

Shale gas in Poland and Ukraine: a great potential and an uncertain future

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Introduction

“The development of shale gas plays has become a “game changer” for the U.S. natural gas market,” reads a 2011 report by the U.S. Energy Information Administration. Once predicted to become the largest natural gas importer in the world, the U.S. are now said to become self-sufficient in natural gas supplies by the 2030s. Shale gas is natural gas extracted from an unconventional source – hydrocarbon-rich shale rock, whose low permeability does not allow for a sufficient flow of gas to the well if conventional drilling technologies are used. Instead, a technology called hydraulic fracturing combined with other know-hows is applied to create multiple fractures in the rock under pressure of a liquid so as to liberate gas from the shale and secure its inflow to the well. Hydraulic fracturing, or ‘fracking’, has radically lowered the costs of shale gas extraction and fuelled the production boom in the U.S. and a number of other countries. While at the beginning of the 2000s shale gas accounted for 1% of the U.S. gas production, by the end of the decade the figure rose to 20% and continues to increase.

The advent of shale gas, which in the U.S. is cheaper than coal and imported gas, liberated vast amounts of coal and liquefied gas on the world market. European countries became interested in shale gas production as a way to diversify natural gas supply and reduce dependency on imports from Russia. One of the reasons why Russia’s western neighbors keenly embraced shale gas production is that Russia has on various occasions used Gazprom as a foreign policy instrument. It comes as no surprise, then, that Poland and Ukraine — who own respectively the first and the third largest shale gas deposits in Europe — has responded with optimism to the prospects of shale gas extraction that could radically change their balance of energy dependence on Russia.

Prospects of shale gas in Poland and Ukraine

Poland

Recent studies revealed that Poland is the country with the largest reserves of shale gas in Europe. The area of shale gas accumulation is vast, stretching from the northern region of Pomerania through the central-eastern regions of Mazovia and Podlasie, to the Lublin region in the east. The analyses conducted have identified three main basins (the Baltic, Podlasie, and Lublin) in the respective areas.

The first, extremely enthusiastic, estimates were published in April 2011 by the U.S. Energy Information Administration (EIA). The EIA estimated that Poland's three shale gas basins contained the total of 5.3 trillion cubic meters of technically recoverable shale gas, promising to Poland a prosperous future based on gas revenues. Nevertheless, to the disappointment of Polish politicians and population who saw in these data a great potential to boost their economy and to improve their country's energy security, these estimates have been heavily reduced less than a year later by a report presented by the Polish Geological Institute - National Research Institute (PGI-NRI) in March 2012. According to Polish geology experts, estimated shale gas resources underneath the Polish soil could be as low as 346.1 to 767.9 billion cubic meters. Despite such a drastic and significant reduction in estimates, these numbers would still guarantee profits for shale gas industry and the Polish Ministry of Environment has issued numerous licenses for the exploration of hydrocarbons from unconventional sources in order to correct and verify the data of preliminary surveying. As of October 2012, the Minister of the Environment had granted more than hundred concessions for shale gas exploration, a number of which went to the world energy giants. Companies such as Chevron, Marathon Oil, Exxon Mobil, ConocoPhillips and ENI as well as smaller companies such as Talisman Energy, BNK Petroleum, Cuadrilla Resources, 3Legs Resources, San Leon Energy, Realm Energy International, Emfesz and also Polish companies Orlen, Petrolinvest, Lotos and PGNiG obtained concessions.

