French energy policy within the European Union framework: From black sheep to model ?

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Introduction

The debate over the creation of a common European energy policy has been going on for a number of decades. Right from the start, the first common institution of the original six countries of the European Union was the European Coal and Steel Community (ECSC) in 1951. It was followed in 1957 by the European Economic Community (EEC) and the European Atomic Energy Community (known as Euratom). The founders of the European Union were aware of the strategic character of energy. After years of slow drift, the question of pooling energy stakes is again at the heart of European policy making. The discussions on a common energy policy have been recently brought back into the spotlight by the evolution of energy market fundamentals, climate change constraints, and security of supply priorities (especially the management of relations with some suppliers like Russia).

Today, a complex equation must be solved: provide the European Union (EU[1]) with secure and inexpensive energy (which is a strong element of competition), and reduce at the same time greenhouse gas emissions. The current European dependence on imported energy resources is increasing further and the energy sector has entered into a turbulent period in terms of prices and security of supply. These factors create a number of risks and uncertainties in the European energy landscape. They also create a need to think about a common strategy over the long-term. They raise the fundamental question of future prices and the availability of energy. Dealing with tendencies towards "national economic protectionism", the European Commission (EC) in March 2006 presented the EC Green Paper

[1] Today, the EU 27 members are Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

- European strategy for secure, competitive and sustainable energy (EC, 2006(a)) that provides a basis for discussions on European energy policy. Looking at the diversity of the energy situation within the European Union, the idea itself of a common policy was unrealistic a few years ago. Nevertheless, a shared vision has always existed among the Member States (MS) for the creation of a single energy market. A convergence on energy goals in the long term is obvious but a divergence in the means to reach them still exists. The European Commission reacts quickly as soon as there is a risk of collusion between energy actors. However, it stays prudent on the definition of the energy mix which is out of its field of competences. Today, it is not clear that Member States would like to engage in discussions on a common energy policy with a common energy mix. There are still a lot of areas in which countries do not want to deal with sensitive issues at the supranational level preferring instead to retain their national sovereignty.

In the European energy markets integration process, France has sometimes been referred to as the "black sheep", with its national energy model built on strong state intervention, two energy champions (state owned firms Electricité de France EDF and GDF - Suez[2]), nuclear power as the main source of electricity, and the French defense of the concept of "public service". At the same time, France is less dependent on energy imports compared to other Member States. The country acted decisively in the 1970s to limit its dependence on fossil fuels and now it is well positioned to deal with fuel costs and global warming. France is one of the European countries that emits the least greenhouse gases. However, France is also facing the same international demands and developments with the same risks and uncertainties as other European countries. It needs to diversify its energy mix and improve its security of supply. How can France define its national energy policy within the emerging European context? What could be the role of France in the creation of a common European energy policy ? As the French energy model does not fit neatly into all aspects of a nascent European policy (e.g. deregulation process, renewable energy development…), France has been under pressure to adapt. When the French energy policy was defined in 2005, the challenge was to protect national interests and take into account the European process. The highly strategic energy sector was, and is still, at the core of numerous debates. France is demonstrating that nations can successfully address their energy vulnerabilities but its example also illustrates that today no single energy option will be the cheapest, cleanest and safest.

[2] GDF-Suez is the result of the merger between Gaz de France and Suez in 2008.

This chapter focuses on the main French concerns related to energy policy within the European Union context. It is divided into three related parts. The first section presents the French energy situation to understand the national constraints compared to other Member States in the European Union. The second section analyses the French energy policy model in more depth with its objectives and new instruments. The final section discusses the French energy challenges in the European framework, and more precisely with the nuclear power park. Two current and major issues will be presented to explain the ambiguous position of France in the European Union. On the one hand, the French regulated tariffs are considered as anticompetitive by European authorities. The "nuclear rent" management and the dominant position of the French utility are at the heart of the debates. On the other hand, the European Union has the possibility to become the world leader in fighting climate change opening the nuclear option to Member States. This paper focuses on the French energy challenges and the general attitude of France toward a common energy policy. France has been evolving gradually from its position of "black sheep" to an interesting position of protecting its national interests while still complying with the European energy-environment objectives and therefore perhaps presenting itself as a model for other Member States to emulate

Section 1: The French energy situation in the European Union

The history of European nations and their respective energy reserves have implied a very high level of energy diversity throughout the European Union. When comparing Member States, it is surprising to notice the differences that exist, depending on the energy mix, the industrial organization, the role played by the state, the dependence on imports, the technology choices and so forth. In France, the history of energy policy has always been characterised by a very strong intervention of the state. Public firms, or those controlled by the state, allowed the development of the French energy sector. They played a major role in its modernization, in the promotion of independence and in security of supply. The French nuclear program, launched shortly after the first oil crisis in 1973, is a good example since nuclear power covers approximately 40% of the French current energy needs (whereas in 2008 the world's total share of nuclear power in primary energy consumption is about 7%). This very "hexagonal" and state oriented vision has to change with the globalisation of energy markets, the integration process of the European Union, the multiplication of uncertainties, the new climate changes challenges, and also with the financial constraints facing states for energy

investments. France, like other European countries, has to find solutions for its energy dependence. Its energy mix underlines its national choices and priorities.

