

Ensuring Security of Supply of Natural Gas in the European Union's Common Energy Policy

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Abstract: The problematic of energy policy is nowadays widely disputed in the European Union community. In a global context characterized by highly and raising dependency of the economic activity on the energetic resources, the European authorities had launched a strategy in this sector which regards the problems of access to secure and affordable energy products. The aim of this paper is linked to the natural gas field of the European energetic concerns, and it assumes the high dependency of internal consumption on imports, more than half of the natural gas that is used in the 27 states comes from abroad. Ensuring a higher level of security in the supply is one of the goals that European Union wants to achieve on medium and long term. In these circumstances, actual measurements take into account different type of actions: stabilize relations with existing partner gas exporters (Russia, Algeria, Norway); diversification of transport routes coming from these countries, especially in the idea of trying to avoid transit countries (mainly Ukraine and Belarus); and finally opening discussions and investing in alternative routes which should transport the gas from new suppliers placed in the Caspian Sea or Central Asia region.

Keywords: energy policy; natural gas; security of supply; transit countries

JEL Classification: P48; Q4

1. Introduction

Energy represents one of the main points taken into account when we are talking about economic and social development, and also it influences the improvement of live quality. Natural resources, the energetic ones in special, had influenced and still do, the entire human activity, in special the economic one, although we are talking about national or internal action plan, or at global level, being in the same time one of the core elements in global relationships among countries (here there are considered two main categories, the net exporters and importers, there are no cases worldwide of countries with perfect equilibrium between internal consumption and production of energy). The construction of the European Union in the form that it achieved in current time is the best example of good and deep cooperation between a large numbers of states. There is „desperate” need at EU

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level on a common energy policy. In fact, is needed a „policy based on a vision”, which in turn contains three main components: first, it should be market oriented (competitive and efficient), secondly, it should be accompanied by sustainable savings in energy, and in the third plane it must ensure energy security, meaning here the supply across the entire community space (Glachant et. all, 2010, p. 2). These directions surprise summary but consistently the ideals of European authorities in energy, which, once achieved would contribute to a better cohesion on economic process itself.

2. Main Features in the European Union’s Energy Sector

It is well known that between the economic growth and the energy consumption of national states there is a direct dependency relationship, energy being considered “the main intermediate product that supports a country’s economic and social development”, alongside the capital and the labor force, becoming a key production factor (Tolon-Becerra, 2010, p. 7093).

Starting from the first and second industrial revolution emerged the possibility of developing new production facilities, which in turn suffered a wider diversification, thus leading to a bidirectional relationship. The use of wood and coal as the main resources of consumption was specific in the first half of the last century, but the technological innovations that appeared after the Second World War determined a raising demand for new types of fuels, such as oil and gas, a trend that is provisioned to be maintained or even it can lead in next 20-30 years to a deepened dependency.

Table 1. The evolution of energy intensity for most developed economies from 1999 to 2010(TOE*/millions EUR)

	Global	USA	EU	Japan	Russia	China	India
1990	471	355	233	139	2943	2040	1543
1995	445	340	209	145	3401	1465	1452
2000	405	306	187	145	3074	1059	1295
2005	405	278	181	136	2433	1059	1086
2010	392	267	169	129	2171	981	1007

Source: The European Commission, Energy Pocket Book 2010,

http://ec.europa.eu/energy/observatory/statistics/doc/2010_part_2_energy_pocket_book_2010.pdf

**Tones of Oil Equivalent (unit of measurement equal to the chemical energy released by burning one tone of oil)*

The energy intensity is determined based on the ratio between the internal production, expressed in millions EUR, and the used energy quantity, measured in.

