

Energy Security in the European Union

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Abstract: According to the European Commission, the three challenges that Europe must face related to energy are sustainability, security of supply and reaching an effective competitiveness in the internal energy market. To meet these three challenges, the Commission deems necessary to implement a common energy policy. To this end, it proposed an action plan based on the effective creation of an internal energy market, the solidarity between Member States and security of supply for oil, gas and electricity. Therefore, energy security is one of the main concerns, and so one of the priorities, of the new European energy policy proposed by the Commission. This paper tries to show that even though energy has been on the basis of what we call today European Union, it has been extremely complicated to get a common energy policy. Bearing this in mind, energy security has been one of the main areas of consensus that has led EU to the mentioned Commission proposal, and we can see now the first steps of the so much wanted common energy policy.

Key words: Energy, energy policy, European Union, energy security, security of supply.

1. Introduction: Energy Outlook in the EU Right Now

It is important to consider the energy situation present nowadays in Europe, which went from 15 Member states to 27 in just a few years, and the situation of the main countries that form an integral part of the international environment. Also, the short and mid-term consequences that are going to take place for energy related reasons shouldn't be forgotten.

Due to the economy and population growth, it can be seen that a quick increase on the world's primary energy demand ever since the year 2000 and the forecast for 2030 is pretty much the same. Energy demand will grow an average of 1.6% annually between 2006 and 2030, from 11.730 million of oil equivalent tons to a little more than 17.010 million, which accounts for an increase of about 45% [1]. In the international scene, China and India stand out as the main emerging countries and they account for more

than half of World increase in demand between 2006 and 2030. This demand growth has been slowing down the last few years due to the international economic recession going on from August 2007.

In the last few years, sensitivity of oil prices has become obvious and has caused short-term imbalances in the market. There are two main reasons. The first one is the price increase, reaching its highest point in 2008 and getting up to much higher levels than those present at the beginning of 21st Century. The second one refers to the oil short-term price volatility.

Another aspect that we need to consider is the discovery of oilfield sites. They are more and more scarce and the production coming out of the oilfields is going down at a steady pace. One of the main concerns coming from this matter refers to the exhaustion rate of the oilfields production as they mature. The outcome of the analysis carried out by the World Energy Outlook 2008 shows the possibility of a long-term acceleration of those observed rates (observed fall in production) in all the main production regions of the world.

The authors are also seeing how the gas demand is on the rise and its production forecast is very similar to

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the oil demand since they're getting worst year in and year out. In most European countries, problems arising around nuclear energy make least probable for nuclear energy to be the alternative energy to replace the fossil fuels. Authors don't see a clear path in renewable energy sources. The main reason for this is the current evolution pace of applicable technologies since they're unable to solve the environmental problems in order to guarantee, at the same time, the energy supply.

Europe is characterized by an energy consumption that has maintained a steady growth trend. At the beginning of the 21st Century, the European Commission estimated that the total energy consumption of Europe's Member states was going to increase 15% until 2030.

It can be seen in Table 1 how fossil fuels (oil, gas and coal) account for almost 80% of the total primary energy supply in the EU-27. One of the main objectives being pursued by the energy policy of the future is to reduce the dependency on this type of fuels in favour of renewable energy sources. If we take into consideration a broader timeframe, it can be seen that the renewable energies are growing in a steady pace and that they account in 2010 for almost a 7.5% of the total primary energy supply. Even though this rate seems to be a bit low, it is also a significant piece of information that will allow us to fulfill the obligations accepted in the Kyoto protocol, and, at the same time, to pursue a number of ambitious objectives taken on by the European Union (EU) related to the participation of renewable energy sources.

Nuclear energy accounts approximately for 5%. This

subject deals with current issues due to the different positions taken by Member states. Member countries are the ones in charge of managing their involvement in energy matters, and consequently in view of their different positions, all the EU will do is to propose a debate on this matter, due to the specific weight of its production (providing one third of the electricity needs in the EU), which is considered a "clean" energy since it doesn't generate any greenhouse gases, and is the "cheapest" energy followed by natural gas, coal and wind.

The steady increase in the demand of energy within the EU countries causes an increment of energy resources imports, and consequently, an increase in foreign dependency which grows every year and reveals the absence of an energy policy with relevant objectives, priorities, instruments and concrete actions. According to the European Commission, it was estimated that the EU will have to import more than 70% of its energy sources by 2030, compared with 50% at the beginning of this century [2].