The Polish state distributed the concessions at a considerably low price: there were no guarantees investments in shale gas extraction would be successful, and investors had to bear all of its costs. As a matter of fact, given all the uncertainties, it is difficult to calculate how profitable shale gas extraction in Poland is going to be. One of the factors is the regulatory environment. The Polish government has a say in defining the costs of shale gas production by imposing taxes. Division of revenues, natural resources management policies and concession policies became central issues of the public debate about shale-gas. And so far, the public opinion has been in favor of heavier regulations and a considerable state presence in the shale gas industry so that Poland could fully benefit from its rich resources. The major Law and Justice opposition party criticized the way concessions were sold and called for a tighter regulation of the shale gas business in such a way that the Polish state would be maintain control over the production and utilization of the resources

Partly inspired by the Norwegian experience, the Polish government decided to establish a special state-owned company that would take part in exploratory and production activities, and a 'future generations fund' to contain the inflow of gas revenues. Nevertheless, the decision to impose a state-run company

on all gas explorers proved counter-productive. While on the one hand it ensured a more proper direction of the revenues, on the other it also slowed down the drillings: so far, only 43 wells have been drilled, while hundreds of them will be needed to accurately assess the potential of country's reserves.

Some international companies have already pulled out of gas explorations. They explained their decision by poor results of test drillings and an uncertain regulatory environment. Canadian Talisman Energy Inc. and American Marathon Oil decided to withdraw from explorations saying they had not found enough gas to justify further investments in gas exploration. ExxonMobil has followed Talisman and Marathon Oil out of Poland after its first wells produced disappointing results. On the other hand, Chevron remained positive about the prospects of shale gas, deciding to proceed with drilling new wells.

The withdrawal of these important companies put a pressure on Poland, who is determined to make shale gas profitable. Last April, the Government announced its draft law on taxation of shale gas which is a combination of basic CIT taxation, royalties and additional hydrocarbon tax. Briefly, three taxes are set down: a tax for the extraction for gas, proposed at 1,5 and 3% for unconventional and conventional gas respectively. An additional special hydrocarbons tax is also established and according to the draft it will be charged upon accumulated positive cash flow that relate to the excess of revenues over expenses. A royalty fee of EUR 4.8 - 5.8 per 1,000 cubic meters of nitrogen-rich gas and high-methane gas respectively is also expected to be imposed on shale gas companies operating in Poland. Finally, there will be taxes and fees already in effect for any company active in the oil and gas mining in Poland: corporate income tax, real estate tax and the so-called mining usufruct fee.

This combination of taxes and levies on gas and oil exploration would add up to about 40% percent of the sector's profits from 2015 and Poland decided to postpone shale gas taxation to 2020 in order to attract more investors and to prevent those already involved in the business to exit it.

Currently, new drillings proceed at a very slow pace. Moreover, those already made did not produce remarkable results: according the Polish State Mining Authority, only 12 out of 49 drills have generated some gas flow. Conversely, in order to speculate about the profitability of Polish shale gas it is firstly necessary to proceed with further drillings in order to assess how much gas is actually recoverable. On the other hand, the Polish Government showed a bipartisan determination on promoting the extraction of shale gas that was rare in other European countries so, if nothing, investors will probably be able to count on a strong governmental support for the development of shale gas business.

Ukraine

Ukraine's total shale gas deposits are estimated at around 7 trillion cubic meters, which places the country at the third place in Europe after Poland and Norway. There are two major shale gas fields: Yuzivs'ka, located in Eastern Ukraine (Donets'k and Kharkiv regions) in the Dnipro-Donbas petroleum basin, and Oles'ka in Western Ukraine (L'viv and Ivano-Frankivs'k regions), part of the Poland's Lublin gas basin. Yuzivs'ka field is said to contain around 2 trillion cubic meters of gas, while Oles'ka's deposits are estimated at 1.5 trillion cubic meters. It is yet unknown just how much of these deposits is technically recoverable.

The two shale gas fields have already found their concessionaires. On January, 25 Ukraine (a joint company of the state-owned NAK Nadra-Yuzivs'ka and the private SPK-Geosrvis) signed a 50-year tripartite production separation agreement (PSA) with Royal Dutch Shell. The agreement stipulates Shell's exclusive rights for the exploration and tax-exempt industrial extraction of shale gas on more than 1000 square km of the Yuzivs'ka field. The contract has been locally contested after the Donets'k and Kharkiv regional councils passed a decision to allow Shell's operation in the respective regions without a due consultation with stakeholders. In fact, it was said that the authorization of local administrations came under the political pressure from the President's Party of Regions. In contrast, the American multinational Chevron became interested in the Oles'ka field, and while some initial accords have been reached, Chevron has so far been unsuccessful in negotiating with local authorities in the two regions controlled by the far-right opposition party "Svoboda".