It can show an economy's degree of dependency towards the use of energetic resources. As we can see from Table 1, the situation in the developed states or regions, such as the USA, Japan or the EU shows low levels by comparison to developing economies, such as China, Russia or India. The intensity indicator shows that for small values the economies are based on new technologies or services. Although at first glance, according to the chart below we can observe an increase in energy use, which together with the intensity leads to the conclusion that the European economy is becoming increasingly competitive, energy consumption growth leading to bigger increases of the productivity. The same chart shows the first three components of consumption, namely the three basic resources: coal (that shows a downward trend since 2005), natural gas, which has superior rise than oil. Beside the fact that globally the intensity is following downward trend, the quantitative measurements point out that in absolute value the consumption is increasing (roughly 15% in the last decade).

The resources procurement needed to satisfy the internal demand had been, and still is on the main topics of the national authorities. The European Union is now attempting to transfer this topic to the Community level, developing the idea of a unified community, which can be seen as a strong negotiating partner in the relationship with external suppliers of energy, due to the fact that if, for example we consider the natural gas, from 27 member states only Great Britain and Netherlands are capable to cover internal demand from domestic sources. The other 25 states enjoy different percentage of external dependence, based as we will confirm later on a relatively small number of suppliers.

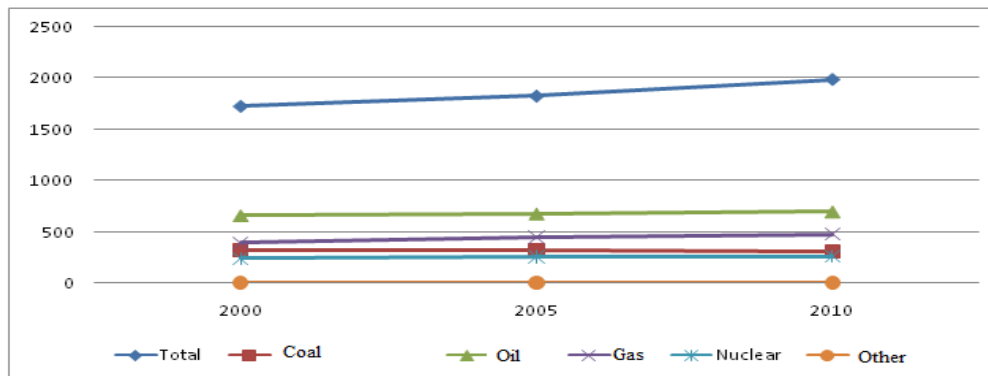


Chart 1. The distribution of the EU domestic consumption per energy resources categories (millions toe)

Source: own processing based on data from Eurostat and BP (2011)

The dependency on imports, showed in chart 2, captures best the overall feature of the European energy system. Lacking the capacity to provide the necessary resources, the EU resorts to external sources in percentages more than half higher

for the primary energy resources (with the exception of coal that is less than 50 % imported). It is important to mention that although oil is the main imported good, there is an increasing tendency towards the use of natural gas, it having values over 50 %. This is one of the main reasons for enacting an energetic policy within the European Community that needs to cover the issues of achieving a higher degree of security in the supply of the imported products.

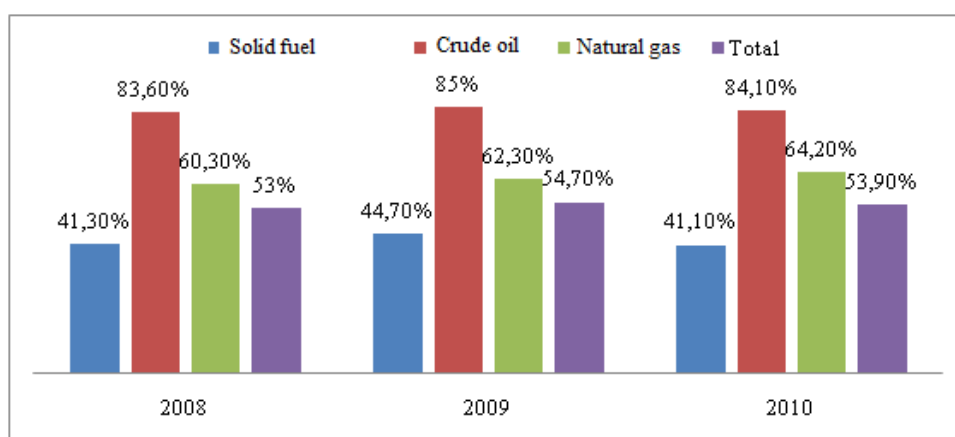


Chart 2. The evolution of EU's import dependency broken down by major energy resources

