

SPAIN
NATIONAL POSITION PAPER



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1. INTRODUCTION

Spain became a member of the European Union (EU) in 1986. Since then, EU membership has led to an increased standard of living and economic growth, and a huge increase on energetic consumption. With limited energy resources, Spain depends mainly on energy imports from third countries which supply 80% of the total energy consumption. In contrast, the average of energy imports within the 27 European Union members European Union is a 52.3%, consequently, security of energy supply is crucial for Spain.

Likewise to the increasing energy consumption, the production coming from renewable energies has increased soundly in the last five years and Spain has also implemented important measures in order to achieve a more energy efficient economy and a more sustainable development. In this sense, Spain is in clear favor of reaching an agreement among the 27 member states to put in place a new Energy Treaty. Based on the Commission's Green Paper, Spain suggests in the last section of this paper some potential contents of the future Treaty in 4 sections: competitive energy markets, security of supply and solidarity, energy mix, and sustainable development.

2. NATIONAL ENERGY POLICY

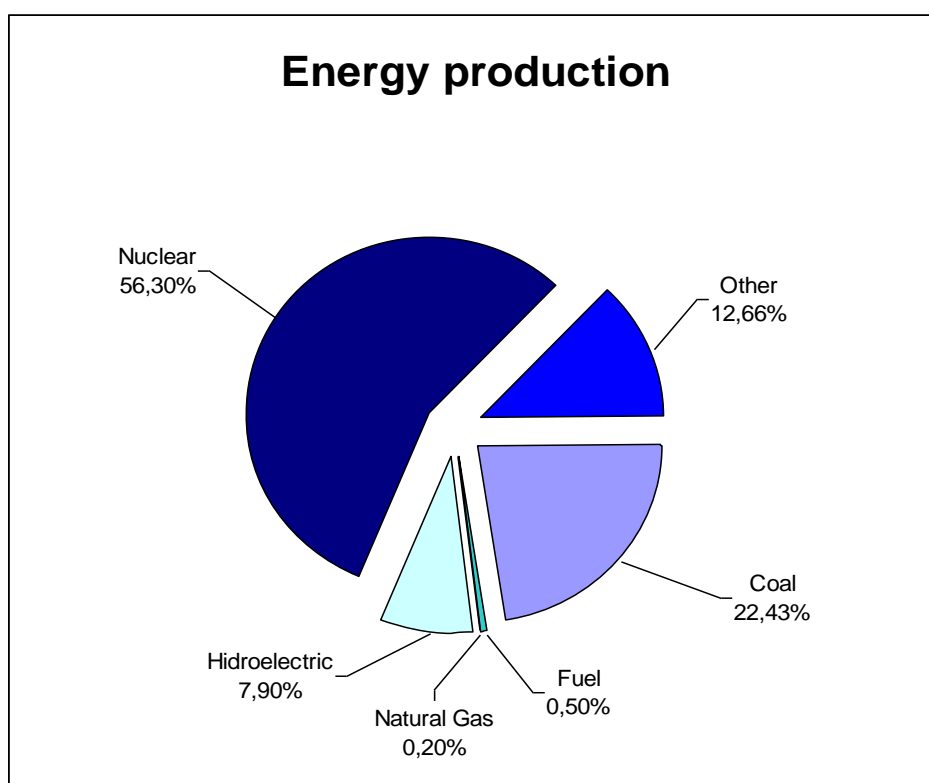
(2.1) Energy production: resources

Spain has limited energy resources, so we must depend upon imports for the bulk of the energy needs. Spain's energy production in the year 2006 was a 3.1% higher than in 2003. This means that Spain is trying to reduce the amount of energy imported from other countries.

As we can see in the first graph, most of Spain's energy production comes from nuclear energy, followed by coal, other renewable energy, hydraulic energy, fuel and natural gas. This means that Spain has to import these two last types of energy (fuel and natural gas) from other countries. The next graphs show the countries we need to depend on in order to import these energies. Our fuel

imports depend mostly from Russia, Libya and Iran, and our natural gas imports from Algeria, Nigeria and Qatar. Spain has enough coal, nuclear and hydraulic energy in order to supply itself without the dependence of other countries.

