

ANALYSIS OF THE ENERGY SECURITY OF THE EUROPEAN UNION AND THE RELATED POLICY FRAMEWORK

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The European Union (EU) is the third largest energy market on the planet following China and USA, consuming more than 1.6 million tons of oil equivalent, this fact determining the community's strength. Nevertheless, this strength is valid only in the case when the market is consolidated, therefore, the strategic goal of the community is to avoid splitting the EU's market into individual member states considering both the economic and political aspects, the force of which is considerably more reduced. This paper aims to comprehensively analyze the energy market of the European Union and determine the key weaknesses which threaten the community's security in this area. At the same time, it is presupposed to identify the key initiatives through which the European Union aspires to consolidate the energy market's integrity in the conditions of growing international competition and changing geopolitical environment. To reach these specific goals, a subset of objectives which are expected to be achieved by applying both quantitative and qualitative research methodologies has been selected. The results reached show that the European Union's efforts are insufficient to consolidate the energy market and deepen the integration, nevertheless, the proposed plans are promising, offering the community a favorable perspective.

Keywords: Energy Union; energy security; diversification; renewables; imports dependence.

JEL Classification: F15, F50, N70, O38, Q40

1. Introduction

Energy security has always been Europe's "Achilles' heel". Presently, the energy challenge of Europe is growing since the worsening of geopolitical context especially in the European Union's (EU) Eastern neighborhood and in the Persian Gulf, raise in the global population, especially in developing countries, and increase in the pressures on human activities' sustainability due to climate change.

The European Union is the third largest energy market on the planet following China and USA, consuming more than 1.8 million tons of oil equivalent (Enerdata, 2017), with this fact determining the community's strength. Nevertheless, this strength is valid only in the case when the market is consolidated, therefore, the strategic goal of the community is to avoid splitting the EU's market into individual member states considering both the economic and political aspects, the force of which is considerably more reduced. In these conditions, it should be underlined that solidarity is a key component of the EU's energy security. Moreover, consolidation of the market should be based on competitive principles comprising the aspects of efficient cost-reflective prices, leadership in renewables and energy-efficient technologies, and overall diversification of supplies. Accordingly, a common Energy Policy for Europe is a critical necessity determining the capacities of the EU to resist external shocks and consolidate the efforts of individual member states to reach improved cooperation and efficiency. Despite the fact that the fundament of the EU was assured by the conclusion of European Coal and Steel Community in 1951 and European Atomic Energy Community in 1957, the European Union has weakly contributed to deepening the integration of the energy market in the years following. The stagnation of cooperation in this area marked the present weaknesses of the EU which have made the community vulnerable in the present changing global economic and political environments. Starting with mid-2000s, the EU has undertaken several actions to foster the cooperation of the member countries in the energy area and, consequently, deepen the integration, a strategic step in this regard was the *European Strategy for a Sustainable, Competitive and Secure Energy* adopted in 2006. By 2015, it was clear that the initiatives are not sufficient to ensure the security of EU's energy sector in the conditions of growing geopolitical tensions following the crisis in Ukraine and subsequent confrontation with Russia, thus, a whole package of comprehensive actions was planned to be implemented.

Accordingly, this paper aims to comprehensively analyze the energy market of the European Union and determine the key weaknesses which threaten the community's security in this area. At the same time, it is presupposed to identify the key initiatives through which the European Union aspires to consolidate the energy market's integrity in the conditions of growing international competition and changing geopolitical environment. To reach these specific goals, a subset of objectives has been selected including an analysis of the energy consumption by member countries as a share in the EU's energy balance, taking into account the average share of them for the period of 2006–2017. This fact will make possible to underline the dominant EU countries within the common energy market, as pivotal nations determining the future policymaking and interests in this area. Afterwards, it is expected to determine the energy dependency of the European Union, calculated as a share of the extra EU

imports in the consumption balance considering key energy products. Further, it is set to identify the relatively safe countries from the point of view of energy dependence, the percentage of net imports of which in gross inland consumption is less than 50% for 2017. Consequently, there will be highlighted the relatively vulnerable countries from the point of view of energy dependence, with percentage of net imports in gross inland consumption being more than 50% by 2017. At the same time there will be identified the main origin of crude oil imports as well as of the natural gas and solid fuel imports.

Simultaneously, it will be analyzed the consumption of primary energy in the European Union and compared to the production of primary energy. At the same time, it will be analyzed the renewable energy production in the European Union, a direction which has become strategic priority in the community and a prospective source which is capable to solve the present energy difficulties of the EU. Also, it will be analyzed the energy market of the European Union through considering a comprehensive policy framework overview and rationed on the role of infrastructure consolidation as a primary step towards import diversification of gas, petroleum, and electric energy and strengthening the opportunities which can be provided by the renewable capacities consolidation, highlighting also the potential associated threats.

Thus, it is expected to assess the extent of energy security in the European Union, determine the most prominent problems the community faces in this regard, as well as to identify and analyze the measures which are undertaken to foster the EU's energy strength in relation to both the internal vulnerabilities and permanently changing external environment. Overall, this research is expected to deepen the readers' understanding regarding the security of the European Union's energy market marking the necessity to foster the integration of the member countries under single umbrella to empower the capacities to efficiently protect the common interests by reinforcing the EU's influence as a unique energy consumer and not as a dispersed group of national markets.

2. Theoretical Background

Energy security is researched within several theoretical flows related to international relations and energy economics. Nevertheless, the coverage and assessment of these issues have rather contextual integration within a general framework rather than specific concentration on the energy security aspects. According to Belyi (2015), energy security is a strategic part of international relations since it is a fundamental direction determining countries' economic development perspectives. This author integrates the energy security within international relations theory by applying four approaches including the rationalist (focused on the analysis of the

structural unbalances between energy producing and consuming regions and the impact of competing interests), the institutionalist (attempting to analyze energy security from the perspectives of international economic institutions), new economics of energy (energy security determined by technology, deregulation, foreign investments, and interdependency in the sector), and, finally, the critical political economy (tending rather to counterbalance the assumptions of the rationalist approach). Metcalf (2014) puts energy security within the framework of energy economics mentioning the importance of the increasing energy efficiency, ensuring stability of the supplies, and strengthening the resistance capacities of households, businesses, and government in the front of energy shocks. Sweeney (2000) begins to theorize starting from two basic assumptions namely that “energy is neither created nor destroyed but can be converted among forms” and “energy comes from the physical environment and ultimately returns there”. Humans need to develop processes that will effectively convert energy to ensure the functionality of economic development Belostecinic *et al.* (2011). It should be made clear distinction between energy commodities (“gasoline, diesel fuel, natural gas, propane, coal, or electricity”) and resources (“crude oil, natural gas, coal, biomass, hydro, uranium, wind, sunlight, or geothermal deposits”), the last being used to harvest energy commodities.

Thus, energy economics is determined by several facts including energy transformation, demand for energy as a derived demand (determined by the use energy to obtain desired services and products), and demand substitution among energy commodities (products and services could be made by using different energy commodities); energy is an essential good, thus, its behavior is determined by optimal consumer choices, and energy is modeled by environmental and climate changes. Thus, energy security is tackled from the perspective of energy efficiency, as a ration between utility and cost. In this framework, it can be underlined that energy security is viewed only through the prism of economic mechanisms, the qualitative dimensions, i.e., geopolitical context, for instance, are weakly covered.

