



EUROPEAN POLICY BRIEF



GLOBAL RE-ORDERING: EVOLUTION THROUGH EUROPEAN NETWORKS

Innovation, networks and energy governance: The case of shale gas

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INTRODUCTION

This Policy Brief explores the role of technological innovation in shaping energy governance and how energy governance is being shaped by actors operating in various types of policy networks in the EU. The main aim of this brief is to explore how new technology – in this case the technology making it possible to produce gas and oil from shale deposits – is about to change the situation in the regional and global energy markets and to analyse the impact of this new technology on energy governance in the EU and in member states.

The emergence of this new technology has created hopes that the EU as a whole – or at least some member states – could reduce their dependence on imports of gas from abroad, and especially from Russia, which has turned out to be a rather challenging partner. However, the question of shale gas has been framed in the European debate in so many ways and seems to be so controversial in a situation when the EU aims to reduce its energy footprint by limiting the use of fossil fuels, that it is still uncertain whether this new technology will make any substantial impact on energy situation in Europe. What complicates the situation even further is the fact that rumours about shale gas abundance in Europe have not yet been confirmed and that shale gas therefore remains a more virtual than real commodity.

However, despite the fact that shale gas is still a virtual commodity in Europe, this technological innovation is about to change energy reality and energy governance in Europe. On the one hand, it is expected that the shale gas revolution that has taken place in the USA can result in the export of gas from the USA, and that some of this export may reach the European gas market. On the other hand, the EU and member states have to take this new technological reality into consideration when designing and implementing energy and environmental policies in Europe.

The idea of using horizontal drilling and fracking to extract gas – and oil – from shale rock formations has already changed regional gas markets in North America and is about to change other gas markets, including the European one. The so called ‘shale gas revolution’ has made the USA the greatest producer of gas, has substantially reduced the US energy import dependence and is expected to have global implications. According to the US Energy Information Agency (EIA), the share of shale gas in the US production of natural gas is to increase from 23% in 2010 to 39% in 2020. The fact that the US gas market is today self-sufficient, that similar geological shale formations exist also in other parts of the world and that the technology can be successfully exported is about to change the global energy market.

According to recent EIA estimates China has the most abundant potential reserves of unconventional gas in the world, followed by Argentina, Algeria, USA, Canada, Mexico and Australia. In Europe, Poland, France and Ukraine are the most promising shale gas producers. Countries like Argentina or Australia can increase their gas production exponentially and can become main gas exporters. China can use its shale gas resources to transform its energy mix and to reduce its dependence on coal and imports of energy from abroad. Poland and Ukraine can use their so far virtual shale gas to reduce or get rid of their gas dependence on Russia. France, on the other hand, decided to ban fracking and continues to rely on nuclear energy as the main source and on imports of gas from abroad. Current producers of traditional natural gas have to face this new gas reality and find new ways of dealing with the shale gas challenge. Although it is expected that the gas markets will in the foreseeable future remain regional, it is also expected that LNG supplies and domestic shale gas will compete with piped gas in Europe and this may pose some challenges to traditional European gas suppliers, including Russia.

The new technology has therefore already had some impact on the gas market and on national, regional and global gas governance. This is, however, neither the first nor the last technological gas revolution to have impact on the gas market and energy governance. The most important advantage of natural gas is the fact that it burns the cleanest of all fossil fuels. On the other hand, however, natural gas is trickier and more costly to transport at long distances than solid or liquid fuels and its storage is very costly and difficult in technological terms. This has not, however, prevented natural gas from becoming one of the most important global fuels. In 2012 almost 24 per cent of energy consumed globally came from gas.

However, before gas could become an important energy commodity some technological obstacles had to be overcome. The two most important technological gas revolutions that had a huge impact on gas market were the gas pipeline technology and LNG technology. The construction of the grid of gas pipelines linking gas producing fields with areas of gas consumption increased the use of gas as an energy source and transformed gas into an important energy commodity that could be traded over long distances and internationally. The technology of gas liquefaction (LNG) has added a new dimension to international gas trade as the liquefied gas could be transported between areas not connected by pipelines and even over longer distances than piped gas.

