

European Policy and “Shale Revolution”

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Abstract The European countries started focusing more attention on the shale gas in the late twenty-first century when the first data on shale gas production came from the USA. Initially, many European countries found that they had no accurate data about the shale gas reserves and lacked adequate infrastructure, professional personnel, and technologies. In many European countries, the prospects of shale gas production raised serious concerns, especially among ecologists, due to its negative impact on the natural environment.

Keywords Ecology, European countries, Production, Reserves, Shale gas, Technologies

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1 Introduction

Many European countries cherished hopes that the shale gas would bring them energy independence. The most radically minded optimists went even further asserting that the consequences of the “shale revolution” would help to liquidate the formula connecting the prices of natural gas and oil in the world market. And in this case, the main losers would be the major natural gas exporters, such as Russia, Algeria, Iran, Bolivia, Qatar, and other Persian Gulf countries.

The European countries seeking to develop shale plays should remember that it is easy to discover shale reserves, but it is much more difficult to extract them. The shale gas production may be cost-effective in long perspective only at the growing gas prices. Besides, it requires great investments through the whole period of shale play exploitation due to the permanently growth of well drilling and fracking operations.

The European countries made public the estimates proving the possibilities to attain energy independence for many decades ahead based on the shale gas production. Many speculative and timeserving declarations were made to heat up this problem instead of its fundamental scientific research. Opposing the shale gas to the hydrocarbons supplied by Russia to Europe acquired political dimensions.

It had to be admitted that the shale gas production projects in Europe due to more complicated geographical conditions are more costly than that in the USA. At the same time, the successful implementation of shale projects in Europe is jeopardized by such factors as complex geological conditions, high population density, strict environment protection regulations, insufficiency of financial stimuli, and tax privileges. As a result, it can be concluded that the shale gas can play its role in Europe, but not earlier than in 5–10 years [1].

2 Europe in Search of Energy Independence

The operation of foreign companies offering their services on shale gas production in Europe is easier in the absence of the unified European legislation regulating this business. Each European country has its own legislation regulating the prospecting and extraction of traditional hydrocarbons, but it does not cover the shale play development and application of related technologies. In March 2011 EC published the Energy Action Plan envisaging transition by 2050 to competitive and low-carbon economics. However, this document does not mention the shale gas.

In general, taking into consideration the differing interests of European countries, it seems quite unlikely that they will develop the unified European legislation. Perhaps, the shale production issues will be included into the next legislative documents of the European Union.

The strategy of the USA pressing on the states yielding to the US influence has been well proven, including in the shale gas production area. First, the USA brings the news about immense shale gas reserves in a country depicting herewith the picture of complete energy independence, and after this the US companies promise billions of investments. But most likely, everything will end up with the trivial sale of technologies and services.

The wide-scale geological prospecting works should be conducted to obtain the reliable information about the shale gas reserves in Europe. Based on such information, the earlier published data may be adjusted both to the greater and lesser side. Consequently, until this moment, all statements made in the European countries about enormous shale gas potential and quick growth of its production are no more than simple declarations. And the more so as the shale play development requires usually the greater volume of services compared to development of traditional oil and gas fields. As a result, the inadequate production capacities and poor development of the services segment in the oil and gas industry and shortage of the equipment and professionals are the main factors impeding the accelerated growth of the shale gas production in Europe.

Sweden cherishing the idea of becoming a large shale gas producer invited Shell that in 2009 started prospecting drilling in this country. However, already in early 2011, the company declared that the prospects of finding shale plays in Sweden are practically nil.

Hypothetically, the considerable shale reserves may be found in the Netherlands. Good prospects in this respect have France, Germany, and Austria. The Austrian company OMV intends to initiate shale surveys nearby Vienna. Romania and Serbia are planning to launch geological prospecting works (Fig. 1).

The shale factor is already producing its effect on the energy policy of the European countries forcing them to revise their approaches to ensuring their energy security. Thus, in early 2013 Romania called off moratorium on application of fracking technology in shale gas prospecting and supported geological surveys of shale gas. The authorization to performance of such works was issued to company Chevron [2]. However, already in early 2015, Chevron closed the shale projects in Romania and later on in Poland.

Following many European countries, Turkey also joined the shale rush. Ankara showed great interest to this hydrocarbon resource. According to preliminary assessments, the shale gas reserves in Turkey may vary from 6 to 20 tcm. The report of the Turkish Association of Petroleum Geologists put the shale gas reserves in the country at 1.8 tcm. These figures cover the reserves in Thrace and South-eastern Anatolia, while the shale gas resources are also available in Eastern Anatolia, Black Sea region, Ankara, and Tavr mountains.

