

Conceptualization of economic security in the context of energy markets' integration

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Abstract

The research includes an analysis of the evolution of fundamental scientific theories regarding security. Based on the systematization of modern definitions the author suggests applying the institutional-transformational approach in order to comprehend the term “economic security of energy market”. The author emphasizes the influence of the theory of risk, the theory of conflict and theory of socio-economic catastrophes on the economic security of energy market. The author studies global trends in the development of the energy sector and determines the positions of Ukraine based on the indicators of the rating “Energy Trilemma Index” In the paper, the conceptual principles of economic security of energy markets, which take into account peculiarities of integration processes, “acquis communautaire”, and stakeholders' interests, are presented. It gives the possibility to consider both economic and social-political factors of the market environment when establishing market priorities of every hierarchical level in a purpose of sustainable development achievement.

Keywords: theories of security, integration, energy market, economic security

Introduction

Intensification of integration processes is connected, first of all, with the necessity to eliminate disproportions and shortcomings of energy supply on the national energy markets. Therefore, uneven allocation of world energy resources encourages the development of energy diplomacy focused on ensuring economic security.

Solving the issue is closely related to the interaction between a fundamental theory, practical challenges and opportunities. Hence, within the integration process, it is important to consider conceptual principles of economic security when establishing priorities of energy markets on each hierarchical level which are based on the idea of reconciliation of stakeholders' economic interests.

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The aim of the present paper is to define the priorities of energy markets on different hierarchical levels and place them into the framework of economic security, which itself is interwoven with fundamental economic theories and integration imperatives.

To reach the aim of this research requires the fulfilment of the following tasks:

- to examine the evolution of fundamental scientific approaches to the comprehension of security;
- to define the term “economic security of energy markets”;
- to investigate the transformation of security theories into energy markets priorities in the context of their integration.

Indeed, a considerable amount of scientific papers on the framework of the above-mentioned topic makes the present research necessary. Such research encompasses, *inter alia*, Collins (2010), who has examined genesis of the views on security, as well as Yergin (2006), and Chester (2010), who have investigated theoretical principles of ensuring energy security as a fundamental component of economic security. Another example is Dedenkulov’s (2013) paper that is dedicated to the analysis of influence of energy factors on international relations. On a further note, the aspects of structural energy diplomacy were defined by Zhiznin (2007). Additionally, Fray (2006) analyzed the priorities of needs in energy policy that need to be satisfied. Last but not least, the papers of Dolishnii and Petranko (2009) and Zlunitsyna and Zhurlov (2012) outlined the integration of Ukrainian and European energy markets.

Yet, despite the numerous scientific papers, there still is a need to concretize the influence of security theories on the integration process of energy markets as the fundamental principles of modern imperatives.

The methodological basis of this research encompasses the use of the historical and evolutionary, dialectical, systemic and functional approaches. This is done so to intensify the dogmatic of the researched topic as well as to define the term “economic security”. During the course of the present research paper, the author will identify the level of energy security, as well as the level of its risks in national economies by using economic and statistical methods. Further, the author will present inductions, visual and graphical, grouping and generalization methods when investigating the peculiarities of security theories transformation in the context of energy markets integration.

1. The Evolution of Economic Security Theories

When dealing with the problems of energy supply of in some countries in the context of global economic integration, a coordination of efforts of the whole world community is required. Any failure in its operation inevitably leads to economic losses of functionally interdependent national

economies. According to F. Myuller “the issue of reliable energy resources supply is becoming more significant under consideration of the world community; a lot, if not most, of modern countries, relate the prospects of their physical survival to this problem” (Myuller, 2003, p. 6).