Figure 1. Spain: energy production

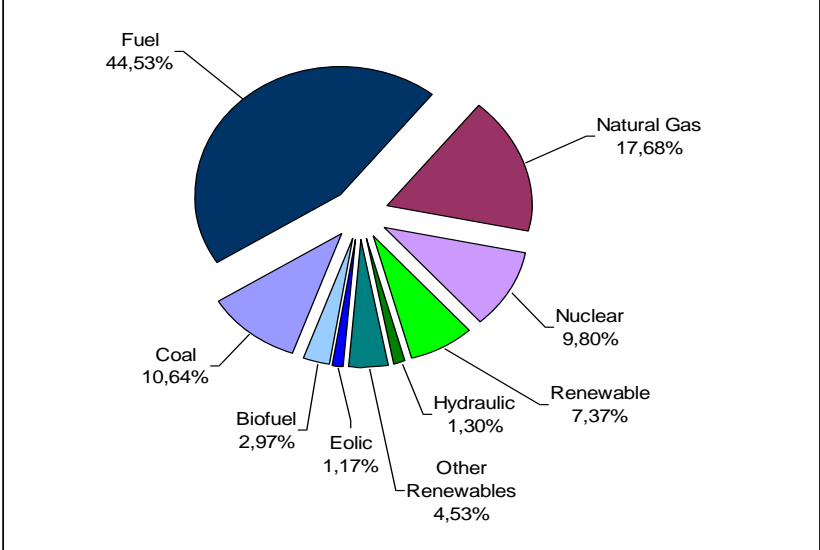


Source: own elaboration with INE data (2006)

(2.2) Energy consumption: sources and suppliers

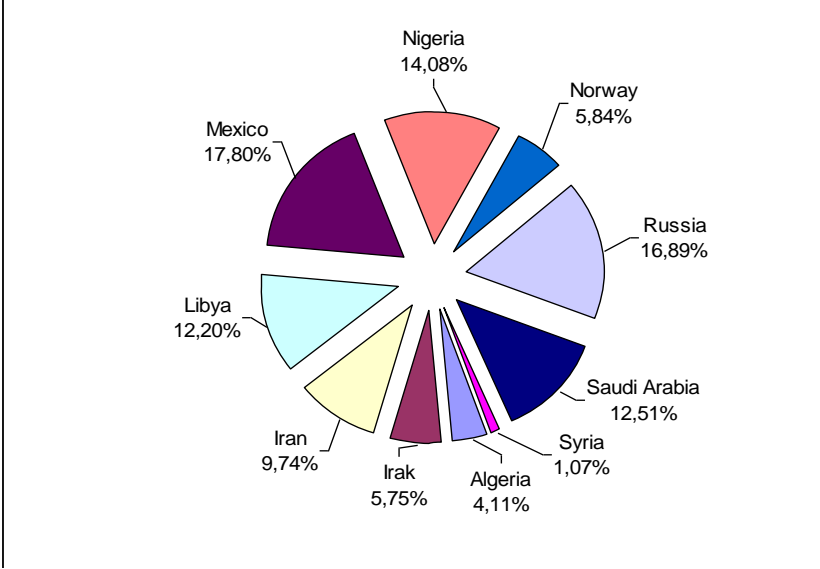
Primary energy consumption, which is the energy that has not been subjected to any conversion or transformation process, consists mainly of fuel, being natural gas and coal other important primary sources in our country. Secondary energy consumption, which is the form of energy generated by conversion of primary energies, consists of oil products and electricity.

