

Political Economy of Shale Gas Industry in Eastern Europe

By Vlad Ivanenko and Benjamin Schlesinger*

In general, natural resource development proceeds when producers define advantageous projects, investors find them profitable, lenders accept the risks, and communities decide they can live with the externalities. With greater degrees of risk and uncertainty in any of these enablers, higher returns must be secured to attract capital and, similarly, communities may become more involved configuring and approving projects. All the while, the surrounding legal, regulatory and business framework may help to steer the path taken by the resource development and may become crucial as the risks and uncertainties rise.

The situation with the nascent shale gas industry in Eastern Europe is no exception to this formulation. In spite of promising preliminary assessments, producers face a number of uncertainties that force especially careful decision-making. Communities may welcome the prospective benefits of incremental gas production but nonetheless remain concerned over environmental consequences that are unknown or poorly understood. In this situation, it is the political will, or the lack of it, that may tip the balance to one or another side. In a region as diverse as Eastern Europe, first movers may reap significant benefits but may also experience considerable risk.

We begin this discussion with a review of prospects for shale gas development in Eastern Europe, we then consider the local political situation, discuss impediments that must be overcome and, finally, conclude with policy options that may contribute to timely and profitable development of shale gas resources in the region, while minimizing the environmental risks.

Shale Gas Prospects in Eastern Europe

In April 2011, the U.S. Energy Information Administration (EIA) released estimates of technically recoverable shale gas in 32 countries, four of which are located in Eastern Europe (see Table 1). Location of the key prospects are illustrated in Figure 1.

The information in Table 1 suggests a highly positive outlook for shale gas, particularly in Poland, with an estimated 187 Tcf of technically recoverable resources. One must keep in mind the limitations of EIA's assessment, however, as it is based on geological similarities between shale plays in the U.S. and formations in other countries for which log data are available. Consequently, Eastern Europe's shale gas prospects are hypothetical at this point, and must await the results of exploratory drilling and analysis. Thus far (at year-end 2011), Poland is the most advanced in this respect, with more than 100 wells, while the other three countries are far behind, e.g., media reports indicate that only about a dozen shale wells have been drilled in promising shale fields in Hungary and Ukraine. Shale well drilling in other Eastern European countries has yet to commence, although preparatory work is evidently ongoing.

Results of drilling operations thus far appear mixed. Halliburton conducted initial hydraulic fracturing operations for the Polish Oil and Gas Company (PGNiG) at the Markowola-1 well in August 2010; discouraging results suggested that the fracturing technology needed to be adapted to geological conditions more specific to Poland. Also in 2010, ExxonMobil withdrew from Hungary, which had been considered promising, after failing to discover commercial quantities of shale gas. On the other hand, three local producers – PGNiG in Poland, RAG Rohol-Aufschungs in Hungary, and Kulczyk Oil Ventures in Ukraine – have each claimed field successes. While commercial production has yet to evolve, exploratory programs are continuing in light of the region's considerable potential.

Country	2009 Natural Gas Market (Tcf) ¹			Proved Natural Gas Reserves (Tcf) ²	Technically Recoverable Shale Gas Resources (Tcf) ³
	Production	Consumption	Imports (Exports)		
Poland	0.21	0.58	64%	6	187
Ukraine	0.72	1.56	54%	39	42
Lithuania	-	0.10	100%	-	4
Russia (Kaliningrad)	-	0.02	98%	-	19

Table 1 - Estimated Shale Gas Resources in Selected Eastern European Countries

Sources: 1. EIA, 2011. International Energy Statistics, March (apart from Kaliningrad's data that come from EuropeAid, 2007. Kaliningrad Fuel and Energy Balance Final Report, February); 2. Oil and Gas Journal, Dec. 6, 2010, p. 46-49; 3. Advanced Resources International, Inc., 2011. World Shale Gas Resources: An Initial Assessment of 14 Regions outside the United States, April 2011.

*Vlad Ivanenko is a Senior Economist with Natural Resources Canada. Benjamin Schlesinger is President of Benjamin Schlesinger and Associates. Ben Schlesinger may be reached at bschles@bsaenergy.com See footnotes at end of text.