At the same time, the scholars such as V. Guseynov and A. Goncharenko point out that “constantly increasing the importance of energy resources in the world politics causes a new aggravation of hidden and open confrontation between leading countries for gaining control over them” (Guseynov, 2008, p. 55). In the opinion of V. Ogneva and A. Sidorov (2015, p. 85), a new type of relations is both the growing vulnerability of participants in the international system from each other's actions (so-called “negative interdependence”) and stronger dependence of achieving goals by one side from considering the interests of other (so-called “positive interdependence”). These statements indicate the contradictory nature of energy markets, as the latter can be both a tool of cooperation and a tool of competition that quite often turns into energy confrontation.

It should be noted that electricity market substantially differs from other markets because of its complicated technologically unified electric power system (EPS) that has the following inherent features (Belyaev and Podkovalnikov, 2004, pp. 16-20):

1. Continuity of electric power production and consumption. This means the necessity to maintain a constant balance of EPS capacity due to the impossibility to store (accumulate) electric power on a large scale;
2. Parallel (simultaneous) operation of the whole EPS and the use of special energy transportation (electric power transmission lines), that provide for the participation in electricity markets only for the current power stations and consumers directly connected to EPS;
3. Long terms of shortage elimination on the electricity market. This feature requires taking special measures (by the government) to prevent deficiency, in particular maintaining centralized system of long-term planning of EPS development.

Considering peculiarities of EPS, the author suggests to treat the energy market as a system of relations, territorially and functionally restricted by electric power system, that appear in case of buying and selling of electric power and/or additional services, as well as transmission, distribution and supply of electric power to consumers on the principles of continuity, safety, affordability and reconciliation of economic interests of its participants.

According to the territories covered by EPS there are so-called local (LEM) (limited to some territory (settlement, district) or a segment of consumers within some certain country), national (NEM) (a set of LEMs within a country) and regional energy markets (energy space of two or more countries with common geographical area and interests in energy sector for implementing transborder

agreements). Thus, an important task is to ensure the economic security of every single member of a certain electricity market by reconciling economic interests in the context of sustainable development.

The author considers it reasonable to analyze the problems of economic security of energy markets using scientific approaches to the comprehension of security. Against this background, according to the classical theory of political realism, economic security of NEM is to be considered within the context of a struggle for providing a reliable energy sources supply. Because energy resources are strategic and assure economic security of every country, the latter have to struggle for them.

In the opinion of A. M. Schlesinger “ever since the industrial Revolution, energy and the need to secure its supply have been fundamental to any position of power in the world” (Schlesinger, 2005, p. 13). Thus, according to the representatives of political realism, security is treated as an access to energy sources, that is necessary for developing a national authority, or in other words, it is the centre of geopolitical confrontation.

Unlike the theory of realism, representatives of liberal approach point out the prospects of developing international relations. The latter ones mean peace and cooperation in energy sector. It can be achieved by establishing certain rules, generally recognized order based on universal values and interests.

Liberals point out that for separate countries it is impossible to gain energy independence, and emphasize the need to conclude multilateral agreements and endorse initiatives, which in their opinion is the only way to ensure security.

Hence, whereas according to classical scientific approaches to the comprehension of security essence, it is possible to use force to gain and maintain access to energy resources following the principles of theory of political realism, it also remains possible to cooperate – thereby using the main component of political liberalism, which gives the global economic security its purpose.

As of the 20th century changes in security threats led to a criticism of traditional approaches, particularly in the context of post-modernism. Universities in Wales, Copenhagen and Paris became the cornerstones of critical (non-traditional) security studies, each of which pushed for its own approach to conceptualize security.

The Wales approach, hence, developed the so-called an “emancipatory theory”. Its advocates a universal security system that is focused on an individual but neither a state nor nations. As K. Booth (2007) noted, it is not always a state protects freedom and life of its citizens. Simultaneously, attention is given to not just physical survival of people but their deliverance from everything that prevents from shaping destiny, including environmental problems.

Among the achievements of the Copenhagen University, the securitization theory introduced by B. Buzan (1998) is the most significant. According to latter, being approved by the society, an agent (a spokesman of a state who has enough authority in the society) transforms a certain factor into a threat, legitimizing the breaking of rules.