Considering this background, this research is set to cover three gaps in the existing literature regarding energy security at the level of the European Union. Firstly, it is set to comprehensively analyze the energy market of the European Union outlining the specific characteristics which will serve as pivots for identification of the positional weaknesses and vulnerabilities. Afterwards, this research aims to build a model of energy security in the European Union and on the basis of this model several recommendations will be offered so as to improve the existing situation.

3. Methodology

To better understand the concept of energy security of the European Union, a two-tier analysis of the EU’s energy market has been performed comprising both

quantitative and qualitative analyses as well as a comprehensive review of the literature existing in the field related to the EU's energy challenge and security. The research begins by undertaking an extensive review of the works published in the field aiming to provide the answer for three fundamental questions including which aspects of energy security are most decisive for the European Union, which indicators could be applied to characterize the EU's energy market and determine the potential weaknesses, and what qualitative aspects should be assessed to have a deeper perception of the present and potential future factors influencing energy market of the EU. Moreover, the qualitative analysis includes the assessment of the energy market of the European Union through the prism of policy framework overview. Also, there are examined the initiatives undertaken by the EU in the areas of gas, petroleum, electric energy, and renewables, directed towards consolidation of the infrastructure which is the primary step towards import diversification and enhanced energy security. Qualitative analysis is based on the assessment of key indicators characterizing the energy market of the European Union. First, it is examined the share of countries in the energy balance of the European Union, averaged for the period of 2007–2017. In this way, there are underlined the member countries with the highest influence in EU's energy market due to their sheer consumption power. Thus, it highlighted the main decision-making powers in the community which are capable to determine future policies' directions. Simultaneously, it is assessed the energy dependency of the European Union by highlighting the share of the extra EU imports by energy products in the final balance. Accordingly, it is possible to point the main products on which the European Union relies the most, hence making the community more dependent on the external environment. At the same time, there are underlined the relatively safe countries from the point of view of energy dependence, with the percentage of net imports in gross inland energy consumption being less than 50% by 2017. Furthermore, it is examined the relatively vulnerable countries from the point of view of energy dependence, with the percentage of net imports in gross inland consumption being more than 50% by 2017. In this way, it can be identified which nations are exposed to the energy risks linked to the external environment to a greater extent. Thus, it can be underlined the primary and secondary member countries which should be concerned about energy security, and therefore, it is offered an overview for the EU decision makers about the most vulnerable member countries in the energy security area; high exposure to the external environment of the EU individual countries weakens the overall energy efficiency of the single market. Afterwards, there are identified the main origins of crude oil, natural gas, and solid fuel imports, accordingly, it is supposed to underline the main sources on which the European Union relies the most and thus is dependent upon. In these conditions, a high level of concentration of imports upon few origin countries

marks large insecurity level in the circumstances of growing geopolitical tensions and interests' competition. Finally, it is compared the consumption and production of primary energy in the European Union, accordingly, it is possible to identify how feasible are the solutions proposed by the EU decision-making factors in satisfying the energy "hunger" of the single market. In these conditions, it is specifically assessed the potential of renewable energy production in the European Union to cover the present and future energy needs of the Union, and also, there are identified the potential associated risks.

Accordingly, this research is aimed to prove the validity of the following hypotheses: (H_1) *the energy security of the European Union is vulnerable*; (H_2) *the low degree of energy imports diversification is a source of potential weakness for the EU's energy market stability*; (H_3) *the measures undertaken by the community are sufficient to resolve the energy problem of the member countries*; and (H_4) *the efforts directed towards consolidation of the EU energy market should be reignited and reframed to increase overall energy stability*.

4. Literature Review

In order to deepen the readers' understanding regarding the concept of energy security in the context of European integration, a subset of relevant literature has been selected covering three main aspects: what is energy security, which strategic areas is it connected to, and what measures the states should undertake to strengthen long-term positions in this area? Accordingly, Yergin (2006) mentioned that the term "energy security" is often used in political and economic discussions that are connected to stable energy supplies. Nevertheless, the meaning of this concept is broader comprising various aspects which in the present form lack systematization and justification. Accordingly, energy security is defined as the state of protection of countries from the threats of deficient energy supplies provided to citizens, society, and economy. The concept also includes the national interests in the respective sector and the expected development paths. At the same time, it presupposes controlled reactions to the changes occurring under different conditions. At the same time, Verraastro and Ladislaw (2007) highlighted that energy is strategic in powering constant economic development. Its security is linked, first of all, to supplies' affordability and reliability. Growing global needs in terms of energy consumption challenge countries' abilities in ensuring energy security due to raising geopolitical competition for resources, growing environmental consequences of oil-intensive economies, and permanent change in the global flows of trade and capital. At the national level energy security is often linked to the extent states are able to assure sector's independence from the external environment. Despite the fact that these ideas might be politically attractive, they

do not all the time prove to lead to an increased energy sustainability and security. In their turn, Cherp and Jewell (2014) stated that energy security could be approached through three questions, i.e., security for whom, security for which values, and security from what threats? These questions should be examined from the perspectives of energy availability, accessibility, affordability, and acceptability. In this regard, the subjects of energy security are nations and their key components, i.e., households, businesses, and public sector. The values which are regarded are closely linked countries' energy systems comprising the social, economic, and political priorities which occur considering the states' energy independence, territorial integrity, and stability of energy supplies. In this context, it should be highlighted that energy security expands beyond this specific sector covering countries' geopolitical climate, economic welfare, and internal policies and social stability. The threats to energy sector are the potential conditions which could disrupt the stability of energy flows causing countries' lower economic resilience. Furthermore, Kruyt *et al.* (2009) said that the defining energy security is highly dependent on the context within which it is examined, there is no specific model to be built in this regard since countries vary in terms of socioeconomic conditions and priorities. Consequently, the indicators that could be considered could be broad and need to have enough justifications so as to be proper, informative, and relevant. However, it is important to underline several trends in the global energy market which will affect all countries including growing spatial discrepancy between consumption and production, increasing overall consumption and trade, as well as expanding concentration of energy production within few countries. Moreover, climate change puts additional pressure on the market of fossil energy in the conditions of slow diversification of production. Moreover, Vivoda (2009) pointed that for oil, gas, and coal importing countries the degree of energy security is closely related to the level of diversification of sources. Implementation of diversification policies is a strategic step towards strengthening long-term economic and social security through assuring constant energy supplies. Namely, the diversification could significantly reduce the energy supplies-related risks for importers due to lower dependence on the external environment. However, diversification cannot cover the risks associated with the general trends on the energy markets, for instance, it could weakly help when the prices of oil increase rapidly. In this regard, improved demand management, technological innovation, and reliance on domestic resources as well as the established reserves could raise the level of long-term energy security. Simultaneously, Augutis *et al.* (2017) underlined that the European Union, in general, and Germany, in particular, at the end of 20th century–beginning of 21st century made a serious mistake which endangered the economic security of Europe from the perspective of the energy sector ever since. Particularly, gas and oil have been considered as economic goods and not