Figure 2. Spain: primary energy consumption



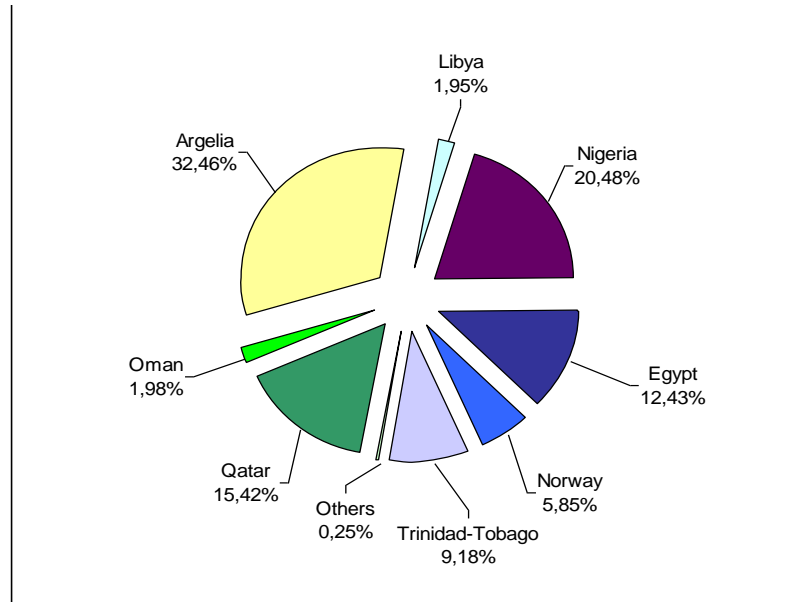
Source: own elaboration with INE data (2006)

Figure 3. Spain: Imports of crude oil by country



Source: own elaboration with Eurostat data (2006)

Figure 4. Spain: natural gas imports



Source: own elaboration with INE data (2006)

In conclusion, and regarding national production and consumption:

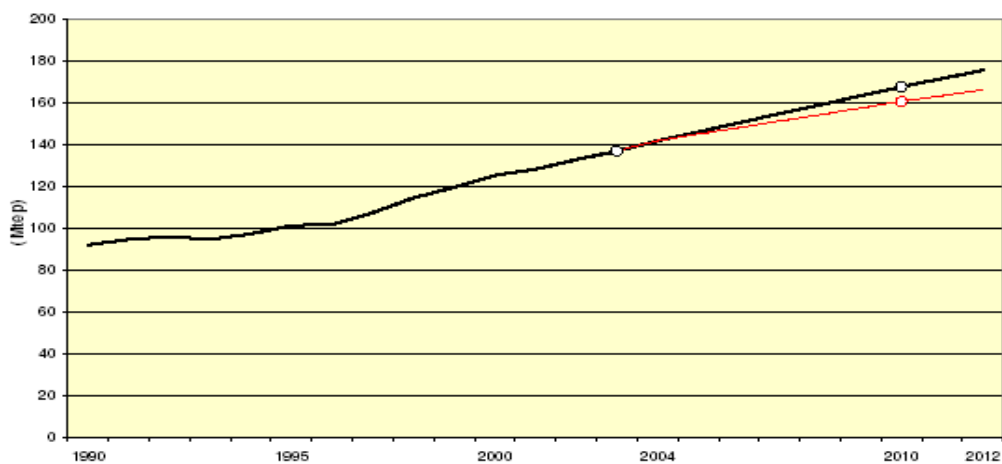
- ✓ Spain's economic growth has led to an increased energy consumption
- ✓ Though producing nuclear energy and coal, Spain remains highly dependent on energy imports.
- ✓ The two most consumed commodities for primary energy, fuel and natural gas, have to be imported almost completely.
- ✓ Although highly diversified, Spain main suppliers are:
 - fuel: Russia, Libya and Iran
 - natural gas: Algeria, Nigeria and Qatar

(2.3) Policy areas

a) Renewable energies: present and future

Energy has always been considered as one of the most important factors who have a great influence on nation's economies. Therefore, States have always applied policies tending to cover their energetic requirements at low costs and with efficiency. Traditional sources of energy have become scarce and their costs have incredibly risen in the latest decades. At the same time, excessive consumption of these traditional sources, like petrol, has increased pollution, reaching alarming levels that menace the world with catastrophic consequences represented by the climate change.

Figure 5. Spain: Primary energy consumption



Source: PER, Programa de Energías Renovables 2005-2010.

Investment and renewable energies appear as the best solution in order to combine environmental protection and economic growth, what has been called sustainable development. This must be the main objective for each country and the key in every energy policy.

