



SPECIAL REPORT

The debate on the future of energy: Shale gas

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1. INTRODUCTION: WHAT IS THE MEANING OF SHALE GAS, UNCONVENTIONAL GAS AND FRACKING?
2. WHY IS NATURAL GAS CLEANER THAN OTHER FOSSIL ENERGY SOURCES?
3. WHO ARE THE DETRACTORS OF FRACKING AND WHAT DO THEY SAY?
4. WHAT ARE THE RISKS FRACKING INVOLVES? HOW CAN WE DEAL AND PREVENT THEM?
5. WHAT DO WE LOSE IF SPAIN DOES NOT GET INVOLVED?
6. WHAT ARE THE POLITICAL LEARNINGS IN SPAIN ABOUT FRACKING?
7. WHAT IS EUROPE'S POSITION?

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1. INTRODUCTION: WHAT IS THE MEANING OF SHALE GAS, UNCONVENTIONAL GAS AND FRACKING?

For many centuries natural gas has been used as a source of energy. Amongst those characteristics that have made of natural gas a common element on our daily lives we can mention its cleanliness, efficiency, versatility and abundance. Part of the electricity we use comes from natural gas. We use it for cooking, heating during the winter and it fuels the engine of our cars.

Shale gas is basically natural gas without any new characteristic and it is also known as **unconventional gas**. Gas is found trapped in rocks and clayey formations with very low permeability. Therefore, in order to extract the gas, unconventional techniques are required so it can flow to the surface.

These unconventional techniques are known as **fracking** or **hydraulic fracturing**. They consist on fracturing the rock in 5,000 meters depth and between 2 and 5 kilometers in lateral length. Then, they pump water mixed with sand (98%) and some chemical additives (2%) in high pressure. The rock is fractured with this process and the gas flows to the surface through the pump.

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2. WHY IS NATURAL GAS CLEANER THAN OTHER FOSSIL ENERGY SOURCES?

Nowadays, natural gas is the cleanest fossil fuel available and it is found in Europe and other continents. For these reasons, natural gas is one of the key points for the transition towards a low carbon economy and a more sustainable energy system.

By a progressive replacement of coal platforms for combined cycle gas plants, we could reduce up to 50% the CO₂ output (that means to be back to 1990 levels) and also reduce up to three times the level of other greenhouse gases (such as NO_x and SO₂).

Many experts advocate for the replacement of coal or oil by natural gas as a tool to reduce greenhouse gases emission by the end of 2030. For this reason, natural gas plays a very important role on the Spanish energy mix.

3. WHO ARE THE DETRACTORS OF FRACKING AND WHAT DO THEY SAY?

Those against fracking warn about the possible water contamination, methane leakages and earthquakes among other risks.

The initials NIMBY (Not In My Back Yard) gather different citizens' groups and neighbors associations that, through social networks, mobilize ecologists and other people concern about this topic by organizing protests

and demonstrations. By using the media as their tool for communication, they aim to create an adverse atmosphere in order to stop the use of this technology in their regions.

According to the French Institute for Sustainable Development and International Relations (IDDRI), people exaggerate when talking about the impact on development of shale gas in Europe. As an example the Institute says that in the USA shale gas is not really fostering a “global rebirth of the industry”.

Although according to the IDDRI report entitled “Unconventional wisdom: an economic analysis of US shale gas and implications for the EU” the growth of the shale gas in the USA has positively affected the natural gas industry and local economies, the **macroeconomic impact has been insignificant**. The report is based on the assumption that the severe reduction of prices on natural gas in the USA was just something circumstantial and it is not sustainable in the long term. Yet the truth is that after the drop on prices at the beginning of 2012, prices have grown again in January 2014.

4. WHAT ARE THE RISKS FRACKING INVOLVES? HOW CAN WE DEAL AND PREVENT THEM?

Those problems arising from shale gas are **well known**. Companies in the sector have improved their strategies on communication and public affairs from presenting

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this technique as a fatal fate to picturing it as a risk that can be controlled and managed.