strategic ones, thus, not being included in foreign and security policies of these countries. The processes on these markets were exclusively turned to private sector without proper attention from high governmental circles. The European Union underestimated the potential geopolitical threats and did not get prepared accordingly, thus being vulnerable in the permanently changing regional and global contexts. These circumstances determined weak positions of the community in the energy market and, therefore, low energy security. At the same time, [Sovacool and Mukherjee \(2011\)](#) highlighted that energy security is closely linked to the availability of resources, their affordability, and their stability. Moreover, it requires permanent technological development and innovation to strengthen energy efficiency in the context of climate change and energy resources' scarcity. In the modern context, energy security is linked to economic resilience which imperatively considers environmental and social sustainability which should be regarded through the prism of minimization of degradation effects on land, water, and life. At the same time, another important component of energy security relates to proper governance and regulation which determine the effectiveness and competitiveness of energy markets, development of infrastructural facilities, promotion of efficient trade, and enhancement of social commitment for energy issues. Also, [Ciută \(2010\)](#) determined that energy security has received little conceptual attention among economists, nevertheless, various meanings of the term tend to be covered within the framework of other subjects, i.e., environmental issues. Presently, three interpretations of energy security are considered coming from three different logics including of war, of subsistence, and a "total" security logic. These determine whole different approaches towards energy security. Thus, the first underlines an imminent implication of geopolitics in the market of energy supplies, with international politics being a key component determining the level of energy security as from this perspective energy is a means of survival. From the perspective of the second logic, energy security is decided by supplies' structural formation, final consumer, and intermediate markets and actors involved establishing the frame of energy demand and supplies' perspectives. For instance, corporate actors are rather concerned about profitability, while consumers about prices, thus, they view the security through different prisms. The third dimension of energy security tends to encompass security of everything: resources, production plants, transportation networks, distribution outlets, and even consumption patterns; everywhere: oil-fields, pipelines, power plants, gas stations, and homes; and against everything: resource depletion, global warming, terrorism, "them", and "ourselves". Finally, [Jansen and Seebregts \(2010\)](#) said that the market of energy is influenced besides demand and supply by a whole range of factors which have different impacts on particular countries from the perspective of energy security. Importers of fossil fuels are more vulnerable from the point of view of energy security due to their

dependence on the external environment and the interests of exporting countries. In this regard, it is required diversification on the affected energy markets which will balance the risks related to partners. Tackling the problems related to energy security should be approached in an integrated way within a multidimensional perspective.

Bahgat (2006) proved that the European Union is highly dependent on energy supplies. This fact reduces community's independence and policymaking freedom in the energy sector, since the EU needs to closely cooperate with the counterparts and compromise on various aspects, not necessarily in the field of energy resources. The European Union is highly vulnerable due to its energy dependence, i.e., the fact subverting its positions both in the regional and global contexts, with the EU having visible energy market weaknesses which can be exploited in the detriment of the member countries. At the same time, Stoddard (2017) demonstrated that the European Union has not paid enough attention towards its energy security. Accordingly, the community failed to efficiently integrate the energy dimension in its trade, foreign, and security policies. Member countries have weakly cooperated in the energy area, with them being dispersed in promoting joint interests. The EU should strengthen its joint dialog with its energy exporting partners in the Persian Gulf and Africa and with Russia so as to gain competitive advantages and report improved efficiency. Stable cooperation of the EU with these countries will ensure community's energy security. Moreover, Siddi (2016) underlined that the crisis in Ukraine and tensioning of relations with the Russian Federation have demonstrated how weak is the European Union in the energy sector and how much it depends on the external environment. The situation created was a trigger for the community to start to integrate the energy markets of the member countries and diversify the supplies. Nevertheless, it should be highlighted that presently the EU lacks a clear and effective energy strategy which will be relevant and sustainable, with the states being reluctant towards integrating these markets since they are not willing to lose control upon these areas. Diversification of imports could support other authoritarian regimes while developing clean technologies is not feasible in the present conditions. Furthermore, Strambo *et al.* (2015) said that assuring energy security is a key priority of the European Union alongside increasing the environmental effectiveness and climate change mitigation. Energy policy of the European Union is set to assure stable supplies, efficient market, and its liberalization as well as to foster the ecological situation. The overall goal is to assure a stable fundament for economic growth and development. The EU's actions in the field of energy security are rather reactive than proactive, since the community failed in building a long-term energy strategy prior to raising tensions with the Russian Federation and growing global competition. Moreover, even in the present uncertain environment, the intensification of integration of the

member countries' energy markets is far from being effective, with states failing to compromise in these areas. Furthermore, Goldthau and Sitter (2015) highlighted that the European Union is well known for its "soft" approaches when negotiating the issues related to the community's energy supply challenge. Political elites in the EU often question the effectiveness of this policy model and invoke the need for more direct and hard measures in protecting its interests on the energy market. Nevertheless, it should be underlined that the EU has turned "soft power", which at the first glance seemed to be a weakness, into a strength through transforming the single market into a gravitational force determining the way both internal and external firms operate. The EU regulatory state became an international energy actor stabilizing energy supply and transit routes. Simultaneously, Lindberg *et al.* (2018) pointed that the present energy system of the European Union is heterogeneous, with member countries pursuing different policies having various priorities. The energy market of the EU is decentralized, with most of the countries promoting individual interests in the detriment of the communitarian ones. Despite the efforts the European Union makes to consolidate its energy sector, the member countries are opposing these tendencies, willing to preserve control over this strategic sector. The competition of interests between national and supranational bodies in the EU creates an environment of uncertainty which reduces the power of the community in ensuring strategic energy security. Also, Boersma and Goldthau (2017) pointed that energy security issues in the European Union have been seriously considered in policymaking beginning with 2015 when this dimension was included into a broader security framework. The background for this change in the paradigms was the Ukrainian crisis of 2014. In the circumstances of growing geopolitical competition, the energy policy of the EU has shifted from liberalization towards securitization. Energy Union should be consolidated through making a trade-off between liberal market principles and stability of energy supplies. The stability must be ensured by building a comprehensive strategy viewing the EU as a unique and organized structure and not as a heterogeneous formation. Finally, Kustova (2017) highlighted that the formation of the European Union was grounded on the cooperation in the energy sector through establishing European Steel and Coal Community. The successful integration proved its advantages and determined the countries to enlarge the cooperation in other sectors. Nevertheless, the process of integrating the community's energy market lagged, with no serious advancements being made through the evolution of the EU. By 2014–2015, the political and economic elites of the EU understood the extent of vulnerability of the community in the energy sector occurring from the lack of integration in this area. They committed to solve this difficulty by establishing Energy Union, nevertheless, the actions in this sector are rather feeble, with much opposing forces being tackled in this process.