1- French energy resources and dependence

In 2008, the French population represented 1% of the world population (around 65 million inhabitants), its gross domestic product (GDP) constitutes 4.7% of the world GDP and its primary energy consumption (258 Mtoe[3]) is about 2.3% of world energy supplies. But it has only 0.01% of the known world fossil fuel reserves (23 Mtoe)[4]. In contrast to several European countries which benefit from raw materials (coal in Germany and Spain, natural gas in the Netherlands, etc), France is poor in energy resources. It does not possess many immediately available energy resources. Since the end of the 1970s, French coal production has fallen from 40 million tons per year to less than 3 million tons per year. The last coal mine closed in 2004. Similarly, with natural gas the field at Lacq supplied between 6 and 7 Mtoe of gas per year contributing up to 15% of France's primary energy production and now provides less than 1% of the national production of primary energy. Oil production has barely exceeded 3 Mtoe per year and presently stands at less than 1.5 Mtoe per year (around 1.8 % of its total oil consumption). Therefore, the country is used to importing all its needs in fossil fuels. The French nuclear program was a response to the oil crises. France, like other industrialized countries, reacted to the two oil crises with measures in favour of the security of supply which deeply modified its national energy mix. In 2009, France has 58 nuclear power reactors with an installed capacity of 63 GW (it is the second largest park in the world after the United States). Since 1973, the priority is clearly the security of energy supplies with regard to the availability and the costs /prices of energies. Therefore, the French energy policy has given priority to the development of a national energy supply, most notably nuclear power and renewable energies.

Today, the European Union is more vulnerable due to the increasing dependence on energy. If nothing is done, energy dependence will reach 70% by 2030: 90% of oil needs and 80% of natural gas consumption will have to be covered by imports (EC, 2006 (a)). This increase of import dependence can be explained by the imbalance between European reserves (0.6% of

[3] Mtoe equals Million of tons oil equivalent.
[4] Almost all the data on the French energy situation are official data from the French administration, source: DGMP web site www.developpement-durable.gouv.fr, Direction Générale de l'Energie et des Matières Premières which is the general directorate for energy and raw materials in France.

oil reserves in the world and 2% for natural gas) and its economic needs. Primary energy production in Europe is forecast to decline while demand is going to increase. Energy dependence is a key issue in the European Union: national production of fossil fuel is decreasing and imports are growing considering that fossil fuel still represents three quarters of the energy consumed. France still imports half of its consumption of primary energy, against nearly three quarters before the nuclear program. In 2008, France produced 138 Mtoe and consumed 258 Mtoe. Thus, it has an energy independence of 50% against 26% in 1973. With no real fossil fuel reserves, France needs to import energy resources[5] even if the nuclear program plays its role and some measures have been implemented to limit the energy consumption as well as initiatives adopted to promote renewable energies.

France is the world's seventh largest consumer of energy with 258 Mtoe in 2008 behind for example Germany (311 Mtoe). With 3.9 toe consumed per inhabitant, France is above the average of the EU 27 (3.5 toe)[6]. Until recent years, France's economic growth, rising population, growth in road transport of passengers and goods, and domestic electricity use, together with the requirements of major industrial consumers of energy (steel, chemicals, paper, cement...) have all contributed to a sustained increase in energy consumption. The most significant increase is unfortunately in the transport sector (from 20% in 1973 to 31% in 2006), while the industrial sector share decreased (from 36% to 24% in 2006) and the residential and services sectors have remained stable (43%). This trend is unacceptable for economic and environmental reasons (energy costs, security of supplies, climate change...). The French government has therefore been implementing corrective measures for several years and reinforced them in the last energy law of 2005. One crucial element is the need to change the different energy uses and especially in transport where oil, a non-substitutable fuel, represents the largest energy source used. The increase of consumption in the transport sector goes beyond energy security of supply, it also implies industrial policies, the regional planning with city mass transportation territory management with city mass transportation, tax policy, social issues and of course the competitiveness of the French economy.

2- The energy mix in the European Union

The energy mix choice is made at the national level in the European framework. There is a convergence on the criteria to develop but some differences exist between Member States. Looking at the countries in the European Union, the diversity of the national energy mix is the

[5] The official forecasts are a doubling of imports by 2025.
[6] Data are from the International Energy Agency IEA.

most obvious difference: 27 countries each with its own unique energy mix. In certain countries like Greece, energy consumption relies exclusively on imported oil and coal. In France, the diversification is higher with some nuclear, hydroelectricity, natural gas and oil. Some states are almost completely dependent on energy imports, like Portugal. The new member countries further accentuate this picture of energy diversity with a strong dependence on Russian gas supplies (especially Hungary) and/or the use of coal (like in Poland).

Figure 1: Primary energy consumption in 2008 (in Mtoe and in %)

Countries	***Total (Mtoe)***	**Oil *%***	**Natural Gas *%***	**Coal *%***	**Nuclear *%***	**Hydro *%***
Bulgaria	**20.1**	26.9	14.6	37.0	17.7	3.7
Czech Republic	**43.3**	22.9	18.0	44.0	13.8	1.2
Finland	**26.8**	39.4	13.3	12.6	20.3	14.4
France	**257.9**	35.7	15.4	4.6	38.6	5.6
Germany	**311.1**	38.0	23.7	26.0	10.8	1.4
Greece	**34.6**	61.9	10.9	24.8	-	2.3
Hungary	**24.7**	31.3	43.7	11.3	13.6	-
Netherlands	**91.4**	50.9	38.0	10.1	1.0	-
Poland	**97.4**	25.5	12.8	61.0	-	0.7
Portugal	**22.6**	60.7	18.3	13.9	-	7.1
Spain	**143.9**	53.6	24.4	10.1	9.3	2.6
Sweden	**46.7**	31.1	1.8	4.2	31.1	31.7
United Kingdom	**211.6**	37.2	39.9	16.7	5.6	0.5
EU 27	**1728.2**	40.7	25.5	17.4	12.3	4.1
US	***2299.0***	*38.5*	*26.1*	*24.6*	*8.4*	*2.5*