As a substitute for traditional energy sources, renewable energies are getting more and more important as development in them is increasing. The most important renewable energies are:

- Solar energy: The most important one, as the sun is the origin of many other renewable energies.
- Wind energy: Wind is able to push huge windmills strategically placed on mountains and next to the coast. The windmills parks are able to supply whole nations with energy.
- Biomass: Is the amount of organic elements coming from natural or artificial transformations happening in every organic process.
- Hydroelectric energy: Obtained through dams, combining two objectives: getting energy and saving water.

Spain has experienced a huge increase of energetic demand for the last fifteen years. Its excessive energetic dependence (around 80%) and the priority of preserving the environment is forcing our government to implant and apply efficient energetic policies based on renewable energies.

According to this, in Spain, the substantial growth of the renewable energies use is based on economic, social and environmental strategies.

Likewise to the increasing energy consumption, the production coming from renewable energies has increased a lot since 2004, as it can be seen in the following tables, the first one indicating the production (referred to renewable energies) and total consumption of energy in 2004, while the second one shows the actual influence of renewable energies and future perspectives.

Figure 6. Spain: RENEWABLE ENERGIES PRODUCTION (2004)

	Renewable energies production in 2004		
	Power (MW)	Production (GWh)	Production in terms of Primary Energy (ktep)
Electricity Production			
Hydraulic (>50 MW)	13.521	23.673	1863
Hydraulic (10-50 MW)	2997	5097	438
Hydraulic (<10 MW)	1749	4729	407
RSU	189	1223	390
Biomass	344	2193	680
Windmills	8100	15056	1290
Biogas	141	825	267
TOTAL ELECTRIC AREAS	27.041	52.796	5335
Thermal Use			
Biomass			3487
Biogas			28
TOTAL TERMIC AREAS			3515
Biofuel (transports)			
TOTAL BIOFUEL			228
RENEWABLE ENERGIES			9078
PRIMARY ENERGETIC CONSUME			141567
RENEWABLE ENERGIES/PRIMARY ENERGETIC CONSUME			6,4%

Source: PER, Programa de Energías Renovables 2005-2010.

Figure 7. Spain: renewable energies production: PROJECTIONS

	Production in Primary Energy terms (ktep)			
	2004	2010		
		Renewable Energies Scenes		
		Actual day	Probable	Optimistic
TOTAL ELECTRIC AREAS	5.973	7.846	13.574	17.816
TOTAL THERMAL AREAS	3.538	3.676	4.445	5.502
TOTAL BIOFUELS	228	528	2.200	2.528
TOTAL RENEWABLE ENERGIES	9.739	12.050	20.219	25.846

ENERGY CONSUMPTION	141.567	166.900	167.100	167.350
Renewable energies/Primary energy(%)	6,9%	7,2%	12,1%	15,4%

Source: PER, Programa de Energías Renovables 2005-2010.

According to the information provided, and trying to reach the most optimistic previsions, the Spanish Government has implanted an energetic programme, the **Renewable Energetic Plan**. The Plan's main objectives should be covered within the period of 2005-2010. These objectives are based on the improvement of the renewable energies and one of them is covering the 12,1% of the total energetic demand with "clean energies" in 2010. They are divided in several groups, according to each kind of energy:

Wind energy: the objective is to increase the production in 12.000MW, reaching the total amount of 20.155 MW. This means to double the actual production.

The main forces and opportunities to reach the objective are:

- a) Lots of places that can be used for establishing windmills parks.
- b) Legislation that favours the use and promotion of this energy.
- c) Private companies interested in renewable energies.
- d) Autonomic Governments investment.
- e) Introduction of the newest technologies.

Hydroelectric energy: the objective is to increase the hydraulic production of little dams from 1749 to 2199MW and from 2897 to 3257MW in bigger dams.

Hydroelectric energy is one of the most important sources of energy in Spain, which has been used for years and has become a mature market based on huge investments. However, its importance has been decreasing, during the last years, as a consequence of bureaucratic problems and the development of other renewable energies who are in comparison less expensive and more harmless to the environment.

The consecution of these objectives will be possible with the support of the following facts:

- a) A great hydroelectric potential in Spain.
- b) Positive laws for hydroelectric companies
- c) Mature sector.
- d) Available technology and Spanish investment.

