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Energy Security in European Union

Eze Friday IKECHUKWU*
Ketevan CHAKHAVA**

Abstract

This article examines the role of the European Union in assurance to Energy Security for its citizens, types of energy, challenges that hinders the supply of energy. Tension between European states and effects on the European Union. Ways of developing infrastructure towards clean resources to reduce gas emissions and climate changes to achieve energy sustainability. Particular focusing on the challenges and treats in securing energy for the European union examine influence of actors such as organization and countries on the energy market for the European union. Furthermore the research paper examines the future plans of the European Union towards energy security and alternative energy resources for decrease dependence on fossil fuel.

Keywords: energy, European Union, gas, fossil fuel, Russia

Introduction

"Energy security is the state of the economy which enables to cover prospective demand for fuel and energy", the term was used in one of the European Union's publications about energy. There are several factors that contribute immensely to the supply of energy in European Union, including partner countries, organizations and regional countries to get the best deals of Energy to ensure energy. One of the main energy suppliers for Europe is Russia. 26% of the gas that the EU consumes comes from this huge country. Russia, along with Qatar are among the largest oil producers in the world. The Organization of the Petroleum Exporting Countries (OPEC) being the largest producer of energy in term of fossil fuel provides Europe with over 40% of its total crude oil imports. The biggest individual suppliers are Libya, Nigeria and Saudi Arabia - each one of them delivers over 8% of the Europe's total oil imports.

Recent events in Europe prior to the tension between Ukraine and Russia have proven that there is no assurance and security to energy within Europe. Over the last decade the European Union has taken several precaution in securing energy for it member countries, in ensuring diversified range of energy sources start from Fossil fuel (Gas , Oil and coal) to renewable and nuclear energy (wind energy, solar, hydroelectric, geothermal and biomass). Adaptation of this policy will reduces its energy consumption by developing Infrastructures to help deliver low energy economy to ensure a sustainable and uninterrupted energy supply.

Energy Security

There are many various definitions related to the energy security. For example the Center for Strategic and International Studies (CSIS), USA describes it as "state's constant ability to maintain its operation without serious disorders. "According to International Energy Agency it's an "uninterrupted physical availability of supplies, reasonably priced and used in harmony with the environment." However the most complex definition which will be used hereafter was used on one of European Union's publications: "Energy security is the state of the economy which enables to cover prospective demand for fuel and energy, in a technically and economically justified by

* B.A. student of the International Black Sea University, Tbilisi, Georgia.
E-mail: stiffmiester4u@gmail.com

** M.A., Invited Lecturer of the International Black Sea University, Tbilisi, Georgia.
E-mail: kchakhava@ibsu.edu.ge

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the requirements of environmental protection. (Agency, 2015) This condition provides diversification of supplies of imported fuels and increases the share of energy from renewable sources, production capacity from domestic resources - oil, natural gas and the use of domestic coal deposits, allowing for uninterrupted operation of the energy system of the country in case of interruption of supply from one source. Increase energy security can also contribute to the dispersion of energy sources." (Commission, 2015) Definition is undoubtedly the most complex one because it's related not only to explanation what the energy security is but it also explains circumstances when the question of the energy security is the most relevant.

Currently Europe is facing a growing demand for energy and is also struggling with problems of price volatility and supply disruptions. For example, more than half of the energy in the EU -28 come from countries outside the EU - and the percentage is substantially increased over the last decade. The difficult situation on this continent proves how important is to analyze the various sources of energy in order to understand the current state of the situation as well as predict as future trends to reduce dependence on Russia.

Energy Suppliers in Europe

European Union being one of the largest energy consumers in the world has a wide range of Energy supplier across the world in order to achieve Energy Security and diversify its sources of Energy supply and avoid interruption to its supply.

There are several factors that contribute immensely to the supply of energy in European Union, including partner countries, organizations and regional countries to get the best deals of Energy to ensure energy. Relation Europe – Russia is very hard to predict. As a response to the Russian – Ukrainian gas crisis in January 2009 the legal framework for security of supply has been changed and in September 2009 council of the European Union adopted Directive 2009 / 119 / EC imposing an obligation on EU Member States to maintain minimum stocks of crude oil or petroleum products. These measures concerning markets of oil and gas are to ensure that all parties take effective measures to prevent potential blackouts and minimize the effects of such interruptions. The regulations described above prove how strongly Europe depends on Russian Federation in terms of supply of energy. Good example of European country depending on energy supplied by Russia is Poland: 70% of gas and 93% of petroleum consumed by Poland comes from Russian Federation. Looking at general statistics from Europe In 2013, it accounted for 39% of its natural gas imports. Using a wide range of energy sources and diversification of suppliers, routes and transport mechanisms can play an important role in terms of guaranteeing security of supply. It is believed that building reliable partnerships with the countries - suppliers, transit countries and countries - consumers, can reduce the risk of the EU's energy dependence.