These two technological revolutions have also had consequences for the development of the gas market in Europe and in the EU. The EU is in a peculiar position – its ‘domestic’ gas production represents only 4.4% of global gas production and is dwindling (– 5.5% between 2011 and 2012, or 149.6 bcm in 2012 compared with 325.3 bcm in 1996 which was the top year), while its gas consumption represents 13.4% of the global consumption and has increased over the last two decades from 330 bcm in 1992 to 444 bcm in 2012. The immediate result of these dynamics is that the EU’s gas import dependence has increased from 48.9% in 2000 to 62.4% in 2010.

In 2011 the main sources of gas import to the EU were the piped gas coming from Russia (107.1 mtoe), Norway (91.5 mtoe), Libya (2 mtoe via GreenStream) and Algeria (42.2 mtoe via TransMed)

and LNG coming mostly from Qatar (35.5 mtoe), Nigeria (14.1 mtoe) and Trinidad (3.4 mtoe). Germany was by far the greatest importer of gas in the EU, importing 81.34 mtoe of gas, 28.97 of which came from Russia and 26.06 from Norway. Germany was followed by Italy, the UK, France, Spain, Belgium, the Netherlands, Austria and Poland, each of them importing more than 10 mtoe of gas. The list of countries exporting gas to Europe consists of Norway and Trinidad, two well-established liberal democracies, and several other countries facing various types of democracy related challenges. The most important gas exporter to Europe, Russia has until early 2014 been defined as EU's strategic energy partner with which the EU signed in March 2013 a document on long-term energy cooperation entitled *Roadmap. EU-Russia Energy Cooperation until 2050*.

However, when Russia decided to challenge the existing post-Cold war order in Europe by annexing a part of Ukraine in March 2014 and by threatening Ukraine with military intervention, the EU decided to introduce limited sanctions against Russia and threatened Russia with revision of the form and the content of their strategic partnership. Russia's actions gave also a new impetus to the European debate on energy security and the question of energy dependence on Russia, renewing the fears expressed since the 1980s that making Europe more dependent on Russia as a supplier of energy may pose several security challenges and limit Europe's freedom of manoeuvre.

Main challenges in European energy governance 2014

This new geopolitical reality influences also the EU's thinking about risks the EU and member states have to address when shaping their energy policy. In 2008 Behrens and Egenhofer identified six of these risks and their list is still valid: (1) import dependence on producer and transit countries; (2) investment risk, including investments within the EU internal market and beyond; (3) environmental risks from climate change, regional/local pollution or contamination due to accidents; (4) regulatory and political risks due to inefficient or failed regulation or local market disruptions; (5) risks associated mainly with market failure; (6) excessive energy prices.¹

The shape of energy policy of the EU as a whole and of single EU member states is strongly influenced by choices made by policy makers who have to deal with the whole set of tensions characteristic of the situation developing in 2014. The choices they make depend on a number of factors, such as the endowments of single countries with specific sources of energy, their positions in energy value and market chains and energy import dependence, but also on their historical experience and perceptions of possible energy partners and other questions.

When shaping their national policies they have to decide whether they are more preoccupied with the security of supply or the security of demand. Since the overwhelming majority of EU member states are net energy importers, they quite naturally pay most attention to the security of supply while their suppliers are indeed most interested in the security of demand. Those who must import energy from abroad may view this need as a threatening dependence and not as possibility to build strong interdependence with those who supply them with energy. When making decisions on energy they decide whether they want to have more predictability and stability or whether they can live with market and price volatility. Those preferring stability may for instance be more willing to sign long-term gas contracts while those who are willing to take more market related risks may be more prone to choose gas contracts based on spot price or to opt for LNG supplies. For members of the EU the question of coordination of their energy policies at the European level is also important – they can either make the EU speak with one voice on energy and strengthen coordination of their national energy policies by building pan-European energy infrastructure, or they may choose to compete with other EU members and make the EU adopt a more chaotic, less coherent and therefore less predictable and efficient common energy policy.