At present company Shell started shale gas development in the southeast of Turkey after signing in February 2013 the Agreement on Cooperation with the



Fig. 1 European shale gas basins (<http://clauswarum.blogspot.ru/2014/07/shale-revolution.html>)

National Petroleum Company of Turkey. The Canadian Trans Atlantic Petroleum is also operating in the Turkish territory.

Developing their shale plays, the European countries face numerous problems. In December 2012 Great Britain issued permits to some companies for continuation of test drilling in the Lancashire County in the west of the country. Later on they were suspended due to underground shocks. However, in August 2015 the British government once again focused attention on the shale gas production. The Department for Communities and Local Government was entitled to interfere into consideration by local authorities of applications for shale play prospecting and shale gas extraction. This decision fits the policy pursued in Great Britain that is targeted to attracting oil and gas companies to participation in shale projects.

In Hungary several wells were drilled, but they were recognized non-perspective and the program of shale gas production was closed.

In July 2015 the Dutch government adopted the decision on banning the shale gas production. This ban was declared for 45 years. The Dutch government explained that such decision was taken because of the lack of accurate data on the shale gas reserves and availability of negative environmental impacts. Great attention of the Dutch government to this issue was connected with the complicated situation in the fuel and energy complex of the country. In 2014 in the Netherlands

the gas production dropped by 19% which forced the government to seek alternative sources – shale gas production.

In March 2015 the Dutch-British Shell had frozen surveys of shale gas in SAR. The main reason here was the lack of reserves fit for commercial-scale development.

In August 2015 Total refused from implementation of the shale project in Denmark where the application of the fracking technology was permitted. Around 40 million EUR were invested into this project. However, the shale play surveys had shown that there were no reserves required for launching the commercial-scale production.

3 First Results of Shale Gas Production in Bulgaria

In June 2011 Chevron, one of the US major petroleum and gas companies, obtained the permit to development of the shale play in the northeast of Bulgaria nearby Novi Pazar during 5 years. Chevron won the bids for shale gas prospecting and development after it offered to the Bulgarian government a bonus of 30 million EUR worth for the license. The main rival of Chevron was Canadian BNK. According to initial estimates, the shale gas reserves in Bulgaria make up to 1 tcm.

After launching the shale play development that was planned to be started not earlier than in 7 years, after completion of prospecting works, Sofia expressed hopes to alleviate its dependence on the Russian natural gas export. However, already in early 2012, the Bulgarian government banned the shale gas prospecting with application of fracking technologies due to negative environmental consequences. For the breach of this ban, a penalty of 100 million Bulgarian levs or about 65 million USD was charged. The government called off the license from Chevron. Thus, Bulgaria became the second country in the European Union after France that imposed ban on the fracking technology.

In 2012 US Secretary of State Hillary Clinton and US Special Envoy for Eurasian Energy Richard Morningstar visited Bulgaria. They tried to press on the Bulgarian authorities requiring the revision of the shale gas policy. However, Bulgaria did not agree to revise the adopted decision and, in fact, postponed for an uncertain period the implementation of the shale projects.

4 Lithuania Is Seeking to Produce Shale Gas

Lithuania is also planning to develop shale plays and these hydrocarbon resources draw attention of world’s largest gas producing companies.

Several years ago, the Lithuanian scientists had already declared about availability of shale gas plays in this country stating that the shale gas reserves made around 480 bcm with the recoverable resources of 100 bcm. The prospective shale