The Ukraine-Shell PSA on the Yuzivs'ka field could result in the largest foreign direct investment in Ukrainian history. "Shell's basic scenario would be investing more than USD 10 billion, optimistic scenario — USD 50 billion," commented the deal the Environment and Natural Resources Minister Oleh Proskuryakov. The PSA puts all expenses on Shell until the moment when the actual production will begin. This means the company will have to invest more than USD 400 million in exploration investments before actually knowing whether shale gas production will be profitable.

According to an optimist scenario, Shell would start industrial-scale shale gas extraction not sooner than in 2017. However, it is not yet known whether shell gas extraction in Ukraine will be profitable: after the turn in business expectations in Poland, there are chances that both Shell and Chevron might walk away. Yet, Ukrainian Government has opted for a different regulatory model of the shale gas business than Poland: Ukraine, with generally low levels of market freedom, totally exempted the

British-Dutch multinational from taxation. The PSA is confidential and the exact share of production that Shell will own is unknown, but various sources put it at 40 to 69%, specifying that the number is contingent on profitability and production volumes. What is known, though, is that the gas allocated to the state, namely, the joint state-private company, will be divided at 85 to 15 % between Nadra-Yuzivs'ka and SPK-Geoservis.

In several years the real prospects of Yuzivs'ka field will be known better: Shell started test drilling already in 2012 at a lot leased before the PSA on Yuzivs'ka field was signed. Yet, already now shale gas production is severely contested by Gazprom and Russian high state officials. It is also a topic of hot domestic debate, with ecological concerns being the main contentious issue. It has become clear that the possible prospects of gas price reduction that the shale gas could bring to Ukraine is not merely a matter of economic losses for Gazprom, but also the one of political stakes for Russian foreign policy.

Shale gas and energy security in Poland

Energy security is a highly debated topic in Poland. Located in the centre of Europe with a little amount of energy resources of its own, Poland relies heavily on oil and gas imports from abroad, in particular from Russia, who supplies 70 per cent of Polish total gas needs. Such a heavy dependence on Russian gas has not been beneficial for Poland, who has suffered for its weak bargaining position. Moscow knows it can dictate prices and Poland is currently paying one of Europe's highest price for gas, almost USD 500 for 1,000 cubic meters. Over time, Poland has sought new sources of gas in order to limit its dependence on Russia. It constructed new pipelines linked to Europe's supply grid and signed a deal with Germany – Gazprom's largest customer – who re-sells part of the Russian gas it imports to Poland at price lower than the one in Gazprom-Poland contract. In addition, Poland started building a liquefied natural gas terminal on the Baltic Sea, which will allow to further diversify gas supply. This said, it's not surprising that after the discovery of the rich shale gas reserves in Poland, the country's government became more optimistic about its energy security. The U.S. Energy Information Administration estimates of April 2011 were so optimistic that if its data had been true, Poland would have become an influential gas producer, so important to be able to alter the gas supply scheme in Europe. The new estimates, published in March 2012 by the Polish Geological Institute, drastically revised the size of shale gas reserves in Poland but still kept realistic Polish hopes for a more secure energy future.

Given Polish high dependence on Russia as a single major – and at times unreliable – supplier, it is undeniable that the development of the shale gas industry would translate into energy security for Poland, and finally put an end to Warsaw’s dependence on Moscow’s supplies. As a matter of fact, the Polish energy security debate has become also a debate on national sovereignty and independence. Interestingly, the internal discussion took form of a rhetoric according to which supporting shale gas means supporting Polish independence and Polish ‘motherland’.

