The Impact of the Energy Crisis on the Final Consumers of Energy

Oana PRICOPOAIA[1]
Irina SUSANU[2]
Ciprian MATIȘ[3]
Nicoleta CRISTACHE[4]
Sabin MURARIU[5]
Tincuța VRABIE[6]

Abstract

According to the European Parliament, the EU is facing a major energy crisis, triggered on the one hand by natural gas shortages and on the other by the explosive rise in energy prices. In this context, the aim of this paper is to identify the requirements of the final energy consumer and the opinions on energy produced from renewable sources (E-RES) and to analyze the factors influencing investments in E-RES. In order to achieve the proposed goal, the following objectives were formulated: objective 1 - review of the literature on investments in renewable energy; objective 2 - to establish the implications generated by the Russian-Ukrainian conflict on the activity of the energy sector; objective 3 - evaluation of the contribution of green certificates (CV) in stimulating the production of green energy; objective 4 - identify the end consumer's perspective on the transition from conventional to renewable energy sources.

Keywords: *energy crisis and politics, social and economic effects, renewable energy, final consumer*

JEL classification: Q40, Q43, Q47
DOI: 10.24818/RMCI.2022.4.560

1. Introduction

Currently, the EU, implicitly Romania, is facing an unprecedented energy crisis, which requires the adoption of special measures, taken in good time. According to EU statements, this year, the price of natural gas has multiplied several times, causing energy bills that are increasingly difficult to bear for many domestic and industrial consumers in the Union, energy poverty registering an unprecedented increase, with disproportionate effects on the states members

[1] Dunarea de Jos University of Galati, Romania, oana.pricopoaia@ugal.ro
[2] Dunărea de Jos Uiversity of Galati, România, irinasusanu@gmail.com
[3] Dunărea de Jos Uiversity of Galati, România, ciprian.matis@ugal.ro
[4] Dunărea de Jos Uiversity of Galati, România, cristache.nicoleta@yahoo.de
[5] Dunărea de Jos Uiversity of Galati, România, sabin.murariu @ugal.ro
[6] Dunărea de Jos Uiversity of Galati, România, tincuta.vrabie@ugal.ro

(https://www.europarl.europa.eu/doceo/document/P-9-2021-004363_RO.html, 2021). Although the Russian-Ukrainian war amplified these effects, we find that before the invasion of Ukraine, wholesale gas prices were about 200% higher than in February 2022, with wholesale electricity prices following a similar pattern.

If initially, unreasonably high energy prices were determined by the increased demand for gas globally, with a view to economic recovery after the COVID-19 pandemic, later the political-military conflict between Ukraine and Russia aggravated the energy crisis. It is obvious that the escalation of conflicts with Russia, Europe's main supplier, will generate blockages in energy supply, which will ultimately lead to the explosion of energy prices. No country in the world can ignore the fact that all fields of activity depend primarily on electricity, even more so the economic field. The national economies continue to maintain the focus on the transition to green energy which is becoming a necessity considering the increase in prices for mineral resources which are being consumed at an alert pace, but also the current Russian-Ukrainian conflict which is causing governments to find ways to supply countries without only with electricity, but especially with fuel.

In this context, the aim pursued in this paper is to identify the final energy consumer's requirements and opinions regarding energy produced from renewable sources (E-SRE) and to analyze the influencing factors on investments in E-SRE. In order to achieve the proposed goal, the following objectives were formulated: *objective 1 - review of specialized literature regarding investments in renewable energy; objective 2 - establishing the implications generated by the Russian-Ukrainian conflict on the activity of the energy sector; objective 3 - evaluation of the contribution of green certificates (CV) in stimulating the production of green energy; objective 4 - identifying the final consumer's perspective on the transition from conventional to renewable energy sources. The results of the research* are materialized in building the profile of the final consumer, both the physical consumer and the profile of legal entities, users of electricity from renewable sources. *The results obtained* are of real use to national governments, but also to other decision-makers in the energy industry, because the profile of the final consumer can alert them to the identification of concrete measures to avoid social, economic and political conflicts, depending on the grievances expressed by the type of consumers. Under these conditions, the legislator has the possibility to contribute to the protection of consumers, i.e. to adopt short-term social and economic measures as preventive measures to avoid the outbreak of social conflicts, or as proposed by the EC, the governments of the member countries can call on the use of revenues additional costs resulting from the sale of emission certificates to reduce the pressure on domestic consumers.