Fracking processes are subject to very strict safety rules and environmental protection. Therefore, if the technic intervention is carried out properly and well monitored, **most possible risks can be controlled.**

- **Contamination of surface and ground water:** one of the main targets of the industry should be protecting surface and ground water. Under normal conditions, it is almost impossible that freshwater becomes contaminated during the fracking process since fracking is carried out at depth tends under several impermeable layers and far from aquifers. This fact has been proved and confirmed several times.
- **Air pollution:** this process could reduce by 50% the greenhouse gases produced by traditional coal-fired stations.
- **Risks for health:** the biggest concern and what causes more rejection are the chemical additives. Such additives are completely public and they must be registered according to the European legislation REACH, which rules the use of all chemical components by any industry.
- **Landscapes' and fields' alterations:** the area needed for these processes of drilling

and stimulation is equivalent to the area of one to three football fields. So, there is not a great visual impact and drilling companies will minimize it even if it was only for their own interest.

- **Soil contamination when closing the wells:** according to current legislation, once the process is finished, companies must seal the wells and leave the field as it was before the works (which will consequently minimize the environmental impact).
- **Seismic risk:** fracking has been used in over 2 million wells all over the world for more than 60 years. Throughout all these years, only two cases of seismicity linked to fracking have been registered in the UK. One of 1.5 and another of 2.4 degrees on the Ritche scale (both almost unnoticeable).

5. WHAT DO WE LOSE IF SPAIN DOES NOT GET INVOLVED?

Regarding the political front, the energy strategy must be one of the priorities on the government's action beyond electoral interests. The ideal situation would be for energy policies to be coordinated together with industrial, environmental, foreign, economic and R&D policies. Some European countries like the UK or Denmark have already followed this path by creating a specific Ministry which manages and regulates this area.

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In order to sustain its economic development, Spain needs a secure, constant, affordable, and with a low environmental impact energy supply. One of the main challenges we are facing nowadays, is the fact of guaranteeing this energy supply in an efficient and sustainable way in a world where energy sources are becoming more and more limited.

It is very important that Spain explores new energy resources and invests on this area since nowadays, **the country still relies on other countries regarding energy and it imports almost 100% of the oil and gas the country needs.** Another problem is that these imports come from politically unstable countries, which means that prices of energy invoices raise and there is a consequent declining on competitiveness of our industrial sector.

Taking into account the great energy dependence with a self-sufficiency of gas supply of only 0.2% and 10,000 million of euros spent on importation, **those national resources that could help to improve the situation cannot be ignored.** Therefore, although shale gas has not been a revolution in Spain as it happened in the USA, it could still play an important role on energy policies. Although Spain has optimistic estimations, the country is still on the previous phase to exploration. **Therefore, we do not know yet the real potential of shale gas in Spain.**

According to the latest reports in Spain, it is estimated that along the *Cordillera Cantábrica*, there are billions of cubic meters of shale gas. Starting in the fifties, 13 investigation bore wells have been drilled in Álava. According to the prospections carried out, there is a potential reserve of unconventional gas and its confirmation and assessment needs complementary research works.

By using this energy resource the advantages are not only a reduction on the energy dependence. As direct consequences we can list: **attraction of investments, job creation, growth on our industry competitiveness and greater tax revenues.** In the current economic scenario, these consequences represent a very positive effect.

Another important aspect of the exploration and production of conventional gas and especially unconventional gas **is the jobs' creation which could open new doors for our technicians and engineers.** Around 600,000 people work in the shale gas industry in the USA and numbers could increase in 2035 by 1.6 million. As for the UK, the shale gas industry is expected to create around 74,000 direct and indirect jobs. Moreover, the sector has a great dependence on **local manpower** which helps to **revitalize several local communities.**

Regarding competitiveness, several decades were needed for the USA to develop the technology of hydraulic fracking. Once the processes

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started, they already had a lot of information about the subsoil so they could choose new places to drill and also counted with a very developed industry supporting the drilling. **Europe inherits the technological development of the USA but needs to develop its information about the subsoil** (which will need some time).

Big gas and oil companies have preferred mature and developed markets due to its developed technological capacity (like the USA). Nowadays, **the industry starts to get interested in the European potential as well, including the Spanish one.**

6. WHAT ARE THE POLITICAL LEANINGS IN SPAIN ABOUT FRACKING?

At the beginning of 2014, some parties such as *PP*, *UPyD* and *CiU* rejected at the Congress of Deputies and initiative of the *Izquierda Plural* which was supported by PSOE and on which PNV decided to abstain and which aimed to ban fracking in Spain. The outcome of this voting does not guarantee the success of these processes which are currently on its first stages.

The current government supports fracking considering it one of the techniques that will improve the reliance on hydrocarbon in Spain, which has a direct impact on energy costs and competitiveness.