The enthusiasm due to the prospect of becoming autonomous in the energy field explains also why in Poland concerns over the environmental impact of shale gas extraction were remarkably less important than they were in the other European states. A June 2011 poll demonstrated that the majority of Poles (82%) were in favor of shale gas, and that the public opinion considered shale gas a path to Poland’s energy security, rather than as a risk.

Not surprisingly, Gazprom CEO Alexei Miller was quick to rebuke Polish enthusiasm, claiming that shale gas will not be easily extractable and that Gazprom doesn’t fear a reduction of its business with Poland. Interestingly, in November 2011 Gazprom officials signed off on a price cut of nearly 20% for PGNiG – Polish state-controlled oil and natural gas company – worth about \$1 billion a year. The signature of this new deal came after the positive results of the American research published in April 2011 and before the more negative results of the Polish analysis of March 2012, suggesting a connection between the newly acquired Polish leverage and the agreed price-cut. Doubtlessly, shale gas can give a great leverage to Poland and – if eventually found in the estimated amounts – it will be able to change the gas trade-balance between Moscow and Warsaw almost neutralizing Moscow’s favorite and most influential post-cold-war weapon.

Geopolitics of shale gas in Ukraine

Likewise, domestic and foreign commentators often interpret the issue of Ukrainian shale gas (and unconventional gas extraction in general) in geopolitical terms. With 60% of natural gas consumption covered by imports, Ukraine’s economy is highly dependent on the price of natural gas negotiated. The price of gas, indeed, is a topic that has fuelled negotiations between Ukraine and Gazprom, the main gas supplier: of 32.5 billion cubic meters Ukraine imported in 2012, 26 billions came from Gazprom. The gas price is one of the currencies of Ukraine-Russia diplomacy: a multiyear gas discount starting in 2017 was incorporated in 2010 in the so called “Kharkiv accords” — an agreement that prolonged the Russian lease of Ukrainian naval facilities in Sevastopol’, Crimea from 2017 for 25 years with a possible 5-year extension in exchange for gas price discounts and an increase in gas transport rent. This is,

however, but one example of how Gazprom has become a leverage of the Russian foreign policy in the neighborhood. Recently, Russia has insisted on Ukraine joining the Customs Union of Russia, Belarus and Kazakhstan, offering gas price discounts in exchange. However, Ukrainian Government has been wary of entering the Customs Union: signing the accords with the three former ‘fellow republics’ would mean jeopardizing the already-initialed Association Agreement with the EU that in perspective could open new markets for iron, Ukraine’s main export item.

However, as the iron exports stagnate and Ukraine experiences severe difficulties with collecting revenues for the budget, the issue of gas prices is becoming all the more important. At a meeting on May, 26 in Sochi the presidents of Ukraine and Russian Federation Viktor Yanukovych and Vladimir Putin, according to the Ukrainian newspaper *Kommersant*, discussed Ukraine’s participation in the Customs Union with an *observer status* (the agreement is to be signed in Astana on May, 29) and the creation of a joint Ukraine-Russia consortium to manage Ukrainian gas-transporting system (GTS). ‘The pipe’ that supplies a great part of Russian export gas to Europe, is one of the main levers Ukraine has used to counter Russia’s aggressive pricing and supply policies. However, as new pipelines from Russia to Western Europe are built, Ukraine is losing the ability to mobilize the control over the gas pipelines as an argument in gas pricing negotiations with Gazprom. At the same time, the GTS needs modernization and constant maintenance; in a TV-broadcasted “dialogue with the country” on February, 22 Viktor Yanukovych announced that Ukraine is currently negotiating the terms on which a Ukraine-Russia GTS consortium will be created. This consortium, with Gazprom taking the leading role in it, is likely to lease the Ukrainian GTS on conditions of its modernization¹ and — once again — reduction of gas prices for Ukraine. Crucially, Ukrainian private companies will also take part in the new consortium, thus radically reshaping the status quo in which the Ukrainian state-owned giant *Naftobaz* (that is also likely to be privatized) controls the GTS. The exact accords are yet to be reached. But be it as it may, “gas diplomacy” remains – and probably will remain – one of the main ways in which Russia exerts its pressure on Ukraine, unless gas supplies are diversified.