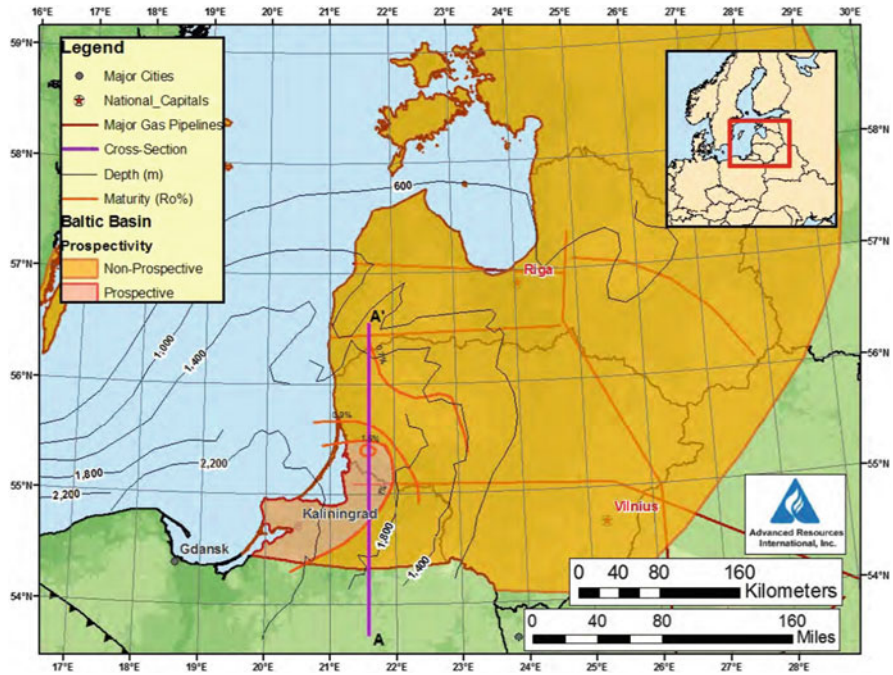


Fig. 2 Potential shale gas basins in Lithuania, Latvia, Estonia, and Kaliningrad Region (<http://www.shale-gas-information-platform.org/areas/news/detail/article/lithuania-to-consider-shale-gas.html>)

gas plays occur in the southwest of Lithuania and extend as far as Poland and Kaliningrad Region in Russia where they are most abundant (Fig. 2). According to rough estimates, the cost of plays may be as high as 30 billion US dollars.

In July 2011 US Secretary of State Hillary Clinton promised support of Lithuania in attaining its energy independence. The country considered the possibility to import shale gas from the USA. In November 2011 Vilnius made public its plans to conduct in 2012 the international tender for prospecting of shale plays which potential reserves, “as it was found out,” would satisfy the needs of the country’s economics for 30–50 years ahead [3].

However, not everybody in Lithuania supports such plans. The idea to reorientate the domestic energy sector to shale gas production evoked torrents of criticism from ecologists. The arguments voiced by the Lithuanian authorities did not convince the ecologist who firmly opposed the application of shale gas production technologies. There were many publications in Lithuania saying that because of great areas required for shale gas extraction and great environmental risks, the shale business attractiveness was rather questionable; moreover, it may incur the irreparable damage to the nature.

5 Ukraine and Belarus: First Experience of Shale Gas Production

Of all post-Soviet countries, the greatest interest to shale gas was observed in Belarus and Ukraine endeavoring to reduce their dependence on hydrocarbon supply from Russia.

Ukraine passed decisions targeted to identification of the real shale gas reserves and prospects of their development. In 2010 Ukraine initiated development of the state purposeful economic program of utilization of coalbed methane and shale gas. This program was planned for the 2010–2014 timeframe.

In 2010–2012 Ukraine was seeking to invite for shale play development such well-known Western companies as ExxonMobil, Halliburton, ConocoPhillips, and Shell. The interest to development of the rather complicated shale plays was expressed also by Eni and Total. The agreement stipulated that French Total would assess the prospects of shale gas production in Ukraine; Shell was going to organize shale gas production in the Kharkov and Donetsk regions (Yuzovsky play) with the reserves of 4 tcm and in the Lvov and Ivano-Frankovsk regions (Olesky play) with the estimated reserves of 2.98 tcm of shale gas (Fig. 3).

In 2011 Shell confirmed its interest in development of the Yuzovsky oil and gas field and its intention to invest about one billion US dollars into the shale projects in Ukraine. According to Shell estimates, the potential of the Ukrainian project was approximately 20 bcm of shale gas per year.

Ukraine cherished great hopes for the US aid with implementation of the shale projects. Accordingly, the Ukrainian government and the USA signed the Memorandum of Mutual Understanding concerning the unconventional hydrocarbon sources, including shale gas, in order to recover shale gas in the Ukrainian territory. The governments of the USA and Ukraine undertake to encourage and develop



Fig. 3 Shale gas reserves in Ukraine and Poland (<http://www.globalresearch.ca/wp-content/uploads/2014/10/Shale-Gas-in-Poland-and-Ukraine.jpg>)

direct contacts and cooperation among respective governmental authorities, universities, research centers, institutes, and prospecting and producing companies.

In February 2011 the company Naftogaz of Ukraine signed the Memorandum of Cooperation for prospecting the unconventional hydrocarbon reserves in the territory of Ukraine by US company ExxonMobil. It envisaged assessment of the reserves of coalbed methane, shale gas, tight gas, and other unconventional hydrocarbons in Ukraine. In September 2011 Naftogaz of Ukraine and ExxonMobil signed Draft Agreement on Unconventional Hydrocarbon Prospecting and Development in Ukraine.