The insecuritisation theory, introduced by theorists of the Paris University, contains the ideas of blurring boundaries between internal and external security considering the latter as a complex of traditional threats to a state.

The systematization of “economic security” definitions that are present in modern economics (see Annex 1), enables to distil a range of approaches to it, namely: protective, condition-oriented, resource and potential, competitive, process-based, harmonized.

When examining these scientific approaches, it should be emphasized that the definition of an object of economic security still remains ambiguous. This term is treated in the context of either a certain enterprise or national economy (of a state) in general. However, taking into account a subjective-functional structure of the energy market, which has been analyzed before (Bihun, Shmatenko, 2017), the level of its economic security depends on not only functioning of business unities (energy generating, supplier and distributor) but also activities of such members as investors, consumers and regulatory bodies. Due to market integration processes, the latter ones act according to domestic legislation and also consider requirements of international energy laws.

Therefore, a lack of scientific studies on economic security of the energy market in the context of integration reflects the urgent need for theoretical and methodological works in this area.

Considering the structure of the energy market, the author notes that using any of presented theoretical approaches does not enable to show the whole specificity of the market, which is being investigated, except technological peculiarities of functioning, as there are also:

- an institutional structure of the market including a system of interrelated elements – institutions which are regulated by the rules of market functioning. These rules are taken from national and international acts, provisions and laws;
- dialectical interdependence between the members of the energy market. Being on opposing sides in economic relations, energy producers and consumers nevertheless share common interests about the market. If a producer cannot satisfy its consumers' needs, it cannot satisfy its own ones. Interdependence between these groups objectively determines their cooperation;
- the transformation of the electricity market model which means its organizational restructuring due to the integration into REM;
- ecocentric behavior of market members that means recognition of the primary importance of preserving nature for current and future generations. The value of nature requires collective

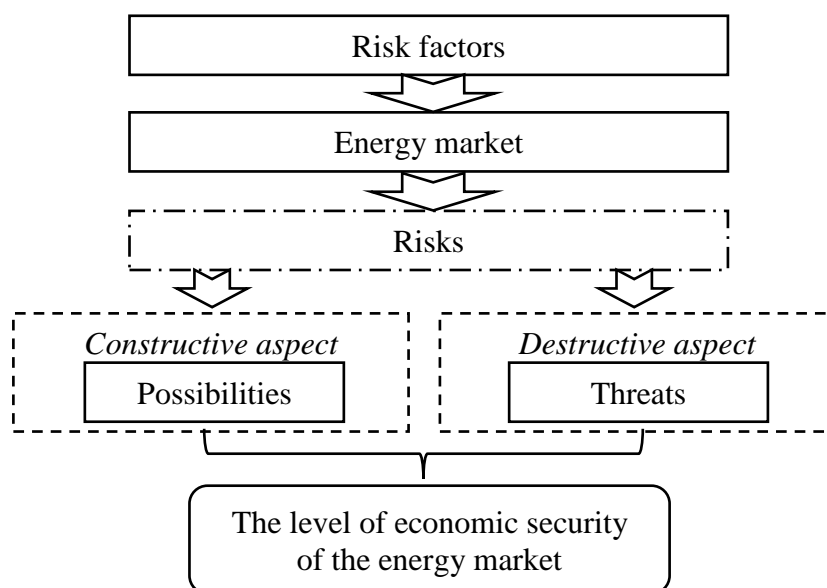
actions to ensuring sustainable development of society. Within the framework of energy markets, it means measures on improving energy efficiency, as well as implementing low-carbon technologies etc.

Hence, based on the above-mentioned market features, the author suggests to apply the institutional-transformational approach in order to define the term “economic security of energy market”. Thus, the author treats economic security of energy market as a set of conditions of energy market functioning, in particular caused by transformational processes, which protect all stakeholders from real and potential threats, as well as provide for the realization of their dialectically related economic interests based on sustainable development principles.