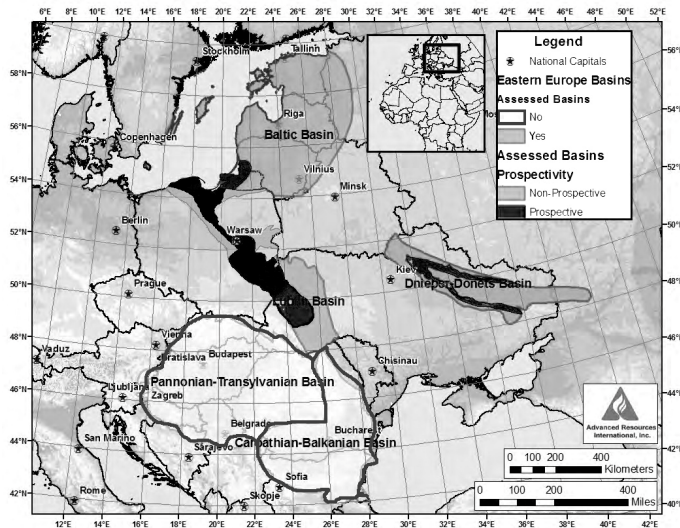


Figure 1 - Location Shale Gas Prospects in Eastern Europe

Source: Advanced Resources International, Inc., 2011. World Shale Gas Resources: An Initial Assessment of 14 Regions outside the United States, April 2011.

Local Institutional Environment: Incentives and Roadblocks

The political framework in Eastern Europe vis-à-vis shale well drilling may be thought of as a two-layered structure. The first layer is formed by European Commission (EC) energy policy goals for the European Union (EU) as a whole, including Eastern European members. The second layer consists of national governments and their in-country priorities. These two sets of goals do not necessarily converge, which alone may pose exploration and development (E&D) uncertainties. We consider below how the interactions among the foregoing play out with respect to shale gas development in the region.

In its Third Energy Directive concerning natural gas, the EU spelled out an energy strategy aimed at establishing a unified, secure European gas market. To this end, the EU proposed five policies: to force incumbent companies having a de facto monopoly position to unbundle their merchant functions from their transportation operations, to encourage investments in interconnectors across external borders, to diversify gas supply both through pipelines and liquefied natural gas (LNG) terminals, to streamline

rules and procedures for projects of European interest, and to foster competition so that consumers have access to gas energy at affordable prices. These goals echo and strengthen those contained in earlier EU gas directives, many of which remain to be implemented.

While national preferences for the region may diverge from country to country, there are some commonalities within Eastern Europe. All local governments claim to seek a measure of supply diversity to minimize delivery and dependence risks arising out of their critical dependence on Russian gas, although all recognize that stable supplies from Russia will remain critical to the region's gas industries. Regional energy authorities recognize that natural gas is a low-carbon substitute for coal and oil in a variety of end-uses, but the need to minimize energy expenditures takes priority over environmental concerns. They appreciate that Russia's gas supply deliveries to Western Europe will become more stable and reliable with completion of the North-Stream Pipeline but they sense that there is no comparable "silver bullet" available for Eastern Europe. As a consequence, gas supplies to the region will need to be diversified and strengthened in other ways, e.g., by timely development of in-country resources and increased reliance on LNG (although also imported).

The foregoing discussion suggests some daylight exists between the EU's directives and individual country needs. Indeed, that fact that national energy institutions throughout Europe's gas industries have often followed their own policy goals, or have only slowly adapted to EU objectives, further complicates the local gas business environment vis-à-vis shale gas. For example, while accepting in principle the idea of unbundling gas infrastructure from the commodity itself – a process that the U.S., Canada and the UK have completed – some individual countries have sought to retain national control over local gas commodity and infrastructure chains. Some have continued to foster national gas 'champion' companies that have phased in third-party access (TPA) only in measured steps over many years, if at all.

For example, were TPA in effect on Poland's pipelines, they could offer shale producers (and any other indigenous gas suppliers) a broadened market reach that might stimulate and, indeed, accelerate development, all other things equal. Moreover, the air quality, low carbon, and other environmental benefits of natural gas tend to be subsumed in countries that must, instead, encourage economic growth as a priority, particularly in Eastern Europe. Countering this, almost all countries of the region (except the Czech Republic and Hungary) have a negative trade balance in goods, thus they see in local gas production an opportunity to reduce significant expenses on purchasing imported supplies. Finally, expansion of gas transportation infrastructure in Eastern Europe is complicated by risks relating to market uncertainties, ownership/financing, and permitting complexities, e.g., we note continuing difficulties in advancing the inter-Baltic "Amber" pipeline proposed by Poland.