Source: Eurostat (online data codes: nrg_100a, nrg_101a, nrg_102a and nrg_103a)

3. New Challenges for a Common Energy Policy

The availability of modern energy resources (renewable) and classic (fossil fuels) is considered a critical foundation for the future sustainable development. Within the international community there is an increasing debate on the topic of establishing a common goal on the “universal access to modern energy services”, based on a “political priority” that should become a matter on the national agendas of all member states (Brazilian et alli., 2010, pp. 1-3).

In fact no “energy system is not invulnerable to the possibility of interruptions arising from one or more suppliers or due to fluctuations in the demand” (Creti and Villeneuve, 2009, p. 106). The Russian gas crisis from 2006 or 2009 are also well known, moments when the Ukrainian influence as an intermediate in the EU gas transmission became a topic on the agenda, but at the same time we observed a decrease in the Russian total production of over 10%, which could be considered an additional cause of the temporarily supply interruption.

In order to meet energetic needs, the EU members depend, mostly, on imported fossil fuels; which raises important questions related to three issues:

- supply security;
- environmental policies;
- the decision-making process in the energy sector.

Of course, there is no doubt that any energy production or consumption process, in its various forms and uses, has a huge impact on the environment. In the EU, nearly 80% of total energy consumption comes from fossil fuels, which is the main source of emissions of greenhouse gases, which finally leads to climate changes. The energy-related emissions have environmental effects in the sense of air, water and soil pollution, thus presenting the risk of damaging human health but also affecting the nature or the biodiversity. Thus European intentions to reduce pollution find a rational explanation, especially maintaining a very productive environment but in the context of increasingly scarce harmful emissions. In this case the EU is supporting investments programs among member states in the development of the renewable sources, in order to achieve a 20% increase in energy consumption coming from these sources.

In their vast majority fossil fuels come from foreign sources, from outside the EU, thus the Union is becoming highly dependent on energetic imports. The dependency on a small number of countries that have sufficient natural sources of oil and gas, some of them being characterized by economic and political volatile environments (Russia or states near the Middle East), creates very unsafe trade relationships, often defined by uncertainty that comes from the exporting partners. Therefore, the reduction of greenhouse gas emissions and the assurance of a high security of supply became the main political commitments made in the Community that realized the need to change “the way we produce and consume energy” (Adelle et alli., 2009, p. 9).

Recent developments in coal, natural gas and oil prices are signs announcing the “fundamental changes in the global energy market”, fueled mainly by the increased demand for fossil fuels in values higher than the supply capacities, especially in “regions / countries known for high levels of consumption” (de Jong, van der Linde, 2008, p.2). Thus the impossibility to meet the demand due to a variety of obstacles, that are “above ground” and not necessarily geological factors, which prevent the increase and stabilization of the supply. So another key aspect of the European energy policy is the subject of creating a single market in the energy sector. The energy products should also move freely within the Community as goods and capitals do, a single internal energy market can only be achieved by eliminating trade barriers and obstacles. It is also necessary the harmonization of national fiscal policies, especially those related to price formation, or legal norms on the environment. An internal energy market is one that may confer a healthy growth of the European economy, ensuring a high level of supply.

One of the main components of energy security is the security of supply, closely linked to economic development both at micro and macroeconomics. Imports and exports of energy products have a significant impact on the countries' balance of payments. Similarly, the state budget is particularly influenced by subsidies, taxation and the costs incurred by state-owned companies operating in the energetic sector, them having the market monopoly in most cases.