Note: For each country, the highest percentage has been highlighted

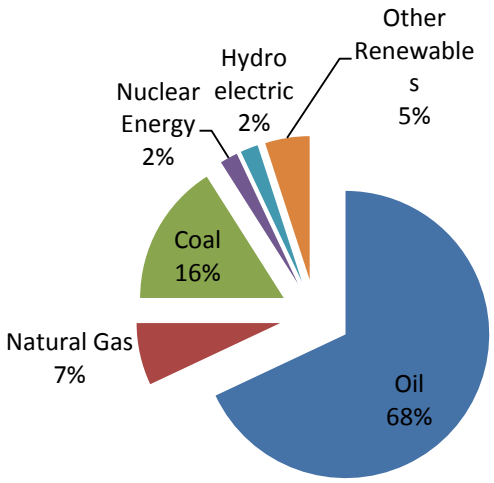
Source: BP Statistical Review of World Energy (2009)

France is neither an oil and gas exporting country, nor is it a producing one. During the 1970s energy crises, it assessed its vulnerability to oil imports and its lack of gas and coal reserves. France decided that nuclear power was the best option. Between 1973 and 2008, its primary energy consumption evolved: coal now represents only 5% (16% in 1973), oil share 34% (68% in 1973), gas consumption doubled (from 7% in 1973 to 15% today), electricity consumption was multiplied by 10 (from 4 to 42%) and renewable energies represent 5% of the total. There was a massive development of electric usage. The government is trying now to make consumers understand that available cheap energy is a thing from the past. From 10% of the final consumption in 1973, the total electricity consumption was multiplied by three (mainly residential and tertiary) to represent 23% today. Today France represents 17% of the

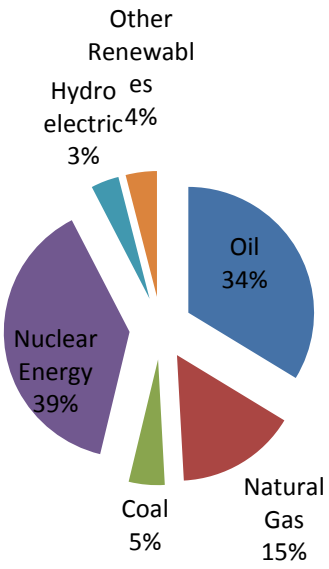
world's nuclear activity with 58 reactors and 78% of the electricity produced is from nuclear power (450 billion kWh of 574 billion kWh). A strategy of a full-fledged fuel cycle was chosen by France[7]. Most of the reactors started between 1980 and 1995 (49 units). The lifetime of a third of the current operating nuclear power plants will end around 2020. In 2007, France started a third generation EPR reactor (European Pressurized Water Reactor[8]) that should be operational in 2012[9].

Figure 2: The French energy mix in 1973 and 2008 (in %)

1973 - *185 Mtoe*



2008 – *258 Mtoe*



Source: BP Statistical Review of World Energy and DGEMP

3- National energy priorities in the European Union

National energy priorities continue to dominate European energy debates. The strategic energy sector remains linked to national considerations. Among the numerous debates, one is especially in the middle of all discussions: the nuclear option. Member States' positions used to be extreme on this subject, but some governments seem to have had a change of mind. Certain countries are interested in nuclear energy development (like Finland which built the

[7] France is one of the few countries where all fuel cycle facilities are found: conversion, enrichment, fabrication, reprocessing and recycling of nuclear materials.
[8] The EPR, European Pressurized Reactor, is the third-generation PWR developed under Franco-German cooperation.
[9] France has also devoted research programs to the fourth generation technology (sodium cooled fast reactor). Those units should be operational by 2040.

latest nuclear power plant in operation in Europe), which limits fossil fuel imports and the emission of carbon dioxide. France is not the only Member State to use nuclear energy,[10] but it is Europe's most enthusiastic advocate. The nuclear program is vital for France in its search for energy independence. The nuclear option is gaining ground again and a number of governments are opening again the debate (United Kingdom and Spain) while other governments are looking to protect their coal industry, like Germany or Poland. Government policies are changing, impacting also the energy mix. Italy and Germany are for instance revising their position on nuclear energy: Germany was organizing the closing of its nuclear power plants and Italy voted for a "no" to the nuclear option.

At the same time, some Member States have decided to proceed further with the use of renewable energy sources than laid out in European Directives (Denmark, Germany, etc.). In March 2007, at the European level, leaders accepted the target of 20% of renewable sources in energy consumption by 2020 (in exchange for flexibility on each country's contribution to the common goal). At a climate change summit, the European Union adopted a long term strategy for energy policy and climate change, called the "3x20", Climate action and renewable energy package: cutting the carbon dioxide emission by 20% from the 1990 level by the year 2020, developing renewable energy sources (20% share in the EU energy mix**)**, and promoting energy efficiency (20% improvement). In response to the new Renewable Energy Directive, one of the first and most important steps in 2009 will be for the Member States to develop their Renewable Energy Action Plans.