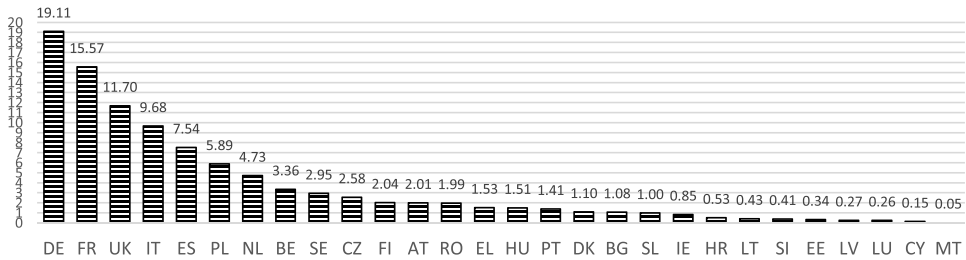
Omer (2008) said that energy security and sustainability are two closely interrelated concepts when considering a long-term perspective. Improving the efficiency of energy use is one of the main directions strengthening the sustainability of human activities. Moreover, sustainability of energy supplies should be regarded from the position of cost relevance, and new technologies should be justified in terms of the investments made. Energy use should have minimal effects on the environmental quality and surroundings, the fact which will ensure reduced destructive consequences of human activities on the regional and global ecosystems. Moreover, Radovanović *et al.* (2017) argued that energy sustainability should not be limited only to measuring the security of resources' supplies. It is important to consider also the social and environmental dimensions. In this regard, it should be underlined that the European Union faces important challenges in terms of energy security at the level of member states; larger economies due to their sheer economic size are more stable and have larger financial resources in building more efficient energy networks and systems. The EU in the conditions of low energy centralization has limited abilities in balancing the discrepancies. Furthermore, Narula and Reddy (2015) underlined that measuring energy sustainability and security must be made in a multidimensional perspective through covering the following three dimensions including geopolitical contexts, economic reliability of resources, and environmental impact. When assessing the level of energy security or sustainability, it is necessary to identify the key dimensions which are able to frame a comprehensive perspective on this area; the fact contributing to raising the understanding of the whole picture. Also, Jakob and Steckel (2016) determined that energy sustainability is a primary factor motivating its security. To effectively approach this dimension, the following aspects must be considered including climate impact, costs of environmental effects of mitigation, impacts on the water and food security, development perspectives of technological progress, and the associated risks and the benefits to be reported as a result of minimization of pollution activities. Energy security and sustainability should be ensured through feasible measures with enough justification and relevance. Moreover, Barbier (1987) mentioned that environmental efficiency, conservation, and economic development are not conflicting but mutually reinforcing. Countries should develop strategies which are not detrimental to the existing ecosystems through fostering technologies which will intensively exploit clean energy sources so as to minimize the negative impact of the anthropic factor upon the environmental quality. Finally, Kurze and Lenschow (2018) proved that despite the fact that the EU has a multilevel approach towards enhancing energy security, the main priority is put on energy sustainability and not security of supplies; this situation is connected to the community's limited empowerments in the energy sector. Energy Union is a relatively recent structure with the main aim being put on strengthening the

efforts of the member countries. It is supposed to solve the strategic weaknesses of the EU in the area of energy security enlarging the focus on supplies' diversification and stability alongside developing internal clean energy generation capacities.

As a result, the ideas previously mentioned by the authors can be summarized as follows: energy security of countries should be regarded from short- and long-term perspectives; the first is rather determined by the stability of supplies and the capacity of reserves while the second is decided by the interpositional of more complex framework of fundamental factors. Accordingly, it includes such directions as energy efficiency, structure of consumption, dependence on the external environment, diversification of imports, tendencies in energy trade, geopolitical contexts, ecological sustainability, and resilience of consumption. The European Union has paid little attention towards ensuring its energy security both in the short and long terms. One of the key integrational drivers, i.e., integration of energy market, received reduced attention, the fact which weakened the overall positions of the member states, with them having missed opportunities in developing pan European energy projects capable of ensuring the necessary fundament for comprehensive economic progress in all regions. Lack of consolidation and centralization of the European Union's energy market motivated reduced effectiveness in promoting the system's sustainability due to the fact that the policies which have been promoted had a national impact rather than a pan European one. Furthermore, within political and economic elites, energy security has been rather neglected and underestimated, only when the Ukrainian crisis erupted, European elites understood their strategic weakness in this sector, the situation which motivated the initiation of actions in this regard.

5. The Energy Market of the European Union: Comprehensive Examination

In order to assess the level of European Union's energy security, it is necessary to comprehensively analyze the community's energy market so as to be able to identify key characteristics which determine a reduced or bigger vulnerability in the context of the present socioeconomic arrangements in this area and the potential future challenges. From the perspective of this research, the first step in examining the EU's energy market is to identify which countries form the backbone. As can be seen in Fig. 1, Germany is the largest energy "submarket" in the community, holding almost 1/5 of the total consumption. This country is followed by France, 15.57%, the United Kingdom, 11.70%, Italy, 9.68%, and Spain, 7.54%. These five states concentrate more than 63% of the total energy consumption. This situation makes these nations to be the primary decisional factors in the field of



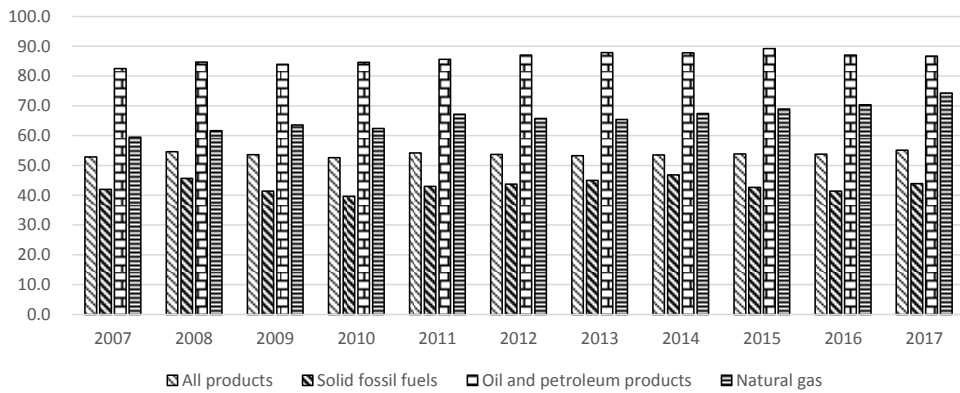
Source: Own calculations based on data provided by Eurostat, indicator's code [nrg_bal_s].

Figure 1. Energy consumption by countries, percentage of the European Union, averaged for the period of 2009–2017.

energy, with all other countries, despite their number, playing rather a secondary role. The competition of interests among the European Union countries in the field of energy determines the first weakness of the community in this area, namely the interests dissonance. From this perspective, the energy market of the EU is rather an association of national ones which are heavily dominated by five countries. Lack of a unique and consolidated cross-Union energy sector coordinated by a supranational authority minimizes the power of the European Union in providing centralized energy supplies assuring the same prices for all the countries as well as security, affordability, and sustainability levels. It should be marked that the European Union realizes the importance and benefits of a consolidated energy market, the fact being proved by *Energy 2020 — A strategy for competitive, sustainable and secure energy*; priority 2: building a pan-European integrated energy market. However, according to a report published by the Directorate General of Energy of the European Commission (2018) (second quarter), the energy market of the European Union is far from being consolidated, with the situation being proved by the market of gas supplies in the EU; in this regard, it can be mentioned, for instance, that the wholesale gas price in the community is highly heterogeneous (European Commission, 2018). Accordingly, the price for megawatt hour of gas for European markets varies from one country to another, for example, in Portugal it is 15.53 EUR, Germany: 18.75 EUR, Romania: 19.65 EUR, France: 21.88 EUR, Poland: 22.13 EUR, and Finland: 25.27 EUR. The same observations can be made for the industrial and domestic consumers, where important alternations are registered. For instance, the price for domestic consumers varies from 11.31 EUR cents per kilowatt hour in Sweden and 3.35 EUR cents in Romania, to 6.03 EUR cents in Germany and 8.16 EUR cents in Portugal. In this regard, it should be mentioned that the decisive factor is played by governmental levies, with the different sizes of them proving, once again, the high heterogeneity level in the energy market,