Norway

On the background of the crisis in Ukraine, when Moscow turned off the last month the gas tap for Kiev, Norway, a large oil producer, has repeatedly offered his services for European countries. Norway's mountainous areas along with numerous water resources can very quickly provide large amounts of renewable energy. It is worth noting that the Norwegians adopted a different strategy for the development of its green installations than the rest of Europe. The strategy adopted by the Norwegians is based on the expansion and modernization of existing facilities. It is a much faster way to achieve high power generation than the strategy pursued by many countries in Europe and involving new investments. To support the development and performance technology at the Norwegian University of Science and Technology (NTNU), founded hydro-electronica special laboratory, which was equipped with special water tunnels. Thanks to this technology it can be evaluated in terms of their strength against shifting mountain ranges. In addition, the laboratory has made in scale 1:65 Norwegian power Torpa. It is the world's first model equipped with the physical power equivalent to a path that traverses the water including emerging air surges. The success of research may lead to the internationalization power, so that it can be used to absorb excess energy from wind and solar farms in Europe and at the time of increased demand release of energy to the distribution network. Norway is the sixth world producer of electricity using hydroelectric power. Electricity produced with their participation currently provides up to 96% of energy needs of the country. Norway currently operates 937 hydroelectric power plants, which can be used by European Union in greater quantities in the future when new grid connections are built. Norway is also one of the biggest oil and gas exporters. It's placed on the third position worldwide, right after Saudi Arabia and Russia. In 2012, the 31% of all the EU's natural gas imports and 11% of its crude oil imports.

Central Asia and Caucasus Countries

Cooperation with the countries of Central Asia and Europe wasn't very visible so far, however taking into consideration, changes related to politics and the possibility to establish new partnerships, beneficial for both regions. The importance of Central Asia in the context of the economy European countries is important especially in the field of energy exports from these countries - oil and gas but also other goods. Countries in the region in trade foreign cooperate primarily with Russia or China however the situation has been changing for the past five years. A growing number of competitors from Western Europe and United States of America is trying to reach to Central Asia in order to use their natural resources. Countries with the biggest potential are: Azerbaijan, Turkmenistan, Kazakhstan and Uzbekistan. European Union signed a Memorandum of Understanding in order to start cooperation. Another worth to mention element is the INOGATE program. It's an agreement signed between Eastern Europe, the Caucasus and Central Asia. The main aim of the program is to help all the involved countries to minimize their dependence on fossil fuels energy imports and also improving security of supply and fighting climate change.

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Organization of the Petroleum Exporting Countries (OPEC)

OPEC is an organization, which aims to control the world's oil production, the level of prices and maintenance charges. It was founded in Baghdad, Iraq, with the signing of an agreement in September 1960 by five countries namely Islamic Republic of Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. They were to become the Founder Members of the Organization. These countries were later joined by Qatar, the United Arab Emirates, Indonesia, Libya, Algeria, Nigeria, Gabon, Ecuador and Angola. The main aim of the organization is to: "*coordinate and unify the petroleum policies of its Member Countries and ensure the stabilization of oil markets in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers and a fair return on capital for those investing in the petroleum industry."* (Mess, 2015) The countries, which are OPEC members, are very powerful source of energy by providing Europe with over 40% of its total crude oil imports. The biggest individual sup-pliers are Libya, Nigeria and Saudi Arabia - each one of them delivers over 8% of the Europe's total oil imports. The coop-eration between OPEC countries and Europe is so important that there are annually arranged meetings at ministerial level to discuss various issues including the promotion of more sta-ble oil prices as well as transparent markets.

In summary, majority of Europe's gas imports come via pipelines from Russia, Norway and Algeria. One part, in the form of liquefied natural gas, is imported in tankers from Qatar and Nigeria. The current nature and structure of the global gas market does not leave many possibilities for it to gas cartel can freely adjust the volume of production and price levels - as is the OPEC. The nature of the market for example, "higher cost and more strict rules for the transport of natural gas, compared to oil or coal". Besides, the current Russian energy export policy is not multinational rather more of a monopoly compared to OPEC, "Russia has never sought to join (or been invited to join OPEC), despite its share of the world gas trade." Also in the case of oil, Russia is unwilling to surrender its power in the market.

Threats of the Energy Security in the European Union

There are two types of threats defined European Union: short-term supply interruptions due to technical problems or weather anomalies political interference and long-term when the supply does not meet demand because of the actions of economic entities, financial or political problems involved in investments in production and transportation.