According to this definition, economic security of energy markets depends considerably on comprehending the basic principles of accompanying scientific theories such as theory of risk, theory of conflict and theory of social and economic catastrophes.

Undoubtedly, the development of conceptual principles of economic security is inevitably related to the category of risk. If we adhere to the position that risk, on the one hand, is a cause of threat (destructive aspect) and possibility raise the level of economic security (constructive aspect) on the other (see Figure 1), then the risk of economic security of energy market will be considered as deliberate actions of regulatory bodies in energy sector, focused on positive results of energy market functioning with alternative choices, that provides for possible adverse consequences.

Figure 1. Influence of risks on the level of economic security of the energy market



Source: Developed by the author based on Romanov, Butuhanov (2001), Rudashevskiy (1990), Yaresko (2014)

The International Index of Energy Security Risk, introduced by the US Chamber of Commerce in 2016 (Global Energy Institute, 2016), enables to compare energy security risks of 25 most energy-consuming countries of the world (including Ukraine). According to the methodology of this index, the higher the scores, the more risks are on the market of a country.

In general, countries have demonstrated a tendency of keeping their positions in this rating or have taken active measures on their improvement. Ukraine, in this context, kept within 1995-2014 the poorest 25th position, making it being perceived as a country with the lowest level of energy security among the biggest countries that consume energy resources. In 2014 the level of energy security risks of Ukraine (1944) was higher than the one of the leading country Norway (733), exceeding it by 265.2%.

Thus, the identification, analysis and evaluation of risks are getting more significant in the process of ensuring economic security of energy markets.

However, in accordance with the theory of conflicts, recurrent decline in economic security of energy markets is also a result of dynamic economic processes, namely the emergence of different conflict situations.

As the key world hydrocarbon resources are the assets of national state-owned companies, and processing facilities, distribution of hydrocarbon – of transnational corporations, then the actions of REM members are often motivated not by market interests but by own ones. A renown American scientist A. N. Chomsky (2007) believes that emergence of new consumers and producers of energy resources can lead to a conflict over the access to limited natural resources. Therefore, an important task for the entities of energy markets in the context of integration is to solve conflict situation by harmonizing interests.

2. Energy Trilemma and global trends in the development of the energy sector

However, the representatives of the theory of socio-economic catastrophes point out that even slight changes in the environment can radically alter the development of such an economic agent. That is why it is an important task for energy markets to prevent a potential bifurcation (especially an ecological one) and to devise mechanisms of avoiding irreversible changes. For instance, climate changes were the cause for the UN to call for sustainable development and to encourage building of a decarbonized economy thereby transforming the current development model, the latter being known for high energy and resource consumption, into a model of economic growth with low-level carbon emission.

According to statistics of the “Global Energy Statistical Yearbook” (Enerdata, 2017), in the period between 2000 and 2016 the total global share of renewable energy sources increased on average by 1.6%/ p.a. At the same time, EU member countries reached 4.6% p.a. thereby becoming leaders. Within the same time period in Ukraine, this index amounted to -0.1% p.a.

Only within 2016 the energy intensity of global economy came down by 2.04%. This indicates that there is a general improvement of energy efficiency and structural changes in most countries.

Tendencies in energy sector are also reflected in the annual rating of energy markets sustainability of the countries “Energy Trilemma Index” (World Energy Council, 2017) which is based on three aspects – energy security, social equality in getting the access to energy resources and reduction of the injurious effect of the energy sector on the environment.

Based on the analysis of 125 countries, eight states such as Denmark, Sweden, Switzerland, Great Britain, France, Spain, Italy and Slovakia, became the leaders in 2017, receiving the highest “AAA” rank. It should be mentioned that in 2014 only two countries were absolute leaders – Switzerland and Sweden. Ukraine was placed 48th in the overall rating of the countries (ABD), having climbed 17 positions in comparison with the results of 2015 (see Table 1).