2. Literature review

The development and investment in technologies for the production of renewable energy has become a desired goal of governments, which is why the renewable energy sector plays an important role in the economy and economic

growth (https://ec.europa.eu/commission/presscorner/detail/ro/qanda_22_1512, 2022). With the Russian-Ukrainian conflict in mind, countries that are energy dependent on the conflicting countries are looking for solutions to avoid suffering from this unexpected conflict. Investments are conditioned by the increase in energy savings, but also by the cost of the investment, less important being the benefits brought by comfort and the reduction of carbon emissions.

In order to increase energy efficiency, to the support offered by the state in increasing the consumption of E-SRE, there is also the encouragement of consumers from profile companies to become prosumers, which will contribute not only to the generation of new ideas, but also to increasing the number of investments in sustainable energy technologies.

Another important aspect, *relevant to the achievement of objective 3,* which has raised many questions, is the link between efficiency gains and political implications considering future energy transformation policy. Also, there are studies that emphasize among the solutions proposed by the EU Green Paper the need for fiscal and financial stimulation in terms of research and development of renewable technology, improving the orientation of funding from the State, the formation and stabilization of markets for research results (Câmpeanu, 2007). The lack of tax harmonization and frequent changes do nothing but complicate the entire technological process. Analyzing the renewable energy support system through CV in Poland, it was shown that there is a strong connection between the applied CV system and the decisions of governmental and legislative institutions, which reduces the interest of investors in SRE (Adamczyk and Graczyk, 2020). As a rule, in energy field, the role of risk management plans is defining, being applicable both at the level of private and public companies, especially governmental ones.

In this sense, Rimšaitė (2019) focuses on the emergence of corruption and regulations against it in the energy sector. The specific characteristics of this sector reveal the instability of the regulations that at some point turn into more or less direct obstacles for entrepreneurs. Corruption comes from both the public and private sectors, classified as *supply-side and demand-side corruption.* Anti-corruption programs require enforcement from the highest hierarchical level down to employees. On the other hand, Colgan (2013) explains the causes of the Russia-Ukraine war that started in 2014 due to fluctuations in energy markets and the perspective of energy markets, based on the resource dependence theory and conceptual framework. The author's research demonstrates that Russia's economy is highly dependent on revenues from gas exports to Ukraine and the European Union, but also that Ukraine's energy fields and pipeline system have the potential to be a direct competitive threat to Russia's energy exports.

The most recent studies focus on the ability to develop energy independence, especially for countries affected by the Russian-Ukrainian conflict. Analysts in the field of renewable energy recalculated their estimates, mainly in the US, in Europe the results were not too favorable, with investors expecting significant political support given the pronounced dependence of EU countries on Russian oil and gas. In short, the speed of the transition to a low-carbon economy

appears to be distinct between the US and Europe. *These aspects constitute the foundations for establishing objective 2 of the paper.*

Prices are increasing due to several influencing factors, including the COVID-19 pandemic, which accelerated the demand for resources after the resumption of activity, but also the Russian-Ukrainian conflict, which depends on the import of oil and natural gas. The transition from conventional to renewable sources cannot be achieved suddenly. In addition to investment in technology, adaptation is needed, both of which take time. According to the latest studies, the main element in the transition to green energy is acceptance and support from end consumers. *In the major industrialized countries of the West, renewables have, regardless of this expansion, a high degree of acceptance with approval ratings well above 80% in most cases* (AEE_RK29_Internationale_ Akzeptanzumfragen_EN, 2016). O. Bayulgen and S. Benegal (2019) used a survey to test the influence of economic frameworks on individuals' perception of E-SRE. The final consumer is strongly influenced by the negative economic aspects and less by the positive ones of this transition, which is why economic managers are directly responsible for informing the population.

