_i < 0.75$	Subset of medium variables	$f(SS_5)=1-f(SS_4)$
$x_i = 0.75 \pm 0.05$		$f(SS_5)=1$
$x_i = 0.8 \pm 0.05$		$f(SS_6)=(0.6-x_i)*10$
$0.8 > x_i < 0.9$		$f(SS_6)=1-f(SS_5)$
$x_i = 0.9 \pm 0.05$ $x_i = 1$	Subset of high-level variables	$f(SS_7)=1$
		$f(SS_7)=(0.75-x_i)*10$
		$f(SS_8)=1-f(SS_7)$
		$f(SS_8)=1$

Table 3: Calculation of the confidence function of the “energy politics efficiency” fuzzy set [compiled by the authors]

Fuzzy set (FS)	Estimation of the energy politics and the energy security	Confidence function (f_l)
$FS \leq 0.1$	Extremely inefficient energy politics, an extremely low level of the energy security	$f_l=1$
$0.1 > FS < 0.25$		$f_l_1=(0.25-FS)*10$
$FS = 0.25 \pm 0.05$	Inefficient energy politics, a low level of the energy security	$f_l_2=1-f_l_1$
$FS = 0.3 \pm 0.05$	Efficient energy politics and the energy security is pre-medium	$f_l=1$
$0.35 > FS < 0.5$		$f_l_3=(0.5-FS)*10$
$FS = 0.45 \pm 0.05$	Medium efficiency of the energy politics and the medium level of the energy security	$f_l_4=1-f_l_3$
$FS = 0.5 \pm 0.05$		$f_l=1$
$0.6 > FS < 0.75$	Upper-medium efficiency of the energy politics and the energy security	$f_l_5=(0.75-FS)*10$
$FS = 0.75 \pm 0.05$	High-level efficiency of the energy policy and the energy security	$f_l_6=1-f_l_5$
$FS \geq 0.8$		$f_l=1$

the recent 100 years (Figure 1). Nowadays, the main world reserves of fossil (fuel) energy resources are concentrated in Russia, the Middle East, the USA, and Canada. The European continent has small reserves of primary or fossil (traditional) energy resources.

All countries that have reserves of various types of primary energy resources will definitely strive not only to rationalize their use (to reduce the energy intensity and to improve the energy efficiency), but also to improve the efficiency and performance of their extraction from the depths of Earth and to decrease losses when mining. At the same time, countries that do not have enough fossil fuels and energy will strive to improve their energy efficiency and to diversify their national energy sectors. Thus, it is likely that in the long-term run the spatial and geographical picture of world energy will be transformed, including the change in the specifics of the civilizational development.

It is necessary to understand that the EU depends on supplies of fuel and energy resources, and since 1990s this dependence has been constantly increasing (Table 5). According to the Eurostat (2019), the main supplier of mineral oil and natural gas to European markets is Russia. This is about 35% of the oil import to the EU. As for the import of natural gas to Europe, Russia provides more than 39%, Norway – 29.5%, and Algeria – 12.8%. Almost half of the EU countries (19) import more than 50% of the natural gas from Russia, and some of them are still completely dependent on the Russian gas (European Commission, 2019; Eurostat, 2019).

Table 6 shows the actual and forecast investments of the EU in its energy sector.

Since 1990s the EU management politics, in particular the energy sector, have been constantly updated. This is when there was a

Table 4: Initial values of the variables in the “energy politics efficiency” fuzzy set (Yearbook Enerdata, 2019; International Energy Agency, 2019; International Renewable Energy Agency, 2019; Eurostat, 2019)

Variable	2000	2018
European union		
Stability of energy supplies (x_1)	0.724	0.709
Economic satisfaction of consumers (x_2)	0.731	0.801
Competitiveness of the domestic energy market (x_3)	0.409	0.496
Diversification of the domestic market (x_4)	0.236	0.322
Russian federation		
Stability of energy supplies (x_1)	0.692	0.713
Economic satisfaction of consumers (x_2)	0.882	0.737
Competitiveness of the domestic energy market (x_3)	0.357	0.124
Diversification of the domestic market (x_4)	0.110	0.136

transition to a new political paradigm called the open method of coordination (OMC).