Table 1. Ranking of Ukraine according to the Energy Trilemma Index

Indicator	2015	2016	2017	Score
Energy security	28	28	11	A
Energy equity (accessibility and affordability)	60	61	63	B
Environmental sustainability	111	108	102	D
Energy Trilemma Index	65	63	48	ABD

Source: World Energy Council (2017)

In 2017 there was the considerable improvement of energy security of Ukraine (an improvement of 17 positions in comparison with 2016) which enabled to reach the 11th position in the world rating. Thus, together with a good indicator of availability of energy supply Ukraine got A and B ranks respectively. However, there still is the lowest indicator of environmental sustainability (102 position out of 125) as a result of carbon dioxide emission while producing electricity. It leads to unbalanced resilience profile of domestic energy sector (ABD). Therefore, there is a need to improve energy efficiency policy and to apply the potential of the renewable energy sector of the country.

The authors of the rating point out that developed countries have more opportunities to ensure a safe, affordable and emission-free energy sector and to balance the energy trilemma. The reason is a shift to renewable energy sources including hydro- and nuclear energy industries.

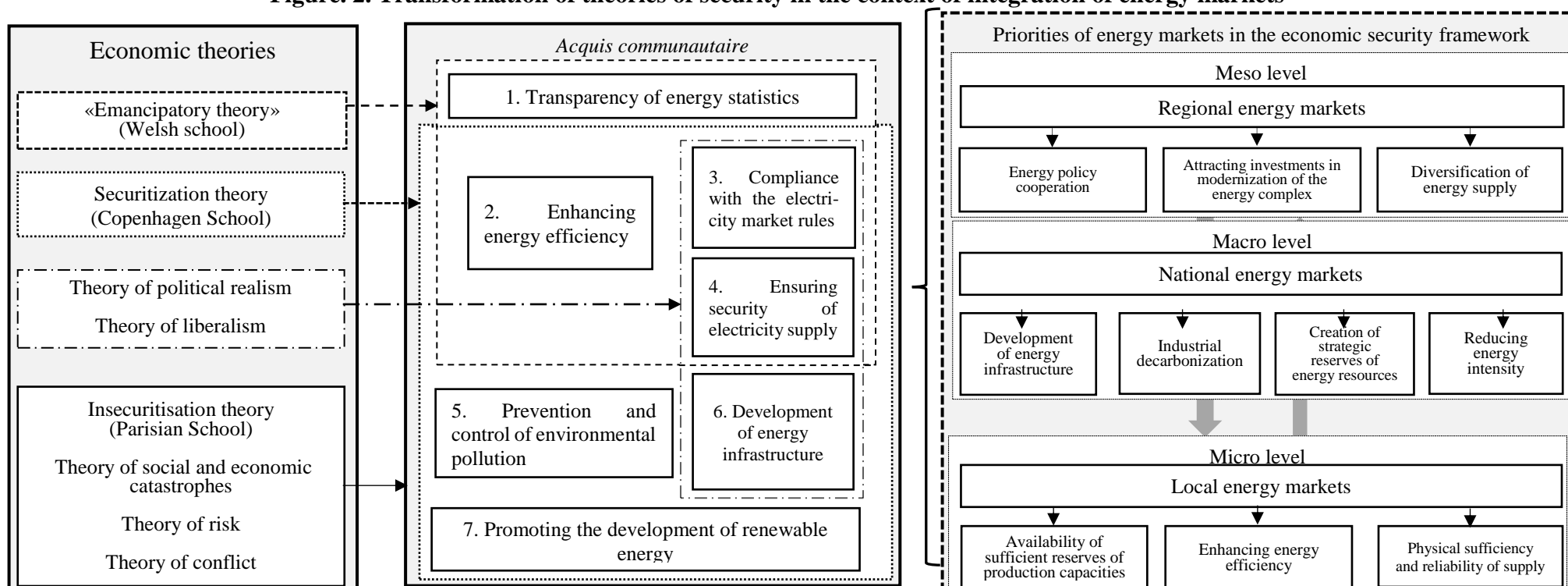
As O. Malikova (2012) states, for a fast formation of the decarbonized economy, it needs objective technological preconditions that are deeply interwoven with a decoupling effect (a gap between the speed of economic growth and the increase of impact on the environment) and a change of configuration and conditions of the market competition. Thus, the development vector of world NEM involves a considerable decrease of impact on the environment, in particular the possibility of changeover to an almost complete satisfaction of energy needs by using alternative energy sources.