Also the choice between availability, affordability and sustainability may shape national and supranational decisions in the field of energy. Here for instance the German way of addressing the country's energy dilemmas, known as *energiwende*, is an example of how sustainability issues could be addressed at a national level. Poland's sticking to its coal as the main domestically

¹ Behrens, A. and Egenhofer, C. (2008) 'Energy Policy for Europe. Identifying the European Added-Value.', *CEPS Task Force Report*, Brussels: CEPS available at <http://www.ceps.be/ceps/dld/1452/pdf>.

available source of energy may be an example of how the preference for availability and affordability may influence energy policy making and energy governance. Another important tension shaping energy governance in Europe today is the one between the perceived need for the regulation of the energy market and the arbitrariness epitomized in the current debate by the discussion on the need to have a broad legal framework regulating energy relations in the region that could prevent the outbreaks of new gas and oil wars, negatively affecting relations between suppliers, transit countries and European buyers of energy. The Energy Charter Treaty and President Medvedev's 2008 calls for a new legal framework regulating energy cooperation are examples of this drive towards more regulation of energy relations in Europe that could have an impact on the shape of European energy governance in the coming years. Also the introduction of the Third Package by the EU is an attempt at greater regulation of the European energy market.

In the wake of Russian actions in Ukraine, one of the measures discussed at the national and the EU level was the idea of greater co-ordination of the EU's common energy policy, launched by the Polish Prime Minister Donald Tusk. This co-ordination is to strengthen the EU's negotiating position vis-à-vis main suppliers of energy with the goal of making the EU less dependent on gas supplies from Russia. As a part of the response to the emerging new situation in relations between Russia and the EU, one should also pay more attention to the development of shale gas resources in Europe.

Shale gas in Europe – a PR hype, a panacea, or something in-between?

Poland is the most active promoter of the development of shale gas resources in Europe. There are two main reasons for this – the hope for finding rich shale gas deposits in Poland and the wish to make the country less dependent on energy supplies from Russia, with which Poland has a number of unsettled historical scores. The huge public interest in shale gas was triggered by the report published in 2011 by the US governmental agency – the Energy Information Administration (EIA) – that assessed that Poland could have 5300 bcm of shale gas which could cover Poland's gas needs in many coming centuries. Although in 2012 two new reports were published by the Polish Geological Institute and the USGS reducing the estimates to between 346 and 768 bcm or even to 38 bcm (USGS), the publication of the new EIA report in 2013 assessing Polish shale gas resources to be 4100 bcm has resulted in a new round of vigorous debate on the future of shale gas in the country.

The development of the shale gas sector is only one of the measures that are to improve the energy security of the country. Another important step is the construction of the LNG terminal and support for the European policy of development of the pan-European energy infrastructure with more interconnectors and reverse capacity. A number of actors who form what could be labelled a Polish–European shale gas issue network have been involved in the promotion of the Polish views on shale gas in Europe. The members of this informal issue network belong to various categories, such as corporate actors, national and international interest organisations and NGOs, members of the Polish and European executive branch, members of the Polish parliament and Polish members of the European Parliament representing its various factions, representatives of local communities and administration, Polish and international energy experts working in various national and international think tanks and, finally, a number of Polish and international journalists who take an active part in shaping both the national and international debate on the pros and cons of shale gas development.

Although those network actors work together on addressing the issue of shale gas in Europe and in Poland, their interests vary. The main dividing line goes between those who see shale gas as an opportunity and those who view shale gas as a threat. Depending on which of the shale gas camps the members of the network belong to, they may adopt various strategies and formulate various goals. One can therefore say, paraphrasing Alexander Wendt, that shale gas is what network actors make of it.