including in the policymaking area. Lack of consolidation is also proved by differences in the price for industrial consumers, excluding VAT and other recoverable taxes. Thus, for instance, in Sweden one would pay 3.91 EUR cents for a kilowatt hour, Denmark: 2.91 EUR cents for a kilowatt hour, Germany: 2.52 EUR cents for a kilowatt hour, Bulgaria: 2.04 EUR cents for a kilowatt hour, Romania: 2.38 EUR cents for a kilowatt hour, France: 2.57 EUR cents for a kilowatt hour, and Belgium: 2.09 EUR cents for a kilowatt hour (European Commission, 2018). Overall, it can be highlighted that despite the EU efforts, the energy market of the community still remains weakly consolidated, the fact undermining its capacity in resisting shocks and ensuring equal benefits for all the citizens of the community regardless of their nationality.

The market of energy of the European Union is heavily dependent on imports, the situation which threatens the economic security of the community. For instance, the European Union has been consistently affected by the gas disputes between Russia and Ukraine. Since these disputes have not been simple business disagreements between Russian Gazprom and Ukrainian Naftohaz, but rather complex geopolitical and economic confrontations between these states, the European Union has faced imminent risks related to gas supplies which threatened not only the functionality of the industry, but also the security of the citizens in the cities which were heated with Russian gas in the middle of the winter. As can be seen in Fig. 2, in 2017 the European Union imported 55.1% of all its energy supplies, the situation which has not improved over the decade. The highest dependency rate is registered in terms of the petroleum products, with over the period more than 80% being imported. Nevertheless, the high dependency rate in this regard does not necessarily suppose high associated risks, as in the case of gas market. This fact is determined by many advantages of petroleum over the gas, including: the price is much more connected to demand and supply, it can easily be transported, the costs of developing and maintaining necessary infrastructure is lower, and, the key advantage is related to the diversity of important sources. The gas market to a lower or greater extent lacks these advantages, since the prices are based on contractual agreements in most cases, infrastructure is highly expensive, and interchangeability of sources is reduced. In 2017, the European Union imported more than 74% of all gas supplies, the fact which is slightly lower as compared to the oil market. Nevertheless, if the dynamics in the area of petroleum products remained more or less similar during the period of 2006–2017, than in the gas market, the share of imports in the total balance has grown by 15% during the same period. Unlike oil and gas, the market of solid fuels is much less dependent on imports, with only 40% of all the products being imported, a share which is stable in dynamics. The main disadvantage of these resources is related to their



Source: Eurostat (online data code: nrg_ind_id).

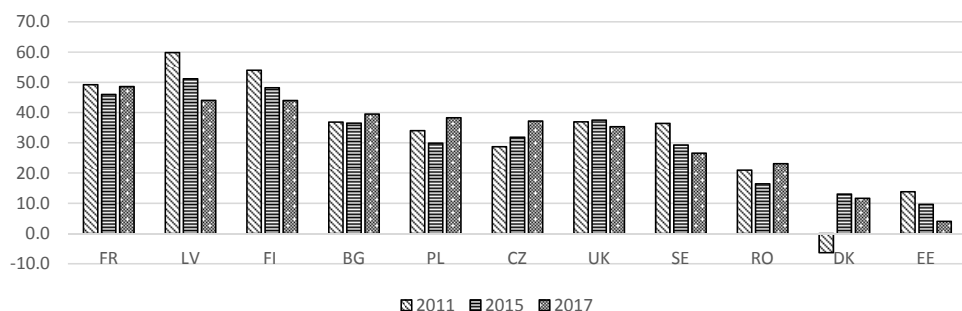
Figure 2. Energy dependency of the European Union, share of the extra EU imports (percentage of net imports in gross inland consumption and bunkers, based on tons of oil equivalent).

high pollution level, in particular considering coal, thus, they are not viewed as a sustainable alternative to substitute gas and petroleum.

Since the European Union's energy market is far from being consolidated and represents rather an association of national energy systems, some of the countries are safer in terms of energy security than other. Based on the information provided in Fig. 3, it can be underlined that the safest countries in this regard are Estonia, Denmark, Romania, and Sweden. Thus, these nations are less vulnerable considering the energy shocks, having an increased capacity to provide stable supplies to the citizens and industry. These countries are safe in terms of both long- and short-term energy security. The risks which are associated with long-term energy security include the internal and external dimensions. Thus, considering the domestic area, the above-mentioned nations are more likely to reduce the risks which are related to the connection of domestic production, transformation of energy, and consumers since they are capable to generate more energy supplies based on available internal resources and reserves. It is ensured by internal energy resilience effect which defines an enhanced internal ability to tackle disruptions in energy supply. Considering the external dimension, these countries are less exposed to energy dependency and, thus, the related risks including those associated with potential disruptions of energy imports due to various reasons and causes. This fact is reflected by their ability to substitute energy supplies with internal resources or by switching to other routes and sources.

On the opposite pole, there are the European Union's countries registering the highest levels of energy dependence, i.e., Malta, Cyprus, Luxembourg, Portugal,

A. Ignatov

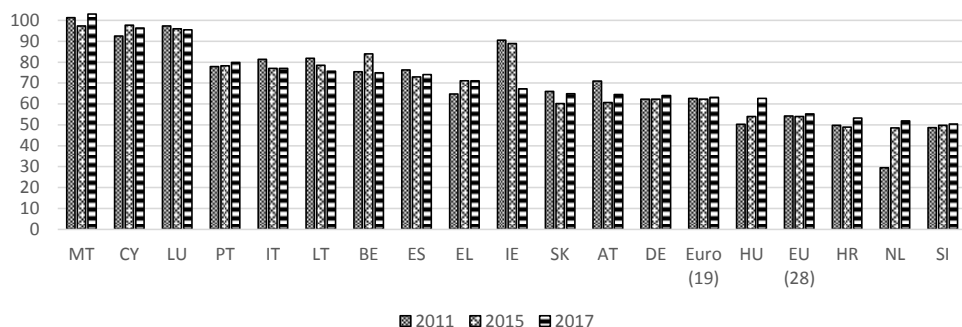


Source: Eurostat (online data code: nrg_ind.id).

Figure 3. Relatively safe countries from the point of view of energy dependence (percentage of net imports in gross inland consumption and bunkers, based on tons of oil equivalent < 50% by 2017).

Italy, Lithuania, and Belgium. Especially, it is important to remark that besides Italy, one of the key economies of the EU, Germany and Spain also record high levels of energy dependency, importing much supplies to cover domestic energy consumption (Fig. 4). These countries are vulnerable considering long-term energy security due to their dependence on the external environment and geopolitical context.