France is among the group of countries in favor of the wording "non CO_2 emission resources or technologies" instead of "renewable energies". In this country, a balance still needs to be found between relying on nuclear power with low electricity generation costs and renewable energies which need to be subsidized to help their development. The breakdown of consumption of renewable energies in 2007 was the following: biomass still represents 58 % (mostly wood) followed by hydroelectricity with 28%, then, waste 6%, wind and photovoltaic 1%, heat pumps 2%, biogas 1%, biofuel 3% and other 1% (DGEMP, 2008). Thanks to all the measures taken by the government, the French market is among the leading ones in terms of progress to develop renewable energies[11]. The share of renewable energies in primary energy consumption[12] is still low with 7% with an EU average of 7.5% in 2007[13]. Compared to the

[10] 47% of the nuclear electricity in the European Union is generated solely by France, but for example, the UK owns 19 reactors (12 GW), Sweden 10 reactors (9 GW), and Germany 17 reactors (20 GW)…
[11] Source: Observ'ER (2009), "The state of renewable energies in Europe", 8th EurObserv'ER Report,
[12] Looking at the objectives of 2020, the share of energy from renewable sources in final consumption of energy in 2007 was 10.3 % and the target is 23%.

other countries, France was responsible for 9.5% of the CO_2 emissions in the EU 15 in 2007 (Germany 20.7% and UK 13.5%)[14]. Per inhabitant, the country is the 11th highest in the EU 15 with six tons of CO_2 (12.7 for Finland, 10 for Germany and 8.1 for EU 27). It is also among the last group of countries in the EU 15 in terms of CO_2 emissions per unit of GDP. France does not really emit CO_2 emissions thanks to the use of nuclear power but the oil consumption for transportation is still increasing and the renewable energies (other than hydropower) need to be developed.

Energy intensity, a measure of the relationship between energy consumption and national economic production. varies between the 27 Member States. For instance, in 2006, the energy intensity varied from 125 for Denmark and 300 for Luxembourg (in Mtoe, 1995 prices). The new members present energy intensities higher than those in the older Member States[15]. The potential for improvement is very high because their emissions of greenhouse gases per inhabitant are higher than the European average. The structure of the French economy is more directed towards the services sector than other industrialized countries, which gives it a comparative advantage in the energy intensity (150 for France). Moreover, since the 1970s, France has made efforts to control energy consumption: between 1982 and 2006, the annual improvement of energy intensity was – 1.1%.

Considering its energy situation in the European Union, the challenge for the French government and administration was to define a new national energy policy, more in line with the European framework yet not neglecting its own interests.

Section 2: The French energy policy: priorities and instruments

Like all the other Member States in the European Union, France has always had its own, distinct energy policy. After World War II, the energy sector appeared clearly as a highly strategic one. For many decades, the government has decided on the energy policy in the name of the nation. With the process of European integration, some governments lost a part of their sovereignty but not in this sector. The European Commission gives recommendations on energy policy, even if a true common energy policy does not yet exist (at least not before the first step in the implementation of the third energy package). Member States are still

[13] The leaders are Sweden with 31%, Latvia 30%, Austria 23%, and Finland 23%... usually countries that use a lot of hydropower.
[14] The EU 15 was responsible for 82% of the total of CO_2 emissions of the EU 27 in 2007.
[15] The 7th new members from EU 15 to EU 25 presented energy intensities until 1400 for Estonia and Latvia.

responsible for the definition and implementation of their own national energy policy. France defines *its* national energy policy but has to take into consideration new European constraints. The complementarities and the differences between national energy vision and the European one are helpful to understand the European Union energy position and the possible development of a common policy.

1- Objectives of the Energy Act of 2005

A year before the publication at the European level of the Green Paper in 2006, France issued its national energy law. At present, French energy policy is defined by the Energy Act of 2005[16] which emphasizes French interests through four priority axes. The first two apply to most of the European members. Even if they are shared at the EU level, the last two are more specific to France as they underline a higher degree of state intervention. The comparison between the French law and the European point of view is interesting. The timing was perfect to highlight the French position in the European debate. In this bill, the French energy priorities are expressed in the form of four major objectives[17]:

- ***"To contribute to national energy independence and guarantee security of supply".***

As France has very limited energy resources, meeting its energy needs involves a risk that should be managed proactively. This objective is formulated on the short and long terms relevant to quantity and price. There is a double goal: to limit the exposure of the French economy to fluctuation in energy prices (in particular developing national energy production) and to ensure the availability of sufficient capacity to cope with problems of energy shortages (electricity blackout, lack of gas storage...)

- ***"To protect human health and the environment in particular by fighting against climate change"***

Energy consumption and production can have a major impact on the environment, mainly the the emission of green house gases, but also the emission of pollutants and the production of radioactive wastes. One key purpose of the French energy policy is to control the changes in environment protection with CO_2 emission and ensure that the risks of the nuclear sector are properly managed. In addition to this Energy bill and within the framework of its Kyoto

[16] Planning Act 2005-781 of the 13th of July, "Loi d'Orientation sur l'Energie" loi n°2005-781 of the 13th of July 2005 is available on the website of the French administration: www.legifrance.fr.
[17] The titles of the 4 goals are the original titles from the law with strategic words.

commitments, the Plan "Climat" (2004) decided on measures to save nearly 15 million tons of carbon equivalents per year by 2010 (which means a quartering of CO_2 emission by 2050).

- ***"To ensure competitive energy prices"***.

The price, quality and availability of energy are determining factors in France's competitiveness. This goal relies on the national nuclear program that allows France to have a low electricity generation cost for households and industries. France is keen to maintain its economic advantage in terms of cost production and the "public service" missions.

- ***"To guarantee social and technical cohesion by ensuring access to energy for all"***

It is important that the energy policy provides everyone, and in particular the most deprived in society, with access to a quality energy source at a competitive price. Solidarity but also taxation, regulated tariffs, and public service missions, such as, for electricity, the obligation of supply, the equal treatment of customers, etc. are all part of the French way of managing energy.

