

The EU Shale Gas Debate – A Status Report

The EU Institutions and Shale Gas Developments

EU Commission

The debate within the EU regarding shale gas has heated up over the past year due largely to the huge price decreases brought about for US gas consumers due to the shale gas boom in America. The EU's dependence on Russian oil and gas imports for much of its energy needs is another key factor stoking the debate. *Within the EU Commission the debate on the pros and cons of shale gas exploration and drilling started in earnest in 2011 with the publication of a [Study on the legal framework and environmental laws surrounding unconventional gas in Europe](#), carried out by the law firm *Phillipe and Partners*. The main purpose of the Study was to analyse how the relevant applicable European legal framework, including environmental law, is applied to the licensing/authorisation and operational permitting for prospecting, exploration and production/exploitation of shale gas based on a sample of four Member States (Poland, France, Germany and Sweden). The study concludes that most legislative structures are already in place at an EU level (Hydrocarbons Directive, Natura 2000, Water Framework Directive REACH, Environmental Liability Directive), although the package would need fine tuning in the event of large scale drilling and exploitation throughout Europe.*

In September of 2012, the EU Commission published three new studies on unconventional fossil fuels, in particular shale gas. The studies look at the potential effects of these fuels on energy markets, the potential climate impact of shale gas production, and the potential risks shale gas developments and associated hydraulic fracturing ("fracking") may present to human health and the environment.

- *The Study on [unconventional gas: potential energy market impacts in the EU](#); outlines how unconventional gas developments in the US have led to greater Liquefied Natural Gas supplies becoming available at global level, indirectly influencing EU gas prices.*
- *The Study on [climate impact of potential shale gas production in the EU](#); shows that shale gas produced in the EU causes more GHG emissions than conventional natural gas produced in the EU, but – if well managed – less than imported gas from outside the EU, be it via pipeline or by LNG due to the impacts on emissions from long-distance gas transport.*
- *The Third and Final Study is entitled; [support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe](#). It highlights that extracting shale gas generally imposes a larger environmental footprint than conventional gas development. Risks of surface and ground water contamination, water resource depletion, air and noise emissions, land take, disturbance to biodiversity and impacts related to traffic are deemed to be high in the case of cumulative projects.*

To further fuel debate the EU Commission launched a stakeholder [Consultation](#) on the future development of unconventional fossil fuels such as shale gas in Europe in **December 2012** and the Consultation closed on March 20, 2013. A [summary](#) of the main results and contributions to the Consultation were presented on June 7, 2013 and some of the key aspects of the consultation are outlined below:

- *Responses from Poland represented over half of the total (11,714 out of 22,122 individuals) and overall were very supportive of shale gas.*
- *Most respondents were from Poland, France, Romania, Spain and Germany.*
- *A large majority of respondents agree on the lack of adequate legislation, the need for public information and the lack of public acceptance of shale gas.*

Based on the above consultation responses the EU Commission is expected to publish a Communication outlining suggested next policy and legislative steps in mid to late 2013.

EU Council

*On May 22, 2013, during the [EU Summit](#) meeting in Brussels, EU Heads of State discussed EU Energy Policy, including the possibility of [exploiting](#) the continents Shale Gas reserves. One of the most vociferous supporters of shale gas during the meeting was the UK Prime Minister David Cameron, who stated after the meeting **"we must not be left behind in the global race," "Europe has 75% of the United States's shale resources, but America is drilling 100 times faster than Europe."** The EU Council President, Herman Van Rompuy, on his side acknowledged the role that EU shale gas could play in the future, but specified that it was up to individual Member States to make their own energy choices. **He stated at a post-summit press conference that discussions had included the shale gas topic and said that "shale gas could become part of the energy mix for some Member States, perhaps less for others,"***

European Parliament

On November 21, 2012, the European Parliament voted on two own-initiative reports on shale gas. Polish [MEP Boguslaw Sonik's](#) (EPP) report on [the environmental impacts of shale gas](#) was first to be put to the plenary vote. The report was adopted (by 562 votes in favour, 86 against and 43 abstentions). The report emphasises that shale gas can be extracted safely in the EU without a moratorium. Indeed, an amendment put forward for a [moratorium was defeated](#). The report therefore supports further shale gas development and states that any risks should be contained through pre-emptive measures including proper planning, testing, use of new and best available technologies, best industry practices alongside monitoring and robust regulation.