A significant part of the specialized literature highlights the lack of consumer information regarding the technologies that can be used in the use of SRE. For example, the use of the questionnaire method and the econometric analysis of the answers show that the level of knowledge possessed by the respondents reaches a neutral level of notoriety of technologies for the use of renewable resources among the researched population (Constantin et al., 2019). For a more in-depth analysis of the requirements of the final consumers of S-REG, we will next carry out a meta-analysis of the literature, in order to outline the anatomy of the energy industry and the grievances of the final consumers in the last 3 years, more precisely with the onset of the health crisis, followed by the energy crisis and politics. Thus, in table no. 1 a relevant part of the studies that had a significant impact on our research and contributed to the conceptualization of the econometric model are presented.

Table 1. Meta-analysis – end consumers and E-SRE

Author (year)	The main goal	Results	Impact
Constantin et al et. al. (2019)	The aim of the paper is to identify and analyze the perception of Romanians regarding the increase in energy efficiency in households and the desire to use energy based on SRE.	The results of the research show that Romanians have invested in increasing energy efficiency in households, the main improvements being energy savings through the purchase of economical electrical appliances or the thermal insulation of the home.	A high importance given to economic factors aimed at purchasing systems based on E-SRE and a lower importance to environmental protection considerations.

Author (year)	The main goal	Results	Impact
Seetharaman (2019)	The objective of the research is to identify the impact of social, economic, technological and regulatory barriers in the implementation of E-SRE. The data was collected through an online questionnaire answered by 223 professionals working in the energy sector around the globe.	This research shows that social, technological and regulatory barriers have a strong influence on E-SRE implementation, while economic barriers indirectly influence it significantly.	High impact due to the identification of barriers that hinder the research and development of technologies and increase the profitability of E-SRE.
Laura Rimšaitė (2019)	The purpose of the article is to analyze and evaluate the factors that determine the actions of corruption in the energy sector and to reveal the relationships between competition law and regulation of corruption.	The results focus on sector-specific corruption, such as resource location, politics and public procurement.	The increased impact of energy resources on everyday life and monopolistic businesses resulting in high prices for consumers.
Renata Marks-Bielska et. al. (2020)	The objectives of the research were to determine the importance of renewable energy (RES) in the energy mix of Poland and to obtain the opinion and level of knowledge of the society regarding the use and development of non-conventional energy based on a questionnaire.	The research concluded that respondents approve of the development of SRE in Poland. At the same time, they argue that the purchase and installation of devices for the production of non-conventional energy are too expensive. Respondents encourage the provision of subsidies in SRE investments and the granting of greater tax breaks related to these investments.	High impact due to the importance of SRE exploitation and investments in renewable technology.

Author (year)	The main goal	Results	Impact
Janusz Adamczyk and Magdalena Graczyk (2020)	The purpose of the article was to analyze the support system for the development of RES energy production using the so-called mechanism of "green" certificates of origin, which in Poland already has a tradition of 14 years.	The results highlight the mismanagement of the CV system, particularly in government and legislative institutions. The feedback was examined with a long delay, which contributed to the decrease in the interest of entrepreneurs to invest in SRE and even led to their bankruptcy.	The impact is high due to the correlation between the CV support scheme and investments in E-SRE.
Nicolae Marinescu (2020)	The aim of the paper was to highlight the evolution of the E-SRE policy in Romania, to investigate the incentives and their effects and to critically evaluate the impact of the changes on the E-SRE producers, through an exploratory study and several interviews with company directors by E-SRE.	The main finding was that the revision of the subsidy scheme and the changes in energy policy that followed are the major determinants of the declining financial performance of E-SRE producers.	High impact to improve policy making in these challenging times faced by manufacturers in the E-SRE market.
Deng M et al. (2022)	The main aim of the paper is to analyze the influence of renewable energy and economic growth from the two dimensions of natural resources and the institutional environment, resource dependence and anti-corruption regulations being the main variables.	The research results show that for all sampled countries, in the model of resource dependence and anti-corruption regulation, there is a positive relationship between renewable energy and the economy.	High impact through the established correlation between energy efficiency and the institutional environment for the energy transition.