The main problem is the great dependency that EU's countries have, considering the fact that there are less import sources. Analyzing this piece of information, we'll see that the main imports of oil and gas come from Russia, Norway and the OPEC countries. The incorporation of 12 new countries to the EU has caused a dependency increase on crude oil and gas coming from Russia [3]. In the European scene, the energy dependency and vulnerability to confront outside sources is a common characteristic to all member States, which doesn't generate any insecurities in the case of

Table 1 Total primary energy supply (%): EU-27 and representative countries, 2008.

Source/country	EU-27		Germany		France		United Kingdom		Poland		Spain	
	1997	2008	1997	2008	1997	2008	1997	2008	1997	2008	1997	2008
Oil	38.50	34.53	39.5	31.5	34.9	31.6	36.0	32.58	17.9	24.7	53.0	47.2
Gas	21.01	24.57	20.5	23.13	12.7	14.59	33.5	38.78	9.2	12.74	10.5	22.12
Coal	20.24	18.77	24.8	26.15	5.9	5.06	17.6	18.29	68.8	57.39	17.0	13.9
Fossil	79.75	77.87	84.8	80.8	53.5	51.2	87.2	89.7	95.9	94.8	80.5	83.22
Nuclear	14.30	13.87	12.7	11.06	41.7	43.45	11.2	7.77	0.0	—	13.4	9.98
Renewables*	5.95	8.26	2.5	8.14	4.9	5.33	1.6	2.58	4.1	5.19	6.1	6.81

*: Hydro, geothermal, wind, solar and biomass.

Source: International Energy Agency, 2010 and own elaboration

Norway, but it does when the exporting parties are Russia, Algeria, Central Asia or the Persian Gulf [4].

It can be considered that the production of EU Member states (especially Great Britain) is important. 46% of gas consumption and 21% of the oil consumption has its origin in member countries. Nevertheless, many sector specialists foresee that oil reserves in the EU and Norway could run out between 2020 and 2030 [5].

In environmental, economic and social terms, both supply and demand are unsustainable in a broad timeframe. That's the reason why the global energy system must turn around. In this report they stand out the two big energy challenges that must be achieved in the long run: first, the energy supply in a reliable and accessible way should be secured; and secondly, an efficient system of energy supply should be achieved, keeping up with the environment (minimal CO₂ emissions).

2. EU's Energy and Political Security Background

In today's Europe, made up of 27 member States, there is an everyday debate about the need to pursue a common energy policy with clear objectives, to consolidate the unstable Internal Energy Market and to create mechanisms that will let us reach stability in energy security matters.

In order to better understand the meaning of energy policy in the EU, let us focus in one of its definitions as: "a set of proceedings emanated from the Commission, the Council and the Parliament to act upon the quantity, cost and availability of a number of energy sources, with a especial consideration to the environment" [6].

The EU and the rest of the world need energy fluxes that are reliable, affordable and viable. The enormous energy dependency and vulnerability of the EU member States from abroad reveals the key concept of energy security. One of the main challenges of the EU's "future energy policy" is to guarantee the mentioned security in all of its member states.

This concept is also known as "security of supply" or

"security of goods". It's not relevant at this point how we call it, the important point is its meaning. After taking a first look, energy security in energy-consuming countries means security of supply. In these terms, we find the most widespread definition of energy security, "availability of an adequate energy supply at affordable prices" [7] but it is also the most subjective and, subsequently, less operative.

2.1 First Historical Appearances

Way before the signing of the Energy's European Chart (1991) and the existence of the Green and White Papers, published by the Commission, there were two treaties of great relevance to lay down the principles for a much needed and common energy policy in the EU, where the founding member States were aware of the necessity of a common approach in energy matters: the ECSC (European Coal and Steel Community Treaty), in 1951, and the EURATOM Treaty in 1958. The first indication is got in history about "energy security" when they revealed that institutions must ensure the regular supply of common markets and guarantee a fair access to production means, ensuring the implementation of lower prices and promoting better conditions for workers.

In line with these important treaties for the future of energy relationships, we saw the evolution that took place in the EU which went from EEC (European Economic Community) to the current EU.

In 1991, the European Commission proposed the creation of the European Chart for Energy. Negotiations began in Brussels, in June 1991, and concluded with the signature¹ of a final document in

¹ Signatory countries: Albania, Germany, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Canada, inter-State Economic Committee, European communities, Czechoslovakia, Cyprus, Denmark, Spain, United States of America, Estonia, Russian Federation, Finland, France, Georgia, Greece, Hungary, Ireland, Iceland, Italy, Japan, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta., Moldavia, Norway, Netherlands, Poland, Portugal, United Kingdom and North Ireland, Romania, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan and Yugoslavia.

