COMMUNITY POSTS

Thursday, 13 January 2011

The economic implications for Europe of the shale gas revolution

13/01/2011

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Will the success of the "shale gas revolution" in the U.S signal the end of Europe's reliance on piped gas? Andrey Konoplyanik doubts so and explains why the domestic production of shale gas in Europe is unlikely to be as simple and effective as it was in the U.S

In the past year developments in unconventional gas, particularly shale gas have been received with much enthusiasm. Most commentators depict rosy prospects in the near future for gas consumers, especially in European countries – major consumers and importers of natural gas – which will be able to produce cheaply, in huge volumes their own, domestic shale gas which will replace for many European states expensive imported pipeline gas. Alternatively, this could lead to intensive growth of competition between producing states of traditional pipeline gas (Russia, Norway, Algeria) and LNG (Qatar, Algeria, Nigeria, Oman, Trinidad & Tobago) destined for export markets in Europe and Asia, since both regions will be increasingly supplied by their own domestic shale gas. The predicted result will be downward pressure on gas prices benefiting the consumer, leading to further expansion of short-term and spot trade and futures pricing and development of liquid hubs. Finally, gas market liberalisation using the Anglo-Saxon model of open, competitive, a liquid gas market will be established in continental Europe backed up by the Third EU Energy package.

The conclusion to this situation is that facing increased competition for the European export market; Russia/Gazprom will loose and give up part of its market share, because formulae-based oil-indexed pricing within Gazprom's long-term gas export contracts (LTGEC) is very clumsy. In result, gas consumers will shift from current high Gazprom's prices and inflexible contracts to LNG with its current low spot prices and more flexible contractual structures. Of course, European consumers will prefer to use their own shale gas rather than import pipeline gas from Russia. The European gas market will benefit from cheap gas (local shale gas plus imported LNG) and less dependence on Russian gas, which some Western experts consider as a major threat to European energy security since Russia-Ukraine gas crises of January 2006 and 2009.

Although this optimistic view reflects mostly Western vision of the current situation of the European gas market will future development will follow the above-pictured scenario?

The recent rapid increase in U.S shale gas production needs to be considered as one of three major interrelated factors influencing current international gas markets development. The other factors are the global economic recession and LNG developments. The U.S shale gas development was the starting token in a "domino effect" for the European gas market, which will have political consequences for all parties within cross-border gas value chains destined for Europe. The indirect consequences for Europe from shale gas development, in my opinion, will considerably exceed direct prospective input of shale gas into European energy balance.

Prior to global economic crisis, the U.S experienced a boom in unconventional gas production. But the global recession has reduced gas consumption. The decreased demand for gas with the simultaneous growth of domestic supply of shale gas has diminished U.S demand for imported LNG to zero. As a result, LNG supplies within the Atlantic basin that were earlier destined for the US market, were re-oriented to Europe where demand has also diminished due to the global crisis. This resulted in over supply of gas in Europe. The radical difference between Europe and the U.S, though, is that in the U.S imported LNG was competing with domestic shale gas - and has lost its market share. While in Europe, additional volumes of imported LNG began to compete with pipeline gas mostly from Russia, Norway and Algeria. In the currently oversupplied European gas market, LNG has its competitive advantage in flexibility over pipeline gas under LTGEC with oil-indexed pricing.

EU-oriented LNG supplies came mostly from rather new projects in the Atlantic basin and Middle East (in Qatar, Nigeria, Oman, etc.) which were recently started under "project financing" terms, which means – developed mostly by debt capital. This is why LNG suppliers from such projects have to market their gas by any means in order to pay back recent debt-financed project investments and to return their project-related debts to the lenders. This is why spot LNG suppliers are ready and quick to undertake a sharp price decreases to capture and/or expand their market share. While pipeline gas suppliers on LTGEC terms recalculates price-levels within existing formulas usually once in a quarter and can change/adapt pricing formulae only in result of bi-lateral agreements based on negotiations between supplier and purchaser. This requires time and within this time-lag contract prices for pipeline gas stayed higher than spot prices for LNG.

In these circumstances, buyers of pipeline gas diminish their purchased volumes to minimal contractual take-and/or-pay (TOP) obligations and require that suppliers either further formally downgrade the TOP limit, or allow them to buy below minimal TOP obligations without contractual sanctions. Alternatively, they can review contract formulae and index it to spot quotations in longer term, to deviate from oil indexation. Other options requires some other actions that diminish contract prices for pipeline gas in LTGEC to the current level of spot prices. Adaptability to the changing market environment of LTGEC is objectively lower than of short-term and spot contracts. This has resulted in partial loss by Gazprom of its current gas market share in Europe. Whether this loss will be temporary or not depends on Gazprom itself.