The second report to be voted on was that of Greek [MEP Niki Tzavela](#) (EFD) on [the industrial aspects of shale gas](#). The report was adopted (by 492 votes in favour, 129 against and 13 abstentions). The Report states that EU Member States should be free to decide whether to proceed with shale gas development. MEPs concluded that concerns over well safety can be

addressed through the adoption of best practices in well development and construction...and invites the EU Member States to ensure that these practices are followed in shale gas development. *The report also calls on the EU to follow the US lead in shale gas environmental standards for fracking that require companies to capture methane and other pollutant gas emissions.*

As energy policy is of the competence of EU Member States the two afore mentioned “own initiative” reports are not binding in nature but the results of the voting give a clear signal that a vast majority of EU MEPs are in favour of EU shale gas exploration and mining in the future under a robust regulatory regime .

EU Member States and Shale Gas Developments

The attitude towards the exploration and drilling for shale gas within the EU is very diverse as exemplified already by the various responses by stakeholders in the above mentioned consultation. In general shale gas exploration has been more prevalent in Central and Eastern Europe than in Western Europe however there are some exceptions to the rule. Below you will find a map outlining the main areas where shale gas can be found on the European Continent:

Shale Gas Exploration Areas in Europe*



*Source International Energy Agency, OECD 2012

Summary Table:

Selected EU Member States Estimated Shale Gas Reserves and EU Government Positions Regarding Shale Gas Exploration

Country	Estimated Shale Gas Reserves (tcf)*	Current Government Position on Shale Gas Exploration
Bulgaria	17	Against
Denmark	32	For
France	137	Against
Germany	17	Undecided
Hungary	3,288 bcm*	Undecided
Lithuania	120 bcm*	For
Netherlands	26	Undecided
Poland	148	For
Romania	51	For
Spain	8	For
Sweden	10	For
UK	26	For

*trillion cubic feet *billion cubic metres

Below you will find a more detailed overview of the status of shale gas discussions and activities in all the key countries listed in the above table.

On May 17, 2013, the EIA published its latest [Study](#) of shale gas reserves across the world including a chapter dedicated to the European continent. The below overview has used a number of sources including the EIA Study, news reports as well as information gathered from the [Shale Gas Europe website](#).

EU Countries Positive Towards Shale Gas Exploration

Denmark

Research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated Denmark's reserves at around [32 trillion cubic feet of shale gas](#). At present both Total and E&P Denmark B.V. are exploring for deep shale gas in two license areas in northern Denmark. Total submitted the work program for the first exploration well, Vendsyssel-1, in late 2012 and plans a six year exploration program to determine whether their lease areas contain sufficient shale gas resources to warrant further development.

Lithuania

On May 30, 2013, the Lithuanian Parliament, the Seimas, [passed a Law](#) which will pave the way to the Lithuanian Government signing a shale gas exploration deal with Chevron. In addition, the Seimas passed legislative amendments making it mandatory to carry out an

environmental impact assessment (EIA) where exploration and/or extraction involves hydraulic fracturing. According to Lithuanian Government [estimates](#), the country could hold 480 billion cubic meters of unconventional gas with around 120 billion cubic meters recoverable. ***If these unconventional gas reserve estimates are confirmed, Lithuania, which consumed 3.4 billion cubic meters in 2011, supplied by Gazprom, could provide for its own gas demand for the next 30-40 years.***

Poland

Poland's potential shale gas reserves are extensive, stretching along a belt from the northern coastal area between Słupsk and Gdańsk, eastwards through Warsaw and on towards South Eastern Lublin and Zamość. Initial research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated that Poland's reserves at around [148 trillion cubic feet of shale gas](#), potentially covering up to 300 years of domestic supply.

The Polish government has been one of the most vociferous supporters of the potential benefits shale gas, especially as concerns economic wealth as well as increased energy independence. ***The Polish Government has set a target of starting commercial shale gas operations by the beginning of 2015.*** To date 111 shale gas and two tight gas exploration concessions have been granted by the Polish government to companies including ***PGNiG, Marathon Oil, ExxonMobil, San Leon Energy and Chevron.*** The concession areas cover 29% of Poland's territory. During this exploration phase 21 wells have been drilled, including two horizontal ones.