Source: processing authors

Following the analysis of the studies presented in the table above, we note the results of the mentioned authors regarding the final consumer's perspective on the transition from conventional to renewable energy sources. Some authors direct their attention to the lack of legislative regulations that do not encourage entrepreneurs and the obstacles posed by taxation and corruption (Deng et al., 2022, Rimšaitė, 2019). Moreover, due to the pressures brought by the Russian-Ukrainian conflict, the need for energy independence is increasingly sought by the countries that had Russian imports as support. Authors such as Vainio et al. (2019)

analyzed socio-economic aspects in order to project the image of Finnish citizens about the transition to sustainable energy. Analyzing the final Romanian consumers, identifying and analyzing the opinions regarding the increase in energy efficiency, their lack of information is highlighted not only from the point of view of the economic environment, but also of the academic one. For example, there are Romanian authors who propose the launch of information and promotion campaigns to contribute to awareness of the role of energy based on renewable resources for sustainable development (Constantin et al., 2019).

3. Research methodology

This section of the paper describes the research methods used to build the energy end-user profile and opinions on renewable energy (E-SRE) and to analyze the influencing factors on E-SRE investments. Our research is quantitative, based on the questionnaire method; the structure of the questionnaire, the number of respondents, the criteria for inclusion and exclusion of answers can be viewed in table no. 2.

Table 2. Research strategy

Database: Questionnaire on green certificates and their involvement in the current energy crisis		
Type of research: quantitative, based on the questionnaire method		
Structure of the questionnaire: 20 multiple-choice questions and 2 matrix-type questions		
Inclusion criteria;	**Individual: energy subscribers**	**legal entities: energy subscribers**
Exclusion criteria	incomplete answers	incomplete answers
Results		
No exclusion criteria	107	31
With exclusion criteria	0	0
Data processing date	03.05.2022	
Processing the results	SPSS 25 application	
Questionnaire access link: https://forms.gle/u3v3NCYoXRL2YMnu6		

Source: processing authors

The data collected following the application of the questionnaire are interpreted and analyzed in the next section of the paper.

3.1 Results and discussions

The opinion of final consumers, natural persons, regarding the energy transition (OCFPFT)

For the OCFPFT analysis, the way of grouping the questions in the questionnaire can be seen in table no. 3:

Table 3. Grouping dependent and independent variables

V - Consumer Opinion on the Energy Transition (OCFPFT)	V6 - Education level (I12)
V1 – Age (I7)	V7 – CV payment obligation (I16)
V2 – Gender (I8)	V8 – Investments and production of E-SRE (I18.4, I.18.5, I.18.6, I.18.7, I.18.9, I.18.12)
V3 – Environment of origin (I9)	V9 – CV input (I.18.10, I.18.11)
V4 – Occupation (I10)	V10 – The parties involved in the energy production and distribution process (I.19.1, I.19.2, I.19.3, I.19.4)
V5 – Monthly income (I11)	V11 – Crisis Resolution (I22)

Source: processing authors

We aim to find a model that can help us design the profile of the final consumer of electricity, a natural person. We can see below, the correlation calculated in SPSS, between the dependent variable OCFPFT and the independent variables:

Table 4. Model summary

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.566[a]	0.320	0.241	0.31906	2.178

a. Predictors: (Constant), V11, V5, V7, V1, V2, V6, V3, V9, V4, V10, V8

b. Dependent Variable: V

Source: processing authors with SPSS 25

According to table no. 4, we find that between the dependent variable OCFPFT and the independent variables V1-V11 there is an average correlation with a link of 0.566. Analyzing the determination ratio, we note that the variation of the variables independently influences the variation of the OCFPFT variable by 32%.