Some scientists and researchers (Scott and Trubek, 2001) favorably estimate the new political paradigm and believe that this new management architecture provides both decentralization of EU states management and coordination of efforts made by state authorities to achieve pan-European development goals, and greater participation of the civil society in discussing and taking decisions that are commonly important for the EU.

However, there are critical scientific opinions about the OMC efficiency. Thus, for example, Idema and Kelemen (2006), Kelemen (2004) believe that the new political paradigm of the pan-European government is a failure of the plan in practice. Referring to the report of the European Parliament (Dated, 2006), the authors show that the introduction of informal institutions in a strictly formalized structure of state (executive, legislative and judicial) power in the EU member states creates the preconditions

for abuse (both by the state and by public and corporate sectors). Abuses may concern any aspect of the European community's life, and the energy sector is not an exception (Idema and Kelemen, 2006; Kelemen, 2004).

However, it is necessary to note that in terms of the energy politics, in 2005 the EU developed a common strategic platform (in 2007 the platform was finalized, and from 2009 to the present it has been regularly supplemented and updated) based on three key principles today: energy sustainability, security of supply, competitiveness and competitive power in the energy sector (European Commission, 2019; Eurostat, 2019). Therefore, in 2013, the EU energy politics included the following main components (Figure 2).

Among a rather long list of political initiatives already implemented in energetics (within the EU), the most important ones for Russia

and the post-Soviet states (except for the Baltic countries that have already become the EU members) include the following:

1. Political decisions on the renewable energy (innovations, competition among manufacturers, consumer education, economic/financial/fiscal and information support for manufacturers and consumers),
2. Provisions to ensure the energy efficiency in the economic and social sector,
3. Taxation of the production, distribution and consumption of traditional energy, and
4. Provisions related to the environmental protection and climate change.

The EU was one of the first to actualize the problem of fuel (hydrocarbon) energy and the way to solve it by transiting to the renewable energy. The possibility of the widespread use of renewable energy resources was mentioned for the 1st time in 1986, and the adopted directives (2001, 2003, 2007 and all subsequent ones) aimed at achieving a 20% share of renewable energy resources in the final consumption of energy resources in the EU. It is necessary to note that this goal has already been achieved in Sweden, Finland, Denmark, and Estonia. At the end of 2018, the share of energy resources obtained from renewable resources ranged from 18% to 19% in the final consumption in all EU countries (Yearbook Enerdata, 2019). At the same time, Europe produces almost 37% of the world's renewable energy, and the CIS countries produce twice less, while possessing an incomparably larger base of resources for obtaining energy resources from renewable sources.

Table 5: EU dependence on import of organic energy carriers (European Commission, 2019; International Energy Agency, 2019; Eurostat, 2019)

Year	Dependence on import, %			
	Solid fuel	Oil and oil products	Natural gas	On average
1990	19.9	80	45.5	44.2
2000	30.6	75.7	48.8	46.7
2010	39.5	84.5	62.2	52.6
2012	42.2	86.5	65.8	53.3
2013	44.1	87.4	65.2	53.1
2014	45.6	87.4	67.2	53.4
2018	42	88.6	66	53

Table 6: Actual and forecast EU investments in energy (European Commission, 2019; Yearbook Enerdata, 2019; International Energy Agency, 2019; Eurostat, 2019)

Indicator	Annual average investments (2015-2018)	New energy politics (2019-2035)	Scenario that assumes the maximum decrease in CO ₂ emissions (2019-2035)
Investments in energy supply, bln USD			
Investments in energy supply	152	3,214	3,528
Oil	20	394	358
Natural gas	30	351	453
Coal	3	19	16
Power industry	96	2,227	2,566
Biofuel	2	44	136
Investments in energy efficiency, bln USD			
Totally in energy efficiency	---	2,170	2,998
Manufacturing industry	---	82	154
Transport	---	1,187	1,560
Construction	---	900	1,285
Investments in energy supply and energy efficiency, bln USD in total			
In total	---	5,384	6,526