In 2012–2014 the Western oil and gas companies investigated the shale plays. Simultaneously, the Ukrainian authorities conducted negotiations with the local councils in the eastern and western regions urging them to sign the Draft Product Sharing Agreement with Shell and Chevron. However, the difficulties of shale gas production, lack of accurate information about shale gas reserves, and environmental risks forced to postpone the terms of commercial-scale development of shale plays.

In 2015 the US companies continued investigation of shale plays. Regardless of finding immense shale gas reserves, the US companies refused to initiate development of these plays located in Ukraine. In late 2015 Chevron declared about unilateral withdrawal from the project on development of the Olessky play in the Lvov and Ivano-Frankovsk regions to be implemented under the Product Sharing Agreement. Such decision was taken in view of the drop of hydrocarbon prices as well as the political and economic situation in Ukraine.

In March 2015 the Dutch-British Shell closed the project on hydrocarbon survey and prospecting in the Kharkov region. Apart from the unstable political situation in Ukraine, this decision was caused by unfavorable conditions of shale gas production.

For rather a long time, Belarus did not focus attention on study of the shale plays and extraction of shale gas. The search of shale plays was considered non-perspective. However, after learning about a sharp growth of the shale gas production in the USA, the interest in Belarus to shale plays started growing, too. The works on assessing the shale gas potential were started in Belarus in 2011, and already in early 2012, the Belarusian geologists organized surveys of shale plays in the Gomel region. The Belarusian scientists admit that the shale gas reserves in their country may be significant, and in case they are found, the shale gas extraction applying the most advanced technologies is quite probable.

The priority in prospecting works was given to the Lyudvinovsky area in the Gomel Region. Some investigations of its perspectiveness were conducted, including collection of data about the fault zones in this area with which the likely occurrence of shale plays was connected.

6 Difficulties of Shale Gas Production

In 2010–2011 the European countries came out not only with optimistic declarations, but they published information about the first failures of shale gas production. Thus, in 2010 company ExxonMobil refused from implementation of the shale project in Hungary about 75 million US dollar worth as it did not find there the shale gas reserves of commercial significance.

The first results of shale play development in Europe show that no quick escalation of the shale gas production can be expected. For various reasons, it will be difficult for the European countries to repeat the US “shale revolution.”

In Europe all expectations of quick development of shale gas production were based on preliminary data about shale gas abundance and endeavors of many European countries to attain energy independence. All these factors heat up the interest to development of shale plays. However, the reality is quite different. The first results of drilling of shale plays were discouraging. The shale gas reserves fell behind expectations which made unfeasible the shale play development. Moreover, the ecological movement against shale gas production has been widening in the European countries. The opponents of shale projects point to the negative environmental impacts of application of the fracking technology and pollution of water, soil, and air. The growing public movement that pressed on the authorities urged some European countries not to hurry with the shale gas production development. The pace of shale gas production is also affected by the processes in the European gas market – the growing supply of LNG and implementation of new pipeline projects of Russian and Caspian countries. The European countries have no required equipment and technologies, which prevents them from initiating as soon as possible the shale gas production.

7 Conclusions

The pace of shale play development will depend on numerous factors and, first of all, on the resource potential of the European countries. The first results of prospecting drilling were discouraging as there were not found the shale gas resources which means development could be cost-effective. The pace of shale play development is also affected by supply of pipeline gas from Russia, slowdown of economic growth in the European countries which decreases the need in additional volumes of gas, and the deficit of the required equipment and professional personnel.

The main restricting factors for development of the shale gas production in Europe are the following: the shale plays in Europe are in their initial phase of development and have not been adequately studied in terms of geology and cost of production, intensive disturbance of the soil wholeness, and pollution of

groundwaters with chemicals used in fracking, and the cost of shale development in Europe may be four times as large compared to the USA [4].

The development of shale gas production in European countries encounters powerful counteraction on the part of ecological organizations. In September 2012 the Energy Committee and the Environment Commission of the European Parliament passed the resolution concerning hydraulic fracturing of formations and development of unconventional oil and gas resources. This document stressed that the development of the shale oil and gas plays should be subject to regulation. However, this provision has not as yet found its practical application; as a result, each European country conducts the shale play prospecting and development based on its own laws.

Therefore, the shale gas may play its role in the European countries some time later when the cost of its production will be lower, the efficiency of shale play development will be higher, and the environmental risks will be reduced.

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