Like Poland, Ukraine is paying one of the highest prices for gas among other Gazprom clients — more than Western European countries situated 1000 km to the West of Ukrainian borders: 425 USD per 1000 cubic meters. In contrast, Russian gas imported to Germany and then re-sold to Ukraine, costs Ukraine 390 USD per 1000 cubic meters. The difference between the “market” price of Russian gas for

¹ Credit for the gas pipeline modernization is also one of the issues of the ongoing negotiation between Ukraine and the European Commission.

the EU countries, and the “political” price for Ukraine is so big that it makes profitable buying Russian gas from Western European owners. Although in 2012 the volumes of re-imported gas from Western Europe were dismal, Ukrainian importers hope to bring re-import to 8 billion cubic meters in the recent future.

The high price of gas bears its toll on Ukrainian economy and domestic spending. Energy dependence also curtails Ukraine’s ability to maneuver in the geopolitical arena between the EU and Russia. At the same time, the upsurge of Russian gas prices for Ukraine after the “gas war” of 2005 made Ukrainian business restructure and adopt more energy-efficient technologies. The 2008 economic crisis, whose negative effects on production levels are not yet surmounted, further fuelled the restructuring. As a result, while in the last decade Ukrainian GDP more than tripled (from USD 50.1 billion to pre-crisis 180 billion in 2008 to post-crisis 175 billion in 2012), gas consumption fell by 25%, with the decline in imports being even more significant. This signals the growing efficiency of the Ukrainian economy – and at the same time, the growing share of domestically produced gas in the structure of energy consumption, even though the absolute production has reduced by almost a billion cubic meters in the last years. Doubtlessly, the reduction of natural gas imports and consumption are positive signs, not the least so because of the implications for the much-dreamt energy independence.

In this context, shale gas seems to be both an opportunity to diversify energy supplies to Ukraine, and to avoid political pressures from the North-East neighbor. With gas import at its historical minimum, in 2012, Ukraine produces around 40% of natural gas the country consumes - 19,3 billion cubic meters. This figure, however, is incomparable with 68.7 billion cubic meters extracted in 1975 and 1976, when gas production in Ukraine reached its peak. In the 1970s, Ukrainian gas production accounted for 25% of the total gas extraction of the USSR. And the exploitation of shale gas and other unconventional source of hydrocarbons could help Ukraine “to regain its status as a significant gas producer,” reports a recent study by the Center for Eastern Studies. The Ukrainian Ecology and Natural Resources Minister Eduard Stavyts’kyi admitted that “Now we can only predict [the shale gas production figures], and according to an optimist scenario of Shell, [the production can reach] 20 billion cubic meters, and a pessimist scenario has it at not less than 7-8 billion annually. ... If we reach the optimist scenario, [the shale gas production] will completely resolve Ukraine’s problem of gas deficit, and we will even have surplus”.

The estimated rise in production of natural gas — by 11 (“pessimist scenario”) to 17 (“optimist scenario”) billion cubic meters by 2030, to which shale gas is expected to contribute will put a pressure

on the price of Russian gas by reducing imports and creating competition. Today Gazprom seems to be weaker than ever in the last decade, with the world gas market prices driven down by the shale gas boom in the US. Given the fact that in case of a large-scale production of shale gas in Ukraine its price will be at least half the current Russian gas price, shale gas was lauded as a significant opportunity to guarantee Ukrainian energy independence. This was the reason why in the heated public debate around the long-term costs and benefits of the Shell concessions, geopolitical arguments (the current state of energy, and thus political, dependence of Ukraine on Russia) were often cited. The US Ambassador to Ukraine John Tefft said that the joint production of shale gas with Chevron, for which the PSA is still pending due to the resistance of local administrations, and Shell will help Ukraine become “self-sufficient and energy independent”.

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