Figure 1: Dynamics of Energy Consumption in the World, bln t of Oil Equivalent (Yearbook Enerdata, 2019; International Energy Agency, 2019)

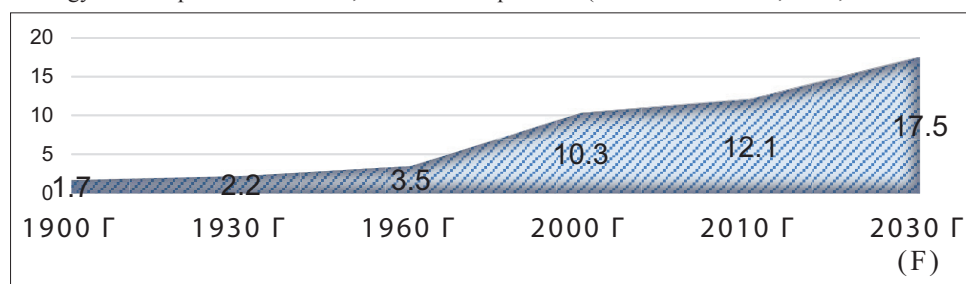
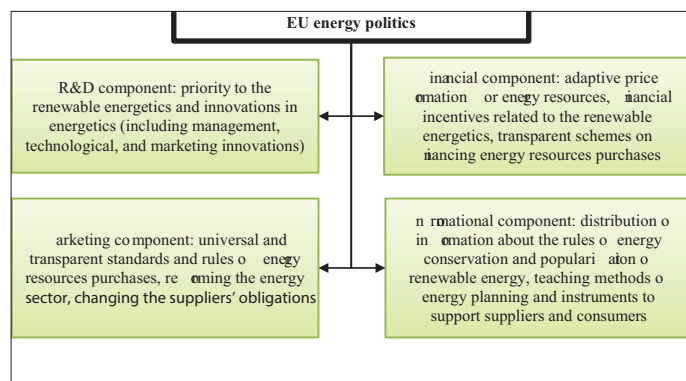


Figure 2: Key components of the EU energy politics (Compiled by the Authors by Using



Sources: European Commission, 2019; Kelemen, 2004; Kanellakis et al., 2013)

By all means, the main reason for the slowdown is the state politics on the renewable energy. For example, uniting the interests of Russia, Belarus, and Kazakhstan within the EEU integration and focusing on the European experience, the European Economic Commission aims at increasing the share of the renewable energy. However, the EEU's common energy market is not yet functioning, and at best it will have been created by 2025 (Eurasian Economic Commission, 2019). Moreover, some Russian scientists, for example, I.V. Matveev (2017), believe that the EEU countries can maintain the priority of fuel energy over nonrenewable fuels, and indicate that Russia and Kazakhstan have more than enough fossil hydrocarbon reserves both to meet domestic needs and to provide the Silk Road Economic Belt with the energy.

This approach is unlikely to be correct because Russia, Kazakhstan, Belarus and some other countries generate about 2.5 thousand metric tons of CO₂ (to compare, the whole Europe generates 3.9 thousand metric tons of CO₂ with more than 10 times increase in the economy productivity) (International Energy Agency, 2019; International Renewable Energy Agency, 2019).

On the contrary, since 2007 the EU energy politics have aimed at reducing CO₂ emissions by 20%. In 2018 the volume of CO₂ emissions in the EU decreased by 13% as compared to 2007. In the CIS countries (including those forming the EEU) the volume of emissions increased by 8% for the same period (Yearbook Enerdata, 2019; International Energy Agency, 2019). From the institutional point of view, the EU success in reducing greenhouse emissions is explained by the system of emission quotas by states (including Iceland, Liechtenstein, and Norway). Every year the number of quotas is reduced, which

- Firstly, stimulates research, development and implementation of renewable energy technologies in the economy and the private sector,
- Secondly, makes the corporate sector, mainly manufacturing companies (but service and trading companies involved in this process as well), strive to improve the energy efficiency.