2- Means and instruments to achieve the energy policy goals

To reach the four goals of the energy bill, the French government employs four means: (1) control of the energy demand through a series of incentives and programs (including an energy saving certificate scheme White Certificates, standards and tax incentives); (2) diversity of the energy mix (by increasing the use of renewable energies and keeping the nuclear option open); (3) development of energy grids and storage capacities (to improve the safety of France's energy supply); and (4) research and development on energy (to meet long term challenges in terms of energy intensity and consumption of renewable energies).

To provide a framework for these decisions "four goals and four means", quantitative objectives were laid down by the Energy Act of 2005:

- A quartering of CO_2 emission by 2050,
- An average reduction of final energy intensity of at least 2% per year from 2015 and of 2.5% from 2015 to 2030,
- A production of 10% of energy needs from renewable energy sources by 2010,
- A use of bio-fuels to a level of 5.75% by the end of 2008 and 7% in 2010.

In this new energy law, the government decided to implement some tools to help to reach the objectives of energy security of supply and more especially for electricity which is strategic[18]. The French government has put in place two specific instruments to regulate the market so as to ensure the security of electricity supply. The first tool is the "multiannual objective contracts" signed with the company of the public distribution system (Réseau de Transport d'Electricité RTE) and with the companies that fulfil public service missions[19]. Electricity and gas public utilities[20] status are very precisely defined by French law: their definition remains however rather broad but typically French with their "public service" missions. Each year, their cost is measured by the national regulatory commission. The second instrument is "multiannual programming of investment in production" (PPI[21]) which lays down objectives of capacity to be installed by primary energy sources. The PPI defines the need in electricity capacities and allows the government, if these capacities are not built, to call for tenders. Therefore the French state has not given up all its prerogatives in terms of electricity investments.

To reduce France's energy dependence, it has been decided to promote energy savings and to invest in nuclear electricity generation and renewable energies. These options provide a reliable long-term supply without greenhouse gas emissions, and nuclear energy ensures stable electricity prices. They also correspond to French energy priorities. It was also decided in 2004 to begin to build an EPR model to have the option of eventually using this technology to replace the present generating facilities but also to support these facilities. The law of June 13, 2006 defines guidelines on nuclear transparency and security. In addition, the law on the management of radioactive materials and waste was published on 29th June 2006. French public opinion seems to be more positive toward nuclear energy compared to other countries (or for some analysts more realistic?). In parallel, since 1974, France has implemented energy saving measures. A tax credit for energy saving and renewable energies was reinforced in 2006[22]. An energy saving certificate scheme has been also implemented. The principle of energy saving certificates is based on an obligation imposed on energy sellers by the public authorities to generate energy savings over a given period. To develop renewable energies,

[18] With regards to petroleum products, France meets EU and IEA obligations on strategic stocks. For natural gas, some similar measures to electricity have been implemented.
[19] The right of access of users to services, the equality of their treatment which is synonymous with the refusal of all discrimination and the continuity of service in time and space are virtues consubstantial with the traditional definition of the French concept of « public service ».
[20] According to the law, the status of EDF and GDF-Suez were changed to become corporations with a gradual opening of their capital whilst keeping them within the public sector.
[21] PPI stands for « Programmation Pluriannuel d'Investissements ».
[22] For example from 40% to 50% for energy production equipment using a renewable energy source and certain types of heat pump.

several support programmes have been put in place. Among them, the systems of obligatory purchase by EDF and the other electricity distributors of electricity generated by renewable energies have given new impetus to renewable sources, such as wind power. Renewable energies benefit from the tax credit since 2005. This procedure has been a great success, since the solar energy market for heating has experienced spectacular growth.

For several decades, France has been striving to diversify its energy mix and to make its energy supply secure. The government chose nuclear power to ensure national independence and environmental protection at a stable and competitive price. The most recent energy laws reinforced its national goals by giving new tools and quantitative objectives. In reaction to the Green Paper in 2006, France made its own proposals public in a memorandum circulated to EU finance ministers. The French memo is relatively close to the Commission's Green Paper but places more emphasis on nuclear power and research in next generation nuclear power stations. As a founding member and a very significant player in the European Union, the role and position of France is critical to the development of a common policy. Nevertheless, compliance with the European framework calls for adjustments to the French mindset and policy approach. The two positions are not so remote: the main goals are the same, some national priorities are underlined and the means may be different.

Section 3: French energy challenges in the European Union framework

While France tries to implement its energy policy, the government has to face several challenges linked to the European integration process and energy market fundamentals. In terms of European energy policy, it is worthwhile trying to understand the French position, as it relates to energy companies' status and state intervention. Some of them are indeed at the core of very animated discussions. At the same time, the energy –environment challenge of the European Union puts France in a good position. The nuclear option would appear to be a key factor in the debate.

1- France and the European energy deregulation process

European law goes beyond the notion of "state" and the construction of the single market must be done through competition. European requirements are a shock for the French culture of *dirigisme* ("colberto-jacobine" state interventionism). They imply major changes of electric and gas industries and, more generally, of all network industries. European regulations imply

a complete separation between competitive activities (generation, purchase and supply of gas and electricity) and regulated activities (transmission). Networks are regarded as opened "essential facilities" with third party access supervised by an independent authority of regulation. The directives of 1996 (electricity) and 1998 (natural gas) initiated the deregulation process and the directive of 2003 provides for the total opening up to competition. Since July 2007, all consumers have the choice of their energy suppliers. This process has raised strong opposition from certain members of the French parliament, who demanded the renegotiation of the directive. Indeed, this opposition reflected several refusals at once: the refusal of Europe, of the markets and of competition. The French political community is conscious of these stakes but is still attracted by the maintenance of a mainly illusory and expensive public intervention policy and forgets that the fundamental word is "European" and not "Franco-French". It is true that politicians are confronted with an electorate attached to the status quo. Employees of public companies stand by their privileges, consumers are against changes and afraid of competition, and companies talk about delocalisation to obtain regulated tariffs. It is not easy to explain to French citizens that GDF-Suez will supply electricity, that EDF will supply gas and that in spite of the nuclear park, the French pay an over CO_2 cost and that the electricity prices will be the same as that generated from coal in Germany.