The Hague, December 16 and 17, 1991. The main objective of that Chart was literally, “to improve the security of energy supply and maximize the efficiency of production, transformation, transportation, distribution and use of energy, in order to increase security and minimize environmental problems, over an acceptable economic base” [8].

The main objective derived from a series of specific objectives. The first one was to obtain an open and competitive market for energy products. The second objective was to establish in the first place, and later intensify, the cooperation in the energy field between the former USSR and today’s European Union. The third one tried to achieve a bigger energy efficiency combined with the environmental protection. These objectives were very ambitious looking back at those years, and today they are necessary to attain the last objective of the EU as a whole, a common economic policy. The Chart was a political compromise between Eastern and Western Europe, without any legal obligations, and where all 51 States and International Organizations signing the Chart committed themselves to pursuing those objectives and to respect the Chart principles.

2.2 The First Papers of the Commission on Energy Security (1995-2000)

It is important to know that the “Green Papers” are Communications published by the Commission about a specific political area (health, food, defense, energy, etc.). They normally state a number of different ideas in order to create a political debate. These papers with the cannot be confused with White Papers, also published by the Commission. The White Papers are characterized by the fact that they are documents that contain common action proposals within a specific scope. In some occasions they are a continuation of a Green Paper already published with the aim of initiate a consultation process within the European scope. Also, they contain a collection of official proposals about different political issues and they are the guide to pursue them.

2.3 White Paper on Energy Policy for the European Union

Before starting to study the Green Papers, the authors have to highlight the 1995 White Paper based on the EU’s energy policy. This book highlighted the importance of national markets integration, rejecting its fragmentation and the negative effect caused by the exterior dependency since it produces a political and economic weakening between member States. Even in 1995 they defended as main energy objectives: having an adequate competitive framework, security of supply of hydrocarbons (gas and oil) and environmental conservation [9]. Later on, in 2006 Green Paper, it can be seen that these objectives will be pretty much the same as they propose for the EU’s future energy policy.

2.4 The First Green Paper

One of the subjects considered with especial insistence in the previous White Paper and developed in detail in 2000 Green Paper, “Towards a European strategy for the security of energy supply” [10], is the vulnerability of the external dependency in member States.

In energy matters, from the end of last century to the beginning of the present one we face common problem in most countries within the EU: the security of energy supply. It is a fact that the primary energy production in the EU will be enough to satisfy the final energy demand of all member States. It can be foreseen that the dependency they have from abroad is going to increase, if anything (authors estimate it will reach 70% by 2030). It becomes also evident that the EU has scarce capacity to have an influence in the energy supply conditions and be able to have an influence in the demand, especially over energy savings, in buildings and transportation alike. The final report carried out on this Green Paper allows us to take a time to reference the weakening of energy supply in the EU over a 20 to 30 years period and its geopolitical, social and environmental fragility, always considering the commitments made by Europe in the Kyoto Protocol.

2.5 Analyzing the New 2006 Green Paper

The 2006 Green Paper offers a series of suggestions and options that could be the basis for a new and general European energy policy. From a methodology point of view, it seems like a more concise and orderly text; it has more conceptual rigor than the documents previously elaborated by the Commission.

The European Commission encourages all member States to do as much as possible in order to develop a common energy policy based on three main objectives:

Sustainability: consists on developing renewable and competitive energy sources, with the ability to become alternatives to fuels needed for transportation; containing the energy demand in Europe; and at the same time being able to fight proactively against climate change, promoting energy efficiency.

Competitiveness: to be able to improve the efficiency of the European network developing the energy internal market. To this purpose, it must assure that the opening of energy markets includes benefits for consumers and the economy in general, and at the same time it encourages a clean and efficient energy production, avoiding the impact of the international high prices of energy on the EU's economy and maintaining Europe within the vertex of the energy technology.

Energy security: improve coordination of the internal energy supply and demand in the EU within an international context [11]. The authors have to tackle the increasing dependency of the EU on imported energy products through a series of actions: reducing the demand, diversifying the energy mix with a bigger use of competitive supplies and renewable energy sources, diversifying supply sources and importation routes; creating a framework that encourages adequate investments that could meet the increasing energy demand; and be able to assure that all European citizens and businesses have access to energy.

3. An Energy Policy for Europe

If there was a decisive year for the future common energy policy, that was 2007. In January of that year, the

Commission made public a document based on the 2006 Green Paper where they revealed a package of integrated actions related to energy and climate change in order to reduce CO₂ emissions in the 21st Century. The Commission proposes this global package of actions in order to look for a new energy policy for Europe, based on the fight against climate change, the impulse of energy security and the competitiveness of the EU. This proposal has a bigger aim than all the previous ones.