4. Natural Gas Supply in the European Union

Comparing the existing situation in the EU for natural gas to the one in USA or in Russia, according to the graphs below we can see the superiority of U.S, in terms of a much higher domestic consumption and upward trends for all 3. The USA has operating capacities similar to Russia (with values more than double compared to the EU), but at the same time insufficient to satisfy the domestic demand.

Russia on the other hand ensures its domestic demand (approximately 400 billion m³) using only a part of the total production, that surpasses 550 billion m³, the gas excess being mostly exported to the EU. At the same time, Russia trades other fuels, but what is specific to the Russian natural gas is that it covers a high percentage of the EU final consumption, which emphasizes the dependence of the European energy sector on few suppliers.

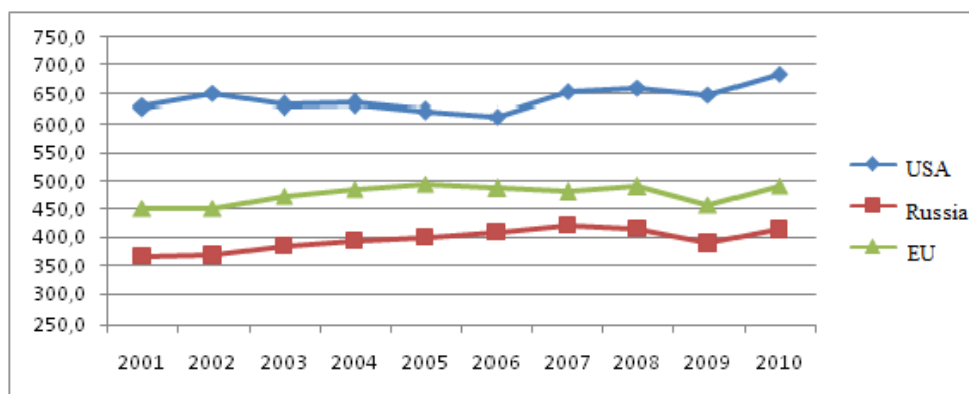


Chart 3. Natural gas consumption (billion cubic meters)

Source: own processing based on data from BP (2011)

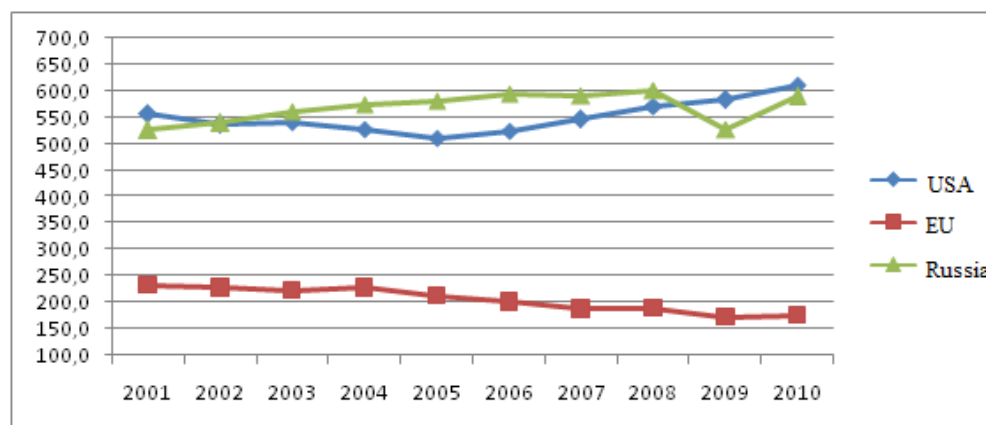


Chart 4. Natural gas production (billion cubic meters)

Source: own processing based on data from BP (2011)