Russia has got environmental protection institutes, and regulates the negative impact on the environment for fiscal purposes (Decree

of the Government of the Russian Federation, 13.09.2016). Moreover, since 2010 there has been federal law "On energy conservation." (Federal Law, 23.11.2009), but at the middle of 2019 the law on quotas for greenhouse emissions was still under development. At the same time, Russia, along with Kazakhstan, is still in the top ten countries in terms of energy intensity of the economy (Yearbook Enerdata, 2019). A high level of energy intensity under the low level of economic productivity in the CIS countries (including the EEU countries) is an evidence of energy wastefulness that is almost not regulated with political decisions.

On the contrary, since 2003 the EU energy politics have been consistently reforming the energy sector in terms of improving the energy efficiency, although it is obvious that the EU will not be able to achieve its stated growth goal (increase in the energy efficiency by 20% by 2020).

In 2019, the total increase in the energy efficiency in the EU countries is about 13-15% (International Energy Agency, 2019; Eurostat, 2019). However, on the other hand, the priorities set by the EU informal energy council in 2012 (Non-paper of the services of the European Commission on Energy Efficiency Directive, 2012) aim at ensuring that the national energy efficiency action plans of each European state include the following obligatory provisions:

1. The use of cogeneration technologies in the economy and the social sector (cogeneration is the joint production of electric and fuel energy), which reduces greenhouse gas emissions,
2. The principle of energy efficiency in state procurement from buying environmentally friendly energy resources to purchasing the energy efficient equipment (including the one designed for the needs of the energy sector),
3. The principle of energy efficiency in the construction of buildings and structures based on a special methodology for estimating the energy characteristics of the facilities that have already been commissioned and are still under construction, which is confirmed by a special certificate with the validity of 10 years,
4. Introduction of voluntary environmental management and environmental audit schemes in the corporate, business and nonprofit sector,
5. The transition to eco-design in goods and products that have direct or indirect but very considerable impact on the energy consumption (office equipment, household appliances, etc.),
6. Optimization of taxation at all stages of the energy cycle (from production and procurement of energy resources to their use, including distribution and final disposal of the resulting wastes) and the introduction of fiscal incentives (subsidies, discounts on energy efficient equipment and taxes) aimed at creating the rational motivation for energy conservation among citizens and economic actors,
7. Implementation of awareness programs (including general education and special) in the area of energy conservation, energy efficiency, and energy ecology,
8. Mandatory monitoring and estimation of implementing directives on energy efficiency and energy conservation. However, at the same time there is no strict and unified methodology of monitoring for all countries, but there are general rules on how, for example, the National Energy

Efficiency Action Plans will be estimated by pan-European coordinating and advisory bodies, and

9. Implementation of various forms of international partnership in the area of energy efficiency, which implies cooperation in this matter not only within the EU, but also far beyond its borders.

Thus, on the one hand, the European energy politics are focused on reducing the share of fuel energy and increasing the share of renewable energy while meeting the relevant needs of the economic and social sectors. However, on the other hand, as Sencar et al. (2014) are absolutely right to note, the superior goals on improving the energy efficiency and environmental friendliness of energy consumption set by the EU can decrease the security, sustainability, and competition in the all-European energy market due to the underdeveloped infrastructure of the renewable energy

sector and due to insufficient evidence of the actual environmental safety of some new renewable energy technologies. The authors of more modern studies also agree with this.

Based on the data from Table 4 and the fuzzy logic algorithm, the authors made the econometric estimation of the efficiency of the EU and Russian energy politics (Table 7).