Solar Thermal Energy: the objective established by the Spanish programme, is to install 4.200.000 m² of photovoltaic modules during the period of 2005-2010.

The sun is a plentiful source of energy with a lot of energetic uses, so it has to be

taken into account in every energetic programme. The main reasons that justify the Spanish development of this kind of renewable energy are:

- The geographic location of Spain.
- Positive perspectives related to the development of houses whose electric and thermal supplies are based on solar energy.
- A great opportunity for the spanish society to participate in and to feel responsible for their countries' Energy project.

Biomass: another important source of energy is the biomass, for which a lot of organic and artificial materials are used in order to produce electricity as well as thermal energy.

The objective is to increase the biomass power in 1695 MW for the year 2010. As it can be seen in the following table, the growth of the energetic power of the biomass will increase periodically during the period 2005-2010.

Figure 8. Spain: Production of biomass power: current and projections

		2005	2006	2007	2008	2009	2010	2005-2010
Biomass Electric Power	MW	10	40	95	210	285	333	973
Biomass Thermal Power	MW	0	50	125	125	200	222	722
								1695

Source: PER, Programa de Energías Renovables 2005-2010.

In conclusion:

- ✓ Spain's most important renewable Energy is Hydroelectric energy even though it is still very expensive and environment disrespectful at the moment.
- ✓ Spain's production generated by renewable energies has steadily been increasing since 2004 and it is foreseen to include the generation of solar energy in this increase of production by setting an objective of installing 4.200.000 m² of photovoltaic modules during the period of 2005-2010
- ✓ Spain has implemented the Renewable Energetic Plan who will be progressing from 2005-200. The Plans main target is covering 12.1% of spanish energy consumption with " clean" or renewable energies

b) Security of energy supply

Generally speaking, Spain, in general, has to be classified as a very energy dependent country, underlined by the fact that more than 80% of the gross energy consumption is met through imports¹. In contrast, the average of energy imports within the 27 European Union members European Union is a 52.3%. Bearing this in mind, security of energy supply is crucial for Spain.

The risks a country is exposed to vary in consideration of the time horizon. On the short term, supply interruptions as well as suddenly increasing energy prices, could jeopardize the Spanish economy. To avoid short term interruptions within petroleum products, minimum security reserves equal to 90 days of sales or consumption are established. Both oil companies and CORES (a public organisation responsible for managing strategic oil reserves) build up reserves equal to 45 days of sales or consumption.

On the long term the objective is to assure the necessary energy supply for securing sustainable economic growth. This aspect is influenced by energy interdependency between producer and consumer, but an asymmetrical one. Thence, Spain is exposed to the risk of being strongly dependant on Algerian gas as deepened later on.

The security of energy supply does also differ considerably concerning the different energy sources. Petroleum can be considered as a very fungible commodity. Indeed, it is traded within a global market. Commercial barriers are, if they even exist, low and so are transport costs. Nonetheless, increasing demand is counteracting this through higher prices. However, prices are built on the stock market in London and New York and hence very transparent, at least in the Atlantic-Mediterranean market. Therefore the main insecurity of petroleum is an economic one, due to price variations. Though, on a short term there still exists certain insecurity, considering that fungibility is restricted cause of logistical or technical aspects, for example when a refinery only works with a determined kind of crude.

¹ source: EUROSTAT: Energy Yearly Statistics 2005, Brussels, 2007

The provenience of petroleum in the case of Spain can be distinguished from other main economies in the European Union like Germany, France, the UK or Italy. Hence, supplies from Latin America are considerably higher in Spain, with Mexico as largest supplier of crude oil². Supplies from Middle East and Africa are significantly larger as well in comparison to the four named countries and bearing in mind the average in the EU. Tough, imports from Norway, Russia and Kazakhstan have a relatively lower importance in Spain.