Table 5. Coefficients

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.022	0.268		7.557	0.000
	V1	0.003	0.040	0.008	0.087	0.931
	V2	0.234	0.075	0.282	3.125	0.002
	V3	0.090	0.069	0.124	1.314	0.192

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
V4	-0.053	0.028	-0.181	-1.928	0.057
V5	0.051	0.036	0.131	1.405	0.163
V6	-0.105	0.026	-0.364	-3.987	0.000
V7	0.091	0.066	0.124	1.378	0.171
V8	0.032	0.065	0.081	0.490	0.625
V9	-0.023	0.056	-0.066	-0.413	0.681
V10	-0.009	0.044	-0.021	-0.197	0.844
V11	0.036	0.031	0.110	1.152	0.252

a. Dependent Variable: V

Source: processing authors with SPSS 25

According to table no. 4, the estimated equation of the multiple linear regression model can be determined for the analyzed data:

$$V= 2{,}022 + 0{,}003 \cdot V1 + 0{,}234 \cdot V2 + 0{,}090 \cdot V3 - 0{,}053 \cdot V4 + 0{,}051 \cdot V5 - 0{,}105 \cdot V6 + + 0{,}091 \cdot V7 + 0{,}032 \cdot V8 - 0{,}023 \cdot V9 - 0{,}009 \cdot V10 + 0{,}036 \cdot V11 \quad \textbf{(1)}$$

According to the ANOVA table, the econometric model is validated with a probability of 95%, because the value of Sig. is lower compared to the significance threshold of 0.05. According to table no. 4, the education level variable has the greatest influence on the OCFPFT. Most of the respondents are people with secondary education, which indicates that they are not receptive to the transition to E-SRE, the lack of information and ignorance of the benefits being the main causes. A low level of education will negatively influence the perception of the final individual consumer towards OCFPFT. There is a strong association between respondents' gender and OCFPFT. The results of our research showed that women are more open to accepting change, interested in a sustainable future and an ecological environment, a result contrary to that obtained by Vainio el al. (2019).

The discrepancy between the results of the two researches is due to the fluctuation between the number of female and male respondents. Significant influences on the dependent variable OCFPF are also observed from the Occupation variable. Based on the answers obtained, we deduce that the occupation and the level of education influence the OCFPFT in the same way. More than 70% of the respondents are employees, with incomes between 2300 - 3400 lei. The increase in respondents' income positively influences this transition because individual consumers have the opportunity to invest in the technology necessary to capture E-SRE or even become prosumers (producers and consumers of E-SRE at the same time), proposing ideas and supporting the investment environment.

Although they are dissatisfied with the obligation to pay CV, end consumers pay these titles monthly in the electricity bill. Through this tax, the state supports E-SRE producers, thus contributing to the transition to green energy and financing E-SRE producers. In the case of the respondents' environment of origin, rural or urban, the frequency of answers is identical and positively influences their opinion. Analyzing the answers obtained on the basis of the questionnaire, in order to solve the current energy crisis directly influenced by the pandemic and the geo-political crisis, the main ideas that motivate the respondents to support the transition are the investments of the Romanian State in hydropower plants, own thermal power plants and other sources, but also the use of sources renewable energy to reduce energy dependence. E-SRE investment and production have a weak influence on OCFPFT.

At the same time, the majority of respondents attach importance to investments in E-SRE, considering the existence of legislation to support the producers of this type of energy to be essential. The end consumers of energy, individuals, are interested in this transition, the only impediment associated with this change being the costs, which is why the respondents encourage those investments that come from potential investors, especially foreign ones. The negative influence of the parties involved in the energy production and distribution process can be explained by the negative image created by public institutions and the energy economic environment.

The natural persons surveyed consider the Government of Romania represented by the Ministry of Energy to be the main culprit of the current energy crisis, and with the increase in energy prices, followed by the non-involvement of the state, they have lost their trust in public institutions, thus considering that they will not get involved considerably in finding solutions to overcome the crisis. Age is the variable that influences the least OCFPFT, in a positive sense. The vast majority of respondents are young people aged between 18 and 34. If these variable increases, the acceptance of energy transition and sustainable development needs changes in the same direction. The change is not significant, which shows a relatively low interest of respondents towards E-SRE. Analyzing the profile of the final individual consumer of electricity, we can conclude that OCFPFT is influenced by the lack of consumer information and mistrust of state institutions as well as the energy economic environment. By knowing the profile and grievances of consumers, policy makers have a starting point in finding solutions to overcome the energy crisis.