One of the criteria to reduce the risks associated with the dependence on the external environment is related to diversification of sources providing energy. As can be seen in Table 1, the Russian Federation is by far the most important partner of the EU in providing oil products, with more than 30% of all community's



Source: Eurostat (online data code: nrg_ind.id).

Figure 4. Relatively vulnerable countries from the point of view of energy dependence (percentage of net imports in gross inland consumption and bunkers, based on tons of oil equivalent > 50% by 2017).

Table 1. Main origin of crude oil imports (percentage of extra EU-28 imports).

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russia	33.7	31.8	33.6	34.7	34.7	33.6	33.7	30.4	29.0	31.9	30.3
Norway	15.0	15.0	15.1	13.7	12.6	11.3	11.8	13.1	12.1	12.5	11.4
Iraq	3.4	3.3	3.8	3.2	3.6	4.1	3.6	4.6	7.6	8.3	8.2
Kazakhstan	4.6	4.8	5.3	5.5	5.7	5.1	5.7	6.4	6.6	6.8	7.4
Saudi Arabia	7.2	6.8	5.7	5.9	8.0	8.8	8.7	8.9	7.9	7.8	6.6
Nigeria	2.7	4.0	4.5	4.1	6.1	8.2	8.1	9.1	8.4	5.7	6.4
Iran	6.2	5.3	4.7	5.7	5.8	1.3	0.0	0.1	0.0	2.9	5.2
Libya	9.7	9.9	8.9	10.1	2.8	8.1	5.6	3.3	2.4	2.3	5.2
Azerbaijan	3.0	3.2	4.0	4.4	4.9	3.9	4.8	4.4	5.2	4.5	4.5
Others	14.6	16.0	14.4	12.7	15.9	15.6	17.9	19.6	20.7	17.4	14.8

Source: Eurostat (online data codes: nrg_ti_sff, nrg_ti_oil, and nrg_ti_gas).

petroleum imports originating from this location. The share of this country in the balance remains stable in dynamics. This level is relatively high and therefore the potential risks associated with this source are also large. Norway is the second provider of oil products for the consumers in the European Union with a share reaching more than 11% in 2017, with a slight decrease in dynamics. The following countries include Iraq and Kazakhstan. As it can be remarked, the diversification of oil sources is relatively low since the first five import partners supply more than 60%. This level is relatively stable in dynamics and does not consistently change over the period. In these conditions, petroleum supplies are exposed to risks that include import disruptions and hybrid threats reflected through the prism of geopolitical and socioeconomic contexts.

The risks associated with the lack of diversification of gas supplies are higher as compared to petroleum market since around 85% of all imports come from the first five partners and 64.7% from the top two sources (Table 2). In these conditions, the low degree of diversification in terms of gas imports puts under risk not only the energy security of the European Union, but also its economic development perspectives, with the community being highly vulnerable considering the evolution of political and economic situations in partner countries. High dependence on just few supply sources minimizes the possibilities of the European Union to maneuver and promote efficient policies in the areas in which are co-interested the importing partner states. For instance, the European Union's and the Russian Federation's interests in the Eastern Europe are often confronting, with EU's gas dependence in this regard being an advantage for Russia coercing the EU to compromise even if the strategic interests of the community are affected. It can be underlined that the

Table 2. Main origin of natural gas imports (percentage of extra EU-28 imports).

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russia	38.7	37.4	33.0	31.9	34.4	34.9	41.1	37.4	37.7	39.8	38.7
Norway	28.1	28.5	29.7	27.9	27.6	31.8	30.4	32.1	32.1	25.1	25.3
Algeria	15.3	14.7	14.1	13.9	13.1	13.3	12.6	12.0	10.8	12.5	10.6
Qatar	2.2	2.3	5.9	9.7	11.6	8.4	6.5	6.8	7.7	5.7	5.2
Nigeria	4.6	4.0	2.4	4.0	4.4	3.1	1.7	1.5	2.0	2.0	2.5
Libya	3.0	2.9	2.9	2.7	0.7	1.9	1.7	2.1	2.1	1.3	1.1
Peru	0.0	0.0	0.0	0.0	0.0	0.8	0.5	0.5	0.3	0.5	0.9
United States	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
Trinidad and Tobago	0.8	1.7	2.0	1.4	1.2	0.9	0.7	0.9	0.6	0.3	0.3
Others	7.3	8.5	9.9	8.3	6.9	5.0	4.7	6.7	6.6	12.9	15.0

Source: Eurostat (online data codes: nrg_ti_sff, nrg_ti_oil, and nrg_ti_gas).

dynamics have not improved over the researched period, with the European Union not reporting any significant step forward towards diversifying its imports. These observations are also valid for Norway and Algeria which are also strategic partners for the European Union in terms of gas imports. It is particularly important to underline that the European Union through its gas dependence is affected by the evolution of bilateral relations between the Russian Federation and Ukraine, with 48.3% of the Russian gas transiting Ukraine so as to reach European consumers (Naumenko, 2018).

The dependence level of the European Union on imports of solid fuels is reduced as compared to gas and oil products (Table 3). Nevertheless, it should be remarked that the community buys more than 87% of all imported solid fuels from

Table 3. Main origin of solid fuel imports, extra EU (percentage of extra EU-28 imports).

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russia	25.2	26.1	31.1	27.4	26.7	26.2	30.0	31.0	29.8	30.7	38.9
Colombia	11.8	11.9	16.4	18.7	21.3	22.2	19.4	19.8	22.2	21.1	16.9
United States	9.7	14.7	14.3	17.6	18.6	22.9	22.3	20.5	14.7	13.2	16.9
Australia	14.2	12.5	7.9	11.3	9.4	8.0	8.5	7.2	11.2	16.3	11.8
South Africa	20.2	16.8	15.6	9.8	8.3	6.6	6.1	7.9	7.4	5.3	4.9
Indonesia	7.8	7.2	6.7	5.5	5.1	4.6	3.3	3.7	4.0	3.4	3.4
Canada	3.3	2.8	1.5	2.1	2.3	1.8	2.0	2.9	1.7	2.3	2.5
Mozambique	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.4	0.5	0.8	1.2
Kazakhstan	0.1	0.3	0.2	0.2	0.3	0.3	0.3	0.6	0.6	1.0	0.7
Others	5.1	5.5	4.2	3.5	4.0	3.0	3.1	3.6	2.4	2.5	2.4

Source: Eurostat (online data codes: nrg_ti_sff, nrg_ti_oil, and nrg_ti_gas).

the first five countries, a level which, despite a relatively low overall dependence as compared to other products, makes the European Union vulnerable due to the high degree of concentration of imports. This situation rather endangers only the community's short-term energy security related to the stability of supplies' provision since the European Union could effectively substitute these products due to the high internal endowment level.

Table 4 provides information regarding use of primary energy in the European Union. As it can be seen, the consumption of primary energy in the EU has decreased during the period of 2007–2017. Petroleum and gas are the most important energy sources powering economic activities in the community holding around 60% share within the whole period. At the same time, the share of renewable energy use has consistently grown, covering by 2017 about 14% of all consumptions. Relatively clean nuclear energy covers the same share of EU energy consumption as in the case of renewable technologies. Traditional resources are still dominating the communitarian energy balance, thus, contributing to a relatively high degree of exposure of the single market to the external environment in the conditions of consistent energy imports dependence. Nuclear heat and renewable technologies, in the present conditions, assure only little more than a quarter of all energy consumptions, with these dimensions requiring much investments both in physical infrastructure and innovation so as to enhance their generation capacities and sustainability.