The gas market is, on contrary, mainly a regional market. Due to scarce suppliers, Spain purchases approximately 80% of its natural gas via pipeline from Algeria, the national gas firm Sonatrach in particular³. Thus, the Maghreb-Europe Gas Pipeline links the Hassi R'mel field in Algeria through Morocco with Spain. Besides, the Medgaz Pipeline between Algeria and Spain is actually under construction and will be finished by 2009. The latter one will therefore reduce Spain's vulnerability towards Morocco.

To reduce the dependency on Algerian gas, Spain is the largest LNG-importer of the European Union. Liquefied Natural Gas providers are multiple, among them Nigeria (29.1% of total LNG-imports), Qatar (20.5% of total LNG-imports) and Egypt (19.7% of total LNG-imports) as most sticking out suppliers.

Conclusions:

- ✓ Spain is a very energy dependent country, more than 80% of the gross energy consumption is met through imports⁴.
- ✓ The objective is to assure the necessary energy supply for securing sustainable economic growth.
- ✓ The main insecurity of petroleum is the economic one, in terms of price variations.
- ✓ Spain is trying to reduce its vulnerability of natural gas supply by building up new pipelines.

² source: EUROSTAT: Energy Yearly Statistics 2005, Brussels, 2007

³ source: BP Statistical Review of World Energy June 2007

⁴ source: EUROSTAT: Energy Yearly Statistics 2005, Brussels, 2007

c) Energy efficiency

Making homes, vehicles, and businesses more energy efficient is seen as a largely untapped solution to addressing global warming, energy security, and fossil fuel depletion. Therefore, the Spanish Government introduced in November 2003 the **Spanish Energy Efficiency Strategy** which was implemented in 2004 and is foreseen to be in progress until 2012. This strategy mainly focuses on the sectors of: energy transformation, transportation, construction, tertiary and residential industry and Agriculture and public services.

Within the progress of carrying out the strategy the Government has formed six inter-ministerial working groups whose purpose is to control the implementation of this strategy. These working groups have been created according to the 6 sectors mentioned above (the sectors on which the strategy is focused). All in all we can conclude that they fix the vertical objectives of the countries Energy Efficiency Policy.

In order to appoint the horizontal objectives of the strategy another group on institutional organization was founded. This group is in charge of the development of objectives with institutional character and stands in close relation to the autonomous communities (Spain's Regions).

To take this strategy into action an E4 Action Plan was launched for the periods of 2005-07 and will be coordinated by the ministries of Tourism, Trade and Industry. The E4 action plan foresees an assessment of Spain's energy supply and also analyses the energy demand of the various economic sectors of the country. This analysis intends to capture the weaknesses in Spain's Energy Efficiency and should determine potential efficiency improvement. The Action plan describes specific programs for each sector regarding the topic of energy efficiency and sets a reachable target for all of them. Briefing the actions to be taken in each of the sectors mentioned by this action plan, we can say that Spain looks forward to a better use of energy in the following ways (by sectors):

-Industry: large and small businesses should strive to make their operations and products more energy efficient, which will help them to save money and be more

competitive. In an effort to achieve this objective, the Spanish Government will pass legislation; sign individual agreements with companies and specific sectors, and pass tax breaks for those companies who achieve these objectives.

-Transportation: encouraging the use of public transportation; tax breaks for those citizens who buy more energy efficient cars; use of alternative fuels, such as natural gas (this doesn't mean a more efficient use of energy, but it contributes to a better environment); and other specific measures.

-Other uses (tertiary, residential industry and public services): measures that encourage a better use of energy at home; passing legislation that will force new constructions to be more energy efficient; a better use of public services, such as street lights, traffic lights and others.

The result of the implementation of these saving measures, is expected to be about 9.824 ktep/year in final energy, and 15.574 ktep/year in primary energy, which would imply, for the sectors, a saving of 2.862 M€/year. The accumulated saving planned during the period 2004-2012, reaches the 41.990 ktep in final energy and 69.950 ktep in primary energy. The financial means needed to carry out the Energy Efficiency Policy and the E4 action Plan will be backed up to 70% by means of low interest loans by public finances and the government.

✓ Making homes, vehicles, and businesses more energy efficient is seen as a largely untapped solution to addressing global warming, energy security, and fossil fuel depletion

✓ Spain has taken important measures in order to achieve a more energy efficient economy and society.