The EU shows a contrary development of the two trends, the situation being characterized by increases in consumption that determine decrease in the production capacity. Unlike the EU, U.S. shows an increasing trend of gas production since 2005 due to the discovery of important deposits in the northern region, which began to be operated at the time. The diversification of the import relations strategy envisages structure of discovered and confirmed reserves, so that partnerships are usually signed based on a certainty regarding the delivery capacity. As the following statistics show, Russia has over a quarter of global natural capacities and therefore, in terms of proximity to the EU, it is one of the most attractive suppliers. An additional feature that must be pointed for this structure is the fact that among first 10 countries with largest reserves of gas discovered, there is no one from the European Union. This stresses out the inability of European space to cope with a raising demand because of the lower internal capacities.

Table 2. The structure of the natural gas reserves discovered and exploited fully in 2010 (trillion cubic meters)

Country	Absolute value	Percentage of total
Russia	47,57	25,0%
Iran	29,6	15,5%
Qatar	25,47	13,3%
Turkmenistan	7,5	3,9%
Saudi Arabia	7,46	3,9%
USA	6,9	3,6%
United Arab Emirates	6	3,19%
Nigeria	5,2	2,7%
Venezuela	4,9	2,6
Algeria	4,5	2,3%

*Source: Natural Gas Market Review, available at:
<http://www.iea.org/publications/freepublications>*

The natural gas imports in the EU countries take place through pipes coming from the main producing closest areas: Algeria, Libya, Norway, Russia and Turkey. In the table below we find a summary of the main pipelines, both those already in use and also those under construction or at the project stage, with the specification that the considered capacity is the maximum, as follows:

- From Algeria the Trans-Med pipeline carrying gas to Italy via Tunisia and Sicily, and the Maghreb-Europe line that supplies Spain through Morocco;
- From Libya - to Italy via Sicily
- From Norway the Langeled pipeline starting at the Ormen Lange (the northern areas of Norway) and supplies the United Kingdom, plus a second high capacity pipe that connects to the North of the Netherlands
- From Turkey the interconnection with Greece that insures the distribution of resources from the Caspian area and the Middle East
- From Russia approximately 80% of the exported gas to the EU transits through Ukraine, where the transportation system is divided into two: a part of the pipes end in Slovakia, the Czech Republic, Germany and Austria; and the other half provides supply to Moldova, Romania and Bulgaria (Bilgin, 2011).

As we can see, Russia has an annual export capacity of 154 million cubic meters, which represents more than half of the total 307.5 that EU imports. Russia was a “reliable supplier” in the 40 years that it served as “the largest exporter to the EU”. Risks in bilateral relations appeared with the “endangering of the Russian situation due to problems arising in terms of transit”. The undermining of the delivery of Russian gas in January 2006 and 2009 to Bulgaria, Romania, Greece, Croatia or Serbia came as a result to the proposals from Ukraine, that, wanting to take advantage of the key position in the transport route, planed a renegotiation of its own price for the imported gas. Thus, the energy security issue is not just about its conceptual meaning accompanied by an implementation by member states or the European Commission, but rather is associated with a “pipeline policy” (Bilgin, 2011, pp. 1085 - 1086).

Table 3. Natural gas pipelines and natural liquefied gas delivery points (billion cubic meters) in 2007

	Existing	In Construction	Project stage	Total
Natural gas source countries				
Algeria	35,3	-	24	59,3
Libya	8,0	-	-	8,0
Norway	108,2	25,5	4,0	137,7
Russia	154,0	13,0	46,5	213,5
Turkey	2,0	-	28,0	30,0
Total	307,5	38,5	102,5	448,5

Liquefied natural gas delivery points				
Belgium	4,6	-	4,6	9,2
France	15,5	-	8,2	23,7
Greece	1,9	-	3,4	5,3
Italy	3,7	-	24,2	27,9
Portugal	4,1	-	-	4,1
Spain	26,7	9,4	3,6	39,7
Great Britain	-	14,8	25,9	40,7
<u>Total</u>	<u>56,5</u>	<u>24,2</u>	<u>69,9</u>	<u>150,6</u>
Total	364,0	62,7	172,4	599,1