According to Eurostat, the European Union currently imports 40 % of its gas, and by 2030 this figure could rise to 70 %. Russia supplies 32% of the EU's needs. (OPEC, 2015) 80% of these supplies running through Ukraine's pipeline network. The remaining gas imported into the European Union comes from Norway, Algeria, Nigeria and Qatar. Some EU countries do not import at all or very little import gas from Russia. These include Belgium, Luxembourg, Ireland, Portugal, Spain, Sweden and the United Kingdom. Denmark remains self-sufficient while Norway and Holland are net gas exporters. Countries such as Greece, Finland, Bulgaria and Lithuania import from Russia over 95 % of its gas).

In the past, Belarus and Ukraine were in dispute with Russia's Gazprom over the price they pay for gas. Expert Institute of Energy Studies at Oxford University, Jonathan Stern, believes that the prospect of disruption to its supplies for Europe is "unlikely" Such a threat would be real, 'if they refuse to pay for Russian gas supplies at market prices and if you allow their contracts". Gazprom building direct pipelines to Western and Southern Europe is further reducing this threat. In this case, there will be the need for a pipeline running through Belarus and Ukraine. The European Union has a higher consumption of Natural gas than crude oil, and due to the fact that we have limited supplier of Natural gas than crude oil makes energy security uncertain with full assurance.

One of the significant threats of Energy Security in Europe is using Energy as a weapon to consumer countries in Europe. Russia-Ukraine gas disputes (also called gas war) - refers to the many disputes between the Russian gas supplier Gazprom and Ukraine, especially in the supply of natural gas, its price and debts. These disputes are a threat to gas supplies to many European countries, which are dependent on Russian natural gas. A serious dispute began in March 2005 about the price of gas transit. The culmination of the dispute was to cut gas supplies to Ukraine on 1 January 2006. The situation returned to normal 4 January 2006. When supplies have been restored, with the signing of a preliminary agreement between the Russian and Ukrainian gas companies. Another clash took place in October 2007, again concerned the debts of Ukraine and led to a reduction in gas supplies in March 2008. In the last months of 2008. Relations between Gazprom and Ukraine again became strained because of a dispute over the size of the debt of Ukraine. In January 2009, a dispute has led many European countries to shut off the gas supply from Gazprom pipeline passing through the territory of Ukraine.

The situation described above proves that natural energy resources can be used as a bargaining counter during political crisis. Taking into consideration big dependence of Europe on external sources of energy from outside of Europe, it is just the beginning of challenges Europe may face because of threats related to relations with biggest energy suppliers.

Alternatives to Energy Security

Over the last decade the European Union has taken several precaution in securing energy for it member countries, in ensuring diversified range of energy sources start from Fossil fuel (Gas, Oil and coal) to renewable and nuclear energy (wind energy, solar, hydroelectric, geothermal and biomass). (Commission, European Commission, 2015) European Union unlike other rising economies like China and India consume more energy, which leads to increase in climate changes. But the European Union rather choose to reduces its energy consumption by developing infrastructures to help deliver low energy economy to ensure a sustainable and uninterrupted energy supply.

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Oil and Gas

Oil and Gas are the highest demands of energy on the global market .Due to global warming, insecurity, increase in price and the monopoly of Russia in Europe and OPEC in the world has made oil the center of attention for the world. With Oil and gas on top of EUs assurance list for its citizens, its only goal is to have and assured uninterrupted energy at a reasonable price for all Europeans.

The EU further on in making energy security in the oil and gas sector more transparent competitive and stable, which is why it has taken precaution to diversity energy such as the construction of the Trans-Caspian gas pipeline , an initiative from the EU to promote energy security .

This is a pipeline construction project that will see the transportation of Natural gas from Turkmenistan and Kazakhstan to the European Union. This is one of the various solutions including trading more extensive with specific OPEC countries to assure diversity and uninterrupted energy supply.

Renewable Energy

Renewable Energy can be classified as energy that come with resources that are natural to harvest such as Solar power, Wind, (thermal, photovoltaic and hydroelectric power, tidal power, geothermal energy and biomass) . All this options can be considered as alternatives for Fossil fuel. Developing countries in Europe such as Norway are gradually adopting the use of renewable energy to cut down the greenhouse gas emissions that are produced by fossil fuel. But adopting this method of a more natural resourceful energy, the EU aims to diversify their demand for energy and suppress their demand for fossil fuel. Also important to say that renewable energy ensure them more energy security than an unreliable fossil fuel.

Adoption of this method by the European Union's doesn't just assure energy security, it also cut down gas emission and regulates employment opportunities within Europe and reduces dependence on fossil fuel energy.

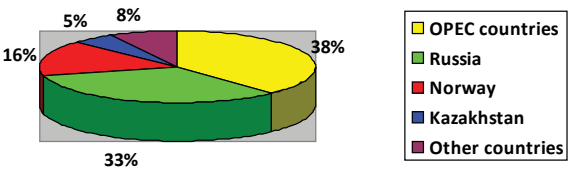
EU Energy Partner Countries

Despite the improvement of energy intensity, EU- 27 is a net importer of energy; EU runs out of resources. This dependence on import may not be a problem, but - As recent turbulence in the energy market - requires appropriate policies on the part of the EU.