Moving Forward in the Fields – Issues and Barriers

The uncertainty surrounding prospects for shale gas in the Eastern Europe and complex political environment suggest that, for the time being, shale gas development must proceed largely on a basis of

private investment, e.g., venture capital funds. Poland constitutes a notable exception. Its government actively supports shale E&D investments of domestic petroleum companies such as PGNiG, Orlen, and Lotos. Although these firms possess sufficient cash flow to sustain shale gas drilling, their financial position is far from that of major producers, thus they must operate conservatively as they are unable to diversify the risk of potential failure. This has kept domestic programs relatively modest, e.g., Natural Gas Europe (2011) reports that Orlen will drill only six shale gas test wells through 2013 at the total cost of \$150 million.

The presence of foreign venture capital has enabled some drilling programs to proceed in Poland, especially where risks of E&D in Poland may be offset by North American operations. For example, the Quantum Fund associated with Hungarian-born financier George Soros has invested about \$100 million in San Leon Energy and BNK Petroleum specifically for these North American companies' shale gas projects in Poland. While beneficial, such involvement alone is insufficient for wide-scale E&D as Quantum Fund's total placement appears adequate to drill about no more than a half dozen wells (at costs comparable to Orlen's).

High E&D costs are of general concern for the region. Sikora (2011) finds the low intensity of drilling to be the key factor driving the average cost of gas extraction services in Poland up to 3-4 times higher than in North America. The problem is not necessarily caused by any challenging local business climate in Poland, but relates more to the fact that a host of shale gas-related technologies are continuing to evolve rapidly and change greatly in North America, despite its relatively advanced shale gas drilling industry. Indeed, North American shale drilling expertise is not necessarily portable from one field in to another in the U.S. and Canada, let alone to Eastern European geological formations. Instead, techniques must be carefully adapted to individual fields and circumstances.

Beyond the foregoing technology transfer questions, natural gas demand and contracting uncertainties pose yet another challenge to Eastern European shale gas development. Since producers cannot yet determine their costs of shale gas E&D and production levels, they will undoubtedly need some form of price and volume assurance. In European gas markets, these are normally arranged through long-term take-or-pay contracts, with prices indexed to petroleum products. Yet the European market is evolving at present, with a counter-play of contract and spot traded markets, which tend to intersect from time to time. Uncertain demand for natural gas (current EU forecasts differ radically) and a surfeit of already-contracted volumes undermine the ability of buyers to enter into new long-term gas sales agreements.

In addition, the outlook for European gas prices is uncertain, with volatility increasing through the interaction of spot and contract markets, as one market, then the other, sets prices. First, in pursuit of supply diversity, the EU-27 has increased its LNG imports from 12.8 million tons per annum (mtpa) in 2002 to 56.2 mtpa in 2010 (UNSD, 2011). The growth in LNG imports, coupled with decreased demand for natural gas during the recession of 2008-9, led to a decrease in the average European price of gas from \$563 per thousand cubic meters (103m³) in October 2008 to \$236 per 103 m³ in July 2009. Then, as the economy improved, contract pricing resumed its leadership and the average had moved back to \$403 per 103 m³ by October 2011 (World Bank, 2011).

The contract pricing of incumbent gas sellers into the region, particularly of Gazprom as key supplier, represent another unknown to shale producers. Vysotsky (2010) claims that Gazprom's national exit border netback price is no more than around \$100 per 103 m³, or \$2.83 per MMBtu, which is below the current Henry Hub price of about \$3.08 per MMBtu (ICE, for December 14, 2011 trades). It is likely that Eastern Europe's nascent shale gas producers will require market prices in excess of this level. Alternative gas pipeline projects have been proposed for the region, but these do not appear to be forthcoming, although interest within the region in securing LNG imports remains high. Eastern Europe has not constructed new gas pipelines since the collapse of the Soviet bloc, apart from interconnectors designed to facilitate the transit of natural gas from Russia to Western Europe. Even if shale gas producers will get access to existing pipelines, therefore, these may be in need of major repair.

A final issue is one of infrastructure development. Funds are needed to construct roads and other infrastructure necessary for shale gas development, but some local governments may consider these too costly to finance internally.

European Priorities and Shale Gas Development

On the positive side of the ledger, the EC maintains several programs that may potentially benefit shale gas development. First, reducing greenhouse gases (GHG) emissions is an EU priority that can boost demand in Eastern Europe, even if countervailing priorities reduce demand elsewhere, e.g., subsidies to renewables. For example, according to World Bank (2011) Poland generated 88 percent of its

electricity from coal in 2010. Switching Polish power plants to natural gas, a cleaner fuel that accounted for 3 percent of total electricity generation in 2010, would reduce EU-wide GHG emissions, the target on which the EC sets a firm limit of 20 percent of 1990 levels by 2020. This approach requires that the EC concludes an assessment of the GHG footprint of shale gas development, a process that has been slow, even if it could be expedited if the U.S. and Canadian governments combine efforts with the EC regulators. At the moment, the uncertainty surrounding environmental consequences of hydraulic fracturing prompts certain countries to accept “do-it-alone” approach.