The action package establishes a series of ambitious objectives focused in GHG (greenhouse gas) emissions and renewable energy sources, with the aim to create an authentic internal market for energy, increasing the use of renewable energy and all of it based on energy efficiency. Within these objectives, there is one that we consider as the sticking point: the Commission proposes that the EU has to make a commitment to reduce 20% the greenhouse gas emissions by 2020, through energy actions. With these last proposed actions, the Commission wishes to improve energy efficiency and increase the use of renewable sources while trying to limit the risk of gas and oil price volatility. In order to achieve it, they try to encourage internal competitiveness and develop clean technologies. It's important to promote participation in renewable energy sources to achieve the reduction of greenhouse gas emissions and reduce the dependency on imported hydrocarbons.

To meet these objectives, a high level of political commitment, a more than outstanding investment volume, a clear set of rules framework and a rigorous, independent and predictable attitude on the part of national regulators are needed. The existence of monopolies or quasi-monopolies, restrictions to transportation, etc. is not a help to reach the marked objectives and it's an insistent sign of how imperfect still is the European internal market.

In short, the proposal made on January 2007 also included a new initiative known as the "three twenties" or "20-20-20" with a triple objective: increase energy efficiency by 20%, increase participation in renewable energy sources by the same amount and reduce the

carbon emissions by the same percentage. All has to be done before the year 2020. These actions are directly related with pursuing a greater energy security while reducing the dependency on external suppliers.

In March 2007, the European Council included within its concluding remarks the previously mentioned “three twenties” policy and left out without specifying some important subjects for Europe’s energy future, as the nuclear dilemma. However, in September 2007, the Commission discussed a more relevant issue to internal market negotiations and relations towards Russia and Algeria. It consisted on the separation of assets for the generation, production, and commercialization of transportation and its operation, which was rejected by Germany and France. These asset separation matters are contemplated in what has been called “third action package” that have the possibility of increasing the internal market efficiency in mind as much as energy security.

4. From the Lisbon Treaty to the Last Actions of the Commission in Energy Policy and Security

In the middle of 2007, and as the IGC (Inter-Governmental Conference) was taking place to draw up a reform Treaty for the EU due to different political, economic and social changes, they pointed out as one of their wishes for the 21st Century, the possibility to establish and operate the energy internal market and the much needed solidarity between member states.

The integration process in Europe was conceived from the beginning with a basic characteristic: the double openness [12]. For this reason, the six initial members² became nine³, and then ten with Greece, twelve with Spain and Portugal, and later twenty-seven⁴ (for the time being).

² Germany, Belgium, France, The Netherlands, Italy and Luxembourg.

³ Denmark, Ireland, and United Kingdom.

⁴ Austria, Bulgaria, Cyprus, Slovakia, Slovenia, Estonia, Finland, Hungary, Latvia, Lithuania, Malta, Poland, Czech Republic, Rumania and Sweden.

4.1 The Lisbon Treaty

It was December 2007 when the Lisbon Treaty was signed as a result of negotiations between member countries in the IGC together with the participation of the Commission and the European Parliament. For the Treaty to enter into force, it must be ratified by everyone. Initially, it had been ratified by 26 Member states, all but Ireland. In the concluding remarks of June 2009, with the certainty that the Treaty was going to offer the Union a better framework for action in numerous areas, the European Council revealed that the Presidents or Chiefs of State had reached an agreement to solve the problems in Ireland’s ratification [13]. The Treaty entered into force the 1st day of December 2009, two years after it was signed.

There have been important advances on energy issues, especially in the energy incorporation as an individual Title in the Lisbon Treaty (Title XXI). Additionally, the consolidated text for the Lisbon Treaty incorporates in several of its articles which are important innovations in energy policy for the EU. Article 4 expresses that the area of energy, along with the environment and the internal market, will be a shared responsibility between the Union and its member States [14]. Later on, article 101 mentions the internal market and its incompatibility with agreements in shared practices that could affect the market. Article 122 favors the existence of adequate actions when problems arise in the supply of different products, especially in the energy sector. Articles 170 and 171 are related with the objective of establishing, developing and strengthen trans-European networks of energy and defend the cooperation with third parties in order to achieve it.

Within Title XXI article 194 can be found, exclusively dedicated to energy. In that article, they make reference to a common energy policy and the objectives they look after with a spirit of solidarity within member States:

1. Guarantee that the energy market works properly;
2. Guarantee the security of energy supply in the Union;

3. Promote energy efficiency and energy savings, as much as the development of new and renewable energy;
4. Promote interconnection of energy networks.