The data obtained indicate that the estimation of the efficiency of the Russian and EU energy politics remains almost unchanged. However, at the same time, it is necessary to pay attention to the fact that the efficiency of the EU energy politics is stably higher than the medium, and the confidence in it is more than 90%. Therefore, the domestic pan-European energy security is also much higher than the medium one. On the contrary, the efficiency of the Russian

Table 7: Results of estimating the efficiency of the EU and Russian energy politics and energy security [calculated by the authors]

Variable	Variable membership function as to the subset					
	f_1	f_2	f_3	f_4	f_5	f_6
EU, 2000						
Stability of supplies	0	0	0	0	0.26	0.74
Economic satisfaction of consumers	0	0	0	0	0.19	0.81
Competitiveness of the domestic energy market	0	0	0.41	0.59	0	0
Diversification of the domestic market	0	0.64	0.36	0	0	0
Medium coefficient	0.000	0.160	0.193	0.148	0.113	0.388
Analysis and estimation results						
Fuzzy set variable = the efficiency of the energy politics is upper-medium, the energy security is upper-medium						0.656
Confidence in the fuzzy set membership to the estimate “the efficiency of the energy politics is upper-medium, the energy security is upper-medium”						93.8%
EU, 2018						
Stability of supplies	0	0	0	0	0.41	0.59
Economic satisfaction of consumers	0	0	0	0	0.01	0.99
Competitiveness of the domestic energy market	0.00	0.00	0.51	0.49	0.00	0.00
Diversification of the domestic market	0.00	0.68	0.32	0.00	0.00	0.00
Medium coefficient	0.000	0.170	0.209	0.122	0.105	0.395
Analysis and estimation results						
Fuzzy set variable = the efficiency of the energy politics is upper-medium, the energy security is upper-medium						0.652
Confidence in the fuzzy set membership estimated as “the efficiency of the energy politics is upper-medium, the energy security is upper-medium”						98.0%
Russian Federation, 2000						
Stability of energy supplies	0	0	0	0	0.58	0.42
Economic satisfaction of consumers	0	0	0	0	0.82	0.18
Competitiveness of the domestic energy market	0	0	0.93	0.07	0	0
Diversification of the domestic market	0.4	0.6	0	0	0	0
Medium coefficient	0.100	0.150	0.233	0.018	0.350	0.150
Analysis and estimation results						
Fuzzy set variable = medium efficiency of the energy politics and the medium level of the energy security						0.573
Confidence in the fuzzy set membership estimated as “the efficiency of the energy politics is pre-medium, and the level of the energy security is pre-medium”						42.7%
Confidence in the fuzzy set membership estimated as “medium efficiency of the energy politics and the medium level of the energy security”						57.3%
Russian Federation, 2018						
Stability of energy supplies	0	0	0	0	0.37	0.63
Economic satisfaction of consumers	0	0	0	0	0.13	0.87
Competitiveness of the domestic energy market	0.26	0.74	0	0	0	0
Diversification of the domestic market	0.14	0.86	0	0	0	0
Medium coefficient	0.100	0.400	0.000	0.000	0.125	0.375
Analysis and estimation results						
Fuzzy set variable = medium efficiency of the energy politics and the medium level of the energy security						0.566
Confidence in the fuzzy set membership estimated as “the efficiency of the energy politics is pre-medium, and the level of the energy security is pre-medium”						43.4%
Confidence in the fuzzy set membership estimated as “medium efficiency of the energy politics and the medium level of the energy security”						56.6%

energy politics is stably at the medium level, but the confidence in this is no more than 57%, i.e., the level of the Russian energy security is volatile and varies from the pre-medium to medium. Under such conditions, it is obvious that the domestic Russian energy vulnerability has remained very high for the recent 18-20 years.