The main and most obvious goal of the proponents of shale gas is to develop shale gas production in Poland and in Europe. However, there are also other problems they may seek to address. Developing shale gas production in member states may serve as an instrument used to attract foreign capital and to increase the level of foreign investment in the Polish economy. Others may

argue that by developing shale gas resources Poland would be able to decrease its dependence on the more polluting domestic coal and that this could help Poland meet its mid- and long-term EU GHG and environmental commitments.

A potential development of the shale gas sector in Poland would also mean the development of a new more innovative branch of the Polish economy. The additional benefit of such a development would be the reduced dependence on energy supplies from abroad, especially from Russia. In the opinion of those who hope that Polish shale gas resources are huge, Poland could become an important exporter of gas to other European countries and the development of shale gas resources could also improve the overall competitiveness of the Polish economy.

Many members of the Polish political class and executive branch see also the development of the shale gas sector as a means to alleviate one of the most challenging structural problems in the Polish economy, namely reducing the high level of unemployment. This belief is based on the American experience, where the development of shale gas and oil resources has had very positive effects on job creation statistics. The most optimistic proponents of shale gas in Poland hope even that this new commodity could help transform Poland into a new Norway and that revenues generated by this new branch could secure a high level of welfare, not only to the current but also to future generations. Here the interests of corporate and 'political' members of the shale gas issue network may clash – the corporate actors are mostly preoccupied with the financial results of the companies they represent and with adding possible shale gas reserves to their companies' reserves, while the 'political' members of the network are most preoccupied with securing the high share of revenue and the state's control over the development of that sector to make the Polish state reap the most out of the economic benefit.

Shale gas skeptics in Poland and in Europe voice in turn several concerns. They argue that the development of shale gas will have negative environmental consequences for the local milieu and on the regional and global level by adding a 'new' fossil fuel to the Polish and European energy mix. In addition, the question of local pollution caused by the production of shale gas is often raised in the debate. They also argue that, instead of investing into a new fossil fuel, Poland – and the EU – should invest in green energy to reduce the environmental footprint of energy use. Another group of skeptics pays more attention to the economic and social aspects of shale gas developments. Some of them argue that shale gas will be more expensive than imported Russian gas. Others still raise the issue of the so called 'resource curse' and the possible negative effect development of shale gas resources in Poland may have on the economy of the country and its governance, claiming that such a development could increase the level of corruption.

However, a possible development of shale gas in a country like Poland could have not only domestic but also international repercussions. Three main international questions seem to be at stake. Firstly, this development could have an impact on the relationship with the current suppliers of gas and energy to Poland, first and foremost Russia. Poland is the third/fourth biggest importer of Russian gas in the EU and one of the most vociferous advocates of the common EU energy policy. Production of huge volumes of shale gas in Poland could therefore change not only the Polish-Russian energy relationship, but also EU-Russian energy relationship.

Secondly, due to the facts that shale gas technology has been developed in the USA, that many American companies are interested in exporting it to other parts of the world, including Poland and Europe, and that the US government has been voicing concerns over Europe's dependence on energy coming from Russia, development of the shale gas sector in Europe – or the import of shale gas from the USA – may also strengthen the trans-Atlantic link and increase the scope of energy cooperation between Europe and the USA.

Thirdly, a potential development of shale gas resources may also influence relations between Poland and the EU. Due to the fact that Poland has since 2004 been a member of the EU and has to follow the rules of the energy and environmental game set by Brussels, Polish policy makers have to take this European dimension into consideration. The institutional setting and division of labour within the European Commission makes the DG Energy the main coordinator of the EU's energy policy. However, the way energy policy is designed and implemented is in addition

influenced by the priorities set by other DGs, such as the DG Environment (Janez Potočnik), the DG Climate (Connie Heddegaard), the DG Competition (Joaquín Almunia) or DG Industry (Antonio Tajani), by national energy policies that are not necessarily coordinated at the EU level and, finally, by the fact that the issue of the security of energy supply is addressed mostly by the actions of the European External Action Service EEAS (Catherine Ashton). If we add also that the European Parliament and other EU bodies have a say in shaping this policy, we understand that making the EU 'buy' the Polish arguments for development of shale gas resources may be a rather demanding task.