3. Economic security in the context of energy markets integration

The controversial genesis of the studies on providing economic security has gradually led to a need for special legislation that would contain a complex of necessary imperatives, prohibitions and restrictions. At the same time, it is important to consider the industry specialization of the market. Normative regulation of any interaction between counterparties in the energy sector is complex and needs to consider three different, economic, social and political factors. In this case, it should be mentioned that there are two interconnected and at the same time mutually exclusive goals: (i) to achieve the economic indicators in the context of constant competition and (ii) the necessity to provide environmental protection.

For instance, the signatories of the Energy Community (2015) made commitments to adopt the key energy legislation of the EU, the so-called “*acquis communautaire*”. The latter involves the creation of a common legal framework on energy markets of the Community member states. This regulatory and legal framework of the EU contains subordinate acts that have been included in The Third Energy Package. It is based on a doctrine of sustainable development and is a set of ideas, concepts and regulations of different sciences, in particular theory of security and its accompanying theories (see Figure 2).

Figure. 2. Transformation of theories of security in the context of integration of energy markets



1. Directive 2008/92/EC of 22 October 2008 concerning a community procedure to improve the transparency of gas and electricity prices charged to industrial end-users; Regulation (EC) 1099/2008 of 22 October 2008 on energy statistics; Regulation (EU) 543/2013 of 14 June 2013 on submission and publication of data in electricity markets.
2. Directive 2012/27/EU of 25 October 2012 on energy efficiency.
3. Directive 2009/72/EC of 13 July 2009 concerning common rules for the internal market in electricity; Regulation (EC) 714/2009 of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity; Regulation (EU) 838/2010 of 23 September 2010 on laying down guidelines relating to the inter-transmission system operator compensation mechanism and a common regulatory approach to transmission charging.
4. Directive 2005/89/EC of 18 January 2006 concerning measures to safeguard security of electricity supply and infrastructure investment.
5. Directive 2011/92/EC of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment ; Directive 2001/80/EC of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants; Directive 2010/75/EC of 24 November 2010 on industrial emissions (integrated pollution prevention and control); Directive 2004/35/EC of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage; Directive 2001/42/EC of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment.
6. Regulation (EU) 347/2013 on guidelines for trans-European energy infrastructure.
7. Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources.

Source: Developed by the author based on Energy Community (2015)

As shown in Figure 2, the main energy legislation of the EU is based on the developments of fundamental theories, the analysis of which directly or indirectly places greater focus on ensuring security. That demonstrates their urgent need to be applied.

According to the Treaty of the Energy Community, which includes both the rules of fair competition and environmental protection, there is a need to have a coordinated vector of energy markets on different levels: local, national and regional. In Figure 2 there is a list of priorities in reflecting the peculiarities of the economic security hierarchy of energy markets. The structure of the latter has the following levels: micro level (LEM), macro level (NEM) and meso level (REM).

Dependence between the levels of economic security of energy markets is mutual: each local or national energy market is directly or indirectly affected by regional energy market and *vice versa*. The choice of certain mechanisms and tools of establishing priorities at each level is made according to the interests of interacting entities of NEM, as well as principles of ecological and economic concepts of sustainable development.

Conclusions

This paper aims at finding a scientific and practical solution to the development of conceptual provisions defining priorities of energy markets on different hierarchical levels in the framework of economic security based on the sustainable development concept. It allows the author to formulate the following theses:

1. Classical scientific approaches to the comprehension of security and the formation of systems of its ensuring at national and international levels are political realism and liberalism that were developed in the framework of traditional military and political approach focused on the interests of a state.