The opinion of final consumers, legal entities, regarding the energy transition (OCFPJT)

For the OCFPJT analysis, the way of grouping the questions in the questionnaire can be seen in table no. 6:

Table 6. Grouping dependent and independent variables

V - the opinion of final consumers, natural persons, regarding the energy transition (PCFPJT)	
V1 – Position held in the company (I3)	V6 – CV payment obligation (I16)
V2 – Total active (I4)	V7 – Investments and production of E-SRE (I18.4, I.18.5, I.18.6, I.18.7, I.18.9, I.18.12)
V3 – Turnover (I5)	V8 – CV input (I.18.10, I.18.11)
V4 – Number of employees (I6)	V9 – The parties involved in the energy production and distribution process (I.19.1, I.19.2, I.19.3, I.19.4)
V5 – Debt ratio (I7)	V10 – Crisis Resolution (I22)

Source: processing authors

Thus, we set out to identify a model that could help us design the profile of the final consumer of electricity, a legal entity. We can see below, the correlation calculated in SPSS, between the dependent variable OCFPJT and the independent variables:

Table 7. Model summary

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.504[a]	.254	-.119	.25224	2.417

a. Predictors: (Constant), V11, V7, V1, V9, V3, V5, V10, V2, V4, V8

b. Dependent Variable: V

Source: processing authors with SPSS 25

According to table no. 5, we find that between the dependent variable the opinion of final consumers legal entities regarding the energy transition and the independent variables V1-V11 there is an average correlation with a link of 0.504. Analyzing the determination ratio, we note that the variation of the variables independently influences the variation of the OCFPJT variable by 25.4%.

Table 8. Coefficients

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.735	.446		6.137	.000
	V1	-.004	.064	-.015	-.067	.947
	V2	.010	.101	.045	.099	.922
	V3	.110	.096	.390	1.145	.266
	V4	-.102	.096	-.486	-1.063	.300
	V5	-.022	.188	-.028	-.118	.907
	V6	-.040	.108	-.080	-.372	.714

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	V7	-.110	.127	-.479	-.865	.397
	V8	.109	.121	.524	.900	.379
	V9	.049	.062	.221	.794	.437
	V10	-.036	.038	-.203	-.961	.348

a. Dependent Variable: V

Source: processing authors

$$V= 2,735 - 0,004 \cdot V1 + 0,010 \cdot V2 + 0,110 \cdot V3 - 0,102 \cdot V4 - 0,022 \cdot V5 - 0,040 \cdot \cdot V6 -0,110 \cdot V7 + 0,109 \cdot V8 + 0,049 \cdot V9 - 0,036 \cdot V10 \quad \textbf{(2)}$$

According to the ANOVA table, the value of Sig. is higher compared to the significance threshold of 0.05, which is why the model created cannot explain the correlation between the variables, it being unvalidated. Most of the respondents hold the management position in micro-entities with a debt level below 60%. They are interested in the transition to E-SRE and affected by the current energy crisis we are facing. The main impediment in the validation of the model was the small number of respondents, to which is also added the non-separation of them by fields of activity.

4. Conclusions

After processing the questionnaire in the SPSS 25 application, I demonstrated that there is an average connection between the answers to the questions that make up the questionnaire and the perception of the OCFPFT. The most significant influence on OCFPFT is the level of education. As this level increases, individuals are more informed and aware of the importance of this transition. In the case of OCFPJT, the model cannot explain the correlation between the variables, the model being unvalidated.

The paper presents a series of implications, the most relevant being the significant OCFPFT link and the independent variables that make up the model. Consumers are directly affected by the increase in electricity prices, and state interventions or increased E-SRE production would reduce the burden of paying bills. Thus, the more the consumer is prone to the transition to E-SRE, the more state institutions and investors will accelerate investments in this type of investment.