The European Commission launched two procedures against France: one for the non-transposition of whole directives and the other one for state aid. Regulated electricity tariffs are considered as subsidies and therefore it is state aid because EDF is still a state firm. According to the Commission, these artificially low tariffs give an economic advantage to some companies and distort competition in the European single market. The European Commission asks for the end of regulated tariffs[23] and the development of market prices through competition. The state intervention on prices and tariffs for electricity and natural gas are under scrutiny. Traditionally, the prices of oil products were administered prices. It is still the case for gas and electricity, at least for certain categories of customers. Is it time to free up these prices? With the deregulation process, the main question is how much "flexibility" can the government give to energy prices. For some people this question should not even be raised because energy prices should be competitive and not state regulated. For other people, it is

[23] In June 2007, the Commission opened an investigation on standard regulated tariffs and return tariffs for large and middle size industrial consumers (not private consumers). French consumers can buy their electricity either on the free market or on the regulated market (standard regulated tariffs) set by the state. Customers who left the regulated market can ask for a special state administrated return tariff (Tarif Réglementé Transitoire d'Ajustement de Marché TARTAM) below the market price. Already 10% of large consumers benefited from this offer.

inconceivable that French consumers should not benefit from the nuclear rent. A change in policy would be problematic from a social and political perspective in France today.

There is not a European energy policy yet. Nevertheless, there is a common competition policy that is applied to the European energy market. At the European Union level, an energy price convergence is expected not an energy mix convergence[24]. What are the challenges for France? France is not ready to lose the benefits of its choices: nuclear power gives the country very low electricity generation costs. This policy involved closing all the coal mines at a huge social and economic cost particularly for the end users. Today French electricity is sourced mainly from nuclear and hydro: the cost of electricity generation is no longer dependent on fossil fuels. It is complicated to compete with the state owned French utility, with its very low production costs not linked to oil prices. The challenge for the government is to find a solution to let French consumers go on benefiting from nuclear low costs while respecting European directives.

In the energy sector inquiry (EC, 2006(b)), the dominant positions of historical companies were already limiting the entry of new actors and hence the benefits of competition. In France, it is hard to compete with EDF's production cost based on nuclear power plants which are almost all fully amortized. Consequently there are no real new entrants at least for the base load production due to the cost advantages of this historical actor. The national fear is that the European Commission will pass a new directive imposing a maximum of market shares for historic companies in their domestic market. To avoid that, competition needs to exist in France otherwise it will lead to the dismantling of EDF. The French utility has been gaining market shares all over Europe for several years but its competitors cannot really penetrate its historical market. Some countries reacted passing some "reciprocity laws" limiting the access of EDF to some assets. The EC called the French government to task for unfair competition, but with a stronger Competition Commission, the threats could become reality.

With limited European interconnections and the refusal of some countries to build nuclear plants (which appears today the most competitive electricity generation technology), French nuclear enjoys a "scarcity rent" from the difference between European price and complete cost of French nuclear power plant generation. On the European market, the price is set to the marginal cost which is the production cost of the last plant called (it is often a natural gas or

[24] It is interesting to remember the market coupling of some power exchanges. The market coupling of APX, Belpex and Powernext will create a single electricity market in the three countries with a single price, only differing when there is insufficient interconnection capacity available on the Belgian – French or the Belgian – Dutch border. The three exchanges thereby provide a better quality of price formation and a greater liquidity in the coupled markets.

coal thermal unit). This price is almost always higher to the French cost of production because French nuclear power plants are not often the last units called. European electricity prices are superior to French regulated tariffs (which are linked to the cost of production of the French mix hydro - nuclear power). Competitors cannot increase their market shares in France: they cannot compete with the economic advantage of EDF. The theoretical solution is easy: new entrants need to have access to French nuclear power plants. This issue raises a multitude of questions with the main one being the regulated tariff of access to nuclear assets. In reality it will be compulsory to define an "access tariff": nuclear power plants could be considered as "essential facilities" built under the monopoly position of EDF. In the Champsaur Commission report (Champsaur, 2009), the debate is open on the development of competition in the French electricity market with the nuclear rent. Two solutions are being currently discussed[25] : (1) to tax the nuclear which means to increase the cost of production of EDF and use the rent (to do what? by whom ?), (2)to allow competitors to have access to nuclear asset (limited in time and in space) with a regulated price fixed by the French Energy Regulatory Commission (CRE[26]). The price should be close to the "economic cost" of nuclear. Competition will be on the supplier margin. There will be no more regulated tariffs "downstream" but a regulated tariff "upstream".

The Champsaur Commission recommends keeping the regulated tariffs for residential consumers on condition that they reflect the cost[27]. In France, the current regulated tariffs are too far from the cost of electricity generation in new power plants to be built. If the authority needs to build new capacities, the power plants have to be profitable which is not the case with the current level of prices[28]. Regulated tariffs do not give the correct incentives for firms to invest and for consumers to choose. During the summer 2009, the President of EDF asked[29] for a 20% increase of the electricity tariffs over three years (2 or 3 € more per month on each energy bill)[30].