4. DISCUSSION

Not only Russian, but also many European, American, and Asian scientists agree that in terms of energy the future world is an “electric and gas world,” i.e., the “energy future” will be ensured by electric energy and gas. However, over the past decade the gas has been creating the risks of lowering the energy security for the EU because up to 80% of the gas is imported, primarily from Russia (Abrahám et al., 2018). In addition, the above problems (underdeveloped infrastructure and insufficiently proven environmental safety of the renewable energy) potentiate the growth of risks and energy dependence of the EU on external supplies of energy resources. Obviously, it is necessary to solve these two problems, as well as the problem of the EU dependence on hydrocarbon fuels by developing the intellectual component of energy supply (including production, distribution and consumption) of economic actors and citizens of European states (Abrahám et al., 2018; Matsumoto et al., 2018; Khattak et al., 2018).

The smart energy supply platform is based primarily on the decentralization of large energy (national or regional) systems, which makes researchers update the issue on the sufficient development of the infrastructure of the renewable energy sector. However, here researchers do not take into account the fact that the pan-European energy market, and above all the renewable energy sector, is truly competitive, unlike, for example, the Russian one. This is one of the conditions for capitalist interests to be realized (satisfied) through socio-ecological corrections or socio-ecological decisions (McCarthy, 2015; Ekers and Prudham, 2018; Behrsin, 2019) aimed at correcting the situation in the environmental and energy sphere of the EU.

The neoliberal concept of political ecology, together with the environmental and economic capitalism as a provider of political decisions has emerged relatively recently. Apparently, it is a reasonable answer to scientific concerns about the underdevelopment of infrastructure and renewable energy technologies. In other words, the works of McCarthy (2015), Ekers and Prudham (2018) and Behrsin (2019) indicate that the renewable energy is a new industry to be used in the economic and entrepreneurial activity. The latter is sure to progress in terms of the infrastructure and technology related to the development and dissemination of the renewable energy, similar to the one observed in the European education, medicine and other socially important areas. However, the liberal approach to regulating the EU energy market recognizes problems (both infrastructural and technological) in the renewable energy sector, but it prefers to solve them not at the expense of the state support and massive government investment in energy (like in Russia), but by stimulating the innovation and implementation activity in the corporate, business, scientific, and social sectors.

In the fundamental work (Allen et al., 2019), several institutional hypotheses were put forward. They logically continue the theme

of the neoliberal approach to the political regulation of national energy markets, its traditional (hydrocarbon) and renewable sectors. In particular, based on a large meta-analysis of sources, for example, the hypothesis is shown that states, when investing in nuclear and fuel energy, almost never change the regulatory approach to the renewable energy.

There is an opposite situation – diversification of energy politics means and instruments. The priority of competition in energy markets stimulates faster development of renewable energy, improves the research activity, and activates the conversion of the intellectual activity results into commercially successful renewable energy technologies. Moreover, some studies (Cumming et al., 2017; Cumming and Schwenbacher, 2018) (Dudin et al., 2018; Alola et al., 2019) show that the reputational interests of the energy competencies of the renewable sector make them increase their investments in improving indicators of the environmental safety of renewable energy technologies, which is also an incentive for spreading “clean technology entrepreneurship” in other industries, sectors, and areas of national economies of the EU countries.

5. CONCLUSION

Thus, the data and results obtained during the study, including those based on the econometric and statistical analysis of development trends in the European and post-Soviet energy sectors, make it possible to formulate the challenges that are characteristic of the energy sectors development in the EU and the states of the former Soviet Union, in particular Russia. Based on the deep content research, the main obstacles to achieving the goals of the European energy strategy have been identified, as well as the ways and areas for overcoming them have been determined.

Using the empirical and institutional analysis, the possibility of applying certain provisions of the EU energy politics in the post-Soviet space has been also considered in the work. The obtained conclusions show that institutionally, socially and economically, Russia and other CIS countries are not ready to implement progressive provisions of the EU energy politics. However, it is obvious that over the recent 5 years, the progress in the infrastructure development, improvement of the environmental safety of renewable energy technologies, and enhancement of the sustainability and competitiveness of energy markets in the EU have been very noticeable. Notwithstanding, the problem of energy dependence on the supply of gas and other fuel energy resources from Russia, the neighboring Eastern and African countries, the CIS countries (in particular, Kazakhstan and Azerbaijan) has not yet been completely resolved. Therefore, it is quite natural to expect that in the next decade the energy politics of the EU will be focused on this particular problem, which can bring external economic risks to, for example, Russia, with its resource-dependent economy.