POLICY IMPLICATIONS AND RECOMMENDATIONS

The issue of shale gas has become an important topic in the current discussion on the future shape of the energy system to be built in Europe. The question is discussed and has to be addressed at both the national and the EU level. The recent negative developments involving the key external supplier of gas to Europe as well as the main transit country have added a new dimension to the discussion on the future of European energy policy. The main long-term goal of the common energy policy is to find a balance between the three main tasks: (1) building a sustainable energy system in Europe and making others follow the EU's path of decarbonisation; (2) securing the security of energy supply; (3) and improving the EU's global competitiveness. This goal can only be achieved by adopting a comprehensive approach to energy policy taking into account all of the internal and external factors that may impact its realisation. The EU has some power to shape its own energy policy and to influence policies and choices of member states, but seems sometimes powerless when it comes to influencing the policies and choices of external actors, including those the EU depends on in energy terms. This may mean that the EU should focus on the use of the instruments of energy policy that are controlled by the EU itself.

The EU cannot ignore the fact that a shale gas revolution is already taking place and that the EU will not be able to stop it at its borders. This revolution has already had an effect on the EU's energy policy by making more LNG available on the global markets, by improving the global competitiveness of the American industry and by making European industry relatively less competitive, by increasing the share of imported – and polluting – coal in the EU's energy mix and by increasing the tensions between those EU members who want to make shale gas work for their benefit – and that of the whole EU – and those who argue that the use of shale gas will only have negative environmental effects. The EU has to weigh all pros and cons and adopt a coherent policy on the development of shale gas in Europe taking into consideration the interests of various actors and states and the new geopolitical gas realities.

European governance has been understood as the aggregation of interests; as the transformation of interests; or as a governance based on the idea of the open method of coordination, that was labeled 'experimentalist governance'. Sabel and Zeitlin describe experimentalist governance as 'a machine for learning from diversity' that is in their view 'especially well-suited to heterogeneous but highly interdependent settings like the EU'.² The reason for that is the fact that local units face similar problems and can learn much from each another's efforts to solve them. The need to secure energy is indeed a problem faced by all member states. Member states have adopted various approaches to their energy policies and have had various energy related experiences. These national solutions and experiences have also influenced their approaches to the common EU energy policy.

The experimentalist approach to governance opens not only for the sharing and comparing of experiences but also for the revision of the goals, metrics, and decision-making procedures. The EU as a whole and some EU member states – like France, Bulgaria, Romania and to a certain extent Germany and the UK – have originally adopted a rather skeptical approach to shale gas.

² Sabel C. F and J. Zeitlin (2011) 'Experimentalist governance', in David Levi-Faur (ed.), *The Oxford Handbook of Governance* (Oxford: Oxford University Press), pp. 169-83.

For the time being, due to various circumstances and industrial life cycles, shale gas is still a virtual commodity in Europe. One of the factors delaying the development of the shale gas sector in Europe is the lack of clear regulatory framework at both the national and the EU level, caused partly by what could be labelled the clash of shale gas interests among various members of the European shale gas issue network and by various approaches to the EU's priorities in energy policy. It seems that the time is now ripe for revision of the EU's common approach to shale gas, for making it a less controversial energy commodity and for giving it a more prominent role in the new emerging European energy governance landscape.

RESEARCH PARAMETERS

The work on this European Policy Brief was conducted within the Work Package 5 of the GR:EEN Project. The study is based on the analysis of official Eurostat data on energy supply, demand, consumption and production and supplemented by a thorough analysis of the current national and European debate on European energy policy and the role of shale gas in it. To make the brief as timely as possible, the author has also tried to incorporate elements of the debate on the future role of Russia as an energy supplier to the EU, as discussed in the wake of the Russian intervention in the Ukraine in March 2014. The views expressed in this policy brief are those of the author alone.

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FURTHER READING

All working papers, policy briefing papers and other publications are available on our website: www.greenfp7.eu/papers