The European Union can cover 47% of energy consumption from internal production capacities, the rest 53% should be imported (Table 5). The main sources of produced energy are nuclear and renewable contributing more than 57% of the total generation. As it can be observed, the generation of nuclear energy constantly decreased in dynamics, the fact being determined by the changes in nuclear policies promoted by decision-making factors due to raising security concerns related to the specific risks associated to this specific energy source, with the production decreasing by more than 15% during the period. At the same time, it should be underlined that the production of energy from renewable sources has permanently increased during 2007–2017 by more than 65%. Presently, it is the second most important source of energy in the community almost matching the capacities of the nuclear one. Simultaneously, the EU's strength in producing solid fuels, oil, and gas remains modest, with this fact being determined by the relatively low level of endowment with natural resources. Thus, the European Union is obliged to import the vast majority of resources.

As can be observed in Fig. 5, the fundament for renewable energy is assured by biomass and processing of agricultural waste which assure almost 18% of all

Table 4. Consumption of primary energy, EU-28, in 2006–2017 (1,000 tons of oil equivalent, %).

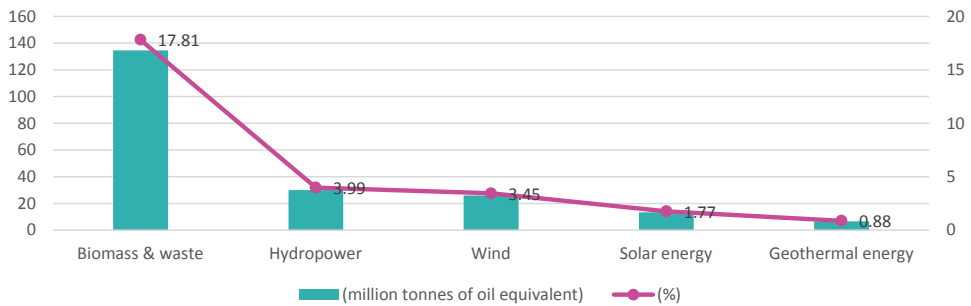
	2007	2009	2010	2011	2013	2014	2015	2016	2017
Total	1,816,424	1,699,883	1,768,186	1,707,824	1,673,717	1,613,407	1,638,724	1,648,853	1,674,924
Solid fossil fuels	18%	15%	16%	16%	17%	16%	16%	14%	14%
Natural gas	24%	24%	25%	24%	23%	21%	22%	23%	24%
Crude oil	37%	36%	34%	35%	33%	35%	36%	36%	36%
Renewables	8%	9%	10%	10%	12%	13%	13%	14%	14%
Nuclear heat	13%	13%	13%	14%	13%	14%	13%	13%	13%

Source: Eurostat (online data codes: nrg_bal_s).

Table 5. Production of primary energy, EU-28, in 2006–2017 (1,000 tons of oil equivalent).

	2007	2009	2010	2011	2013	2014	2015	2016	2017
Total	862,864	820,941	838,118	806,572	792,777	776,491	772,015	758,613	758,209
Renewables and biofuels	136,821	154,469	170,559	168,412	199,017	202,516	211,425	216,678	226,586
Nuclear heat	241,714	228,316	234,583	232,008	223,008	223,611	220,092	213,521	210,724
Solid fossil fuels	179,149	160,041	157,150	159,972	148,327	142,152	138,896	127,171	124,466
Natural gas	170,080	155,817	159,290	142,506	131,259	118,048	107,335	107,319	103,091
Crude oil	109,195	95,980	89,843	78,703	66,592	65,369	69,911	68,349	66,747
Other	25,905	26,318	26,693	24,971	24,575	24,795	24,357	25,576	26,594

Source: Eurostat (online data code: nrg_bal_c).



Source: Eurostat (online data codes: nrg_100a and nrg_107a).

Figure 5. Renewable energy production in the European Union, 2016.

energy productions in the community, followed by hydropower (4%), wind (3.45%), solar energy (1.77%), and geothermal energy (less than 1%). Despite all the advantages provided by renewable energy, it could not cover all the necessities of the European Union in terms of energy. As most of renewable energy is related to biomass and agricultural sector, enhancing the capacities has an unfavorable potential to raise the pressure on the environment. More intensive exploitation of the agricultural land will inevitably decrease the quality of the environment and reduce the effectiveness of the land. Moreover, additional competition for agricultural land and output will have the potential to raise the prices for food. In these conditions, it could be questioned renewable energy's feasibility, sustainability, and resilience within the present technological framework. Accordingly, renewability is not the key aspect of energy security for the European Union on which the community should solely concentrate, nevertheless, it has a strategic significance taking into account a more general context with a wider set of measures which should be applied to strengthen the long-term economic development perspectives. Accordingly, the energy security model which the European Union should develop must have a multidimensional approach. It should concentrate on enhancing the energy efficiency of present consuming facilities, enlarge the infrastructural coverage, cheapen the cost of implementation of clean technologies, as well as strengthen the diversification and interchangeability of energy sources. Moreover, the EU must concentrate efforts to consolidate the energy market of the community, the fact which will improve its resistance in the front of external threats. Consolidation and deeper integration in this area will ensure stability of the energy sector based on resilience principles.

6. The Energy Market of the European Union: Policy Framework Overview

Despite the fact that the European Union has legislated in the area of energy since its formation, only in 2006 the community established a consistent energy policy intention, called *European Strategy for a Sustainable, Competitive and Secure Energy*, marking the strategic direction to strengthen energy security through two pivotal actions, one to be undertaken at the national level of the member countries and the other at the European level. Some of the priorities include enhancing the competitiveness of the internal energy market, diversification of the energy mix, promoting solidarity, sustainable development, and technological effectiveness, as well as innovative and efficient external policy. Another document deepening the cooperation of the member countries in this sector is the EU Treaty of Lisbon underlining the importance of solidarity in assuring stable energy supplies and fostering the collaboration in this policy area. Prior to this document, the regulating power of the European Union was based on its authority in regulating the single market and environment. Nevertheless, in the present conditions and arrangements, the decisive power in regulating the energy sector of the EU remains in the decision-making framework of member states' governments. Progress in this area is directly linked to the voluntary willingness of countries in compromising on strategic aspects. In the conditions when the EU's energy sector is highly dependent on the imports originating from few sources, a low-level integration among the countries in this area both in terms of physical infrastructure and policymaking undermines the overall strength, minimizing the energy security for all member states. Ukrainian crisis and subsequent tensioning of relations between the EU and the Russian Federation showed the extent of weakness of the community in the front of an imminent energy crisis. This situation determined the policymakers to establish *Energy Union Strategy* aiming to provide secure, sustainable, competitive, affordable energy. The five priorities which have been included in this strategy are energy security, solidarity, and trust; a fully integrated European energy market; energy efficiency contributing to moderation of demand; decarbonizing the economy; and fostering research, innovation, and competitiveness. This paper comprehensively assessed the present and potential future weaknesses of the European Union in the energy sector and has set a roadmap which has to consolidate this area. The key actions which must be undertaken include: closer monitoring of gas flows and storage capacities, development of more feasible contingency plans in times of emergency and improving the quality of safeguard mechanisms, diversification of oil and gas supply routes, including LNG, mitigation of the consequences following oil price shocks and gas disruptions risks, protection of critical infrastructure, and