The EU's energy production meets less than half of total IT demand, the rate of dependency on energy imports peaked in 2006. LEVEL 54 %. The share of individual energy sources in total imports was 60 % for sticky, 26 % for natural gas and 13 % for solid fuels. The share of imported electricity and renewable energy accounted for less than 1%.

In 2006, oil imports to EU countries accounted for 608 million tons of oil a contractual term. Most of the oil came from imports from OPEC countries (38%) and Russia (33%), while Norway and Kazakhstan provided 16% and 5% oil. The European Union produces less than one-fifth of its total consumption of this energy source.

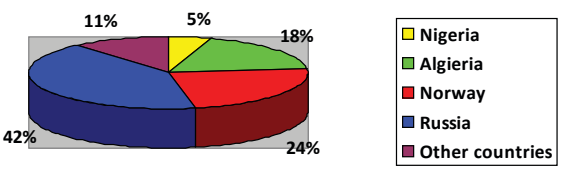
Table 1 Suppliers of the petroleum to the EU within last decade



Source: Europe's current and futures energy position. Demand – resources – investments", 2008, Commission Staff Working Document, EC, COM (2008) 744, Brussels.

The situation looks much better in the gas sector, as domestic production (located mainly in the Netherlands and the UK) caters to about two-fifths of the EU's needs. Natural gas is imported mainly from four major suppliers: Russia, Norway, Algeria and Nigeria.

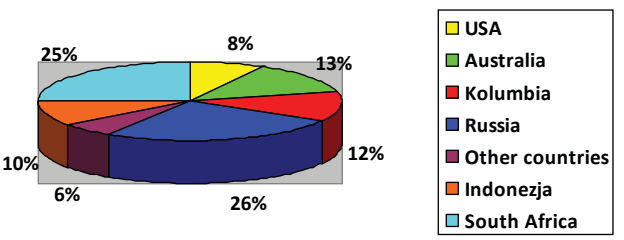
Table 2 Suppliers of the natural gas to the EU within last decade



Source: Europe's current and futures energy position. Demand – resources – investments", 2008, Commission Staff Working Document, EC, COM (2008) 744, Brussels.

Sources coal imports are more dispersed - most supplies come from Russia, South Africa. Australia, Colombia, Indonesia and the United States.

Table 3 Suppliers of the coal to the EU within last decade



Source: Europe's current and futures energy position. Demand – resources – investments", 2008, Commission Staff Working Document, EC, COM (2008) 744, Brussels.

Although the EU's energy imports is high and continues to grow, the situation varies among Member States. Denmark is the only country that is completely independent of energy. In the case of Polish and UK rate of dependence

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on imported fuels is low and fluctuates around 20%. At the other extreme are Ireland, Italy, Portugal and Spain , where the rate of dependence on imports exceeds 80 %. Cyprus and Malta (due to the geographical location), and Luxembourg is a country totally dependent on imports.

Energy Efficiency

The European Union aids the development of energy efficiency by decreasing its consumption of energy and eliminating energy diffusion. In 2006, the European Union pledged that by 2020, it would decrease its annual consumption of energy by 20%. This implies that it will decrease its consumption of energy in sectors like manufacturing, construction, transportation and every conversion. To achieve its goal it has taken multiple precautions to orient multiple stakeholders to set a minimum standard for energy efficiency and rules for infrastructure, service and product labelling.

Conclusion

In summary, we can observe that energy security is a very important factor for the European Union and energy security is one of the bottlenecks it's currently facing now. But with its policies of diversification and decrease in consumption of fossil fuel they are aiming for a more reliable, sustainable energy security for their citizens. In effort to this the have established good partnerships and project both within the country and between other regions like the Caucasus region and central Asia to assure better ways of diversification of energy and decrease its dependence on Russia for fossil fuel and expand infrastructure in adaptation of other natural resourceful sources of energy that reduces climate changes and gas emissions. Furthermore I forecast a more independent European union after the accomplishment of its pipeline projects, Nevertheless in a couple of year to come, there is still a lot of dependency needed to be done by the European union when it comes to Energy Security with Russia . The European Union import more than half of the energy it consumes, which makes it highly dependent in terms of Fossil fuel, It imports (Commission, European Commission, 2015) (90% of crude oil and 66% of Natural gas) total import equals €1 billion per day on imports. (Commission, European Commission, 2015) (Commission, European Commission, 2015)Furthermore to achieve its 2030 goals of cutting down 40% in greenhouse gas, 27% share for renewable energy and 27% for energy saving, It needs to focus more on renewable energy and seek energy sustainability from its new partners from the Caspian basin region and other international every suppliers.

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