Fundamental changes in security conceptualization are presented in critical studies. The interdisciplinary approach is used to contrast the traditional one with three European schools. Except military security, it involves also environmental, economic, political and public security.

The need to analyze the economic security is also determined by the necessity to solve a range of problems that accompany the processes of growing diversity and complication of entrepreneurship activities. Among them, the necessity to understand the principles of the theory of risks, the theory of conflicts as well as the theory of socio-economic catastrophes plays a key role.

2. The conceptual framework of security theory is improved. Unlike the existing frameworks, it is supplemented with a term “economic security of energy market”. Based on institutional and transformational approach, it is treated as the conditions of energy market functioning, in particular,

caused by transformation processes, which ensures the protection of all stakeholders from real and potential threats. It also includes satisfaction of their dialectically related economic interests based on sustainable development principles. At the same time, its peculiarity is the formalization of a dynamic structure of conditions, which determine the system's movement. That enables to affect the processes in the system, which was analyzed.

3. Conceptual principles of economic security of energy markets are presented in the paper. Unlike the existing principles, these take into account peculiarities of integration processes, a set of legislative imperatives, restrictions and stakeholders' interests. It enables to consider both economic and social-political factors of market environment when establishing market priorities of every hierarchical level.

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Annex 1. Theoretical approaches to defining the term “economic security”

Approach	Author	An option of “economic security” definition	An object of economic security
Protective	Kovalev D. (1998)	A protection of enterprise activities against the negative influence of external environment and the ability to eliminate various threats or adapt to the present conditions, which do not have the negative impact on its activity.	Enterprise
	Ortynskiy V. (2009)	A protection of enterprise potential (manufacturing, managerial and engineering, financial and economic) against negative impact of external and internal factors, direct or indirect economic threats.	Enterprise
Condition-oriented	Zhyvko Z. (2012)	A condition, when an enterprise is provided with economic development and continuity of activities, is able to react in proper time, adequately and without losses to the changes of internal and external situations and negative influence of destabilizing factors.	Enterprise
	Abalkin L. (1994)	A set of conditions and factors which provide independence of national economy, its continuity and stability, an ability to get renewed and improved.	National economy
Resource and potential	Zhalilo Ya. (2004)	An ability of a national economy to reproduce itself on a large scale in order to satisfy needs of its population and state, resist destabilizing factors, which cause a threat to the development of a country.	National economy
	Arefieva O. (2001)	An efficient use of resources and present market opportunities that enables an enterprise to avoid internal and external threats ensures its lasting development on the market according to the mission.	Enterprise
Competitive	Kashin A. (2008)	Competitive advantages when material, financial, staff, technical and technological potential and organization structure of an enterprise fit its strategic goals and tasks.	Enterprise
	Vasylytsiv T. (2008)	An operation when an enterprise and its products are competitive on the market and at the same time it is provided with the most efficient use of resources, intellectual potential and human resources; possibility to resist negative influence of external and internal environment of its functioning.	Enterprise
Process-based	Cherniak H. (2017)	A continuous hierarchical process of deliberate organizational and managerial activities of an enterprise that involves identifying, preventing, resisting internal and external threats in order to provide effective functioning of an enterprise.	Enterprise
	Polovnev K. (2002)	A continuous process of supply of manufacturing enterprise that is in some external environment, with continuity of its functioning, financial balance and regular income and also possibility to achieve goals and tasks, its further development and improvement at the different stages of life cycle of an enterprise and within the changes of competitive market strategies.	Enterprise
Harmonized	Zaitseva I. (2011)	A level of harmonization in time and space between economic interests of enterprise's management and the interests of other business entities in the context of the situational approach to managing an enterprise.	Enterprise
	Kozachenko A. (2003)	A harmonization in time and space between economic interests of an enterprise and the interests of other entities of the external environment that operate outside the enterprise.	Enterprise