In turn, the national energy politics in Russia are unlikely to become diversified, harmonized and facing the future in the coming years. There are several key reasons for this:

- Firstly, it is not entrepreneurial, but state totalitarianism that dominates in the Russian economy; this neutralizes the value

of any venture projects, including those related to developing renewable energy, and improving the efficiency of traditional energy,

- Secondly, in Russia the economic and energy politics are not liberal, but conservative, which is aggravated by the foreign economic protectionist politics and internal paternalism in socio-economic and labor relations,
- Thirdly, in the context of the sanctions confrontation between Russia and the West, the mutual scientific and technological exchange is limited, and this affects the research work both in the field of improving traditional energy and in the development of renewable energy,
- Fourthly, Russia has not realized the importance and value of reputation (both economically and in other respects). Therefore, Russian energy companies do not seek to invest in their social and environmental responsibility, but they are actively investing in projects aimed at quick profit and/or its maximization.

Thus, on the one hand, the experience of the systematic evolution of the energy politics of the EU is very valuable. However, on the other hand, it probably cannot be applied to solve the problems of energy security, sustainability, and competitiveness of the national energy market in the Russian Federation. Within this article, the authors have made the institutional analysis of the trends, patterns, and consequences of the European political progress in the energy sector. In their further study of this topic, the authors are going to consider the impact of changes in the energy politics of the EU on the development of “clean technology entrepreneurship.”

6. ACKNOWLEDGMENT

This paper was financially supported by the Ministry of Education and Science of the Russian Federation, which ensures the Peoples' Friendship University (RUDN University) the provision of budget funds for financial support for the implementation of project “Support Tools for Fuel and Energy Complex as a Condition for Achieving Energy Efficiency and Energy Independence of the Region” (Task No. 26.4089.2017/4.6) in 2017-2019.