Romania

Research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated Romania's reserves at around [51 trillion cubic feet of shale gas](#), third largest reserves within the EU. Romanian shale gas reserves could consolidate the country's role as the largest gas producer in Central Europe. In May 2012, the government temporarily suspended permits for shale gas exploration while waiting for the results of the EU's environmental studies on this energy source. The moratorium expired in December 2012 and in March 2013 Prime Minister Victor Ponta [declared that the moratorium would not be extended.](#)

The Romanian government has awarded several concessions for acreage totalling 870,000 hectares to Chevron. Following the lifting of the moratorium, Chevron now [plans to begin exploration work](#) in the second half of 2013. National energy corporation Petrom is also reported to be conducting preliminary analyses in the areas where it operates while Romgaz, MOL, Sterling and East-West all have declared an interest in exploring for Shale Gas within the country.

Spain

Research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated Spain's reserves at around [8 trillion cubic feet of shale gas](#). The Basque government has already invested €40 million in the exploration of wells in the Gran Enara field in Alava, northern Spain. The exploration is being carried out by a consortium, including Ente Vasco de la Energia and two US companies: Heyco Energy España and Cambria Europe.

The regional government of Castilla and León has also issued two licenses for exploration covering 34,765.50 hectares in the province of Burgos to Trofagás, a subsidiary of BNK Petroleum. Several companies hold leases and are actively exploring the Jurassic Shales in the Basque-Cantabrian Basin. For example, San Leon Energy (who acquired Realm Energy and its oil and gas concessions in Spain) has two concession areas, totalling over 210,000 acres in the basin. In addition, BNK Petroleum has a 380,000-acre Jurassic Shale concession in Castillo y Leon and hopes to drill an exploration well in this area during in mid-2013, pending approval.

Sweden

Research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated Sweden's reserves at around [10 trillion cubic feet of shale gas](#). Of the numerous companies that have applied for exploration licenses in Sweden, Shell Oil has been the most active. Shell drilled three wells on their 400-mi² lease area in the Skane Region of Southern Sweden between 2008 to 2011. *However, Shell Oil has since discontinued its exploration due to financial reasons. Other companies with Alum Shale exploration licenses in Sweden are Gripen Gas and Energigas, with twelve licenses in south-central Sweden. However, Gripen Gas is pursuing biogenic source gas with a series of exploration wells in the shallow portion of the Alum Shale.*

UK

On December 13, 2012, the UK government allowed the resumption of exploration for shale gas in the UK (full government statement [here](#)). The decision was based on the latest scientific evidence, including a report by [the Royal Society](#) and an [independent expert report](#) which recommended measures to mitigate the risk of seismic tremors.

Research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated that UK's reserves at around [26 trillion cubic feet of shale gas](#). In early 2013 the British Geological Survey carried out a new [study](#) on shale gas reserves and places the reserves at between 10 to 14 trillion cubic feet of shale gas throughout the UK basins'.

Recently IGas one of the companies carrying out shale Gas exploration in the UK [estimated](#) that UK reserves could be anywhere from 15 trillion cubic feet to 172 trillion cubic feet.

At least six oil and gas companies are targeting shale gas exploration in the UK but only two have actually drilled shale wells. All wells so far have been vertical. UK-based Cuadrilla Resources, partly (43%) owned by Australian drilling company AJ Lucas, is the most active, drilling and coring four shale exploration wells in the West Bowland Sub-basin that confirmed the presence of up to 2-km of gas-bearing organic-rich shale. However, at least one well encountered active faults and high-stress conditions. IGAS Energy has drilled a shale well nearby, coring the 1,600-ft thick Bowland Shale. Horizontal shale wells have not yet been attempted in the UK, nor have flow tests been reported.

Coastal Oil and Gas Ltd., Dart Energy, and Eden Energy also are evaluating their UK shale resource potential but have not yet drilled any shale wells. *Celtique Energie* holds licenses in three areas of the UK: the Cheshire Basin, East Midlands, and the Weald Basin. In the Weald Basin, Celtique has a 50% share in licenses covering 1,000 sq km. The company claims to have unconventional oil and gas potential in the Jurassic Liassic shales, as well as conventional potential in the Triassic.