✓ These measures include encouraging business to be more energy efficient, but also individuals who are now asked to be more energy efficient in their daily life.

3. SPANISH NATIONAL POSITION AND THE NEW ENERGY TREATY

Spain is in clear favor of reaching an agreement between the 27 member states to put in place a new Energy Treaty. The reasons are the following:

1. Though still it does not seem as reachable in a near future, **a common external energy policy is unavoidable.** Recent problems in East Europe have emphasized the need for a common external energy policy in Europe. Europe has to speak with one voice.

2. Europe gains hereby an increased role as energy purchaser what will help to assure the **security of supply** in entire Europe. On the other hand this would help to build up a clear and efficient strategy concerning the actual variety of pipeline projects in Eastern Europe.

3. Moreover, it has to be considered that the importance of energy policy is increasing steeply, particularly concerning **climate change**. Therefore it is, though evident difficulty, necessary to play a leading part in fostering a worldwide climate change.

4. It should be kept in mind that the image of the EU to the rest of the world in the past has precisely been damaged because of not speaking with one voice. Thus, a common external energy policy would also help to boost the external EU image and **position as a global player.**

5. To achieve this common external energy policy a successive European energy plan should be established, where the common external policy should be the culmination, and **the new Energy Treaty, a stepping stone** to build it.

Based on the Commission's Green Paper, Spain suggests the following contents for the new Treaty divided in 4 sections:

**FIGURE 9: NEW ENERGY EUROPEAN TREATY:
Specific proposals**

	<i>Legal bindings on the Treaty</i>
Section 1: Competitive energy markets	<ul style="list-style-type: none"> ✓ Legal right to purchase electricity and gas from any European supplier: The European Union is based on free trade and has by this principle gained economical success since its creation. Hence, to open the energy markets, still mainly dominated by local companies, to foreign suppliers is an inescapable choice to help reducing energy costs in European households. Taking into account the past evolution of gas and electricity prices in whole Europe this aspect gains even more importance. ✓ Enforcement of national competition surveillance institutions ✓ Proposal: creation of a new independent EU body
Section 2: Security of supply &solidarity	<ul style="list-style-type: none"> ✓ Common security standards for EU-27, candidates and potential candidates ✓ Bilateral agreements with third countries (i.e: Russia): binding commitment to include a <u>"most favoured nation" MFN clause</u>, that will extent the conditions of the agreements signed bilaterally with non-EU members, to the rest of the EU members.
Section 3: Energy mix	<ul style="list-style-type: none"> ✓ Achieve 20/20/20: 20% share of renewable fuels by 2020:The recent development of fuel prices underlines the evident necessity of reducing the dependence on certain energy sources. Though already established, the determined 20/20/20 – objectives lack of implementation. ✓ Nuclear energy development and consumption: Regarding the actual energy policy in the members of the European Union, the different positions concerning nuclear energy stand out and should be maintained <u>individually</u>. ✓ Fiscal incentives "solar check": Especially concerning renewable energies the geographical conditions of every country should be taken into account to guarantee an efficient use. Spain has built up a profound competence and experienced a successful record in solar energy. Due to ideal climate conditions Spain beliefs in the fundamental role of solar energy within the range of renewable energies and wants thus fiscal incentives to be permitted in order to improve actual technologies and boosting efficiency.

	<ul style="list-style-type: none"> ✓ Biofuels: due to negative impact of biofuels on food prices rise, Spain points out the need to debate about the pros and cons of the development of this source of energy. The EU Commission should publish a <u>Green Paper on Biofuels</u> to open debate.
Section 4: Sustainable development (climate change & energy efficiency)	<ul style="list-style-type: none"> ✓ Achieve 20/20/20: 20% less of CO2 emissions by year 2020. ✓ Discuss at a European level the possibility of establishing a European standard in public transportation; every European citizen should have the same possibilities to access to a functional and efficient public transportation. ✓ Achieve 20/20/20: improve energy efficiency 20% progressively by year 2020: European binding standards for new buildings construction and house design criteria (isolation, heating, lighting, solar hotwater, optimization of natural light and cogeneration)

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