REFERENCES

- Abrahám, J., Britchenko, I., Jankovic, M., Garškaitė-Milvydienė, K. (2018), Energy security issues in contemporary Europe. *Journal of Security and Sustainability Issues*, 7(3), 387-398.
- Allen, M.L., Allen, M.M.C., Cumming, D.J., Johan, S. (2019), Comparative capitalisms and energy transitions: Renewable energy in the European union. *British Journal of Management*, 2019, 1-35.
- Alola, A.A., Bekun, F.V. and Sarkodie, S.A. (2019), Dynamic impact of trade policy, economic growth, fertility rate, renewable and non-renewable energy consumption on ecological footprint in Europe. *Science of the Total Environment*, 685, 702-709.
- Behrsin, I. (2019), Rendering renewable: Technoscience and the political economy of waste-to-energy regulation in the European union. *Annals of the American Association of Geographers*, 109(5), 1362-1378.
- Cumming, D.J., Leboeuf, G., Schwenbacher, A. (2017), Crowdfunding cleantech. *Energy Economics*, 65, 292-303.
- Cumming, D.J., Schwenbacher, A. (2018), Fintech venture capital. *Corporate Governance: An International Review*, 26(5), 374-389.
- Dudin, M.N., Zasko, V.N., Dontsova, O.I., Osokina, O.I. and Berman, A.M. (2018), Renewable energy sources as an instrument to support the competitiveness of agro-industrial enterprises and reduce their costs. *International Journal of Energy Economics and Policy*, 8(2), 162-167.
- Ekers, M., Prudham, S. (2018), The socioecological fix: Fixed capital, metabolism, and hegemony. *Annals of the American Association of Geographers*, 108(1), 17-34.
- Eurasian Economic Commission. (2019), News and Events. Available from: <http://www.eurasiancommission.org/en/nae/news/Pages/16-08-2019-2.aspx> [Last accessed on 2019 Aug 13].
- European Commission. (2019), Climate Strategies and Targets. Available from: https://www.ec.europa.eu/clima/policies/strategies/2020_en. [Last accessed on 2019 Aug 13].
- Eurostat. (2019), Energy-overview. Available from: <https://www.ec.europa.eu/eurostat/web/energy>. [Last accessed on 2019 Aug 13].
- Federalny zakon “Ob energosberezhenii i o povyshenii energeticheskoy effektivnosti, i o vnesenii izmeneniy v otdelnye zakonodatelnye akty Rossiyskoy Federatsii” ot 23.11.2009 No. 261-FZ (v redaktsii ot 26.07.2019 No. 241-FZ) [Federal Law “On energy conservation and on improving energy efficiency, and on amendments to certain legislative acts of the Russian Federation” No. 261-FZ dated 23.11.2009 (as amended on 26.07.2019 No. 241-FZ).
- Idema, T., Kelemen, R.D. (2006), New modes of governance, the open method of co-ordination and other fashionable red herring. *Perspectives on European Politics and Society*, 7(1), 108-123.
- International Energy Agency. (2019), Data and Statistic. Available from: <https://www.iea.org/statistics/?country>. [Last accessed on 2019 Aug 13].
- International Renewable Energy Agency. (2019), Publication. Available from: <https://www.irena.org>. [Last accessed on 2019 Aug 13].
- Kanellakis, M., Martinopoulos, G., Zachariadis, T. (2013), European energy politics a review. *Energy Politics*, 62, 1020-1030.
- Kelemen, R.D. (2004), The politics of environmental politics in the United States and the European Union. In: Levin, M., Shapiro, M., editors. *Transatlantic Policymaking in an Age of Austerity*. Washington DC: Georgetown University Press.
- Khattak, M.A., Ayoub, M.A.H., Manaf, M.A.F., Mahrul, M.F., Juhari, M.R.M., Mustaffa, S.M.I., Kazi, S. (2018), Global energy security and European union: A review. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, 11, 64-81.
- Matsumoto, K.I., Doumpos, M., Andriosopoulos, K. (2018), Historical energy security performance in EU countries. *Renewable and Sustainable Energy Reviews*, 82, 1737-1748.
- Matveev, I.E. (2017), Energeticheskaya politika EAES v rakurse EPSHP [Energy politics of the EAEU from the perspective of the SREB]. *Russian Foreign Economic Bulletin*, 3, 11-34.
- McCarthy, J. (2015), A socioecological fix to capitalist crisis and climate change? The possibilities and limits of renewable energy. *Environment and Planning A*, 47(12), 2485-2502.
- Non-paper of the Services of the European Commission on Energy Efficiency Directive. (2012), Informal Energy Council. p19-20 Available from: https://www.ec.europa.eu/energy/sites/ener/files/documents/20120424_energy_council_non_paper_efficiency_en.pdf.
- Postanovlenie Pravitelstva Rossiyskoy Federatsii ot 13.09.2016 No. 913 (v redaktsii ot 29.06.2018) “O stavkakh platy za negativnoye vozdeystviye na okruzhayushchuyu sredu i dopolnitelnykh koeffitsiyentah” [Decree of the Government of the Russian Federation No. 913 dated 13.09.2016 (as amended on 29.06.2018) “On fees for negative impact on the environment and additional ratios”.
- Scott, J., Trubek, D.M. (2001), Mind the gap: Law and new approaches to governance in the European union. *European Law Journal*, 8(1), 1-18.
- Sencar, M., Pozeb, V., Kroke, T. (2014), Development of EU (European union) energy market agenda and security of supply. *Energy*, 77, 117-124.
- Yearbook Enerdata. (2019), Statistical Yearbook of World Energy. Available from: <https://www.yearbook.enerdata.ru>. [Last accessed on 2019 Aug 13].