Based on the answers received from the people surveyed and their processing, the perception of E-SRE was made known, an additional reason for political decision-makers not to ignore the grievances of consumers, otherwise they will have to assume the negative consequences.

Regarding the limits of the research, we mention that the main impediment was the number of respondents, the preponderance of respondents from the rural

environment compared to the urban environment, which makes us believe that their receptivity is directly related to the economic impact, the grouping of the respondents' legal entities by fields of activity. As future research directions, we believe that conducting a study based on testing the opinion of E-SRE producers regarding the implications of the state in IER, offers the possibility to identify in a much more objective manner the main obstacles in energy production, exclusively from E- SRE.

References

1. Adamczyk, J., & Graczyk, M. (2020). Green certificates as an instrument to support renewable energy in Poland—strengths and weaknesses. *Environmental Science and Pollution Research, 27*(6), 6577-6588.
2. Bayulgen, O., & Benegal, S. (2019). Green Priorities: How economic frames affect perceptions of renewable energy in the United States. *Energy Research & Social Science, 47,* 28-36.
3. Câmpeanu, V. (2007). *Energia şi dezvoltarea durabilă a României.* Retrieved May 3, 2022, from http://www.ince.ro/Publicatii/Tezaur/IEM-2007-site.pdf#page=22.
4. Colgan, J. D. (2013). *Petro-aggression: When oil causes war.* Cambridge University Press.
5. Constantin, C. P., Chitu, I. B., Gradinaru, E., Dovleac, L., & Bratucu, G. (2019). Approaching the Bioeconomy in Terms of Increasing the Energy Efficiency of Households in Romania. *The AMFITEATRU ECONOMIC journal, 21*(50), 1-90.
6. Deng, M., Leippold, M., Wagner, A. F., & Wang, Q. (2022). The Russia-Ukraine War and Climate Policy Expectations: Evidence from the Stock Market. *Swiss Finance Institute Research Paper,* (22-29).
7. Marinescu, N. (2020). Changes in renewable energy policy and their implications: The case of Romanian producers. *Energies, 13*(24), 6493.
8. Marks-Bielska, R., Bielski, S., Pik, K., & Kurowska, K. (2020). The importance of renewable energy sources in Poland's energy mix. *Energies, 13*(18), 4624.
9. Morina, F., Ergün, U., & Hysa, E. (2021). Understanding Drivers of Renewable Energy Firm's Performance. *Environmental Research, Engineering and Management, 77*(3), 32-49.
10. Rimšaitė, L. (2019). Corruption risk mitigation in energy sector: Issues and challenges. *Energy Policy, 125,* 260-266.
11. Seetharaman, Moorthy, K., Patwa, N., & Gupta, Y. (2019). Breaking barriers in deployment of renewable energy. *Heliyon, 5*(1), e01166.
12. Vainio, A., Varho, V., Tapio, P., Pulkka, A., & Paloniemi, R. (2019).
13. Citizens' images of a sustainable energy transition. *Energy, 183,* 606-616.
14. AEE_RK29_Internationale_Akzeptanzumfragen_EN. (2016). In *WindIndustrie in Deutschland.* Retrieved May 14, 2022, from https://www.windindustrie-in-deutschland.de/publications/aee_rk29_internationale_akzeptanzumfragen_en
15. Criza energetică. Întrebarea prioritară cu solicitare de răspuns scris P-004363/2021. In Parlamentul European. Retrieved March 8, 2022, from https://www.europarl. europa.eu/doceo/document/P-9-2021-004363_RO.html;
16. Întrebări și răspunsuri privind REPowerEU: Acțiune comună la nivel european pentru o energie mai accesibilă din punctul de vedere al prețurilor, mai sigură și mai durabilă. In Comisia Europeană. Retrieved March 8, 2022, from https://ec.europa.eu/ commission/presscorner/detail/ro/qanda_22_1512;