The current state of the European gas market can be characterized as a "crisis situation" and as a "transition situation" to a new market structure. Under these circumstances, a number of optimistic publications for European customers have appeared which extrapolate the current "crisis" in the gas market to "post-crisis" period. They extend to the "post-crisis" period current "crisis" characteristics of price competition (which was recently lost by Gazprom) between its slowly adapted pipelines LTGEC gas prices and heavily dumped prices of spot LNG.

The U.S boom in shale and other non-conventional gas production, prior to global economic crisis, when the costs were decreasing and prices were increasing, resulted in an improved return on investments. Technological achievements in horizontal drilling, 3-D seismic and hydro-cracking made it possible to achieve a downward learning curve effect in exploration and production costs of shale gas. Growing international oil and gas prices since the beginning of this decade have proved increasing return on investments in these projects and stipulated inflow of capital to this industry in the U.S. Moreover, growing prices compensated for mistakes due to lack of experience when the U.S was building its shale gas industry. Therefore, it is important to remember that the most capital-intensive phase of financing and start of production of major shale gas development projects in the U.S took place in a pre-crisis economic environment, which is a very different circumstance from the current economic situation in Europe. To quote Katinka Barysch from the Center for European Reform "in Europe, unconventional gas is not a game changer. Unconventional gas will most likely develop in Europe, but a repeat of the U.S shale gas boom is doubtful."

The state of geological exploration for shale gas in Europe is much poorer than it is in the U.S. Much of U.S shale gas has status of reserves, which are at least technically recoverable. While in Europe, shale gas is still, at best, potential prospective, speculative resources or potential unconventional gas reservoirs. Only drilling can prove whether shale gas is there. The number of onshore drilling rigs in Europe is much less (about 50-70) than in the U.S (exceeding 2000). Qualified personnel not available yet in Europe are also needed in adequate quantities. This big discrepancy could prove crucial as shale needs continuous drilling to maintain production flows because each individual well tends to start with a gush and then loses 70 to 90% of its volume within one to two years. According to Shell, in some EU areas, geology is more complex and formations are not as thick as in the U.S, which adds to difficulties for exploration.

Only now that the shale gas boom is in full swing environmental concerns are being addressed in the U.S. In contrast, in Europe, exploration has started with these concerns already being widely discussed, based on mistakes and problems experienced in the U.S. As well as the fact that shale gas exploration in Europe is in development after BP oil spill in the Mexican Gulf which has increased environmental concerns worldwide. Europe has been much more concerned about the environment in principle than the U.S as reflects different attitude of the EU and the U.S to Kyoto Protocol. Therefore, it will be much more difficult in Europe to address environmental regulations, than it was in the U.S, and to receive all the necessary permissions. Cession of land for shale gas development would also be much bigger problem in Europe.

In the U.S, mineral rights belong to the owner of the land, while in Europe it is the state, which is the owner of the subsoil. Therefore, in the U.S shale gas development is much more socially acceptable since landowners make money from the minerals rights they own. In Europe, shale gas development might face local opposition since people might feel the downside of such industrial development is more than the benefits. These less favourable factors mean that shale gas in Europe will take longer and be more costly than in the U.S so direct effects of shale gas would be most probably rather modest in Europe. Nevertheless, regardless of shale gas developments in Europe, the boom in the U.S has already changed the global gas market. These market changes could be irreversible for non-European gas suppliers, including the Russian Gazprom. Therefore, it is the indirect effects from shale gas development that, from my view, matter more in Europe, rather than a precedent of its domestic production.

As the late Egor Gaidar used to say, "Reforms are usually made not when there is time and money for them available, but when it is not further possible to escape them". Shale gas phenomenon in the US has stipulated a "domino effect" leading to

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order to maintain its competitive long-term market share in Europe.
Although is also another possibility that when supply and demand balance again, post-crisis, in the European gas market, the regular, timely and effective adaptation of Gazprom's LTGECs and their pricing mechanisms to evolving realities of international gas markets will become a permanent and irreversible element of Gazprom's export policy. In that case, the above-mentioned alarmist scenario of potential loss by Russian gas of its market share in international gas markets will, most probably, never materialize.But that depends mostly on Russia/Gazprom itself.
In conclusion: in my opinion, shale gas is not a competitor to Russian gas, but rather a stimulator of Gazprom's export pricing reform.

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