Source: (Kjarstad, Johnsson, 2007, p. 879)

Due to the frictions that occurred lately in the relationship between Gazprom and Ukraine or Belarus, the Russian authorities are also interested in ensuring an increasing gas supply to the EU and therefore also have regard to the following: “the construction of new gas pipelines that will cross the Baltic Sea or the Black Sea; and the expansion of existing pipelines’ capacities up to more than 200 billion cubic meters per year through repairs and agreements signed with NaftoGaz Ukraine (national Ukrainian company similar to the Russian Gazprom)” (Sagen, Tsygankova, 2008, p. 872).

However Russia remains a reliable energy partner, yet the future of bidirectional relations between EU and Russia is concentrated in diversifying the transport routes and eliminate transitory countries in the supply activity (mainly Ukraine and Belarus). The major projects developed are concentrated in building two major pipelines: *South Stream* which should cross the Black Sea and reach the shore near Varna port in Bulgaria, from where the gas will be pumped to Serbia, Hungary, Slovenia and Italy; and the second major project is *Nord Stream*, which is already operational and it supplies Russian gas from Vyborg to Germany, crossing the Baltic Sea.

The new technologies for liquefying natural gas (process which increases the density about 2.5 times) that are part of the European plans for the next period are a way to enhance security. By liquefaction the traditional pipeline transportation is avoided opting for the road or rail transportation. This process is not an absolute novelty, the LNG (Liquefied Natural Gas) being used since the 1960s, albeit at a very small scale, in order to distribute the gas to “isolated markets” (especially Japan and South Korea) over long distances (Egging et. all, 2008).

The only problem with this technique is related to costs, manufacturing and transportation that cover distances under 3000 Km are higher than the classical pipeline solution. “In the 2000s the Europeans showed an exacerbated enthusiasm regarding the liquefaction of gas, identifying the benefits for companies concerning domestic transport on short distances and to occasional destinations”. This option

also shows advantages in relation with transit countries, meaning that any pipeline, in addition to the initial rather large investment, implies their permanent on national territory. Thus the political and commercial risk of interruption is quite high, whereas the liquefied form has the advantage that it can change the route to the user and be delivered in a very short time (Stern, Honore, 2009, p. 404). According to data available in Table 3 the percentage of LNG in total European imported gas is only 15%. This means that there is a reliable perspective on raising the usage of this technique, especially in the Central and Eastern part of the EU. The main users of LNG are countries in western part, mainly Great Britain, Germany or Spain.

Another security matter is related to the development minimum required facilities within the Community for stocking energy products (as regards to gas the storage in a liquefied form is easier, even if it requires some conversion costs). By this, the disturbing effects are much reduced, effects that might arise in the event of external supply disruption, due to the fact that these stocks would provide sufficient resources to industrial consumers for uninterrupted production process and also would avoid the discomfort for the household.

5. Conclusions

Energy wealth is one of the main sources in creating geopolitical advantages for countries that hold important energetic resources (for example those in the Middle East, the Caspian region or Russia). This gives them the opportunity to exercise coercive pressure on country partners who import these resources. Precisely for this reason there is a need to implement a common strategy at EU level to develop the idea of a unified community, which can be seen as a single strong negotiating partner with the energy exporters. Undoubtedly energy policy is one of the key elements in the evolution of the integration process in the European Union. The high degree of dependence across mostly of the member states in the natural gas field leads to a greater concern on security of supply. In this context the EU proposes three broad categories of options: firstly it is taken into account the reconsideration of the relations with Russia by finding new transit routes that should avoid transit countries, secondly the Europeans are considering de diversification of supply through establishing new commercial agreement with other suppliers than Russia; and finally it is promoted a greater usage of the LNG, which should cover the supply from distant sources.

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