EU Countries Undecided About Shale Gas Exploration

Germany

After a lengthy period of study, the German government issued, in late February 2013, [draft legislation](#) that would allow the development of shale and the use of hydraulic stimulation (fracturing) under environmental safeguards. Environmental impact studies will be made mandatory for all projects. The draft legislation also outlaws any fracking activities in protected areas and near drinking wells, which covers around 14% of German territory. *However, due to the upcoming German Federal elections in September and opposition to shale gas exploration by both the Social Democrats and the Green Party in Germany, the enactment of this draft law and the lifting of the national moratorium are still far from certain.*

Research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated Germany's reserves at around [17 trillion cubic feet of shale gas](#). In the absence of a federal law to date, licences have been granted by the German Länder. According to the EIA Report, ExxonMobil has so far been the lead company active in Germany and more in particular the Lower Saxony Basin. The company has drilled a series of test wells on its exploration leases, at least three of which are reported to be testing shale gas potential. Starting in 2008, the company drilled the Damme 2/2A and Damme 3 test wells on its Munsterland concession and the Oppenwehe 1 exploration well on its Minden concession. In late 2010, the company spudded the Niederzwehren test well on its Schaumberg permit.

After drilling these test wells, ExxonMobil halted operations in the province following the passage of a moratorium on hydraulic fracturing.

Realm Energy has also obtained a small, 25-square mile shale gas exploration permit in West Germany. The company plans to explore the oil and gas potential in the Posidonia and Wealden shales underneath its acreage. Realm's concession is valid for three years and does not require well drilling, but does provide the company with data from the 21 wells drilled on its acreage in past years. BNK Petroleum has leased approximately 3,745 square miles for shale, CBM and tight gas sand exploration in West and Central Germany. The company has yet to drill on any of its properties, but reports "targeting shale formations," most likely the Posidonia and Wealden shales. Most of its concessions are not near areas with previously defined shale gas potential, suggesting the company is pursuing a wildcatting approach in Germany.

Hungary

According to a [KPMG report](#) Hungary's shale gas reserves have been estimated 3,288 billion cubic metres although it is unclear how much of this amount is considered as recoverable. *Shale gas exploration is still in an early phase in Hungary, with only a handful of companies having undertaken efforts to assess the country's potential reserves. Initial indications are that the economics of extraction may not be competitive. Exxon Mobil for example, started shale Gas exploration activities in Hungary in 2009. However exploratory drilling was soon abandoned due to disappointing results and rising drilling costs.* Since then several companies have or are carrying out small scale [exploratory drilling](#) including Falcon energy and MOL. In December 2011, Ascent Resources, a UK company, announced that it had discovered [11.7 bcm of unconventional gas](#) near the Slovenian-Hungarian border. Other companies involved in shale gas exploration in Hungary include RAG Hungary Kft. and Cuadrilla Resources Ltd, which are actively seeking reserves in various parts of the country.

Netherlands

Research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated the Netherland's reserves at around [28 trillion cubic feet of shale gas](#). The Dutch Government and [EBN](#) have voiced their support for the responsible shale gas production. *Any decision to proceed will however be based on a comprehensive study commissioned by the government that is due in mid-2013.* Three companies have so far acquired shale gas and oil leases in the Netherlands and are awaiting the findings of the government study. Cuadrilla Resources and DSM Energie have leases in the West Netherland Basin while Queensland Gas Company (now part of BG Group) has leases in north-central Netherlands.

EU Countries Negative Towards Shale Gas Exploration

Bulgaria

Initial research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated that Bulgaria's reserves at around [17 trillion cubic feet of shale gas](#).

The Bulgarian Government has imposed a moratorium on hydraulic fracturing since January 2012 due to pressure from environmental groups. Since then, the Bulgarian Minister of Economy and Energy, Delyan Dobrev, has established a parliamentary committee to assess the moratorium. Foreign Minister Nikolai Mladenov has also said there should be a public debate on the advantages and disadvantages of shale gas in Europe. He described shale gas as a "very important resource" for energy independence.

Before the moratorium came into place, several companies pursued shale gas leasing in Bulgaria but only one shale test well was actually drilled. In June 2011, Chevron received a 5-year shale gas exploration permit for the 4,400-km² Novi Pazar block of northeastern Bulgaria. However, since the shale ban of January 2012 Chevron has only been able to pursue conventional targets in the block without hydraulic fracturing.

France

Initial research by the United States Energy Information Administration and confirmed by the EIA Report, has calculated that France's reserves are vast at around [137 trillion cubic feet of shale gas](#), second only to the reserves of Poland within the EU. However, the French government has imposed a moratorium on shale gas drilling in 2011 due to concerns about its potential impact on the environment. Several exploration licenses have since been [revoked](#). *On September 14, 2012, President Francois Hollande announced a continued ban on hydraulic fracturing in France until the end of his Presidential Term and called for the [revocation](#) of seven outstanding permit applications for hydraulic fracturing operations.*