The costs of shale gas shipping can be reduced if the EU’s Priority Interconnection Plan were to take into consideration potential new plays. The plan envisions the construction of pipelines necessary to link together national gas transmission networks for the reason of energy security. The construction of a trans-European pipeline along lines of the proposed “Germany-Poland-Baltic” system, listed as one of the plan’s priorities could potentially be routed to connect shale fields in Poland to the German gas market. Since the funds for construction come from the European investment banks (EIB and EBRD), it is essential to prove commercial shale gas reserves in northern Poland before the pipeline may be considered investment grade and thereby merit the needed loans.

Yet, the most helpful impetus for shale gas projects in Eastern Europe may come from the resolution of uncertainties hindering its prospects. Different stakeholders in the projects read the situation differently and, sometimes, in the way that impedes their cooperation. For example, regional governments have expectations that the shale gas development will address a host of issues unrelated to their commercial use, ranging from plugging the holes in local budgets, to meeting environmental goals, to advancing contract negotiations with Gazprom. Unsurprisingly, players often prefer to hold their cards close to the chest in light of competition, emerging regulations and market volatility. Instead, frank consultations among current and prospective suppliers, buyers and local regulators, followed with firm guarantees confirmed by international agreements, may be the more promising avenue.

Further, the involvement of independent intermediaries could help stakeholders, be they governments, producers, or local communities, follow the agreed rules of the game. For example, the U.S. sponsors the Global Shale Gas Initiative with the goal of facilitating transfer of shale gas technologies and thereby fostering commercial opportunities for American firms operating in the region. The Initiative does this by aiding national governments with technical expertise and regulatory standards that are consistent with U.S. experience already tested in shale plays, and sharing timely knowledge as it evolves. Beyond this, EU Agency for the Cooperation of Energy Regulators and the EU of the Natural Gas Industry (Eurogas) can bring technology and financial parties to the table, as well as provide preliminary peer review of national shale gas regulations. Going forward, Eurogas would then be in a position to prevent future misunderstandings, and arbitrate if conflicts between producers and authorities arise. On the side of suppliers, Gazprom can usefully participate by contributing to mutual understanding of future changes in market value affected by uncertainty surrounding shale gas prospects in Eastern Europe.

End Note

The future of shale gas development in Eastern Europe remains promising but uncertain. Shale gas production may remain on the fringes of the region’s energy sector, perhaps complementing regional fuel balances, or it may become a major factor in supplying energy to the EU, as has taken place in North America. Either way, timely resolution of the kinds of risks and uncertainties discussed in this paper is important for each player in the Eastern European natural gas market as, frankly, few can benefit from the status quo.

Footnotes

¹ The absence of log data may explain why reserves for central and southern parts of the region (from Slovakia and Hungary to Serbia and Bulgaria) have not been evaluated.

² For example, Naftna Industrija Srbije (NIS), a subsidiary of Russia’s GazpromNeft, prepares for shale gas exploration in western Romania.

³ Ukraine is not a member of the EU.

⁴ See Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.

⁵ Hsieh (2011) reports that only five land rigs available in Poland can be used to drill deep shale gas wells.

⁶ For example, the Polish government has abandoned the idea to introduce the shale gas development as “a common European project” fearing delays associated with the EC regulatory hearings.

References

Natural Gas Europe (2011). *Moving to Diversify: Orlen Starts Shale Gas Drilling*, October 24th, accessed December 15, 2011 at <http://www.naturalgaseurope.com/orlen-commences-shale-gas-drilling-as-a-step-to-diversification-3170>.

Hsieh, Linda (2011). "European shale gas: a long road ahead", *Drilling Contractor Magazine*, July/August.

Sikora, Andrzej (2011). "Developing a Competitive Service Industry in Europe", presentation at the *Global Shale Gas Plays Forum*, Krakow, Poland, September 7-9.

UNSD (United Nations Statistics Division, 2011). *COMTRADE database*, accessed November 13, 2011 at <http://comtrade.un.org/db/dqQuickQuery.aspx>

Vysotsky, Vladimir (2010). *How Can the Development of Shale Gas Affect the Global Energy Market?*, online release by Gazprom dated May 13, accessed December 15, 2011 at <http://gazprom.ru/press/comments/428290/>, (in Russian).

World Bank (2011). *Global Economic Monitor (GEM) Commodities*, accessed November 15, 2011 at <http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1175>

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