In 2013, the government introduced the fracking technique into the Environmental

Assessment Act in order to regulate its use and demand a previous declaration on its environmental impact as it happens with other explorations on hydrocarbon. The organisms in charge of this type of authorizations are the autonomous communities (provided they do not affect more than two autonomous communities).

Those communities that might have slate on its subsoil are against fracking since it could obstruct the investigation projects and dissuade private companies that have financial power and proper technology to explore and exploit the deposits.

For example, the Parliament of Cantabria passed a law banning fracking on its territory. The law has been appealed by the government which considers that the Parliament has exceeded its competences. Other communities like La Rioja and Navarra have also followed the same path as Cantabria. Catalonia modified on its *Ley de Acompañamiento de Presupuesto* for 2013 (budgetary complementary law) its land regulation by banning fracking whenever it implied negative consequences on the geological, environmental, landscape's or socioeconomic characteristics. Other autonomic parliaments like Aragon, Basque Country and Valencia Community have also argued measures willing to ban fracking on their communities.

Even though it seems to be very difficult, the ideal situation would be to have the support of all autonomous communities involved.

Regarding the social aspect, ecologist and touristic associations are the main groups against fracking. Apart from those already-mentioned environmental risks, they claim impacts on tourism due to the visual impact fracking could have in some rural areas.

7. WHAT IS EUROPE'S POSITION?

There are very different opinions all around Europe. During Sarkozy's government France banned fracking. Countries like Germany, Bulgaria, Czech Republic, Denmark or Ireland have imposed a moratorium. Poland and the UK have shown a strong support to this process. In the UK, Prime Minister Cameron announced 20,000 new bore wells.

When facing this scenario, the European Commission and the Parliament are divided about fracking. From the UE's point of view, the American oil and unconventional gas revolution has created awareness and doubts about the Union's industry competitiveness and has raised **awareness on the European governments and a will to promote a revision on the climate and energy policies**. Shale gas in the UE appears as an opportunity to rebalance the energy policies and build a cheaper way to reduce the emissions of greenhouse gases in order to boost economic competitiveness.

For the first time in February 2014, the European Council has taken responsibility for the industrial

policies in order to take control of our industry competitiveness.

The European Commission has made some recommendations to which the members will have to answer with allegations within the next six months. Such recommendations set the framework for the unconventional gas extraction in Europe's subsoil (as well as there are other measures that set the framework for energy and climate change). The Commission gives sovereignty to all countries when legislating this issue. So, **no Directive will be passed yet**. Nevertheless, the Commission intends to monitor the different steps the states are going to take in order to accomplish the recommendations and will review the conditions of the environmental legislations. If the outcome is not what Brussels expected according to its criteria, they will consider the creation of a new law that will be common for all countries.

The European Union needs an ambitious strategy in order to solve the energy challenges as well as the competitiveness of the industry. This strategy needs to include energy efficiency, innovation, the development of low carbon energy sources and what is more important, **a stronger internal market which needs to be correctly interconnected**. Although nowadays shale gas is not a substitute on the current mechanisms of the European energy policy, for those members that have a big dependence on carbon or on the Russian gas, shale gas could be a potential complement for their energy policies.

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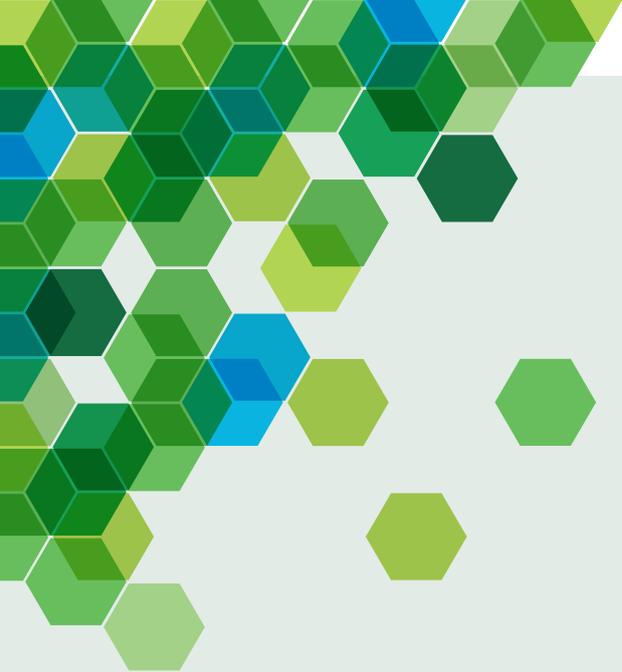
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