After the Champsaur report, a law called NOME (Nouvelle Organisation des Marchés Electriques) was supposed to come into force on 1 July 2010, three years to the day after the

[25] The Champsaur Commission has a preference on the second solution.
[26] CRE stands for Commisison de Regulation de l'Energie.
[27] Regulated tariffs exist in other European countries. Some of them are considering removing them, because they are not compatible with the deregulation philosophy.
[28] Up to now, only 2 EPR prototypes are planned (for up to 40 of similar design). The price paid by consumer should not be set on EPR costs because EPR is not yet the marginal unit (it will be when all units will be changed). The new capacity in France should be the EPR which will be in operation in several years (10 years) and its cost is projected to be 55 €/ MWh (without transport and distribution costs) compared to the 30-40 € / MWh in regulated tariffs in 2008.
[29] The level of regulated tariffs is decided by the government after consultation with EDF and the CRE.
[30] In July 2009, the government authorized an increase of 1.9 % for private consumers.

opening of retail market. However, its review under the Assembly for the fall 2009 has been postponed to spring 2010, leaving some doubt about the date of its effective implementation. The project law NOME, is the next step of opening electricity markets to competition in France. It largely reflects the findings of the report of the Commission Champsaur. Discussions of the project bill are currently underway by French parliamentarians. It may therefore be subject to change. The law theoretically programs the disappearance of regulated tariffs for professionals (not households). The law also included new measures on rent sharing between nuclear suppliers. EDF will thus be forced to sell electricity to its competitors at a price lower than it currently does. The maximum volume and the price would be set annually by the ministers in charge of economy and energy, after consulting the Commission de Regulation de l'Energie. The law is likely to fundamentally change the structure of the electricity market in France. The historical player, EDF seems to be scared by this project bill : it is a direct threat to its dominant position in the French electricity market and it will allow the increase of market shares of its competitors (Poweo, Direct Energy....). Very powerful Unions are against this project law that would “destroy the French energy system”. At the dawn of this great debate, a question is however on everyone's mind: how will the nuclear capacity exchanged worth?

The debate over the management on the French nuclear rent and the organisation of the energy market is just beginning. In the United States, Joskow and Schmalensee (1983) warned us that the deregulation process will take time: “*If deregulation is to play a role in helping to improve the efficiency with which electricity is produced and used, it must be introduced as part of a long-term process that also encompasses regulatory and structural reform” (p.221).* For France, it could take ten years until the new electric capacities are built and running. Will the European Commission have the patience to wait?

2- France and the European climate change constraints

Europe has the potential to become a key actor in the area of energy and climate change in the 21st century. Climate change has recently revealed that the current energy – environment equilibrium is unsustainable. In this area, the incentives to cooperate are obvious. The protection of the environment introduces issues that have to be managed at a global level rather than the European level in the old continent. In the European Union, actions are underway to build a sustainable energy future. Cooperation and solidarity are possible and can be successful as it is already for environmental questions. The European process also leads to

collective agreements. Member States showed solidarity with the European Trading System. They succeeded in setting up the first market of emission permits for CO_2. This market is a major step in the direction of greenhouse gas emissions reduction and might even eventually lead to a single energy market. (See Jørgen Wettestad's chapter in this volume)

The Green Paper published by the Commission in 2006 does not quite reflect a truly common European energy policy but it highlights a certain number of principles on which the Member States agree to build the future energy system. These principles stress three key areas: (1) to improve the energy efficiency; (2) to diversify the energy mix; and (3) to ensure the security of supply. These principles are accompanied by precise national objectives with regard to: energy saving, development of renewable energies, and security storages. Nothing is obviously indicated on nuclear power but each country preserves its freedom of choice. One cannot at the same time reduce the gas emissions and close the door to nuclear power as pointed out by L. de Palacio, the former energy commissioner.

In a carbon-constrained world, in which the European countries are committed to reach their Kyoto targets[31], an increase of coal fired power generation in the absence of carbon capture and storage is not a viable option. The only real alternative is to have nuclear power generation with some renewable energies. During a European summit in March 2007, a new step was made: a binding target of 20% for renewable fuels has been set in exchange for flexibility on each country's contribution to the common goals. References to the national energy mix have been added. It is one of the most ambitious packages on energy security and climate change protection. In an attempt to balance the pro and anti nuclear power countries, it is recognized that nuclear may also play a role in Europe's drive to cut greenhouse gas emissions. Under pressure from several new members, the European Union agreed that individual targets would be allowed for each of the 27 Member States. These new members rely heavily on cheap coal and oil and are reluctant to switch to more costly environmentally friendly alternatives. The economic competitiveness of the countries and the whole European Union is in question.

In the Kyoto protocol, France agreed to stabilise its greenhouse gas emissions at their 1990 level by 2008-2012 (Germany must reduce by 21% and UK by 12.5%). Compared to other Member States, France has small margins of manoeuvre. To comply with this objective, the "Plan Climat" in 2004, the energy bill of 2005 and the nuclear energy laws in 2006 were launched. For France, nuclear power is an answer to energy needs, climate change and fears

[31] Under the Kyoto Protocol, the European Union agrees to reduce its emissions by 8% from level of 1990 by 2012.

of energy supply disruption, but sceptics counter that it is too costly and dangerous to be viable. Within this framework, France can evolve from its role of “black sheep” and better fit into the emerging policy of the European Union. French and European energy policies can be compatible and are not necessarily so different after all.