fostering the environmental friendliness of energy. The strategy is particularly focused on minimizing the risks associated to gas and oil markets, the most important sources of energy powering the economy of the European Union. Another important document which is set to consolidate the energy market of the community is *2030 Framework for Climate and Energy* (of 2014) which aims to cut 40% of greenhouse gas emissions compared to 1990 levels, reach 27% of renewable energy in the final energy consumption balance, enhance the energy efficiency by 27%, and finally boost interconnectivity by 15%, with all of these goals to be achieved by 2030. As it can be observed, the EU has relatively recently undertaken organized actions in the area of energy and its sustainability, with this fact being dictated by the changes in the external economic and political environments. In this regard, it could be mentioned that the community in decision-making is rather a reactive force than a proactive one, under the circumstances which do not improve its energy security perspectives.

7. Gas, Petroleum, Electric Energy, and Renewables: Infrastructure Consolidation as a Primary Step towards Import Diversification

The diversification of gas and petroleum imports is critical for the European Union, since these energy sources hold high share in the EU's energy consumption balance and originate from few countries with which the community has more or less tensioned relations, especially in the Eastern direction. Several factors influence the necessity to diversify the supplies including geopolitical situation, internal policy and regulatory framework, and global economic trends. It is important to underline that in these circumstances, analysis of the energy sector and finding an optimal solution to increase its security should not be focused only on pure economic methods as there is a wide range of factors determining the evolution of this area including social and political contexts, availability and cost of financing, clusters' conflicting interests, etc. The first step towards efficient and sustainable diversification consists in consolidating the energy infrastructure across the community to ensure that all regions are connected to the unique energy network to avoid isolation and the related vulnerabilities of the citizens. The present state of affairs in this area is relatively secure, nevertheless, far from ideal, since many infrastructure projects must be finished or are yet at incipient phase. The European Union highlighted these within the framework of *projects of common interest* (PCIs) aimed to foster the integration of the member countries' energy sectors comprising electricity, natural gas, oil, and renewables. The consolidation of energy system is set to cover PCIs totaling 173 projects; 106 electricity transmission and storage, four smart grid deployment, 53 gas, six oil, and four cross-border carbon dioxide network projects. All

the projects have financing available through Connecting Europe Facility amounting to EUR 5.35 billion and the EU's EUR 30 billion fund for boosting energy, transport, and digital infrastructure between 2014 and 2020.¹ The integration of member countries' energy markets is based on regional principles, i.e., projects covering the Northern Seas Region, Western Europe, Central-Eastern and South-Eastern Europe, Baltic Sea Region, and the Southern Gas Corridor, with the consolidation of integration being directed towards strengthening overall energy security. In this framework, it should be mentioned that development and implementation of projects are feeble; since the first public consultation on PCIs in June 2012, only 25 projects have been implemented. Slow decision-making alongside high degree bureaucracy is hampering the efficient implementation of the projects. Thus, despite the fact that the EU understood the importance of energy market integration, the efficiency of the actions undertaken in this area was rather limited due to the competition of individual member countries' interests. This fact is an important weakness of the community reducing the capacities of the supranational authorities in developing projects which will serve the interest of all member states instead of the individual or group's one.

8. Energy Security in the EU and the US: Comparative Assessment

The USA and the European Union are situated on the opposite poles regarding their sovereign energy security; this situation is characterized by few strategic aspects. First, American economy is much less dependent on imports of energy supplies. Thus, according to *US Energy Information Administration (2018)*, "Domestic energy production equaled about 95% of U.S. energy consumption in 2018." The relatively small "dependence" can be only identified in terms of oil imports. This situation is a major advantage for the US economy since it is almost fully assured with energy supplies, with independence in this sector allowing the US decision makers to efficiently promote sovereign interests and policies. In contrast, the European Union is highly dependent on foreign energy supplies in terms of gas and petroleum, and, to a lesser extent, on solid fuels, with 55% of all energy being consumed originating from abroad. Thus, in strategic terms, more than a half of community's economy is exposed to external risks and interests. Moreover, the situation has not improved in dynamics. As it was previously examined, the EU's energy imports are highly concentrated, with few sources registering high shares. Simultaneously, energy interconnectivity among the EU countries is much less prominent as compared to the US states. Accordingly, the

¹ Information available online at European Commission website; see, for more details, <https://ec.europa.eu/energy/en/topics/infrastructure/projects-common-interest> and <https://ec.europa.eu/energy/en/topics/energy-strategy/energy-union>.

reaction speed, decision-making efficiency, and, most important of all, solidarity of the EU are much more limited as compared to the US, with this situation reducing the community's consumer lever force.

9. Conclusions

This research accepts H_1 mentioning that the energy security of the European Union is vulnerable. Several factors are influencing the community's weaknesses in this sector including, first, high level of dependence on energy imports originating from few sources. Moreover, this vulnerability accentuates when in the energy affairs the geopolitical interests are involved. For instance, the eruption of the political crisis in Ukraine and its subsequent confrontation with the Russian Federation critically affected the security of energy risks in the EU, with the community risking to face disastrous socioeconomic consequences. Furthermore, the EU's support for Ukraine has been rather limited and moderated by its dependence on gas and oil supplies originating from the East. Also, this paper accepts H_2 pointing that the low degree of energy imports diversification is a source of potential weakness for the EU's energy market stability. Namely, the energy security is the weakest point of the EU's economy, with the internal production of energy failing to satisfy critical energy needs. Dependence on energy imports originating from a reduced number of sources, automatically, puts these countries in the list of strategic partners of the EU since the disruptions could lead to EU's economy collapse. This situation worsens in the conditions when EU's internal energy market is weakly interconnected, especially considering key infrastructure nodes. Thus, the community is not able to quickly interchange from one source to another to ensure that the whole EU's economy could be ensured with energy from alternative directions. At the same time, it should be underlined that the proper diversification of imports is weak. In most of the cases, the first three sources consistently dominate the imports, i.e., by the Russian Federation, Norway, and Northern African states. This research rejects H_3 stating that the measures undertaken by the community are sufficient to resolve the energy problem of the member countries. As it was remarked, the EU has been recently undertaking visible steps towards consolidating energy market, with the initiatives meeting important resistance from the member states. The projects developed are implemented stagnantly, with most of them being in process. The orientation of some member states towards renewables is not feasible in the present technological limitations. Renewables, despite being a progressive direction, are not an alternative energy source for the short-medium term so as to completely switch off the traditional energy supplies, with their prospects being rather linked to the long run. Finally, this research accepts H_4 underlining the necessity to undertake further

efforts directed towards consolidation of the EU's energy market, with the process having to be reignited and reframed to increase overall energy stability. More vivid steps must be promoted by the EU's institutions to deeply integrate the national markets, with this action being strategic for the long-term development of the community. Furthermore, the energy sector should rely on a higher degree of centralization so as to be capable of enhancing its reliability and competitiveness in the long term.

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