These objectives must be conceived within the framework of the internal market, ensuring the environmental preservation and, something which is difficult to reconcile, recognizing the right of each State to determine the exploitation conditions of its energy resources and set up the structure for its supplies and energy mix.

After the Lisbon Treaty the authors are getting closer to reach the eagerly awaited single energy policy. It isn't going to be easy to set the basis, but for the first time on the regulations level, they established a list of objectives for that policy. There's still a long way left to cover; authors are aware of how imperfect the internal market is and that is needed to establish a common foreign policy to be able to build an energy policy for all member States.

4.2 2008 Action Plan in Favor of Energy Security

To be able to implement the necessary actions⁵ to reach the basic EU objectives in energy issues: competitiveness, sustainability and energy security, the Commission proposed in November 2008, in the second strategic revision for the energy sector, an EU action plan for the security and solidarity within the sector. It was a way to get closer to the next phase within the energy policy since they were going to examine the possible challenges for 2020 and 2050.

The action plan proposed by the Commission was based in five steps [15]:

1. Infrastructures needed and diversification of energy supply sources;
 2. Exterior relationship in the energy sector;
 3. Oil and gas reserves, and response mechanisms in case of crisis;
 4. Energy efficiency;
 5. Exploitation of energy resources belonging to the EU.
- Additionally, it was revealed the need for the EU to

extend its temporal horizon of provisions in order to prepare its energy future. For this reason, the Commission proposed to renew its energy policy in 2010 to draw up a political program by 2030 and new perspectives by 2050.

In that report they list a series of long-term objectives that we need to consider: to reduce carbon in the electricity supply in the EU from now on to 2050, to finish the dependency on oil in the transportation industry, buildings that not only consume less energy but also end up producing it, and interconnected and intelligent electric network, promote an energy system with great efficiency and low carbon emissions all over the world [16].

4.3 Last Actions in Energy Policy

The Energy and Climate Change package proposed in 2007 was finally approved by the European Parliament at the end of 2008, with lots of modifications from the original plans, due to the reluctance of some member States who felt that some of the measures proposed would affect their national competitiveness in some sectors. It was very difficult to find the EU speaking with one voice, so it was not surprising that at Copenhagen Summit in 2009 the situation found to reach an agreement on climate change at an international forum [17].

Nevertheless the measures related to the energy sector started being implemented in the form of Directives, especially through 2009, with regard to renewable energies (2009/28/EC), the gas and electricity internal markets (2009/72/EC and 2009/73/EC), a new framework for the European Emissions Trading System (2009/29/EC), and particularly related to energy security, the Directive imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products (2009/119/EC).

It is soon to forecast if these measures will give the desired results, as Member States had a period of time to adapt their regulations to the new framework and, at the same time, the crisis has seriously affected measures related to infrastructures building.

⁵ Proposed by the European Council in March 2007.

5. Concluding Remarks

The EU's main problem is that it consumes more hydrocarbons (oil and gas) than the amount member States are able to produce. For this reason, the EU imports those energy sources in most cases from unstable countries. Energy security, also known as security of supply or security of delivery, is therefore defined as: having an adequate supply of energy at reasonable prices.

In the EU there is an unstoppable growth of energy dependency. One of EU's objectives, besides looking for energy security, is to reduce the external imports as much as possible, especially from third countries that are considered conflictive. Most of the EU member States are characterized by the fact that they have a great energy dependency and vulnerability as far as external energy sources is concerned.

The main reason that has moved the political will of governments from member States in the direction of a common energy policy is the growing dependency of imports in order to cover its needs, which is a clear danger for security in energy matters for all countries in the EU. Working jointly is important to guarantee energy security.

Made up of 27 member states in Europe, where the energy dependency on third countries is a fact, energy security is one of the mainstays of the eagerly awaited common energy policy. Together with sustainability and competitiveness, energy security is one of the main energy objectives in the 21st Century. The EU must act as quickly as possible to obtain energy with these characteristics. We need a cleaner energy with less GHG emissions, with a decreasing level of external dependency and with an internal energy market able to provide Europe with a more secure and competitive energy.

The starting point for the European Commission is to have an energy policy with a common voice. At this moment in time, they haven't attained this objective yet and it seems like it's going to be difficult to do it in the short-term. The main problem is to achieve that all

member states could fight jointly looking for common interests. But, in spite of all the problems mentioned above, it seems like the distance is getting shorter and it's possible for us to talk of a common energy policy within the EU in the future.

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