Conclusion

In spite of the energy diversity of the European Union, a common vision has always been shared by all the Member States over energy development for the future. The Single energy Market is still the main common goal. The publication of the Green Paper in 2006 reaffirms the principle of solidarity between the countries in the European Union. EU energy policy is a basket of a number of policies that are concerned with energy markets and energy issues. The last energy and environment packages represent a considerable compromise agreement that would make Europe the world leader in the fight against climate change.

What are the incentives to cooperate? Completion of the internal market, environment protection, and security of supply are the common energy battles that call for a common solution. Unity of the 27 member countries appears as the only means to meet the energy challenges of the 21st century. The European Trading Scheme shows that Member States can work together in the same direction in terms of environmental protection. Why should this not also be the case for energy policy? Energy policy still remains the responsibility of Member States, and decisions vary from one country to another.

A consensus exists on the need to reduce oil usage, develop liquefied natural gas, develop nuclear power in parallel with renewable energies, and keep faith in market mechanisms to decide on choices while some “garde-fous” ("guard rail”) need to be there too. Within a context of rising energy prices and growing world demand for fossil fuel, there is not just one energy source solution. An energy mix is clearly needed. The Europe of energy does not exist yet, but several Member States are actually able to reach certain common positions in energy policy. More flexible forms of integration are necessary to achieve commitments on a regional or functional basis. The entry of the EU institutions into the making of an EU energy policy is recent and shaky. The Member States have always had and still have strong political and legal rights to define and implement autonomous energy policies. What we may need

today is a Schengen[32] area for energy. For some analysts, this kind of agreement would allow legal binding cooperation between member states. It could represent an intermediate step towards harmonization and a common energy policy. It would give greater legal flexibility than is present under the Lisbon Treaty allowing each Member State to enter or not into a new area of European common policy built on formerly kingly rights and powers of Member States. Freedom of choice has always been appreciated by French people!

To move from a shared vision to a European energy policy, large steps are necessary but could be accelerated by a common foreign energy policy. Foreign policy relates to dialogue with the large exporting countries (Russia[33], OPEC), with the big consumers (the United States, China, Japan, India) and also with the poorest countries (where more than one billion individuals do not have access to electricity). It would permit the European Union to speak with a "single and unified voice" in international energy negotiations. Up to now, France like Germany or UK has its own position linked to its energy culture (state intervention, vertical integration, unions…), history (domestic resources, former colonies…)…The globalisation of energy-environment problems makes the multiplication of the international dialogues in bilateral or multilateral forms essential. Even the "conservative party" in the UK one of the most euroskeptical countries thinks it is compulsory to have a European energy policy to assure security of supply and fight against climate change. It is maybe through these two main issues that the development of a common policy will be possible with the support of the biggest Member States.What compromises can be identified and reached between Paris and the European Union so that both "speak as one" on energy and environmental questions? That is the current challenge faced by the French government. France needs to figure out how to be part of the European process while still protecting its national ideas. France could and would like to play a significant role and even try to be a model in the European Union. The debate over the new French project law is a step toward the compliance to European regulation. Some national fears need to disappear (end-users, Unions…) and certain national advantages need to be highlighted (nuclear plants competitiveness, CO_2 emissions, renewable energies, white certificates…). Thus, France might evolve from "black sheep" to an energy model based on better energy intensity, energy independence, low electricity costs, energy capacities storages and, low emissions. France just needs to figure out how to deal with its long history of state intervention in energy sectors. At a stage when the process of European integration is

[32] The Schengen Agreement allows EU citizens to travel within the Schengen area without being subject to police controls. The Agreement was included in the Treaty of Amsterdam in 1997. Today 24 countries are in the Schengen area not all the EU countries are in and some non EU countries are in.

[33] Member States showed solidarity during the Russian Ukrainian gas crises at the beginning of 2009.

at a standstill, the debate about energy issues is part of a larger debate about the nature and destiny of the EU. The European energy market is moving ahead, albeit slowly with its recurring national protectionisms, obstacles and contradictions. Nonetheless it aptly reflects and represents our future as "United in Diversity".[34]

Bibliography

– BP Statistical Review of World Energy 2008 (2009), BP web website
http://www.bp.com/productlanding.do?categoryId=6929&contentId=7044622

– CHEVALIER JM (2009), « The new energy crisis: climate, economics and geopolitics », Palgrave.

– CHAMPSAUR P. (2009), "Rapport de la commission sur l'organisation du marché de l'électricité »,
http://actionnaires.edf.com/fichiers/fckeditor/File/Finance/investors/2009/090424-RapportChampsaur_vf.pdf

– EC (2006(a)), European Commission Competition DG Sector Inquiry on the gas and electricity market Art 17 Regulation 1/2003, Preliminary Report, Bruxelles, 16 Feb, 2006
http://ec.europa.eu/comm/competition/antitrust/others/sector_inquiries/energy/execsum.pdf

– EC (2006(b)), *Green Paper: European strategy for secure, competitive and sustainable energy*, European Commission Competition DG Bruxelles
http://ec.europa.eu/energy/green-paper-energy/doc/2006_03_08_gp_document_fr.pdf

– JOSKOW P. & SCHMALENSEE R. (1983), Markets for Power, MIT Press.

– MERITET S. (2008),« French perspectives in the emerging European Union energy policy», Energy Policy n°35, pp. 4767-4771.

– Observ'ER (2009), "The state of renewable energies in Europe", the 8th EuroObserv'ER report.

[34] It is the motto of the European Union.